

The scanned images of the 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 collected by SGA Storia Geofisica Ambiente (Bologna) on behalf of the Istituto Nazionale di Geofisica e Vulcanologia (Rome), in the frame of the EUROSEISMOS project.

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**The International  
Seismological Summary.  
1953 April, May, June.**

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**INTERNATIONAL GEODETIC AND GEOPHYSICAL UNION.  
ASSOCIATION OF SEISMOLOGY.  
FORMERLY THE BULLETIN OF  
THE BRITISH ASSOCIATION SEISMOLOGY COMMITTEE.**

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The second quarter for 1953 contains 111 epicentres, 85 of which are repetitions from previously adopted epicentres, 43 have been attributed to abnormal focal depth.

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The Director of the I.S.S. wishes to express his thanks to U.N.E.S.C.O. and H.M. Treasury for financial support, which has covered the cost and preparation of this volume. Special thanks are due to the Director of the Royal Meteorological Office and to the Director of Kew Observatory for housing the project free of cost and for providing administrative help.

The Director is also grateful to the International Association of Seismology and the Physics of the Earth's Interior, and to the Government of Canada for their contributions to the finances of the project.

February, 1961.

**KEW OBSERVATORY,  
Richmond,  
SURREY.**

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1953 APRIL, MAY, JUNE.

April 1d. 0h. 37m. Pamir region. Epicentre 38°·5N. 70°·6E.  
Bulletin of Seismo. Stations of U.S.S.R, April-June, 1953, Moscow, 1954, p. 58.

April 1d. 1h. 47m. 34s. Epicentre 40°·0N. 27°·3E. (as on 1953, March 26d.).

Intensity IV in Samothrace; III in Lesbos and Chios.  
Suggested epicentres: 40°·1N. 27°·3E. (Strasbourg).  
40°·2N. 29°·0E. (U.S.C.G.S.).

A. Galanopoulos.  
Seismological Institute Bulletin, 1953, Athens, 1954, p. 47.  
Bulletin séismique mensuel d'Istanbul, April, 1953.

A = +·6826, B = +·3523, C = +·6402; δ = -9; h = -2;  
D = +·459, E = -·889; G = +·569, H = +·294, K = -·768.

		Δ	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Istanbul		1·7	51	i 0 30	- 1	i 0 53	- 1	—	—
Athens		3·4	235	e 0 55	0	i 1 33	- 4	i 1 52	S <sub>g</sub>
Sofia		4·0	313	1 5	+ 1	1 55	+ 3	2 16	S <sub>g</sub>
Bucharest		4·5	349	e 1 12	+ 1	i 2 14	- 4*	e 1 16	P*
Belgrade		7·0	316	i 1 45 <sub>a</sub>	- 1	e 3 34	+ 2*	e 2 4	P*
Timisoara		7·3	324	e 1 51	+ 1	i 4 3	+ 2 <sub>g</sub>	e 3 44	S*
Szeged	E.	8·2	322	2 4	+ 1	e 4 36	+ 5 <sub>g</sub>	e 4 13	S*
Kecskemet	N.	8·8	324	—	—	e 4 12	?	4 44	S <sub>g</sub>
Kalossa		8·9	320	2 11	- 1	e 3 44	-11	e 4 33	S*
Ksara		9·2	129	i 2 21	+ 5	i 4 16	SS	—	e 5·0
Messina	z.	9·3	263	e 2 20	+ 3	i 4 0	- 5	e 2 27	PP
Budapest		9·6	324	e 2 26	+ 5	e 4 52	+ 3*	e 5 14	S <sub>g</sub>
Ogyalla		10·3	323	e 2 41	PP	e 5 29	S <sub>g</sub>	e 3 34	?
Skalnate Pleso		10·5	333	e 2 59	PPP	e 5 41	S <sub>g</sub>	—	e 5·9
Helwan		10·7	161	e 2 33	- 5	e 4 28	-11	e 2 50	PP
Rome		11·4	284	e 3 25	?	e 5 25	SSS	e 4 25	?
Triest		11·5	304	e 2 48	0	e 5 2	+ 3	i 6 4	Q
Raciborzu		12·0	331	e 2 54	- 1	e 5 19	+ 8	e 3 9	PPP
Florence		12·6	293	e 3 20	PPP	e 5 26?	0	—	—
Prato		12·7	293	e 4 12	?	e 5 52	SS	—	—
Prague		13·6	322	e 3 23	+ 6	i 6 2	+12	i 3 34	PP
Cheb		14·6	319	e 3 34	+ 4	e 6 23	+10	e 6 40	SS
Collmberg		15·1	323	e 3 38	+ 2	e 6 7	-18	e 3 56	PPP
Oropa		15·3	298	e 3 21	-18	—	—	—	—
Zürich		15·4	305	e 3 43	+ 3	e 6 49	SS	—	—
Jena		15·5	320	e 3 42	0	e 6 56?	SS	e 3 49	PP
Stuttgart		15·6	310	e 3 43?	0	e 6 56	SS	e 3 47	P
Basle		16·1	304	e 3 54	+ 5	e 16 21	ScS	e 8 44	PcP
Karlsruhe	z.	16·2	310	e 3 48 <sub>k</sub>	- 2	—	—	e 3 55	?
Strasbourg		16·4	308	i 3 59	+ 6	e 4 16	PP	i 4 26	PPP
Besançon		17·0	302	e 4 16	PP	e 4 30	PPP	e 4 41	?
Clermont-Ferrand		18·6	296	e 4 28	+ 7	—	—	—	—
Algiers Univ.	z.	19·3	268	e 4 27	- 2	e 4 45	PP	e 4 55	PPP
Uccle	E.	19·3	311	—	—	e 8 8	+ 6	—	e 10·4
Chambon-la-Forêt		19·7	303	e 4 35	+ 1	—	—	—	—
Paris		19·7	304	e 4 34	0	—	—	e 4 59	PPP
Upsala		20·8	345	i 4 45	0	i 4 58	PP	e 7 58	?
Alicante		21·6	275	4 45	- 9	8 31	-18	5 18	PPP
Kew		22·3	311	—	—	e 9 15	+13	—	—
Tamanrasset	z.	25·2	235	e 5 30	+ 1	e 9 54	+ 2	e 6 21	PPP
Rathfarnham C.	z.	26·3	312	e 5 42	+ 3	—	—	—	—
Kiruna		28·1	356	e 5 54	- 1	e 10 42	+ 2	e 16 37	ScS
Quetta	z.	33·7	93	e 6 43	- 2	—	—	—	—
Scoresby Sund		39·5	336	e 7 38	+ 4	—	—	—	—
College		75·4	358	e 11 45	- 2	—	—	—	—
Hungry Horse		85·6	336	i 12 41	0	—	—	—	—
Fayetteville	z.	87·1	317	i 12 48	- 1	—	—	—	—

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April 1d. 7h. 31m. Peleponese. Epicentre 36°·7N. 21°·8E. (Strasbourg).  
Felt in the region of Messina (Intensity IV at Methoni and Charakopion; III at Ky-parissia and Kalamae).

A. Galanopoulos.

Seismological Institute Bulletin, 1953, Athens, 1954, pp. 47-48.

April 1d. 7h. 39m. Off the south coast of Java.

Recorded as far away as North America. Intensity V at Sidareja, according to Djakarta.

Suggested epicentres: 9°S. 107°·5E. (Strasbourg).

9°·5S. 108°·5E., depth 70km. (U.S.S.R.).

9°S. 109°·5E. (Shillong).

Annales de l'Institut de Physique du Globe, Strasbourg, pt. II, 1953, Strasbourg, 1959, p. 32.

April 1d. 10h. 49m. 42s. (i) } Epicentre 0°·5S. 80°·8W.  
11h. 21m. 24s. (ii) } (as on 1950, May 28d.).

A = +·1599, B = -·9871, C = -·0087; δ = +1; h = +7;  
D = -·987, E = -·160; G = -·001, H = +·009, K = -1·000.

	Δ	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
I Chinchina	7·5	43	i 2 9	- 2*	i 3 44	- 3*	—	—
II	7·5	43	i 2 7	- 4*	i 3 40	- 7*	—	—
I Bogota	8·4	53	e 2 4	- 2	i 3 54	+11	i 2 11	?
II	8·4	53	i 2 11	+ 5	i 3 50	+ 7	—	—
I Galerazamba	12·5	26	i 3 23	PPP	i 5 10	-13	i 5 50	SSS
II	12·5	26	i 2 41	-21	—	—	i 5 53	SSS
I Huancayo	12·7	155	e 3 8	+ 3	e 5 27	- 1	i 3 31	PPP
II	12·7	155	i 3 7	+ 2	i 5 25	- 3	i 3 17	PP
I Kingston	18·8	12	e 5 3	?	—	—	—	—
II	18·8	12	e 4 48	PP	—	—	—	—
I La Paz	20·2	142	i 4 42	+ 3	i 8 44	SS	i 5 11	PPP
II	20·2	142	i 4 41	+ 2	i 8 31	+10	i 5 8	PPP
I Merida	23·0	339	e 4 54	-13	e 9 29	+15	e 10 20	SSS
II	23·0	339	e 4 54	-13	—	—	e 5 15	?
I San Juan	23·7	37	i 5 11	- 3	—	—	5 50	PP
II	23·7	37	i 5 11	- 3	i 9 27	0	—	—
I Fort de France	24·6	52	i 5 24	+ 1	i 9 45	+ 3	—	—
II	24·6	52	i 5 17	- 6	i 9 41	- 1	8 57	PcP
I Vera Cruz	24·7	324	e 5 34	+10	—	—	—	—
II	24·7	324	e 5 57	PP	—	—	—	e 17·0
I Tacubaya	26·8	320	e 5 32	-12	e 10 25	+ 6	e 9 45	?
II	26·8	320	e 5 30	-14	—	—	—	—
I Bermuda	36·1	24	—	—	e 12 42	- 3	e 15 22	SS
II	36·1	24	—	—	e 12 45	0	e 15 20	SS
I Fayetteville	z. 38·5	344	i 7 22	- 4	—	—	—	—
II	z. 38·5	344	i 7 22	- 4	—	—	i 7 40	?
I Lubbock	39·3	333	7 34	+ 2	—	—	—	—
II	39·3	333	7 35	+ 3	—	—	—	—
I Washington	39·4	5	e 7 27	- 6	—	—	—	—
II	39·4	5	e 7 28	- 5	—	—	i 7 37	PP
I Buenos Aires	39·8	149	e 7 42	+ 6	—	—	—	—
I La Plata	40·3	149	—	—	13 54	+ 5	19 6	Q
II	40·3	149	—	—	14 0	+11	17 18	?
I City College, N.Y.	41·6	9	—	—	e 14 5	- 3	—	—
II	41·6	9	—	—	e 14 5	- 3	—	—
I Fordham	41·6	9	e 9 25	PP	e 13 35	PcS	—	—
I Palisades	41·8	9	i 7 51	- 2	i 14 5	- 6	e 17 11	SS
I Buffalo (Larkin)	43·2	3	e 8 2	- 2	—	—	—	—
II	43·2	3	e 8 5	+ 1	—	—	—	—
I Tucson	43·2	322	e 8 3	- 1	—	—	e 9 56	PcP
II	43·2	322	e 8 7	+ 3	—	—	—	e 21·2
I Weston	43·5	10	i 8 7a	0	e 14 31	- 5	(e 18 8)	ScS
II	43·5	10	i 8 4k	- 3	e 14 32	- 4	(e 17 55)	SS
I Harvard	43·7	10	i 8 7k	- 1	—	—	—	—
II	43·7	10	i 8 4k	- 4	e 14 33	- 6	—	—
I Ottawa	45·9	5	e 8 21	- 5	15 0	-11	10 11	PP
II	45·9	5	e 8 21	- 5	15 2	- 9	10 11	PP

Continued on next page.



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		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
II Shawinigan Falls	N.	47.4	8	e 8 52	+14	—	—	—	—
I Halifax		47.5	17	—	—	e 15 34	0	18 30	ScS 24.0
II		47.5	17	—	—	e 15 24	-10	18 12	ScS 24.1
I Palomar	Z.	47.8	318	i 8 41	0	i 8 54	?	i 9 31	?
II	Z.	47.8	318	i 8 41	0	e 8 54	?	e 9 18	?
I Nelson		48.0	323	i 8 41	-2	i 9 14	?	i 9 38	?
II		48.0	323	i 8 42	-1	i 9 13	?	i 9 41	?
I Boulder City		48.2	323	e 8 45	+1	—	—	—	—
II		48.2	323	i 8 44	0	—	—	i 8 47	P
I Seven Falls	E.	48.3	9	—	—	e 15 42	-3	e 18 36	ScS 24.1
II	E.	48.3	9	—	—	e 15 36	-9	e 18 36	ScS 24.2
I Kirkland Lake	Z.	48.5	3	e 8 42	-4	—	—	—	—
II		48.5	3	e 8 42	-4	—	—	—	—
I Riverside	Z.	48.5	319	e 8 47	+1	—	—	—	—
II	Z.	48.5	319	i 8 46	0	—	—	e 9 0	?
I Pasadena		49.1	319	i 8 52	+1	i 9 5	?	i 9 23	?
II		49.1	319	i 8 55	+4	i 9 5	?	i 9 43	?
I Tiucmaha	Z.	51.0	321	e 9 7	+1	—	—	—	—
II	Z.	51.0	321	e 9 5	-1	—	—	i 9 37	?
I Fresno	Z.	51.7	321	e 9 11	0	—	—	—	—
II	Z.	51.7	321	e 9 13	+2	—	—	—	—
I Lick	Z.	53.3	320	i 9 25 <sub>a</sub>	+2	—	—	i 9 39	?
II	Z.	53.3	320	e 9 22 <sub>a</sub>	-1	i 10 16	PcP	i 9 26	P
I Reno		53.5	323	e 9 22	-2	e 10 54	?	e 9 26	P
II	Z.	53.5	323	e 9 30 <sub>k</sub>	+6	—	—	—	—
I Berkeley	Z.	54.0	320	e 9 30	+2	—	—	—	—
II	Z.	54.0	320	e 9 30	+2	—	—	—	—
I Butte		54.1	334	e 9 28	-1	—	—	—	—
II		54.1	334	e 9 26	-3	—	—	i 9 30	P
I Mineral	Z.	55.0	323	e 9 35 <sub>k</sub>	0	—	—	i 10 1	?
II	Z.	55.0	323	e 9 34 <sub>k</sub>	-1	e 10 4	?	i 10 20	?
I Shasta	Z.	55.7	323	e 9 54 <sub>a</sub>	+14	—	—	e 10 30	PcP
II	Z.	55.7	323	e 9 41	+1	—	—	e 10 10	?
I Hungry Horse		56.5	335	i 9 44	-2	i 10 17	?	e 40 9	P'P'
II		56.5	335	e 9 43	-3	—	—	—	—
I Victoria		61.1	330	10 21	+3	—	—	—	—
II		61.1	330	10 21	+3	—	—	—	—
I M'Bour		64.8	73	i 10 42	-1	—	—	—	—
II		64.8	73	i 10 39	-4	—	—	e 9 16	?
I Resolute Bay		75.6	356	e 11 43	-5	e 21 18	-11	e 26 3	SS
II		75.6	356	e 11 44	-4	e 20 48	?	—	—
I Malaga		79.4	53	i 12 10	+1	i 22 14	+4	16 17	?
II		79.4	53	i 12 6	-3	—	—	—	—
I Granada		80.1	52	i 12 12 <sub>k</sub>	-1	22 30	ScS	15 48	PP
II		80.1	52	i 12 12 <sub>k</sub>	-1	i 22 19	+1	16 36	?
I Toledo		80.2	50	e 12 11	-3	e 22 14	-5	i 12 14	P
II		80.2	50	i 12 12	-2	e 22 18	-1	—	—
I Scoresby Sund		80.5	17	e 12 14	-1	e 22 19	-3	e 22 29	ScS
II		80.5	17	e 12 15	0	e 22 19	-3	—	—
I Colloge		80.9	337	e 12 13	-4	—	—	i 12 18	P
II		80.9	337	e 12 16	-1	—	—	—	—
I Almeria		81.0	52	12 28	+10	22 36	+9	15 35	PP
II		81.0	52	12 0	-18	22 25	-2	15 24	PP
II Rathfarnham C.z.		81.2	36	e 11 57	-22	—	—	—	—
I Alicante		82.7	51	12 26	-1	e 22 47	+3	15 41	PP
II		82.7	51	12 26	-1	22 47	+3	15 41	PP
I Tortosa		83.7	49	e 12 19	-13	i 23 7	+13	—	—
I Algiers Univ.	Z.	85.4	53	e 12 35	-5	—	—	e 15 45	PP
II		85.4	53	e 12 32	-8	e 23 11	0	e 15 53	PP
II Chambon-la-Forêt		85.7	42	e 12 40	-2	—	—	i 12 49	PcP
I Paris		86.0	41	—	—	i 23 15	-2	—	—
II		86.0	41	e 12 41	-2	e 23 16	-1	e 23 12	SKKS
I Clermont-Ferrand		86.1	44	i 12 43	-1	—	—	—	—
II		86.1	44	i 12 41	-3	—	—	—	—

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		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.	
		°	°	m. s.	s.	m. s.	s.	m. s.	m.	
I Tamanrasset	z.	86.8	67	e 12 44	- 3	e 23 24	- 1	e 23 7	SKS	—
II	z.	86.8	67	e 12 45	- 2	e 16 2	PP	e 17 49	PPP	—
I Besançon		88.2	43	e 12 53	- 1	e 13 31	?	e 13 57	?	—
II		88.2	43	e 13 1	+ 7	e 13 51	?	e 14 40	?	—
I Strasbourg		89.4	41	—	—	e 23 42	- 7	—	—	—
II		89.4	41	—	—	e 23 46	- 3	—	—	—
I Oropa		89.5	44	e 13 17	+17	—	—	—	—	—
I Stuttgart		90.4	41	e 13 2	- 2	—	—	—	—	—
II	z.	90.4	41	e 13 1	- 3	—	—	—	—	—
I Florence		91.8	46	e 13 11	0	e 24 28	+17	i 25 30	PS	—
I Collmberg	z.	92.8	39	e 13 15	- 1	—	—	—	—	—
I Rome		92.8	48	e 13 16	0	e 24 31	+12	e 30 46	SSP	—
I Cheb		93.3	40	e 21 15	?	e 24 9	{+ 3}	e 26 15	PPS	—
II		93.3	40	e 22 49	?	e 23 47	[- 5]	e 24 32	S	—
I Kiruna		94.7	22	i 13 32	+ 8	e 24 34	- 2	e 24 2	SKS	e 44.3
II	z.	94.7	22	e 13 19	- 5	—	—	—	—	—
I Messina		95.3	52	e 14 9	?	e 23 59	[- 4]	e 25 54	PS	—
I Taranto		96.5	50	e 22 57	?	e 29 27	?	—	—	e 36.3
I Belgrade		98.3	45	e 20 45	?	e 21 28	?	e 22 2	?	—
I Sofia		100.7	47	e 18 55	?	—	—	—	—	—
I Bucharest		102.4	45	e 19 0	?	e 19 39	?	e 19 46	?	—
I Helwan	z.	109.4	59	e 20 4	?	—	—	e 20 15	?	—
I Ksara		112.3	53	i 20 36	?	e 28 22	PS	—	—	—
I Riverview		120.5	230	—	—	e 30 34	PS	e 37 37	SSP	e 59.3
II Brisbane		121.4	238	—	—	e 32 6	PPS	—	—	e 63.9
II Quetta	z.	137.5	43	e 19 26?	[ 0]	e 26 39	[+ 4]	i 22 7	PP	—
I Poona	z.	149.3	53	19 48	[+ 2]	—	—	—	—	—
II	z.	149.3	53	i 19 50	[+ 4]	—	—	—	—	—
I Chatra		151.4	23	e 19 49	[- 1]	—	—	—	—	e 93.3
II		151.4	23	e 19 49	[- 1]	—	—	—	—	e 93.6

April 1d. 18h. 11m. 25s. Epicentre 29°·0N. 142°·0E. Focus at Base of Superficial Layers. (as on 1952, Sept. 28d.).

Intensity IV at Torisima. Epicentre 30°·0N. 142°·8E. Depth 80km. Seismo. Bull. Cent. Met. Obs., Japan, April, 1953, Tokyo, 1953, pp.9-10.

A = -·6903, B = +·5393, C = +·4823;  $\delta = -3$ ;  $h = +2$ ;  
D = +·616, E = +·788; G = -·380, H = +·297, K = -·876.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Torisima		2.1	315	0 37	+ 4	1 1	+ 2	—	—
Hatidyozima		4.5	336	e 1 12	+ 4	—	—	—	—
Mera		6.2	343	1 35	+ 3	—	—	—	—
Osima		6.2	340	1 33	+ 1	2 37	- 5	—	—
Omaesaki		6.4	331	e 1 48	+14	2 51	+ 4	—	—
Misima		6.6	338	e 1 41	+ 4	2 57	+ 5	—	—
Shizuoka		6.7	334	e 1 45	+ 6	3 8	+13	—	—
Yokohama		6.7	343	1 41	+ 2	2 53	- 2	—	—
Tokyo	N.	6.9	345	1 44	+ 3	2 56	- 4	—	—
Hunatu		7.0	338	e 1 46	+ 3	—	—	—	—
Kashiwa		7.0	346	1 50	+ 7	3 5	+ 3	—	—
Kohu		7.2	337	e 1 49	+ 3	3 13	+ 6	—	—
Iida		7.4	333	e 1 54	+ 6	3 18	+ 6	—	—
Titibu		7.4	341	i 1 51	+ 3	3 11	- 1	—	—
Kameyama		7.5	323	1 58	+ 8	3 15	0	—	—
Kumagaya		7.5	344	1 52	+ 2	3 14	- 1	—	—
Mito		7.5	351	1 51	+ 1	3 10	- 5	—	—
Nagoya	N.	7.5	327	e 1 53	+ 3	3 29	+14	—	—
Utunomiya		7.7	347	e 1 55	+ 2	3 15	- 5	—	—
Gihu		7.8	327	e 1 57	+ 3	—	—	—	—

Continued on next page.

The scanned images of the 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 collected by SGA Storia Geofisica Ambiente (Bologna) on behalf of the Istituto Nazionale di Geofisica e Vulcanologia (Rome), in the frame of the EUROSEISMOS project.

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		$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.
		°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.
Maebasi		7.8	342	e 1	55	+ 1	3	19	- 3	—	—	—
Hikone		7.9	324	2	2	+ 7	—	—	—	—	—	—
Matumoto	E.	7.9	336	e 2	0	+ 5	3	35	+10	—	—	—
Oiwake		7.9	339	1	58	+ 3	3	28	+ 3	—	—	—
Osaka		7.9	317	e 2	3	+ 8	—	—	—	—	—	—
Kyoto		8.0	320	2	0	+ 3	3	29	+ 2	—	—	—
Onahama		8.0	354	e 1	56	- 1	3	19	- 8	—	—	—
Kobe		8.1	316	e 2	18	+20	—	—	—	—	—	—
Matsuro	Z.	8.1	338	2	1	+ 3	3	42	+12	—	—	—
Sumoto	N.	8.1	313	e 2	3	+ 5	3	36	+ 6	—	—	—
Shirakawa		8.2	350	e 2	3	+ 3	3	24	- 8	—	—	—
Nagano	N.	8.3	338	e 2	2	+ 1	3	43	+ 8	—	—	—
Takamatu		8.6	310	e 2	12	+ 7	3	50	+ 8	—	—	—
Inawasiro	E.	8.7	350	e 2	7	+ 1	3	37	- 8	—	—	—
Toyama		8.7	334	e 2	13	+ 7	4	5	+20	—	—	—
Hokusima		8.8	352	e 2	7	- 1	3	39	- 8	—	—	—
Niigata	E.	9.2	345	e 1	54	-19	3	26	-31	—	—	—
Sendai		9.3	355	e 2	12	- 3	3	49	-10	—	—	—
Ooita		9.8	298	e 2	30	+ 8	—	—	—	—	—	—
Mizusawa	E.	10.1	357	2	27	+ 1	4	11	- 8	—	—	—
Kagosima		10.2	287	e 2	41	+14	—	—	—	—	—	—
Miyako	Z.	10.6	0	e 2	28	- 5	4	19	-12	—	—	—
Morioka		10.7	357	e 2	31	- 3	4	26	- 8	—	—	—
Akita		10.8	352	e 2	41	+ 6	4	29	- 7	—	—	—
Saga	N.	10.9	296	2	45	+ 8	—	—	—	—	—	—
Aomori		11.8	356	e 2	49	0	4	55	- 5	—	—	—
Mori		13.1	355	e 3	7	+ 1	—	—	—	—	—	—
Obi-hiro		13.9	3	e 3	23	+ 6	—	—	—	—	—	—
Sapporo		14.0	358	e 3	20	+ 2	6	14	+21	—	—	—
Nemuro		14.6	11	e 3	48	?	5	51	-17	—	—	—
Zô-Sè		18.1	283	e 4	11	+ 1	e 7	39	+11	—	—	—
Nanking		20.2	284	4	34	- 1	8	18	+ 4	—	—	—
Bagnio		23.3	243	i 5	6	0	i 9	26	+14	—	—	—
Chatra		48.1	282	i 8	39	+ 1	—	—	—	—	—	e 30.0
College		55.7	29	i 9	36	+ 1	—	—	—	—	—	—
Poona	Z.	62.5	277	i 10	23	+ 1	—	—	—	—	—	—
Quetta		64.0	292	i 10	32k	0	e 19	4	- 1	—	—	—
Resolute Bay		69.7	14	i 11	11k	+ 3	—	—	—	—	—	—
Victoria		71.7	45	11	20	0	—	—	—	—	—	—
Kiruna	Z.	74.2	340	i 11	36k	+ 1	i 12	20	?	i 11	48	pP
Mineral	Z.	76.3	52	e 11	47a	0	—	—	—	e 11	54	pP
Berkeley	Z.	77.0	54	e 11	51a	0	—	—	—	—	—	—
Hungry Horse		77.4	42	i 11	54	+ 1	—	—	—	—	—	—
Lick	Z.	77.6	54	e 11	55a	+ 1	—	—	—	i 12	26	?
Reno	Z.	77.9	52	e 11	56a	0	—	—	—	—	—	—
Fresno	Z.	79.2	54	i 12	19k	sP	e 12	41	?	e 12	51	?
Butte		79.4	43	i 12	5	+ 1	—	—	—	—	—	—
Scoresby Sund		80.1	355	i 12	9	+ 1	—	—	—	—	—	—
Tinemaha	Z.	80.1	54	i 12	8	0	—	—	—	—	—	—
Upsala	Z.	80.4	335	i 12	9k	- 1	i 12	26	sP	i 12	42	?
China Lake	Z.	81.2	54	i 12	14	0	—	—	—	—	—	—
Pasadena		81.6	56	i 12	16	0	—	—	—	i 12	23	pP
Riverside	Z.	82.3	56	i 12	19	- 1	—	—	—	—	—	—
Palomar	Z.	83.0	56	i 12	23	0	—	—	—	—	—	—
Nelson		83.2	54	i 12	24	0	—	—	—	i 12	29	P
Tucson		87.9	54	e 12	48	+ 1	—	—	—	—	—	—
Collmberg		88.3	331	e 12	49	0	e 16	16	PP	e 16	30	?
Jena		89.2	331	e 12	59	+ 5	e 13	20	?	e 13	50	?
Helwan	Z.	91.7	306	e 13	5	0	e 13	22	sP	—	—	—
Stuttgart		91.8	331	e 13	5	- 1	—	—	—	—	—	—
Fayetteville	Z.	96.4	43	i 13	27a	0	—	—	—	—	—	—
Algiers Univ.	Z.	104.1	326	e 18	21	PP	—	—	—	—	—	—
Alicante		104.4	330	e 18	39	PP	21	57	PKS	—	—	50.7
Tamanrasset	Z.	113.6	316	e 18	37	[+ 2]	e 28	57	PS	e 19	28	PP
Huancayo		141.4	72	e 19	23	[- 5]	—	—	—	—	—	—

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April 1d. 19h. 49m. Epicentre 36°·6N. 71°·4E. Depth 100km.  
Bulletin of Seismo. Stations of U.S.S.R., April-June, 1953, Moscow, 1954, p.58.

April 2d. 3h. 56m. 10s. Epicentre 5°·1S. 151°·3E. Depth of focus 0·005.  
(as on 1952, Dec. 24d.).

A = -·8737, B = +·4784, C = -·0878;  $\delta = -7$ ;  $h = +7$ ;  
D = +·480, E = +·877; G = +·077, H = -·042, K = -·996.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.	
		°	°	m. s.	s.	m. s.	s.	m. s.	m.	
Brisbane		22·4	175	i 4 51	- 3	i 8 52	+ 1	i 5 2	pp	
Riverview		28·6	180	i 5 50 <sub>a</sub>	- 2	i 10 34	0	i 6 9	pP	e 14·0
Melbourne	E.	33·1	189	i 7 52	PPP	i 11 43	- 2	i 13 56	SS	
Baguio		37·1	306	i 7 9 <sub>a</sub>	+ 3	i 12 52	+ 5	i 8 50	PPP	
Apia		37·4	106	e 7 4	- 4	—	—	—	—	
Auckland	N.	38·3	149	i 7 15	- 1	—	—	c 6 19	?	
Karapiro	N.	39·5	150	e 7 23	- 3	—	—	—	—	
Yakusima		40·6	333	e 7 39	+ 4	13 59	+19	e 7 54	pP	
Cobb River	E.	40·7	154	7 33	- 3	—	—	—	—	
Tuai	N.	40·9	149	e 7 30	- 7	—	—	—	—	
Kaimata	N.E.	41·4	158	e 7 44	+ 3	—	—	—	—	
Miyazaki		41·4	334	i 8 2	pP	i 13 58	+ 7	—	—	e 19·4
Wellington		41·7	154	7 40	- 4	e 13 47	- 9	c 10 1	PPP	e 18·8
Koti		41·9	337	e 7 50	+ 4	e 14 23	sS	i 8 6	pP	
Tokyo		42·0	346	e 8 14	+28	e 14 10	+10	e 9 53	PPP	
Ooita		42·4	335	e 7 38	-12	e 13 43	-23	i 8 13	pP	
Takamatu		42·4	339	e 7 53	+ 3	e 14 7	+ 1	—	—	
Perth		42·6	227	8 27	+36	14 10	+ 1	i 17 23	SS	i 20·1
Christchurch		42·7	157	i 7 49 <sub>a</sub>	- 3	(e 17 20)	SS	e 10 6	PPP	e 17·3
Matusiro		43·2	345	8 10	pP	e 14 9	- 9	c 17 10	SS	e 20·4
Hamada		43·7	337	7 46	-14	14 17	- 8	i 8 0	?	e 19·3
Hokusima		43·8	348	8 16	pP	e 14 51	sS	e 17 47	SS	e 21·0
Djakarta		44·3	267	e 8 26	+21	e 14 55	+21	e 10 7	PP	
Mizusawa	E.	45·0	349	7 48	-23	—	—	8 33	pP	
Hong Kong		45·4	308	8 18	+ 4	15 0	+10	8 35	pP	
Zô-Sô		46·0	323	i 8 22 <sub>a</sub>	+ 3	i 15 7	+ 9	i 8 38	pP	
Aomori		46·7	349	e 8 33	+ 9	i 15 46	PPS	i 9 28	?	
Nanking		48·2	322	i 8 39	+ 3	e 15 32	+ 3	i 8 56	pP	
Nemuro		48·5	355	e 9 4	+26	e 15 35	+ 2	—	—	
Sapporo		48·8	350	e 9 2	+21	e 15 38	0	e 16 15	PPS	
Macquarie Is.		49·7	174	e 8 45	- 2	i 8 48	P	—	—	
Honolulu		56·3	60	i 9 34	- 2	e 17 14	- 6	—	—	
Shillong	E.	65·2	301	i 10 38	+ 1	e 19 13	0	11 8	PcP	
Chatra		69·6	301	i 11 6	+ 2	e 20 6	0	11 25	pP	32·8
Hyderabad	E.	75·3	290	e 11 56	pP	e 21 5	- 6	—	—	
Poona		79·8	290	i 12 4	+ 1	e 22 0	+ 1	15 2	PP	
College		82·7	22	i 12 16	- 2	e 22 21	- 8	i 12 32	pP	e 34·0
Quetta		87·6	300	i 12 43	+ 1	i 23 8	[+ 6]	i 13 2	pP	
Berkeley		90·3	52	e 12 55 <sub>k</sub>	0	e 23 20	[+ 1]	i 13 12	pP	e 40·8
Santa Clara	E.	90·5	52	e 23 25	SKS	(e 23 25)	[+ 5]	—	—	e 42·2
Shasta		90·5	49	e 12 56 <sub>a</sub>	0	e 23 22	[+ 2]	i 13 8	pP	
Victoria		90·6	42	12 56	0	—	—	—	—	
Lick	Z.	90·7	52	e 12 57 <sub>a</sub>	0	e 16 33	PP	i 13 18	pP	
Mineral	Z.	91·0	49	e 12 58 <sub>a</sub>	0	i 13 29	sP	i 13 16	pP	
Fresno	Z.	92·1	53	e 13 3	0	e 16 50	PP	e 13 20	pP	
Reno		92·3	50	e 13 5 <sub>k</sub>	+ 1	e 23 35	[+ 5]	e 13 22	pP	
Pasadena		93·2	56	i 13 9	+ 1	i 23 39	[+ 4]	i 13 26	pP	e 42·4
Tinemaha		93·4	53	i 13 10	+ 1	e 23 40	[+ 4]	i 13 26	pP	
China Lake	Z.	93·8	55	i 13 11	0	—	—	i 13 29	pP	
Riverside	Z.	93·9	56	i 13 12	0	—	—	i 13 29	pP	
Palomar	Z.	94·3	57	i 13 15	+ 2	—	—	i 13 31	pP	
Boulder City		96·1	54	i 13 22	0	e 23 58	SKKS	i 13 39	pP	
Nelson		96·1	54	i 13 21	- 1	e 23 57	SKKS	i 13 38	pP	
Hungry Horse		96·9	41	i 13 25	0	e 24 0	SKKS	i 13 42	pP	
Butte		97·9	43	e 13 44	pP	—	—	e 17 42	PP	

Continued on next page.

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	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.	
	$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.	
Tucson	99.3	57	e 13 37	+ 1	e 26 26	PS	e 17 34	PP	e 45.1
Resolute Bay	101.0	15	e 13 44 <sub>a</sub>	0	e 24 12	[- 4]	e 25 50	PS	e 41.3
Lubbock	106.8	56	c 17 56	?	—	—	—	—	—
Kiruna	109.2	342	i 18 23	PKP	e 26 13	S	e 27 51?	SP	e 48.8
Fayetteville	z. 112.7	53	i 18 30	[+ 1]	e 25 14	[+ 7]	e 14 37	P	—
Ksara	113.9	304	e 19 22?	PP	21 59	PPP	i 19 51	pPP	—
Scoresby Sund	114.5	357	18 38	[+ 5]	e 29 10	PS	e 18 54	pPKP	53.8
Upsala	115.1	336	i 18 33	[- 1]	—	—	—	—	e 50.8
Pretoria	z. 116.9	238	i 18 40	[+ 2]	—	—	—	—	—
Istanbul	z. 117.3	313	18 39	[+ 1]	e 19 54	PP	e 20 24	pPP	—
Helwan	118.4	301	18 47	[+ 7]	25 32	[+ 4]	i 18 59	pPKP	—
Kimberley	z. 118.6	234	i 18 41	[+ 1]	—	—	—	—	—
Kirkland Lake	z. 118.8	37	e 18 41	[0]	—	—	e 28 58	PKKP	—
Copenhagen	119.8	334	e 20 38	PP	—	—	—	—	59.8
Raciborzu	z. 120.4	327	e 18 46	[+ 2]	—	—	—	—	—
Cleveland	120.7	43	i 18 44 <sub>a</sub>	[0]	e 24 14	?	e 20 11	PP	—
Potsdam	121.7	331	i 20 46	PP	—	—	e 23 20	PPP	e 59.8
Collmberg	122.4	329	e 18 48	[0]	e 28 43	PKKP	e 19 6	pPKP	—
Ottawa	122.7	37	i 18 48	[0]	25 46	[+ 3]	30 14	PS	—
Jena	123.3	330	e 18 50	[0]	e 20 37	PP	e 19 15	pPKP	—
Cheb	123.4	330	e 20 52	PP	e 25 46	[+ 1]	e 30 40	PS	61.3
Witteveen	z. 124.2	336	i 18 54 <sub>k</sub>	[+ 3]	—	—	i 19 11	pPKP	—
Seven Falls	v. 124.7	33	—	—	27 26	SKKS	37 8	SS	58.0
Triest	125.3	324	e 18 51?	[- 3]	e 30 30	SP	e 31 3	PSKS	62.8
De Bilt	125.4	334	e 20 50	PP	e 30 50?	PS	—	—	e 54.8
Taranto	125.8	316	e 20 53	PP	e 31 3	PS	—	—	—
Stuttgart	125.9	329	e 18 56	[+ 1]	e 32 8	PPS	e 19 14	pPKP	e 63.8
Karlsruhe	z. 126.1	332	e 18 56 <sub>k</sub>	[+ 1]	—	—	e 19 13	pPKP	—
Palisades	126.1	42	e 18 56	[+ 1]	e 27 42	SKKS	e 21 1	PP	e 57.2
Strasbourg	126.7	330	i 18 57	[+ 1]	e 38 2	SS	e 19 15	pPKP	60.8
Uccle	v. 126.7	335	e 31 9	PS	e 38 33	sSS	e 43 1	SSS	e 57.8
Harvard	126.8	38	i 18 58 <sub>a</sub>	[+ 2]	e 38 2	SS	i 19 15	pPKP	e 59.6
Weston	127.0	38	i 18 58 <sub>a</sub>	[+ 1]	e 38 15	SS	i 19 11	pPKP	e 58.8
Zürich	127.1	329	e 18 57 <sub>a</sub>	[0]	—	—	e 19 14	pPKP	—
Bologna	127.4	323	e 19 9	pPKP	e 33 15	?	—	—	—
Basle	127.5	329	e 18 59 <sub>a</sub>	[+ 1]	e 24 16	?	e 20 44	PP	—
Florence	127.8	323	i 18 59 <sub>k</sub>	[+ 1]	i 31 20	PS	i 21 12	PP	—
Messina	128.0	317	i 18 59 <sub>k</sub>	[0]	e 34 3	?	e 21 22	PP	—
Kew	128.1	337	e 34 1	?	e 40 53	?	—	—	e 58.8
Pavia	128.2	326	e 19 10	pPKP	e 31 24	PS	e 21 27	PP	e 61.8
Rome	128.2	321	e 19 1	[+ 2]	e 32 43	PPS	e 21 23	PP	—
Besançon	128.5	331	e 19 1	[+ 1]	e 22 49	PKS	i 19 19	pPKP	—
Oropa	128.5	328	e 19 3	[+ 3]	—	—	—	—	—
Rathfarnham C.	z. 128.5	343	e 31 38	pPS	—	—	—	—	—
Paris	129.0	333	i 19 2	[+ 1]	e 28 11	SKKS	i 19 20	pPKP	e 60.8
Chambon-la-Forêt	129.7	333	i 19 4	[+ 2]	i 19 29	sPKP	i 19 22	pPKP	—
Halifax	130.2	32	e 19 3 <sub>a</sub>	[0]	22 22	SKP	i 19 22	pPKP	—
Huancayo	130.6	111	i 19 7	[+ 3]	i 23 1	PKS	i 19 25	pPKP	—
Clermont-Ferrand	130.9	331	i 19 7	[+ 3]	i 22 26	SKP	e 21 48	pPP	69.8
Buenos Aires	131.6	148	e 20 50	?	—	—	—	—	—
Bogota	134.8	88	e 19 16	[+ 4]	i 22 46	PKS	i 32 48	?	—
La Paz	135.5	120	i 19 16	[+ 3]	i 22 50	PKS	21 52	PP	—
Tortosa	135.8	327	i 19 22	[+ 9]	i 22 40	SKP	—	—	—
Bermuda	136.8	46	e 28 50	PKKP	i 22 45	SKP	e 32 1	SP	e 65.1
Algiers Univ.	z. 137.1	322	e 19 15	[- 1]	e 23 7	PKS	e 19 33	pPKP	—
Alicante	138.1	326	e 19 22	[+ 4]	26 12	[- 8]	22 58	PKS	65.6
Toledo	138.8	330	e 19 22	[+ 3]	e 22 52	PKS	22 20	PP	—
Almeria	140.3	326	19 50	pPKP	27 0	[+ 37]	i 22 50	pPP	69.0
Granada	140.6	327	22 56 <sub>a</sub>	pPP	29 53	SKKS	32 46	SKSP	72.5
San Juan	141.1	66	i 19 19	[- 4]	—	—	e 22 25	PP	—
Malaga	141.4	327	i 19 18	[- 6]	i 22 48	SKP	26 0	PPP	74.8
Tamanrasset	z. 142.6	302	i 19 23 <sub>k</sub>	[- 3]	e 27 6	[+ 39]	e 19 42	pPKP	—
Fort de France	146.7	71	i 19 35	[+ 2]	—	—	i 19 54	pPKP	—
M'Bour	165.2	310	i 19 59	[+ 2]	e 25 0	PP	i 20 17	pPKP	—



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April 2d. 11h. 56m. 29s. Epicentre 37°·6N. 141°·7E. Focus at Base of Superficial Layers. (as on 1952, November 23d.).

Intensity V at Onahama and Hukusima; IV at Sendai, Inawasiro, Mito, Shirakawa, and Tukubasan; II-III at Utunomiya, Miyako, Tyosi, and Tokyo. Epicentre 37°·5N. 141°·5E. Depth 45km.

Seismo. Bull. Cent. Met. Obs., Japan, for April, 1953, Tokyo, 1953, p. 10-11, with macro-seismic chart.

$$A = -.6233, B = +.4923, C = +.6076; \quad \delta = +4; \quad h = -1;$$

$$D = +.620, E = +.785; \quad G = -.477, H = +.377, K = -.794.$$

		$\Delta$ °	Az. °	P.		O-C.		S.		O-C.		Supp.	
				m.	s.	s.		m.	s.	s.	m.	s.	
Isinomaki		0·9	340	0	19	+ 3		0	30	+ 2	—	—	
Onahama		0·9	224	e 0	13 <sub>a</sub>	- 3		0	22	- 6	—	—	
Sendai		0·9	317	0	17 <sub>k</sub>	+ 1		0	28	0	—	—	
Hukusima		1·0	279	i 0	19 <sub>k</sub>	+ 1		0	32	+ 1	—	—	
Yamagata		1·2	302	0	19	- 1		0	31	- 5	—	—	
Inawasiro	E.	1·3	268	e 0	19	- 3		0	34	- 4	—	—	
Shirakawa		1·3	248	0	21 <sub>k</sub>	- 1		0	33	- 5	—	—	
Mito		1·5	219	0	23	- 1		0	39	- 5	—	—	
Mizusawa		1·6	344	0	27	+ 1		0	47	+ 1	—	—	
Utunomiya		1·8	234	e 0	25	- 4		0	44	- 7	—	—	
Sakata		1·9	311	e 0	34	+ 3		0	58	+ 4	—	—	
Tukubasan		1·9	223	0	25	- 6		0	43	-11	—	—	
Tyosi	N.	2·0	200	e 0	34	+ 2		0	53	- 3	—	—	
Miyako	Z.	2·1	6	e 0	34	+ 1		0	56	- 3	—	—	
Morioka		2·1	349	e 0	34	+ 1		0	59	0	—	—	
Niigata	N.	2·1	279	e 0	33	0		0	53	- 6	—	—	
Kashiwa		2·2	219	e 0	37	+ 2		0	58 <sub>?</sub>	- 3	—	—	
Kunagaya		2·4	232	e 0	35	- 3		0	59	- 7	—	—	
Maebasi		2·4	240	e 0	35	- 3		1	2	- 4	—	—	
Akita		2·5	329	e 0	43	+ 4		1	13	+ 4	—	—	
Tokyo		2·5	219	e 0	35	- 4		1	3	- 6	—	—	
Titibu		2·7	233	e 0	38	- 4		1	5	- 9	—	—	
Aikawa		2·8	279	e 0	39	- 4		1	13	- 3	—	—	
Oiwake		2·8	243	0	42	- 1		1	26	+10	—	—	
Takada		2·8	260	e 0	45	+ 2		1	22	+ 6	—	—	
Hatinohe		3·0	357	e 0	46	0		1	28	+ 6	—	—	
Matusiro	Z.	3·0	248	0	42	- 4		1	15	- 7	—	—	
Mera		3·0	209	0	48	+ 2		1	21	- 1	—	—	
Nagano	N.	3·0	252	e 0	44	- 2		1	25	+ 3	—	—	
Hunatu	N.	3·1	228	e 0	49	+ 1		1	22	- 2	—	—	
Kohu		3·1	232	e 0	46	- 2		1	23	- 1	—	—	
Misima	E.	3·2	222	e 0	47	- 2		1	24	- 3	—	—	
Ajiro		3·3	220	e 0	51	0		1	23	- 6	—	—	
Aomori		3·3	348	0	57	+ 6		1	36	+ 7	—	—	
Matumoto		3·3	246	e 0	55	+ 4		1	37	+ 8	—	—	
Osima		3·4	214	e 0	50	- 2		1	26	- 6	—	—	
Iida		3·7	237	e 0	57	+ 1		1	41	+ 2	—	—	
Shizuoka		3·7	226	e 0	56	0		1	36	- 3	—	—	
Toyama		3·7	256	e 1	2	+ 6		1	45	+ 6	—	—	
Wazima		3·8	269	e 0	58	0		1	46	+ 4	—	—	
Hakodate		4·2	350	e 1	9	+ 6		2	4	+12	—	—	
Kanazawa		4·2	256	e 1	11	+ 8		—	—	—	—	—	
Mori	N.	4·5	349	1	10	+ 2		2	5	+ 5	—	—	
Nagoya	E.	4·5	239	e 1	11	+ 3		2	0	0	—	—	
Hukui		4·6	252	e 1	12	+ 3		—	—	—	—	—	
Urakawa		4·6	10	e 1	10	+ 1		2	7	+ 5	—	—	
Hatidyozima		4·8	200	e 1	13	+ 1		2	1	- 6	—	—	
Hikone		4·9	244	1	15	+ 2		—	—	—	—	—	
Tomakomai		4·9	359	e 1	21	+ 8		2	16	+ 6	—	—	
Tsuruga	E.	4·9	249	1	11	- 2		2	9	- 1	—	—	

Continued on next page.

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		$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.	
				m.	s.		m.	s.		m.	s.
Kameyama		5.0	239	e 1	23	+ 8	2	13	+ 1	—	—
Kyoto	E.	5.4	243	e 1	27	+ 7	2	31	+ 9	—	—
Sapporo		5.5	357	e 1	27	+ 5	2	39	+14	—	—
Osaka		5.8	242	e 1	44	+18	2	42	+10	—	—
Takamatu	E.	7.0	244	e 1	34	- 9	3	1	- 1	—	—
Ooita		9.3	245	e 1	45	-30	3	26	-33	—	—
Quetta	Z.	60.9	287	i 10	7	- 5	—	—	—	—	—
China Lake	Z.	76.5	55	e 11	48	0	—	—	—	e 12	3 pP
Riverside	Z.	77.7	57	e 11	54	- 1	—	—	—	—	—
Palomar	Z.	78.4	57	e 11	59	0	—	—	—	—	—
Collmberg		80.7	330	e 12	5	- 6	—	—	—	—	—
Fayetteville	Z.	89.8	42	i 12	57	+ 1	—	—	—	—	—

April 2d. 18h. 59m. Epicentre 37°·7N. 21°·1E. (Strasbourg).

Felt Intensity III at Zakynthos in Island of Zante.

A. Galanopoulos.

Seismological Institute Bulletin, 1953, Athens, 1954, p. 48.

April 2d. 20h. 22m. Epicentre 42°·5S. 173°·4E.

Intensity IV in the Cheviots; I-II at Wellington. Magnitude 5ca.

Seismological Bulletin No. E-132 for April to June, 1953, Wellington, 1955, p. 1.

April 3d. 0h. 7m. Epicentre 38°·6N. 25°·4E. (Strasbourg).

Intensity III at Chios.

A. Galanopoulos.

Seismo. Institute Bulletin for 1953, Athens, 1954, p. 49.

April 3d. 4h. 17m. 47s. Epicentre 21°·0S. 174°·0W. (as on 1952, April 24d.).

$A = -.9293$ ,  $B = -.0977$ ,  $C = -.3563$ ;  $\delta = +9$ ;  $h = +4$ ;

$D = -.105$ ,  $E = +.995$ ;  $G = +.354$ ,  $H = +.037$ ,  $K = -.934$ .

		$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.	
				m.	s.		m.	s.		m.	s.		m.
Apia		7.4	16	i 1	49	- 3	i 3	6	-12	—	—	3.6	
Tuai	N.	19.3	201	e 4	34	+ 5	e 7	47	-15	e 8	3	S	—
Wellington		22.3	204	e 4	58	- 3	8	51	-11	e 16	25	ScS	e 10.9
Cobb River	E.	23.0	206	e 5	9	+ 2	e 9	3	-11	—	—	—	—
Kaimata	N.E.	24.7	207	e 5	25	+ 1	e 9	55	+11	—	—	—	—
Christchurch		25.1	203	e 5	31	+ 3	e 9	50	- 1	e 5	50	?	e 11.7
Brisbane		30.7	251	e 7	17	PP	e 11	27	+ 6	—	—	—	e 13.0
Riverview		33.7	240	i 6	46	+ 1	e 12	30	+22	—	—	—	e 15.9
Baguio		74.2	295	i 11	27	-13	20	13?	-59	—	—	—	—
Berkeley	Z.	76.1	40	i 11	52k	+ 1	i 12	29	?	i 11	58	PcP	—
Lick	Z.	76.1	40	e 11	52a	+ 1	i 12	55	?	i 11	59	PcP	—
Pasadena		76.3	45	i 11	52	0	e 13	25	?	i 11	59	PcP	e 37.4
Palomar	Z.	76.7	46	i 11	54	- 1	—	—	—	i 12	15	PcP	—
Riverside	Z.	76.8	45	i 11	56	+ 1	—	—	—	e 12	37	PcP	—
Fresno	Z.	76.9	42	e 11	55a	- 1	e 12	56	?	e 12	2	PcP	—
China Lake	Z.	77.7	44	e 12	1	+ 1	—	—	—	i 12	5	P	—
Shasta	Z.	77.9	38	e 12	2a	+ 1	—	—	—	—	—	—	—
Mineral	Z.	78.1	38	e 12	2a	0	i 12	36	?	e 12	9	PcP	—
Tinemaha	Z.	78.1	43	i 12	2	0	—	—	—	i 12	47	?	—
Reno		78.6	40	e 12	6a	+ 1	e 22	18	+16	e 12	35	PcP	—
Nelson		79.5	46	i 12	9	- 1	i 12	40	?	i 12	29	PcP	—
Boulder City		79.6	46	i 12	11	+ 1	e 22	19	+ 7	i 12	22	PcP	—
Tucson		80.3	50	e 12	15	+ 1	e 22	1	-19	e 15	25	PP	e 40.5
Hong Kong		82.2	297	—	—	—	22	13?	-26	—	—	—	—
Victoria		82.6	32	12	27	+ 1	—	—	—	—	—	—	—

Continued on next page.



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## 1953

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		$\Delta$ °	Az. °	P.		O-C. s.	S.		O-C. s.	Supp.		L. m.
				m.	s.		m.	s.		m.	s.	
Tacubaya		83.5	67	e	12 29	- 2	—	—	—	—	—	—
Butte		86.8	38	e	12 47	0	—	—	—	—	—	—
Hungry Horse College		87.3	36	e	12 49	- 1	—	—	—	—	—	—
Fayetteville	z.	87.9	11	i	12 52	- 1	—	—	—	—	—	—
		94.3	53	i	13 22 <sub>a</sub>	- 1	—	—	e	17 18	PP	—
La Paz		98.3	112	e	13 56	+15	24 26	[+ 7]	17 49	PP	50.1	
Bogota		100.9	89	—	—	—	e 25 31	+ 3	—	—	51.2	
Palisades		110.9	53	—	—	—	e 28 43	PS	—	—	e 52.0	
Seven Falls	e.	113.9	47	—	—	—	e 29 7	PS	34 19	SS	61.2	
Bermuda		116.8	64	—	—	—	e 27 31	{+38}	e 36 13	SS	e 64.4	
Kimberley	z.	127.3	201	19	8	[+ 1]	—	—	—	—	—	—
Upsala	z.	140.3	353	i	19 26	[- 5]	—	—	—	—	—	—
Copenhagen		145.0	355	i	19 39	[ 0]	—	—	—	—	—	—
Potsdam	z.	148.2	353	e	19 49	[+ 4]	—	—	—	—	e 86.2	—
Witteveen	z.	148.2	359	i	19 49	[+ 4]	—	—	—	—	—	—
Collnberg		149.3	352	e	19 51	[+ 5]	—	—	e 20 6	PKP <sub>2</sub>	—	—
Raciborzu		149.4	346	e	19 51 <sub>a</sub>	[+ 5]	e 21 55	?	e 20 4	PKP <sub>2</sub>	—	—
Skalnate Pleso		149.7	312	e	20 1	[+14]	e 21 41	?	e 20 10	PKP <sub>2</sub>	—	—
Jena		149.8	354	i	19 52	[+ 5]	e 20 23	?	e 20 9	PKP <sub>2</sub>	—	—
Prague		150.2	351	i	19 54 <sub>a</sub>	[+ 6]	e 27 7	[+13]	e 23 18	PP	—	—
Ksara		150.7	302	e	19 56	[+ 8]	—	—	i 23 31	PP	—	—
Istanbul	z.	152.0	323	e	15 43?	?	—	—	e 18 51	?	—	—
Karlsruhe	z.	152.0	357	e	19 51	[+ 1]	—	—	e 19 58	?	—	—
Stuttgart	z.	152.2	356	e	19 51	[ 0]	e 19 58	?	e 20 6	PKP <sub>2</sub>	—	—
Strasbourg		152.4	358	i	19 59	[+ 8]	—	—	e 20 19	PKP <sub>2</sub>	e 82.2	—
Paris		152.8	5	i	19 59	[+ 7]	i 20 19	?	i 20 8	PKP <sub>2</sub>	e 84.2	—
Chambon-la-Forêt		152.9	5	i	19 59	[+ 7]	—	—	—	—	—	—
Belgrade	z.	153.4	336	e	19 53 <sub>a</sub>	[+ 1]	—	—	e 23 19	PP	—	—
Besançon		153.8	0	e	19 51	[- 2]	e 20 2	?	e 20 11	PKP <sub>2</sub>	—	—
Triest	z.	154.6	350	e	19 50	[- 4]	—	—	e 20 59	?	—	—
Helwan	z.	155.5	296	e	19 57	[+ 2]	e 24 5	PP	i 20 18	PKP <sub>2</sub>	—	—
Pavia		155.8	356	—	—	—	e 34 34	PS	e 38 14	PPS	—	—
Florence		156.9	350	e	19 55	[- 2]	e 29 40	?	e 21 27	PP	75.1	—
Taranto		158.4	339	—	—	—	e 30 58	{- 6}	—	—	—	—
Rome		158.5	349	e	19 58	[- 1]	e 30 53	{-11}	e 44 15	SS	e 75.9	—
Messina	e.	161.0	341	e	20 38	PKP <sub>2</sub>	e 24 41	PP	e 52 13	SSS	—	—
Alicante		161.8	18	20	23	[+20]	e 27 29	[+23]	20 56	PKP <sub>2</sub>	74.9	—
Granada		161.8	27	20	3 <sub>k</sub>	[ 0]	44 57	SS	20 45	PKP <sub>2</sub>	85.9	—
Malaga		161.9	28	i	20 9	[+ 6]	e 27 21	[+15]	i 21 3	PKP <sub>2</sub>	89.5	—
Algiers Univ.	z.	164.1	9	e	20 5	[ 0]	e 24 29	PP	e 20 58	PKP <sub>2</sub>	—	—
Tamanrasset	z.	178.2	—	i	20 13 <sub>k</sub>	[+ 1]	e 32 32	{-10}	e 22 2	PKP <sub>2</sub>	—	—

April 3d. 17h. 52m. Epicentre 35°-9N. 141°-6E. Depth 20km.  
Intensity IV at Mito, Tyosi; II-III at Onahama, Utunomiya, Kashiwa, Shirakawa, Inawasiro, Hukusima, and Sendai.  
Seismo. Bull. Cent. Met. Obs., Japan, April, 1953, Tokyo, 1953, pp.11-13, with macroseismic chart.

April 3d. 20h. 40m. Epicentre 39°-6N. 71°-2E.  
Bulletin of Seismological Stations of U.S.S.R., for 1953, April-June, Moscow, 1954, p.58.

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April 4d. 5h. 52m. 13s. Epicentre 36°·3N. 141°·5E. (as on 1950, June 17d.).

Intensity V at Tyosi, Mito, and Onahama; IV at Tukubasan, Kashiwa, Utunomiya, Shirakawa, Inawasiro, and Hukusima; II-III at Tokyo, Yokohama, Maebasi, Osima, Sendai, Kohu, Hatidyojima, Sakata, and Kusiro. Epicentre 35°·8N. 141°·9E. Depth 40km. Seismo. Bull. Cent. Met. Obs., Japan, April, 1953, Tokyo, 1953, p.13-15, with macroseismic chart p 13.

$$A = -0.6322, B = +0.5029, C = +0.5894; \quad \delta = -2; \quad h = 0;$$

$$D = +0.623, E = +0.783; \quad G = -0.461, H = +0.367, K = -0.808.$$

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Onahama		0.8	323	e 0 23k	+ 5	0 35	+ 4	—	—
Tyosi	N.	0.8	222	i 0 14k	- 4	0 21	-10	—	—
Mito		0.9	276	i 0 21k	+ 1	0 30	- 4	—	—
Tukubasan		1.1	266	0 13	- 9	0 20	-19	—	—
Kashiwa		1.3	250	0 24	- 1	0 39	- 5	0 35	S
Shirakawa		1.3	308	0 30k	+ 5	0 50	+ 6	—	—
Utunomiya	Z.	1.4	281	i 0 27k	0	0 48	+ 2	—	—
Hukusima		1.7	330	i 0 36a	+ 5	1 1	+ 7	—	—
Inawasiro	E.	1.7	319	e 0 36	+ 5	1 2	+ 8	—	—
Kumagaya		1.7	265	e 0 32	+ 1	0 56	+ 2	—	—
Yokohama		1.7	240	i 0 33a	+ 2	0 54	0	—	—
Mera	Z.	1.9	224	0 30	- 4	0 51	- 8	—	—
Maebasi		2.0	273	i 0 36k	+ 1	1 5	+ 3	—	—
Sendai		2.0	346	i 0 41a	+ 1g	1 9	+ 3g	—	—
Titibu		2.0	261	i 0 35	0	1 1	- 1	—	—
Isinomaki		2.1	356	0 43	+ 1g	1 7	+ 1*	—	—
Yamagata		2.1	335	0 43	+ 1g	1 14	+ 5g	—	—
Ajiro		2.3	238	0 37	- 3	1 6	- 3	—	—
Oiwake		2.3	271	0 42	0*	1 26	+ 10g	—	—
Osima		2.3	228	0 36	- 4	1 7	- 2	—	—
Hunatu	N.	2.4	250	i 0 45a	+ 1*	1 18	- 1g	—	—
Misima		2.4	240	0 38a	- 3	1 9	- 3	—	—
Kohu		2.5	254	i 0 42	- 1	1 21	- 2g	—	—
Niigata	Z.	2.5	311	i 0 31	-12	1 3	-11	—	—
Matusiro		2.7	275	0 47	+ 2	1 18	- 1	—	—
Nagano		2.7	278	i 0 48a	- 1*	1 20	+ 1	—	—
Mizusawa		2.8	354	0 51	0*	1 42	+ 10g	0 54	Pg
Shizuoka		2.8	242	i 0 46a	- 1	1 26	- 1*	—	—
Takada		2.8	287	0 48	+ 1	1 26	- 1*	—	—
Matumoto	E.	2.9	269	i 0 49	+ 1	1 32	+ 2*	—	—
Sakata		2.9	334	i 1 1	+ 3g	1 37	+ 1g	—	—
Aikawa		3.1	304	0 54	+ 3	1 42	0g	—	—
Iida		3.1	255	i 0 50a	- 1	1 35	- 1*	—	—
Omaesaki	Z.	3.2	238	0 50	- 2	1 41	+ 2*	—	—
Miyako	N.	3.4	6	0 58	+ 3	1 38	+ 1	—	—
Morioka		3.4	356	i 1 0	- 1*	1 46	+ 1*	—	—
Takayama	N.	3.4	268	e 1 0	- 1*	1 51	- 1g	—	—
Hamamatu		3.5	243	e 0 54	- 3	1 40	0	—	—
Hatidyojima		3.5	204	0 53	- 4	1 25	-15	—	—
Toyama		3.5	279	i 1 1a	+ 4	1 42	+ 2	—	—
Akita		3.6	343	1 3a	- 1*	2 0	+ 1g	—	—
Nagoya	E.	3.8	254	i 1 2	+ 1	2 0	+ 3*	—	—
Wazima	Z.	3.8	289	1 4	+ 3	2 2	- 4g	—	—
Gihu		3.9	258	e 1 4	+ 2	1 58	- 2*	—	—
Kanazawa		3.9	279	e 1 5	+ 3	—	—	—	—
Hatinohe		4.2	0	1 11	+ 4	2 4	- 5*	—	—
Hukui		4.2	266	e 1 8	+ 1	2 6	- 3*	—	—
Ibukisan	N.	4.2	259	e 1 13	- 2*	—	—	—	—
Hikone		4.4	258	1 11	+ 1	2 20	- 5g	—	—
Kameyama		4.4	251	1 7	- 3	2 14	- 1*	—	—
Tu		4.4	250	i 1 7	- 3	2 15	0*	—	—
Tsuruga	E.	4.5	263	i 1 10	- 1	2 22	+ 4*	—	—
Aomori		4.6	354	1 18	+ 6	2 18	- 2*	—	—
Kyoto		4.9	256	i 1 14	- 3	2 26	- 3*	—	—
Owase		4.9	245	e 1 11	- 6	2 13	- 2	—	—

Continued on next page.

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		$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.
		°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.
Maizuru		5.0	262	1	20	+ 2	2	14	- 4	—	—	—
Osaka		5.2	251	e 1	12	- 9	2	16	- 6	—	—	—
Kobe		5.4	254	e 1	24	0	2	40	- 4*	—	—	—
Hakodate		5.5	355	i 1	36	- 1*	2	57	- 5 <sub>g</sub>	—	—	—
Siomisaki		5.5	241	e 1	21	- 4	2	55	+ 8*	—	—	—
Toyooka	Z.	5.5	265	e 1	24	- 1	2	42	- 5*	—	—	—
Wakayama		5.6	250	e 1	28	+ 1	2	52	+ 2*	—	—	—
Sumoto		5.7	252	1	27	- 1	2	49	- 4*	—	—	—
Mori	N.	5.9	351	1	35	+ 4	2	56	- 3*	—	—	—
Torisima		5.9	191	e 1	23	- 8	2	46	+ 6	—	—	—
Urakawa		5.9	9	e 1	36	+ 5	2	48	+ 8	—	—	—
Tottori	N.	6.0	265	e 1	33	+ 1	3	12	- 6 <sub>g</sub>	—	—	—
Himeji		6.1	255	e 1	36	+ 2	2	52	+ 7	—	—	—
Tokusima		6.1	250	e 1	37	+ 3	3	30	+ 8 <sub>g</sub>	—	—	—
Tomakomai	E.	6.2	1	e 1	49	0*	3	24	- 1 <sub>g</sub>	—	—	—
Okayama		6.4	258	e 1	36	- 2	3	15	+ 1*	—	—	—
Takamatu	N.	6.4	254	1	34	- 4	2	48	- 5	—	—	—
Saigo	E.	6.6	272	e 1	42	+ 1	3	10	+ 12	—	—	—
Suttsu		6.6	352	e 1	55	- 1*	3	12	- 8*	—	—	—
Muroto		6.7	245	e 1	41	- 1	2	51	- 9	—	—	—
Yonago		6.7	265	e 1	42	0	3	20	- 3*	—	—	—
Obi-hiro		6.8	11	e 1	50	+ 6	3	8	+ 5	—	—	—
Sapporo		6.8	359	e 1	44 <sub>a</sub>	0	3	12	+ 9	—	—	—
Matsue		6.9	265	1	41	- 4	3	36	+ 7*	—	—	—
Kusiro		7.0	18	e 2	0	- 2*	3	8	0	—	—	—
Koti		7.1	250	1	46	- 2	3	19	+ 9	—	—	—
Asahigawa		7.5	5	e 1	56	+ 3	—	—	—	—	—	—
Matuyama		7.6	253	e 1	52	- 3	3	16	- 7	—	—	—
Nemuro		7.6	21	e 1	57	+ 2	3	21	- 2	—	—	—
Hirosima		7.7	257	i 1	54 <sub>a</sub>	- 2	3	27	+ 2	—	—	—
Hamada		7.8	262	e 1	50	- 8	3	39	+ 11	—	—	—
Simidu	E.	7.8	246	1	55	- 3	4	9	- 9 <sub>g</sub>	—	—	—
Abashiri	E.	8.0	15	2	6	+ 6	3	29	- 4	—	—	—
Uwazima		8.0	250	1	52	- 8	4	2	0*	—	—	—
Ooita		8.7	251	e 2	10	0	4	15	- 7*	—	—	—
Simonoseki		9.0	258	2	16	+ 3	4	0	+ 2	—	—	—
Wakkanai	E.	9.1	1	e 2	18	+ 4	4	32	- 2*	—	—	—
Miyazaki		9.4	245	i 2	17 <sub>a</sub>	- 1	4	57	- 14 <sub>g</sub>	—	—	—
Hukuoka		9.5	257	2	19 <sub>a</sub>	- 1	4	25	+ 15	—	—	—
Kumamoto		9.5	252	e 2	20	0	4	54	+ 8*	—	—	—
Saga	E.	9.7	255	i 2	22 <sub>a</sub>	0	5	11	- 9 <sub>g</sub>	—	—	—
Unzendake		9.9	252	2	26	+ 1	5	1	+ 3*	—	—	—
Ituhara		10.2	262	e 2	25	- 6	4	33	+ 6	—	—	—
Kagosima		10.2	246	2	51 <sub>k</sub>	+ 20	4	48	+ 21	—	—	—
Nagasaki		10.2	253	2	29	- 2	4	28	+ 1	—	—	—
Yakusima		10.9	241	e 2	37	- 3	4	48	+ 4	—	—	—
Zō-Sō		17.7	259	i 4	3 <sub>a</sub>	- 7	e 7	25	- 1	—	—	—
Nanking		19.3	265	i 4	22 <sub>a</sub>	- 7	8	2	0	—	—	—
Baguio		27.2	230	i 5	43	- 4	i 10	35	+ 10	—	—	—
Hong Kong		27.5	248	e 6	34	+ 44	11	4	+ 34	—	—	14.0
Shillong	E.	43.5	270	i 8	4	- 3	e 14	35	- 1	14	47	PS
Chatra		46.7	275	i 8	30	- 2	e 15	17	- 5	10	22	PP
College		49.7	32	i 8	56	0	i 16	5	+ 1	—	—	e 18.6
Djakarta		53.3	225	e 9	14 <sub>a</sub>	- 9	i 16	40	- 14	e 20	28	SS
New Delhi		53.9	281	e 9	25	- 2	i 16	56	- 6	e 20	21	SS
Warsak Dam	E.	56.1	292	e 9	36	- 7	e 17	44	PS	—	—	28.8
Hyderabad		58.3	269	i 9	56	- 3	i 17	55	- 6	18	7	PS
Quetta		61.2	288	i 10	15 <sub>k</sub>	- 4	i 18	35	- 3	e 39	48	P'P'
Poona		61.5	273	i 10	16	- 5	18	40	- 2	12	36	PP
Kodaikanal	E.	63.1	265	i 10	26	- 6	—	—	—	—	—	—
Resolute Bay		63.3	15	e 10	31 <sub>a</sub>	- 2	e 18	53	- 11	i 10	43	?
Brisbane		64.4	169	—	—	—	e 19	9	- 9	—	—	e 34.8
Kiruna	Z.	67.2	339	i 10	57 <sub>a</sub>	- 1	i 11	22	PcP	i 11	11	?
Riverview		70.3	172	i 20	49	PS	i 20	23	- 6	i 21	23	ScS
Shasta	Z.	71.5	53	e 11	25	+ 1	e 11	33	PcP	e 17	16	?

Continued on next page.

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		$\Delta$	Az.	P.		O - C.	S.		O - C.	Supp.		L.
		$^{\circ}$	$^{\circ}$	m.	s.	s.	m.	s.	s.	m.	s.	m.
Mineral	z.	72.2	53	i 11	29	0	e 11	38	PcP	e 17	22	?
Hungry Horse		72.3	43	i 11	29	0	—	—	—	e 13	58	PP
Scoresby Sund		72.8	355	i 11	33	+ 1	e 21	4	+ 6	i 11	44	PcP
Berkeley		73.1	56	e 11	34 <sup>k</sup>	0	e 11	51	PcP	e 30	5	?
Upsala		73.6	335	i 11	36	- 1	i 11	53	PcP	i 14	20	PP
Lick	z.	73.8	56	i 11	39 <sup>k</sup>	+ 1	i 12	24	?	e 16	56	?
Reno		73.8	53	e 11	39	+ 1	e 11	49	PcP	e 17	25	?
Tinemaha	z.	76.2	55	i 11	53	+ 1	e 12	29	?	e 18	7	?
China Lake	z.	77.3	54	e 11	58	0	—	—	—	e 17	20	?
Logan		77.4	47	e 12	1	+ 3	—	—	—	—	—	—
Pasadena		77.9	56	i 12	3	+ 2	e 21	52	- 2	i 12	14	PcP
Copenhagen		78.6	333	i 12	5	0	e 22	23	+ 21	—	—	e 36.4
Riverside	z.	78.6	56	e 12	4	- 1	—	—	—	e 17	16	?
Boulder City		79.1	54	i 12	9	+ 1	i 15	8	PP	i 17	42	?
Nelson		79.2	54	i 12	10	+ 2	i 14	53	PP	i 17	31	?
Palomar	z.	79.3	57	e 12	10	+ 1	i 12	21	PcP	e 15	16	PP
Skalnate Pleso		80.2	326	e 12	26	+ 12	e 22	29	+ 10	e 17	29	?
Raciborzu	z.	80.5	327	e 12	19	+ 4	e 12	28	PcP	e 15	31	PP
Potsdam	z.	80.9	330	e 12	18	+ 1	—	—	—	—	—	e 44.8
Istanbul	z.	81.2	316	12	19	0	22	30?	+ 1	15	26	PP
Ksara		81.6	305	12	11	- 10	22	33	0	15	35	PP
Collmberg		81.8	330	e 12	20	- 2	e 12	32	PcP	e 15	23	PP
Budapest		82.0	325	e 12	25	+ 2	e 22	27	- 10	e 12	30	PcP
Ogyalla		82.1	326	e 12	52	+ 28	e 15	58	PP	e 20	59	?
Prague		82.1	329	e 12	25	+ 1	e 22	33	- 5	e 22	56	ScS
Jena		82.6	331	e 12	26	0	e 12	38	PcP	e 12	55	?
Witteveen	z.	82.9	335	i 12	30	+ 2	i 12	41	PcP	—	—	—
Cheb		83.0	330	—	—	—	e 22	48	+ 1	e 23	5	ScS
Wellington		83.0	156	e 17	59	?	e 22	41	- 6	e 20	12	?
Belgrade		83.2	322	e 12	29	0	e 22	51	+ 2	e 15	43	PP
Tucson		84.0	54	e 12	35	+ 2	—	—	—	—	—	—
De Bilt		84.1	335	e 12	34	0	e 23	17	+ 19	—	—	e 42.8
Christchurch		84.3	158	—	—	—	e 23	20	+ 20	e 23	4	PPS
Stuttgart		85.3	331	e 12	39	- 1	e 23	5	- 5	e 12	51	PcP
Karlsruhe	z.	85.4	332	e 12	32	- 8	e 12	45	PcP	—	—	e 44.8
Uccle		85.4	335	e 12	31	- 9	e 23	7	- 4	e 12	52	pP
Triest		85.8	327	i 12	39 <sup>a</sup>	- 3	i 23	2	[- 4]	e 16	0	PP
Strasbourg		86.0	332	e 12	55	+ 12	e 24	24	PS	e 26	17	?
Kew		86.4	337	—	—	—	e 23	36	+ 15	—	—	e 40.8
Helwan	z.	87.1	305	12	47	- 2	e 12	59	PcP	16	14	PP
Besançon		87.8	332	e 12	52	0	e 13	3	?	e 16	29	PP
Bologna		87.8	327	—	—	—	e 23	13	[- 6]	e 24	25	PS
Paris		87.8	334	e 12	49	- 3	i 13	6	?	e 16	36	PP
Taranto		88.0	321	—	—	—	23	26	[+ 5]	—	—	e 42.8
Pavia		88.2	329	i 12	52	- 2	e 23	20	[- 2]	e 23	59	S
Oropa		88.3	330	e 12	53	- 2	i 23	14	[- 8]	i 29	32	SS
Florence		88.4	326	i 12	56	+ 1	e 23	16	[- 7]	e 16	25	PP
Chambon-la-Forêt		88.5	334	e 12	54	- 2	—	—	—	e 13	6	?
Lubbock		88.7	48	e 12	58	+ 1	—	—	—	—	—	—
Rome		89.3	325	i 12	58	- 1	23	25	[- 4]	24	55	PS
Clermont-Ferrand		90.1	333	e 13	4	+ 1	—	—	—	—	—	47.8
Messina		90.6	321	i 13	3 <sup>k</sup>	- 2	24	3	+ 3	e 30	5	SS
Fayetteville	z.	91.3	42	i 13	8	- 1	i 13	29	?	i 13	21	pP
Seven Falls	z.	92.0	21	—	—	—	e 24	6	- 6	33	48	SSS
Harvard	z.	96.0	24	e 13	38	+ 8	e 26	11	PS	—	—	e 53.0
Algiers Univ.	z.	97.7	327	e 13	36	- 2	e 17	34	PP	e 19	25	PPP
Alicante		97.8	331	13	40	+ 2	25	3	+ 1	17	39	PP
Toledo		97.8	334	e 13	37	- 1	—	—	—	—	—	59.1
Almería		99.9	331	i 14	1	+ 13	24	27	[ 0]	25	19	S
Granada		100.0	333	18	2	PP	24	38	[+ 11]	—	—	51.4
Tamanrasset	z.	108.0	317	14	23	- 1	e 25	37	[+ 33]	e 28	7	PS
Pretoria	z.	122.9	260	e 18	58?	[ 0]	—	—	—	—	—	—
La Paz		147.1	61	19	49	[+ 6]	30	5	(+ 3)	42	23	SS

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April 5d. 3h. 21m. 51s. Epicentre 40°·7N. 20°·0E. (as on 1953, March 31d.).

A = +·7145, B = +·2600, C = +·6495;  $\delta = -4$ ;  $h = -2$ ;  
D = +·342, E = -·940; G = +·610, H = +·222, K = -·760.

		$\Delta$ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	Supp. m. s.	L. m.
Taranto		2·1	262	0 38	+ 1	1 3	- 1	—	1·4
Sofia		3·2	51	e 0 49	- 3	e 1 33	+ 1	e 1 47	—
Athens		4·0	132	e 1 4	0	i 1 52	0	i 1 11	—
Belgrade		4·1	5	e 1 8k	+ 3	e 2 6	0*	e 1 23	—
Messina		4·2	236	i 1 7k	0	i 1 58	+ 1	i 1 15	—
Reggio Calabria		4·2	234	e 1 20	- 4 <sub>g</sub>	e 1 56	- 1	—	—
Timisoara		5·1	10	e 1 35	+ 5*	i 3 3	+ 15 <sub>g</sub>	e 1 42	—
Rome		5·8	285	e 1 20	- 9	i 2 59	+ 3*	—	e 3·3
Triest		6·7	319	i 1 41 <sub>a</sub>	- 1	i 2 53	- 7	e 1 53	i 3·8
Istanbul		6·9	84	1 46	+ 1	e 2 57	- 8	1 55	—
Florence		7·2	298	—	—	e 2 44	?	—	e 4·0
Pavia		9·1	303	—	—	e 3 44	- 16	—	—
Oropa	z.	10·1	303	i 1 9?	?	—	—	—	—
Prague		10·2	339	e 2 32	+ 1	e 5 36	S <sub>g</sub>	e 3 13	—
Zürich		10·6	313	e 2 36	0	e 4 43	+ 6	—	—
Cheb		10·8	333	—	—	e 6 5	?	—	e 6·4
Stuttgart		11·1	320	e 2 41	- 2	e 4 41	- 8	e 3 6	e 4·9
Basle		11·2	312	e 2 42	- 2	—	—	—	e 6·5
Collnberg	z.	11·7	338	e 2 47	- 4	—	—	—	e 6·5
Jena		11·8	333	e 2 51?	- 2	e 4 47	- 9	—	e 6·6
Strasbourg		11·8	316	e 3 9	+ 16	—	—	—	e 5·9
Besançon		12·0	308	e 2 55	0	—	—	—	—
Ksara		14·4	113	e 3 41	+ 14	e 5 41	- 28	—	—
Chambon-la-Forêt		14·6	306	e 3 35	+ 5	—	—	—	—
Paris		14·8	309	e 3 38	+ 6	—	—	e 3 45	?
Upsala	z.	19·2	355	e 4 27	- 1	—	—	—	—
Tamanrasset	z.	21·6	219	i 4 53k	- 1	e 8 44	- 5	e 5 20	PP 10·8
Scoresby Sund		36·7	338	e 7 11	+ 1	—	—	—	—

April 5d. 8h. 54m. 22s. Epicentre 33°·5S. 179°·0W. (as on 1952, Aug. 2d.).

A = -·8355, B = -·0146, C = -·5493;  $\delta = 0$ ;  $h = +1$ ;  
D = -·017, E = +1·000; G = +·549, H = +·009, K = -·836.

		$\Delta$ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	Supp. m. s.	L. m.
Auckland	N.	6·1	235	e 1 36	+ 2	—	—	—	—
Tuai	N.	6·2	209	e 1 35	0	2 44	- 4	—	—
Karapiro	N.	6·3	222	e 1 39	+ 3	e 2 50	0	—	—
Tongariro	z.	7·2	216	e 1 49	0	e 3 44	+ 31	—	—
New Plymouth	E.	7·9	223	e 2 3	+ 4	e 3 44	+ 14	—	—
Wellington		9·2	211	e 2 14	- 2	i 3 52	- 11	—	—
Cobb River	E.	10·0	218	e 2 47	+ 20	e 4 10	- 12	—	—
Kaimata	N.E.	11·8	217	e 2 49	- 4	4 55	- 11	—	—
Christchurch		12·0	211	e 2 47	- 8	4 56	- 15	—	—
Brisbane		24·8	277	e 5 33	+ 8	e 9 45	- 1	—	—
Riverview		24·8	261	i 5 26 <sub>a</sub>	+ 1	e 9 43	- 3	i 5 44	e 11·7
Pasadena		88·2	46	i 12 53	- 1	—	—	i 13 5	?
Lick	z.	88·4	42	e 12 54 <sub>a</sub>	- 1	—	—	i 13 1	?
Palomar	z.	88·5	48	i 12 55 <sub>a</sub>	- 1	—	—	i 13 18	?
Riverside	z.	88·6	46	i 12 55	- 1	—	—	i 13 10	?
Fresno	z.	89·1	43	e 12 56 <sub>a</sub>	- 2	—	—	—	—
China Lake	z.	89·7	45	i 13 0	- 1	—	—	e 13 16	?
Tinemaha	z.	90·2	44	e 13 4	0	—	—	—	—
Shasta	z.	90·4	39	e 13 2 <sub>a</sub>	- 2	—	—	e 13 31	?
Reno	z.	91·0	41	e 13 5 <sub>a</sub>	- 2	—	—	e 13 21	?

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	$\Delta$ °	Az. °	P. m. s.		O-C. s.	S. m. s.		O-C. s.	Supp. m. s.		L. m.
Nelson	91.3	46	e 13	8	- 1	—	—	—	i 13 21	?	—
Tucson	91.6	51	i 13	10	0	—	—	—	i 13 27	?	—
Hungry Horse College	100.0 101.0	37 12	e 18	1 48	PP - 5	—	—	—	—	—	—
Resolute Bay	120.4	17	e 18	49 <sub>a</sub>	[- 4]	—	—	—	—	—	—
Harvard	123.7	58	e 19	1	[+ 1]	—	—	—	—	—	—
Quetta	z. 124.7	286	e 18	58	[- 4]	—	—	—	—	—	—
Halifax	129.8	56	e 19	10	[- 2]	—	—	—	—	—	—
Scoresby Sund	140.9	12	e 19	22	[-10]	—	—	—	—	—	—
Kiruna	z. 143.8	348	i 19	31	[- 6]	—	—	—	—	—	—
Reykjavik	146.2	18	i 19	41	[ 0]	—	—	—	i 20 14	?	—
Ksara	151.0	281	e 19	50	[+ 1]	i 21 42	?	?	i 20 14	?	—
Upsala	z. 151.4	342	i 19	51	[+ 1]	i 20 0	?	?	i 20 8	PKP <sub>2</sub>	—
Helwan	z. 154.0	270	19	59	[+ 6]	e 20 32	?	?	e 20 43	?	—
Collmberg	z. 160.2	336	e 19	57	[- 4]	—	—	—	e 20 37	PKP <sub>2</sub>	—
Jena	z. 160.9	338	e 20	52	PKP <sub>2</sub>	—	—	—	—	—	—
Stuttgart	163.6	341	e 20	1?	[- 3]	—	—	—	e 20 53	PKP <sub>2</sub>	—
Tamanrasset	z. 168.6	200	e 20	8	[ 0]	e 25 4	PP	—	e 21 12	PKP <sub>2</sub>	—

April 5d. 10h. 15m. 35s. Epicentre 22°·9N. 121°·5E. (as on 1952, Dec. 29d.).

A = -·4818, B = +·7862, C = +·3869;  $\delta$  = -7;  $h$  = +4;  
D = +·853, E = +·522; G = -·202, H = +·330, K = -·922.

	$\Delta$ °	Az. °	P. m. s.		O-C. s.	S. m. s.		O-C. s.	Supp. m. s.		L. m.
Bagulo	6.5	187	i 2	1	+ 7*	i 3 53	+18 <sub>g</sub>	—	—	—	—
Hong Kong	6.9	265	1	58	- 3	—	—	—	—	—	4.0
Z6-S6	8.2	358	e 1	50	-13	i 3 16	-22	—	—	—	—
Nanking	9.4	346	e 2	10	- 8	3 53	-14	—	—	—	—
Shillong	E. 27.1	280	e 5	54	+ 8	e 10 40	+16	e 6 7	PP	e 15.6	—
Chatra	31.4	284	i 6	32	+ 7	e 11 56	+24	14 36	SSS	15.7	—
Poona	z. 44.6	273	i 8	36	+20	—	—	—	—	—	—
Quetta	48.9	291	i 8	54 <sub>k</sub>	+ 4	e 15 49	- 4	i 16 12	?	—	—
College	69.8	27	e 11	7	- 7	—	—	—	—	e 38.3	—
Kiruna	73.1	337	i 11	31	- 3	e 21 1	0	i 11 54	PcP	e 38.8	—
Ksara	74.2	300	i 11	45	+ 5	i 21 16	+ 2	—	—	—	—
Istanbul	77.1	310	11	59	+ 2	—	—	e 15 25?	PP	49.4	—
Upsala	77.2	330	i 11	55	- 2	e 26 25?	SS	i 12 13	PcP	—	—
Helwan	z. 79.1	297	i 12	11 <sub>k</sub>	+ 3	e 12 28	PcP	e 12 51	?	—	—
Resolute Bay	79.9	9	e 12	7 <sub>a</sub>	- 5	—	—	—	—	—	—
Prague	83.0	322	e 12	34	+ 6	—	—	e 12 58	?	—	—
Collmberg	z. 83.3	323	e 12	29	- 1	—	—	e 15 39	PP	—	—
Scoresby Sund	83.4	349	e 12	27	- 3	—	—	28 19	SS	41.4	—
Cheb	84.2	323	e 12	35	+ 1	e 12 50	?	e 13 37	?	e 44.9	—
Jena	z. 84.2	323	e 12	35	+ 1	—	—	e 12 42	PcP	—	—
Taranto	85.6	312	11	38	-63	e 23 18	+ 5	15 48	PP	e 39.4	—
Stuttgart	86.6	322	e 12	47	+ 1	—	—	—	—	e 46.4	—
De Bilt	87.0	327	e 12	49?	+ 1	e 23 25	- 2	—	—	e 43.4	—
Messina	87.8	311	e 12	54	+ 2	e 20 59	?	—	—	47.4	—
Florence	88.0	318	e 12	55 <sub>a</sub>	+ 2	e 23 59	+23	e 16 35	PP	—	—
Rome	z. 88.1	315	e 12	55 <sub>a</sub>	+ 1	e 23 16	[- 5]	—	—	—	—
Paris	90.3	325	e 13	4	0	—	—	—	—	e 48.4	—
Chambon-la-Forêt	90.9	325	e 12	53	-14	—	—	—	—	—	—
Shasta	93.3	43	e 13	15 <sub>a</sub>	- 3	e 13 26	PcP	e 13 35	?	—	—
Hungry Horse	93.4	34	i 13	16	- 2	—	—	—	—	—	—
Lick	z. 95.6	46	e 13	26 <sub>k</sub>	- 2	—	—	—	—	—	—
Butte	95.7	34	e 13	27	- 2	—	—	—	—	—	—
Fresno	z. 97.2	46	e 14	13 <sub>k</sub>	+37	—	—	—	—	—	—
Tamanrasset	z. 102.9	303	15	47	?	—	—	e 18 19	PP	—	—
Tacubaya	122.2	47	e 18	14	[-43]	—	—	—	—	—	—

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April 5d. 14h. 30m. Epicentre near 9°·0S. 79°·0W.

Off Coast of Peru. Depth of focus 100km.

Intensity IV at Chimbote and Hala Casagrande.

Annales de l'Institut de Physique du Globe de Strasbourg, Nouvelle série, Tome XVIII, Seconde partie, Séismologie, for 1953, p.34.

April 6d. 0h. 36m. 24s. Epicentre 7°·0S. 132°·0E. Depth of focus 0·005.

A = -·6642, B = +·7376, C = -·1211;  $\delta$  = -12; h = +7;  
D = +·743, E = +·669; G = +·081, H = -·090, K = -·993.

	$\Delta$ °	Az. °	P.		O - C.	S.		O - C.	Supp.		L.	
			m.	s.	s.	m.	s.	m.	s.	m.		
Djakarta	25·0	270	i 5	14 <sub>a</sub>	- 5	i 9	36	0	i 5	55	PP	—
Brisbane	28·5	137	i 5	48	- 3	i 10	31	- 2	i 6	3	pP	i 13·6
Perth	29·0	209	e 5	56	0	11	36	+55	7	19	PPP	—
Riverview	32·0	149	i 6	23 <sub>k</sub>	+ 1	i 11	33	+ 5	i 6	37	pP	i 15·5
Melbourne	E. 32·9	160	i 6	33	+ 3	e 11	48	+ 6	i 7	52	PP	13·2
Hong Kong	34·0	329	e 6	46	+ 6	i 11	55	- 4	e 7	6	pP	14·6
Kagosima	38·4	357	7	16	- 1	13	6	- 1	—	—	—	—
Miyazaki	38·7	359	i 7	19	0	i 13	12	+ 1	—	—	—	e 16·1
Zô-Sê	39·3	346	i 7	23 <sub>k</sub>	- 1	i 13	16	- 4	i 7	38	pP	—
Simidu	39·6	2	i 7	26	- 1	i 13	23	- 2	—	—	—	—
Ooita	40·0	0	e 7	31	+ 1	e 13	31	0	—	—	—	—
Muroto	40·1	3	e 7	29	- 2	e 13	32	0	e 9	42	PcP	—
Hukuoka	40·4	358	e 7	32	- 1	e 13	34	- 3	e 16	41	SS	e 19·7
Koti	40·4	2	i 7	32	- 1	e 13	28	- 9	i 7	49	pP	e 16·7
Siomisaki	40·4	4	e 7	32	- 1	e 13	23	-14	—	—	—	e 16·4
Matuyama	40·6	1	i 7	34	- 1	e 13	29	-11	e 8	44	PP	e 15·4
Nanking	40·8	342	i 7	37 <sub>k</sub>	0	i 13	43	0	i 7	53	pP	—
Takamatu	41·1	2	e 7	38 <sub>k</sub>	- 1	e 13	45	- 2	e 9	50	PcP	16·8
Hirosima	41·2	1	i 7	38 <sub>k</sub>	- 2	13	41	- 7	—	—	—	—
Sumoto	41·2	4	i 7	40	0	13	46	- 2	e 18	23	Q	e 19·4
Kobe	41·6	4	e 7	43	0	e 13	50	- 4	—	—	—	—
Osaka	41·6	4	i 7	41 <sub>k</sub>	- 2	e 13	51	- 3	e 17	3	SS	—
Hamada	41·7	0	7	42	- 2	13	55	- 1	e 17	7	SS	e 18·6
Tu	41·7	6	i 7	39	- 5	i 13	54	- 2	e 9	33	PP	—
Kameyama	41·8	6	i 7	46	+ 1	13	50	- 7	—	—	—	—
Kyoto	41·9	5	i 7	46 <sub>k</sub>	0	e 13	58	- 1	—	—	—	e 17·4
Nagoya	42·2	6	i 7	42	- 6	13	55	- 8	e 7	56	pP	—
Shizuoka	42·2	8	7	46	- 2	e 14	0	- 3	—	—	—	—
Toyooka	42·4	3	e 8	0	+10	e 14	15	+ 9	—	—	—	—
Tsuruga	42·6	4	i 7	51 <sub>k</sub>	0	i 14	6	- 3	—	—	—	—
Saigo	43·0	1	i 7	55	0	e 14	13	- 2	—	—	—	—
Tokyo	43·1	8	e 7	56	+ 1	e 14	49	+33	e 9	30	PP	—
Matumoto	43·4	6	7	58	0	e 14	19	- 2	—	—	—	—
Maebasi	43·7	7	e 7	57	- 3	e 13	54	-31	(e 17	51)	SSS	e 17·8
Matusiro	43·7	6	7	57	- 3	14	19	- 6	16	55	SS	18·6
Toyama	43·7	5	i 7	59 <sub>k</sub>	- 1	e 14	25	0	e 8	49	?	—
Nagano	N. 43·8	6	e 7	59	- 2	e 14	24	- 3	e 8	35	pP	—
Mito	43·9	8	e 8	1	- 1	e 14	24	- 4	—	—	—	—
Utunomiya	43·9	7	e 8	0	- 2	e 14	27	- 1	—	—	—	—
Onahama	44·5	8	e 8	6	- 1	e 14	34	- 3	—	—	—	—
Shirakawa	44·6	7	8	6	- 2	14	37	- 1	e 8	18	pP	—
Inawasiro	E. 45·0	8	e 8	12	+ 1	e 14	42	- 2	—	—	—	—
Hokusima	45·2	7	8	12	- 1	14	47	0	—	—	—	—
Niigata	45·2	6	i 8	4	- 9	14	37	-10	e 8	35	pP	i 20·4
Yamagata	45·7	8	e 8	15	- 1	14	52	- 2	—	—	—	—
Sendai	45·8	9	e 8	15	- 2	e 14	52	- 3	e 18	14	SS	—
Sakata	46·2	7	e 8	25	+ 5	e 15	5	+ 4	—	—	—	—
Mizusawa	46·7	8	8	23	- 1	15	8	0	—	—	—	—
Akita	47·1	8	8	26	- 1	e 15	14	0	i 9	6	sP	—
Morioka	47·2	10	e 8	26	- 2	e 15	14	- 1	—	—	—	—

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		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.	
		$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.	
Miyako	Z.	47.3	10	8 27	- 2	15 14	- 3	8 49	pP	—
Aomori		48.3	8	i 8 35	- 2	15 6	-25	18 4	ScS	—
Auckland	N.	49.0	133	e 8 44	+ 2	—	—	—	—	e 24.1
Cobb River	E.	49.6	139	e 8 36?	-11	—	—	—	—	—
Kaimata	N.E.	49.6	142	8 46	- 1	e 15 48	- 1	e 10 47	PP	—
Urakawa		49.9	10	e 8 46	- 3	e 15 54	+ 1	—	—	—
Vladivostok		49.9	0	i 8 47	- 2	15 53	0	—	—	—
Karapiro	N.	50.0	134	e 8 51	+ 1	e 15 59	+ 5	—	—	—
Sapporo		50.6	8	i 8 52	- 2	e 15 53	-10	e 9 16	pP	—
Shillong		50.7	311	i 8 55	0	e 15 56	- 8	10 13	PcP	—
Christchurch		50.9	142	i 8 56k	- 1	i 16 8	+ 1	e 9 12	pP	e 19.1
Wellington		51.0	138	i 8 55k	- 2	e 16 0	- 8	e 9 9	pP	e 22.1
Nemuro		51.6	12	e 8 59	- 3	e 16 12	- 4	—	—	—
Calcutta	E.	51.9	306	i 9 2 <sub>a</sub>	- 2	i 16 20	- 1	21 29	SSS	—
Macquarie Is.	N.	52.1	160	e 0 13	?	i 6 47	?	—	—	—
Colombo	E.	53.8	283	—	—	16 45	- 1	—	—	27.4
Kurilsk		53.9	13	i 9 16	- 3	i 16 46	- 2	—	—	—
Yuzno-Sakhlinsk		54.6	8	i 9 21	- 3	i 16 55	- 2	—	—	—
Chatra		54.9	310	i 9 27	+ 1	i 17 1	0	10 29	PcP	25.2
Madras	E.	55.2	292	i 9 29	+ 1	i 17 5	0	10 33	PcP	—
Ulegorsk		56.5	8	i 9 36	- 2	17 22	0	—	—	—
Kodaikanal	E.	56.9	287	i 9 39	- 2	i 17 24	- 4	13 3	PPP	26.4
Hyderabad		58.2	295	i 9 49	- 1	i 17 46	- 4	11 55	PP	26.4
Kyakhta		61.3	341	i 10 10	- 1	i 18 26	+ 1	—	—	—
Kabansk		62.7	343	i 10 20	0	i 18 46	+ 4	—	—	—
Poona		62.7	295	i 10 21	+ 1	18 39	- 3	11 9	PcP	28.3
New Delhi		63.5	307	e 10 25	- 1	i 18 46	- 6	12 44	PP	29.2
Irkutsk		63.6	341	i 10 26	0	i 18 58	+ 4	—	—	—
Petropavlovsk		64.0	16	i 10 26	- 3	18 55	- 4	—	—	—
Magadan		68.0	10	i 10 54	0	19 49	+ 2	—	—	—
Przhevsk		69.3	320	i 11 4	+ 2	i 20 7	+ 4	—	—	—
Warsak Dam	E.	70.2	309	i 11 6	- 2	i 20 12	- 1	i 11 25	PcP	31.6
Naryn		70.3	318	i 11 10	+ 1	i 20 18	+ 4	i 11 25	pP	—
Almata		70.6	320	i 11 12	+ 2	i 20 21	+ 3	—	—	—
Rybach'e		70.7	319	i 11 12	+ 1	i 20 21	+ 2	e 11 28	pP	—
Khorog		71.5	313	11 17	+ 1	e 20 32	+ 4	e 11 33	pP	—
Frunse		71.9	319	i 11 19	+ 1	—	—	i 11 35	pP	—
Andijan		72.4	316	i 11 23	+ 2	20 41	+ 3	i 11 40	pP	—
Quetta		72.4	304	i 11 22k	+ 1	i 20 38	0	i 11 41	PcP	—
Dzhergetal		72.5	315	e 11 23	+ 1	20 44	+ 4	—	—	—
Semipalatinsk		72.5	328	i 11 19	- 3	—	—	11 38	pP	—
Fergana		72.6	316	i 11 23	+ 1	i 20 43	+ 2	—	—	—
Kulyab		73.0	313	11 25	0	20 45	0	—	—	—
Garm		73.1	315	e 11 26	+ 1	i 20 47	+ 1	—	—	—
Obi-garm		73.4	314	i 11 27	0	i 20 49	- 1	11 43	pP	—
Stalinabad		74.0	314	i 11 31	+ 1	—	—	11 48	pP	—
Honolulu		74.3	66	i 11 31	- 1	—	—	—	—	—
Lunacharskoe		74.8	316	i 11 36	+ 1	e 21 6	+ 1	11 51	pP	—
Tashkent		74.8	316	i 11 36	+ 1	i 21 6	+ 1	e 11 53	pP	—
Tchimkent		74.9	317	i 11 37	+ 1	i 21 10	+ 4	i 11 57	pP	—
Samarkand		75.7	313	11 40	0	—	—	—	—	—
Tananarive		82.5	252	e 12 20	+ 3	e 22 34	+ 7	e 21 2	?	—
Sverdlovsk		85.8	328	i 12 33	- 1	i 22 59	- 1	i 12 49	pP	—
Baku		88.5	311	12 50	+ 3	e 23 13	[+ 5]	e 13 6	pP	—
Shemakla		89.5	311	i 12 52	+ 1	23 16	[+ 2]	i 16 26	PP	—
Makhach-Kala		90.7	313	i 12 59	+ 2	i 23 49	+ 4	—	—	—
Goris		91.1	310	i 13 0	+ 1	23 26	[+ 3]	16 33	PP	—
Kirovobad		91.2	311	13 0	+ 1	23 27	[+ 3]	16 17	PP	—
College		92.1	25	i 13 0	- 3	i 23 56	- 2	e 16 47	PP	e 38.0
Tiflis		92.5	312	i 13 7	+ 2	i 23 36	[+ 5]	24 10	ScS	—
Erevan		92.6	310	i 13 9	+ 3	i 25 14	PS	—	—	—
Leninakan		93.1	311	e 13 10	+ 2	—	—	16 55	PP	—
Tsikhlis-Dzhvari		93.5	311	13 15?	+ 5	23 41?	[+ 4]	—	—	—
Borzhomi		93.6	311	i 13 11	+ 1	i 23 40	[+ 3]	13 31	pP	—
Abastumanj		94.0	311	e 13 20	+ 8	—	—	—	—	—

Continued on next page.

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	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.	
	°	°	m. s.	s.	m. s.	s.	m. s.	m.	
Piatigorsk	94.0	314	13 12	0	i 23 40	[ 0]	i 13 29	pP	—
Zugdidi	94.8	313	13 21	+ 5	i 23 46	[+ 2]	i 17 19	PP	—
Sotchi	96.4	313	e 17 17	PP	i 23 54	[+ 1]	i 25 56	PS	—
Moscow	98.2	326	13 30	- 1	i 24 5	[+ 3]	13 49	pP	—
Grahamstown	z. 98.9	235	i 13 38	+ 4	—	—	—	—	—
Ksara	98.9	303	13 55	pP	26 34	PS	17 42	PP	—
Pretoria	z. 99.3	243	e 13 39?	+ 3	—	—	—	—	—
Theodosia	99.6	315	e 13 38	0	i 24 13	[+ 4]	e 13 55	pP	—
Yalta	100.5	314	e 13 42	0	i 24 16	[+ 3]	i 17 47	PP	—
Kimberley	z. 101.5	239	e 13 50	+ 4	—	—	—	—	—
Pulkovo	101.9	330	e 13 47	- 1	e 24 16	[- 4]	e 20 3	PPP	—
Helwan	102.7	299	e 13 52	+ 1	24 27	[+ 3]	18 6	PP	—
Kishinev	104.1	317	e 13 56	- 1	i 24 32	[+ 2]	e 14 16	pP	—
Istanbul	104.3	311	13 59	+ 1	25 44	+ 3	18 20	PP	—
Kiruna	104.5	338	i 13 57k	- 2	i 25 39?	- 3	i 14 16	pP	e 47.6
Shasta	106.4	50	e 14 8k	P	e 17 41	?	e 18 31	PP	—
Berkeley	z. 106.7	53	e 14 9k	P	e 18 31	PP	e 18 2	PKP	—
Lwow	106.9	320	e 14 20	P	i 24 46	[+ 3]	i 18 41	PP	—
Mineral	z. 107.0	50	e 14 10k	P	e 14 23	pP	e 18 17	PKP	—
Santa Clara	E. 107.0	53	—	—	e 24 35	[- 8]	—	—	—
Lick	z. 107.2	53	i 14 12a	P	e 18 38	PP	e 14 52	pP	—
Resolute Bay	107.3	12	i 14 10k	P	i 26 7	+ 2	i 18 31	PP	—
Upsala	108.1	331	i 18 43	PP	i 26 3	S	i 21 1	PPP	e 48.6
Uzhgorod	108.2	319	e 14 17	P	e 24 50	[+ 2]	25 44	SKKS	—
Reno	z. 108.5	50	e 14 17k	P	i 18 44	PP	e 14 40	pP	—
Fresno	z. 108.7	54	e 14 17	P	e 18 46	PP	e 18 19	PKP	—
Skalnate Pleso	109.4	320	e 18 15	[- 8]	e 28 13	PS	e 18 41	PP	—
Timisoara	109.4	316	e 18 14	[- 9]	e 24 59	[+ 6]	i 19 23	PP	—
Tinemaha	z. 109.9	54	i 18 55	PP	—	—	—	—	—
Belgrade	110.2	315	e 18 37a	[+ 13]	e 29 45	PPS	e 19 23	PP	—
Pasadena	110.3	57	i 14 25	P	e 28 52	PS	i 18 28	PKP	e 49.9
Raciborzu	110.5	322	e 18 14	[- 11]	e 26 2	SKKS	e 19 15	PP	—
China Lake	z. 110.6	54	e 14 25	P	i 19 0	PP	e 18 18	?	—
Riverside	z. 111.0	57	e 14 27	P	i 19 3	PP	e 18 28	PKP	—
Hungry Horse	111.1	41	i 14 28	P	i 29 26	PKKP	i 18 27	PKP	—
Ogyalla	111.1	319	e 19 5	PP	e 25 4	[+ 3]	e 21 20	PPP	—
Palomar	z. 111.5	57	e 14 33	P	i 19 6	PP	e 18 55	PKP	—
Copenhagen	112.2	328	19 6	PP	25 12	[+ 7]	28 36	PS	53.6
Boulder City	112.8	54	e 14 37	P	—	—	—	—	—
Nelson	112.8	54	i 14 36	P	—	—	i 18 33	PKP	—
Prague	112.9	322	e 18 31	[+ 1]	e 25 10	[+ 2]	e 19 6	PP	e 54.6
Potsdam	113.0	325	i 19 36	PP	i 28 46	PS	e 34 57	SS	e 55.6
Taranto	113.3	311	18 1	[- 29]	25 5	[- 4]	34 59	SS	—
Collnberg	z. 113.4	323	e 14 38	P	e 29 25	PS	e 18 31	PKP	—
Bergen	N. 113.6	335	e 27 2	SKKS	e 32 50	?	e 34 46	SS	e 54.5
Cheb	114.1	323	e 18 32	[ 0]	e 25 8	[- 4]	e 19 49	PP	e 60.6
Logan	114.1	47	e 14 44	P	—	—	e 19 26	PP	—
Jena	114.3	324	e 18 35	[+ 3]	e 26 49	SKKS	e 19 36	PP	—
Scoresby Sund	114.4	351	e 14 44	P	i 29 6	PS	i 18 34	PKP	55.6
Triest	114.6	318	e 18 34	[+ 1]	i 25 14	[ 0]	e 19 55	PP	57.1
Messina	115.0	310	e 18 35	[+ 1]	i 27 14	SKKS	19 41	PP	53.6
Witteveen	z. 116.4	328	i 18 39a	[+ 3]	—	—	—	—	—
Bologna	116.5	317	e 18 56	[+ 19]	i 29 46	PS	e 19 53	PP	—
Rome	116.5	314	e 18 28	[- 9]	e 25 23	[+ 2]	e 19 44	PP	e 52.3
Stuttgart	116.5	322	e 18 38	[+ 1]	e 25 23	[+ 2]	e 19 42	PP	e 58.6
Tucson	116.6	57	e 18 40	[+ 3]	e 26 14	[+ 52]	i 19 44	PP	e 46.8
Florence	116.8	316	e 15 45	?	e 25 25	[+ 3]	i 18 31	PKP	55.9
Karlsruhe	z. 116.9	323	e 18 39	[+ 2]	e 19 43	PP	e 18 52	pPKP	—
Prato	116.9	316	e 18 25	[- 12]	e 29 28	PS	—	—	—
Chur	117.0	319	e 18 39	[+ 1]	e 25 15	[- 8]	—	—	—
Zürich	117.4	321	e 18 39	[+ 1]	e 19 58	PP	e 18 57	pPKP	—
De Bilt	117.5	327	e 19 54	PP	e 29 30	PS	e 36 6	SS	e 53.6
Strasbourg	117.5	323	i 18 40	[+ 2]	e 29 36	PS	e 19 55	PP	e 54.6
Pavia	117.8	319	e 19 54	PP	e 29 32	PS	e 36 7	SS	e 54.9
Basle	118.0	321	e 18 41	[+ 2]	—	—	e 19 58	PP	—

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	$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.	
	°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.	
Oropa	118.4	318	e 17	27	[-73]	e 25	2	[-26]	e 28	36	?	51.6
Abetlecn	118.5	334	e 22	5	PKS	i 27	45	SKKS	i 29	35	PS	e 61.4
Uccle	118.6	326	i 18	42	[+ 1]	e 25	4	[-25]	e 26	45	S	e 56.6
Besançon	119.1	322	i 18	44	[+ 2]	e 19	55	PP	i 19	4	pPKP	—
Reykjavik	120.0	348	i 18	46 <sub>a</sub>	[+ 3]	—	—	—	—	—	—	—
Kew	120.8	328	i 18	43 <sub>k</sub>	[- 2]	e 36	41	SS	i 19	21	PP	e 58.6
Chambon-la-Forêt	121.0	323	i 18	46	[+ 1]	i 20	37	PP	i 19	0	pPKP	—
Clermont-Ferrand	121.5	321	e 18	47	[+ 1]	e 30	11	PS	e 20	24	PP	66.6
Rathfarnham Castle	122.8	332	i 18	50 <sub>a</sub>	[+ 1]	e 26	51	[+68]	23	12	PPP	e 55.1
Lubbock	123.7	54	18	53	[+ 2]	—	—	—	—	—	—	—
Algiers Univ.	z. 125.0	311	i 18	56	[+ 3]	e 22	26	PKS	e 21	1	PP	—
Tortosa	125.3	316	e 18	53	[- 1]	—	—	—	i 20	6	?	—
Tamanrasset	z. 126.3	293	e 18	58	[+ 3]	e 26	19	[+26]	i 20	50	PP	51.7
Alicante	127.0	314	18	58	[+ 1]	26	3	[+ 7]	21	5	PP	60.3
Tacubaya	128.8	71	e 19	7	[+ 7]	—	—	—	e 21	44	PP	—
Toledo	128.8	317	e 18	56	[- 4]	e 26	14	[+14]	i 21	14	PP	79.3
Fayetteville	z. 128.9	48	e 15	14	P	i 21	5	PP	i 19	1	PKP	—
Almeria	129.0	313	i 18	57	[- 4]	26	1	[ 0]	21	1	PP	68.5
Granada	129.7	314	19	1 <sub>a</sub>	[- 1]	i 28	43	SKKS	19	31	pPKP	68.1
Malaga	130.5	314	i 18	37	[-27]	25	49	[-16]	i 21	17	PP	62.8
Kirkland Lake	z. 130.8	28	e 19	5	[+ 1]	—	—	—	e 22	25	PKP	—
Vera Cruz	131.7	71	e 19	15	[+ 9]	—	—	—	e 22	44	PKS	—
Averroes	134.2	311	e 19	13?	[+ 3]	—	—	—	—	—	—	—
Cincinnati	134.2	40	i 19	11	[+ 1]	—	—	—	—	—	—	—
Cleveland	z. 134.6	36	e 19	5 <sub>k</sub>	[- 6]	i 22	38	SKP	i 21	41	PP	—
Ottawa	134.8	27	e 19	9	[- 3]	26	6	[- 8]	21	41	PP	—
Buffalo (Larkin)	135.2	32	i 19	11	[- 1]	—	—	—	—	—	—	—
Shawinigan Falls	N. 135.2	23	e 19	14	[+ 2]	—	—	—	i 22	44	PKS	—
Seven Falls	E. 135.5	22	e 19	18	[+ 5]	28	42	SKKS	i 22	48	PKS	—
Mobile	135.6	52	e 19	16	[+ 3]	—	—	—	22	47	PKS	—
Pittsburgh	136.1	35	i 19	16	[+ 2]	—	—	—	i 22	47	PKS	—
La Plata	137.3	168	22	48	PKS	40	6	SS	25	6	PPP	69.0
Washington	138.9	34	e 19	13	[- 6]	—	—	—	i 19	21	PKP	—
Harvard	139.0	26	i 19	12 <sub>k</sub>	[- 7]	i 29	3	SKKS	e 22	9	PP	e 67.5
Palisades	139.0	29	i 19	11	[- 8]	e 28	48	SKKS	e 22	7	PP	e 65.5
City College, N.Y.	139.1	29	i 19	20	[+ 1]	—	—	—	i 22	8	PP	—
Weston	139.2	26	e 19	8 <sub>a</sub>	[-12]	e 29	3	SKKS	i 21	54	PP	e 68.2
Halifax	140.1	17	e 19	15	[- 6]	i 22	49	PKS	i 22	19	PP	—
Huancayo	146.9	125	i 19	39	[+ 6]	e 41	41	SS	i 23	3	PP	e 60.8
M'Bour	148.7	288	i 19	40	[+ 4]	i 23	11	PKS	i 23	35	PP	—
La Paz	149.3	140	i 19	42 <sub>k</sub>	[+ 5]	i 26	49	[+12]	i 23	12	PP	87.8
Bermuda	150.3	29	i 19	41	[+ 3]	e 42	41	SS	e 33	33	PS	e 70.6
Chinchina	152.4	19	i 20	7	[+25]	30	58	SKKS	e 20	26	PKP <sub>2</sub>	—
Bogota	154.0	93	i 19	49	[+ 5]	i 23	22	PKS	i 20	9	PKP <sub>2</sub>	—
San Juan	159.0	55	i 19	53	[+ 3]	—	—	—	—	—	—	—
Fort de France	165.0	59	e 19	58	[+ 2]	—	—	—	e 24	38	PP	—

April 6d. 2h. 24m. Epicentre 37°·7N. 72°·0E. Depth of focus 120km.  
Seismo. Bulletin of Stations of U.S.S.R. for 1953, April-June, Moscow, 1954, pp.60,61.

April 6d. 3h. 49m. 50s. Epicentre 9°·7N. 125°·7E. Depth of focus 0·025.  
(as on 1950, Sept. 25d.).

A = -·5753, B = +·8006, C = +·1674;  $\delta = -5$ ;  $h = +7$ ;  
D = +·812, E = +·584; G = -·098, H = +·136, K = -·986.

	$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.
	°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.
Baguio	8.3	324	i 1	51	- 7	i 3	30	0	—	—	—
Hong Kong	16.7	320	i 3	41	- 3	6	37	- 6	—	—	7.1
Yakusima	21.1	11	e 4	29	- 1	e 8	10	+ 1	—	—	—
Zô-Sè	21.7	350	i 4	34 <sub>a</sub>	- 2	i 8	22	+ 3	—	—	—
Kagosima	22.2	10	4	43	+ 2	8	33	+ 5	—	—	—

Continued on next page.

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	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Miyazaki	22.7	13	i 4 47	+ 1	i 8 40	+ 4	e 5 19	e 10.7
Nanking	23.1	344	i 4 49 <sub>a</sub>	- 1	i 8 52	+ 9	—	—
Simidu	23.9	15	i 4 58 <sub>a</sub>	+ 1	8 58	+ 1	—	—
Ooita	24.0	11	e 4 59	+ 1	e 8 56	- 2	e 9 10	—
Hukuoka	24.2	9	e 4 58 <sub>a</sub>	- 2	e 9 9	+ 7	e 5 33	—
Djakarta	24.5	231	e 5 5 <sub>k</sub>	+ 2	i 10 22	SS	i 6 20	—
Muroto	24.7	16	e 5 6	+ 1	e 9 9	- 1	—	—
Torisima	24.7	31	e 5 4	- 1	—	—	e 5 41	—
Hirosima	25.3	12	i 5 9	- 1	9 19	- 1	—	—
Takamatu	25.7	18	e 5 13	- 1	e 9 25	- 2	15 53	11.5
Sumoto	25.9	17	i 5 17	+ 1	i 9 30	0	—	e 11.9
Kobe	26.4	17	e 5 16	- 5	e 9 34	- 4	e 10 46	—
Osaka	26.4	17	e 5 25	+ 4	e 9 49	+ 11	e 6 29	—
Kyoto	26.8	17	e 5 32	+ 8	e 9 44	0	e 6 15	e 12.0
Tu	26.8	19	5 23	- 1	e 9 43	- 1	—	—
Kameyama	26.9	19	5 26	+ 1	9 45	- 1	e 10 19	?
Toyooka	27.0	16	e 5 26	0	e 9 44	- 4	—	—
Hikone	27.2	20	i 5 27	- 1	e 9 57	+ 6	—	—
Omaesaki	27.3	22	e 5 25	- 4	9 52	0	—	11.3
Nagoya	27.4	21	5 24	- 6	9 47	- 7	e 5 54	pP
Tsuruga	27.5	19	e 5 30	- 1	i 9 52	- 4	—	—
Shizuoka	27.7	22	e 5 34	+ 2	9 58	- 1	—	—
Kohu	28.4	22	e 5 38	- 1	e 10 7	- 3	—	—
Matsuro	29.0	19	5 43	- 1	10 46	+ 26	6 34	pP
Nagano	N. 29.1	19	e 5 56	+ 11	e 10 18	- 3	—	—
Sendai	31.5	24	e 6 0	- 6	e 10 53	- 6	—	e 13.4
Mizusawa	E. 32.4	22	6 18	+ 4	e 11 8	- 5	—	—
Miyako	33.2	23	e 6 14	- 7	11 24	- 1	—	—
Vladivostok	33.7	8	i 6 24	- 1	—	—	—	—
Mori	34.8	19	6 12	- 22	11 56	+ 6	—	—
Shillong	35.8	301	i 6 42	- 1	e 12 2	- 3	7 52	PP
Sapporo	35.9	19	e 6 44	+ 1	e 12 6	- 1	—	—
Yuzno-Sakhlinsk	39.8	17	i 7 18	+ 2	13 6	+ 1	—	—
Chatra	40.2	302	i 7 19	0	i 13 11	0	8 50	PP
Kurlisk	40.2	24	e 7 22	+ 3	13 12	+ 1	—	—
Uglegorsk	41.6	17	i 7 30	- 1	i 13 29	- 3	—	—
Perth	42.5	192	—	—	i 15 25	?	i 18 0	SSS
Kyakhta	43.6	342	i 7 45	- 2	e 14 1	0	8 21	pP
Madras	E. 44.7	280	i 7 58	+ 2	i 14 22	+ 5	9 39	PP
Kabansk	45.0	344	7 58	0	—	—	8 33	pP
Brisbane	45.5	145	i 9 58	PP	i 14 37	+ 9	i 10 46	PPP
Irkutsk	45.9	342	8 4	- 1	e 14 32	- 2	—	—
Hyderabad	46.5	285	i 8 11	+ 1	i 14 44	+ 2	9 57	PP
New Delhi	49.1	300	e 8 30	0	i 15 14	- 5	i 16 14	?
Riverview	49.6	152	i 8 43 <sub>a</sub>	+ 9	i 15 42	+ 16	i 9 15	pP
Petropavlovsk	50.8	25	e 8 43	0	15 41	- 1	—	—
Poona	E. 50.9	286	i 8 45	+ 2	15 46	+ 2	9 57	PcP
Przhevalsk	52.6	317	i 8 57	+ 1	e 16 6	- 1	—	—
Naryn	53.9	316	i 9 4	- 2	—	—	—	—
Rybach'e	54.2	316	i 9 7	- 1	—	—	—	—
Warsak Dam	E. 55.0	305	i 9 10	- 4	—	—	—	—
Semipalatinsk	55.2	327	e 9 13	- 2	—	—	—	—
Frunse	55.4	316	i 9 15?	- 1	e 16 48?	+ 4	—	—
Khorog	55.8	310	i 9 21	+ 2	—	—	—	—
Andijan	56.2	313	i 9 22	0	i 16 56	+ 1	—	—
Fergana	56.5	313	i 9 23	- 1	i 16 59	0	—	—
Dzhergetal	56.6	312	i 9 24	- 1	—	—	—	—
Garm	57.2	311	e 9 29	0	e 17 8	0	—	—
Kulyab	57.4	309	9 30	- 1	—	—	—	—
Obi-garm	57.6	311	i 9 32	0	—	—	—	—
Quetta	58.2	300	e 9 34	- 2	i 17 21	0	i 17 33	?
Tashkent	58.6	313	i 9 38	- 1	—	—	—	—
Tchimkent	58.7	314	i 9 39	- 1	—	—	—	—
Samarkand	59.9	310	9 45	- 3	—	—	—	—
Bairam-Ali	63.3	307	i 10 11	0	i 18 28	+ 2	—	—

Continued on next page.

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	$\Delta$ °	Az. °	P. m. s.		O-C. s.	S. m. s.		O-C. s.	Supp. m. s.		L. m.
Ashkabad	66.3	307	i 10	31	+ 1	—	—	—	—	—	—
Kizyl-Arvat	68.0	309	—	—	—	e 19 26	+ 3	—	—	—	—
Sverdlovsk	68.4	328	i 10	42	- 1	19 24	- 3	—	—	—	—
Baku	73.0	310	i 11	14	+ 4	—	—	—	—	—	—
Shemakla	73.9	310	i 11	17	+ 1	—	—	—	—	—	—
Makhach-Kala	74.8	312	i 11	22	+ 1	—	—	—	—	—	—
Goris	75.7	308	i 11	28	+ 2	e 20 53	+ 3	—	—	—	—
Kirovobad	75.7	310	11	27	+ 1	20 51	+ 1	e 12 7	pP	—	—
Grozny	76.1	313	i 11	31	+ 3	—	—	—	—	—	—
Tiflis	76.8	311	i 11	34	+ 2	21 4	+ 2	—	—	—	—
Erevan	77.1	309	i 11	38	+ 4	21 16	+11	—	—	—	—
Gori	77.3	310	11	37	+ 2	—	—	—	—	—	—
Leninakan	77.6	310	e 11	40	+ 4	—	—	—	—	—	—
Borzhom	77.9	311	i 11	40	+ 2	21 16	+ 2	—	—	—	—
Tsikhlis-Dzhvari	77.9	311	e 11	41	+ 3	e 21 16	+ 2	—	—	—	—
Piatigorsk	78.0	313	11	39	0	21 15	0	—	—	—	—
Zugdidi	79.0	311	11	47	+ 3	i 21 28	+ 3	—	—	—	—
College	79.8	25	i 11	49	+ 1	e 21 28	- 6	e 26 28	SS	e 32.6	—
Sotchi	80.5	313	i 11	52	0	e 21 38	- 3	—	—	—	—
Moscow	81.0	325	11	55	0	e 21 43	- 3	—	—	—	—
Theodosia	83.4	314	i 12	9	+ 2	e 22 10	0	—	—	—	—
Pulkovo	84.4	329	i 12	14	+ 2	e 23 31	PS	—	—	—	—
Yalta	84.4	314	i 12	13	+ 1	e 22 18	- 2	—	—	—	—
Ksara	84.5	303	i 12	16	+ 3	e 23 52	PS	e 12 58	pP	—	—
Kiruna	86.8	338	i 12	23 <sub>a</sub>	- 1	e 22 29	[- 1]	e 15 51	PP	e 42.2	—
Kishinev	87.6	318	i 12	29	+ 1	—	—	—	—	—	—
Istanbul	z. 88.7	312	12	33	0	e 24 34	PS	e 13 12	pP	—	—
Helwan	89.0	300	i 12	36 <sub>k</sub>	+ 2	e 23 10	+ 6	e 13 19	pP	—	—
Uzhgorod	90.5	320	i 12	48	+ 7	—	—	—	—	—	—
Upsala	90.6	331	i 12	42	0	i 23 17	- 1	e 22 55	SKS	e 42.2	—
Resolute Bay	92.2	10	i 12	51 <sub>a</sub>	+ 2	i 23 33	+ 1	e 24 43	PS	—	—
Skalnate Pleso	92.6	321	e 12	55	+ 4	e 25 20	PPS	e 14 24	?	—	—
Raciborzu	E. 93.6	323	e 13	0	+ 5	—	—	e 17 23	PP	—	—
Copenhagen	94.7	329	e 13	2	+ 2	23 25	[+ 9]	25 40	PS	46.2	—
Potsdam	95.8	325	e 13	4	- 1	e 23 28?	[+ 6]	e 23 10?	?	e 50.2	—
Prague	N. 95.9	323	e 13	8	+ 2	e 18 18	?	e 15 15	?	—	—
Collmberg	z. 96.2	324	e 17	3	PP	—	—	e 18 8	?	—	—
Scoresby Sund	97.0	350	i 13	13 <sub>a</sub>	+ 2	i 23 37	[+ 9]	31 4	SS	46.2	—
Cheb	97.1	324	e 17	11	PP	e 24 17	+ 3	e 23 36	SKS	e 35.4	—
Jena	97.2	324	e 13	13	+ 1	—	—	e 13 27	?	—	—
Triest	98.0	320	e 13	16	+ 1	e 23 35	[+ 2]	—	—	—	—
Messina	99.5	312	e 17	27	PP	e 23 40	[- 1]	e 26 30	PS	—	—
Stuttgart	99.5	324	e 13	24	+ 2	e 23 43	[+ 2]	e 17 29	PP	e 52.2	—
De Bilt	100.2	328	—	—	—	e 23 40	[- 4]	e 26 10?	PS	e 50.2	—
Rome	100.3	316	i 17	36	PP	e 26 4	PS	e 31 39	SS	e 50.8	—
Florence	100.4	318	i 16	46	?	i 23 50	[+ 5]	—	—	—	—
Strasbourg	100.5	323	e 26	35	PS	e 23 49	[+ 3]	e 27 28	PPS	49.2	—
Hungry Horse	101.9	36	e 13	37	+ 4	—	—	e 16 16	?	—	—
Reykjavik	z. 102.4	347	e 17	30	PP	—	—	—	—	—	—
Butte	104.0	38	e 13	47	+ 5	—	—	—	—	—	—
Clermont-Ferrand	104.6	322	—	—	—	e 28 19	PPS	—	—	—	61.2
Boulder City	107.2	48	e 18	3	[- 0]	—	—	—	—	—	—
Nelson	107.3	48	i 17	41	[- 22]	—	—	i 18 10	PKP	—	—
Alicante	110.7	317	18	16	[+ 6]	28 17	PS	18 54	PP	52.1	—
Tamanrasset	z. 113.1	300	e 18	19	[+ 5]	e 26 42	S	e 19 2	PP	—	—
Fayetteville	z. 121.0	37	i 18	35	[+ 5]	—	—	e 20 26	PP	—	—
Halifax	125.3	8	i 18	43 <sub>k</sub>	[+ 5]	37 9	SS	20 32	PP	—	—
Harvard	125.7	15	i 18	44 <sub>k</sub>	[+ 5]	e 37 22	SS	i 20 36	PP	—	—
Palisades	126.4	18	e 18	45	[+ 5]	—	—	—	—	e 62.5	—
San Juan	149.7	22	e 19	20?	[- 2]	—	—	—	—	—	—
Huancayo	159.2	99	e 19	46	[+ 11]	e 30 42	SKKS	e 44 10	SS	—	—
La Paz	164.9	118	19	51	[+ 10]	e 31 28	SKKS	i 20 52	PKP <sub>1</sub>	—	—



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April 6d. 5h. 56m. Epicentre 35°·7N. 139°·8E. Depth of focus 60km.  
Intensity IV at Tokyo, Kashiwa; II-III at Tsubasan, Yokohama, Ajiro, Utunomiya, Osima, Hunatu, and Kohu.  
Seismo. Bull. Cent. Met. Obs., Japan, April, 1953, Tokyo, 1953, pp.15-16, with macroseismic chart.

April 6d. 9h. 33m. Epicentre 42°·5N. 143°·7E. Depth of focus 40km.  
Intensity IV at Kusiro; II-III at Obihiro, Urukawa, and Hatinohe.  
Seismo. Bull. Cent. Met. Obs., Japan, April, 1953, Tokyo, 1953, pp.16-17, with macroseismic chart.

April 6d. 12h. 14m. 44s. Epicentre 52°·6N. 160°·3E. (as on 1953, March 26d.).

A = -·5742, B = +·2056, C = +·7924;  $\delta = -13$ ;  $h = -6$ ;  
D = +·337, E = +·941; G = -·746, H = +·267, K = -·610.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Obihiro		15·0	237	e 3 52	+17	—	—	—	—
Sapporo		15·9	241	e 3 51	+ 4	e 7 11	+27	—	e 7·7
Mori	N.	17·0	239	e 4 12	+11	—	—	—	9·7
Miyako	Z.	18·1	232	4 10	- 4	—	—	—	—
Mizusawa	E.	18·9	233	4 22	- 2	5 10	?	—	—
Sendai		19·7	231	e 4 27	- 7	e 8 4	- 6	—	—
Hokusima		20·3	232	e 4 36	- 4	e 8 21	- 2	—	11·5
Utunomiya		21·6	232	e 4 48	- 6	e 8 50	+ 1	—	—
Kumagaya		22·1	232	e 5 3	+ 4	e 9 0	+ 2	—	—
Maebasi		22·1	231	e 4 56	- 3	e 8 55	- 3	—	—
Matusiro		22·3	235	4 56	- 5	9 4	+ 2	12 10	Q 13·9
Nagano		22·3	233	e 5 9	+ 8	e 8 58	- 4	—	—
Tokyo	N.	22·3	230	e 5 3	+ 2	e 9 42	+40	e 6 21	? —
Wazima		22·3	237	e 5 7	+ 6	e 9 19	+17	—	—
Misima	E.	23·1	230	e 5 17	+ 9	e 9 15	- 1	—	—
Kyoto		24·8	235	e 5 20	- 5	e 9 40	- 6	—	e 12·1
Osaka		25·2	235	e 5 32	+ 3	e 9 59	+ 7	—	—
Sumoto		25·7	235	e 5 31	- 2	e 10 7	+ 6	—	14·1
Takamatu		26·2	236	e 5 34	- 4	e 10 2	- 7	—	13·4
Hamada		26·7	240	e 5 44	+ 1	e 9 53	-24	—	—
Koti		27·0	236	e 5 47	+ 2	e 10 36	+14	e 6 8	PP —
Ooita		28·3	239	e 6 11	+14	e 11 6	+23	—	—
College		28·7	44	i 6 0	- 1	e 10 47	- 3	e 6 12	? e 11·7
Zô-Sê	Z.	35·6	249	i 6 57 <sub>a</sub>	- 4	—	—	—	—
Nanking	Z.	36·3	253	i 7 3 <sub>a</sub>	- 4	—	—	—	—
Resolute Bay		43·7	22	i 8 8 <sub>a</sub>	0	i 14 42	+ 3	e 17 56	ScS e 24·9
Victoria		46·5	63	8 37	+ 6	—	—	—	—
Baguio		47·7	236	i 8 35	- 5	i 14 29	?	—	—
Hungry Horse		51·6	58	i 9 10	0	—	—	—	—
Shasta		51·9	70	e 9 12 <sub>k</sub>	0	e 9 34	?	e 10 4	PcP —
Mineral	Z.	52·6	70	i 9 20 <sub>a</sub>	+ 2	i 9 24	P	i 10 14	PcP —
Reno		54·2	69	e 9 36 <sub>k</sub>	+ 7	—	—	—	—
Lick	Z.	54·6	73	e 9 36 <sub>k</sub>	+ 4	i 10 2	?	i 10 29	PcP —
Fresno	Z.	56·1	72	e 9 51 <sub>k</sub>	+ 8	—	—	—	—
Kiruna		56·2	344	i 9 43 <sub>a</sub>	- 1	e 17 32	- 1	e 12 46	PPP c 29·3
Tinemaha	Z.	56·8	71	e 9 48	0	i 10 3	?	e 10 44	PcP —
Logan		57·1	63	e 9 51	+ 1	—	—	—	—
Scoresby Sund		57·2	2	i 9 51 <sub>a</sub>	0	e 17 54	+ 8	e 19 56	ScS 29·3
China Lake	Z.	58·0	71	e 9 55	- 2	i 10 14	?	i 10 25	PcP —
Pasadena	Z.	58·8	73	e 10 4	+ 2	i 10 48	PcP	e 11 32	? —
Chatra		59·1	275	e 10 2	- 2	e 18 3	- 8	e 18 18	PS 27·4
Riverside	Z.	59·4	73	e 10 11	+ 5	i 10 23	?	e 10 58	PcP —
Boulder City		59·5	69	e 10 8	+ 1	—	—	i 10 25	? —
Nelson		59·7	69	i 10 8	- 1	—	—	i 10 15	? —
Palomar	Z.	60·2	73	e 10 15	+ 3	e 12 53	PP	i 10 18	? —

Continued on next page.

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	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.	
	°	°	m. s.	s.	m. s.	s.	m. s.	m.	
Upsala	63.9	340	i 10 36 <sub>a</sub>	- 1	i 19 11	- 1	i 19 28	PS	e 30.3
Tucson	64.5	70	c 10 40	- 1	—	—	—	—	c 44.7
Kirkland Lake	67.3	39	c 10 56	- 3	—	—	—	—	—
Lubbock	68.5	62	11 8	+ 2	—	—	—	—	—
Quetta	68.5	292	i 11 3 <sub>k</sub>	- 3	e 20 6	- 2	—	—	—
Copenhagen	68.9	342	i 11 9	0	20 27	+14	—	—	33.3
Fayetteville	70.6	56	i 11 16 <sub>a</sub>	- 3	—	—	—	—	—
Ottawa	71.2	38	c 11 19	- 4	—	—	—	—	—
Hyderabad	71.4	275	c 11 20	- 4	—	—	—	—	—
Seven Falls	71.5	34	—	—	e 20 40	- 3	21 22	PS	29.3
Potsdam	71.8	340	i 11 27 <sub>k</sub>	+ 1	e 20 49	+ 3	e 11 45	PcP	e 37.3
Cleveland	72.1	44	c 11 23	- 5	e 11 26 <sub>a</sub>	P	e 12 22	PcP	—
Buffalo (Larkin)	72.2	42	i 11 27	- 2	—	—	—	—	—
Witteveen	72.7	344	i 11 33 <sub>a</sub>	+ 1	—	—	i 12 14	PcP	—
Cincinnati	72.8	47	11 29	- 3	—	—	—	—	—
Raciborzu	72.8	336	e 11 33	+ 1	e 12 25	?	e 11 58	PcP	—
Collmberg	72.9	339	e 11 31	- 2	e 21 35	ScS	e 11 54	PcP	—
Skalnate Pleso	73.1	334	e 11 40	+ 6	e 21 8	+ 7	—	—	—
Jena	73.5	340	e 11 37	+ 1	e 21 5	- 1	e 11 52	PcP	—
De Bilt	73.6	345	i 11 37	0	e 21 28	ScS	i 11 58	PcP	e 40.3
Prague	73.7	338	e 11 37	- 1	e 21 23	+15	e 12 1	PcP	e 40.3
Rathfarnham C.	73.9	352	e 12 0	PcP	—	—	—	—	—
Cheb	74.2	340	e 11 40	0	e 21 16	+ 2	e 16 28	PPP	e 40.3
Ogyalla	74.8	335	e 11 46	+ 2	e 21 43	ScS	e 22 19	PPS	e 43.3
Harvard	75.2	37	i 11 46 <sub>a</sub>	0	e 21 26	+ 1	i 11 54	PcP	—
Weston	75.4	37	i 11 46 <sub>a</sub>	- 1	—	—	—	—	—
Palisades	75.6	39	e 11 52	+ 4	—	—	—	—	e 39.7
City College, N.Y.	75.8	39	e 11 48	- 2	—	—	—	—	—
Timisoara	75.9	332	e 9 40	?	—	—	e 10 4	?	—
Karlsruhe	76.0	341	c 11 49	- 2	—	—	—	—	—
Halifax	76.1	31	i 11 50	- 1	21 38	+ 3	i 11 58	PcP	—
Stuttgart	76.1	341	c 11 50	- 1	e 21 34	- 1	e 12 1	PcP	e 40.3
Washington	76.2	42	e 11 51	- 1	—	—	i 12 0	PcP	—
Strasbourg	76.5	342	e 11 54	0	e 21 57	ScS	e 12 5	PcP	e 37.3
Belgrade	77.0	332	e 11 52 <sub>a</sub>	- 4	e 22 4	ScS	e 12 31	PcP	e 50.0
Paris	77.2	345	i 11 58	+ 1	e 22 8	ScS	i 12 10	PcP	e 43.3
Basle	77.5	342	c 11 59 <sub>a</sub>	0	—	—	—	—	—
Zürich	77.5	342	c 11 58	- 1	—	—	e 12 10	PcP	—
Istanbul	77.6	325	e 11 59	- 1	21 15	-36	e 12 18	PcP	40.3
Chambon-la-Forêt	78.0	345	i 12 2	0	—	—	i 12 16	PcP	—
Triest	78.0	337	e 11 57	- 5	e 22 6	+11	e 23 16?	PPS	41.3
Besançon	78.1	342	i 12 3	+ 1	e 13 7	?	e 12 12	PcP	—
Oropa	79.3	341	e 12 29	PcP	—	—	—	—	—
Pavia	79.5	340	c 12 6	- 4	e 22 26	+15	—	—	—
Clermont-Ferrand	80.1	344	e 12 13	0	e 22 22	+ 4	—	—	40.3
Florence	80.4	338	c 12 13 <sub>a</sub>	- 2	e 22 35	+14	e 15 33	PP	e 39.3
Tacubaya	81.0	70	c 12 27	+ 9	—	—	e 12 35	PcP	—
Ksara	81.3	316	i 12 20	0	23 18	PS	15 26	PP	—
Rome	81.8	336	i 12 22 <sub>a</sub>	0	e 22 36	+ 1	e 22 54	?	e 40.0
Athens	82.2	327	—	—	i 22 53	ScS	i 23 48	PPS	—
Messina	84.5	333	c 12 34	- 2	e 23 11	+ 9	—	—	—
Tortosa	85.3	345	c 13 16	+36	—	—	—	—	—
Riverview	86.4	188	12 44	- 1	—	—	—	—	—
Helwan	86.6	318	i 12 45 <sub>k</sub>	- 1	—	—	e 12 55	PcP	—
Toledo	86.9	348	c 12 49	+ 1	23 16? [+ 3]	—	—	—	—
Alicante	87.9	346	12 46	- 7	e 23 12	[- 8]	16 14	PP	41.6
Almeria	89.7	347	12 55	- 6	23 35	[+ 4]	16 21	PP	44.4
Tamanrasset	101.8	336	e 14 4	+ 8	e 25 38	+ 3	e 17 58	PP	—
La Paz	127.7	65	e 18 44	[-24]	—	—	—	—	—
Pretoria	135.3	289	e 19 52	[+30]	—	—	—	—	—

April 7d. 8h. 2m. Epicentre 42°5N. 44°8E.

Seismological Bulletin of the U.S.S.R. for April-June, 1953, Moscow, 1954, p. 62.



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April 7d. 17h. 28m. 33s. Epicentre 24°·5S. 180°. Depth of focus 0·090.  
(as on 1943, June 3d.).

A = -·9110, B = ·0000, C = -·4124;  $\delta = -1$ ;  $h = +3$ ;  
D = ·000, E = +1·000; G = +·412, H = ·000, K = -·911.

		$\Delta$		Az.		P.		O-C.	S.		O-C.	Supp.		L.
		°	'	°	'	m.	s.	s.	m.	s.	s.	m.	s.	m.
Auckland	N.	13·1		199		c 2	52	+ 3	c 5	12	+ 6	—	—	—
Karapiro	N.	13·9		195		2	58	+ 1	c 5	31	+11	—	—	—
Tuai	N.	14·5		189		e 3	2	- 1	5	34	+ 4	—	—	—
Tongariro	Z.	15·1		193		e 2	55	-14	c 6	12	SS	i 6	53	?
New Plymouth	E.	15·4		196		e 3	17	+ 5	c 5	57	+11	c 6	39	SSS
Wellington		17·3		193		i 3	30k	0	c 6	21	+ 3	c 3	45	PP
Cobb River	E.	17·6		198		3	33	0	6	27	+ 3	—	—	—
Kaimata	N.E.	19·3		198		e 3	49	+ 1	e 6	52	0	—	—	—
Christchurch		19·9		195		e 3	55	+ 1	c 7	3	+ 1	i 4	3	?
Brisbane		24·4		256		e 7	4	?	i 8	6	- 8	i 14	27	ScS
Riverview		26·8		242		i 4	52a	- 3	i 8	46	- 5	i 8	1	PcP
Baguio		70·8		299		i 10	11a	- 7	i 18	38	- 8	—	—	—
Zô-Sè	Z.	78·9		312		10	58a	- 5	e 20	8	- 5	12	50	pP
Nanking		81·1		311		i 11	11k	- 3	i 20	29	- 6	13	5	pP
Berkeley	Z.	82·4		43		i 11	21a	0	—	—	—	—	—	—
Lick	Z.	82·4		43		i 11	22a	+ 1	c 14	40	PP	i 13	35	pP
Pasadena		82·7		48		i 11	23a	+ 1	i 14	43	PP	i 13	25	pP
Fresno	Z.	83·2		45		i 11	25a	0	—	—	—	e 14	35	sP
Palomar	Z.	83·2		49		i 14	46	PP	—	—	—	i 14	51	?
Riverside	Z.	83·2		48		i 11	24a	- 1	i 14	52	PP	c 13	31	pP
China Lake	Z.	84·1		47		i 11	29a	0	—	—	—	e 13	34	pP
Shasta		84·1		40		i 11	29a	0	e 14	51	PP	e 13	31	pP
Mineral	Z.	84·3		41		e 11	30a	0	i 11	35	PcP	e 13	36	pP
Tinemaha	Z.	84·4		45		i 11	31a	0	e 15	3	PP	e 13	36	pP
Reno	Z.	84·9		42		i 11	33a	0	—	—	—	—	—	—
Nelson		85·9		48		i 11	38	0	—	—	—	i 15	7	PP
Tucson		86·8		52		i 11	44	+ 2	e 21	48	ScS	—	—	—
Victoria		88·5		34		i 11	48a	- 2	—	—	—	—	—	—
Logan		91·2		44		i 12	3	0	—	—	—	i 15	49	PP
College		92·5		13		i 12	4	- 5	—	—	—	i 14	6	pP
Hungry Horse		93·4		37		i 12	11	- 2	—	—	—	i 15	57	PP
Fayetteville	Z.	100·8		55		i 12	45	- 1	i 15	37	?	i 17	1	PP
Resolute Bay		112·1		16		e 17	22k	[- 5]	—	—	—	e 18	14	PP
Ottawa		116·8		49		i 17	36a	[- 1]	—	—	—	—	—	—
Grahamstown	Z.	117·2		205		—	—	—	e 35	27	?	—	—	—
Harvard		119·4		53		i 17	45k	[+ 3]	—	—	—	—	—	—
Quetta		120·9		292		i 17	44	[- 1]	e 25	26	SKKS	i 15	13	P
Kimberley	Z.	121·9		205		i 17	49	[+ 2]	—	—	—	e 33	0	?
Pretoria	Z.	123·1		211		—	—	—	e 30	2	PS	i 32	13	?
Halifax		125·3		51		i 17	53a	[ 0]	—	—	—	—	—	—
Kiruna		134·9		349		i 18	0	[- 12]	e 24	41	[+ 16]	i 20	53	SKP
Upsala	Z.	142·6		346		i 18	19k	[- 8]	i 21	9	SKP	i 19	47	?
Ksara		147·4		294		18	38	[+ 5]	21	41	sPKP	20	43	pPKP
Copenhagen		147·5		346		i 18	35	[+ 2]	—	—	—	i 20	43	pPKP
Potsdam	Z.	150·4		345		e 18	42	[+ 4]	—	—	—	c 20	51	pPKP
Istanbul		150·7		312		18	43	[+ 5]	25	49?	[+ 61]	e 20	51	pPKP
Raciborzu	Z.	150·8		336		e 18	43	[+ 4]	—	—	—	e 18	53	PKP <sub>2</sub>
Rathfarnham C.	Z.	150·8		7		i 18	37	[- 2]	e 18	43	?	e 20	54	pPKP
Witteveen	Z.	151·3		353		i 18	45a	[+ 6]	i 18	55	PKP <sub>2</sub>	i 21	2	pPKP
Collnberg	Z.	151·4		343		e 18	38	[- 1]	i 18	55	PKP <sub>2</sub>	e 20	58	pPKP
Helwan	Z.	151·7		287		e 18	39	[- 1]	e 22	33	PP	e 20	54	pPKP
Jena		152·1		342		e 18	40	[ 0]	e 18	59	PKP <sub>2</sub>	e 22	25	PP
Prague		152·1		340		e 18	48	[+ 8]	e 22	2	sPKP	e 20	54	pPKP
De Bilt		152·2		353		e 18	58	PKP <sub>2</sub>	—	—	—	i 20	58	pPKP
Stuttgart		154·7		345		e 18	43	[- 1]	e 28	43	SKKS	e 20	53	pPKP

Continued on next page.

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	$\Delta$ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	Supp. m. s.	L. m.
Strasbourg	155.2	348	i 18 45	[+ 1]	e 18 53	?	e 19 11 PKP <sub>2</sub>	—
Paris	155.6	355	e 18 46	[+ 1]	e 22 0	sPKP	e 20 57 pPKP	e 59.4
Chambon-la-Forêt	156.5	356	e 18 45	[- 1]	—	—	i 19 16 PKP <sub>2</sub>	—
Besançon	156.8	350	e 18 47	[ 0]	—	—	i 19 18 PKP <sub>2</sub>	—
Oropa	158.0	346	e 27 2	PPP	e 32 27	SKSP	—	—
Pavia	158.1	343	—	—	e 29 2	SKKS	—	—
Clermont-Ferrand	158.6	353	e 19 26	PKP <sub>2</sub>	—	—	—	—
Rome	159.8	333	e 18 50	[ 0]	e 29 4	SKKS	42 24 SS	—
Messina	E. 161.0	320	e 37 27?	PPS	e 29 6	SKKS	—	—
Toledo	164.3	11	i 19 52k	PKP <sub>2</sub>	—	—	e 24 3 PP	—
Alicante	166.2	2	e 23 15	PKS	—	—	—	73.4
Malaga	167.2	16	i 23 57	PP	—	—	e 26 1 pPP	—
Tamanrasset	Z. 174.7	—	i 19 2k	[+ 1]	e 30 34	SKKS	e 21 29 pPKP	—

April 7d. 23h. 58m. 14s. Epicentre 3°·1N. 127°·1E. Focus at Base of Superficial Layers.  
(as on 1949, April 8d.).

A = -·6023, B = +·7964, C = +·0537;  $\delta$  = -10;  $h$  = +7;  
D = +·798, E = +·603; G = -·032, H = +·043, K = -·999.

	$\Delta$ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	Supp. m. s.	L. m.
Baguio	14.7	335	i 3 26	- 1	i 6 7	- 3	—	—
Djakarta	22.3	246	e 4 55k	- 1	i 9 4	+10	i 9 46 SS	—
Hong Kong	22.9	328	e 4 59	- 3	i 9 8	+ 3	—	—
Zô-Sè	28.4	350	i 5 52a	- 2	10 39	+ 2	—	—
Brisbane	39.4	142	i 7 21	- 7	e 13 19	- 8	i 8 56 PP	—
Vladivostok	40.1	6	e 7 32	- 2	i 13 34	- 4	—	—
Shillong	40.6	307	i 7 36	- 2	e 13 37	- 8	17 39 ScS	—
Calcutta	E. 42.2	301	e 8 14	pP	i 14 12	+ 3	i 17 49 ScS	—
Riverview	43.2	150	i 7 56a	- 4	i 14 20	- 4	i 17 35 SS	e 23.0
Melbourne	E. 44.0	159	—	—	e 17 57	ScS	—	—
Chatra	44.9	305	e 8 12	- 1	i 14 48	0	14 1 PcS	20.4
Yuzno-Sakhlinsk	45.7	15	e 8 18	- 2	e 14 58	- 2	—	—
Kurilsk	45.8	20	e 8 18	- 2	—	—	—	—
Uglegorsk	47.6	14	e 8 34	0	—	—	—	—
Hyderabad	E. 49.8	290	e 8 49	- 3	i 15 54	- 4	—	—
Kyakhta	50.2	343	8 54	- 1	16 6	+ 3	—	—
Kabansk	51.7	345	9 6	0	16 27	+ 3	—	—
Irkutsk	52.6	343	e 9 13	0	16 40	+ 4	—	—
New Delhi	53.8	303	e 9 19	- 3	i 16 49	- 3	20 38 SS	—
Poona	E. 54.3	291	i 9 22	- 3	17 0	+ 1	10 31 PcP	24.6
Przhevalsk	58.4	320	9 56	+ 1	—	—	—	—
Magadan	59.2	14	e 9 58	- 2	—	—	—	—
Naryn	59.5	317	e 10 4	+ 2	i 18 10	+ 2	—	—
Rybach'e	59.9	318	e 10 6	+ 1	—	—	—	—
Warsak Dam	E. 60.1	308	e 10 21	pP	e 18 13	- 3	(23 46) ?	23.8
Frunse	61.1	318	e 10 13	0	—	—	—	—
Khorog	61.1	312	e 10 14	+ 1	e 18 31	+ 3	—	—
Andijan	61.8	316	i 10 17	- 1	i 18 38	+ 1	—	—
Dzhergetal	62.0	314	10 20	+ 1	18 42	+ 2	—	—
Fergana	62.1	315	e 10 19	- 1	i 18 43	+ 2	—	—
Namangan	62.3	315	e 10 23	+ 2	i 18 48	+ 4	—	—
Garm	62.6	314	e 10 23	0	—	—	—	—
Kulyab	62.7	312	e 10 26	+ 2	18 49	0	—	—
Quetta	62.7	303	i 10 22	- 2	i 18 50	+ 1	e 39 29 P'P'	—
Obi-garm	63.0	313	e 10 26	0	—	—	—	—
Stalinabad	63.6	313	i 10 29	- 1	i 19 0	0	—	—
Tashkent	64.2	315	e 10 35	+ 1	19 7	0	—	—
Tohimkent	64.3	317	e 10 35	+ 1	e 19 9	+ 1	—	—
Samarkand	65.3	313	10 37	- 4	i 19 18	- 3	—	—
Bairam-Ali	68.4	309	e 10 59	- 1	19 58	0	—	—

Continued on next page.

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	$\Delta$ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	Supp. m. s.	L. m.
Ashkabad	71.4	309	11 20	+ 1	20 35	+ 2	—	—
Kizyl-Arvat	73.2	310	e 11 31	+ 2	21 2	+ 8	—	—
Sverdlovsk	74.7	329	e 11 37	- 1	i 21 9	- 2	—	—
Baku	78.2	311	i 12 0	+ 2	—	—	—	—
Shamakla	79.2	311	e 12 4	+ 1	i 21 58	- 1	—	—
Makhach-Kala	80.3	313	i 12 10	+ 1	i 22 14	+ 3	—	—
Goris	80.9	310	i 12 12	0	e 22 16	- 1	i 22 22	S <sub>c</sub> S
Kirovobad	81.0	311	12 12	- 1	22 16	- 2	e 12 28	pP
Tananarive	81.1	251	12 12	- 1	—	—	—	—
Grozny	81.6	313	i 12 15	- 1	i 22 21	- 3	—	—
Tiflis	82.2	311	12 19	0	22 32	+ 1	e 12 26	PcP
Gori	82.7	311	e 12 23	+ 1	—	—	—	—
Leninakan	82.9	310	e 12 22	- 1	e 22 36	- 2	—	—
Tsikhlis-Dzhvari	83.2	310	12 26	+ 2	—	—	—	—
Piatigorsk	83.6	314	12 24	- 2	22 44	- 1	—	—
Abastumanj	83.7	310	e 12 27	0	—	—	—	—
Zugdidi	84.4	312	e 12 31	+ 1	22 51	- 2	—	—
Sotchi	86.0	313	e 12 37	- 1	e 23 7	- 1	—	—
Moscow	87.2	326	e 12 43	- 1	i 23 17	- 3	e 12 58	pP
Theodosia	89.0	315	e 12 55	+ 2	i 23 40	+ 4	—	—
Ksara	89.3	304	i 12 57	+ 3	i 23 45	+ 6	—	—
Yalta	90.0	314	e 12 56	- 1	i 23 45	- 1	—	—
Pulkovo	90.8	330	i 24 59	PS	e 23 27	[- 1]	e 23 54	S
Kiruna	93.4	338	i 13 10	- 3	e 23 42	[- 1]	e 24 15	S
Kishinev	93.4	317	e 13 11	- 2	—	—	—	e 45.8
Helwan	93.5	300	13 14	0	23 46	[+ 3]	16 59	PP
Istanbul	94.0	311	13 15	- 1	e 25 40	PS	e 17 16	PP
Lwow	96.1	321	e 13 25	0	—	—	—	—
Upsala	z. 97.0	331	e 13 35	+ 5	i 17 12	PP	i 13 52	pP
Uzhgorod	97.4	319	e 13 34	+ 3	—	—	—	—
Resolute Bay	98.4	10	e 13 33k	- 3	—	—	e 14 2	?
Copenhagen	101.0	329	—	—	e 24 29	[+ 6]	—	48.8
Potsdam	101.9	325	e 18 10?	PP	e 26 58	PS	—	e 50.8
Collnberg	z. 102.4	324	e 13 51	- 3	—	—	e 17 25	?
Jena	103.3	324	e 14 13?	pP	e 24 35	[+ 2]	e 18 16	PP
Scoresby Sund	103.7	350	14 16	pP	e 24 38	[+ 3]	e 18 30	PP
Triest	103.8	319	e 12 26	?	i 24 38	[+ 2]	e 22 37	?
Messina	104.8	311	e 25 53	?	e 24 42	[+ 2]	e 33 31	SS
Stuttgart	105.6	323	e 18 36?	PP	e 24 46	[+ 2]	e 27 37	PS
Bologna	105.9	318	—	—	e 26 0	- 1	—	e 51.4
Rome	105.9	315	e 18 50	PP	e 24 49	[+ 4]	e 29 4	PPS
Florence	106.2	317	e 18 48	PP	e 24 50	[+ 3]	e 27 48	PS
De Bilt	106.5	327	—	—	e 27 28	PS	—	e 50.8
Strasbourg	106.5	323	—	—	e 27 48	PS	e 28 50	PPS
Pavia	107.0	319	—	—	e 29 20	S	e 28 0	PS
Besançon	108.2	322	e 18 51	PP	—	—	e 19 11	sPP
Paris	109.5	325	e 18 53	PP	e 29 25	PPS	e 19 13	sPP
Kew	109.7	328	—	—	e 28 21	PS	—	e 53.8
Clermont-Ferrand	110.6	321	—	—	e 28 29	PS	—	58.8
Tamanrasset	z. 117.5	298	i 18 45	[+ 2]	e 19 49	PP	e 19 5	sPKP
Fayetteville	z. 125.2	40	i 18 58	[+ 1]	e 20 42	PP	i 28 36	PKKP
Halifax	131.5	10	i 19 12	[+ 3]	i 22 27	SKP	—	—
Palisades	132.1	21	—	—	e 22 35	SKP	—	e 64.4
Chinchina	155.9	68	e 19 44	[- 6]	—	—	—	—
Huancayo	156.1	113	e 19 54	[+ 3]	—	—	—	—

April 8d. 8h. 13m. Epicentre 34°-75S, 71°-5W. Depth of focus about 100km. (Strasbourg).  
Felt Intensity V between 33° and 34° in Chile, particularly in and around Santiago.

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April 8d. 11h. 50m. Epicentre 39°15'N. 20°59'E. Rome. 39°9N. 29°6E. Athens.  
Felt in the Region of Yannina: Intensity VIII at Gheroplatanos, with considerable damage; VI at Vasilikon; V at Daliano, and Delvinakion; and in Thesprotia: Intensity III at Philiates. Followed by 39 aftershocks, of which 8 were strongly felt at Gheroplatanos.

A. Galanopoulos.  
Seismological Institute Bulletin, 1953, Athens, 1954, p.50.

April 8d. 19h. 50m. Epicentre 35°9N. 142°2E.  
Seismo. Bull. Cent. Met. Obs., Japan. April, 1953, Tokyo, 1953, p.17-18.

April 10d. 2h. 28m. Epicentre 36°5N. 140°1E. Depth 105km.  
Intensity IV at Mito and Tukubasan; II-III at Utunomiya, Kashiwa, and Onahama.  
Seismo. Bull. Cent. Met. Obs., Japan, April, 1953, Tokyo, 1953, p.18, with macroseismic chart.

April 10d. 15h. 42m. Epicentre 36°7N. 70°1E. Depth 200km.  
Bulletin of Seismo. Stations of U.S.S.R. for April-June, 1953, Moscow, 1954, p.63.

April 11d. 10h. 27m. Provisional Epicentre 40°4S. 174°7E.  
Depth of focus about 60km. Magnitude about 5.5.  
Felt from Taumarunui and New Plymouth to Banks Peninsula. Maximum intensity V-VI at Farewell Split and Foxton.  
Seismological Bulletin E.132 for New Zealand Stations for April-June, 1953, Wellington, 1955, p.2.

April 12d. 15h. 7m. 42s. Epicentre 29°0S. 68°0W. Depth of focus 0.020.

Epicentre given by the U.S.C.G.S.

$$A = +.3282, B = -.8122, C = -.4823; \quad \delta = 0; \quad h = +2;$$

$$D = -.927, E = -.375; \quad G = -.181, H = +.447, K = -.876.$$

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Copiapo	E.	2.6	308	i 1 16	S	(i 1 16)	- 1	i 1 56	?
Santa Lucia	N.	5.0	207	i 1 32	+18	i 2 28	+16	2 15	?
Buenos Aires		9.8	127	e 2 17	- 1	4 5	- 1	—	—
La Plata		10.4	127	i 2 23	- 3	4 18	- 2	3 0	?
La Paz		12.4	359	e 2 45	- 7	i 5 4	- 3	i 2 50	P
Huancayo		18.2	336	i 4 4	+ 1	i 7 24	+ 6	i 4 38	pP
Bogota		33.9	348	e 6 57	pP	e 11 29	sS	e 12 45	PcS
Chinchina		34.5	347	e 6 24	-11	—	—	—	—
Fort de France		44.0	10	e 7 42	-11	—	—	—	—
San Juan		47.1	2	i 8 8	- 9	—	—	i 8 49	pP
Tacubaya		56.8	324	e 9 35	+ 5	—	—	—	—
Washington		68.1	353	e 10 39	- 5	—	—	i 11 23	pP
Fayetteville	z.	69.3	337	i 10 49 <sub>a</sub>	- 3	i 11 12	PcP	i 11 32	pP
Lubbock		70.0	330	10 55	- 1	—	—	—	—
Weston		71.1	357	i 11 0 <sub>a</sub>	- 3	—	—	—	—
Harvard		71.2	357	i 10 58 <sub>a</sub>	- 5	—	—	i 11 41	pP
Tucson		73.2	323	e 11 17	+ 2	—	—	—	—
Halifax		73.4	3	i 11 11	- 5	13 49	PP	11 55	pP
Palomar	z.	77.4	319	i 11 42	+ 3	i 12 47	sP	i 12 27	pP
Kirkland Lake	z.	77.6	352	e 11 35	- 5	—	—	e 12 17	pP
Nelson		78.0	322	i 11 44	+ 2	—	—	i 11 52	?
Riverside	z.	78.2	319	i 11 45	+ 2	—	—	i 12 30	pP
Pasadena		78.7	319	i 11 48	+ 2	i 12 4	PcP	i 12 32	pP
Kimberley	z.	78.8	116	i 11 45	- 1	—	—	—	—
China Lake	z.	79.6	321	e 11 53	+ 2	—	—	e 12 37	pP
Tinemaha	z.	80.9	321	i 12 1	+ 3	—	—	i 12 45	pP
Fresno	z.	81.5	320	e 12 2 <sub>a</sub>	+ 1	e 14 10	?	e 17 27	PPP
Lick	z.	82.8	320	e 12 12 <sub>a</sub>	+ 5	—	—	e 12 54	pP
Pretoria	z.	82.9	115	i 12 4?	- 4	—	—	—	—
Reno	z.	83.5	322	e 12 13 <sub>k</sub>	+ 2	—	—	e 12 58	pP

Continued on next page.

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		$\Delta$	Az.	P.	O - C.	S.	O - C.	Supp.	L.	
		$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.	
Butte		84.9	330	i 12 19	+ 1	—	—	i 13 3	pP	—
Mineral	z.	85.0	321	i 12 20 <sub>a</sub>	+ 2	—	—	e 13 3	pP	—
Shasta		85.7	321	e 12 22 <sub>k</sub>	0	e 13 15	sP	—	—	—
Hungry Horse		87.3	331	i 12 30	0	—	—	—	—	—
Tamanrasset	z.	87.5	62	i 12 34 <sub>k</sub>	+ 3	e 15 44	PP	i 13 8	pP	—
Messina	E.	102.7	54	—	—	e 23 56	[- 7]	e 28 36	PPS	—
College		111.7	333	16 18	?	—	—	—	—	—
Ksara		116.2	64	e 20 39	?	e 28 59	SP	—	—	—
Quetta	z.	141.1	77	e 19 7	[- 5]	—	—	i 19 15	PKP	—

April 12d. 18h. 48m. Epicentre  $37^{\circ}7'N$ ,  $141^{\circ}3'E$ . Depth 40km.

Intensity II-III at Onahama and Sendai.

Seismo. Bull. Cent. Met. Obs., Japan, April, 1953, Tokyo, 1953, p.19, with macroseismic chart.

April 13d 4h. 48m. Epicentre  $31^{\circ}6'N$ ,  $131^{\circ}8'E$ . Depth of focus 40km.

Intensity II-III at Miyazaki.

Seismo. Bull. Cent. Met. Obs., Japan, for April, 1953, Tokyo, 1953, p. 19-20, with macroseismic chart.

April 13d. 10h. 2m. Epicentre  $34^{\circ}6'N$ ,  $132^{\circ}5'E$ . Depth of focus 10km.

Intensity IV at Hiroshima ; II-III at Hamada and Okayama.

Seismo. Bull. Cent. Met. Obs., Japan, for April, 1953, Tokyo, 1953, p. 20-21, with macroseismic chart.

April 13d. 11h. 39m. Epicentre  $41^{\circ}4'N$ ,  $142^{\circ}2'E$ . Depth of focus 40km.

Intensity IV at Hatinohe ; II-III at Miyako.

Seismo. Bull. Cent. Met. Obs., Japan, for April, 1953, Tokyo, 1953, p. 21, with macroseismic chart.

April 13d. 12h. 51m. Epicentre  $39^{\circ}0'N$ ,  $22^{\circ}6'E$ . (Strasbourg).

Felt in Provinces of Phthiotis (Intensity VII at Ladikon ; VI at Hypati ; V at Makrykouri, Sperchias, and Lamia), in Parnassis (IV at Amphissa), in Lokris (IV at Molos), in Vonitsa (III at Astakoas), in Trichonis, and on the island of Leukade.

A. Galanopoulos.

Seismological Institute Bulletin, 1953, Athens, 1954, p. 52.

April 13d. 18h. 19m. Tian Shan region. Epicentre  $43^{\circ}0'N$ ,  $77^{\circ}5'E$ .

Bulletin of Seismo. Stations of the U.S.S.R. for April-June, 1953, Moscow, 1954, p. 64.

April 13d. 23h. 15m. Epicentre near  $38^{\circ}25'N$ ,  $27^{\circ}25'E$ . (Strasbourg).

Felt in the islands of Lesbos (Intensity III at Plomarion) and Samos (Intensity III at Vathy). Slight damage also at Izmir. Felt at Kemalpassa, Menemen, Odemis, Torbali, Tire, and Siferihisar in Turkey.

A. Galanopoulos.

Seismological Institute Bulletin, 1953, Athens, 1954, p. 52.

Bulletin séismique mensuel d'Istanbul, avril, 1953.

April 13d. 23h. 35m. Tian Shan region. Epicentre  $40^{\circ}5'N$ ,  $73^{\circ}2'E$ .

Bulletin of Seismo. Stations of the U.S.S.R. for April-June, 1953, Moscow, 1954, p. 64.

April 14d. 1h. 21m. Epicentre  $42^{\circ}4'N$ ,  $144^{\circ}1'E$ . Depth of focus 20km.

Intensity IV at Kusiro ; II-III at Nemuro.

Seismo. Bull. Cent. Met. Obs., Japan, for April, 1953, Tokyo, 1953, p 21-22, with macroseismic chart.

April 14d. 8h. 23m. Epicentre  $35^{\circ}6'N$ ,  $141^{\circ}2'E$ . Depth of focus 60km.

Intensity V at Tyosi ; II-III at Mito and Utunomiya.

Seismo. Bull. Cent. Met. Obs., Japan, for April, 1953, Tokyo, 1953, p. 22-23, with macroseismic chart.



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April 14d. 13h. 29m. 26s. Epicentre 8°·2S. 71°·0W. Depth of focus 0·090.  
(as on 1950, December 28d.).

Intensity III-IV at Pucallpa ; I-II at Chorillos in Peru.

A = +·3223, B = -·9360, C = -·1417 ;  $\delta = +5$  ;  $h = +7$  ;  
D = -·946, E = -·326 ; G = -·046, H = +·134, K = -·990.

	$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.
	°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.
Huancayo	5·7	228	i 1	39	0	i 2	58	0	—	—	—
La Paz	8·7	162	i 2	11k	+ 5	i 4	2	+14	i 2	24	PP
Bogota	13·1	346	i 2	50	+ 1	i 5	16	+10	i 3	8	PP
Chinchina	13·9	340	i 2	56	- 1	i 5	19	- 1	i 3	13	PP
Antofagasta	E. 15·4	178	3	15	+ 3	5	49	+ 3	—	—	—
Balboa Heights	19·0	335	e 3	47	+ 1	e 7	18	SS	—	—	—
Galerazamba	19·3	348	i 3	50	+ 2	i 6	51	- 1	i 4	4	PP
Fort de France	24·8	24	i 4	37	- 1	i 8	15	- 5	—	—	—
Santa Lucia	N. 25·1	179	4	38	- 2	8	15	-10	e 14	15	ScS
Ciudad Trujillo	26·5	4	i 4	54	+ 1	—	—	—	i 7	40	PcP
Kingston	26·6	348	e 4	52	- 2	i 7	45	?	i 7	51	PcP
San Juan	26·9	10	i 4	56	0	i 11	45	PcS	—	—	—
Concepción	N. 28·5	180	e 5	8	- 2	i 9	13	- 5	e 8	7	PcP
Buenos Aires	28·7	157	5	12	0	9	17	- 4	—	—	—
La Plata	29·1	157	i 5	15	0	i 9	23	- 4	6	52	PP 13·1
Merida	34·3	328	i 5	58k	- 1	i 10	36	-10	i 12	10	PcS
Oaxaca	35·7	317	i 6	12k	+ 2	i 11	7	0	—	—	—
Vera Cruz	36·8	319	i 6	22k	+ 2	i 11	22	- 2	—	—	—
Puebla	38·1	316	e 6	28k	- 2	i 11	38	- 5	—	—	—
Tacubaya	39·0	316	i 6	34k	- 3	i 11	52	- 4	i 12	14	PcS
Bermuda	40·8	9	i 6	51k	- 1	e 12	18	- 4	e 8	35	pP
Mobile	42·0	338	7	0	- 1	—	—	—	e 7	51	?
Guadalajara	42·8	313	e 7	11	+ 4	i 12	45	- 5	—	—	—
Columbia	43·0	348	i 7	9	0	i 11	26	?	—	—	—
Washington	47·2	355	i 7	39	- 2	—	—	—	i 10	37	PPP
Morgantown	48·3	351	i 7	46	- 4	i 13	58	- 8	—	—	—
Cincinnati	48·7	347	i 7	47	- 6	i 14	1	-11	—	—	—
Fordham	48·9	359	i 7	52	- 2	i 14	10	- 4	—	—	—
Palisades	49·0	359	i 7	52k	- 3	i 14	10	- 6	i 9	42	pP
Pittsburgh	49·1	351	i 7	52	- 4	i 14	12	- 5	i 16	35	ScS
Fayetteville	Z. 49·2	335	i 7	52	- 4	e 14	0	-18	i 9	57	pP e 16·6
St. Louis	49·9	341	i 7	57	- 4	i 14	21	- 7	—	—	—
Weston	50·3	1	i 8	3k	- 1	i 14	29	- 4	i 10	13	pP e 20·9
Cleveland	50·4	351	i 8	2	- 3	i 14	27	- 8	i 17	36	sS
Lubbock	50·8	328	8	6	- 2	—	—	—	—	—	—
Buffalo (Larkin)	51·3	353	i 8	10	- 2	e 14	40	- 7	—	—	—
Halifax	53·0	8	i 8	23k	- 1	15	2	- 7	10	19	pP 21·8
Ottawa	53·5	357	i 8	25k	- 2	15	10	- 6	10	14	pP 21·9
Shawinigan Falls	N. 54·5	359	i 8	33	- 1	e 15	24	- 5	10	28	pP 22·3
Seven Falls	E. 55·1	1	i 8	34	- 4	i 15	28	- 8	18	52	sS 22·2
Tucson	55·3	320	i 8	37	- 3	i 15	33	- 6	—	—	—
Kirkland Lake	Z. 56·7	353	i 8	46k	- 3	i 15	49	- 8	i 9	34	PcP
M'Bour	58·1	67	i 9	2	+ 3	i 16	20	+ 5	i 10	58	pP
Barratt	Z. 59·5	315	i 9	6k	- 2	i 12	0	sP	i 11	4	pP
Palomar	Z. 60·0	317	i 9	8k	- 3	i 16	37	- 2	i 11	7	pP
Nelson	60·1	320	i 9	9	- 3	—	—	—	—	—	—
Boulder City	60·2	320	i 9	11	- 2	i 16	38	- 3	—	—	—
Riverside	Z. 60·8	317	i 9	14k	- 3	i 12	6	sP	i 11	14	pP
Pasadena	61·4	317	i 9	18k	- 2	i 16	51	- 5	i 11	19	pP
China Lake	Z. 61·9	318	i 9	21k	- 3	i 12	11	sP	i 11	20	pP
Logan	62·2	327	i 9	23	- 3	—	—	—	—	—	—
Tinemaha	63·1	319	i 9	28k	- 4	i 17	12	- 5	i 11	36	pP
Fresno	63·9	318	i 9	33k	- 3	e 17	19	- 7	i 11	21	pP
Lick	65·5	318	e 9	44k	- 2	e 17	42	- 3	e 38	15	P'P'
Reno	65·5	321	i 9	45k	- 1	i 17	43	- 2	e 11	47	pP

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	$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.
	°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.
Santa Clara	65.7	318	i 9	47 <sub>a</sub>	- 1	i 17	46	- 2	—	—	—
Berkeley	66.2	318	i 9	51 <sub>k</sub>	0	i 17	42	-12	e 11	52	pP
Mineral	67.1	320	i 9	53 <sub>k</sub>	- 3	i 10	30	PcP	e 38	6	p'P'
Saskatoon	67.4	337	9	54	- 4	17	57	-11	(22	22)	SS
Hungry Horse	67.8	331	i 9	59	- 1	i 18	9	- 3	—	—	22.4
Shasta	67.8	320	i 9	57	- 3	p 18	12	0	i 12	34	PP
Arcata	69.0	320	e 10	5	- 3	e 18	21	- 5	—	—	—
Corvallis	70.5	322	i 10	18	+ 2	i 18	39	- 4	—	—	—
Victoria	72.8	327	i 10	29 <sub>k</sub>	- 1	19	5	- 3	i 12	34	pP
Averroes	73.1	51	i 10	29	- 3	19	11	- 1	12	39	pP
Lisbon	73.9	46	i 10	38 <sub>k</sub>	+ 2	i 19	25	+ 5	12	48	pP
Coimbra	75.0	45	i 10	44 <sub>k</sub>	+ 2	i 19	35	+ 3	12	54	pP
Malaga	76.6	49	i 10	53	+ 2	i 19	42	- 7	i 13	32	PP
Granada	77.4	49	i 10	59 <sub>a</sub>	+ 4	i 20	2	+ 4	13	11	pP
Toledo	78.0	47	i 11	1	+ 3	i 20	6	+ 2	13	19	pP
Almeria	78.1	49	i 11	12	PcP	i 20	4	- 1	13	44	PP
Alicante	80.1	49	i 11	12	+ 3	i 20	27	+ 2	21	10	SP
Tamanrasset	80.9	65	i 11	16 <sub>a</sub>	+ 3	e 20	24	- 9	i 13	28	pP
Reykjavik	81.0	19	i 11	15 <sub>k</sub>	+ 1	i 20	35	+ 1	e 13	18	pP
Tortosa	81.6	47	i 11	19	+ 2	i 20	38	- 2	—	—	—
Rathfarnham Castle	81.9	33	i 11	18 <sub>k</sub>	0	i 20	44	+ 1	i 13	28	pP
Algiers Univ.	82.3	51	i 11	20 <sub>k</sub>	0	e 20	40	- 7	e 13	34	pP
Jersey	82.7	38	i 11	24	+ 2	i 20	45	- 6	e 14	38	PP
Barcelona	83.0	46	e 11	28	+ 4	i 20	58	+ 4	(e 29	25)	PKKP
Sitka	83.4	331	i 11	25	- 1	—	—	—	—	—	e 29.4
Resolute Bay	84.0	353	i 11	27 <sub>k</sub>	- 2	i 20	59	- 4	i 13	36	pP
Edinburgh	84.6	32	—	—	—	i 20	56	-13	e 24	55	?
Kew	84.6	36	i 11	34	+ 2	i 21	5	- 4	i 13	42	pP
Clermont-Ferrand	84.9	43	i 11	34	+ 1	i 21	14	+ 2	i 13	46	pP
Durham	85.1	33	i 20	59	SKS	i 21	14	0	25	4	?
Scoresby Sund	85.1	15	i 11	34	0	i 20	59	[- 1]	i 13	39	pP
Paris	85.4	39	i 11	37	+ 1	i 21	17	0	i 13	46	pP
Aberdeen	85.7	31	i 11	41	+ 4	i 21	18	- 1	e 13	46	pP
Besançon	87.2	42	i 11	44	0	i 14	57	sP	i 13	57	pP
Uccle	87.2	38	i 11	43	- 1	i 21	34	+ 1	e 13	53	pP
Neuchatel	87.8	42	i 11	47	0	e 21	18	[ 0]	e 14	20	pP
De Bilt	88.0	37	i 11	48	0	i 21	19	[ 0]	14	1	pP
Oropa	88.2	44	i 11	47	- 2	i 21	27	SKKS	e 14	5	pP
Basle	88.4	42	e 11	49	- 1	e 21	21	[ 0]	e 14	3	pP
Strasbourg	88.7	41	i 11	51	0	e 21	22	[- 1]	e 14	1	pP
Pavia	88.9	44	i 11	53	+ 1	e 21	49	+ 1	e 23	2	SP
Zürich	89.0	42	i 11	53 <sub>k</sub>	0	e 21	24	[- 1]	e 14	5	pP
Witteveen	89.1	36	i 11	54	+ 1	—	—	—	e 14	6	pP
Karlsruhe	89.2	40	i 11	54 <sub>k</sub>	0	e 21	52	+ 1	e 14	5	pP
Chur	89.5	43	e 11	56	+ 1	e 21	27	[- 1]	e 14	9	pP
Stuttgart	89.7	41	i 11	56 <sub>k</sub>	0	i 21	28	[- 1]	i 14	7	pP
Prato	89.9	46	i 11	57	0	i 23	11	SP	—	—	—
Salo	89.9	44	i 11	55	- 2	i 21	26	[- 4]	e 14	13	pP
Siena	90.0	46	i 12	4	+ 7	e 21	42	[+11]	i 12	24	?
Florence	90.1	46	i 11	56 <sub>k</sub>	- 2	e 22	21	+22	i 14	9	pP
Bologna	90.3	45	e 13	55	pP	—	—	—	—	—	—
Honolulu	90.3	291	i 11	57	- 2	—	—	—	—	—	—
Bergen	90.4	29	i 11	59 <sub>k</sub>	0	i 22	3	+ 1	i 14	9	pP
Rome	90.6	48	i 12	0	0	i 22	3	0	i 14	12	pP
Rocca di Papa	90.7	48	e 12	1	+ 1	e 22	5	+ 1	e 26	2	SS
Kimberley	91.1	120	i 12	3	+ 1	—	—	—	—	—	—
Jena	91.7	39	i 12	5	0	i 21	41	[+ 1]	i 14	18	pP
College	91.8	335	i 12	3	- 3	22	2	-12	—	—	—
Grahamstown	91.8	124	i 12	6	0	—	—	—	—	—	—
Cheb	92.0	39	i 12	6 <sub>a</sub>	0	i 21	42	[ 0]	e 14	19	pP

Continued on next page.



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	$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.	
	°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.	
Triest	92.1	44	i 12	14k	+ 7	e 22	34	+18	e 14	25	pP	—
Messina	92.3	52	e 12	5	- 3	i 21	42	[- 2]	e 14	22	pP	—
Collnberg	z. 92.6	39	i 12	9	0	e 23	33	SP	e 14	29	pP	—
Potsdam	92.8	37	i 12	10k	0	i 21	46	[ 0]	i 14	25	pP	—
Copenhagen	93.0	34	i 12	12k	+ 1	21	48	[ 0]	14	25	pP	—
Prague	93.3	39	i 12	12k	0	e 22	29	+ 2	e 14	24	pP	—
Taranto	93.9	50	11	54	-21	21	14	[-38]	15	24	sP	—
Pretoria	z. 94.7	117	i 12	19	0	—	—	—	—	—	—	—
Ogyalla	95.5	42	e 12	28	+ 6	e 22	1	[ 0]	e 14	43	pP	—
Raciborzu	95.7	39	i 12	25k	+ 2	i 22	4	[+ 2]	e 14	38	pP	—
Pietermaritzburg	z. 95.8	121	e 12	25	+ 1	—	—	—	—	—	—	—
Kalossa	95.9	43	e 12	27	+ 3	22	2	[- 1]	14	47	pP	—
Budapest	96.0	43	e 12	25	+ 1	e 22	55	+ 6	26	55	sS	33.1
Upsala	96.3	30	i 12	25k	- 1	i 22	52	0	i 14	39	pP	—
Szeged	E. 96.6	44	12	29	+ 2	22	6	[ 0]	e 26	16	sSKS	—
Belgrade	96.7	46	i 12	29a	+ 1	i 22	6	[- 1]	e 14	37	pP	—
Skalnate Pleso	97.0	41	e 12	33	+ 4	e 22	59	+ 1	e 14	41	pP	—
Timisoara	97.4	45	e 12	22	- 9	e 22	10?	[- 1]	e 26	26	sSKS	—
Kiruna	z. 98.1	23	i 12	33k	- 1	i 22	14	[ 0]	i 14	45	pP	—
Uzhgorod	98.3	42	e 12	36	+ 1	22	32	SKKS	—	—	—	—
Athens	98.7	53	e 12	37	0	i 22	15	[- 2]	e 14	52	pP	—
Sofia	98.7	48	e 12	39	+ 2	i 22	16	[- 1]	e 16	48	PP	—
Lwow	99.4	41	i 12	40	0	i 22	18	[- 2]	i 14	58	pP	—
Helsinki	100.0	29	—	—	—	i 22	20	[- 3]	—	—	—	—
Bucharest	100.8	45	e 8	51	?	i 22	26	[- 1]	—	—	—	—
Iasi	E. 101.8	44	—	—	—	i 22	29	[- 3]	—	—	—	—
Wellington	102.3	225	—	—	—	e 22	34?	[ 0]	—	—	—	—
Kishinev	102.7	43	e 12	54	0	i 22	33	[- 3]	e 17	11	PP	—
Pulkovo	102.7	29	i 17	17	PP	e 23	46	+ 1	e 22	32	SKS	—
Christchurch	102.9	222	—	—	—	e 22	34	[- 3]	e 26	40	sSKS	—
Istanbul	102.9	49	e 12	55?	0	23	54	+ 7	e 15	4?	pP	40.6
Helwan	104.7	61	e 13	6	P	22	40	[- 5]	15	27	pP	—
Yalta	106.5	46	17	44	PP	27	7	sSKS	—	—	—	—
Theodosia	107.1	45	17	53	PP	—	—	—	—	—	—	—
Moscow	107.2	33	e 13	11?	P	i 27	6	sSKS	i 17	49	PP	—
Ksara	108.5	57	i 17	50	PP	i 26	31	SP	i 20	5	PPP	—
Sotchi	110.6	46	18	15	PP	e 23	9	[- 1]	e 24	7	SKKS	—
Zugdidi	112.3	48	i 18	25	PP	—	—	—	—	—	—	—
Piatigorsk	112.9	45	e 17	19	[-10]	i 24	24	SKKS	—	—	—	—
Borzhomi	113.6	48	e 17	26	[- 4]	24	34	SKKS	i 18	35	PP	—
Tananarive	113.7	114	e 17	34	[+ 4]	28	16	PS	e 20	12	SKP	—
Tiflis	114.6	47	17	34	[+ 2]	i 23	26	[+ 1]	e 28	39	PS	—
Erevan	114.7	49	i 17	28	[- 4]	23	26	[ 0]	18	40	PP	—
Grozny	115.0	45	e 17	33	[ 0]	—	—	—	i 18	50	PP	—
Kirovobad	116.0	48	e 17	26	[- 9]	e 23	28	[- 2]	e 18	49	PP	—
Goris	116.2	49	e 17	15	[-20]	28	34	PS	18	39	PP	—
Makbach-Kala	116.3	45	e 18	52	PP	i 23	39	[+ 7]	i 27	52	SKSP	—
Klyuchi	117.3	330	e 18	56	PP	—	—	—	—	—	—	—
Shemakla	117.7	48	e 17	38	[ 0]	—	—	—	i 19	9	PP	—
Sverdlovsk	118.7	27	i 17	42	[+ 2]	e 22	11	PPP	i 18	8	pPKP	—
Magadan	119.9	337	e 17	42	[ 0]	—	—	—	—	—	—	—
Riverview	122.2	221	i 17	47a	[ 0]	i 23	52	[ 0]	i 21	47	pPP	—
Melbourne	E. 123.2	214	—	—	—	e 23	57	[+ 2]	—	—	—	—
Kiyzl-Arvat	123.8	47	i 17	52	[+ 1]	i 25	40	SKKS	i 29	57	PS	—
Brisbane	124.6	229	i 28	54	SP	i 23	58	[- 1]	i 25	41	SKKS	—
Ashkabad	125.7	48	i 17	56	[+ 2]	i 24	8	[+ 6]	—	—	—	—
Bairam-Ali	128.6	49	i 18	1	[+ 1]	i 26	11	SKKS	i 23	17	PPP	—
Kurilak	130.2	324	e 18	2	[ 0]	—	—	—	i 20	27	pPKP	—
Ulegorsk	130.7	332	18	4	[+ 1]	21	31	PKS	i 20	24	pPKP	—
Samarkand	131.1	43	18	5	[+ 1]	23	45	PPP	20	28	pPKP	—

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	$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.	
	°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.	
Tchimkent	131.5	38	i 18	6	[+ 1]	i 24	4	[-14]	i 21	35	PKS	—
Semipalatinsk	131.6	24	i 20	23	pPKP	—	—	—	—	—	—	—
Tashkent	131.8	39	i 18	8	[+ 2]	i 21	36	PKS	i 20	28	pPKP	—
Yuzno-Sakhlinsk	131.9	330	18	7	[+ 1]	21	34	PKS	—	—	—	—
Stalinabad	132.9	42	i 18	8	[ 0]	—	—	—	e 22	49	pPP	—
Obi-garm	133.4	42	i 18	10	[+ 1]	i 26	37	SKKS	i 20	30	pPKP	—
Namangan	133.5	39	i 18	10	[+ 1]	i 21	42	PKS	i 20	31	pPKP	—
Fergana	133.9	39	i 18	11	[+ 1]	i 21	41	PKS	i 20	33	pPKP	—
Kulyab	133.9	43	18	11	[+ 1]	—	—	—	—	—	—	—
Andijan	134.1	39	i 18	11	[+ 1]	i 21	44	PKS	i 20	33	pPKP	—
Frunse	134.1	35	i 18	12	[+ 2]	i 26	47	SKKS	i 20	32	pPKP	—
Dzhergetal	134.2	41	e 18	12	[+ 2]	—	—	—	—	—	—	—
Obi-hiro	134.2	324	—	—	—	e 21	33	PKS	—	—	—	—
Ili	134.8	31	i 18	12	[ 0]	—	—	—	—	—	—	—
Quetta	135.1	55	i 18	14	[+ 2]	i 24	35	[+10]	e 20	33	pPKP	—
Almata	135.2	32	i 18	14	[+ 2]	—	—	—	i 20	33	pPKP	—
Rybach'e	135.3	35	i 18	14	[+ 2]	i 21	49	PKS	i 20	37	pPKP	—
Khorog	135.4	43	i 18	13	[+ 1]	i 21	48	PKS	—	—	—	—
Irkutsk	135.9	4	i 18	14	[+ 1]	21	48	PKS	i 20	33	pPKP	—
Naryn	135.9	34	e 18	10	[- 3]	i 21	51	PKS	i 20	37	pPKP	—
Kabansk	136.2	2	i 18	14	[+ 1]	e 26	42	SKKS	20	34	pPKP	—
Mori	N. 136.2	326	e 18	11	[- 2]	—	—	—	—	—	—	—
Przhevsk	136.5	32	18	5	[- 9]	—	—	—	—	—	—	—
Warsak Dam	E. 137.0	48	i 18	20	[+ 5]	i 24	7	[-21]	i 20	46	pPKP	—
Kyakhta	137.9	3	i 18	18	[+ 1]	i 21	54	PKS	i 20	37	pPKP	—
Sendai	138.5	321	e 18	18	[ 0]	e 21	4	SKP	—	—	—	—
Vladivostok	139.8	333	i 18	9	[-12]	—	—	—	—	—	—	—
Utunomiya	140.2	319	e 18	14	[- 7]	e 21	58	PKS	—	—	—	—
Kumagaya	140.8	320	e 18	15	[- 8]	e 20	59	SKP	—	—	—	—
Maebasi	140.8	319	e 18	20	[- 3]	e 21	3	SKP	e 21	22	PP	—
Tokyo	140.8	319	18	19	[- 4]	e 24	13	[-21]	e 22	1	PKS	39.1
Nagano	141.2	322	e 18	20	[- 4]	e 21	13	SKP	—	—	—	—
Matusiro	141.3	322	i 18	13	[-11]	i 24	43	[+ 8]	i 20	28	pPKP	—
Kohu	141.6	320	e 18	21	[- 4]	e 22	2	PKS	—	—	—	—
Toyama	141.8	322	18	20	[- 5]	e 19	43	?	e 20	8	?	—
Nagoya	142.9	320	18	23	[- 4]	—	—	—	e 18	44	?	—
Hikone	143.3	321	18	26	[- 1]	—	—	—	e 18	46	?	—
Kameyama	143.4	320	e 18	26	[- 1]	—	—	—	e 21	44	PP	—
New Delhi	143.8	51	18	28 <sup>a</sup>	[ 0]	i 27	43	SKKS	e 39	49	SS	—
Poona	144.4	69	18	30	[+ 1]	i 24	29	[-10]	e 20	47	pPKP	—
Sumoto	z. 144.7	322	i 18	29 <sup>k</sup>	[ 0]	—	—	—	e 20	47	pPKP	—
Takamatu	145.3	322	i 18	31	[+ 1]	e 39	52	SS	e 20	48	pPKP	—
Muroto	145.9	320	i 18	33 <sup>a</sup>	[+ 2]	e 19	17	?	e 20	53	pPKP	—
Hamada	146.0	324	18	30	[- 1]	e 29	8	SKKS	(e 40	1)	SS	e 40.0
Koti	z. 146.1	322	i 18	35	[+ 4]	—	—	—	—	—	—	—
Hirosima	146.2	323	18	33 <sup>k</sup>	[+ 2]	—	—	—	—	—	—	—
Matuyama	146.4	322	i 18	33	[+ 1]	—	—	—	e 20	51	pPKP	—
Simidu	147.0	321	i 18	34 <sup>k</sup>	[+ 1]	e 19	18	?	e 20	51	pPKP	—
Hukuoka	147.9	325	18	38	[+ 4]	—	—	—	e 20	56	pPKP	—
Asosan	148.0	325	18	40	[+ 6]	—	—	—	—	—	—	—
Saga	148.2	325	i 18	40	[+ 6]	—	—	—	i 22	2	PP	—
Kodaikanal	E. 148.8	82	i 19	38	[+62]	—	—	—	—	—	—	—
Hyderabad	E. 148.9	69	18	32	[- 4]	e 25	24	[+38]	e 40	30	SS	—
Kagosima	149.3	322	18	41 <sup>k</sup>	[+ 5]	e 21	14	SKP	—	—	—	—
Yakusima	150.1	320	e 18	35	[- 2]	—	—	—	—	—	—	—
Colombo	E. 151.1	90	18	40	[+ 1]	e 28	25	SKKS	e 21	5	pPKP	—
Madras	E. 151.3	77	18	41	[+ 2]	e 28	24	SKKS	e 21	28	SKP	—
Chatra	152.2	44	18	41	[+ 1]	e 28	25	SKKS	e 21	21	SKP	—
Z6-Sè	154.5	336	i 18	37 <sup>?</sup>	[- 7]	—	—	—	19	0 <sup>?</sup>	PKP <sub>2</sub>	—
Nanking	z. 154.6	341	i 18	44	[ 0]	i 22	48	PP	i 21	5	pPKP	—
Calcutta	E. 155.6	51	e 18	50	[+ 5]	i 27	48	?	i 32	59	PSKS	—
Shillong	156.2	40	18	48	[+ 2]	e 28	52	SKKS	e 21	14	pPKP	—
Bandung	164.9	177	i 18	59	[+ 4]	i 29	33	SKKS	e 19	56	PKP <sub>2</sub>	—
Hong Kong	165.1	341	e 23	34 <sup>?</sup>	PP	e 36	34 <sup>?</sup>	SPP	e 42	11	SS	—
Djakarta	165.6	171	i 18	58 <sup>k</sup>	[+ 2]	e 29	36	SKKS	e 21	22	pPKP	—
Bagulo	166.1	307	i 18	56 <sup>k</sup>	[ 0]	i 29	34	SKKS	(43	34)	SS	43.6

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April 15d. 1h. 17m. 4s. Epicentre 49°·5N. 155°·5E. Focus at Base of Superficial Layers.  
(as on 1953, March 11d.).

A = -·5933, B = +·2704, C = +·7582;  $\delta = -1$ ;  $h = -5$ ;  
D = +·415, E = +·910; G = -·690, H = +·314, K = -·652.

	$\Delta$ °	Az. °	P.		O-C. s.	S.		O-C. s.	Supp.		L. m.
			m.	s.		m.	s.		m.	s.	
Petropavlovsk	4·1	27	i 1	2	0	i 1	46	- 3	—	—	—
Kurilsk	6·7	233	i 1	46	+ 7	i 3	10	+15	—	—	—
Klyuchi	7·5	24	e 1	52	+ 2	—	—	—	—	—	—
Ulegorsk	8·8	272	i 2	18	+10	4	5	+18	—	—	—
Yuzno-Sakhlinsk	8·9	258	i 2	20	+11	e 4	9	+20	—	—	—
Magadan	10·4	347	2	35	+ 5	4	37	+11	—	—	—
Vladivostok	17·5	257	e 4	3	0	—	—	—	—	—	—
Kabansk	30·5	294	i 6	14	+ 2	—	—	—	—	—	—
Kyakhta	31·1	292	e 6	19	+ 2	—	—	—	—	—	—
Irkutsk	31·9	296	e 6	26	+ 2	—	—	—	—	—	—
Nanking	32·4	252	6	32 <sub>a</sub>	+ 3	11	45	+ 5	—	—	—
College	33·0	41	e 6	32	- 2	e 11	41	- 8	e 12	8	ssS e 13·8
Resolute Bay	47·7	20	i 8	34 <sub>a</sub>	- 1	e 15	25	- 3	e 18	49	SS
Przhevalsk	51·8	295	e 9	10	+ 3	—	—	—	—	—	—
Sverdlovsk	52·9	317	i 9	15	0	16	40	0	—	—	—
Frunse	53·9	296	i 9	24	+ 2	—	—	—	—	—	—
Hungry Horse	55·9	54	i 9	35	- 2	—	—	—	i 9	48	pP
Shasta	55·9	66	i 9	36 <sub>a</sub>	- 1	e 10	24	?	i 9	48	pP
Chatra	56·3	274	e 9	42	+ 2	e 17	39	PS	19	27	ScS 26·9
Andijan	56·5	296	i 9	43	+ 2	—	—	—	—	—	—
Mineral	z. 56·6	66	e 9	41 <sub>a</sub>	- 1	i 10	21	?	i 9	54	pP
Namangan	56·7	296	i 9	45	+ 2	—	—	—	—	—	—
Fergana	57·1	295	e 9	46	0	—	—	—	—	—	—
Berkeley	57·8	69	e 9	49	- 1	e 17	47	+ 1	i 10	3	pP e 26·6
Lunacharskoe	57·9	298	e 9	51	0	—	—	—	—	—	—
Tashkent	57·9	298	e 9	52	+ 1	—	—	—	—	—	—
Butte	58·1	55	i 9	51	- 1	—	—	—	—	—	—
Dzhergetal	58·1	295	e 9	54	+ 2	—	—	—	—	—	—
Kiruna	58·2	342	i 9	51	- 2	e 17	56	+ 5	i 10	43	PcP e 27·2
Reno	58·2	65	e 9	53	0	e 17	53	+ 2	e 10	6	pP
Lick	z. 58·5	69	e 9	54 <sub>a</sub>	- 1	e 11	29	?	e 10	8	pP
Khorog	59·0	293	e 10	2	+ 3	—	—	—	—	—	—
Kulyab	59·8	294	10	5	+ 1	—	—	—	—	—	—
Fresno	z. 60·0	68	e 10	4 <sub>a</sub>	- 2	—	—	—	e 10	54	PcP
Stalinabad	60·0	296	i 10	6	0	—	—	—	—	—	—
Samarkand	60·3	298	10	9	+ 1	—	—	—	—	—	—
Scoresby Sund	60·3	359	i 10	7	- 1	e 18	18	0	—	—	29·9
Tinemaha	z. 60·7	67	i 10	9	- 1	e 10	54	PcP	i 10	21	pP
Logan	61·3	58	i 10	14	0	—	—	—	—	—	—
China Lake	z. 61·9	67	i 10	17	- 1	i 10	50	PcP	i 10	30	pP
Pasadena	62·7	69	i 10	22	- 2	i 10	54	PcP	i 10	36	pP e 26·5
Riverside	z. 63·3	69	i 10	26	- 2	—	—	—	i 10	49	pP
Boulder City	63·5	65	i 10	29	0	—	—	—	i 10	51	pP
Nelson	63·7	65	i 10	29	- 1	i 11	1	PcP	i 10	43	pP
Bairam-Ali	64·5	298	i 10	37	+ 1	19	13	+ 2	—	—	—
Upsala	65·8	339	i 10	43	- 1	i 10	46	?	i 12	7	?
Ashkabad	66·4	302	i 10	51	+ 3	—	—	—	—	—	e 31·9
Kizyl-Arvat	66·8	304	e 10	58	+ 8	—	—	—	—	—	—
Quetta	66·8	291	i 10	51	+ 1	e 20	7	PPS	—	—	—
Tucson	68·5	65	i 11	0	- 1	—	—	—	—	—	—
Baku	69·2	309	e 11	9	+ 4	—	—	—	—	—	—
Shemakla	69·6	310	e 10	59	- 9	—	—	—	—	—	—
Piatigorsk	69·8	315	11	9	0	i 20	13	- 3	—	—	—
Copenhagen	70·7	340	i 11	15	+ 1	—	—	—	—	—	33·9
Kirovobad	70·7	311	11	16	+ 2	20	26	+ 1	—	—	—

Continued on next page.

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		$\Delta$ °	Az. °	P. m. s.	O - C. s.	S. m. s.	O - C. s.	Supp. m. s.	L. m.
Tiflis		70.7	313	i 11 16	+ 2	—	—	—	—
Poona	z.	70.8	277	i 11 15	0	—	—	—	—
Borzhom		71.3	313	11 23	+ 5	e 20 40	+ 8	—	—
Zugdidi		71.5	315	e 11 22	+ 3	—	—	—	—
Kirkland Lake	z.	71.6	36	e 11 18 <sub>a</sub>	- 2	—	—	—	—
Goris		71.7	310	11 22	+ 2	20 38	+ 1	—	—
Sotchi		71.7	316	e 11 20	0	—	—	—	—
Leninakan		71.9	313	e 11 32	+10	—	—	—	—
Erevan		72.0	312	e 11 24	+ 2	—	—	—	—
Theodosia		72.4	321	11 24	- 1	—	—	—	—
Lubbock		72.6	58	e 11 24	- 2	—	—	—	—
Kishinev		73.3	326	11 30	0	—	—	—	—
Yalta		73.3	321	11 31	+ 1	—	—	—	—
Potsdam		73.6	338	e 11 32	0	—	—	—	e 37.9
Raciborzu	z.	74.3	333	e 11 44	+ 8	—	—	—	—
Uzhgorod		74.3	330	e 11 36	0	—	—	—	—
Collenberg	z.	74.6	337	e 11 36	- 2	—	—	e 12 36	?
Witteveen	z.	74.7	342	i 11 40 <sub>k</sub>	+ 2	—	—	—	—
Fayetteville	z.	74.9	53	i 11 38	- 1	—	—	i 11 50	pP
Jena		75.3	337	e 11 42	0	—	—	e 14 57	sPP
Prague	N.	75.4	336	e 11 42	0	e 12 7	?	e 14 27	PP
Ottawa		75.5	35	i 11 40 <sub>a</sub>	- 3	—	—	—	—
Shawinigan Falls	N.	75.6	32	e 11 42	- 1	—	—	—	—
De Bilt		75.7	342	e 11 44	0	e 21 26	+ 4	—	e 37.9
Rathfarnham C.	z.	76.4	350	i 11 47 <sub>a</sub>	- 1	—	—	e 12 46	?
Cleveland	z.	76.5	41	i 11 47 <sub>a</sub>	- 1	—	—	—	—
Karlsruhe	z.	77.9	339	e 11 56	0	—	—	—	—
Stuttgart		77.9	338	i 11 56 <sub>a</sub>	0	e 22 44	PPS	—	e 42.9
Belgrade		78.2	329	e 11 59	+ 1	e 12 26	sP	e 22 38	PS
Strasbourg		78.4	339	e 11 59	0	—	—	e 21 21	?
Morgantown		78.7	42	i 11 59	- 1	—	—	—	—
Basle		79.4	339	e 12 5	+ 1	—	—	e 12 19	pP
Paris		79.4	343	i 12 4	0	e 22 27	[+14]	i 12 22	pP
Zürich		79.4	339	e 12 5 <sub>a</sub>	+ 1	—	—	—	e 36.9
Harvard		79.5	34	e 12 4	- 1	—	—	—	—
Triest		79.6	334	i 12 5 <sub>a</sub>	0	e 22 34	SP	e 27 26?	SS
Besançon		80.1	340	i 12 9	+ 1	e 12 38	?	e 12 24	pP
Chambon-la-Forêt		80.2	343	i 12 11	+ 2	—	—	—	—
Ksara		81.3	313	i 12 17	+ 3	—	—	e 20 55	?
Florence		82.0	335	i 13 19 <sub>a</sub>	+61	e 23 37	+68	e 33 25	?
Clermont-Ferrand		82.1	341	e 12 30	+11	—	—	—	42.9
Riverview	N.	83.0	184	—	—	e 23 50	PPS	—	e 40.2
Taranto		83.2	330	—	—	e 22 36	- 5	—	—
Rome		83.4	333	i 12 27	+ 2	e 23 2	ScS	e 24 1	PPS
Tacubaya		85.0	66	e 12 23?	-10	—	—	—	e 41.4
Messina		85.8	330	e 24 15	PS	—	—	—	42.6
Helwan	z.	86.7	314	12 43	+ 1	i 13 6	?	i 13 23	?
Alicante		90.0	342	13 0	+ 3	e 23 57	+11	16 39	PP
Bermuda		91.0	34	—	—	e 24 21	+26	—	—
Tamanrasset	z.	103.2	332	e 13 56	- 1	—	—	—	—
La Paz		131.8	64	19 8	[- 2]	—	—	—	—
Pretoria	z.	133.2	279	e 19 16	[+ 3]	—	—	—	—
Kimberley	z.	137.4	280	e 19 22	[+ 2]	—	—	—	—

April 15d. 6h. 38m. Epicentre 28°·0N. 97°·5E.

Bulletin of the Seismo. Stations of the U.S.S.R. for April-June, 1953, Moscow, 1954, p. 68.

April 15d. 14h. Tian-Shan region. Epicentre 43°·8N. 77°·9E.

Bulletin of Seismo. Stations of the U.S.S.R. April-June, 1953, Moscow, 1954, p. 68.

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April 17d. 0h. 2m. 50s. Epicentre 5°·2S. 77°·2W.

Felt in Peru. Intensity V at Chachapoyas, Moyobamba, and San Ignacio ; IV at Huancabamba. Magnitude 6 (Pasadena).

E. Silgado.

Datos sísmológicos del Perú, 1952-1955, Boletín de la Sociedad geológica del Perú, Tomo XXIX, Lima, 1957, p. 24.

A = +·2156, B = -·9723, C = -·0901 ;  $\delta = -3$  ;  $h = +7$  ;  
D = -·976, E = -·216 ; G = -·019, H = +·088, K = -·996.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Huancayo	7·1	163	i 1 50	+ 2	i 3 11	+ 1	—	—
Bogota	10·3	19	i 2 34	+ 2	i 4 41	+11	i 3 14	i 5·8
Chinchina	10·3	11	i 2 34	+ 2	c 3 38	-52	c 5 36	—
La Paz	14·5	141	i 3 28	0	i 6 37	SSS	15 56	8·4
Galerazamba	16·0	8	e 4 1	PP	e 6 53	+ 7	—	8·2
Kingston	23·0	2	e 5 15	+ 8	e 10 3	SS	—	—
Ciudad Trujillo	24·7	17	i 5 18	- 6	i 9 55	+11	—	—
Fort de France	25·6	40	e 5 24?	- 8	—	—	—	—
San Juan	26·0	25	i 5 35	- 1	i 10 8	+ 2	—	—
Merida	28·6	336	i 6 0k	0	i 10 55	+ 7	—	—
Tacubaya	32·5	320	e 7 37	PP	—	—	—	—
La Plata	E. 34·6	150	6 46	- 7	12 22	0	8 4	PP 17·8
	N. 34·6	150	6 58	+ 5	12 22	0	17 16	ScS 18·1
Columbia	39·1	356	e 7 35	+ 4	—	—	—	—
Bermuda	39·3	17	e 7 33	+ 1	e 13 25	- 9	e 16 26	SS e 18·0
Washington	43·9	1	i 8 9	- 1	—	—	i 8 38	? —
Fayetteville	z. 44·0	341	i 8 10	- 1	(e 14 40)	- 3	—	— e 14·7
Cincinnati	44·6	353	i 8 14	- 2	—	—	—	—
Morgantown	44·7	357	i 8 14	- 2	—	—	—	—
Lubbock	44·9	332	8 18	0	—	—	—	—
Fordham	45·9	5	e 8 26	0	i 15 11	0	—	—
Palisades	46·1	5	i 8 27	- 1	i 15 12	- 2	i 10 12	PP e 20·7
Cleveland	46·6	356	i 8 31k	- 1	—	—	—	—
Weston	47·7	7	i 8 40a	0	e 15 35	- 1	—	e 19·7
Harvard	47·8	7	i 8 40a	- 1	e 15 34	- 4	—	e 26·3
Buffalo (Larkin)	47·9	359	i 8 39	- 3	—	—	—	—
Tucson	48·9	322	i 8 50	0	e 15 53	0	—	—
Ottawa	50·4	2	i 8 59	- 2	16 12	- 2	18 46	ScS —
Halifax	51·2	13	i 9 6a	- 1	16 17	- 8	10 21	PcP —
Shawinigan Falls N.	51·7	5	e 9 10	- 1	—	—	—	—
Seven Falls	E. 52·4	7	e 9 11	- 5	16 43	+ 1	—	—
Kirkland Lake	z. 53·2	358	e 9 19a	- 3	—	—	i 10 29	PcP —
Palomar	z. 53·5	320	i 9 24	0	—	—	i 10 32	PcP —
Nelson	53·7	323	i 9 25	- 1	i 10 16	?	i 10 24	PcP —
Boulder City	53·9	323	i 9 27	0	i 10 2	?	i 10 20	? —
Riverside	z. 54·2	320	i 9 29	0	—	—	e 10 35	PcP —
Pasadena	54·8	320	i 9 35	+ 1	i 17 20	+ 6	i 10 36	PcP —
China Lake	z. 55·5	322	i 9 38	- 1	—	—	i 10 25	? —
Logan	56·2	330	e 9 44	0	—	—	—	—
Tinemaha	z. 56·7	322	i 9 47	- 1	—	—	i 10 46	PcP —
Fresno	z. 57·4	321	e 9 52a	- 1	—	—	—	—
Lick	z. 59·0	320	i 10 5a	+ 1	—	—	i 10 38	? —
Reno	z. 59·2	323	e 10 6k	+ 1	—	—	e 10 16	? —
Santa Clara	E. 59·2	320	—	—	e 18 31	PS	—	—
Berkeley	59·7	320	e 10 8a	- 1	e 18 23	+ 4	e 10 48	PcP e 30·6
Butte	59·8	333	e 10 8	- 1	—	—	—	—
Mineral	z. 60·8	323	e 10 14a	- 2	e 10 34	?	i 11 0	PcP —
Shasta	61·5	323	e 10 18a	- 3	—	—	e 10 57	PcP —
Hungry Horse	62·2	334	i 10 25	- 1	—	—	e 39 17	P'P' —
M'Bour	63·1	71	i 10 30	- 2	—	—	—	—

Continued on next page.



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		$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.
		°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.
Victoria		66.8	329	i 10	55 <sub>a</sub>	- 1						
Malaga		79.7	51	i 12	10	- 1	e 21	22	-51	e 16	47	PPP 42.6
Granada		80.4	51	i 12	16 <sub>a</sub>	+ 1	e 22	16	- 5	e 23	4	PS 42.6
Resolute Bay		80.5	355	i 12	13 <sub>a</sub>	- 2	e 22	28	+ 6			e 39.4
Reykjavik	z.	80.5	21	i 12	15 <sub>k</sub>	0						
Toledo		80.8	48	i 12	17 <sub>a</sub>	0	e 22	25	0	e 15	15	PP 46.8
Almeria		81.2	52	i 12	19	0	e 22	17	-12	e 15	19	PP 42.0
Alicante		83.1	50	15	33	PP	e 22	17	-31	e 17	28	PPP 39.4
Rathfarnham Castle		83.1	35	i 12	21	- 8				i 12	31	P e 39.2
Scoresby Sund		84.0	16	i 12	32	- 1	e 23	0	+ 3	e 23	50	PS 40.2
Tortosa		84.3	48	i 12	43	+ 8						
Algiers Univ.	z.	85.5	53	e 12	32	- 9	e 16	16	PP	i 12	41	P
Tamanrasset	z.	85.6	67	i 12	43 <sub>k</sub>	+ 2	e 23	12	- 1	e 23	58	PS 40.2
Kew College		86.1	38	i 12	43	- 1				i 12	56	? e 42.2
		86.5	336	i 12	44	- 2						
Chambon-la-Forêt		87.0	42	i 12	47	- 1				i 12	59	? —
Clermont-Ferrand		87.2	44	e 12	50	+ 1						
Paris		87.3	41	i 12	49	- 1	e 23	39	+10	i 13	2	? e 42.2
Uccle	E.	88.9	39				e 23	43	- 1			e 41.2
Besançon		89.4	43	e 12	59	- 1				e 13	19	? —
De Bilt		89.6	88	e 13	4	+ 3	e 23	46	- 5			e 42.2
Basle		90.5	43	e 13	5 <sub>a</sub>	0						
Oropa		90.5	45	e 14	7	+62	e 25	45	PPS			
Witteveen	z.	90.6	86	i 13	6 <sub>a</sub>	+ 1						
Strasbourg		90.7	41	e 13	5	- 1				e 13	43	? e 41.2
Zürich		91.1	43	e 13	8	0						
Stuttgart		91.7	41	e 13	10	0						
Jena		93.4	39	e 13	18	0				e 17	2	PP —
Rome		93.4	48				e 25	39	PS	e 31	7	SSP 43.3
Cheb		93.9	40	e 13	44	+23	e 24	20	- 9	e 26	19	PPS —
Copenhagen		94.2	34	e 13	22	0	e 24	28	- 3			51.2
Collnberg	z.	94.3	39	e 13	22	- 1				e 17	7	PP —
Triest	z.	94.6	44	e 13	21	- 3						
Taranto		97.0	50				e 26	51	PPS	e 36	26	? —
Upsala	z.	97.0	30	i 13	34 <sub>k</sub>	- 1	e 17	5	PP	i 13	39	P —
Kiruna	z.	97.8	22	i 17	31	PP						
Kimberley	z.	98.2	120	i 13	40	0						
Istanbul	z.	105.9	48	18	38	PP						57.2
Ksara		112.3	56	e 14	28	P	e 29	5	PS	e 19	34	PP —
Quetta	z.	138.4	49	i 19	30	[+ 2]						
Chatra		154.0	33	e 19	54	[+ 1]						e 91.2

April 17d. 11m. 10m. New Britain.

Suggested epicentres: 4°S. 154°E. (U.S.C.G.S.).

3°5S. 151°5E. Depth 90km. (Wellington).

Probably foreshock of earthquake on 23d. at 16h.

April 17d. 15h. 23m. Pamir region. Epicentre 39°5N. 71°2E.

*Loc. cit.* 14h., pp. 68-69.

April 17d. 19h. 31m. Epicentre 38°5N. 69°6E.

*Loc. cit.* p. 69.

April 17d. 21h. 50m. Epicentre 37°1N. 20°5E. (Strasbourg).

Intensity IV at Zante.

A. Galanopoulos.

Seismological Institute Bulletin, 1953, Athens, 1954, p. 54.

April 18d. 22h. 9m. Epicentre 37°0N. 70°5E. Depth of focus 220km.

Bulletin of Seismo. Stations of the U.S.S.R. for April-June, 1953, Moscow, 1954, p. 69.

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April 18d. 23h. 25m. 23s. Epicentre 8°·3N. 103°·7W.

A = -·2344, B = -·9615, C = +·1434;  $\delta = -1$ ;  $h = +6$ ;  
D = -·972, E = +·237; G = -·034, H = -·139, K = -·990.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Oaxaca	11·0	37	e 2 40	- 2	—	—	—	5·5
Puebla	11·9	26	e 2 56	+ 2	e 5 16	+ 7	—	e 5·8
Tacubaya	11·9	21	e 2 55	+ 1	—	—	—	5·9
Guadalajara	12·3	2	—	—	e 5 46	SSS	—	—
Vera Cruz	13·1	33	e 3 13	+ 3	—	—	—	e 6·6
Merida	18·5	46	e 4 17	- 2	—	—	—	9·1
Chihuahua	20·4	355	e 4 45	+ 4	e 8 28	+ 3	e 8 46	PcP 10·2
Tucson	24·7	347	e 5 25	+ 1	e 10 4	+20	(e 11 0)	SSS e 11·0
Lubbock	25·2	6	5 30	+ 1	10 8	+16	—	—
Palomar	z. 27·7	338	e 5 52	0	—	—	—	—
Chinchina	28·1	94	e 5 54	- 1	e 10 41	+ 1	e 6 41	PP —
Riverside	z. 28·5	336	e 6 1	+ 2	—	—	—	—
Pasadena	29·0	336	e 6 3	- 1	e 10 57	+ 3	(e 12 43)	SSS e 12·7
Nelson	29·1	343	i 6 4	0	i 6 14	?	i 6 28	?
Boulder City	29·4	343	e 6 7	0	i 6 12	?	i 6 17	?
Bogota	29·7	94	e 6 14	+ 4	e 11 8	+ 2	e 7 1	PP 13·6
China Lake	z. 30·2	339	e 6 15	+ 1	—	—	—	—
Tinemaha	z. 31·5	339	e 6 27	+ 1	—	—	—	—
Fresno	z. 31·9	337	e 6 27	- 2	—	—	e 8 31	?
Lick	z. 33·2	334	e 6 43 <sub>a</sub>	+ 3	—	—	e 9 24	PcP —
Berkeley	33·9	334	—	—	e 12 20	+ 9	e 14 35	SSS e 14·8
Logan	34·1	350	i 6 51	+ 3	—	—	—	—
Reno	z. 34·3	339	e 6 53	+ 3	—	—	e 8 55	?
Huancayo	34·7	125	e 6 53	- 1	e 12 32	+ 8	e 14 49	SSS e 17·0
Cincinnati	35·2	27	i 6 56	- 2	—	—	—	—
Mineral	z. 35·7	337	e 7 4 <sub>a</sub>	+ 2	i 7 25	?	e 8 30	PP —
Shasta	z. 36·3	337	e 7 7 <sub>a</sub>	0	—	—	e 9 31	PcP —
Morgantown	37·8	32	i 7 16	- 4	i 13 7	- 4	—	—
San Juan	37·8	70	e 7 16	- 4	—	—	—	—
Butte	38·3	351	i 7 24	0	—	—	—	—
Cleveland	38·4	27	i 7 22 <sub>k</sub>	- 3	i 13 18	- 2	e 8 53	PP —
Washington	38·7	34	e 8 42	PP	—	—	—	—
Philadelphia	40·5	35	e 9 9	PP	e 13 49	- 3	—	—
Hungry Horse	40·9	350	i 7 43	- 3	—	—	e 9 35	PcP —
City College, N.Y.	41·8	35	e 9 46	PcP	e 14 8	- 3	—	—
Palisades	41·9	35	i 7 51	- 3	i 14 15	+ 2	i 9 31	PP e 19·7
Fort de France	42·1	78	—	—	e 14 16	0	—	—
La Paz	43·0	125	i 8 5 <sub>a</sub>	+ 2	i 14 36	+ 7	10 38	PPP 22·6
Bermuda	43·4	51	—	—	e 14 40	+ 5	e 18 12	ScS e 20·3
Victoria	43·4	342	14 41	S	(14 41)	+ 6	—	19·3
Ottawa	44·1	28	e 8 9	- 3	14 46	+ 1	18 20	ScS —
Harvard	44·3	35	—	—	i 14 52	+ 4	—	e 22·0
Weston	44·3	35	e 8 10	- 3	e 14 50	+ 2	—	e 22·9
Seven Falls	z. 47·8	30	e 10 37	PP	15 37	- 1	19 7	SS 23·3
Halifax	50·1	37	—	—	e 16 10	0	—	24·5
Resolute Bay	66·5	4	e 10 50	- 4	19 42	- 2	e 27 14	Q e 34·4
Scoresby Sund	79·5	20	e 12 11	+ 1	i 22 17	+ 6	i 27 28	SS 37·6
Rathfarnham Castle	87·8	37	(e 31 27)	PKKP	—	—	—	e 31·4
Malaga	92·5	53	13 17	+ 3	i 23 59	(- 1)	16 55	PP 44·2
De Bilt	94·9	36	—	—	e 25 37?	PS	—	—
Alicante	95·1	50	17 16	PP	24 35	- 4	25 52	PS 44·6
Clermont-Ferrand	95·6	43	—	—	e 26 4	PS	e 31 25	SS 46·6
Strasbourg	97·7	39	e 26 18	PS	e 31 28	SS	e 31 50	SSP e 44·6
Pavia	99·8	42	—	—	e 28 8	PPS	—	—
Rome	103·3	45	e 27 21	PS	e 33 13	SS	e 28 33	PPS —
Messina	z. 107·0	47	e 27 59	PS	e 33 44	SS	—	—
Ksara	123·2	40	e 19 53	[+54]	e 31 6	PS	e 39 6	?

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April 19d. 4h. 36m. Epicentre 41°·7N. 142°·5E. Depth 50km.  
Intensity II-III at Urakawa and Hatinohé.  
Seismo. Bull. Cent. Met. Obs., Japan, April, 1953, Tokyo, 1953, p.23-24, with macroseismic chart p.23.

April 19d. 11h. 36m. Epicentre 40°·8N. 77°·8E.  
Bulletin Seismo. Stations of the U.S.S.R. for April-June, 1953, Moscow, 1954, p.69-70.

April 19d. 15h. 54m. Epicentre 30°·0N. 131°·5E. Depth 60km.  
Intensity II-III at Yakusima.  
Seismo. Bull. Cent. Met. Obs., Japan, April, 1953, Tokyo, 1953, p.24, with macroseismic chart.

April 19d. 22h. 47m. 39s. Epicentre 50°·0N. 179°·5W.

Felt at Adak. Epicentre 50°·5N. 179°·0W.

L. M. Murphy and W. K. Cloud.  
United States Earthquakes, 1953, U.S.C.G.S., Serial 785, Washington, 1955, p.26.

$$A = -.6453, B = -.0056, C = +.7639; \quad \delta = -1; \quad h = -5;$$

$$D = -.009, E = +1.000; \quad G = -.764, H = -.007, K = -.645.$$

	$\Delta$	Az	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Adak	2.6	43	e 0 33	-11	i 0 47	-30	—	—
College	22.3	36	i 4 52	-9	i 9 1	-1	(e 9 51)	SSS e 9.8
Victoria	35.9	70	7 2	-2	—	—	—	—
Shasta	40.3	80	7 41 <sub>a</sub>	+1	—	—	e 7 59	?
Mineral	z. 41.0	80	e 7 46 <sub>a</sub>	0	—	—	e 8 45	?
Resolute Bay	41.2	23	e 7 42 <sub>k</sub>	-6	e 13 34	-28	e 9 48	PcP
Hungry Horse	41.6	66	i 7 49	-2	e 13 49	-19	i 10 6	PPP
Berkeley	42.0	84	e 7 54	0	e 14 10	-4	i 8 1	?
Santa Clara	E. 42.5	84	—	—	e 14 26	+4	e 18 19	SSS e 20.8
Reno	z. 42.6	80	e 8 0 <sub>a</sub>	+1	e 14 8	-15	e 14 24	PPS
Lick	z. 42.7	84	i 8 2 <sub>k</sub>	+2	—	—	i 8 25	?
Butte	43.6	67	i 8 6	-2	—	—	—	—
Fresno	z. 44.2	83	e 8 15	+3	—	—	e 9 44	PP
Tinemaha	z. 45.1	83	e 8 20	0	—	—	i 8 29	?
China Lake	z. 46.2	83	e 8 29	+1	e 8 38	?	e 9 33	?
Logan	46.4	73	i 8 30	0	—	—	—	—
Pasadena	z. 46.9	86	e 8 31	-3	i 8 41	P	i 10 5	PcP
Riverside	z. 47.3	85	e 8 39	+2	—	—	—	—
Zô-Sè	E. 47.5	270	e 8 55	+17	—	—	—	—
Boulder City	47.9	81	i 8 42	0	i 8 57	?	i 9 17	?
Nelson	48.0	81	e 8 22	-21	—	—	—	—
Palomar	z. 48.2	85	e 8 43	-1	—	—	e 8 54	?
Nanking	48.5	273	e 8 59	+13	—	—	—	—
Tucson	52.8	82	e 9 19	0	16 29	-18	e 11 28	PcP e 25.0
Lubbock	57.6	74	9 54	0	—	—	—	—
Scoresby Sund	58.7	9	10 3	+1	22 3	SS	—	— 29.4
Kirkland Lake	z. 60.2	50	e 10 9	-3	—	—	—	—
Fayetteville	z. 60.6	67	i 10 12 <sub>a</sub>	-3	—	—	—	—
Kiruna	z. 61.5	352	i 10 19	-2	i 11 3	PcP	—	—
Apia	63.9	171	i 13 2	PP	—	—	i 13 19	?
Cincinnati	64.1	60	10 36	-2	—	—	—	—
Cleveland	64.1	56	i 10 36	-2	e 19 19	+5	—	—
Morgantown	66.3	57	i 10 50	-2	—	—	—	—
Palisades	68.4	51	i 11 3	-3	e 19 46	-21	e 31 25	Q e 33.4
Harvard	68.5	49	e 11 3	-3	e 20 5	-3	i 11 33	PcP
Weston	68.7	49	i 11 6 <sub>a</sub>	-1	—	—	—	—
Upsala	z. 69.6	352	i 11 12	-1	i 11 36	PcP	i 11 51	?
Shillong	70.0	286	e 11 26	+11	e 11 34	PcP	e 11 49	?
Halifax	70.5	43	i 11 16 <sub>k</sub>	-2	—	—	—	—
Chatra	72.0	292	i 11 38	+10	e 21 1	+12	—	— e 41.4

Continued on next page.

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		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Rathfarnham C.	z.	76.9	5	i 11 56k	0	i 12 9	PcP	e 12 32	?
Witteveen	z.	77.4	357	i 12 0k	+ 2	—	—	—	—
De Bilt		78.2	358	e 12 3	0	e 22 51	PPS	e 11 43	P
Collmberg	z.	78.5	353	e 12 4	0	—	—	e 12 56	?
Jena		79.0	353	e 12 8	+ 1	e 12 35	?	e 13 34	?
Quetta	z.	80.8	307	i 12 24	PcP	—	—	—	—
Stuttgart		81.3	355	e 12 21	+ 1	—	—	—	—
Paris		81.6	359	i 12 23	+ 2	e 12 44	?	e 13 38	?
Strasbourg		81.6	356	i 12 22	+ 1	—	—	e 13 10	?
Chambon-la-Forêt		82.4	359	i 12 27	+ 2	—	—	—	—
Besançon		83.0	357	i 12 30	+ 2	—	—	—	—
Belgrade	z.	84.0	346	e 12 36	+ 3	—	—	e 13 5	?
Triest		84.0	352	e 12 35	+ 2	e 22 30	-27	e 15 36	PP
Istanbul		85.9	339	e 12 46	+ 3	—	—	e 15 21?	?
Florence		86.1	353	i 12 44a	0	e 23 17	- 1	e 36 5	?
Poona	z.	86.2	294	i 12 55	+11	—	—	—	—
Rome		87.9	351	e 24 51	PS	e 23 41	+ 6	e 29 21?	SS
San Juan		90.2	61	i 13 7	+ 3	—	—	i 13 15	?
Messina		91.2	348	i 13 8	0	e 20 6	?	e 20 57	?
Alicante		92.0	1	16 50	PP	24 10	- 2	30 16	SS
Helwan	z.	95.9	333	i 13 33k	+ 3	—	—	—	—
La Paz	E.	116.2	84	e 18 46	[+ 1]	—	—	—	—
Pretoria	z.	147.7	309	i 19 54	PKP <sub>2</sub>	—	—	—	—
Pietermaritzburg	z.	150.8	302	e 20 1	PKP <sub>2</sub>	—	—	—	—
Kimberley	z.	151.9	310	i 20 5	PKP <sub>2</sub>	—	—	—	—

April 20d. 11h. 1m. 45s. Epicentre 15°·3S. 172°·5W. (as on 1952, June 19d.).

A = -·9567, B = -·1260, C = -·2622;  $\delta$  = -10;  $h$  = +6;  
D = -·131, E = +·991; G = +·260, H = +·034, K = -·965.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Apia		1.6	19	i 0 29k	- 1	i 0 47	- 4	—	—
Wellington		28.2	202	—	—	e 12 15	SSS	—	—
Christchurch		30.9	202	—	—	i 13 51	Q	—	e 15.8
Brisbane		34.2	244	—	—	e 8 9	PP	—	e 10.7
Riverview		37.6	234	—	—	e 12 53	-15	i 15 52	SS
Berkeley	N.	70.8	41	—	—	e 20 38	+ 3	e 29 27	?
Lick	z.	70.9	41	e 11 22a	+ 1	—	—	e 11 53	PcP
Fresno	z.	71.7	42	e 11 27a	+ 1	—	—	—	—
Palomar	z.	71.8	47	e 11 27	+ 1	—	—	e 11 47	PcP
Riverside	z.	71.8	46	e 11 27	+ 1	e 12 29	?	e 11 48	PcP
China Lake	z.	72.7	44	e 11 32	0	—	—	e 11 54	PcP
Mineral	z.	72.8	39	i 11 32a	0	—	—	i 11 53	PcP
Tinemaha	z.	72.9	43	e 11 47	+14	—	—	—	—
Baguio		73.2	293	e 11 28	- 7	e 20 52	-10	e 14 4	PP
Reno	z.	73.4	40	e 11 37a	+ 1	e 18 21	?	e 12 39	?
Nelson		74.5	46	i 11 42	0	—	—	—	—
Boulder City		74.6	46	i 11 44	+ 1	—	—	—	—
Tucson		75.6	51	e 11 49	+ 1	e 21 42	+13	—	—
Zô-Sè		78.6	308	i 11 59a	- 6	e 21 57	- 5	—	—
Logan		79.7	42	i 12 13	+ 2	—	—	—	—
Tacubaya		79.9	67	e 12 18	+ 6	—	—	—	—
Nanking		80.6	307	i 12 11a	- 5	i 22 22	- 1	—	—
Butte		81.4	38	i 12 21	+ 1	—	—	—	—
Hungry Horse		81.9	36	i 12 22	- 1	—	—	—	—
College		82.1	10	12 20	- 4	—	—	—	—
Lubbock		83.0	53	12 31	+ 3	—	—	—	—
Huancayo		93.6	103	—	—	i 24 9	{+ 1}	e 31 22	SS
La Paz		99.0	110	e 12 39	-65	i 23 51	[-31]	16 37	PP
Bogota	N.	99.3	88	—	—	e 25 53	+39	—	—
Cleveland	E.	100.7	50	—	—	i 24 38	[+ 8]	—	—

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		$\Delta$ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	Supp. m. s.	L. m.
Palisades		106.3	51	—	—	e 24 59	[+ 3]	—	e 50.0
De Bilt		143.4	1	—	—	e 23 15?	PKS	c 71 3	e 78.2
Collmberg	z.	143.8	355	e 19 7	[-30]	—	—	e 19 48	PKP <sub>2</sub>
Jena	z.	144.3	354	e 19 35	[-3]	e 20 10	?	e 20 30	?
Paris		146.3	6	e 19 42	[+ 1]	e 20 41	?	e 19 53	PKP <sub>2</sub> e 81.2
Karlsruhe	z.	146.4	357	e 19 43 <sub>a</sub>	[+ 1]	e 20 49	?	e 19 56	PKP <sub>2</sub>
Stuttgart	z.	146.6	357	e 19 42	[+ 0]	e 34 3	PSKS	e 19 55	PKP <sub>2</sub>
Strasbourg		146.8	358	i 19 44	[+ 2]	e 20 28	?	i 19 57	PKP <sub>2</sub>
Chambon-la-Forêt		147.1	6	e 19 45	[+ 2]	i 20 3	?	e 19 56	PKP <sub>2</sub>
Basle		147.8	0	e 19 46 <sub>a</sub>	[+ 2]	e 20 55	?	e 23 45	PP
Zürich		148.0	359	e 19 42	[-2]	—	—	—	—
Besançon		148.1	2	e 19 46	[+ 2]	e 20 24	?	e 20 0	PKP <sub>2</sub>
Istanbul		148.2	328	19 46	[+ 1]	e 23 13	PKS	20 11	PKP <sub>2</sub>
Ksara		148.4	311	e 19 46	[+ 1]	—	—	23 13	PKS
Triest		149.3	351	i 19 50 <sub>k</sub>	[+ 4]	e 25 55	[-58]	e 23 35	PKS
Clermont-Ferrand		149.4	6	e 19 51	[+ 5]	—	—	—	81.2
Salo	N.	149.7	355	e 19 49	[+ 2]	e 31 1	?	e 20 9	PKP <sub>2</sub>
Florence		151.4	355	e 19 56 <sub>k</sub>	[+ 6]	e 30 26	{ 0 }	e 20 15	PKP <sub>2</sub>
Rome		153.1	351	e 19 59 <sub>k</sub>	[+ 7]	e 30 34	{ -1 }	e 33 50?	PSKS
Helwan	z.	153.7	308	e 19 51	[-2]	i 23 43	PKS	i 20 11	PKP <sub>2</sub>
Alicante		156.0	15	18 56	[-60]	25 58	[-63]	20 16	PKP <sub>2</sub> 80.0
Messina	E.	156.1	345	e 17 40	?	e 26 31	[-30]	e 21 33	?
Tamanrasset	z.	172.3	14	e 20 15	[+ 4]	e 25 23	PP	e 21 32	PKP <sub>2</sub>

April 21d. 11h. 40m. Epicentre 36°·2N. 140°·3E. Depth of focus 50km.  
Intensity IV at Mito, Kashiwa, and Tsubasan; II-III at Utunomiya, Tokyo, Kumagaya, and Titibu.  
Seismo. Bull. Cent. Met. Obs., Japan, for April, 1953, Tokyo, 1953, p. 25, with macroseismic chart.

April 22d. 10h. 3m. Provisional epicentre 33°S. 178°W. Depth of focus 100km.  
Magnitude 5.75-6.  
Bulletin E-132 for 1953, April, May, June, of Seismological Stations of New Zealand, Wellington, 1955, p. 3.

April 23d. 3h. 50m. 56s. (I) ) Epicentre 30°·5N. 96°·7E.  
3h. 53m. 32s. (II) )

$$A = -1.007, B = +.8572, C = +.5050; \quad \delta = -4; \quad h = +1;$$

$$D = +.993, E = +.117; \quad G = -.059, H = +.502, K = -.863.$$

		$\Delta$ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	Supp. m. s.	L. m.
I Shillong		6.5	222	e 1 38	- 1	e 2 54	- 1	2 11	P <sub>r</sub>
I Chatra		9.1	249	i 2 16	+ 2	i 4 0	0	4 26	S <sub>r</sub>
II	E.	9.1	249	i 2 25	+11	i 4 8	+ 8	—	—
I Calcutta	E.	10.9	225	e 2 37	- 3	i 4 33	-11	—	—
I New Delhi		17.1	268	e 3 57	- 5	i 7 14	+ 2	4 17	PP 7.9
I Hong Kong		17.6	112	4 11	+ 3	—	—	—	—
II		17.6	112	4 10	+ 2	7 3	-20	—	9.3
I Nanking		19.0	79	i 4 22 <sub>k</sub>	- 4	7 58	+ 3	—	—
II		19.0	79	i 4 22 <sub>k</sub>	- 4	i 7 58	+ 3	—	—
I Zô-Sè	z.	21.0	80	i 4 46 <sub>k</sub>	- 1	8 42	+ 5	—	—
II		21.0	80	i 4 46 <sub>k</sub>	- 1	—	—	e 8 53	PcP
I Hyderabad	E.	21.1	236	i 4 48	0	8 39	0	i 8 50	PcP 11.1
I Warsak Dam	E.	21.6	287	i 4 56	+ 2	i 5 18	PP	i 5 28	PPP 6.0
II	E.	21.6	287	4 52	- 2	—	—	—	—
I Madras	E.	23.2	225	i 5 8	- 1	—	—	—	—
I Poona		23.9	245	i 5 16	0	9 36	+ 6	6 4	PPP 11.6
I Quetta		25.6	278	i 5 32	0	i 6 15	PP	i 6 22	PPP
II	z.	25.6	278	i 5 30	- 2	—	—	—	—
I Baguio		25.9	116	5 40	+ 5	—	—	—	—
II		25.9	116	5 44	+ 9	(5 44)	P	—	—
I Djakarta		37.7	162	e 7 21	+ 2	e 11 28	?	e 8 58	PPP e 22.2
II		37.7	162	e 7 5	-14	e 17 40	ScS	—	i 21.8

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		$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.
		°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.
I	Ksara	50.9	290	9	10?	+ 5	16	26	+ 5	—	—	—
II		50.9	290	9	11	+ 6	—	—	—	—	—	—
I	Istanbul	54.6	301	9	31	- 1	e 19	31	ScS	—	—	—
II		54.6	301	9	32	0	—	—	—	—	—	—
I	Helwan	55.8	287	e 9	39	- 2	17	26	- 2	10	39	PcP
II		55.8	287	—	—	—	e 17	28	0	—	—	—
I	Kiruna	51.0	333	—	—	—	i 17	42	- 1	e 23	19	SSS
II		51.0	333	—	—	—	e 17	44	+ 1	e 21	23	SS
I	Upsala	58.8	326	i 9	59k	- 3	e 18	46	PPS	i 10	22	?
II		58.8	326	i 10	1	- 1	e 18	5	- 2	i 12	9	PP
I	Skalnate Pleso	59.1	312	e 13	35	PPP	e 18	5	- 6	e 18	56	?
II		59.1	312	e 13	12	PPP	e 18	12	+ 1	e 20	58	?
I	Raciborzu	z. 60.2	314	e 10	10	- 2	—	—	—	e 10	52	PcP
I	Ogyalla	60.7	311	—	—	—	e 19	31	ScS	e 23	28	?
II		60.7	311	e 10	58	PcP	—	—	—	—	—	—
I	Copenhagen	62.3	321	e 10	26	0	i 18	50	- 2	22	58	SS
II		62.3	321	e 10	24	- 2	i 18	50	- 2	—	—	—
I	Prague	62.5	315	i 10	31	+ 3	e 18	47	- 7	e 12	47	PP
II		62.5	315	i 10	35	+ 7	e 18	48	- 6	—	—	e 34.7
I	Potsdam	62.8	317	e 10	31	+ 1	e 18	59	+ 1	e 25	58	SSS
II		62.8	317	e 10	31	+ 1	e 18	58	0	—	—	e 31.5
I	Collmberg	63.1	316	e 10	29	- 3	e 10	33	P	e 10	40	?
II	z.	63.1	316	e 10	30	- 2	—	—	—	—	—	e 26.7
II	Taranto	63.4	303	—	—	—	19	10	+ 4	—	—	—
I	Cheb	63.8	315	e 10	41	+ 5	e 19	10	- 1	e 23	8	SS
II		63.8	315	—	—	—	e 19	10	- 1	—	—	e 32.5
I	Jena	64.1	315	e 10	36	- 2	e 10	41	?	e 11	37	?
II		64.1	315	e 10	36	- 2	e 10	41	?	e 11	11	PcP
I	Triest	64.3	310	i 10	36k	- 3	i 19	14	- 3	e 11	8	pP
II		64.3	310	i 10	38k	- 1	i 19	15	- 2	e 11	16?	pP
II	Bergen	N. 64.7	327	—	—	—	e 23	45	SS	—	—	—
I	Messina	65.4	301	e 10	44	- 3	e 19	28	- 2	e 25	42	?
II		65.4	301	e 10	46	- 1	e 19	26	- 4	—	—	—
I	Stuttgart	66.2	314	e 10	49	- 3	e 19	32	- 8	—	—	—
II		66.2	314	e 10	51	- 1	e 19	38	- 2	e 23	58	SS
I	Bologna	66.3	309	e 11	17	PcP	e 19	46	+ 4	—	—	—
II		66.3	309	e 11	21	PcP	—	—	—	—	—	—
I	Rome	66.4	306	e 10	54	+ 1	19	38	- 5	e 13	28	PP
II		66.4	306	e 10	56	+ 3	e 19	40	- 3	14	54	PPP
I	Witteveen	z. 66.4	319	e 10	52	- 1	—	—	—	—	—	—
II	z.	66.4	319	e 10	52	- 1	—	—	—	—	—	—
I	Florence	66.6	308	i 11	2	+ 8	e 20	6	PS	e 27	29	SSS
II		66.6	308	i 10	55	+ 1	—	—	—	—	—	33.3
I	Zürich	67.1	313	e 10	59	+ 2	—	—	—	—	—	—
I	Strasbourg	67.2	314	e 10	58	0	e 19	52	0	e 13	30	PP
II		67.2	314	i 11	0	+ 2	e 19	48	- 4	—	—	e 31.6
I	De Bilt	67.5	318	e 11	4	+ 4	e 19	56	0	—	—	—
II		67.5	318	e 11	4	+ 4	—	—	—	—	—	—
I	Pavia	67.5	310	—	—	—	e 19	51	- 5	—	—	e 34.7
I	Basle	67.6	313	e 10	58	- 3	e 13	4	?	e 14	39	?
II		67.6	313	e 11	0	- 1	—	—	—	—	—	—
I	Besançon	68.8	313	e 11	6	- 2	i 13	47	PP	e 14	33	?
II		68.8	313	e 11	7	- 1	—	—	—	e 11	36	PcP
I	Paris	70.3	315	e 11	16	- 1	e 20	28	- 1	i 13	59	PP
II		70.3	315	e 11	18	+ 1	e 20	28	- 1	e 26	2	?
I	Scoresby Sund	70.3	342	e 11	15	- 2	—	—	—	—	—	—
II		70.3	342	i 11	17	0	—	—	—	—	—	37.5
I	Chambon-la-Forêt	70.8	315	e 11	18	- 2	—	—	—	—	—	—
II		70.8	315	e 11	17	- 3	—	—	—	—	—	—
I	Kew	70.8	319	e 11	22	+ 2	e 20	35	0	—	—	e 29.1
II		70.8	319	e 11	22	+ 2	e 20	36	+ 1	—	—	—

Continued on next page.

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		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
I	Clermont-Ferrand	71.2	312	e 11 23	0	e 20 38	- 2	—	—
II		71.2	312	—	—	e 20 39	- 1	—	—
I	College	72.7	24	i 11 28	- 4	—	—	—	—
II		72.7	24	11 29	- 3	—	—	—	—
I	Rathfarnham C.	73.3	323	i 11 35	0	e 21 16	+12	i 11 23	? e 41.6
II		73.3	323	—	—	e 20 56	- 8	—	e 41.6
I	Resolute Bay	74.8	3	i 11 42 <sub>a</sub>	- 2	—	—	i 11 46	P
II		74.8	3	i 11 43 <sub>a</sub>	- 1	—	—	i 11 46	P
I	Tortosa	75.0	308	e 11 34	-11	i 21 22	- 1	—	—
I	Algiers Univ. z.	75.1	303	e 11 43	- 3	—	—	i 14 24	PP
II		75.1	303	e 11 43	- 3	—	—	—	—
I	Alicante	76.9	307	11 52	- 4	e 21 32	-11	14 43	PP
I	Almeria	79.0	306	11 16	-51	21 39	-27	26 30	SS
I	Granada	79.6	307	i 11 14 <sub>k</sub>	-56	e 21 40	-32	27 5	SS
II		79.6	307	11 16 <sub>a</sub>	-54	—	—	—	—
I	Tamanrasset z.	79.7	290	i 12 11 <sub>a</sub>	0	e 22 6	- 7	e 15 11	PP
II		79.7	290	e 12 16	+ 5	e 22 15	+ 2	e 15 17	PP
I	Malaga	80.4	307	e 10 58	-77	23 23	PPS	e 16 5	? 47.1
I	Pretoria z.	86.2	237	i 12 42	- 2	—	—	—	—
I	Pietermaritzburg z.	86.9	233	e 12 48	0	—	—	—	—
I	Kimberley z.	90.4	236	i 13 2	- 2	—	—	—	—
I	Hungry Horse	96.8	20	i 13 33	- 1	—	—	—	—
II		96.8	20	e 13 34	0	—	—	—	—
I	Ottawa	104.2	354	e 12 16	?	—	—	—	—
I	Tinemaha z.	105.3	28	e 18 33	PP	—	—	—	—
I	China Lake z.	106.6	28	e 18 23	PKP	—	—	e 18 44	PP
I	Boulder City	107.5	26	e 13 22	?	—	—	—	—
II		107.5	26	e 15 34	?	—	—	—	—
I	Nelson	107.8	26	e 14 30	P	—	—	—	—
II		107.8	26	e 22 1	?	—	—	—	—
I	Palomar z.	109.0	29	e 18 31	[ 0]	—	—	—	—
I	Bogota	144.0	344	i 19 36	[- 1]	—	—	—	—
II		144.0	344	i 19 37	[ 0]	—	—	—	—
I	Huancayo	160.2	336	e 20 48	PKP <sub>2</sub>	—	—	—	—
II		160.2	336	e 20 50	PKP <sub>2</sub>	—	—	—	—
I	La Paz	N. 160.3	311	e 20 24	[+23]	—	—	—	—

April 23d. 10h. 32m. Epicentre 36°·7N. 71°·0E. Depth of focus 210km.  
Bulletin of Seismological Stations of the U.S.S.R. for April-June, 1953, Moscow, 1954, p. 70.

April 23d. 12h. 53m. Epicentre 35°·8N. 27°·2E. (Strasbourg).  
Intensity IV at Karpathos.

A. Galanopoulos.  
Seismological Institute Bulletin, 1953, Athens, 1954, p. 56.

April 23d. 16h. 24m. 22s. Epicentre 4°·5S. 153°·3E. (as on 1940, Sept. 12d.).

Magnitude 7.75. Damage and faulting in New Britain, with a tsunami (Press).

$$A = -.8907, B = +.4480, C = -.0779; \quad \delta = +12; \quad h = +7;$$

$$D = +.449, E = +.893; \quad G = +.070, H = -.035, K = -.997.$$

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
	Guam	19.8	334	i 4 44	+ 9	—	—	—	—
	Brisbane	22.9	182	i 5 4	- 2	i 9 52	SS	i 5 32	PP
	Riverview	N. 29.2	184	i 6 10 <sub>k</sub>	+ 5	i 11 3	+ 5	i 7 2	PP
	Melbourne	E. 34.0	172	e 6 49	+ 1	i 12 15	+ 2	i 9 39	PcP
	Apia	35.6	107	e 7 22	+21	i 12 41	+ 3	i 8 9	PP
	Torisima	36.9	342	e 7 13	+ 1	e 13 13	+15	e 6 36	? e 17.1
	Auckland	N. 37.8	150	e 7 31	+11	13 47	+36	—	—
	Baguio	38.4	304	7 16	- 9	13 14	- 6	i 7 27	? e 16.5
	Karapiro	N. 39.0	151	7 30	0	e 17 48	ScS	e 7 42	pP
	New Plymouth	E. 39.2	153	e 7 59	+28	e 14 7	+35	e 9 37	PPP

Continued on next page.

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		$\Delta$	Az.	P.	O - C.	S.	O - C.	Supp.	L.
		$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Tongariro	Z.	40.0	152	7 37	- 1	i 14 12	+28	i 8 3	? e 17.4
Cobb River	E.	40.4	157	e 7 41	0	e 14 2	+12	e 7 54	? e 17.6
Tuai	N.	40.4	150	e 7 43	+ 2	e 13 57	+ 7	8 3	pP 17.9
Osima		41.2	343	e 7 48	0	e 13 56	- 6	e 9 38	PP e 19.0
Siomisaki		41.2	339	7 49	+ 1	e 13 58	- 4	17 4	SS i 19.8
Omaesaki		41.4	342	e 7 46	- 4	e 14 15	+10	(e 17 26)	SS e 17.4
Wellington		41.4	155	e 7 49	- 1	e 14 34	+29	e 8 41	? e 17.6
Ajiro		41.5	343	e 7 49	- 1	e 14 14	+ 7	i 9 43	PP e 17.3
Misima		41.6	343	e 7 54	+ 3	e 14 15	+ 7	e 9 35	PP e 17.4
Owase		41.6	339	e 7 57	+ 6	e 14 12	+ 4	e 9 57	PcP 22.0
Muroto		41.7	336	e 7 50	- 2	e 12 59	?	e 8 57	? e 17.4
Shizuoka		41.7	343	e 7 53	+ 1	14 21	+11	17 29	ScS 24.7
Yokohama		41.7	343	e 8 3	+11	14 40	+30	9 23	PP 20.8
Miyazaki		41.8	332	e 7 55	+ 2	i 14 21	+10	i 8 13	pP i 17.5
Simidu		41.8	334	e 7 54	+ 1	e 14 12	+ 1	e 9 48	PP 17.4
Kagosima		41.9	330	e 7 55	+ 1	14 18	+ 5	e 13 14	? —
Tokyo		41.9	344	e 7 52	- 2	e 14 4	- 9	i 9 56	PPP 19.2
Kashiwa		42.0	339	e 7 50k	- 4	e 14 6	- 8	e 9 35	PP 25.1
Tu		42.1	341	7 51	- 4	e 14 12	- 4	e 9 35	PP 17.6
Kameyama		42.2	341	7 52	- 4	14 2	-15	e 9 42	PP 17.7
Koti		42.2	335	e 7 57	+ 1	e 14 14	- 3	e 9 43	PP 17.5
Tokusima		42.2	338	e 8 1	+ 5	e 14 21	+ 4	—	—
Nagoya		42.3	341	e 7 59	+ 2	e 14 26	+ 7	16 54	SS 20.5
Sumoto		42.4	339	7 52	- 6	14 22	+ 2	17 54	ScS 20.4
Christchurch		42.5	159	e 7 57	- 2	e 14 33	+11	e 14 52	? e 18.6
Kumagaya		42.5	344	e 7 57	- 2	e 14 5	-17	9 24	PP 19.7
Kobe		42.6	338	e 7 56	- 3	e 14 43	+20	e 9 45	PP e 20.5
Kyoto	E.	42.6	339	e 7 58	- 1	e 14 26	+ 3	(e 18 8)	SSS e 18.1
Hikone		42.7	340	8 1	+ 1	e 14 41	+17	e 12 0	? 18.4
Himeji	N.	42.7	338	e 8 5	+ 5	14 38	+14	e 10 9	PPP 18.1
Takamatu		42.7	338	e 7 54	- 6	e 14 22	- 2	10 21	PPP 17.4
Utunomiya	E.	42.7	344	e 8 2	+ 2	e 14 26	+ 2	17 20	SS 21.4
Matuyama		42.8	336	e 8 17	+16	e 14 40	+14	e 10 3	PcP e 19.4
Maebasi		42.8	344	e 8 1	0	e 14 32	+ 6	e 18 19	SSS 21.0
Onahama		42.8	346	e 8 1	0	e 14 35	+ 9	(e 17 35)	SS e 17.6
Kumamoto		42.9	332	e 8 0	- 2	e 14 30	+ 3	(e 18 24)	SSS e 18.4
Oiwake		42.9	344	e 8 2	0	14 29	+ 2	18 27	SSS 23.2
Matumoto		43.0	342	8 4	+ 1	e 14 10	-19	(18 11)	ScS 18.2
Takayama		43.1	342	e 8 14	+10	e 14 41	+11	—	—
Tsuruga	N.	43.1	341	8 1	- 3	14 35	+ 5	e 9 53	PP 17.6
Matusiro	N.	43.2	343	e 7 59	- 5	14 18	-14	9 32	PP 20.3
Hirosima		43.4	335	8 7	+ 1	14 27	- 8	(e 17 42)	SS e 17.7
Saga	N	43.4	332	e 8 9	+ 3	e 14 34	- 1	—	e 20.7
Hukuoka		43.6	333	e 8 4	- 4	i 14 44	+ 6	18 2	ScS 20.7
Inawasio	E.	43.6	346	e 8 3	- 5	e 14 21	-17	e 10 22	PPP —
Tomie		43.6	330	8 12	+ 4	14 26	-12	e 7 55	? —
Toyama		43.6	338	e 8 14	+ 6	e 14 36	- 2	e 10 42	PPP e 20.7
Hokusima		43.7	345	e 8 6	- 2	14 32	- 7	i 10 10	PcP 17.8
Kanazawa		43.7	341	e 8 13	+ 5	e 14 38	- 1	e 17 52	SS e 21.6
Simonoseki		43.7	333	8 7	- 1	i 14 41	+ 2	—	—
Yonago		43.9	336	e 8 9	- 1	e 14 19	-23	—	—
Hamada		44.0	335	8 24	+13	i 14 56	+13	e 14 7	PcS e 17.2
Matsue		44.0	336	8 22	+11	14 37	- 6	—	—
Sendai		44.1	347	e 8 11	- 1	e 14 42	- 3	10 7	PcP 19.6
Niigata		44.2	344	e 7 52	-20	14 34	-12	9 9	? 16.6
Yamagata		44.2	346	e 8 13	+ 1	e 14 56	+10	e 10 38	PPP e 20.5
Wazima		44.4	342	e 8 15	+ 1	e 14 57	+ 8	(e 18 1)	SS e 18.0
Perth		44.5	227	i 8 33	+18	15 2	+11	10 3	PP —
Aikawa		44.6	344	e 8 17	+ 1	14 53	+ 1	—	—
Ituhara		44.7	332	e 8 20a	+ 4	14 58	+ 4	(18 34)	ScS 18.6
Mizusawa	N.	44.8	347	8 22	+ 5	15 2	+ 7	—	20.7
Miyako		45.1	348	e 8 12	- 8	e 15 3	+ 4	e 10 2	PP e 21.0
Morioka		45.4	347	e 8 23	+ 1	e 15 12	+ 8	—	—
Bandung		45.5	265	e 8 28	+ 5	i 15 21	PPS	i 10 23	PP e 22.9
Akita		45.6	346	8 26	+ 2	e 15 10	+ 4	e 18 14	SS e 21.0

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	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Hatinohe	46.1	348	e 8 30	+ 2	e 15 7	- 7	e 8 18	? e 19.5
Djakarta	46.3	266	e 8 29	0	i 15 26	PS	c 10 11	PP e 21.2
Aomori	46.5	347	e 8 36	+ 5	15 14	- 5	18 26	ScS 20.6
Hong Kong	46.6	307	8 38	+ 6	15 11	-10	8 46	? —
Z0-S0	46.8	322	e 8 25	- 8	i 15 11	-13	i 8 27 <sub>a</sub>	P —
Urakawa	47.4	350	e 8 35	- 3	e 15 22	-10	e 10 23	PP e 22.9
Mori	47.8	348	8 46	+ 5	15 44	+ 6	10 43	PP 20.7
Kusiro	E. 47.9	352	8 44	+ 2	e 15 47	+ 8	(e 20 19)	SSS e 20.3
Tomakomai	N. 48.0	348	e 8 45	+ 2	e 15 27	-14	i 10 53	PPP —
Nemuro	48.1	353	e 8 47	+ 4	i 15 50	+ 8	e 10 12	PcP e 22.0
Suttsu	48.5	348	e 8 39	- 7	e 16 3	+15	e 11 38	PPP e 21.3
Sapporo	48.6	348	e 8 47	0	e 15 44	- 5	e 19 13	SS e 24.1
Abashiri	49.0	352	e 8 50	0	16 4	+ 9	20 23	SSS 24.3
Nanking	49.0	320	8 44 <sub>a</sub>	- 6	15 48	- 7	c 8 41	? —
Asahigawa	49.1	351	e 9 0	+ 9	e 16 3	+ 7	—	— e 21.3
Kurilsk	49.7	355	e 8 53	- 3	16 8	+ 4	—	— —
Macquarie Is.	50.1	175	i 8 40	-19	i 15 44	-26	10 35	PP —
Wakkanai	E. 50.8	351	e 9 32	+28	e 16 33	+13	—	— —
Vladivostok	51.2	340	i 8 58	- 9	16 32	+ 7	—	— —
Yuzno-Sakhlinsk	52.1	351	i 9 14	0	16 47	+ 9	—	— —
Ulegorsk	54.2	352	9 32	+ 3	17 21	PS	—	— —
Honolulu	54.3	59	e 8 42	-48	e 17 28	PPS	—	— —
Petropavlovsk	57.6	3	9 55	+ 1	18 2	PS	—	— —
Klyuchi	60.9	5	e 10 19	+ 2	18 53	PS	—	— —
Mitchell Field	61.8	21	e 9 31	-52	e 19 2	PS	—	— —
Magadan	63.9	359	i 10 36	- 1	—	—	—	— —
Shillong	66.6	301	e 10 53	- 1	e 19 47	+ 2	13 29	PP 31.0
Kyakhta	67.9	330	e 10 58	- 4	—	—	—	— —
Kabansk	68.8	332	e 11 1	- 7	i 20 13	+ 2	—	— —
Calcutta	E. 68.9	296	i 11 5 <sub>k</sub>	- 4	i 20 13	0	13 38	PP —
Irkutsk	70.1	331	11 17	+ 1	20 33	+ 6	—	— —
Chatra	E. 71.0	301	e 11 17	- 5	e 20 33	- 4	30 51	PKKP 33.6
Colombo	E. 74.2	278	11 42	+ 2	21 7	- 7	14 57	PP 34.0
Madras	E. 74.6	285	i 11 44	+ 1	i 21 26	+ 8	—	— —
Kodaikanal	E. 76.9	282	i 12 0	+ 4	i 21 51	+ 8	14 53	PP 36.2
Hyderabad	77.0	288	i 11 57	+ 1	i 21 49	+ 4	27 3	SS 37.0
Dehra Dun	N. 79.6	302	e 11 50	-20	i 20 56	?	i 25 20	? e 31.8
New Delhi	80.0	300	e 12 12	- 1	i 22 21	+ 4	17 21	PPP 37.4
Heard Island	80.4	217	e 12 37	+22	e 22 40	+19	15 43	PP —
College	81.4	21	i 12 20	0	i 28 5	SS	e 12 9	? i 33.6
Poona	81.5	289	e 12 8	-13	22 24	- 8	17 11	PPP 40.0
Przhevalsk	82.0	314	e 12 18	- 5	e 22 47	ScS	i 12 37	? —
Semipalatinsk	82.8	322	12 23	- 4	—	—	e 15 31	PP —
Almata	83.2	315	e 12 21	- 8	i 23 0	ScS	i 17 38	PPP —
Naryn	83.5	313	e 12 34	+ 3	i 23 3	ScS	i 23 32	PS —
Rybach'e	83.6	314	i 12 38	+ 7	i 22 59	+ 6	—	— —
Sitka	83.7	31	e 12 58	+26	i 23 10	ScS	—	— —
Frunse	84.8	314	e 12 30	- 7	i 23 19	ScS	—	— —
Andijan	86.1	311	e 12 36	- 8	i 23 35	ScS	i 24 8?	PS —
Fergana	86.4	311	e 12 36?	- 9	—	—	—	— —
Namangan	86.6	311	e 12 38	- 8	—	—	—	— —
Dzhergetal	86.7	310	e 12 42	- 5	—	—	—	— —
Arcata	87.3	49	—	—	e 24 19	PS	—	— e 36.0
Garm	87.4	310	e 12 48	- 2	—	—	—	— —
Kulyab	87.6	308	12 45	- 6	—	—	—	— —
Tchimkent	88.3	312	i 12 59	+ 4	i 23 41	+ 2	—	— —
Berkeley	88.4	52	e 13 0	+ 5	e 24 2	+22	e 16 40	PP e 41.3
Corvallis	88.4	46	e 13 7	+12	e 23 53	ScS	e 36 38	Q e 42.4
Tashkent	88.4	312	e 12 54	- 1	23 52	ScS	e 12 59	PcP —
Santa Clara	88.5	52	e 13 53	+57	—	—	e 14 16	? e 41.5
Stalinabad	88.5	309	i 12 59	+ 3	—	—	—	— —
Shasta	88.6	49	i 13 2	+ 6	e 23 55	ScS	e 18 42	PPP e 36.5
Lick	88.8	52	e 13 5 <sub>k</sub>	+ 8	i 13 34	?	e 16 34	PP e 39.8
Victoria	88.9	41	13 2	+ 4	e 23 38	- 6	i 24 14	? 36.7
Quetta	89.0	300	i 13 0	+ 2	i 23 40	- 5	e 25 3	PS i 40.8

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	$\Delta$	Az.	P.		O - C.	S.		O - C.	Supp.		L.
	$^{\circ}$	$^{\circ}$	m.	s.	s.	m.	s.	s.	m.	s.	m.
Mineral	89.2	50	e 13	36	+37	e 24	46	PS	e 24	32	?
Samarkand	90.0	309	13	3	0	c 24	8	ScS	—	—	—
Fresno	90.2	53	e 13	8	+4	—	—	—	e 13	24	?
Reno	90.4	50	e 13	11	+7	e 24	12	+14	e 31	14	?
Pasadena	91.3	56	e 13	5	-4	e 23	58	-8	e 16	51	PP i 42.0
Tinemaha	91.4	53	e 13	16	+7	e 24	26	+19	i 13	49	?
China Lake	91.9	54	e 13	8	-3	e 13	36	?	i 13	47	?
Riverside	91.9	56	e 13	9	-2	i 13	30	?	i 13	51	?
Palomar	92.3	57	e 13	20	+7	i 13	33	?	i 14	6	?
Bairam-Ali	93.6	307	e 13	24	+5	—	—	—	17	7	PP
Boulder City	94.1	55	e 13	19	-3	i 24	6	(-6)	i 17	34	PP
Nelson	94.1	55	e 13	18	-4	i 26	42	PPS	i 14	34	?
Hungry Horse	95.1	42	e 13	20	-6	i 30	38	PKKP	e 38	37	P'P'
Sverdlovsk	95.2	327	i 13	38	+11	i 24	42	+2	17	13	PP
Butte	96.1	44	e 13	36	+5	e 25	8	+20	—	—	—
Ashkabad	96.6	308	e 13	28	-5	e 24	29	(-1)	—	—	—
Logan	96.6	49	e 13	41	+8	—	—	—	—	—	—
Bozeman	97.2	44	e 14	10	+34	e 25	14	+17	—	—	—
Tucson	97.3	58	e 13	48	+12	i 27	8	PPS	i 26	39	PS i 41.6
Kizyl-Arvat	98.3	310	e 13	49	+8	—	—	—	17	54	PP
Saskatoon	99.7	38	e 18	8	PP	e 24	41	(-11)	e 25	41	S 40.6
Resolute Bay	100.0	15	e 13	43	-5	i 25	28	+8	17	58	PP
Chihuahua	101.5	62	e 15	4	+69	e 27	32	PS	e 19	54	PPP
Tananarive	103.4	250	e 27	23	PS	32	53	SS	—	—	49.0
Baku	103.7	310	e 18	24	PP	e 24	51	[+6]	—	—	—
Shemakla	104.0	311	i 14	30	+24	—	—	—	—	—	—
Guadalajara	104.1	70	e 18	48	PP	e 25	40	-15	e 33	42	SSP
Makhach-Kala	104.6	314	e 14	22	+13	25	6	[+17]	i 18	50	PP
Lubbock	104.8	57	18	58	PP	—	—	—	—	—	—
Kirovobad	105.7	311	e 14	23	P	e 25	36	(+1)	e 18	58	PP
Grozny	105.8	313	i 14	36	P	—	—	—	—	—	—
Goris	105.9	310	e 14	34	P	25	11	[+16]	19	1	PP
Tiflis	106.8	313	e 14	30	P	i 26	34	+17	28	18	PS
Erevan	107.2	311	e 14	32	P	—	—	—	19	7	PP
Gori	107.2	313	e 14	40?	P	—	—	—	e 19	14?	PP
Piatigorsk	107.6	315	i 18	55	PP	i 25	9	[+7]	i 21	5	PPP
Leninakan	107.6	312	19	8	PP	25	40	(-8)	21	2	PPP
Lincoln	108.0	48	e 19	14	PP	—	—	—	—	—	—
Moscow	108.0	328	e 14	35	P	i 25	8	[+4]	i 25	45	SKKS
Tacubaya	108.0	71	e 15	47	?	e 26	35	S	e 34	22	PSPS
Abastumanj	108.2	313	e 18	21	[-9]	e 24	38	[-27]	—	—	—
Zugdidi	108.8	314	e 14	57	P	—	—	—	e 19	13	PP
Puebla	108.9	71	e 20	14	?	e 25	58	(+1)	e 29	6	PPS
Kiruna	109.2	343	e 18	28	[-4]	i 25	51	(-8)	e 14	51	P
Pulkovo	110.0	334	e 18	28	[-5]	e 25	54	(-11)	e 14	34	P
Sotchi	110.1	315	e 14	57	P	—	—	—	e 19	12	PP
Oaxaca	110.4	72	—	—	—	e 29	6	PS	e 46	5	Q e 52.0
Veracruz	110.9	71	e 15	54	?	e 24	59	[-17]	e 29	26	PPS
Punta Arenas	111.6	154	e 20	33	?	25	24	[+5]	26	24	SKKS 52.6
Helsinki	112.1	336	e 20	23	?	e 25	38	[+17]	—	—	—
Thodosia	112.7	318	e 15	9	P	—	—	—	e 19	17	PP
St. Louis	113.4	50	e 21	41	PPP	—	—	—	e 23	37	PPPP
Yalta	113.7	316	e 15	11	P	—	—	—	e 19	36	PP
Scoresby Sund	114.0	358	e 18	40	[-1]	i 29	30	PS	e 15	5	P 58.6
Chicago	114.1	46	e 19	51	PP	—	—	—	—	—	—
Ksara	115.2	305	18	56	[+13]	29	44	PS	e 15	16	P
Upsala	115.3	337	i 18	48	[+4]	e 25	41?	[+8]	e 15	15	P e 53.6
Kishinev	116.3	322	e 18	41	[-5]	i 26	47	(-2)	i 20	9	PP
Mobile	116.7	58	e 19	10	[+24]	—	—	—	—	—	—
Merida	116.9	69	e 20	37	?	e 30	17	PPS	e 32	47	PKKS
Iasi	117.0	320	e 19	14	[+27]	29	56	PS	30	14	?
Grahamstown	117.2	230	e 19	3	[+16]	—	—	—	—	—	—
Kirkland Lake	117.2	37	e 18	53	[+6]	—	—	—	e 20	11	PP
Cincinnati	117.5	48	i 20	16	PP	—	—	—	—	—	—
Lwow	117.9	326	e 15	23	P	i 27	2	(+3)	i 20	18	PP

Continued on next page.



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1953				232									
		Δ	Az.	P.	O-C.	S.	O-C.	Supp.	L.				
		°	°	m. s.	s.	m. s.	s.	m. s.	m.	s.		m.	
Istanbul	z.	118.4	315	18 40	[-10]	20 6	PP	15 35	P				
Cleveland		118.9	45	e 18 35 <sup>k</sup>	[-16]	e 27 54	S	e 20 32	PP				
Pretoria	z.	118.9	238	e 18 54	[+ 3]								
Bucharest		119.1	319	e 19 9	[+18]	i 25 48	[+ 1]	i 20 29	PP			47.6	
Helwan		119.1	302	19 8	[+17]	e 27 59	S	e 15 38	P				
Bergen	N.	119.2	343	e 19 2	[+11]	e 25 55	[+ 8]	i 20 28	PP			e 50.7	
Uzhgorod		119.5	326	19 6	[+14]	26 4	[+16]	15 34	P				
Buffalo		120.1	43	e 19 13	[+20]								
Copenhagen		120.1	336	e 19 10	[+17]	27 59	S	e 15 44	P				
Buffalo (Larkin)		120.3	43	e 18 57	[+ 4]								
Pittsburgh		120.4	45	e 20 41	PP	i 26 47	{-29}						
Reykjavik		120.4	358	i 18 53	[- 1]	e 28 20	S	e 30 35	PS			e 57.1	
Skalnate Pleso		120.4	327	e 20 20	PP	e 27 37	{+21}	e 23 7	PPP			e 51.6	
Kimberley	z.	120.5	233	e 18 57	[+ 3]								
Morgantown		120.7	47	i 19 0	[+ 6]	e 26 28	[+35]						
Concepción	N.	121.0	139	20 18	PP	30 30	PS	37 1	SS			50.6	
Raciborzu		121.0	329	e 19 52	PP	e 30 1	PS	e 23 9	PPP				
Ottawa		121.1	38	e 18 49	[- 6]	30 21	PS	22 15	PKS			51.0	
Timisoara		121.6	323	e 19 17 <sup>?</sup>	[+21]	e 41 48	SSS	e 20 57	PP			e 48.6	
Columbia		121.7	52	e 19 10	[+14]	e 30 43	PS						
Sofia		121.7	318	e 19 25	[+29]	i 26 52	{-33}	e 20 56	PP				
Budapest		121.9	324	e 19 12	[+16]	27 32	{+ 6}	30 28	PS			50.1	
Kecskemet		121.9	325	18 10	[-46]	21 57	?	19 59	PP			e 50.6	
Szeged		122.0	323	18 56	[- 1]	25 32	[-25]	e 20 47	PP			e 54.2	
Potsdam		122.1	333	e 19 8 <sup>?</sup>	[+11]	i 30 53	PS	i 20 53	PP			e 54.6	
Ogyalla		122.2	327	e 19 49	[+52]	e 25 3	[-54]	20 50	PP			e 55.6	
Shawinigan Falls	N.	122.3	35	e 18 53	[- 4]	25 51	[- 7]	27 13	SKKS			51.1	
Belgrade		122.5	322	e 19 17	[+19]	e 27 54	{+23}	e 37 13	SS			e 54.2	
Kalossa	N.	122.5	325	e 19 17	[+19]	27 35	{+ 4}	e 20 39	PP				
Collnberg		122.8	331	e 18 54	[- 4]	e 37 37	SS	e 15 43	P			e 51.1	
Prague		122.9	330	e 20 5	?	e 26 2	{+ 3}	e 30 47	PS			e 57.1	
Seven Falls	E.	123.1	34	e 19 4	[+ 5]	30 49	PS	20 53	PP				
Jena		123.8	332	e 19 1 <sup>?</sup>	[+ 1]	e 26 23	[+21]	e 20 56	PP			60.1	
Santa Lucia	N.	123.8	136	e 21 46	?	28 35	{+55}	e 23 32	PPP			52.6	
Cheb		123.9	331	e 20 42	PP	e 30 44	PS	e 37 45	SS			e 51.1	
Philadelphia		123.9	43	e 20 55	PP								
Aberdeen		124.0	344	e 20 35	PP	i 25 49	[-14]	i 30 58	PS			58.6	
Palisades		124.3	41	i 19 6	[+ 5]	e 25 52	[-12]	e 15 47	P			e 51.0	
City College, N.Y.		124.4	41	e 19 8	[+ 7]								
Fordham		124.4	41	e 19 4	[+ 3]								
Witteveen	z.	124.6	338	e 19 6	[+ 4]	i 19 48	?	i 20 41	PP				
Harvard		125.1	39	e 19 6	[+ 3]	e 26 12	[+ 6]	e 31 8	PS				
Weston		125.3	39	e 19 9 <sup>a</sup>	[+ 6]	e 29 14	S	e 38 26	PSPS				
Edinburgh	E.	125.4	344	e 22 40	PKS	e 31 21	PS	e 38 34	SS				
De Bilt		125.7	338	e 19 21	[+17]	e 26 22	[+14]	e 15 56	P			e 52.6	
Durham		125.9	343	i 19 32	[+28]	e 20 17	?	i 21 15	PP				
Triest		126.0	326	i 19 8 <sup>k</sup>	[+ 4]	e 27 57	{+ 3}	i 31 10	PS			59.2	
Stuttgart		126.4	332	e 19 4	[- 1]	e 26 35	[+25]	e 16 10	P			57.6	
Karlsruhe		126.6	333	e 19 10 <sup>a</sup>	[+ 5]	e 38 7	SS	e 21 17	PP			e 57.6	
Taranto		126.7	319	20 41	PP	e 30 51	PS					60.6	
Uccle		127.0	337	e 19 11	[+ 5]	e 26 29	[+17]	e 22 48	PKS			e 55.6	
Strasbourg		127.2	332	e 19 4	[- 3]	e 25 57	[-15]	e 15 44	P				
Chur		127.5	331	e 18 59	[- 8]	e 38 32	SS					e 53.2	
Zürich		127.6	331	e 19 11	[+ 4]	e 19 53	?	e 21 21	PP				
Salo		127.8	328	e 19 13	[+ 5]	e 26 28	[+14]	e 38 59	SSP			63.3	
Basle		128.0	332	e 19 14	[+ 6]	e 19 22	?	e 21 31	PP				
Bologna		128.1	326	e 19 15	[+ 7]	e 38 40	SS	e 22 29	PKS			e 65.2	
Kew		128.3	340	i 19 22	[+13]	e 31 2	PS	i 21 31	PP			e 50.6	
Florence		128.5	325	e 19 8	[- 1]	i 22 52	PKS	e 16 23 <sup>a</sup>	P				
Rathfarnham Castle		128.5	345	i 19 7	[- 2]	e 26 37	[+21]	e 21 23	PP			e 66.0	
Halifax		128.6	33	e 19 17	[+ 8]	26 14	[- 2]	24 13	PPP				
Prato		128.6	325	e 19 17	[+ 8]	i 31 8	PS						
Neuchatel		128.7	331	e 19 10	[ 0]	e 28 48	{+37}						
Pavia		128.8	328	e 19 14	[+ 4]	e 38 43	SS	e 21 0	PP			e 63.0	
Siena		128.8	325	e 19 49	[+39]	e 32 53	PPS	e 21 47	PP			62.2	

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	$\Delta$ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	Supp. m. s.	L. m.
Besançon	128.9	332	e 19 14	[+ 4]	i 21 37	PP	i 24 19	PPP
Rocca di Papa	128.9	323	e 19 23	[+13]	e 22 38	SKP	e 21 28	PP
Huancayo	128.9	109	e 19 13	[+ 3]	e 22 58	PKS	e 21 14	PP
Messina	129.0	318	e 19 20	[+10]	i 27 30	{-43}	e 16 22	P
Rome	129.0	323	e 19 24	[+14]	i 31 46	PS	e 16 22	P
Oropa	129.1	329	i 19 12	[+ 2]	i 22 56	PKS	i 16 40	P
Kingston	129.3	71	e 21 58	PP	—	—	—	—
Paris	129.3	335	e 19 15	[+ 4]	i 26 14	[- 4]	e 16 14	P
Chambon-la-Forêt	130.0	335	e 19 7	[- 5]	i 20 3	?	e 15 58	P
Jersey E.	130.7	340	e 21 41	PP	e 40 28	?	e 23 37	?
Montezuma	130.8	126	e 21 44	PP	—	—	23 49	?
Buenos Aires	130.9	146	e 20 11	[+57]	—	—	24 19	PPP
La Plata	131.0	146	19 8	[- 6]	39 2	SS	22 44	PKS
Chinchina	131.3	87	e 19 34	[+20]	e 39 42	SS	i 22 48	PKS
Clermont-Ferrand	131.4	332	e 19 20	[+ 5]	e 39 29	SS	e 22 3	PP
Galerazamba	131.5	80	e 19 58	[+43]	e 38 47	SS	e 22 18	PP
Bogota	132.8	88	e 19 38	[+21]	e 33 38	PPS	i 22 39	PKS
La Paz	134.0	118	i 19 37 <sub>a</sub>	[+18]	i 26 38	[+ 9]	i 28 50	SKKS
Bermuda	134.9	47	e 19 29	[+ 8]	i 40 15	SS	e 22 19	PP
Barcelona	135.1	330	e 22 13	PP	26 34	[+ 3]	45 11	SSS
Tortosa	136.4	330	i 19 33	[+ 9]	—	—	i 22 31	PP
Algiers Univ. z.	137.9	324	e 19 18	[- 9]	i 28 58	{-10}	e 22 17	PP
Alicante	138.7	329	19 22	[- 6]	26 51	[+14]	25 20	PPP
San Juan	139.0	66	i 19 32	[+ 3]	23 2	PKS	—	—
Toledo	139.3	333	e 19 32	[+ 3]	29 19	{+ 2}	22 14	PP
Coimbra	140.8	338	19 44	[+12]	41 20	SS	22 57	PP
Almeria	140.9	328	i 19 37	[+ 5]	26 46	[+ 5]	29 32	SKKS
Granada	141.2	331	i 19 45 <sub>k</sub>	[+12]	27 30	[+49]	32 25	SKSP
Malaga	142.0	331	i 19 46	[+12]	23 8	PKS	i 22 42	PP
Lisbon	142.4	337	23 54	? *	26 39	[- 4]	24 28	?
Tamanrasset z.	143.9	304	e 19 34	[- 3]	e 33 27	PS	e 22 47	PP
Angra do Heroísmo	146.0	1	e 22 35	PP	i 42 38	SS	—	—
Averroes	146.2	330	e 19 44	[+ 3]	e 27 14	[+25]	e 23 10	PKS
M'Bour	166.3	316	i 20 26	[+19]	—	—	—	—

April 24d. 2h. 9m. 44s. Epicentre 76°·7N. 7°·8E. (as on 1951, October 16d.).

A = +·2294, B = +·0314, C = +·9728;  $\delta$  = -5; h = -13;  
D = +·136, E = -·991; G = +·964, H = +·132, K = -·232.

	$\Delta$ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	Supp. m. s.	L. m.
Kiruna	9.7	150	i 2 23 <sub>k</sub>	+ 1	e 4 16	+ 1	i 2 32	PP
Scoresby Sund	10.4	246	e 2 24	-10	i 4 18	-14	i 2 29	?
Reykjavik	15.7	233	i 3 45	+ 1	—	—	i 3 48	P
Upsala	17.3	166	i 4 2	- 2	i 7 24	+ 8	i 4 24	PPP
Helsinki	17.6	148	e 4 4	- 4	i 7 36	+13	—	—
Pulkovo	18.7	143	i 4 19	- 3	e 7 52	+ 4	—	—
Aberdeen	19.9	195	i 4 43	+ 7	i 8 32	+17	i 5 42	?
Copenhagen	21.2	172	i 4 47	- 2	i 8 41	0	i 8 52	PcP
Resolute Bay	22.4	318	i 4 58 <sub>a</sub>	- 4	i 9 11	+ 7	—	—
Durham	22.5	193	i 5 5	+ 3	9 10	+ 5	e 4 31	?
Moscow	23.7	134	e 5 13	- 1	9 31	+ 4	—	—
Witteveen z.	24.0	181	i 5 18 <sub>a</sub>	+ 1	—	—	i 5 24	?
Rathfarnham Castle	24.1	198	i 5 4 <sub>k</sub>	-14	e 9 16	-18	i 6 10	PPP
Potsdam	24.5	172	i 5 24	+ 2	i 9 47	+ 7	i 6 17	PPP
De Bilt	24.7	182	i 5 26 <sub>a</sub>	+ 2	i 9 51	+ 7	e 10 58	?
Kew	25.5	190	i 5 34	+ 2	e 10 6	+ 9	e 6 34	PP
Collmberg	25.6	172	e 5 30	- 2	e 9 51	- 8	e 8 38	PcP
Jena	25.9	173	e 5 34	- 1	e 10 16	+12	e 6 6	PP
Uccle	26.0	185	e 5 35	- 1	e 10 7	+ 1	e 6 0	sP
Prague	26.9	170	e 5 43	- 2	e 10 25	+ 5	e 6 40	PP

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	$\Delta$	Az.	P.	O - C.	S.	O - C.	Supp.	L.	
	e	e	m. s.	s.	m. s.	s.	m. s.	m.	
Raciborzu	27.0	163	e 5 48	+ 3	e 10 40	+18	e 6 38	PP	—
Sverdlovsk	27.2	107	e 5 46	- 1	10 31	+ 6	—	—	—
Lwow	27.7	156	i 5 51	- 1	i 10 34	+ 1	—	—	—
Karlsruhe	27.8	178	e 5 53	0	e 10 44	+ 9	e 6 33	PP	e 12.6
Skalnate Pleso	28.0	161	e 5 55	0	e 10 50	+12	e 6 50	PP	—
Stuttgart	28.0	177	e 5 53	- 2	e 10 45	+ 7	e 6 32	PP	e 14.3
Paris	28.1	187	i 5 54	- 1	e 10 37	- 3	i 6 0	pP	e 12.3
Strasbourg	28.2	179	e 5 56	0	e 10 44	+ 3	e 7 4	PP	—
Uzhgorod	28.8	158	e 6 3	+ 1	10 52	+ 1	—	—	—
Chambon-la-Forêt	28.9	187	e 6 4	+ 1	—	—	i 6 10	pP	—
Ogyalla	29.2	165	e 6 8	+ 3	e 11 2	+ 4	e 6 43	PP	—
Basle	29.3	180	e 6 5	- 1	e 6 10	?	e 8 4	?	—
Zürich	29.5	180	e 6 8	0	—	—	—	—	—
Besançon	29.6	182	e 6 8	- 1	e 7 59	?	e 7 5	PP	—
Kishinev	31.0	150	i 6 19	- 2	e 11 20	- 6	—	—	—
Szeged	31.0	162	e 6 27	+ 6	—	—	7 0	PP	—
Clermont-Ferrand	31.1	185	e 6 22	0	e 11 37	+ 9	e 13 23	SS	16.3
Oropa	31.2	180	e 6 27	+ 4	14 17	SSS	e 8 36	PcP	—
Triest	31.3	172	e 6 29	+ 5	i 11 39	+ 8	e 7 20	PP	e 14.2
Bologna	32.4	174	e 6 50	+16	—	—	—	—	—
Florence	33.1	174	e 6 29 <sup>a</sup>	-11	e 12 4	+ 5	e 7 34	PP	—
Bucharest	33.3	166	e 6 46	+ 5	—	—	—	—	e 16.6
Siena	33.5	174	e 6 56	+13	—	—	—	—	—
Theodosia	33.8	143	e 6 44	- 2	e 12 12	+ 2	—	—	—
Yalta	34.1	145	e 6 49	+ 1	e 12 19	+ 5	—	—	—
Rome	35.0	172	e 6 54 <sup>k</sup>	- 2	12 30	+ 2	i 8 4	PP	16.7
Sochi	35.8	138	e 7 2	- 1	—	—	—	—	—
Platigorsk	35.9	134	7 5	+ 1	12 51	+ 9	—	—	—
Tortosa	36.1	188	e 7 9	+ 4	—	—	i 8 36	PP	—
Taranto	36.6	167	—	—	14 50	SS	—	—	16.3
Istanbul	36.9	153	7 11	- 1	12 59 <sup>?</sup>	+ 1	8 33	PP	—
Grozny	37.0	131	i 7 13	0	—	—	—	—	—
Zugdidi	37.2	136	7 18	+ 3	—	—	—	—	—
Toledo	37.3	194	e 7 20	+ 4	—	—	—	—	—
Makhach-Kala	37.7	129	i 7 23	+ 4	—	—	—	—	—
College	37.9	344	e 7 19	- 1	—	—	—	—	—
Abastumanj	38.1	134	e 6 58 <sup>?</sup>	-24	—	—	—	—	—
Tiflis	38.4	133	7 26	+ 1	13 27	+ 7	—	—	—
Alicante	38.6	189	7 28	+ 2	13 26	+ 3	9 1	PP	18.8
Messina	38.8	170	e 7 31	+ 3	e 13 24	- 2	e 9 1	PP	i 16.2
Leninakan	39.2	134	e 7 46 <sup>?</sup>	+15	—	—	—	—	—
Athens	39.5	159	i 7 36 <sup>a</sup>	+ 2	e 13 40	+ 3	e 16 35	SS	—
Kirovobad	39.7	132	7 36	0	—	—	—	—	—
Erevan	39.9	134	e 7 39	+ 2	—	—	—	—	—
Algiers Univ.	z. 40.0	185	e 7 37	- 1	e 9 16	PP	e 9 43	PPP	—
Granada	40.0	192	i 7 40 <sup>a</sup>	+ 2	i 13 48	+ 4	9 17	PP	i 18.8
Almeria	40.2	191	7 34	- 6	13 38	-10	9 8	PP	19.3
Shemakla	40.2	129	i 7 43	+ 3	—	—	—	—	—
Malaga	40.4	194	e 7 41	0	e 15 24	?	9 47	PPP	16.9
Baku	40.6	128	e 7 49	+ 6	—	—	—	—	—
Goris	40.9	131	7 46	0	14 1	+ 3	—	—	—
Irkutsk	41.3	68	7 48	- 1	e 14 7	+ 3	—	—	—
Kabansk	42.0	66	i 7 53	- 1	e 14 21	+ 7	—	—	—
Magadan	42.0	27	e 7 53	- 1	—	—	—	—	—
Seven Falls	E. 42.1	273	e 7 52	- 3	14 16	0	17 23	SS	20.2
Halifax	42.8	265	e 7 58	- 3	—	—	—	—	—
Tchimkent	42.8	104	i 7 48 <sup>?</sup>	-13	—	—	—	—	—
Shawinigan Falls	N. 43.1	275	e 8 0	- 4	—	—	—	—	—
Kirkland Lake	z. 43.3	282	e 8 0	- 5	—	—	e 9 41	PP	—
Frunse	43.4	100	i 8 7	+ 1	e 14 44	+ 9	—	—	—
Almata	43.6	97	e 8 10	+ 2	—	—	—	—	—
Kyakhta	43.6	68	i 8 7	- 1	14 45	+ 7	—	—	—
Lunacharskoe	43.7	106	i 8 9	+ 1	—	—	—	—	—
Tashkent	43.7	106	i 8 10	+ 2	—	—	—	—	—
Rybach'e	44.1	99	e 8 16 <sup>?</sup>	+ 4	i 14 53 <sup>?</sup>	+ 8	—	—	—

Continued on next page.

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	$\Delta$ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	Supp. m. s.	L. m.
Namangan	44.5	103	i 8 17	+ 2	—	—	—	—
Ashkabad	44.6	118	i 8 17	+ 1	—	—	—	—
Przhevalsk	44.6	95	e 8 18	+ 2	—	—	—	—
Ksara	44.8	146	i 8 20	+ 3	—	—	10 2	PP
Samarkand	44.8	109	8 19	+ 2	—	—	—	—
Andijan	44.9	103	i 8 20	+ 2	e 15 8	+12	—	—
Ottawa	44.9	278	i 8 13 <sub>a</sub>	- 5	14 36	-20	—	—
Fergana	45.1	103	i 8 19	- 1	e 15 7	+ 8	—	—
Naryn	45.1	98	e 8 22	+ 2	i 15 8	+ 9	—	—
Bairam-Ali	45.7	114	i 8 26	+ 2	—	—	—	—
Dzhergetal	46.1	105	e 8 30	+ 2	—	—	—	—
Garm	46.1	106	e 8 30	+ 2	—	—	—	—
Stalinabad	46.2	107	i 8 30	+ 2	e 15 22	+ 7	—	—
Harvard	46.6	272	i 8 35 <sub>a</sub>	+ 3	e 15 28	+ 7	—	e 24.7
Weston	46.7	272	i 8 35 <sub>a</sub>	+ 3	e 15 24	+ 2	—	e 23.5
Kulyab	47.1	107	8 38	+ 3	—	—	—	—
Khorog	47.9	104	e 8 44	+ 2	—	—	—	—
Helwan	48.2	152	8 44	0	15 46	+ 3	10 38	PP
Palisades	48.6	273	e 8 44	- 3	i 15 53	+ 4	e 10 42	PP
Cleveland	49.9	281	e 8 54 <sub>k</sub>	- 3	i 16 6	- 1	i 9 0	P
Hungry Horse	50.0	313	i 8 54	- 4	—	—	e 10 45	PP
Uglegorsk	51.2	37	e 9 6	- 1	—	—	—	—
Morgantown	51.3	279	i 9 7	- 1	—	—	—	—
Victoria	51.3	320	9 8	0	—	—	—	—
Butte	52.0	311	i 9 10	- 3	—	—	—	—
Cincinnati	52.8	283	i 9 16	- 3	—	—	—	—
Yuzno-Sakhlinsk	53.4	38	e 9 20	- 4	—	—	—	—
Quetta	53.9	113	i 9 28	+ 1	e 16 52	-10	i 9 34	?
Tamanrasset	z. 54.0	183	i 9 27 <sub>a</sub>	- 1	e 11 21	PP	e 10 20	PcP
Bermuda	54.7	261	e 9 33	0	e 17 15	+ 2	—	e 23.4
Shasta	58.8	318	e 10 1 <sub>k</sub>	- 1	e 15 21	?	e 11 18	PcP
Reno	z. 59.5	315	e 10 11 <sub>k</sub>	+ 4	—	—	e 11 20	PcP
Chatra	61.6	93	i 10 21	- 1	—	—	—	e 33.9
Tinemaha	z. 61.6	313	e 10 16	- 6	—	—	—	—
Lick	z. 61.9	317	e 10 22	- 2	—	—	—	—
Boulder City	62.1	310	i 10 22	- 3	—	—	—	—
Fresno	z. 62.2	314	e 10 26	0	—	—	e 12 26	PP
Nelson	62.4	310	i 10 23	- 4	i 12 34	PP	i 10 28	P
China Lake	z. 62.8	312	i 10 26	- 4	—	—	—	—
Nanking	z. 63.7	62	10 34	- 2	—	—	—	—
Pasadena	64.5	312	i 10 38	- 3	—	—	i 12 47	PP
Riverside	z. 64.5	312	i 10 37	- 4	—	—	—	—
Palomar	z. 65.0	310	e 10 41	- 3	—	—	—	—
Tucson	65.0	305	e 10 42	- 2	—	—	—	e 37.4
Zô-Sè	z. 65.1	60	e 10 40	- 5	—	—	—	—
Chihuahua	67.6	300	e 10 54	- 7	e 19 36	-21	—	—
San Juan	68.5	259	e 11 6	0	—	—	—	—
Tacubaya	75.1	291	e 11 35	-11	—	—	e 19 8	?

April 24d. 23h. 38m. 34s. Epicentre 43°·5N. 86°·5E.

A = +.0444, B = +.7263, C = +.6859;  $\delta = -6$ ;  $h = -3$ ;  
D = +.998, E = -.061; G = +.042, H = +.685, K = -.728.

	$\Delta$ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	Supp. m. s.	L. m.
Przhevalsk	6.0	263	1 35	+ 3	2 47	+ 4	—	—
Almata	7.0	271	e 1 44	- 2	3 3	- 5	—	—
Rybach'e	7.7	266	e 1 54	- 2	e 3 23	- 2	—	—
Naryn	8.0	259	e 2 2	+ 2	i 3 33	0	—	—
Sempalatinsk	8.1	330	1 36	-26	—	—	—	—
Frunse	8.7	270	e 2 10	0	—	—	—	—
Andijan	10.9	260	e 2 45	+ 5	—	—	—	—
Namangan	11.3	262	e 2 48	+ 2	e 4 58	+ 4	—	—
Fergana	11.4	259	2 47	0	—	—	—	—
Dzhergetal	12.3	255	3 0	+ 1	—	—	—	—

Continued on next page.

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	$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.
	$^{\circ}$	$^{\circ}$	m.	s.	s.	m.	s.	s.	m.	s.	m.
Tchimkent	12.4	275	e 3	2	+ 1	—	—	—	—	—	—
Khorog	12.8	247	e 3	8	+ 2	e 5	30	0	—	—	—
Lunacharskoe	12.9	266	e 3	8	+ 1	—	—	—	—	—	—
Obi-garm	13.5	255	e 3	17	+ 2	—	—	—	—	—	—
Kulyab	13.9	252	3	20	- 1	—	—	—	—	—	—
Stalinabad	14.3	256	i 3	31	+ 5	—	—	—	—	—	—
Irkutsk	14.8	47	e 3	37	+ 5	e 6	25	+ 7	—	—	—
Samarkand	15.1	262	3	36	0	—	—	—	—	—	—
Kabansk	16.0	51	i 3	47	- 1	—	—	—	—	—	—
Chatra	z. 16.6	178	i 3	59	+ 3	—	—	—	—	—	—
New Delhi	16.7	210	e 3	58	+ 1	e 6	58	- 5	4	10	PP
Bairam-Ali	19.4	261	4	29	- 1	—	—	—	—	—	—
Quetta	20.4	236	i 4	42	+ 1	i 8	28	+ 3	i 4	59	PP
Sverdlovsk	21.1	318	e 4	47	- 1	8	37	- 2	—	—	—
Ashkabad	22.0	265	4	58	0	—	—	—	—	—	—
Poona	z. 27.1	207	i 5	44	- 2	—	—	—	—	—	—
Nanking	27.8	103	e 5	54	+ 1	e 10	37	+ 2	—	—	—
Shemakla	28.1	278	e 6	2	+ 7	—	—	—	—	—	—
Kirovobad	29.7	279	e 6	9	- 1	—	—	—	—	—	—
Goris	30.2	277	e 6	12	- 2	—	—	—	—	—	—
Tiflis	30.5	282	e 6	25	+ 8	—	—	—	—	—	—
Gori	30.9	282	e 6	27	+ 7	—	—	—	—	—	—
Piatigorsk	31.1	287	e 6	27	+ 5	—	—	—	—	—	—
Erevan	31.2	279	e 6	25	+ 2	—	—	—	—	—	—
Hong Kong	31.2	122	—	—	—	e 11	26?	- 3	—	—	—
Borzhomi	31.5	282	e 6	23	- 3	—	—	—	—	—	—
Moscow	33.2	309	e 6	43	+ 3	—	—	—	—	—	—
Pulkovo	37.2	316	e 7	18	+ 3	13	9	+ 7	—	—	—
Kiruna	41.7	329	e 7	45	- 7	e 17	26	SS	i 7	51	P
Istanbul	41.8	288	7	52	- 1	—	—	—	e 9	35	PP
Lwow	42.2	301	e 7	53	- 3	—	—	—	—	—	—
Upsala	43.6	317	i 8	5	- 3	e 16	26	?	i 9	0	? c 22.8
Helwan	z. 45.5	272	e 8	22	- 1	—	—	—	—	—	—
Collmberg	48.4	306	e 8	43	- 3	e 8	49	P	e 9	8	?
Jena	49.4	307	e 8	51	- 2	e 8	57	P	e 10	11	PcP
Triest	z. 50.2	300	e 8	57	- 3	e 9	7	?	e 11	10	PP
Stuttgart	51.7	305	e 9	9?	- 2	—	—	—	e 9	15	P
Messina	z. 52.4	290	e 9	20	+ 4	—	—	—	—	—	e 26.4
Florence	z. 52.6	298	e 9	19	+ 1	e 20	43	SS	—	—	—
Rome	z. 52.7	296	—	—	—	e 20	45	SS	e 22	9	SSS
Besançon	54.3	304	e 9	28	- 2	—	—	—	e 9	34	?
Scoresby Sund	55.3	337	e 9	36	- 2	—	—	—	—	—	—
Paris	55.6	307	e 9	37	- 3	e 9	57	?	e 9	44	?
Chambon-la-Forêt	56.1	307	e 9	44	+ 1	—	—	—	i 9	51	?
College	64.0	23	10	35	- 3	—	—	—	—	—	—
Tamanrasset	z. 68.3	281	e 11	4	- 1	—	—	—	e 11	11	?
Hungry Horse	86.8	14	i 12	45	- 2	—	—	—	—	—	—
Pretoria	z. 87.2	230	e 12	50	+ 1	—	—	—	—	—	—
Nelson	98.8	17	e 13	43	0	—	—	—	e 16	17	?
Huancayo	144.9	328	e 19	41	[+ 2]	—	—	—	—	—	—

April 25d. 16h. 23m. 38s. Epicentre 43°·5N. 86°·5E. (as on 24d.).

	$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.
	$^{\circ}$	$^{\circ}$	m.	s.	s.	m.	s.	s.	m.	s.	m.
Warsak Dam	E. 15.0	236	e 3	43	PP	e 6	43	SS	—	—	—
Chatra	16.6	178	e 3	58	+ 2	e 7	8	+ 8	e 11	22	?
New Delhi	16.7	210	e 3	57	0	6	58	- 5	4	9	PP
Shillong	18.4	163	e 4	22	+ 4	e 4	41	PP	e 5	21	?
Quetta	20.4	236	i 4	42k	+ 1	i 8	24	- 1	i 8	28	S
Hyderabad	N. 26.9	197	e 5	41	- 4	e 10	45	SS	—	—	—
Poona	27.1	207	i 5	48	+ 2	e 11	16	SS	e 11	42	?
Nanking	27.8	103	e 5	59	+ 6	e 10	42	+ 7	—	—	e 13.2
Hong Kong	31.2	122	—	—	—	e 11	22?	- 7	—	—	e 17.4
Ksara	40.1	274	e 7	43	+ 4	e 10	1	?	—	—	—

Continued on next page.



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		$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.	
				m.	s.		m.	s.		m.	s.		
Kiruna		41.7	329	i 7	50	- 2	i 9	39	PP	i 9	57	PPP	i 21.8
Upsala		43.6	317	i 8	6	- 2	e 14	52	PPS	i 9	52	PP	i 22.8
Helwan	z.	45.5	272	e 8	22	- 1	—	—	—	e 10	2	PP	—
Raciborzu	z.	45.7	304	e 8	24	0	—	—	—	—	—	—	—
Copenhagen		47.3	313	e 8	36	- 1	—	—	—	i 8	42	?	24.4
Prague		48.0	305	e 19	44	?	e 22	32	?	e 23	11	?	e 24.8
Collinberg		48.4	306	e 8	43	- 3	e 15	42	- 4	(e 19	22)	SS	e 19.4
Jena		49.4	307	e 8	51	- 2	e 8	58	?	e 11	46	PPP	—
Triest	z.	50.2	300	i 9	0 <sup>a</sup>	0	e 9	6	?	e 10	59	PP	—
Witteveen	z.	51.5	311	e 9	17	+ 8	—	—	—	—	—	—	—
Stuttgart		51.7	305	e 9	8	- 3	—	—	—	e 9	15	P	e 27.4
Messina	z.	52.4	290	e 9	14	- 2	—	—	—	e 10	54	?	—
Florence	z.	52.6	298	e 9	9	- 9	—	—	—	e 10	4	?	—
Rome		52.7	296	e 9	10	- 8	e 11	14	PP	e 22	54	?	—
Zürich		52.7	304	e 9	22	+ 4	—	—	—	—	—	—	—
Basle		53.2	304	e 9	21	- 1	—	—	—	—	—	—	—
Besançon		54.3	304	e 9	28	- 2	—	—	—	i 9	35	P	—
Scoresby Sund		55.3	337	e 9	37	- 1	—	—	—	i 9	43	P	30.4
Paris		55.6	307	e 9	38	- 2	e 16	48	-37	i 9	45	P	e 28.4
Kew		55.9	311	—	—	—	e 17	32	+ 3	e 21	44	SS	—
Chambon-la-Forêt		56.1	307	e 9	44	+ 1	—	—	—	e 9	50	P	—
Resolute Bay		62.1	1	e 10	21	- 4	—	—	—	i 10	27	P	e 40.8
Alicante		63.0	299	11	24	PcP	20	41	[+20]	14	5	PPP	34.4
College		64.0	23	i 10	35	- 3	—	—	—	—	—	—	—
Tamanrasset	z.	68.3	281	e 11	5	0	e 11	24	PcP	e 13	39	PP	—
Victoria		84.7	19	12	36	- 1	—	—	—	—	—	—	—
Hungry Horse		86.8	14	i 12	46	- 1	—	—	—	—	—	—	—
China Lake	z.	98.1	19	e 13	40	0	—	—	—	—	—	—	—
Boulder City		98.6	17	e 13	43	+ 1	—	—	—	—	—	—	—
Nelson		98.8	17	e 13	42	- 1	—	—	—	e 13	47	PcP	—
Huancayo		144.9	328	i 19	41	[+ 2]	—	—	—	—	—	—	—
La Paz		145.5	312	e 19	40	[ 0]	—	—	—	—	—	—	—

April 26d. 12h. 20m. Provisional epicentre 57°S. 144°E. Magnitude 5.5ca.  
Seismological Observatory Bulletin of New Zealand E.132, April, May, June, 1953, Wellington, 1955, p. 5.

April 26d. 20h. 39m. China. Epicentre 40°1N. 77°3E.  
Bulletin of Seismological Stations of the U.S.S.R., April-June, 1953, Moscow, 1954, pp. 74-75.

April 27d. 23h. 21m. Provisional epicentre 37°9S. 176°3E.; Depth 200km.  
Magnitude 5.25.  
Seismological Observatory Bulletin for New Zealand E.132, April, May, June, 1953, Wellington, 1955, p. 5.

April 28d. 4h. 24m. Pamir region. Epicentre 38°6N. 70°5E.  
Bulletin of Seismo. Stations of the U.S.S.R. for April-June, 1953, Moscow, 1954, p. 75.

April 28d. 7h. 8m. Pamir region. Epicentre 39°3N. 74°0E.  
*Loc. cit.* 4h., 24m., p. 75.

April 28d. 9h. 40m. Provisional epicentre 35°5S. 179°W. Depth > normal.  
Magnitude 5.25ca.  
Seismological Observatory for Stations of New Zealand, Bulletin E.132, April-June, 1953, Wellington 1955, p. 5.

April 28d. 16h. 22m. Tian-Shan region. Epicentre 41°7N. 72°7E.  
*Loc. cit.*, 4h. and 7h., pp. 75-76.

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April 29d. 3h. 31m. 18s. Epicentre 9°·7S. 159°·6E. (as on 1950, Nov. 8d.).

A = -·9241, B = +·3437, C = -·1674;  $\delta = +11$ ;  $h = +7$ ;  
D = +·349, E = +·937; G = +·157, H = -·058, K = -·986.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.	
		°	°	m. s.	s.	m. s.	s.	m. s.	m.	
Brisbane		18·7	198	i 4 20	- 2	i 7 57	+ 9	i 4 30	PP	—
Riverview		25·2	196	i 5 29 <sub>k</sub>	0	i 9 59	+ 7	i 5 40	pP	e 12·6
Melbourne	E.	31·0	202	—	—	e 13 54	SSS	i 14 36	Q	e 16·1
Karapiro	N.	31·5	155	e 6 25	- 1	—	—	—	—	—
Tuai	N.	33·0	154	e 7 2	+23	—	—	—	—	—
Cobb River	E.	33·3	161	e 6 44	+ 3	e 12 2	0	—	—	—
Wellington		34·2	160	e 6 46	- 3	e 8 21	PPP	e 5 47	?	e 16·7
Kaimata	N.E.	34·3	164	e 6 50	0	—	—	—	—	—
Christchurch		35·6	164	e 6 59	- 2	e 12 42?	+ 4	e 8 14	PP	—
Perth		46·1	235	—	—	e 15 27	+13	e 18 23	SS	e 22·7
Baguio		46·5	305	i 8 31	0	i 15 19	0	—	—	—
Osima		48·2	338	e 8 46	+ 2	—	—	—	—	—
Omaesaki		48·5	337	e 8 48	+ 2	—	—	—	—	—
Misima		48·7	338	e 8 47	- 1	—	—	—	—	—
Shizuoka		48·7	338	8 49	+ 1	e 16 0	+10	—	—	—
Tokyo	N.	48·9	339	e 8 52	+ 2	e 16 1	+ 8	e 11 12	PPP	e 23·6
Hunatu		49·1	339	e 8 51	0	—	—	—	—	—
Kohu	N.	49·3	337	e 8 52	- 1	—	—	—	—	—
Kameyama		49·4	336	8 55	+ 2	e 10 46	PP	e 12 2	?	—
Kumagaya		49·4	339	e 8 55	+ 2	—	—	—	—	—
Nagoya	N.	49·5	337	e 8 56	+ 2	—	—	—	—	—
Kagosima		49·6	327	e 9 0	+ 5	—	—	—	—	—
Osaka		49·6	334	e 8 58	+ 3	—	—	—	—	—
Koti		49·7	332	e 8 55	- 1	e 16 6	+ 2	—	—	—
Takamatu		50·0	333	e 8 58	0	e 16 7	- 2	—	—	—
Matusiro		50·2	338	i 8 58 <sub>a</sub>	- 2	e 15 48	-23	e 10 52	PP	22·5
Sendai		50·8	342	e 9 4	0	—	—	—	—	—
Bandung		51·4	270	e 9 13	+ 4	e 16 33	+ 5	i 19 15	ScS	—
Hamada		51·4	331	9 11	+ 2	e 16 14	-14	—	—	e 26·0
Djakarta		52·3	271	9 12?	- 3	i 16 37	- 3	i 19 6	ScS	—
Hong Kong		54·7	307	9 33	0	17 14	+ 1	—	—	—
Zô-Sè		54·8	320	i 9 33 <sub>a</sub>	- 1	i 17 15	+ 1	—	—	—
Nanking		56·9	319	i 9 50 <sub>a</sub>	+ 1	17 44	+ 2	—	—	—
Yuzno-Sakhlinsk		58·4	347	10 0	0	—	—	—	—	—
Petropavlovsk		62·6	359	10 26	- 2	18 54	- 2	—	—	—
Klyuchi		65·8	2	i 10 47	- 2	e 19 34	- 1	—	—	—
Shillong		74·6	301	i 11 45	+ 2	e 21 11	- 7	12 4	PcP	—
Kyakhta		75·5	328	11 47	- 1	21 26	- 2	—	—	—
Kabansk		76·4	330	i 11 53	0	i 21 36	- 2	—	—	—
Irkutsk		77·7	330	11 59	- 1	e 21 46	- 6	—	—	—
Chatra		79·0	301	i 12 5	- 2	e 22 1	- 5	—	—	—
Hyderabad	E.	84·5	289	e 12 32	- 4	i 22 57	- 5	—	—	—
Berkeley		86·7	52	e 12 47	0	e 23 12	[ 0 ]	e 23 19	S	e 41·0
Santa Clara		86·8	52	—	—	e 23 28	+ 3	—	—	e 40·6
Lick	Z.	87·0	52	e 12 48 <sub>a</sub>	0	i 12 38	?	e 16 21	PP	—
Shasta	Z.	87·3	48	12 50 <sub>a</sub>	0	—	—	e 12 59	PcP	—
Fresno	Z.	88·3	53	e 12 55 <sub>a</sub>	0	e 13 4	PcP	e 16 38	PP	—
Pasadena		89·0	56	i 12 58	0	i 13 6	PcP	i 13 24	?	e 40·8
Reno		89·0	50	e 12 59 <sub>a</sub>	+ 1	e 24 0	+15	e 13 11	PcP	—
Poona	E.	89·1	289	—	—	e 22 42	-64	—	—	—
Riverside	Z.	89·6	56	e 13 1	0	i 13 28	?	e 13 10	PcP	—
Tinemaha		89·6	53	i 12 58	- 3	i 13 6	PcP	i 13 24	?	—
China Lake	Z.	89·8	54	e 13 3	+ 1	—	—	i 13 12	PcP	—
Palomar	Z.	89·9	57	e 13 4	+ 2	i 13 11	PcP	i 13 33	?	—
Przhevalsk		90·1	313	i 13 3	0	i 23 32	[- 1]	—	—	—
Almata		91·3	314	i 13 9	0	i 23 38	[- 2]	—	—	—
Naryn		91·6	312	i 13 10	0	i 23 40	[- 2]	e 18 48	PPP	—
Rybach'e		91·7	313	e 13 11	+ 1	23 40	[- 3]	25 22	PS	—
Frunse		92·9	312	13 14	- 2	—	—	e 16 57	PP	—
Andijan		94·2	310	i 13 23	+ 1	i 24 31	0	i 23 53	SKS	—

Continued on next page.

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## 1953

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	$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.	
			m.	s.		m.	s.		m.	s.		
Fergana	94.5	310	e 13	25	+ 2	i 23	55	[- 3]	—	—	—	
Namangan	94.7	310	e 13	18	- 6	i 23	57	[- 2]	—	—	—	
Dzhergetal	94.8	309	e 13	16?	- 9	—	—	—	—	—	—	
Kulyab	95.7	308	13	31	+ 2	24	3	[- 2]	—	—	—	
Obi-garm	95.9	308	e 13	29	- 1	—	—	—	e 17	17	PP	—
Tchimkent	96.4	312	e 13	32	0	i 24	6	[- 3]	—	—	—	
Stalinabad	96.6	308	e 13	34	+ 1	i 24	9	[- 1]	—	—	—	
Tashkent	96.6	311	13	31	- 2	i 24	5	[- 5]	e 17	27	PP	—
Quetta	z. 97.0	300	i 13	33	- 2	—	—	—	—	—	—	—
Bairam-Ali	101.7	306	e 18	12	PP	i 24	36	[+ 1]	—	—	—	—
Sverdlovsk	103.0	326	i 18	18	PP	24	39	[- 2]	e 25	38	S	—
Resolute Bay	103.4	15	e 15	1	+57	e 25	36	-13	e 27	27	PS	e 47.8
Ashkabad	104.7	307	—	—	—	i 24	50	[+ 1]	—	—	—	—
Kizyl-Arvat	106.4	309	—	—	—	e 24	55	[- 2]	—	—	—	—
Makhach-Kala	112.7	313	i 19	30	PP	—	—	—	—	—	—	—
Grozny	113.9	313	e 19	26	PP	—	—	—	—	—	—	—
Kirovobad	113.9	311	e 18	43	[+ 2]	25	24	[- 4]	19	37	PP	—
Goris	114.0	310	e 19	38	PP	—	—	—	—	—	—	—
Leninakan	115.7	311	e 19	54	PP	—	—	—	—	—	—	—
Moscow	115.7	328	e 19	40	PP	e 26	42	{- 3}	e 25	42	SKS	—
Piatigorsk	115.7	315	i 19	46	PP	—	—	—	—	—	—	—
Borzhom	115.9	312	e 18	46	[+ 1]	—	—	—	i 19	52	PP	—
Kiruna	116.0	344	i 18	44	[- 1]	i 25	30	[- 6]	e 22	19	PKS	e 54.7
Zugdidi	116.9	313	e 19	54	PP	—	—	—	—	—	—	—
Sotchi	118.2	315	e 20	2	PP	—	—	—	—	—	—	—
Scoresby Sund	119.3	1	e 18	52	[+ 1]	e 25	47	[- 1]	i 20	9	?	57.7
Theodosia	120.7	317	e 20	23	PP	—	—	—	—	—	—	—
Ottawa	120.9	42	i 18	54k	[ 0]	—	—	—	—	—	—	—
Yalta	121.7	317	e 20	29	PP	—	—	—	—	—	—	—
Kimberley	z. 122.0	227	i 18	57	[ 0]	—	—	—	—	—	—	—
Ksara	123.3	303	e 20	42	PP	23	2	PPP	34	56	?	—
Kishinev	124.2	321	e 20	47	PP	—	—	—	—	—	—	—
Harvard	124.8	44	i 19	3k	[+ 1]	—	—	—	—	—	—	—
Weston	125.0	44	e 19	2	[ 0]	—	—	—	—	—	—	—
Kwow	125.7	326	e 19	5	[+ 1]	—	—	—	—	—	—	—
Galerazamba	126.1	83	e 21	20	PP	—	—	—	—	—	—	—
La Paz	N. 126.1	118	19	6	[+ 2]	—	—	—	—	—	—	65.3
Istanbul	126.4	314	19	5?	[ 0]	20	1	?	e 24	43	?	—
Uzhgorod	127.3	326	e 19	15	[+ 8]	—	—	—	—	—	—	—
Copenhagen	127.4	337	e 21	0	PP	—	—	—	—	—	—	64.7
Hclwan	z. 127.8	300	19	14	[+ 6]	i 21	9	PP	e 23	58	PPP	—
Halifax	129.1	38	e 18	54	[-16]	—	—	—	—	—	—	—
Potsdam	129.5	334	e 21	19	PP	—	—	—	—	—	—	e 64.7
Ogyalla	130.0	327	e 17	6	?	—	—	—	e 23	59	PPP	—
Collmberg	130.3	332	e 19	14	[+ 1]	e 26	17	[- 4]	e 21	27	PP	e 72.6
Prague	130.5	331	e 19	35	[+ 22]	e 21	16	PP	e 29	2	PKKP	—
Jena	131.2	332	e 19	15?	[+ 1]	e 21	30	PP	i 22	38	PKS	—
Cheb	131.5	333	e 22	46	PKS	e 26	26	[+ 2]	e 31	25	SKSP	e 67.2
Witteveen	z. 131.7	338	e 22	42?	PKS	—	—	—	—	—	—	—
De Bilt	132.9	338	e 22	42?	PKS	—	—	—	—	—	—	e 62.7
Bermuda	133.4	54	e 23	2	PKS	e 28	54	{+ 13}	e 32	17	PS	e 63.6
Stuttgart	133.8	333	e 19	21	[+ 2]	e 28	42	{- 2}	e 21	48	PP	e 70.7
Triest	z. 133.8	327	e 22	48	PKS	e 28	4	?	e 23	3	?	—
Karlsruhe	z. 134.0	334	e 19	20	[ 0]	e 21	51	PP	e 23	4	?	—
Strasbourg	134.6	334	e 22	11	PP	e 24	46	PPP	e 31	49	PKKS	64.7
Rathfarnham Castle	135.1	347	e 22	42?	PKS	—	—	—	—	—	—	e 68.7
Kew	135.2	342	e 22	4	PP	e 34	5	PPS	e 23	3	PKS	e 68.7
Florence	136.3	326	e 40	27	SSP	—	—	—	—	—	—	—
Besançon	136.4	334	e 22	3	PP	e 22	56	SKP	e 22	24	?	—
Pavia	136.5	329	—	—	—	e 38	39	P'P'	—	—	—	—

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	$\Delta$ °	Az. °	P. m. s.		O-C. s.	S. m. s.		O-C. s.	Supp. m. s.		L. m.
Paris	136.6	338	e 22	17	PP	e 22	57	SKP	—	—	e 63.7
Siena	136.6	326	e 22	4	PP	e 32	16	PS	—	—	—
Oropa	136.7	331	i 21	44	PP	—	—	—	—	—	—
Rome	136.8	323	i 22	8	PP	i 23	9	SKP	e 32	17	PSKS
Messina	N. 137.0	317	e 21	55	PP	e 40	20	SS	e 22	56	PKS
Chambon-la-Forêt	137.3	338	e 19	21	[- 5]	i 20	1	?	e 22	15	PP
Algiers Univ.	Z. 145.7	325	i 19	41k	[+ 1]	e 19	49	?	e 23	3	PP
Toledo	146.6	336	i 19	46k	[+ 4]	i 19	53	?	23	12	PP
Almeria	148.5	332	i 19	46	[+ 1]	23	23	PKS	29	43	?
Granada	148.7	333	19	49a	[+ 4]	36	15	PPS	23	28	PP
Malaga	149.4	334	i 19	51	[+ 5]	i 26	54	[+ 1]	i 23	23	PKS
Tamanrasset	Z. 152.0	301	e 19	53	[+ 3]	e 27	2	[+ 6]	e 23	41	PP
M'Bour	174.3	—	i 26	32	?	—	—	—	—	—	—

April 29d. 5h. 26m. Epicentre 35°·8N. 121°·2W. (U.S.C.G.S.).

Intensity V at Bryson.

L. M. Murphy and W. K. Cloud.

United States Earthquakes, 1953, U.S.C.G.S., Serial 785, Washington, 1955, p. 13.

April 29d. 12h. 47m. Epicentre 35°00'N. 118°44'W. (U.S.C.G.S.).

Intensity V at Wheeler Ridge; IV at Bakersfield, Los Angeles, Tehachapi.

L. M. Murphy and W. K. Cloud.

United States Earthquakes, 1953, U.S.C.G.S., Serial 785, Washington, 1955, p. 13.

April 29d. 20h. 21m. 6s. Epicentre 42°·3N. 143°·0E. Depth of focus 0·005.

(as on 1953, Feb. 16d.).

Intensity V at Urakawa, Obihiro, Tomakomai; IV at Kusiro, Sapporo, Hatinohe;

II-III at Miyako, Muroran, Asahigawa, Mori, Hakodate, Nemuro, and Aomori.

Epicentre 42°·2N. 143°·2E. Depth 55km.

Seismo. Bull. Cent. Met. Obs., Japan, April, 1953, Tokyo, 1953, p.25-26, with macroseismic chart p.25.

$$A = -0.5925, B = +0.4465, C = +0.6706; \quad \delta = +12; \quad h = -3;$$

$$D = +0.602, E = +0.799; \quad G = -0.536, H = +0.404, K = -0.742.$$

	$\Delta$ °	Az. °	P. m. s.		O-C. s.	S. m. s.		O-C. s.	Supp. m. s.		L. m.
Urakawa	0.2	227	i 0	11k	0	0	18	- 1	—	—	—
Obihiro	0.6	13	i 0	14	0	0	24	- 1	—	—	—
Tomakomai	1.1	282	i 0	25	+ 5	0	42	+ 6	—	—	—
Kusiro	1.2	56	0	20	- 2	0	37	- 1	—	—	—
Sapporo	1.4	302	i 0	26k	+ 2	0	45	+ 2	—	—	—
Asahigawa	1.5	343	i 0	31k	+ 5	0	52	+ 7	—	—	—
Hakodate	1.8	253	e 0	33	+ 3	0	54	+ 2	—	—	—
Mori	N. 1.8	264	0	32	+ 2	0	56	+ 4	—	—	—
Abashiri	2.0	28	e 0	35	+ 3	0	58	+ 1	—	—	—
Hatinohe	2.1	212	0	33k	- 1	0	58	- 1	—	—	—
Suttsu	2.1	284	e 0	33	- 1	1	2	+ 3	—	—	—
Aomori	2.2	229	i 0	38	+ 3	1	6	+ 4	—	—	—
Nemuro	2.2	61	e 0	34	- 1	0	57	- 5	—	—	—
Miyako	2.8	196	e 0	42	- 2	1	11	- 6	—	—	—
Morioka	3.0	208	e 0	46	- 1	1	19	- 3	—	—	—
Wakkanai	E. 3.2	343	1	6	+17	1	51	+24	—	—	—
Akita	3.4	221	e 0	53	+ 1	1	34	+ 2	—	—	—
Mizusawa	E. 3.5	205	0	54	0	1	35	+ 1	—	—	—
Isinomaki	4.1	199	e 0	59	- 3	1	42	- 7	—	—	—
Sakata	4.2	216	e 1	11	+ 8	1	47	- 5	—	—	—
Sendai	N. 4.3	202	e 1	4	- 1	1	52	- 2	—	—	—
Yamagata	4.5	217	e 1	8	+ 1	2	1	+ 2	—	—	—
Kurilsk	4.6	49	i 1	9	0	2	0	- 2	—	—	—
Yuzno-Sakhlin	4.6	358	1	11	+ 2	2	5	+ 3	—	—	—
Hukusima	4.9	204	e 1	15	+ 2	2	10	+ 1	—	—	—

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		$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.
		°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.
Inawasiro	E.	5.2	206	e 1	21	+ 4	2	20	+ 3	—	—	—
Aikawa		5.6	222	e 1	23	0	2	25	- 2	—	—	—
Onahama		5.6	197	e 1	36	+13	2	23	- 4	—	—	—
Shirakawa		5.6	203	e 1	26	+ 3	2	41	+14	—	—	—
Mito		6.2	199	e 1	33	+ 2	2	39	- 2	—	—	—
Utunomiya	N.	6.2	204	e 1	31	0	2	36	- 5	—	—	—
Takada		6.4	217	e 1	35	+ 1	2	49	+ 3	—	—	—
Maebasi	Z.	6.6	208	e 1	37	0	2	59	+ 8	—	—	—
Nagano	N.	6.7	215	1	43	+ 5	3	5	+11	—	—	—
Kunagaya		6.8	206	e 1	38	- 1	3	8	+12	—	—	—
Matusiro		6.8	214	e 1	40	+ 1	2	58	+ 2	—	—	—
Uglegorsk		6.8	355	1	40	+ 1	3	0	+ 4	—	—	—
Wazima	N.	6.8	226	e 1	39	0	3	5	+ 9	—	—	—
Kashiwa	N.	6.9	201	1	34	- 7	2	51	- 8	—	—	—
Oiwake		6.9	212	e 1	42	+ 1	3	9	+10	—	—	—
Titibu		7.0	207	e 1	48	+ 6	—	—	—	—	—	—
Tokyo		7.1	202	1	50	+ 6	2	58	- 6	—	—	—
Matumoto	N.	7.2	214	1	56	+11	3	18?	+12	—	—	—
Toyama		7.2	220	e 1	44	- 1	—	—	—	—	—	—
Yokohama		7.3	202	1	56	+10	3	0	- 9	—	—	—
Kohu		7.5	209	e 1	52	+ 3	3	10?	- 4	—	—	—
Misima	N.	7.8	205	1	54	+ 1	3	38	SS	—	—	—
Ajiro	N.	7.9	204	1	54	- 1	3	15	- 8	—	—	—
Iida		7.9	212	e 1	58	+ 3	3	43	SS	—	—	—
Osima		8.0	201	e 1	53	- 3	3	19	- 7	—	—	—
Gihu		8.4	217	e 2	6	+ 4	—	—	—	—	—	—
Nagoya	E.	8.5	215	e 2	4	+ 1	3	56	SS	—	—	—
Kameyama	N.	9.0	217	e 2	12	+ 2	4	1	+10	—	—	—
Kyoto		9.2	220	e 2	12	0	4	0	+ 5	—	—	—
Toyooka		9.3	226	e 2	13	- 1	3	55	- 3	—	—	—
Takamatu	E.	10.6	224	e 2	31	0	4	44	SS	—	—	—
Koti	E.	11.5	224	—	—	—	e 5	53	+62	—	—	—
Matuyama		11.7	227	e 3	5	PP	5	57	+61	—	—	—
Petropavlovsk		15.1	39	e 3	40	+ 9	—	—	—	—	—	—
Magadan		17.9	13	4	2	- 4	7	21	+ 1	—	—	—
Klyuchi		18.1	34	e 4	14?	+ 6	e 7	29?	+ 4	—	—	—
Zô-Sè	E.	20.7	244	4	33	- 4	—	—	—	—	—	—
Nanking		21.8	250	4	45 <sub>a</sub>	- 3	e 8	42	+ 2	—	—	—
Kabansk		26.3	305	i 5	31	0	e 10	2	+ 5	—	—	—
Kyakhta		26.3	302	i 5	31	0	10	2	+ 5	—	—	—
Irkutsk		27.8	304	5	44	- 1	e 10	24	+ 2	—	—	—
Hong Kong		31.3	239	—	—	—	e 11	16	- 1	—	—	c 16.6
Baguio		32.2	224	i 5	10	-74	i 11	50	+19	—	—	—
Semipalatinsk		42.9	304	7	53	- 1	—	—	—	—	—	—
College		44.0	34	8	3	0	—	—	—	—	—	—
Przhevalsk		46.6	295	8	26	+ 3	15	17	+10	—	—	—
Almata		47.3	295	i 8	29	0	—	—	—	—	—	—
Chatra		47.7	270	i 8	32	0	e 15	4	-18	—	—	c 27.9
Naryn		48.7	293	i 8	40	0	e 15	39	+ 3	—	—	—
Frunse		49.1	296	i 8	43	0	e 15	45	+ 3	i 9	3	pP
Andijan		51.5	293	i 9	1	0	—	—	—	i 9	22	pP
Namangan		51.8	293	i 9	4	+ 1	—	—	—	9	24	pP
Fergana		52.0	293	i 9	4	- 1	—	—	—	—	—	—
Sverdlovsk		52.1	316	i 9	6	0	i 16	24	+ 1	—	—	—
Tehimkent		52.6	297	i 9	10	+ 1	e 16	38	+ 8	—	—	—
Dzhergetal		53.0	293	i 9	12	0	—	—	—	—	—	—
Tashkent		53.3	295	i 9	14	- 1	e 16	41	+ 1	—	—	—
Khorog		53.5	290	i 9	17	+ 1	—	—	—	—	—	—
Garm		53.7	292	i 9	18	0	—	—	—	—	—	—
Obi-garm		54.2	292	i 9	10?	-11	—	—	—	—	—	—
Kulyab		54.6	291	9	23	- 1	—	—	—	—	—	—
Stalinabad		54.9	293	i 9	25	- 1	e 17	5	+ 4	—	—	—
Samarkand		55.6	295	9	31	0	17	13	+ 3	—	—	—
Resolute Bay		57.2	15	e 9	36	- 7	—	—	—	—	—	—
Bairam-Ali		59.9	296	i 10	1	- 1	—	—	—	—	—	—

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	$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.
	°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.
Quetta	60.6	286	i 10	7	+ 1	e 18	26	+10	—	—	—
Kiruna	62.0	339	i 10	14 <sub>a</sub>	- 2	e 18	33	- 1	e 20	6	ScS e 29.9
Ashkabad	62.3	298	i 10	17	- 1	e 18	40	+ 3	—	—	—
Poona	62.5	271	i 10	17	- 2	—	—	—	—	—	—
Kizyl-Arvat	63.0	300	i 10	23	+ 1	—	—	—	—	—	—
Moscow	63.8	323	10	26	- 2	e 18	54	- 2	—	—	—
Pulkovo	64.3	329	i 10	31	0	e 19	5	+ 3	—	—	—
Makhach-Kala	66.2	308	i 10	43	0	—	—	—	—	—	—
Baku	66.3	304	10	45	+ 1	—	—	—	—	—	—
Shemakla	66.9	305	i 10	47	0	—	—	—	—	—	—
Grozny	67.0	308	i 10	47	- 1	19	37	+ 2	—	—	—
Scoresby Sund	67.0	355	i 10	47	- 1	e 19	27	- 8	e 11	9	pP 32.9
Shasta	67.0	56	e 10	49	+ 1	—	—	—	—	—	—
Hungry Horse	67.1	45	i 10	49	0	—	—	—	—	—	—
Kirovobad	68.2	306	10	57	+ 1	e 19	58	+ 9	e 11	18	pP
Piatigorsk	68.2	310	10	53	- 3	19	51	+ 2	—	—	—
Tiflis	68.6	308	10	58	0	19	58	+ 4	—	—	—
Gori	68.8	308	e 11	0	+ 1	—	—	—	—	—	—
Upsala	68.8	334	10	55 <sup>?</sup>	- 4	i 13	13	PP	i 11	8	pP
Goris	69.0	305	e 11	0	- 1	—	—	—	—	—	—
Borzhomi	69.3	308	i 11	4	+ 2	e 20	9	+ 6	—	—	—
Reno	69.3	55	e 11	10	+ 8	—	—	—	—	—	—
Lick	69.5	58	e 11	4 <sub>k</sub>	0	—	—	—	—	—	—
Abastumanj	69.7	308	e 11	8 <sup>?</sup>	+ 3	—	—	—	—	—	—
Akhalkalaki	69.7	307	e 11	10 <sup>?</sup>	+ 5	—	—	—	—	—	—
Erevan	69.7	306	e 11	7	+ 2	20	13	+ 6	—	—	—
Zugdidi	69.8	310	e 11	1	- 4	e 20	7	- 1	—	—	—
Sotchi	70.3	312	e 11	8	- 1	20	14	0	—	—	—
Theodosia	71.7	315	e 11	17	0	e 20	30	0	—	—	—
Tinemaha	71.8	57	e 11	20	+ 2	—	—	—	—	—	—
Yalta	72.7	315	e 11	22	- 1	e 20	42	0	—	—	—
China Lake	73.0	57	e 11	26	+ 1	—	—	—	—	—	—
Kishinev	73.7	320	i 11	28	- 1	—	—	—	—	—	—
Pasadena	73.7	59	e 11	37	+ 8	—	—	—	e 11	55	pP
Copenhagen	73.8	334	i 11	29	0	e 20	56	+ 2	—	—	37.9
Lwow	73.8	324	e 11	29	0	e 20	56	+ 2	—	—	—
Riverside	74.3	59	e 11	32	0	—	—	—	—	—	—
Boulder City	74.6	55	i 11	36	+ 2	i 11	42	PcP	i 11	49	pP
Nelson	74.8	55	i 11	35	0	i 11	42	PcP	i 12	0	sP
Raciborzu	76.1	327	e 11	43	+ 1	—	—	—	e 12	4	pP
Potsdam	76.2	332	—	—	—	e 21	29	+ 8	—	—	e 38.9
Collmberg	77.1	330	e 11	47	- 1	—	—	—	e 12	10	pP
Prague	77.6	329	e 11	52	+ 1	e 16	30	PPP	e 12	12	pP
Istanbul	77.8	316	11	52	0	22	8	+30	e 14	46	PP
Jena	78.0	330	e 11	53	0	e 14	12	?	e 12	15	pP
Witteveen	78.0	335	i 11	54 <sub>k</sub>	+ 1	—	—	—	—	—	—
Ksara	79.1	306	i 12	0	+ 1	—	—	—	e 15	18 <sup>?</sup>	PP
Belgrade	79.2	322	e 12	0	0	—	—	—	—	—	—
Tucson	79.6	56	e 12	3	+ 1	—	—	—	—	—	—
Stuttgart	80.6	331	e 12	7	0	—	—	—	e 12	29	pP e 40.9
Paris	82.8	335	i 12	18	0	i 12	30	PcP	e 11	59	? e 39.9
Besançon	83.0	332	i 12	20	0	—	—	—	e 13	1	? e 33.3
Bologna	83.4	327	—	—	—	e 29	21	?	—	—	—
Chambon-la-Forêt	83.6	335	e 12	22	- 1	—	—	—	—	—	—
Pavia	83.6	329	—	—	—	e 22	28	-10	—	—	e 39.3
Oropa	83.7	330	i 12	23	0	i 22	20	-19	—	—	—
Florence	84.0	327	e 12	25	0	e 23	1	ScS	—	—	—
Taranto	84.1	322	—	—	—	22	51	+ 8	—	—	43.9
Helwan	84.6	306	i 12	28 <sub>k</sub>	0	e 12	58	sP	e 12	50	pP
Rome	85.0	325	e 12	29	- 1	e 22	48	[+ 3]	—	—	—
Fayetteville	86.1	43	e 12	35	0	—	—	—	—	—	—
Morgantown	89.6	32	i 12	53	+ 1	—	—	—	—	—	—
Harvard	90.0	25	e 12	56	+ 2	—	—	—	—	—	—
Weston	90.2	25	i 12	57 <sub>k</sub>	+ 2	—	—	—	—	—	—
Tacubaya	96.0	57	e 12	16	-65	—	—	—	—	—	—
Tamanrasset	104.3	319	17	27	?	e 18	9	PKP	e 18	18	PP
Pretoria	124.8	265	e 18	54	[+ 1]	—	—	—	—	—	—

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April 30d. 6h. 26m. 42s. Epicentre 20°·6S. 169°·0E. (as on 1953, March 3d.).

A = -·9196, B = +·1788, C = -·3498;  $\delta = -1$ ;  $h = +5$ ;  
D = +·191, E = +·982; G = +·343, H = -·067, K = -·937.

		$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.	
		°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.	
Brisbane		16·1	242	i 3	54	+ 5	i 6	42	- 7	i 4	5	PP	e 7·8
Auckland	N.	17·0	164	i 3	56	- 5	e 7	11	+ 1	e 4	21	PP	—
Karapiro	N.	18·2	163	e 4	13	- 3	e 7	53	+16	e 4	44	PP	—
New Plymouth	E.	18·9	167	e 4	17	- 7	e 8	4	+11	—	—	—	—
Tuai	N.	19·5	162	e 4	29	- 2	e 8	8	+ 2	e 4	57	pP	—
Apia		19·6	73	i 4	28	- 4	i 8	10	+ 2	i 6	23	?	e 9·3
Riverview		20·6	227	i 4	47k	+ 4	8	37	+ 8	i 5	12	PP	e 9·9
Cobb River	E.	20·7	173	e 4	44	0	e 8	41	+10	e 8	30	S	e 8·9
Wellington		21·2	169	i 4	46	- 3	e 8	43	+ 2	e 5	19	PP	—
Christchurch		23·1	173	i 5	7	- 1	9	16	0	—	—	—	—
Melbourne	E.	27·0	225	i 5	58	+13	i 10	28	+ 6	i 6	26	PP	—
Guam		41·4	322	i 7	56	+ 6	i 14	16	+11	—	—	—	—
Perth		48·6	246	11	33	PPP	15	58	+ 9	20	6	SSS	23·0
Honolulu		52·8	40	e 9	27	+ 8	e 16	31	-16	—	—	—	—
Torisima		57·8	332	9	58	+ 3	e 17	58	+ 4	e 10	51	PcP	—
Baguio		60·1	305	i 10	15	+ 4	i 18	28	+ 4	—	—	—	—
Bandung		60·8	275	i 10	29	+13	i 18	45	+12	—	—	—	e 25·3
Djakarta		61·9	275	i 10	27a	+ 3	i 18	45	- 2	i 12	36	PP	e 26·0
Misima	E.	62·3	333	e 10	17	- 9	—	—	—	—	—	—	—
Tokyo		62·5	334	e 10	25	- 3	e 18	59	+ 5	11	48	PP	e 25·8
Yakusima		62·8	324	e 10	10	-20	—	—	—	—	—	—	—
Kohu		62·9	333	e 10	34	+ 4	—	—	—	—	—	—	—
Kumagaya		63·0	334	i 10	33a	+ 2	19	5	+ 4	—	—	—	—
Maebasi		63·4	334	i 10	36	+ 2	e 19	37	+31	—	—	—	—
Miyazaki		63·4	325	e 10	25	- 9	i 19	15	+ 9	—	—	—	e 27·1
Oiwake		63·5	333	e 10	29	- 5	—	—	—	—	—	—	—
Kagosima		63·6	324	e 10	39	+ 4	—	—	—	—	—	—	—
Kyoto		63·7	331	e 10	39	+ 3	e 11	8	?	e 11	23	PcP	—
Matumoto	E.	63·7	333	e 10	39	+ 3	—	—	—	—	—	—	—
Matusiro	N.	63·8	333	10	37	+ 1	e 19	0	-11	i 11	32	PcP	26·2
Hokusima		63·9	336	10	41a	+ 4	e 19	8	- 4	—	—	—	—
Takamatu		63·9	329	e 10	41	+ 4	e 19	16	+ 4	—	—	—	—
Nagano		64·0	333	e 10	41	+ 3	e 19	28	+15	e 13	28	PP	—
Matuyama		64·2	327	e 11	28	PcP	e 13	36	PP	e 14	37	PPP	—
Miyako		65·0	338	i 10	46a	+ 2	e 19	26	0	—	—	—	—
Hamada		65·4	327	10	44	- 3	—	—	—	e 17	28	?	—
Akita		65·8	337	e 10	52	+ 3	19	42	+ 7	e 13	40	PP	—
Urakawa		67·0	341	e 10	48	- 9	e 23	2	?	e 10	55	P	e 33·1
Nemuro		67·2	343	e 11	0	+ 2	e 19	53	+ 1	e 13	44	PP	e 32·2
Mori	N.	67·7	338	e 11	10	+ 9	20	6	+ 8	—	—	—	34·2
Kurilsk		68·3	345	i 11	5	0	i 20	9	+ 3	—	—	—	—
Sapporo		68·3	340	i 11	7a	+ 2	e 20	5	- 1	e 13	41	PP	e 36·3
Hong Kong		68·4	306	11	9	+ 3	e 20	6	- 1	13	38	PP	—
Zô-Sê		68·9	318	i 11	11a	+ 2	20	17	+ 4	—	—	—	—
Nanking		71·1	317	i 11	24a	+ 2	i 20	42	+ 4	—	—	—	—
Yuzno-Sakhlinsk		71·3	341	i 11	25	+ 2	i 20	47	+ 6	—	—	—	—
Vladivostok		72·0	333	i 11	29	+ 1	i 20	53	+ 4	—	—	—	—
Ulegorsk		73·4	343	i 11	37	+ 1	i 21	8	+ 3	—	—	—	—
Petropavlovsk		74·0	353	11	39	0	21	11	0	—	—	—	—
Klyuchi		76·9	356	i 11	55	- 1	21	43	0	—	—	—	—
Magadan		81·2	352	i 12	17	- 2	22	29	0	—	—	—	—
Berkeley		86·8	48	i 12	46a	- 1	e 22	58	[-15]	e 15	43	PP	e 39·4
Santa Clara		86·8	48	e 12	47k	0	e 24	40	PS	—	—	—	e 39·9
Lick	Z.	87·0	48	i 12	48k	0	e 13	24	?	i 12	51	PcP	—
Shillong		87·8	299	i 12	57	+ 5	e 23	40	+ 6	e 16	5	PP	—
Fresno	Z.	88·1	49	e 12	52a	- 2	—	—	—	e 13	11	PcP	—
Pasadena		88·1	53	i 12	51	- 3	e 23	37	0	i 16	18	PP	e 40·1
Shasta		88·1	45	e 12	53a	- 1	e 23	34	- 3	e 24	56	PS	—
Mineral		88·5	46	e 12	56	0	—	—	—	—	—	—	—
Palomar	Z.	88·7	54	i 12	55	- 2	—	—	—	i 13	9	PcP	—

Continued on next page.

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		$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.	
		°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.	
Riverside		88.7	53	i 12	54	- 3	—	—	—	i 13	4	PcP	—
China Lake	z.	89.2	51	i 12	57	- 2	—	—	—	—	—	—	—
Reno		89.3	48	e 12	58	- 1	e 23	37	[+ 8]	e 13	46	PcP	e 38.4
Tinemaha		89.3	50	i 12	59	0	—	—	—	—	—	—	—
Corvallis	z.	89.5	42	i 13	0	0	—	—	—	—	—	—	e 41.4
Kyakhta		89.5	325	i 13	2	+ 2	23	58	+ 8	e 16	36	PP	—
Calcutta	N.	89.6	294	e 13	1	0	i 23	55	+ 4	—	—	—	—
Kabansk		90.4	328	i 13	7	+ 3	i 24	1	+ 3	e 18	44	PPP	—
Sitka		90.6	27	i 13	3	- 2	e 23	31	[- 5]	—	—	—	—
Nelson		91.2	52	i 13	5	- 3	—	—	—	—	—	—	—
Boulder City		91.3	52	i 13	7	- 2	—	—	—	i 13	21	PcP	—
College		91.4	17	i 13	5	- 4	e 23	49	[+ 8]	e 16	34	PP	e 37.6
Irkutsk		91.7	327	13	12	+ 2	24	13	+ 3	23	44	SKS	—
Chatra		92.2	297	e 13	12	- 1	e 23	43	[- 3]	—	—	—	e 50.3
Tucson		92.9	57	e 13	14	+ 2	e 24	40	+ 20	e 16	7	PP	e 41.9
Madras	E.	93.4	283	i 13	21	+ 3	e 24	18	- 6	e 16	21	PP	—
Kodaikanal	E.	95.0	279	i 13	30	+ 4	i 24	6	[+ 5]	—	—	—	—
Chihuahua		95.4	62	—	—	—	e 27	18	PPS	e 29	22	?	—
Logan		95.8	48	e 13	28	- 1	—	—	—	e 17	22	PP	—
Hyderabad		96.5	287	e 13	24	- 8	e 24	58	+ 7	e 17	27	PP	47.3
Hungry Horse		96.9	44	i 13	32	- 2	e 17	27	PP	i 30	17	PKKP	—
Tacubaya		98.2	72	e 17	27	PP	e 24	54	- 11	e 24	13	SKS	e 46.5
Lubbock		100.4	58	e 13	49	- 1	—	—	—	—	—	—	—
Poona	E.	101.0	287	i 13	56	+ 3	e 25	37	+ 8	e 17	24	?	42.2
New Delhi	N.	101.1	297	e 13	55	+ 2	e 25	32	+ 2	e 24	20	SKS	—
Bombay		102.0	286	i 14	1	+ 4	i 25	42	+ 5	i 32	53	SS	—
Przhevalsk		104.0	311	14	11	+ 5	—	—	—	18	29	PP	—
Semipalatinsk		104.8	319	14	11	+ 1	—	—	—	18	22	PP	—
Almata		105.3	311	e 14	14	+ 1	—	—	—	18	32	PP	—
Naryn		105.5	310	i 14	16	+ 3	i 26	13	+ 7	i 18	36	PP	—
Rybach'e		105.7	310	i 14	18	+ 4	e 26	12	+ 4	i 18	57	PP	—
Frunse		106.9	310	e 14	25	P	i 26	19	+ 1	i 18	47	PP	—
Fayetteville	z.	107.2	57	e 14	22	P	e 29	47	PPS	e 18	28	?	e 53.6
Khorog		107.9	305	e 18	54	PP	—	—	—	—	—	—	—
Audijan		108.0	307	i 14	24	P	25	42	{- 9}	18	56	PP	—
Fergana		108.4	307	e 14	27	P	e 28	14	PS	i 19	2	PP	—
Namangan		108.6	307	e 14	30	P	e 24	51	[- 15]	i 18	56	PP	—
Huancayo		108.9	111	i 18	25	[- 6]	e 25	8	[0]	e 18	58	PP	e 45.5
La Plata		109.2	141	18	42	[+ 10]	25	18	[+ 9]	21	42	PPP	50.1
Quetta		110.1	297	e 14	46	P	e 25	34	[+ 21]	i 26	54	[+ 48]	—
Stalinabad		110.3	306	e 19	7	PP	—	—	—	—	—	—	—
Lunacharskoc		110.4	308	e 14	33	P	26	3	{- 5}	19	13	PP	—
Tashkent		110.4	308	e 14	36	P	28	57	PS	e 19	11	PP	—
Tchimkent		110.4	309	e 14	36	P	—	—	—	i 19	16	PP	—
Tananarive		110.5	239	—	—	—	e 34	23	SS	—	—	—	e 53.3
Resolute Bay		111.3	16	e 18	35	[- 1]	e 30	8	PPS	e 28	44	PS	e 44.7
La Paz		112.9	118	e 18	44	[+ 5]	25	20	[- 4]	i 19	25	PP	50.8
Cincinnati		115.3	56	i 18	41	[- 3]	i 29	21	PS	—	—	—	—
Bairam-Ali		115.4	303	i 18	47	[+ 3]	—	—	—	i 19	47	PP	—
Chinchina		115.5	93	e 18	44	[0]	25	28	[- 6]	29	34	PS	—
Grahamstown	z.	115.5	215	—	—	—	e 29	24	PS	—	—	—	—
Bogota		116.8	96	—	—	—	i 29	40	PS	—	—	—	55.3
Sverdlovsk		117.1	325	e 15	6	P	25	28	[- 12]	i 19	44	PP	—
Galerazamba		117.7	88	e 20	41	PP	e 25	41	[- 1]	e 29	51	PS	60.3
Ashkabad		118.4	304	i 18	52	[+ 2]	25	38	[- 6]	20	11	PP	—
Morgantown		118.8	56	i 18	48	[- 3]	—	—	—	e 20	18	PP	—
Kirkland Lake	z.	119.0	46	e 18	49	[- 2]	—	—	—	—	—	—	—
Buffalo (Larkin)		119.9	52	e 18	51	[- 2]	—	—	—	—	—	—	—
Kimberley	z.	120.0	217	i 18	54	[+ 1]	—	—	—	—	—	—	—
Kizyl-Arvat		120.1	305	18	55	[+ 2]	—	—	—	20	23	PP	—

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		$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.
		$^{\circ}$	$^{\circ}$	m.	s.	s.	m.	s.	s.	m.	s.	m.
Pretoria	z.	120.2	222	e 18	55	[+ 2]	—	—	—	—	—	—
Washington		121.0	55	i 18	55	[+ 0]	—	—	—	—	—	—
Ottawa		122.0	47	e 18	54 <sup>k</sup>	[- 3]	e 29	58	PS	20	28	PP 58.8
Palisades		123.5	53	i 18	57	[- 2]	i 32	4	PPS	i 20	37	e 58.1
Shawinigan Falls	N.	124.0	47	e 18	50	[- 10]	—	—	—	22	36	PKS
Harvard		125.2	51	i 19	0 <sup>k</sup>	[- 3]	i 32	34	PPS	i 20	50	PP e 55.5
Seven Falls	E.	125.2	45	e 19	2	[- 1]	30	44	PS	23	42	PPP
Weston		125.4	51	i 19	1 <sup>a</sup>	[- 2]	e 32	38	PPS	i 20	52	PP e 59.1
Shemakla		126.0	306	i 19	7	[+ 3]	28	7	{+ 13}	i 21	21	PP
Makhach-Kala		126.6	309	e 19	8	[+ 3]	—	—	—	e 21	8	PP
Kirovobad		127.7	307	e 19	9	[+ 1]	e 22	31	PKS	e 21	17	PP
Goris		127.8	305	e 16	4	P	27	52	{- 14}	19	9	PKP
Grozny		127.9	309	i 19	10	[+ 2]	—	—	—	i 21	6	PP
San Juan		128.2	81	i 19	6	[- 3]	—	—	—	—	—	—
Kiruna		128.8	345	i 19	7 <sup>a</sup>	[- 3]	e 28	6	{- 6}	i 21	14	PP e 60.3
Tiflis		128.8	307	i 19	12	[+ 2]	e 31	30	PS	i 22	44	PKS
Erevan		129.1	307	i 19	13	[+ 3]	i 21	25	PP	i 24	19	PPP
Gori		129.2	308	19	14	[+ 4]	—	—	—	—	—	—
Leninakan		129.6	307	e 19	16	[+ 5]	22	48	PS	—	—	—
Piatigorsk		129.7	311	e 19	13	[+ 2]	22	38	PS	i 21	28	PP
Scoresby Sund		129.7	5	i 19	12	[+ 1]	39	30	SSP	i 21	21	PP 60.3
Moscow		129.7	326	i 19	12	[+ 1]	i 22	36	PKS	e 21	17	PP
Akhalkalaki		129.8	308	e 19	22	[+ 10]	—	—	—	—	—	—
Borzhomi		129.8	308	i 19	16	[+ 4]	i 22	41	PKS	i 21	29	PP
Abastumanj		130.2	308	e 19	18	[+ 6]	—	—	—	—	—	—
Halifax		130.6	48	e 19	11 <sup>k</sup>	[- 2]	31	25	PS	21	16	PP
Zugdidi		130.8	310	i 19	17	[+ 3]	i 22	45	PKS	—	—	—
Bermuda		131.0	65	i 19	13	[- 1]	i 22	39	PKS	e 34	45	? e 61.7
Pulkovo		131.1	334	i 19	15	[+ 1]	e 26	33	{+ 10}	e 21	39	PP
Fort de France		132.0	88	e 19	18	[+ 2]	i 22	44	PKS	—	—	—
Sotchi		132.2	311	e 19	16	[ 0]	e 31	55	PS	i 22	45	PKS
Helsinki		133.0	338	i 22	45	PKS	—	—	—	—	—	—
Theodosia		134.8	314	e 19	21	[ 0]	22	54	PKS	e 21	53	PP
Upsala		135.8	340	i 19	16	[- 7]	e 26	25	[- 7]	e 22	0	PP e 58.3
Yalta		135.8	314	e 19	24	[+ 1]	i 22	58	PKS	e 22	4	PP
Reykjavik	z.	135.9	7	i 19	23	[ 0]	—	—	—	—	—	—
Ksara		136.6	298	i 19	30	[+ 6]	—	—	—	i 22	11	PP
Kishinev		138.4	321	i 19	29	[+ 1]	i 23	4	PKS	i 22	20	PP
Bergen	N.	138.6	349	e 23	1	PKS	e 33	23	PS	e 35	58	PPS e 63.2
Lwow		139.8	325	i 19	27	[- 3]	—	—	—	i 22	30	PP
Istanbul		140.4	311	i 19	27	[- 4]	i 23	6	PKS	i 22	32	PP
Copenhagen		140.8	340	i 19	26	[- 6]	23	15	PKS	41	18	SS 63.3
Helwan		140.8	293	19	27	[- 5]	23	1	PKS	22	38	PP
Bucharest		141.2	317	e 19	28	[- 5]	i 29	51	{+ 23}	—	—	—
Uzhgorod		141.5	325	19	31	[- 2]	26	40	[- 2]	—	—	—
Skalnate Pleso		142.1	328	e 19	7	[- 27]	e 22	49	PP	e 40	57	SS e 65.8
Raciborzu		142.6	331	i 19	34 <sup>k</sup>	[- 1]	e 27	45	{+ 62}	e 22	58	PKS
Aberdeen		142.9	352	i 19	43	[+ 7]	i 26	41	[- 3]	i 22	48	PP e 70.0
Potsdam		143.2	336	i 19	36 <sup>k</sup>	[ 0]	i 23	18	PKS	i 22	48	PP e 66.3
Timisoara	N.	143.6	320	e 19	40 <sup>?</sup>	[+ 3]	—	—	—	—	—	—
Budapest		143.8	325	19	37	[ 0]	e 33	28	PS	23	6	PKS e 79.8
Kecskemet	N.	143.8	324	19	39	[+ 2]	—	—	—	—	—	—
Szeged		143.9	323	i 19	41	[+ 4]	23	21	PKS	22	55	PP
Ogyalla		144.0	326	e 19	42	[+ 5]	e 29	30	{- 14}	e 22	37	PP
Collmborg		144.1	334	i 19	35	[- 3]	e 38	18	?	e 22	20	PP
Kalossa	E.	144.4	326	e 26	0	PPP	e 27	24	{+ 38}	—	—	—
Prague		144.4	332	i 19	39 <sup>a</sup>	[+ 1]	e 26	27	[- 19]	e 22	44	PP e 70.8
Belgrade		144.5	320	e 19	38	[ 0]	e 26	54	{+ 8}	e 23	21	PKS e 74.3
Jena		144.9	335	e 19	38	[- 1]	i 19	50	PKP <sub>2</sub>	e 23	2	PP
Durham		145.1	351	i 19	42	[+ 3]	—	—	—	—	—	—

Continued on next page.

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		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Witteveen	z.	145.1	343	i 19 39 <sub>a</sub>	{ 0 }	—	—	—	—
Athens		145.4	309	i 19 38 <sub>a</sub>	{ - 2 }	—	—	i 19 52	?
De Bilt		146.1	343	i 19 42 <sub>a</sub>	{ + 1 }	e 23 14	PP	i 20 58	?
Rathfarnham Castle		147.2	356	i 19 43	{ 0 }	e 23 19	PP	i 19 50	PKP <sub>2</sub>
Uccle		147.5	343	e 19 39	{ - 4 }	e 20 21	sPKP	e 19 48	pPKP <sub>2</sub>
Karlsruhe	z.	147.6	337	e 19 42	{ - 2 }	i 20 19	sPKP	e 23 18	PP
Stuttgart		147.6	336	e 19 43	{ - 1 }	e 33 30	PSKS	i 20 3	pPKP
Triest		147.8	327	i 19 45 <sub>a</sub>	{ + 1 }	e 27 6	{ + 15 }	e 23 0	PP
Kew		148.1	348	i 19 44	{ 0 }	e 23 22	PP	e 33 46	PS
Strasbourg		148.3	337	i 19 46	{ + 1 }	e 30 18	{ + 9 }	i 23 18	PP
Taranto		148.8	318	19 47	{ + 2 }	e 29 38	{ - 34 }	42 37	SS
Chur		148.9	334	e 19 47	{ + 1 }	—	—	—	—
Zürich		148.9	335	e 19 46 <sub>a</sub>	{ 0 }	e 23 18	PP	e 19 50	PKP <sub>2</sub>
Basle		149.2	336	e 19 47 <sub>a</sub>	{ + 1 }	—	—	—	—
Salo		149.4	332	e 19 46 <sub>k</sub>	{ 0 }	e 31 5	{ + 50 }	i 20 18	pPKP
Bologna		149.8	330	e 19 50	{ + 3 }	e 29 52	{ - 25 }	e 20 23	pPKP
Paris		149.8	343	e 19 46	{ - 1 }	i 30 27	{ + 10 }	i 23 29	PP
Neuchatel		149.9	336	e 19 48	{ + 1 }	—	—	—	—
Besançon		150.0	337	i 19 47	{ 0 }	i 23 31	PP	i 20 0	PKP <sub>2</sub>
Florence		150.4	327	i 19 49	{ + 1 }	i 43 11	SSP	i 20 6	PKP <sub>2</sub>
Pavia		150.4	333	e 19 50 <sub>a</sub>	{ + 2 }	e 25 58	{ - 56 }	e 20 19	pPKP
Prato		150.4	327	e 19 42	{ - 6 }	i 43 29	SSP	—	—
Chambon-la-Forêt		150.6	342	i 19 50	{ + 2 }	—	—	i 19 56	?
Oropa		150.6	333	i 19 48	{ 0 }	e 30 10	{ - 12 }	i 23 33	SKP
Siena		150.6	327	i 19 57	{ + 9 }	i 22 6	?	i 21 17	?
Rocca di Papa	z.	150.9	324	e 19 50	{ + 1 }	i 19 56	?	i 20 5	PKP <sub>2</sub>
Rome		150.9	324	i 19 49 <sub>a</sub>	{ 0 }	e 30 18	{ - 5 }	i 20 21	pPKP
Messina		151.1	316	i 19 49 <sub>a</sub>	{ 0 }	i 23 33	SKP	e 43 0	SS
Reggio Calabria		151.1	316	e 19 52	{ + 3 }	—	—	i 20 3	PKP <sub>2</sub>
Clermont-Ferrand		152.4	339	i 19 54	{ + 3 }	i 23 43	PP	i 20 14	PKP <sub>2</sub>
Tortosa		157.6	339	i 20 0	{ + 2 }	—	—	i 24 10	PP
Algiers Univ.	z.	159.7	326	i 20 1 <sub>a</sub>	{ + 1 }	e 23 25	PKS	e 20 43	PKP <sub>2</sub>
Toledo		159.9	346	e 20 3	{ + 2 }	24 25	PP	i 20 44	PKP <sub>2</sub>
Alicante		160.1	337	e 19 58	{ - 3 }	27 2	{ - 3 }	20 41	PKP <sub>2</sub>
Coimbra		160.3	354	20 11	{ + 10 }	24 28	PP	20 45	PKP <sub>2</sub>
Almeria		162.2	338	i 20 2	{ - 1 }	27 6	{ - 1 }	i 20 54	PKP <sub>2</sub>
Granada		162.3	343	i 20 5 <sub>k</sub>	{ + 2 }	26 36	{ - 31 }	20 56	PKP <sub>2</sub>
Malaga		162.9	343	i 20 7	{ + 3 }	31 32	{ + 4 }	i 20 53	PKP <sub>2</sub>
Tamanrasset	z.	164.5	281	e 20 6	{ + 1 }	e 31 49	{ + 13 }	i 21 5	PKP <sub>2</sub>
Averroes		167.0	347	i 20 10	{ + 3 }	24 54	PP	i 21 16	PKP <sub>2</sub>
M'Bour		171.6	136	i 20 9	{ - 1 }	i 25 18	PP	i 21 33	PKP <sub>2</sub>

April 30d. 9h. 32m. Epicentre 36°·4N. 141°·4

Intensity II-III at Hukushima.

Seismo. Bull. Cent. Met. Obs., Japan, for April, 1953, Tokyo, 1953, p. 27.

April 30d. 15h. 39m. Epicentre 37°·3N. 70°·2E.

Bulletin of Seismo. Stations of U.S.S.R. for April-June, 1953, Moscow, 1954, p. 81.

April 30d. 15h. 45m. 22s. Epicentre 41°·1N. 47°·7E. (as on 1948, Dec. 4d.).

A = +·5086, B = +·5590, C = +·6548;  $\delta$  = -8;  $h$  = -2;

D = +·740, E = -·673; G = +·441, H = +·484, K = -·756.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Shemakla	0.8	123	i 0 14	- 2 <sub>r</sub>	—	—	—	—
Kirovobad	1.1	250	i 0 29	+ 7 <sub>r</sub>	e 0 45	+ 6	—	—
Baku	1.8	113	i 0 33	- 1*	—	—	—	—
Goris	1.9	213	0 39	+ 1 <sub>r</sub>	1 8	+ 5 <sub>r</sub>	—	—
Makhach-Kala	1.9	355	i 0 39	+ 1 <sub>r</sub>	1 8	+ 5 <sub>r</sub>	—	—

Continued on next page.



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	$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.
	°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.
Tiflis	2.3	286	i 0	47	+ 1 <sub>g</sub>	i 1	14	- 2 <sub>g</sub>	—	—	—
Erevan	2.6	249	i 0	52	0 <sub>g</sub>	1	33	+ 7 <sub>g</sub>	—	—	—
Grozny	2.6	327	e 0	53	+ 1 <sub>g</sub>	—	—	—	—	—	—
Gori	2.8	288	i 0	55	- 1 <sub>g</sub>	i 1	29	+ 2*	—	—	—
Leninakan	3.0	264	1	1	+ 1 <sub>g</sub>	—	—	—	—	—	—
Akalkalaki	3.2	275	1	0	+ 2	i 1	46	0 <sub>g</sub>	—	—	—
Borzhomi	3.3	283	i 1	1	+ 2*	1	43	+ 1 <sub>g</sub> *	—	—	—
Tsikhlis-Dzhvari	3.3	281	1	0	+ 1*	1	42	0*	e 1	51	S <sub>g</sub>
Abastumanj	3.7	282	e 1	10	- 4 <sub>g</sub>	—	—	—	—	—	—
Piatigorsk	4.5	313	1	17	- 3*	—	—	—	—	—	—
Zugdidi	4.6	290	i 1	21	- 1*	—	—	—	—	—	—
Sotchi	6.4	296	e 1	44	+ 6	—	—	—	—	—	—
Ashkabad	9.0	111	e 2	0	- 13	e 3	33	- 25	—	—	—
Yalta	10.5	293	e 2	32	- 3	—	—	—	—	—	—
Ksara	11.9	236	e 3	7	+ 13	i 6	47	L	—	—	(i 6.8)
Istanbul	14.1	276	3	30	+ 7	6	21	+ 19	3	41	PP
Kishinev	14.8	300	i 3	37	+ 5	—	—	—	—	—	—
Samarkand	14.8	89	e 3	24	- 8	—	—	—	—	—	—
Moscow	16.1	336	3	48	- 1	6	44	- 5	—	—	—
Lunacharskoe	16.2	82	i 3	48	- 2	—	—	—	—	—	—
Tashkent	16.2	82	e 3	46	- 4	—	—	—	—	—	—
Tchimkent	16.4	78	3	46	- 7	i 6	58	+ 2	—	—	—
Kulyab	17.3	93	4	0	- 4	—	—	—	—	—	—
Garin	17.4	89	4	2	- 4	—	—	—	—	—	—
Helwan	z. 17.4	235	e 4	8	+ 2	e 8	2	?	e 4	22	PP
Sverdlovsk	17.8	23	e 4	7	- 4	—	—	—	—	—	—
Dzhergetal	18.1	87	4	14	0	e 7	38	+ 3	—	—	—
Namangan	18.1	84	i 4	11	- 3	—	—	—	—	—	—
Fergana	18.3	85	i 4	13	- 4	i 7	38	- 1	—	—	—
Andijan	18.6	84	i 4	18	- 3	i 7	48	+ 2	—	—	—
Athens	18.7	267	i 3	15 <sub>a</sub>	?	—	—	—	i 3	40	?
Lwow	18.7	305	i 4	25	+ 3	i 8	0	+ 12	—	—	—
Khorog	18.8	92	i 4	21	- 2	—	—	—	—	—	—
Quetta	z. 19.1	118	i 4	23	- 4	—	—	—	—	—	—
Uzhgorod	19.5	303	e 4	37	+ 6	—	—	—	—	—	—
Timisoara	E. 19.6	292	e 4	41	+ 9	—	—	—	—	—	—
Frunse	20.0	77	i 4	36	- 1	e 8	9	- 8	—	—	—
Rybach'e	21.2	77	i 4	49	0	i 8	46	+ 5	—	—	—
Naryn	21.2	80	e 4	47	- 2	i 8	55	+ 14	—	—	—
Pulkovo	21.6	337	i 4	53	- 1	—	—	—	—	—	—
Almata	21.8	74	e 4	53	- 3	—	—	—	—	—	—
Ogyalla	22.0	297	e 4	58	0	e 9	17	+ 21	e 9	32	SS
Raciborzu	22.4	304	e 5	6	+ 4	e 12	40	PcS	e 5	26	PP
Przhevsk	22.9	74	5	9	+ 3	—	—	—	—	—	—
Taranto	23.0	278	—	—	—	e 8	58	- 16	—	—	12.0
Prague	24.8	303	e 5	45	+ 20	e 10	4	+ 18	e 6	17	PPP
Messina	24.9	274	e 6	0	+ 34	e 10	3	+ 16	—	—	—
Triest	z. 25.0	292	i 5	33 <sub>k</sub>	+ 6	e 6	29	PPP	e 6	12	PP
Collnberg	25.9	304	e 5	37	+ 2	e 6	28	PPP	e 6	15	PP
Potsdam	26.0	308	—	—	—	e 10	38	+ 32	—	—	e 14.6
Rome	26.3	283	e 5	41 <sub>a</sub>	+ 2	10	26	+ 15	6	18	PP
Upsala	26.4	325	i 5	41	+ 1	i 11	19	SS	i 6	25	PP
Jena	26.7	304	e 5	45	+ 2	e 10	38	+ 21	e 6	5	PP
Florence	26.9	288	e 5	46	+ 1	e 10	53	+ 33	e 6	32	PP
Stuttgart	28.1	299	e 5	56	+ 1	e 11	12	+ 32	—	—	e 15.6
Oropa	29.0	292	e 5	43	- 21	e 10	30	- 24	6	19	PP
Kiruna	z. 30.6	340	i 6	18	0	e 11	18	- 2	i 7	17	PP
Tamanrasset	39.7	257	e 7	40	+ 4	—	—	—	e 8	1	?
Scoresby Sund	45.2	334	i 8	22	+ 2	—	—	—	18	20	SS
College	73.7	7	e 11	37	- 1	—	—	—	—	—	—
Hungry Horse	89.5	348	i 13	2	+ 2	—	—	—	—	—	—
Nelson	101.9	346	e 18	8	PKP	—	—	—	—	—	—

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May 1d. 9h. 39m. Epicentre 35°·7N. 74°·8E.

Bulletin of the Seismo. Stations of U.S.S.R. for 1953, April-June, Moscow, 1954, p. 83.

May 1d. 14h. 29m. Epicentre 39°·4N. 70°·9E.

*Loc. cit.* 1d. 9h.

May 1d. 20h. 6m. 41s. Epicentre 38°·6N. 26°·3E. (as on 1949, November 23d.).

Felt in Aegean Archipelago. Intensity VII at Mandamados, Kalloni, Vatoussa, and Molybdos in Isle of Lesbos; IV-V at Hoy Marina, Haghiassos, Mytilini in Isle of Lesbos; Kardamyla, Neochorion, and Venita in Isle of Chios; IV Hag Kirovox in Ikaria; III-IV at Samos and Limiu; III at Kastron in Lemnos and in the Isle of Skyros. Macro-seismic area 70,000 sq. km.

A. Galanopoulos.

Seismological Institute Bulletin, 1953, Athens, 1954, p. 57.

A = +·7024, B = +·3472, C = +·6213;  $\delta = -7$ ;  $h = -1$ ;  
D = +·443, E = -·896; G = +·557, H = +·275, K = -·784.

	$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.	
	°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.	
Athens	2·1	253	i 0	36	- 1	i 1	2	- 2	i 0	39	P*	—
Istanbul	3·3	40	e 0	47	- 6	i 1	33	- 2	i 0	55	P	—
Sofia	4·7	332	e 1	15	+ 1	e 2	4	- 6	e 1	31	P <sub>r</sub>	2·6
Bucharest	5·8	358	e 1	38	+ 9	i 2	43	+ 5	—	—	—	—
Taranto	7·2	288	e 2	39	+15 <sub>r</sub>	—	—	—	—	—	—	—
Belgrade	7·6	327	e 2	20 <sub>a</sub>	+ 7*	e 3	16	- 7	e 2	42	P <sub>r</sub>	e 4·0
Timisoara	8·0	334	e 2	9	+ 9	i 4	17	?	e 4	22?	S <sub>r</sub>	e 4·8
Messina	8·4	271	e 1	29	?	e 3	41	- 2	—	—	—	—
Szeged	8·9	331	—	—	—	e 4	10	+15	4	47	S <sub>r</sub>	—
Ksara	9·1	119	e 3	4	P <sub>r</sub>	—	—	—	—	—	—	e 4·8
Kalossa	9·6	328	—	—	—	e 4	44	- 5*	e 5	1	?	e 6·3
Kecskemet	9·6	332	e 3	38	P <sub>r</sub>	e 5	18	+ 1 <sub>r</sub>	e 4	58	S*	—
Helwan	9·7	153	e 2	18	- 4	4	0	-15	2	34	PPP	—
Budapest	10·4	332	2	37	+ 3	e 5	6	SS	—	—	—	e 6·0
Ogyalla	11·0	330	e 3	13	?	e 5	32	S*	e 6	1	S <sub>r</sub>	e 6·6
Rome	11·1	292	e 3	45	?	—	—	—	—	—	—	e 6·8
Triest	11·7	311	e 2	55	+ 4	e 5	24	+20	e 6	2	SS	8·1
Florence	12·5	299	e 4	21	?	—	—	—	—	—	—	e 6·7
Raciborzu	12·9	336	e 3	20	PP	—	—	—	—	—	—	e 6·6
Prague	14·2	328	e 3	30	+ 6	e 5	1	?	e 4	9	?	e 8·3
Collmberg	15·8	328	e 3	52	+ 7	—	—	—	e 3	23	?	—
Stuttgart	16·0	315	e 3	48	0	—	—	—	e 3	57	?	e 8·7
Jena	16·1	325	e 3	52	+ 3	e 4	6	PP	e 3	57	?	—
Karlsruhe	z. 16·5	315	e 3	52 <sub>k</sub>	- 2	—	—	—	—	—	—	—
Strasbourg	z. 16·7	313	i 3	58	+ 1	e 4	25	?	e 4	10	PP	e 8·8
Copenhagen	19·5	336	e 4	27	- 4	e 8	4	- 2	—	—	—	10·3
Uccle	19·7	316	e 4	31	- 3	e 7	53?	-17	—	—	—	e 11·3
Witteveen	z. 19·7	325	i 4	30 <sub>a</sub>	- 4	—	—	—	—	—	—	—
Chambon-la-Forêt	19·8	307	e 4	34	- 1	—	—	—	—	—	—	—
Paris	19·9	309	e 4	34	- 2	e 8	23	+ 8	i 5	4	PPP	—
Alicante	21·0	279	4	40	- 7	8	29	- 8	—	—	—	10·2
Upsala	22·0	348	i 4	54	- 4	i 5	49	?	i 5	27	PP	e 11·8
Kew	22·6	316	e 5	3	0	—	—	—	—	—	—	e 11·3
Tamanrasset	z. 23·8	235	e 5	15	0	e 9	40	+12	i 5	53	PP	—
Rathfarnham C.	z. 26·7	316	e 5	47	+ 4	—	—	—	—	—	—	—
Kiruna	29·5	357	i 6	2	- 6	—	—	—	i 6	47	PP	e 15·8
Quetta	z. 34·4	90	e 7	7	+16	—	—	—	—	—	—	—
College	76·8	358	11	50	- 5	—	—	—	—	—	—	—
Hungry Horse	86·5	335	i 12	42	- 4	—	—	—	—	—	—	—

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May 1d. 21h. 18m. 19s. Epicentre 33°·7N. 72°·5E. Depth of focus 0·005.

Given by the Stations of U.S.S.R.

A = +·2507, B = +·7951, C = +·5523;  $\delta = +7$ ;  $h = +1$ ;  
D = +·954, E = -·301; G = +·166, H = +·527, K = -·834.

		$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.
		°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.
Warsak Dam	E.	0·8	291	i 0	8	- 9	—	—	—	—	—	—
Khorog		3·8	350	i 1	1	+ 3	i 1	57	+15	i 1	9	?
Dzhergetal		5·6	350	1	23	0	e 2	58	+31	i 1	42	?
Garm		5·6	342	e 1	23	0	i 2	30	+ 3	i 1	47	?
Stalinabad		5·7	329	i 1	24	0	i 2	58	+29	—	—	—
Quetta		5·8	234	i 1	21 <sup>a</sup>	- 4	i 2	33	+ 1	i 1	50	?
New Delhi		6·5	140	i 1	30	- 5	i 2	43	- 6	1	39	PP
Andijan		7·0	359	i 1	43	+ 1	i 3	14	+13	i 3	55	L (i 3·9)
Namangan		7·3	355	e 1	46	0	i 2	53	-16	—	—	—
Samarkand		7·4	325	i 1	45	- 3	e 3	19	+ 8	—	—	—
Lunacharskoe		8·0	343	i 1	54	- 2	—	—	—	—	—	i 4·2
Tashkent		8·0	343	e 1	55	- 1	e 3	34	+ 8	e 2	38	?
Naryn		8·2	19	e 1	58	- 1	i 3	33	+ 2	i 2	14	?
Tchimkent		8·9	346	i 2	7	- 1	—	—	—	i 2	25	?
Rybach'e		9·2	17	i 2	12	0	3	59	+ 4	—	—	—
Bairam-Ali		9·3	298	e 2	14	0	i 3	55	- 3	—	—	—
Frunse		9·3	10	i 2	14	0	—	—	—	—	—	—
Przhevalsk		9·9	26	2	22	0	4	19	+ 7	—	—	—
Almata		10·2	19	i 2	25	- 1	i 4	28	+ 8	—	—	—
Kizyl-Arvat		14·1	297	e 3	24	+ 6	i 6	39	+46	—	—	—
Chatra		14·4	114	e 3	17	- 5	—	—	—	—	—	6·8
Bombay	E.	14·8	179	i 3	48	+21	e 6	12	+ 2	4	1	PP
Poona	E.	15·2	175	3	16	-16	6	6	-13	3	41	P
Hyderabad		17·1	160	3	53	- 3	e 7	22	+19	—	—	—
Semipalatinsk		17·6	16	3	59	- 3	—	—	—	—	—	e 9·4
Shillong	E.	18·7	108	4	9	- 6	e 7	32	- 6	4	25	PP
Shemakla		20·2	298	e 4	29	- 3	i 8	25	+15	—	—	—
Makhach-Kala		21·6	303	i 4	47	+ 1	—	—	—	—	—	—
Goris		21·7	294	i 4	48	+ 1	i 8	48	+10	—	—	—
Madras	E.	21·8	159	—	—	—	8	48	+ 8	—	—	—
Grozny		22·9	303	i 5	1	+ 2	i 9	13	+13	—	—	—
Erevan		23·2	295	i 5	5	+ 3	e 9	23	+18	—	—	—
Gori		23·8	298	e 5	11	+ 3	—	—	—	—	—	—
Kodaikanal	E.	23·8	168	—	—	—	e 10	10	SS	—	—	—
Borzhomi		24·3	298	e 5	17	+ 5	e 9	40	+16	—	—	—
Sverdlovsk		24·5	344	5	15	+ 1	e 9	41	+14	—	—	—
Piatigorsk		25·0	304	i 5	24	+ 5	i 9	59	+23	—	—	—
Zugdidi		25·4	300	e 5	24	+ 1	e 9	56	+14	—	—	—
Irkutsk		29·4	41	e 5	55	- 4	e 11	27	?	—	—	—
Kabansk		30·6	42	e 6	12	+ 2	e 12	3	?	—	—	—
Pulkovo		37·9	327	i 7	15	+ 2	e 13	7	+ 8	—	—	—
Lwow		38·9	310	e 7	19	- 2	—	—	—	—	—	—
Upsala		44·0	324	i 8	3	0	e 17	41 <sup>?</sup>	SS	i 9	48	PP e 24·3
Prague	N.	45·0	310	e 8	17	+ 6	e 15	45	+61	e 10	2	PP
Kiruna		45·1	335	i 8	12	0	e 18	18	SS	—	—	e 23·7
Collmberg		45·9	311	e 8	18	0	—	—	—	e 10	9	PP
Copenhagen		46·3	318	e 8	23	+ 2	—	—	—	18	50	SS
Jena		46·8	310	e 8	25	0	—	—	—	e 10	18	PP
Stuttgart		48·6	308	e 8	39	0	e 15	41	+ 6	—	—	e 28·7
Besançon		50·9	306	e 8	55	- 2	—	—	—	—	—	—
Paris		52·9	309	e 9	14	+ 2	—	—	—	e 9	21	pP
Chambon-la-Forêt		53·2	308	e 9	16	+ 2	—	—	—	—	—	—
Tamanrasset	z.	59·1	278	e 9	56	0	—	—	—	e 12	10	PP
College		76·8	17	11	47	+ 1	—	—	—	—	—	—

May 1d. 21h. 35m. Epicentre 41°·0N. 48°·0E.

Bulletin of Seismo. stations of U.S.S.R. for 1953, April-June, Moscow, 1954, pp. 84-85.

The scanned images of the 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 collected by SGA Storia Geofisica Ambiente (Bologna) on behalf of the Istituto Nazionale di Geofisica e Vulcanologia (Rome), in the frame of the EUROSEISMOS project.

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May 2d. 5h. 41m. 51s. Epicentre 38°·6N. 26°·3E. (as on 1d.).

Intensity IV at Eressos, Plomariion, Mytilini and Skopeles in the Isle of Lesbos; IV at Nenita in Chios; III at Mitylinae in Samos. Felt also at Ganakkale, Dikiti, and Ayvalik.

A. Galanopoulos.

Seismological Institute Bulletin, 1953, Athens, 1954, p. 58.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.	
	°	°	m. s.	s.	m. s.	s.	m. s.	m.	
Athens	2·1	253	e 0 32	- 5	i 0 56	- 8	i 1 0	S	—
Istanbul	3·3	40	0 47	- 6	i 1 35	0	0 56	P*	—
Sofia	4·7	332	e 1 14	0	i 2 27	+ 3*	e 2 8	S	2·7
Bucharest	5·8	358	e 1 34	+ 5	e 2 38	0	—	—	—
Taranto	7·2	288	—	—	e 2 54	-19	—	—	e 4·6
Belgrade	7·6	327	2 11 <sub>a</sub>	- 2*	i 4 7	- 4 <sub>g</sub>	e 2 26	P <sub>g</sub>	i 4·3
Timisoara	8·0	334	c 2 3 <sub>?</sub>	+ 3	e 4 17 <sub>?</sub>	- 7 <sub>g</sub>	—	—	—
Messina	8·4	271	c 2 5	- 1	e 3 37	- 6	e 4 38	S <sub>g</sub>	—
Szeged	8·9	331	—	—	4 29	+ 1*	i 4 59	S <sub>g</sub>	—
Ksara	9·1	119	i 2 13	- 1	e 4 40	+ 6*	—	—	—
Kalossa	9·6	328	e 2 24	+ 3	e 5 13	- 4 <sub>g</sub>	e 3 45	?	—
Kecskemet	9·6	332	—	—	e 4 40	- 9*	5 16	S <sub>g</sub>	—
Helwan	9·7	153	e 2 19	- 3	4 1	-14	e 2 38	?	—
Budapest	10·4	332	e 2 38	+ 4	e 5 2	SS	e 2 47	PP	6·0
Ogyalla	11·0	330	e 3 56	?	—	—	—	—	e 5·6
Rome	11·1	292	e 3 35	?	—	—	—	—	e 7·6
Skalnate Pleso	11·4	340	e 3 31	?	e 4 4	?	—	—	e 5·9
Triest	11·7	311	e 2 55	+ 4	i 5 15	+11	6 40	SSS	—
Florence	12·5	299	e 3 39	PP	e 4 34	?	—	—	e 7·5
Bologna	12·7	303	e 3 38	?	e 4 50	-38	—	—	—
Raciborzu	12·9	336	e 3 22	+15	e 5 31	- 2	e 5 15	?	—
Prague	14·2	328	e 3 26	+ 2	e 6 4	0	e 3 37	PP	e 7·9
Pavia	14·3	303	e 4 25	?	e 5 14	?	—	—	—
Zürich	15·6	310	e 3 49	+ 6	—	—	—	—	—
Collnberg	15·8	328	e 3 41	- 4	—	—	e 3 52	?	—
Stuttgart	16·0	315	e 3 54	+ 6	—	—	e 4 5	?	e 8·4
Jena	16·1	325	e 3 52	+ 3	e 8 2	Q	e 5 25	?	e 8·8
Karlsruhe	16·5	315	e 3 57	+ 3	—	—	e 4 15	PP	e 8·6
Potsdam	16·6	331	e 3 59	+ 3	—	—	e 4 3	?	e 8·2
Strasbourg	16·7	313	e 4 0	+ 3	e 4 57	?	e 4 11	PP	8·6
Besançon	17·2	307	e 4 8	+ 5	—	—	—	—	—
Copenhagen	19·5	336	i 4 27	- 4	—	—	—	—	10·2
Uccle	19·7	325	e 4 35	+ 1	—	—	—	—	e 11·2
Chambon-la-Forêt	19·8	307	e 4 38	+ 3	—	—	—	—	—
Paris	19·9	309	e 4 38	+ 2	e 8 9 <sub>?</sub>	- 6	e 4 55	PP	—
Upsala	22·0	348	e 4 52	- 6	i 5 8	?	i 5 28	PP	e 12·0
Kew	22·6	316	—	—	e 8 9	-58	—	—	—
Tamanrasset z.	23·8	235	i 5 18	+ 3	e 9 40	+12	e 5 54	PP	11·2
Rathfarnham Castle	26·7	316	e 6 1	+18	—	—	—	—	e 15·3
Kiruna	29·5	357	i 6 3	- 5	i 6 47	PP	i 6 19	?	e 13·2
Quetta z.	34·4	90	6 45	- 6	—	—	—	—	—
Scoresby Sund	40·5	337	i 7 43	+ 1	—	—	—	—	20·2

May 2d. 5h. 51m. Epicentre 34°·6'N. 117°38'W. (U.S.C.G.S.).

Intensity V at Riverside; IV at Altadena, Los Angeles, and Pasadena.

L. M. Murphy and W. K. Cloud.

United States Earthquakes for 1953, U.S.C.G.S. Serial No. 785, Washington, 1955, p. 14.

May 2d. 8h. 56m. Epicentre 29°·0N. 127°·8E.

Seismo. Bull. Cent. Met. Obs., Japan, for May, 1953, Tokyo, 1953, p. 9.

May 2d. 10h. 6m. Epicentre 38°·7N. 26°·5E.

Intensity IV at Nenita in Chios, also felt at Canakkak, Ayvalik, and Tzmis.

A. Galanopoulos.

Seismo. Institute Bulletin, 1953, Athens, 1954, p. 58.

May 2d. 12h. 37m. Epicentre 48°·1N. 16°·8E.

Intensity V-VI at Regelsbrunn and Region of Bruck. Macroseismic area 11,600 sq. km.

Jahrbücher der Zentralanstalt für Meteorologie und Geodynamik, Jahrgang, 1953, Neue Folge, 89. Band, Vienna, 1954, pp. E2, E6, E7 with macroseismic chart p. E8.

The scanned images of the 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 collected by SGA Storia Geofisica Ambiente (Bologna) on behalf of the Istituto Nazionale di Geofisica e Vulcanologia (Rome), in the frame of the EUROSEISMOS project.

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May 2d. 14h. 10m. Epicentre 39°·1N. 71°·7E.  
Bulletin of Seismo. stations of U.S.S.R. for 1953, April-June, Moscow, 1954, p. 85.

May 2d. 14h. 13m. Epicentre 37°·4N. 69°·9E.  
*Loc. cit.* 14h. 10m.

May 2d. 18h. 37m. 39s. Epicentre 38°·6N. 26°·3E. (as at 5h.).

Destructive at Karaburun and Izmir, with many casualties.  
Intensity VI at Mandamados, Vatoussa, Vriessa, and Skalochori in the Isle of Lesbos ; V-VI at Vrontados in Chios ; V at Oenoussae ; IV-V at Nenita and Neochorion in Chios ; IV at Plomarion, Hag. Marina, Molybdos in Lesbos, and Kalimassia in Chios ; III at Limin Vathy in Samos, Kastron in Lemnos, and in the Isle of Skyros. Macroscopic area 70,000 sq. km.

A. Galanopoulos.  
Seismological Institute Bulletin for 1953, Athens, 1954, p. 58.

	Δ	Az.	P.		O-C.	S.		O-C.	Supp.		L.	
			m.	s.		m.	s.		m.	s.		
Athens	2·1	253	e 0	38	+ 1	i 1	8	+ 4	i 0	43	P <sub>g</sub>	—
Istanbul	3·3	40	0	47	- 6	1	36?	+ 1	0	56	P*	—
Sofia	4·7	332	e 1	5	- 9	i 2	8	- 2	—	—	—	i 2·5
Bucharest	5·8	358	e 1	28	- 1	e 2	41	+ 3	e 1	42	P*	—
Taranto	7·2	288	e 1	47	- 2	—	—	—	—	—	—	—
Belgrade	7·6	327	e 2	3 <sub>a</sub>	+ 8	e 3	17	- 6	e 2	32	P <sub>g</sub>	e 4·0
Timisoara	8·0	334	e 2	6	+ 6	e 3	52	-10*	e 4	17	S <sub>g</sub>	e 4·9
Messina	8·4	271	e 2	9	+ 3	e 3	41	- 2	—	—	—	—
Iasi	8·6	6	e 2	12	+ 3	—	—	—	—	—	—	—
Szeged	8·9	331	e 2	21	+ 9	3	59	+ 4	2	56	P <sub>g</sub>	—
Ksara	9·1	119	—	—	—	e 4	3	+ 3	—	—	—	—
Kalossa	9·6	328	2	45	P*	5	25	+ 8 <sub>g</sub>	3	15	P <sub>g</sub>	e 5·5
Kecskemet	N. 9·6	332	—	—	—	e 4	58	+ 9*	e 5	23	S <sub>g</sub>	—
Helwan	9·7	153	e 2	19	- 3	i 4	0	-15	i 4	5	S	—
Budapest	10·4	332	e 2	39	+ 5	e 5	7	SSS	2	42	PP	6·0
Ogyalla	11·0	330	—	—	—	e 4	45	- 2	e 5	15	SS	e 6·6
Rome	Z. 11·1	292	—	—	—	e 4	0	-49	—	—	—	—
Skalnate Pleso	11·4	340	—	—	—	e 5	9	+13	—	—	—	e 5·8
Triest	11·7	311	e 2	43	- 8	e 5	4	0	e 3	49	P <sub>g</sub> P <sub>g</sub> P <sub>g</sub>	i 6·8
Florence	12·5	299	e 3	40	+38	—	—	—	—	—	—	e 6·3
Raciborzu	12·9	336	e 3	6	- 1	e 3	48	?	e 3	21	PP	—
Prague	14·2	328	e 3	38	+14	e 6	6	+ 2	e 4	14	PP	e 7·8
Cheb	15·2	324	e 3	47	+ 9	e 6	35	+ 7	e 7	25	Q	e 8·6
Zürich	15·6	310	e 3	45 <sub>a</sub>	+ 2	e 6	55	+18	—	—	—	—
Collmberg	15·8	328	e 3	48	+ 3	—	—	—	—	—	—	e 8·8
Stuttgart	16·0	315	e 3	43?	- 5	e 7	2	SS	e 3	49	P	e 8·4
Jena	16·1	325	e 3	49	0	e 6	47?	- 2	e 3	54	?	e 8·4
Karlsruhe	Z. 16·5	315	e 3	59 <sub>k</sub>	+ 5	—	—	—	e 4	5	PP	—
Potsdam	16·6	331	e 3	59	+ 3	e 7	21	SS	e 4	3	PP	e 8·4
Strasbourg	16·7	313	e 3	57	0	e 7	16	SS	i 4	1	PP	8·4
Besançon	17·2	307	e 3	51	-12	—	—	—	e 4	2	PP	—
Copenhagen	19·5	336	i 4	26	- 5	e 8	3	- 3	—	—	—	10·4
Uccle	19·7	316	e 4	31	- 3	e 6	24	?	e 7	13	?	e 9·4
Witteveen	Z. 19·7	325	i 4	30 <sub>a</sub>	- 4	—	—	—	—	—	—	—
Chambon-la-Forêt	19·8	307	e 4	35	0	—	—	—	—	—	—	—
Paris	19·9	309	e 4	33	- 3	e 8	21	+ 6	e 4	47	PP	e 10·4
De Bilt	20·0	321	e 4	31	- 6	e 7	51	-26	e 8	21	PS	e 10·4
Alicante	21·0	279	e 4	57	+10	e 8	51	+14	—	—	—	10·6
Upsala	22·0	348	i 4	51	- 7	e 8	49	- 7	i 5	17	PP	e 14·4
Kew	22·6	316	i 5	2	- 1	e 9	20	+13	—	—	—	e 12·4
Almeria	22·8	275	5	22	+17	9	41	+30	—	—	—	16·4
Toledo	23·5	283	e 5	12	0	—	—	—	e 6	24	PPP	—
Granada	23·6	277	e 5	29 <sub>a</sub>	+16	9	40	+15	—	—	—	—
Tamanrasset	Z. 23·8	235	i 5	15 <sub>k</sub>	0	i 9	38	+10	e 5	51	PP	—
Malaga	24·3	277	i 5	19	- 1	i 10	16	+39	17	25	ScS	—

Continued on next page.



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	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Durham	24.8	320	—	—	e 9 52	+ 6	—	—
Aberdeen	26.3	325	e 7 59	?	i 10 25	+14	—	—
Rathfarnham Castle	26.7	316	e 5 41	- 2	e 11 47	SS	—	e 14.7
Kiruna	29.5	357	i 6 3	- 5	e 11 9	+ 7	i 7 6	PP
Quetta	z. 34.4	90	6 51?	0	—	—	—	i 15.3
Scoresby Sund	40.5	337	e 7 40	- 2	—	—	9 23	PP
Poona	z. 45.7	102	i 8 18	- 6	—	—	e 12 2	?
College	76.8	358	11 50	- 5	—	—	—	—
Morgantown	77.0	310	i 11 54	- 2	—	—	—	—
Hungry Horse	86.5	335	i 12 42	- 4	—	—	—	—

May 2d. 18h. 38m. 7s. Epicentre 51°·9N. 159°·9E. (as on 1952, December 27d.).

A = -·5814, B = +·2128, C = +·7853;  $\delta$  = +1;  $h$  = -6;  
D = +·344, E = +·939; G = -·737, H = +·270, K = -·619.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Nemuro	12.9	234	e 3 14	+ 7	e 6 38	L	—	e 8.4
Abashiri	13.1	239	e 3 44	+34	—	—	—	8.1
Wakkanai	E. 13.7	248	e 4 26	?	—	—	—	e 9.4
Obi-hiro	14.4	238	e 4 9	?	—	—	—	—
Urakawa	15.2	237	e 3 56	+18	e 6 23	- 5	—	e 8.9
Sapporo	15.3	242	e 3 59	+20	e 7 41	?	e 8 21	?
Mori	N. 16.4	241	e 4 17	+24	—	—	—	e 10.0
Aomori	17.2	238	e 4 3	0	—	—	—	9.1
Miyako	17.5	232	e 4 3	- 4	—	—	—	e 9.3
Morioka	17.8	334	e 4 6	- 5	—	—	—	—
Akita	18.4	234	e 4 23	+ 5	e 6 15	?	e 7 10	?
Sendai	19.1	231	e 4 21	- 6	e 8 2	+ 5	—	e 11.5
Yamagata	19.4	232	e 4 24	- 6	—	—	—	10.9
Hokusima	19.7	232	e 4 28	- 6	e 8 17	+ 7	—	—
Inawasiro	E. 20.0	232	e 4 33	- 4	—	—	—	—
Shirakawa	20.3	231	e 4 24	-16	—	—	—	—
Maebasi	21.4	231	e 4 47	- 4	e 8 40	- 5	e 4 59	PP
Kumagaya	21.5	232	e 4 53	+ 1	e 7 49	-58	—	—
Matusiro	21.7	235	i 4 50	- 5	i 8 58	+ 7	—	10.6
Nagano	21.7	233	e 4 51	- 4	e 8 49	- 2	—	e 12.5
Tokyo	21.7	229	e 5 2	+ 7	8 53	+ 2	e 6 8	?
Toyama	22.1	235	e 4 55	- 4	—	—	—	e 10.8
Matumoto	E. 22.1	235	e 4 57	- 2	—	—	—	—
Kohu	N. 22.3	231	e 4 58	- 3	—	—	—	—
Mera	22.3	227	e 5 7	+ 6	—	—	—	—
Misima	N. 22.5	228	e 5 18	+16	—	—	—	—
Shizuoka	22.9	231	e 5 10	+ 4	e 9 18	+ 5	—	—
Omaesaki	23.3	231	e 5 19	+ 9	—	—	—	—
Nagoya	E. 23.5	233	e 5 9	- 3	—	—	e 5 27	PP
Kameyama	23.9	233	e 5 7	- 9	9 33	+ 3	10 19	Q
Osaka	24.6	235	e 5 32	+ 9	—	—	e 6 26	PPP
Takamatu	25.6	237	e 5 34	+ 2	e 10 13	+14	—	—
Hamada	26.2	240	e 5 36	- 2	—	—	—	e 13.6
Koti	26.4	236	e 5 52	+12	e 10 24	+12	—	e 15.6
College	29.3	44	6 8	+ 2	—	—	—	—
Nanking	35.8	253	6 59 <sub>a</sub>	- 4	e 12 34	- 7	—	—
Resolute Bay	44.5	22	e 8 16 <sub>a</sub>	+ 1	—	—	—	e 24.0
Hong Kong	45.8	247	—	—	e 14 53?	-16	—	e 20.9
Baguio	47.1	237	i 8 23	-12	—	—	19 53?	SS
Hungry Horse	52.2	58	e 9 14	- 1	—	—	—	33.9
Shasta	z. 52.4	70	e 9 17 <sub>a</sub>	+ 1	—	—	—	—
Mineral	z. 53.1	70	e 9 23 <sub>a</sub>	+ 2	e 9 29	?	e 9 33	?
Berkeley	54.3	73	e 9 27	- 3	e 17 29	+22	e 23 53	Q
Reno	z. 54.7	69	e 9 34	+ 1	—	—	e 10 0	?
Santa Clara	E. 54.9	73	—	—	e 17 22	+ 6	—	—

Continued on next page.

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		$\Delta$	Az.	P.		O-C.	S.	O-C.	Supp.		L.
		°	°	m.	s.	s.	m.	s.	m.	s.	m.
Lick	z.	55.0	73	e 9	33 <sup>a</sup>	- 2	—	—	—	—	—
Fresno	z.	56.5	72	e 9	47	+ 1	—	—	e 9	57	?
Kiruna		56.8	344	e 9	49	+ 1	e 21	28	SS	i 10	3
Tinemaha	z.	57.2	71	e 9	52	+ 1	—	—	—	i 9	57
Scoresby Sund		57.9	2	e 10	0	+ 4	e 18	1	+ 6	—	—
China Lake	z.	58.5	71	e 10	0	0	e 10	10	?	e 10	31
Chatra		58.9	275	e 8	38	?	e 18	26	PPS	—	—
Riverside	z.	59.9	73	e 10	9	- 1	—	—	—	—	e 34.9
Boulder City		60.0	69	i 10	11	0	—	—	—	—	—
Nelson		60.1	69	i 10	12	+ 1	—	—	—	i 11	15
Palomar	z.	60.6	73	i 10	14	- 1	i 10	26	?	i 10	44
Upsala		64.5	340	i 10	41 <sup>a</sup>	0	e 19	27	+ 8	i 10	56
Tucson		64.9	70	e 10	44	+ 1	—	—	—	—	pP
Bergen	N.	66.2	347	e 13	23	PP	e 19	22	-18	e 17	2
Quetta		68.5	292	i 11	5	- 1	e 19	53?	-15	—	?
Copenhagen		69.4	342	e 11	17	+ 5	i 20	35	+17	—	—
Fayetteville		71.2	56	i 11	22	- 1	—	—	—	—	37.9
Seven Falls	E.	72.2	34	—	—	—	e 20	59	+ 8	21	33
Cleveland		72.8	44	e 12	29 <sup>k</sup>	?	e 21	0	+ 2	—	PS
Poona	N.	73.2	279	21	4	S	(21	4)	+ 2	28	10
Witteveen	z.	73.2	344	i 11	51 <sup>k</sup>	+16	—	—	—	—	—
Collmberg	z.	73.4	339	e 11	38	+ 2	—	—	—	—	—
Bombay		73.6	280	e 11	35	- 2	e 20	55	-12	14	24
Skalnate Pleso		73.6	334	e 12	16	?	e 21	28	PS	e 18	31
Jena		74.1	340	e 11	47	+ 7	—	—	—	e 12	2
Prague		74.2	338	e 11	38	- 2	e 12	1	PcP	e 14	15
Rathfarnham C.	z.	74.5	352	e 12	14	+32	—	—	—	—	PP
Cheb		74.7	340	e 11	37	- 6	e 22	16	PPS	e 12	11
Morgantown		75.0	45	i 11	26	-19	—	—	—	—	?
Ogyalla		75.3	335	e 12	17	+30	e 18	6	?	e 12	40
Stuttgart		76.6	341	e 12	0	+ 6	—	—	—	e 12	9
Halifax		76.8	31	e 10	45	?	—	—	—	—	PcP
Strasbourg		77.1	342	e 12	13	+16	e 22	5	+19	—	—
Istanbul	z.	78.0	325	12	10?	+ 8	—	—	—	—	e 40.9
Ksara		81.6	316	i 12	25	+ 4	e 23	1	+28	—	—
Bermuda		87.4	36	—	—	—	e 23	40	+10	e 34	31
Alicante		88.5	346	e 12	47	- 9	e 23	21	[- 3]	—	?
Tamanrasset	z.	102.3	336	e 13	37	-22	—	—	—	e 17	58

May 2d. 19h. 7m. Epicentre 45°·4N. 14°·5E.

Intensity IV at Bakar, Jelenje, Kraljevica, and Rijeka ; III at Fuzine and Lokve, according to the Annual Seismo. Bulletin of Zagreb.

Annales de l'Institut de Physique du Globe de Strasbourg, Nouvelle Série, Tome XVIII, Deuxième partie, Séismologie, Strasbourg, 1959, p. 41.

May 3d. 1h. 14m. Epicentre 38°·7N. 26°·5E. (Strasbourg).

After-shock of earthquake at 18h. on 2d.

Intensity III at Plomariion in Island of Lesbos ; felt also at Canakkale in Turkey.

A. Galanopoulos.

Seismological Institute Bulletin, 1953, Athens, 1954, p. 59.

Bulletin séismique mensuel d'Istanbul, mai, 1953.

May 3d. 5h. 55m. Epicentre 35°·6N. 140°·3E. Depth of focus 60-70 km.

Intensity IV at Osima ; II-III at Tokyo, Yokohama, Utunomiya, Hunatu, and Kohu.

Seismo. Bull. Cent. Met. Obs., Japan, for May, 1953, Tokyo, 1953, pp. 9-10, with macro-seismic chart.

May 3d. 8h. 46m. Caucasus region. Epicentre 40°·7N. 48°·1E.

Seismological Bulletin of the U.S.S.R. for April-June, 1953, Moscow, 1954, p. 86.

May 3d. 21h. 26m. Epicentre 35°·7N. 140°·0E. Depth of focus 75km.

Intensity IV at Osima, Ajiro, and Hunatu ; II-III at Tokyo, Kashiwa, Yokohama, Titibu, Tukubasan, Kakioka, Kohu, and Utunomiya.

Seismo. Bull. Cent. Met. Obs., Japan, for May, 1953, Tokyo, 1953, pp. 10-11, with macro-seismic chart.

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May 3d. 23h. 57m. 5s. Epicentre 25°·0N. 102°·9E.

A = -·2026, B = +·8845, C = +·4203;  $\delta = +4$ ;  $h = +3$ ;  
D = +·975, E = +·223; G = -·094, H = +·410, K = -·907.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.	
		°	°	m. s.	s.	m. s.	s.	m. s.	m.	
Shillong	K.	10·0	275	2 30	+ 3	—	—	e 2 19	P	—
Hong Kong		10·7	102	e 3 7	PPP	4 55	SS	—	—	—
Chatra		14·3	281	e 3 29	+ 3	—	—	—	—	—
Nanking		15·6	60	i 3 41 <sub>a</sub>	- 2	i 6 54	SS	—	—	—
Zô-Sô		17·2	64	4 3 <sub>a</sub>	0	7 34	SS	—	—	—
New Delhi		23·2	285	e 5 10	+ 1	e 9 25	+ 7	10 15	SSS	11·7
Poona	N.	27·7	262	i 5 46	- 6	10 49	+16	6 51	PPP	—
Bombay	E.	28·5	264	e 4 56	-63	e 10 4	-42	e 9 10	PcP	—
Djakarta		31·2	171	e 6 11 <sub>a</sub>	-12	e 17 13	ScS	—	—	—
Ksara		58·1	296	e 9 56	- 2	e 21 6	SS	—	—	—
Helwan	z.	62·8	292	10 28	- 2	—	—	—	—	—
Kiruna		64·3	335	i 10 39 <sub>k</sub>	0	e 23 43	SS	e 34 54	PKKS	e 30·9
Upsala	z.	66·4	327	i 10 53 <sub>k</sub>	0	i 11 22	PcP	i 11 49	?	—
Copenhagen		70·0	324	i 11 16	+ 1	—	—	—	—	37·9
Prague		70·3	317	e 11 17	0	e 11 33	PcP	e 13 10	?	—
Collmberg		70·8	319	e 11 20	0	—	—	e 11 30	?	—
Jena		71·8	318	e 11 26	0	—	—	e 11 30	?	—
Triest	z.	72·0	313	e 11 18	-10	—	—	e 12 7	?	—
Stuttgart		74·0	317	e 11 39	0	e 21 23	PS	e 11 44	?	e 40·9
Witteveen	z.	74·1	322	i 11 41 <sub>a</sub>	+ 1	—	—	—	—	—
Florence	z.	74·3	311	e 11 27	-14	—	—	—	—	—
Strasbourg		74·9	317	e 11 45	+ 1	—	—	—	—	—
College		75·4	25	11 46	- 1	—	—	—	—	—
Besançon		76·5	316	e 11 54	0	—	—	—	—	—
Scoresby Sund		77·2	344	e 11 58	+ 1	—	—	—	—	41·9
Paris		78·1	318	i 12 2	0	e 12 14	PcP	e 12 19	?	—
Chambon-la-Forêt		78·5	318	e 12 5	+ 1	—	—	—	—	—
Resolute Bay		79·9	5	e 12 11 <sub>k</sub>	- 1	—	—	—	—	—
Rathfarnham C.	z.	81·0	325	i 12 10 <sub>?</sub>	- 8	—	—	—	—	—
Tamanrasset	z.	86·9	294	e 12 47	- 1	—	—	e 16 7	PP	—
Pretoria	z.	88·0	241	e 12 56	+ 3	—	—	—	—	—
Hungry Horse		99·8	25	e 13 47	0	—	—	—	—	—

May 4d. 4h. 3m. 59s. Epicentre 53°·8N. 161°·7E. Focus at Base of Superficial Layers.  
(as on 1953, January 7d.).

A = -·5632, B = +·1863, C = +·8051;  $\delta = +9$ ;  $h = -7$ ;  
D = +·314, E = +·949; G = -·764, H = +·253, K = -·593.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.	
		°	°	m. s.	s.	m. s.	s.	m. s.	m.	
College		27·2	45	i 5 44	+ 1	e 10 20	+ 3	—	—	e 12·6
Nanking		37·4	252	e 7 6	- 6	e 12 54	- 3	—	—	—
Resolute Bay		42·3	23	e 7 52	0	—	—	—	—	—
Hungry Horse		50·3	59	e 8 56	+ 1	—	—	—	—	—
Shasta	z.	50·8	71	e 8 57 <sub>k</sub>	- 2	—	—	e 9 7	pP	—
Mineral	z.	51·4	71	e 9 6 <sub>k</sub>	+ 2	e 9 44	?	e 9 12	pP	—
Reno	z.	53·0	70	e 9 21	+ 5	—	—	e 10 25	PcP	—
Lick	z.	53·5	74	e 9 26 <sub>a</sub>	+ 7	—	—	e 9 35	pP	—
Fresno	z.	54·9	73	e 9 33 <sub>k</sub>	+ 3	—	—	—	—	—
Kiruna		55·3	344	e 9 31 <sub>a</sub>	- 1	e 17 26	+14	19 46	pP	e 27·0
Tinemaha	z.	55·6	72	e 9 42	+ 7	—	—	—	—	—
Scoresby Sund		56·0	2	—	—	17 49	sS	e 19 53	?	30·0
China Lake	z.	56·8	72	e 9 44	+ 1	e 10 4	?	e 9 51	pP	—
Pasadena	z.	57·7	74	i 9 59	pP	—	—	—	—	—
Boulder City		58·3	71	e 9 55	+ 1	—	—	—	—	—

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		$\Delta$ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	Supp. m. s.	L. m.
Riverside	z.	58.3	74	e 10 2	pP	—	—	—	—
Nelson		58.5	71	i 9 57	+ 2	—	—	—	—
Upsala	z.	63.1	341	i 10 26 <sub>a</sub>	0	i 10 45	sP	i 10 38	pP
Tucson		63.3	71	e 10 28	0	—	—	—	—
Kirkland Lake	z.	65.8	40	e 10 37	- 7	—	—	—	—
Copenhagen		68.0	342	—	—	c 20 13	sS	—	37.0
Quetta	z.	68.8	293	i 11 0	- 3	—	—	—	—
Fayetteville		69.2	56	i 11 4	- 1	—	—	—	—
Potsdam		71.0	341	e 11 17	+ 1	—	—	—	c 42.0
Witteveen	z.	71.7	345	i 11 21	+ 1	—	—	—	—
Raciborzu	z.	72.0	337	e 11 22	0	—	—	—	—
Jena		72.7	340	e 11 26	0	e 11 45	sP	e 11 39	pP
Rathfarnham C.	z.	72.8	353	i 11 31 <sub>?</sub>	+ 4	—	—	e 11 56 <sub>?</sub>	?
Morgantown		72.9	45	i 11 28	0	—	—	i 12 7	?
Prague		72.9	339	e 11 30	+ 2	e 11 53	sP	e 11 41	pP
Harvard		73.8	37	e 11 34	+ 1	—	—	—	—
Poona	z.	74.0	279	i 11 30	- 4	—	—	—	—
Weston		74.0	37	e 11 35 <sub>a</sub>	+ 1	—	—	—	—
Halifax		74.6	31	e 11 37	- 1	—	—	—	—
Stuttgart		75.2	342	e 11 41	0	—	—	—	e 45.0
Strasbourg		75.6	343	i 11 44	+ 1	—	—	e 11 57	pP
Paris		76.3	347	e 11 45	- 2	—	—	i 12 1	P <sub>c</sub> P
Basle		76.7	343	e 11 49	- 1	—	—	—	—
Zürich		76.7	343	e 11 49 <sub>a</sub>	- 1	—	—	—	—
Chambon-la-Forêt		77.1	346	e 11 53	+ 1	—	—	—	—
Istanbul	z.	77.1	326	11 52	0	22 1	sS	—	45.0
Besançon		77.2	343	e 11 52	0	—	—	—	—
Florence		79.6	339	e 12 7	+ 2	e 22 28	sS	—	—
Helwan	z.	86.3	319	12 39	- 1	—	—	e 13 4	?
Alicante		86.9	347	12 40	- 3	22 58	[- 6]	—	41.2
Tamanrasset	z.	101.0	337	e 13 46	- 2	e 17 32	?	e 17 54	PP

May 4d. 11h. 29m. 15s. Epicentre 53°·8N. 161°·7E. Focus at Base of Superficial Layers.  
(as at 4h.).

		$\Delta$ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	Supp. m. s.	L. m.
Nemuro		14.9	232	c 4 9	+39	e 7 19	+64	c 9 33	?
Wakkanai	E.	15.4	245	—	—	e 6 23	- 3	—	—
Urakawa		17.1	236	—	—	e 7 32	SS	—	c 9.0
Sapporo		17.2	240	e 4 33	PPP	e 7 32	SS	c 8 30	?
Hatinohe		19.0	234	e 4 33	+11	e 8 0	+12	—	c 10.0
Aomori		19.1	238	e 4 33	+10	e 8 1	+10	—	—
Miyako		19.5	232	4 20	- 7	e 8 6	+ 6	—	—
Morioka		19.8	233	e 4 26	- 4	—	—	—	—
Akita		20.3	234	e 4 29	- 7	8 25	+ 9	e 5 36	?
Mizusawa	E.	20.3	234	4 48	PP	8 12	- 4	—	—
Sakata		21.1	234	e 4 50	+ 6	e 8 57	SS	—	—
Sendai		21.1	231	e 4 39	- 5	e 8 35	+ 3	—	—
Yamagata		21.4	232	e 4 41	- 6	—	—	—	—
Hokusima		21.7	232	e 4 47	- 3	e 8 43	0	—	—
Inawasiro	E.	22.0	232	e 4 46	- 7	—	—	—	—
Niigata		22.2	233	e 5 9	pP	e 9 31	SS	—	—
Shirakawa		22.3	231	e 4 52	- 4	—	—	—	—
Mito		22.8	229	e 4 59	- 2	e 9 3	0	—	—
Utunomiya		23.0	231	e 4 53	-10	e 9 4	- 3	—	—
Kumagaya		23.5	230	e 5 8	0	9 16	0	—	—
Maebasi		23.5	231	e 5 4	- 4	9 16	0	—	—
Nagano	N.	23.6	233	e 5 8	- 1	e 9 19	+ 2	—	—
Matusiro		23.7	235	1 5 7	- 3	9 19	0	9 23	S
Oiwake		23.7	233	e 5 11	+ 1	e 9 24	+ 5	—	11.8
Tokyo	N.	23.7	228	e 5 3	- 7	e 9 33	+14	i 6 16	?

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		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	I.
		$\circ$	$\circ$	m. s.	s.	m. s.	s.	m. s.	m.
Wazima		23.7	237	e 5 7	- 3	e 9 17	- 2	—	—
Matumoto		24.1	234	5 11	- 2	9 28	+ 2	—	—
Toyama		24.1	234	c 5 11	- 2	e 9 29	+ 3	—	—
Hunatu		24.3	231	e 5 14	- 1	e 9 30	+ 1	—	—
Kohu		24.3	231	e 5 13	- 2	e 9 29	0	—	—
Mera		24.3	228	e 5 34	PP	—	—	—	—
Misima		24.5	229	e 5 15	- 2	e 9 39	+ 6	—	—
Osima		24.7	229	e 5 2	-17	—	—	—	—
Shizuoka		24.9	231	5 21	0	9 45	+ 5	—	—
Gihu		25.3	233	e 5 24	- 1	—	—	—	—
Nagoya	E.	25.4	232	5 30	+ 4	—	—	e 6 3	PP
Kameyama		25.9	233	e 5 29	- 2	—	—	—	—
Toyooka		26.2	237	e 5 30	- 3	—	—	—	—
College		27.2	45	i 5 44	+ 1	i 10 21	+ 4	i 10 39	sS
Siomisaki		27.4	233	e 5 43	- 1	—	—	—	c 11.2
Koti		28.4	236	e 5 52	- 2	e 10 36	- 1	—	—
Zô-Sè		36.8	248	i 7 3 <sub>a</sub>	- 3	c 12 35	-13	—	—
Nanking		37.4	252	i 7 7 <sub>a</sub>	- 5	e 12 48	- 9	—	—
Resolute Bay		42.3	23	e 8 3	pP	i 14 17	+ 6	i 18 8	ScS
Victoria		45.2	63	8 16	0	—	—	—	e 19.2
Seattle	Z.	46.3	63	i 8 31	+ 7	—	—	—	—
Hong Kong		47.6	248	—	—	e 14 45	-42	—	—
Baguio		49.1	237	i 8 45	- 1	i 15 47	- 1	—	24.8
Hungry Horse		50.3	59	i 8 56	+ 1	e 10 27	PcP	c 38 24	P'P'
Shasta	Z.	50.8	71	e 9 1	+ 2	e 20 23	SS	i 9 13	pP
Mineral	Z.	51.4	71	e 9 4 <sub>a</sub>	0	e 11 25	PP	i 9 18	pP
Butte		52.6	60	e 9 13	0	—	—	i 9 26	pP
Berkeley		52.7	74	e 9 17	+ 4	e 16 48	+11	e 9 26	pP
Reno		53.0	70	e 9 19 <sub>a</sub>	+ 3	e 16 47	+ 5	e 9 30	pP
Santa Clara	E.	53.3	74	—	—	e 16 49	+ 3	—	—
Lick	Z.	53.5	74	e 9 19 <sub>k</sub>	0	e 11 25	PP	e 9 27	pP
Fresno	Z.	54.9	73	e 9 33 <sub>a</sub>	+ 3	—	—	—	—
Kiruna		55.3	344	i 9 31 <sub>a</sub>	- 1	e 17 16	+ 4	i 9 45	pP
Tinemaha	Z.	55.6	72	e 9 39	+ 4	i 10 7	sP	i 9 49	pP
Scoresby Sund		56.0	2	i 9 39 <sub>k</sub>	+ 1	e 17 33	+11	e 17 47	sS
Pasadena		57.7	74	e 9 53	+ 3	i 10 45	PcP	i 10 3	pP
Shillong	E.	58.0	271	—	—	i 16 49	-59	e 39 48	P'P'
Boulder City		58.3	71	i 9 56	+ 2	i 18 1	+ 9	i 10 26	?
Riverside	Z.	58.3	74	e 9 54	0	—	—	i 10 7	pP
Nelson		58.5	71	i 9 56	+ 1	i 10 37	PcP	i 10 8	pP
Chatra		59.8	274	e 10 2	- 2	e 18 11	- 1	e 35 45	?
Reykjavik	Z.	62.4	3	i 10 24	+ 2	—	—	—	—
Upsala		63.1	341	i 10 25	- 1	e 18 55	+ 1	i 10 38	pP
Tucson		63.3	71	e 10 29	+ 1	—	—	—	e 31.8
Warsak Dam	E.	63.5	292	e 10 28	- 1	e 19 11	+12	—	e 34.0
New Delhi		64.3	284	e 10 32	- 2	20 19	ScS	i 20 35	?
Kirkland Lake	Z.	65.8	40	e 10 43	- 1	—	—	—	—
Copenhagen		68.0	342	i 10 58	0	i 20 0	+ 7	i 11 11	pP
Quetta		68.8	293	i 10 59 <sub>k</sub>	- 4	e 19 56 <sub>?</sub>	- 7	i 11 12	pP
Fayetteville		69.2	56	i 11 5	0	e 21 5	ScS	e 36 5	?
Ottawa		69.7	39	e 11 6	- 2	—	—	—	—
Seven Falls	E.	70.0	35	—	—	e 20 25	+ 8	25 8	SS
Cleveland	Z.	70.7	45	i 11 15 <sub>k</sub>	+ 1	—	—	e 11 42	PcP
Potsdam		71.0	341	i 11 17 <sub>k</sub>	+ 1	e 20 33	+ 4	i 11 29	pP
Witteveen	Z.	71.7	345	i 11 22 <sub>a</sub>	+ 2	—	—	i 11 35	pP
Collmberg		72.0	340	e 11 21	- 1	e 20 59	sS	e 11 35	pP
Raciborzu		72.0	337	e 11 23	+ 1	e 20 55	+15	e 21 4	PS
Iasi		72.1	330	i 11 31	+ 8	e 21 9	+28	—	—
Hyderabad	E.	72.2	275	—	—	i 21 38	PPS	—	—
Skalnate Pleso		72.4	335	e 11 26	+ 1	e 20 56	+11	e 11 38	pP

Continued on next page.



The scanned images of the 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 collected by SGA Storia Geofisica Ambiente (Bologna) on behalf of the Istituto Nazionale di Geofisica e Vulcanologia (Rome), in the frame of the EUROSEISMOS project.

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	$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.	
	°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.	
De Bilt	72.7	345	i 11	27 <sup>a</sup>	+ 1	i 21	12	PS	e 11	40	pP	e 35.8
Jena	72.7	340	e 11	27	+ 1	e 20	50	+ 2	e 11	39	pP	—
Rathfarnham Castle	72.8	353	i 11	22	- 5	e 21	3	+14	i 11	1	?	—
Morgantown	72.9	45	i 11	28	0	—	—	—	—	—	—	—
Prague	72.9	339	i 11	29	+ 1	e 20	55	+ 5	e 14	7	PP	—
Cheb	73.3	341	e 11	32	+ 2	i 20	58	+ 3	e 21	27	ScS	e 39.2
Harvard	73.8	37	i 11	33 <sup>k</sup>	0	e 21	0	- 1	—	—	—	e 35.2
Kew	74.0	348	e 11	21	-13	e 21	59	+56	e 36	37?	Q	e 40.8
Poona	z. 74.0	279	i 11	31	- 3	—	—	—	—	—	—	—
Weston	74.0	37	i 11	35 <sup>k</sup>	+ 1	e 25	35	SS	—	—	—	e 36.7
Ogyalla	74.1	336	e 11	38	+ 3	e 21	10	+ 6	e 11	54	pP	e 43.2
Uccle	74.1	345	e 11	37	+ 2	e 21	24	sS	e 11	50	pP	—
Bucharest	74.2	335	e 11	42	+ 7	i 21	29	sS	—	—	—	—
Budapest	74.2	335	11	37	+ 2	e 21	21	sS	16	25	PPP	42.5
Palisades	74.2	39	—	—	—	e 21	6	+ 1	e 29	3	SSS	e 43.3
Bombay	74.3	281	e 11	35	- 1	i 21	5	- 1	14	23	PP	30.8
Fordham	74.3	39	e 11	26	-10	—	—	—	i 11	4	?	—
Halifax	74.6	31	e 11	38 <sup>a</sup>	0	21	12	+ 2	—	—	—	—
Washington	74.7	42	e 11	38	0	—	—	—	—	—	—	—
Karlsruhe	75.1	343	e 11	43 <sup>a</sup>	+ 3	e 21	21	+ 6	—	—	—	—
Stuttgart	75.2	342	i 11	42 <sup>a</sup>	+ 1	e 21	20	+ 4	e 22	10	PS	e 38.8
Djakarta	75.3	238	e 10	31	-71	e 21	29	+12	—	—	—	—
Timisoara	75.3	333	i 11	41	- 1	e 21	38	ScS	e 11	45	P	—
Strasbourg	75.6	343	i 11	44	+ 1	e 21	32	+11	e 11	55	pP	e 40.8
Belgrade	76.3	333	e 11	48	+ 1	e 21	48	sS	e 12	2	pP	e 47.7
Paris	76.3	347	i 11	49	+ 2	e 21	10	-18	i 12	2	pP	—
Jersey	E. 76.5	350	e 15	30	?	—	—	—	—	—	—	—
Basle	76.7	343	e 11	49 <sup>a</sup>	- 1	—	—	—	—	—	—	—
Zürich	76.7	343	e 11	49 <sup>a</sup>	- 1	e 21	37	+ 4	—	—	—	—
Istanbul	z. 77.1	326	11	52	0	22	44	PPS	—	—	—	38.8
Besançon	77.2	343	i 11	54	+ 2	—	—	—	—	—	—	—
Triest	77.2	337	i 11	52 <sup>k</sup>	0	e 21	45?	+ 7	e 14	53	PP	—
Salo	N. 78.0	340	e 11	56	- 1	e 22	23	PS	e 12	48	?	—
Oropa	78.5	342	e 11	16?	-43	i 22	57	PPS	e 23	57	?	—
Pavia	78.6	340	i 12	3 <sup>k</sup>	+ 3	e 22	14	sS	e 14	59	PP	—
Bologna	78.9	339	e 12	6	+ 4	e 22	22	sS	e 13	23	?	—
Clermont-Ferrand	79.2	345	e 12	3	0	e 22	20	sS	—	—	—	37.8
Prato	79.5	339	e 12	3	- 2	i 22	21	sS	—	—	—	—
Florence	79.6	339	i 12	6 <sup>a</sup>	+ 1	i 22	25	sS	i 23	19	PPS	43.8
Tacubaya	79.8	71	e 12	23	sP	—	—	—	—	—	—	—
Siena	80.0	339	e 12	14	+ 6	—	—	—	—	—	—	—
Ksara	81.0	317	e 12	14?	+ 1	e 22	34?	sS	—	—	—	—
Rome	81.1	337	i 12	14	+ 1	e 22	27	+ 8	—	—	—	—
Messina	83.8	334	i 12	26 <sup>k</sup>	- 1	e 23	1	+14	i 12	40	pP	—
Tortosa	84.4	346	e 12	34	+ 4	i 23	7	+14	—	—	—	—
Bermuda	85.2	38	—	—	—	e 23	10	+10	—	—	—	e 44.2
Toledo	85.9	350	i 12	40	+ 2	e 24	12	PS	—	—	—	52.2
Helwan	86.3	319	12	40	0	e 23	18	+ 7	i 12	52	pP	—
Alicante	86.9	347	12	42	- 1	23	25	+ 8	—	—	—	41.5
Algiers Univ.	z. 87.9	343	e 12	47	0	—	—	—	—	—	—	—
Granada	88.5	349	i 13	22 <sup>k</sup>	+32	i 23	58	+26	16	22	PP	46.8
Almeria	88.7	348	12	51	0	23	35	+ 1	18	15	PPP	51.7
Malaga	89.0	349	i 12	52	- 1	i 24	11	+35	16	39	PP	54.5
Tamanrasset	z. 101.0	337	e 13	48	0	e 25	13	- 7	e 27	0	PS	—
M'Bour	112.1	358	e 20	45	?	—	—	—	—	—	—	—
Pretoria	z. 135.7	291	e 18	52	[-25]	—	—	—	—	—	—	—

May 4d. 11h. 49m. Pamir region. Epicentre 38°·6N. 69°·5E.

Bull. of Seismological stations of the U.S.S.R. for April-June, 1953, Moscow, 1954, p. 86.

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May 4d. 15h. 26m. 36s. Epicentre 28°·0S. 63°·5W. Depth of focus 0·090.  
(as on 1953, March 4d.).

A = +·3946, B = -·7914, C = -·4670 ;  $\delta = +11$  ;  $h = +2$  ;  
D = -·895, E = -·446 ; G = -·208, H = +·418, K = -·884.

		$\Delta$	Az.	P.		O-C.		S.		O-C.		Supp.		L. m.	
				m.	s.	s.	m.	s.	s.	m.	s.				
Copiapo	E.	6·1	275	i 1	40	- 3		1	49	?		2	4	?	—
Montezuma		7·2	317	e 1	50	- 2		e 3	16	- 6		—	—	—	—
Antofagasta	E.	7·6	303	e 1	50	- 6		(i 3	25)	- 4		2	46	?	i 3·4
Buenos Aires		7·8	148	1	59	+ 1		3	30	- 2		—	—	—	—
Santa Lucia	N.	8·2	228	i 2	7	+ 5		3	49	+10		3	0	?	—
La Plata		8·4	147	i 1	59	- 5		i 3	42	0		3	24	?	4·1
La Paz		12·2	338	i 2	41k	- 0		i 4	50	0		i 3	4	PP	5·8
Huancayo		19·4	324	i 3	48	- 1		i 6	55	+ 1		i 7	40	PcP	—
Bogota		34·0	342	i 6	5	+ 9		i 10	49	+ 7		i 15	22	ScS	—
Chinchina		34·7	340	i 6	1	- 1		i 10	48	- 4		i 15	13	ScS	—
Galerazamba		40·2	343	12	41	PcS		i 12	13	0		e 15	57	sS	—
Fort de France		42·5	5	i 7	4	- 1		i 12	42	- 4		i 16	2	SS	—
San Juan		46·2	358	i 7	29	- 5		i 13	29	- 8		—	—	—	—
Merida		54·8	331	—	—	—		e 14	49	?		—	—	—	—
Vera Cruz		56·6	323	e 9	27	+38		e 15	59	+ 3		e 9	39	PcP	—
Puebla		57·6	321	e 9	18	+23		—	—	—		e 9	27	?	—
Tacubaya		58·4	321	i 9	2a	+ 2		e 16	22	+ 3		e 12	39	ScP	—
Bermuda		60·1	359	i 9	10k	- 2		i 16	40	0		e 18	0	ScS	—
M'Bour		61·7	52	i 9	23	+ 1		i 12	13	sP		i 11	20	pP	—
Guadalajara		61·8	318	—	—	—		e 12	57	ScP		—	—	—	—
Columbia		63·9	345	i 9	38	+ 2		i 17	27	+ 1		—	—	—	—
Washington		67·8	350	i 10	1	+ 1		—	—	—		i 11	56	pP	—
Morgantown		69·0	347	i 10	8	0		i 18	28	+ 2		—	—	—	—
Fordham		69·1	353	i 10	9	+ 1		e 18	29	+ 2		—	—	—	—
Palisades		69·3	353	i 10	9k	- 1		i 18	31	+ 2		e 19	15	ScS	—
Chihuahua		69·5	322	—	—	—		i 19	1	ScS		—	—	—	—
Cincinnati		69·6	344	i 10	11	0		i 18	32	- 1		—	—	—	—
Pittsburgh		69·8	348	—	—	—		i 18	36	+ 1		—	—	—	—
Fayetteville		70·0	334	i 10	13	- 1		e 18	39	+ 2		i 12	10	pP	—
Weston		70·4	355	i 10	16k	0		e 18	43	+ 1		i 13	1	PP	—
Harvard		70·5	355	e 10	16a	0		i 18	46	+ 3		i 12	14	pP	—
Cleveland		71·1	346	i 10	18k	- 2		i 18	48	- 2		i 12	15	pP	—
Lubbock		71·2	327	—	—	—		e 18	51	0		—	—	—	—
Buffalo (Larkin)		71·9	349	i 10	24	- 1		—	—	—		—	—	—	—
Buffalo		72·0	349	i 10	25	0		—	—	—		i 12	21	pP	—
Halifax		72·3	1	i 10	26k	- 1		i 19	4	+ 1		12	26	pP	30·2
Ottawa		73·9	352	e 10	35a	- 1		19	24	+ 4		12	34	pP	—
Shawinigan Falls N.		74·7	354	e 10	41	+ 1		19	31	+ 2		13	35	PP	—
Tucson		74·9	320	i 10	44	+ 2		e 19	37	+ 6		i 12	42	pP	—
Seven Falls	E.	75·1	356	e 10	45	+ 2		i 19	39	+ 6		—	—	—	—
Grahamstown	Z.	75·3	120	i 10	44	0		—	—	—		i 12	43	pP	—
Kirkland Lake	Z.	77·2	349	e 10	23	-31		e 19	56	0		i 12	54	pP	—
Nelson		79·7	320	i 11	9	+ 2		i 20	28	+ 7		i 13	10	pP	—
Pretoria	Z.	79·7	113	i 11	8	+ 1		—	—	—		—	—	—	—
Pietermaritzburg	Z.	79·8	118	e 11	10	+ 2		—	—	—		—	—	—	—
Boulder City		79·9	320	i 11	10	+ 2		—	—	—		i 11	18	PcP	—
Riverside	Z.	80·0	317	i 11	10a	+ 1		—	—	—		i 13	15	pP	—
Pasadena		80·6	317	i 11	14a	+ 2		i 20	35	+ 5		i 13	15	pP	—
Averroes		80·9	45	i 11	13	0		e 14	11	sP		e 13	3	pP	—
China Lake	Z.	81·4	319	i 11	17a	+ 1		i 14	26	sP		i 13	19	pP	—
Tinemaha	Z.	82·7	319	i 11	24	+ 2		i 20	56	+ 5		i 13	26	pP	—
Fresno		83·3	318	e 11	26a	+ 1		e 21	0	+ 3		e 13	28	pP	—
Tamanrasset	Z.	83·5	60	i 11	26a	0		e 20	52	- 7		i 13	26	pP	—
Lisbon		83·6	40	i 11	26k	- 1		20	54	- 6		14	47	PP	—
Lick	Z.	84·8	317	e 11	35a	+ 2		e 21	26	+15		i 13	38	pP	—

Continued on next page.

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		$\Delta$ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	Supp. m. s.	L. m.	
Malaga		85.0	44	11 35	+ 1	e 20 42	[-18]	17 4	PPP	—
Reno		85.2	320	e 11 38 <sub>a</sub>	+ 3	e 21 21	+ 6	e 13 39	pP	—
Berkeley		85.6	317	i 11 38 <sub>a</sub>	+ 1	e 21 12	- 6	i 13 41	pP	—
Granada		85.8	45	i 11 41 <sub>a</sub>	+ 3	21 26	+ 6	11 50	PcP	46.3
Almeria		86.3	46	i 11 38	- 2	22 2	+37	27 26	SS	44.8
Mineral	z.	86.8	320	e 11 44 <sub>a</sub>	+ 2	e 21 31	+ 1	e 13 45	pP	—
Toledo		87.3	42	i 11 45	0	e 21 19	[+ 4]	e 13 49	pP	—
Shasta		87.5	320	i 11 46 <sub>a</sub>	0	e 21 36	0	e 13 44	pP	—
Hungry Horse		88.4	329	i 11 51	+ 1	i 21 32	SKKS	i 13 54	pP	—
Alicante		88.5	45	11 43	- 7	21 38	- 7	15 24	PP	42.1
Algiers Univ.	z.	89.8	48	i 11 58	+ 2	e 14 56	sP	e 14 1	pP	—
Tortosa		90.5	44	i 12 1	+ 1	i 21 38	[+ 4]	—	—	—
Seattle	z.	92.0	325	14 10	pP	—	—	—	—	—
Christchurch		92.2	217	e 14 18	pP	—	—	—	—	—
Wellington		92.5	220	i 14 16 <sub>k</sub>	pP	—	—	—	—	—
Kaimata	N.E.	93.5	217	e 14 24	pP	—	—	—	—	—
Cobb River	E.	93.8	219	e 14 22	pP	e 22 37	+ 6	—	—	—
Karapiro	N.	94.2	224	14 22	pP	—	—	—	—	—
Rathfarnham C.	z.	94.9	30	i 12 23 <sub>k</sub>	+ 3	e 22 39	- 1	i 14 27	pP	—
Clermont-Ferrand		95.0	41	i 12 20	0	e 22 3	[+ 5]	e 26 0	PPS	—
Paris		96.5	38	i 12 27	0	e 16 26	PP	e 14 38	pP	—
Kew		96.6	35	—	—	e 23 24	+30	—	—	—
Besançon		97.5	39	i 12 31	0	—	—	—	—	—
Pavia		98.3	43	e 15 23	sP	—	—	e 19 4	?	—
Basle		98.6	41	e 12 39	+ 3	e 22 11	[- 6]	—	—	—
Tananarive		98.6	117	e 11 15?	-81	—	—	—	—	—
Rome		98.7	47	e 12 24	-13	e 22 23	[+ 6]	e 18 32	PPP	—
Florence		98.8	45	i 12 36 <sub>k</sub>	- 1	e 23 33	+20	i 18 31	PPP	—
Messina	E.	98.9	51	—	—	e 22 13	[- 5]	e 25 51	SPP	—
Zürich		99.1	42	e 12 38 <sub>k</sub>	0	e 22 15	[- 4]	—	—	—
Strasbourg		99.2	40	i 12 39	0	e 16 44	PP	e 19 7	PPP	—
De Bilt		99.7	36	i 12 42	+ 1	e 22 24	[+ 2]	e 16 50	PP	—
Karlsruhe	z.	99.8	39	e 12 43 <sub>k</sub>	+ 1	e 13 38	?	e 16 43	PP	—
Stuttgart		100.1	41	i 12 44 <sub>k</sub>	+ 1	e 22 28	[+ 4]	e 16 55	PP	—
Witteveen	z.	100.9	35	i 12 48 <sub>a</sub>	+ 1	—	—	—	—	—
Triest		101.3	45	i 12 48 <sub>k</sub>	0	e 26 24?	PS	i 17 5	PP	—
Cheb		102.6	40	e 17 12	PP	e 22 41	[+ 5]	e 26 32	sS	—
Jena		102.6	39	e 12 53	P	e 22 39	[+ 3]	e 17 11	PP	—
Scoresby Sund		102.6	13	i 12 54	P	e 23 45	+ 1	i 27 37	sS	—
Collmberg		103.5	40	e 12 58	P	e 17 17	PP	e 19 6	pPP	—
Prague		103.8	41	i 13 1	P	e 23 56	+ 2	e 27 53	sS	—
Potsdam		104.1	38	e 13 1	P	i 22 48	[+ 6]	i 17 23	PP	—
Resolute Bay		104.4	352	e 13 1	P	—	—	—	—	—
Belgrade		105.2	48	e 16 32	?	e 26 50	PS	e 19 40	PPP	—
Copenhagen		105.3	35	17 31	PP	22 50	[+ 2]	e 24 11	S	—
Raciborz		106.0	41	e 16 19	sP	e 17 37	PP	e 18 5	?	—
Timisoara	N.	106.1	46	e 18 6	PP	e 27 24	PS	—	—	—
Skalnate Pleso		106.8	43	e 17 49	PP	e 20 11	PPP	e 21 3	?	—
Helwan	z.	107.2	66	e 17 9	PKP	—	—	i 17 54	PP	—
Lwow		109.3	43	—	—	i 23 6	[+ 1]	—	—	—
Upsala	z.	109.5	32	i 13 29	P	e 30 48	?	i 17 20	PKP	—
Istanbul		109.6	54	13 34?	P	e 26 24	SP	e 20 55	sPP	—
Riverview	z.	110.3	211	i 17 23 <sub>a</sub>	[- 1]	—	—	—	—	—
Kishinev		111.4	45	e 17 28	[+ 2]	—	—	—	—	—
Ksara		112.3	63	i 18 25?	PP	—	—	20 25	pPP	—
College		112.6	333	i 17 31	[+ 3]	e 16 43	sP	e 13 39	P	—
Kiruna		113.4	25	i 17 32	[+ 2]	e 23 21	[ 0]	i 13 45	P	e 42.4
Yalta		114.2	52	e 17 35	[+ 4]	e 23 27	[+ 3]	e 24 39	SKKS	—
Simferopol		114.3	50	e 17 42	[+10]	e 23 27	[+ 3]	e 18 45	PP	—
Pulkovo		115.6	34	i 17 36	[+ 2]	i 23 32	[+ 3]	i 24 46	SKKS	—

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	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Zugdidi	119.2	54	e 17 37	[- 4]	—	—	—	—
Abastumanj	119.7	55	e 17 46	[+ 4]	—	—	—	—
Borzhomi	120.1	55	e 17 46	[+ 3]	—	—	—	—
Tsikhlis-Dzhvari	120.2	55	17 47	[+ 4]	—	—	—	—
Leninakan	120.3	58	e 19 34	PP	—	—	—	—
Piatigorsk	120.4	52	17 46	[+ 2]	i 23 50	[+ 4]	i 21 18	PKS
Erevan	120.6	57	e 19 11	PP	—	—	—	—
Gori	120.7	55	e 17 48	[+ 4]	—	—	—	—
Tiflis	121.2	57	e 17 48	[+ 3]	e 23 55	[+ 6]	e 21 20	PKS
Grozny	122.1	55	e 17 48	[+ 1]	i 21 25	PKS	i 19 29	PP
Shemakla	123.8	58	i 17 54	[+ 3]	—	—	i 19 49	PP
Baku	124.7	59	e 19 47	PP	—	—	—	—
Kizyl-Arvat	129.4	61	i 20 28	pPKP	—	—	—	—
Ashkabad	130.5	63	i 18 6	[+ 3]	—	—	i 20 31	pPKP
Sverdlovsk	131.5	37	i 18 8	[+ 3]	—	—	i 20 30	pPKP
Bairam-Ali	133.9	64	i 18 13	[+ 3]	i 21 44	PKS	i 20 26	pPKP
Quetta	z. 137.0	75	i 18 19	[+ 4]	i 21 55	PKS	—	—
Samarkand	137.3	62	e 18 7	[- 9]	—	—	—	—
Bombay	139.1	94	i 18 24	[+ 5]	i 21 59	PKS	i 21 6	pPKP
Lunacharskoe	139.4	59	e 18 17	[- 3]	e 21 59	PKS	—	—
Tchimkent	139.6	57	i 18 14	[- 6]	—	—	—	—
Kulyab	139.9	64	18 15	[- 6]	—	—	—	—
Poona	z. 139.9	96	i 18 15	[- 6]	—	—	—	—
Garm	140.3	61	e 18 17	[- 5]	—	—	—	—
Dzhergetal	141.0	61	18 21	[- 2]	—	—	—	—
Namangan	141.3	60	i 18 20	[- 4]	—	—	i 21 33	PP
Warsak Dam	E. 141.3	69	i 18 27	[+ 3]	—	—	—	—
Fergana	141.4	60	i 18 20	[- 4]	—	—	—	—
Khorog	141.4	64	i 18 22	[- 2]	i 21 10	SKP	—	—
Andijan	141.8	60	i 18 21	[- 4]	i 24 31	[- 4]	i 21 38	PP
Frunse	143.2	55	i 18 26	[- 1]	i 27 42	SKKS	i 21 46	PP
Bandung	144.3	167	e 18 34	[+ 5]	—	—	—	—
Rybach'e	144.3	56	i 18 30	[+ 1]	i 22 13	PKS	—	—
Naryn	144.4	56	i 18 31	[+ 2]	—	—	i 21 52	PP
Semipalatinsk	144.6	41	18 30	[+ 1]	—	—	—	—
Almata	144.8	53	i 18 32	[+ 2]	—	—	—	—
Djakarta	z. 144.8	164	e 18 31	[+ 1]	—	—	i 18 34	pPKP <sub>2</sub>
New Delhi	145.5	80	i 18 35	[+ 5]	—	—	—	—
Przhevalsk	146.0	54	i 18 35	[+ 4]	i 27 57	SKKS	—	—
Chatra	z. 154.0	85	i 18 47	[+ 4]	—	—	—	—
Irkutsk	154.1	18	18 46	[+ 3]	e 41 24	SS	—	—
Kabansk	154.9	15	i 18 48	[+ 4]	41 54	SS	i 21 8	pPKP
Kyakhta	156.4	17	18 49	[+ 3]	28 54	SKKS	19 20	PKP <sub>2</sub>
Shillong	E. 157.9	91	e 18 52	[+ 4]	i 19 28	PKP <sub>2</sub>	23 8	PP
Vladivostok	160.4	326	e 18 53	[+ 3]	—	—	—	—
Baguio	167.9	199	i 19 4	[+ 7]	—	—	—	—
Zô-Sè	z. 175.0	—	19 4k	[+ 3]	—	—	24 38	PP
Nanking	z. 175.5	—	19 4k	[+ 3]	i 25 19	[+ 13]	i 21 18	pPKP

May 4d. 23h. 27m. 1s. Epicentre 50°·2N. 157°·3E. Focus at Base of Superficial Layers.  
(as on 1952, December 12d.).

$$A = -0.5929, B = +0.2480, C = +0.7662; \quad \delta = +10; \quad h = -5;$$

$$D = +0.386, E = +0.922; \quad G = -0.707, H = +0.296, K = -0.643.$$

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Petropavlovsk	3.1	16	0 46	- 2	1 24	0	—	—
Klyuchi	6.5	17	1 40	+ 4	3 1	+ 11	—	—
Kurilsk	8.1	235	e 1 59	+ 1	e 3 33	+ 3	—	—
Magadan	10.0	341	e 2 23?	- 1	e 4 25?	+ 8	—	—
Yuzno-Sakhlinsk	10.2	257	e 2 25	- 2	e 4 22	0	—	—

Continued on next page.

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		$\Delta$ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	Supp. m. s.	L. m.
College		31.7	42	i 6 23	0	—	—	—	—
Resolute Bay		46.7	21	e 8 27k	0	—	—	—	—
Hungry Horse		54.5	55	i 9 28	+ 1	—	—	i 10 31	PcP
Shasta	z.	54.6	66	e 9 29k	+ 1	—	—	e 9 41	pP
Mineral	z.	55.2	66	i 9 34k	+ 2	i 10 14	?	i 9 47	pP
Berkeley	z.	56.4	70	e 9 42k	+ 2	—	—	—	—
Butte		56.7	56	e 9 44	+ 1	—	—	—	—
Lick	z.	57.2	70	i 9 48k	+ 2	—	—	—	—
Kiruna		57.9	342	e 9 47	- 4	i 10 14	?	i 10 36	PcP
Presno	z.	58.7	68	e 9 58	+ 1	—	—	e 10 11	pP
Tinemaha	z.	59.3	68	e 10 2	+ 1	—	—	i 10 7	?
Scoresby Sund		59.6	0	i 10 2k	- 1	—	—	—	—
China Lake	z.	60.6	68	i 10 11	+ 1	—	—	i 10 24	pP
Pasadena		61.4	70	i 10 16	+ 1	—	—	i 10 29	pP
Riverside	z.	62.0	70	i 10 19	0	—	—	e 10 32	pP
Boulder City		62.1	66	i 10 22	+ 2	—	—	i 10 35	pP
Nelson		62.3	66	i 10 22	+ 1	—	—	—	—
Upsala	z.	65.5	339	i 10 38	- 4	—	—	—	—
Tucson		67.1	67	i 10 54	+ 2	—	—	—	—
Quetta	z.	67.6	291	i 10 53	- 2	—	—	—	—
Kirkland Lake	z.	70.9	37	e 11 11	- 5	—	—	—	—
Fayetteville		73.5	53	i 11 31	0	—	—	i 11 43	pP
Ottawa		74.3	36	e 11 35k	- 1	—	—	—	—
Collmberg		74.4	337	e 11 34	- 2	—	—	—	—
Jena		75.1	338	e 11 37	- 3	—	—	e 11 47	pP
Morgantown		77.4	42	i 11 54	+ 1	—	—	—	—
Stuttgart		77.7	339	e 11 53	- 2	—	—	—	—
Harvard		78.3	35	i 11 59k	+ 1	—	—	i 12 10	pP
Weston		78.5	35	i 12 0k	+ 1	—	—	—	—
Paris		79.0	343	i 12 1	- 1	—	—	e 12 23	PcP
Halifax		79.1	28	e 12 3	0	—	—	—	—
Basle	z.	79.2	340	e 11 37k	-26	—	—	—	—
Besançon		79.8	341	e 12 6	0	—	—	—	—
Chambon-la-Forêt		79.8	343	i 12 9	+ 3	—	—	—	—
Messina	e.	85.7	330	—	—	e 26 18	?	—	—
Helwan	z.	87.0	315	i 12 42k	- 1	—	—	—	—
Alicante		90.3	343	e 12 57	- 2	23 51	+ 3	16 34	PP
Tamanrasset	z.	103.1	333	e 13 56	- 1	—	—	e 18 10	PP

May 5d. 1h. 25m. Epicentre 46°·3N. 7° 3E. Intensity V at Sion.

E. Wanner.

Jahresbericht des Erdbebendienstes im Jahre, 1953, Zürich, 1954, p. 3. Macro seismic chart. Fig. 6.

May 5d. 16h. 0m. Epicentre 32°·5N. 137°·0E. Depth 350-450km.

Seismo. Bull. Cent. Met. Obs., Japan, for May, 1953, Tokyo, 1953, p. 11.

May 6d. 8h. 22m. Epicentre 38°·7N. 26°·5E.

Felt intensity IV at Neochorion, Isle of Chios.

A. Galanopoulos.

Seismological Institute Bulletin, 1953, Athens, 1954, p. 59. Only recorded very locally.

May 6d. 9h. 46m. Epicentre 40°·9N. 47°·1E.

Bulletin of Seismo. stations of U.S.S.R. for April-June, 1953, Moscow, 1954, p. 88.



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May 6d. 17h. 16m. 50s. Epicentre 36°·5S. 72°·6W. Depth of focus 0·005.  
(as on 1946, December 4d.).

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

		$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.	
		°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.	
Santa Lucia	N.	3·4	27	1	3	+11	1	50	+18	1	26	?	2·0
Santiago		3·4	28	i 1	3	+11	—	—	—	—	—	—	—
Copiapo	E.	9·3	12	e 2	17	+ 3	4	9	+11	3	45	?	—
Buenos Aires		11·7	85	i 2	50	+ 4	5	2	+ 6	—	—	—	—
La Plata		12·0	87	i 2	47	- 3	5	4	+ 1	—	—	—	6·0
Antofagasta	E.	12·9	9	e 3	7	+ 5	i 5	39	+14	i 6	4	?	—
Montezuma		14·2	14	e 3	18	- 1	i 6	56	+60	—	—	—	—
La Paz		20·3	13	i 4	38 <sub>a</sub>	+ 5	i 8	19	+ 7	i 5	8	PP	10·2
Huancayo		24·5	354	i 5	18	+ 4	i 9	40	+13	—	—	—	—
Bogota		40·9	358	i 7	40	+ 3	i 14	6	+22	i 8	2	pP	—
Chinchina		41·3	357	i 7	42	+ 1	i 13	29	-21	i 8	3	pP	—
Balboa Heights		45·7	350	8	20	+ 4	13	46	-68	—	—	—	—
Galerazamba		47·1	357	c 8	31	+ 4	c 15	28	+14	e 19	9	SS	—
Fort de France		52·1	14	i 9	3	- 3	i 16	25	+ 2	14	21	PcS	—
Kingston		54·3	356	i 9	28	+ 6	i 17	0	+ 7	i 11	0	PP	—
Ciudad Trujillo		54·7	4	i 9	26	+ 1	i 17	6	+ 8	—	—	—	—
San Juan		54·9	8	i 9	24	- 2	i 17	4	+ 3	—	—	—	—
Oaxaca		57·9	334	i 9	43 <sub>k</sub>	- 5	e 17	36	- 5	e 10	25	PcP	e 23·4
Merida		59·4	343	e 9	56 <sub>k</sub>	- 2	e 18	8	+ 8	e 24	35	sSS	—
Vera Cruz		59·7	335	i 10	1 <sub>k</sub>	+ 1	e 18	14	+10	e 13	33	PPP	e 29·2
Puebla		60·3	332	e 10	7	+ 3	e 18	19	+ 7	e 10	23	pP	—
Tacubaya		61·0	332	i 10	13 <sub>k</sub>	+ 4	i 18	33	+12	i 10	29	pP	e 29·2
Guadalajara		63·9	328	e 16	38	?	e 19	7	+10	e 25	14	SSS	e 30·5
Mobile		68·4	345	e 10	53	- 4	e 19	53	+ 1	—	—	—	—
Bermuda		68·9	8	i 10	58	- 2	i 20	3	+ 5	e 13	28	PP	e 33·9
Columbia		70·6	354	e 11	11	+ 1	i 20	26	+ 8	—	—	—	—
Chihuahua		72·0	330	e 11	14	- 5	i 20	30	- 4	e 11	23	pP	e 34·5
M'Bour		72·9	56	i 11	24	0	i 21	10	+26	i 11	42	pP	e 33·4
Lubbock		74·9	335	e 11	25	-11	21	12	+ 6	—	—	—	—
Fayetteville		75·0	343	i 11	34	- 2	i 21	11	+ 3	i 11	52	pP	—
Washington		75·1	358	i 11	37	0	i 21	17	+ 8	—	—	—	—
Cincinnati		76·1	352	i 11	40	- 2	—	—	—	—	—	—	—
Morgantown		76·1	354	i 11	41	- 1	i 21	24	+ 4	—	—	—	—
St. Louis		76·5	346	i 11	32	-13	i 21	19	- 5	—	—	—	—
Terre Haute		76·8	349	—	—	—	e 22	10	PS	—	—	—	—
Pittsburgh		76·9	355	i 11	43	- 4	i 21	32	+ 4	i 14	41	PP	—
Fordham		77·0	0	i 11	51	+ 3	e 21	42	+13	—	—	—	—
Palisades		77·1	0	i 11	47 <sub>a</sub>	- 1	i 21	38	+ 8	e 26	33	SS	e 35·2
Tucson		77·2	329	e 11	49	0	e 21	36	+ 4	i 12	26	pP	e 32·9
Grahamstown	z.	77·5	122	e 11	45	- 5	—	—	—	—	—	—	—
Hartford		77·9	0	i 11	49	- 3	23	50	?	—	—	—	—
Cleveland		78·0	353	i 11	52 <sub>a</sub>	- 1	i 21	52	+12	i 14	42	PP	—
Weston		78·5	2	e 11	54 <sub>a</sub>	- 2	i 21	54	+ 9	—	—	—	—
Harvard		78·6	2	e 11	54	- 2	i 26	36	SS	i 12	16	pP	—
Kimberley	z.	78·9	118	i 11	53	- 5	—	—	—	—	—	—	—
Chicago		79·2	349	e 11	59	- 1	i 21	54	+ 1	—	—	—	—
Buffalo (Larkin)		79·2	356	e 11	57	- 3	—	—	—	—	—	—	—
Buffalo		79·3	356	i 11	58	- 2	i 21	55	+ 1	—	—	—	—
Barratt	z.	80·2	325	i 12	39	+34	e 38	52	P'P'	i 12	52	pP	—
Christchurch		80·8	222	e 12	4	- 4	22	10	0	e 12	30	PcP	e 36·7
Wellington		81·0	225	12	7	- 2	22	7	- 5	e 12	22	PcP	e 37·1
Halifax		81·3	7	i 12	7 <sub>a</sub>	- 4	22	19	+ 4	15	16	PP	—
Tnai	N.	81·3	228	e 12	22	+11	e 22	15	0	—	—	—	—
Ottawa		81·6	358	i 12	10 <sub>k</sub>	- 2	i 22	22	+ 4	15	18	PP	34·2
Riverside	z.	81·6	324	i 12	12	0	—	—	—	i 12	32	pP	—

Continued on next page.

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		$\Delta$	Az.	P.		O-C.	S.	O-C.	Supp.		L.	
		°	°	m.	s.	s.	m.	s.	m.	s.	m.	
Nelson		81.9	328	e 12	12	- 2	e 22	33	+12	—	—	
Tongariro	Z.	82.0	227	e 12	12	- 2	—	—	i 12	28	pP e 37.3	
Boulder City		82.1	328	e 12	14	- 1	e 42	8	SKPP'	i 12	34	pP
Kaimata	N.E.	82.1	222	e 12	23	+ 8	e 22	24	+ 1	e 12	35	pP
Pasadena		82.1	324	i 12	14 <sub>a</sub>	- 1	i 22	34	+11	i 12	33	pP e 38.9
Cobb River	E.	82.3	224	e 12	16	0	e 22	23	- 2	e 12	29	pP
Pietermaritzburg	Z.	82.3	121	i 12	13	- 3	—	—	—	—	—	—
Shawinigan Falls	N.	82.7	0	e 12	17	- 1	22	32	+ 3	15	31	PP
Johannesburg		82.8	117	e 12	16	- 2	—	—	—	—	—	—
Karapiro	N.	82.8	228	e 12	18	0	e 22	26	- 4	e 12	29	pP e 42.3
New Plymouth	E.	82.9	226	e 12	31	+12	e 22	27	- 4	—	—	e 42.3
Pretoria	Z.	83.1	117	e 12	16 <sub>?</sub>	- 4	—	—	—	—	—	—
China Lake	Z.	83.2	325	i 12	14	- 7	e 38	45	P'P'	i 12	38	pP
Seven Falls	E.	83.3	2	e 12	23	+ 2	22	42	+ 7	i 12	40	pP 34.9
Auckland	N.	84.0	228	12	35	+10	e 22	47	+ 5	e 28	21	SS e 34.5
Kirkland Lake	Z.	84.5	355	e 12	25 <sub>a</sub>	- 2	—	—	—	—	—	—
Tinemaha	Z.	84.6	325	i 12	27	- 1	—	—	—	i 12	45	pP
Fresno		85.0	323	e 12	26 <sub>a</sub>	- 4	e 22	58	+ 6	e 12	45	pP e 42.0
Angra do Heroismo		85.7	35	i 12	37	+ 4	i 23	14	+15	e 18	4	PPP i 47.9
Heard Island		86.1	160	e 12	23	-12	e 22	43	[- 9]	—	—	—
Lick		86.4	323	e 12	36 <sub>a</sub>	0	e 23	6	+ 1	i 12	55	pP e 41.3
Santa Clara		86.5	323	e 12	39 <sub>k</sub>	+ 2	e 23	1	- 5	—	—	e 41.2
Berkeley		87.1	323	e 12	38	- 2	e 23	24	+12	i 12	58	pP e 36.5
Reno		87.3	326	e 12	39 <sub>a</sub>	- 2	e 23	27	+13	i 13	0	pP
Bozeman		88.7	335	e 12	48	+ 1	e 23	14	[+ 5]	—	—	—
Mineral		88.7	325	—	—	—	e 23	18	- 9	e 23	38	SP
Apia		89.1	254	e 12	52	+ 3	e 23	24	- 7	—	—	e 40.7
Shasta		89.4	325	e 12	48	- 3	e 23	17	[+ 4]	e 30	28	PKKP e 43.4
Butte		89.7	334	i 12	52	0	e 23	20	[+ 5]	—	—	—
Arcata		90.3	324	e 13	8	+13	e 23	28	[+ 9]	—	—	—
Hungry Horse		92.2	334	i 13	2	- 2	e 23	36	[+ 6]	i 13	23	pP
Averroes		92.3	49	i 13	3	- 1	23	31	[+ 1]	16	51	PP e 44.2
Corvallis		92.8	326	e 13	5	- 2	e 23	35	[+ 2]	e 40	23	Q e 46.8
Saskatoon		93.1	340	e 13	10	+ 2	i 24	9	+ 3	i 23	38	SKS 46.7
Tamanrasset	Z.	94.3	65	i 13	12 <sub>k</sub>	- 1	e 23	33	[- 8]	i 17	2	PP
Seattle	Z.	94.8	329	e 13	17	+ 1	e 24	45	+24	—	—	—
Lisbon	Z.	95.0	45	e 13	14	- 3	—	—	—	17	8	PP 45.5
Victoria		95.8	329	13	19	- 1	23	49	[ 0]	—	—	e 39.3
Coimbra		96.4	44	13	25	+ 2	23	55	[+ 2]	17	13	PP 43.2
Malaga		96.4	49	i 13	25	+ 2	i 24	46	+12	i 17	19	PP 45.2
Granada		97.2	49	i 13	26 <sub>a</sub>	- 1	23	53	[- 4]	i 17	27	PP i 46.5
Almeria		97.7	50	26	12	PS	24	22	SKKS	i 24	44	S 46.8
Melbourne	E.	98.3	210	—	—	—	i 24	11	[+ 9]	i 24	57	S 41.7
Toledo		98.7	47	e 13	34	+ 1	24	11	[+ 7]	17	39	PP 46.9
Riverview		99.0	216	e 13	38	+ 3	i 24	51	- 5	i 14	4	pP e 45.3
Alicante		99.9	49	i 13	42	+ 3	i 24	15	[+ 5]	i 17	47	PP 47.2
Algiers Univ.	Z.	101.1	53	i 13	44 <sub>a</sub>	0	e 27	12	PS	e 14	8	pP
Tortosa		102.0	48	i 13	50	+ 2	—	—	—	i 18	2	PP
Brisbane		103.2	221	i 14	5	+11	i 24	25	[- 1]	e 18	4	PP e 47.8
Barcelona		103.3	48	18	10	PP	24	36	[+ 9]	e 33	29	SSP e 45.5
Jersey	E.	105.7	39	e 14	10	P	e 24	46	[+ 9]	e 18	49	PP 51.2
Rathfarnham Castle		106.2	35	i 14	7	P	e 24	46	[+ 6]	i 14	28	pP e 53.2
Clermont-Ferrand		106.4	45	e 14	9	P	i 24	53	[+12]	i 18	39	PP 51.2
Sitka		107.1	330	e 14	18	P	—	—	—	18	35	PP
Chambon-la-Forêt		107.3	43	i 14	14	P	—	—	—	i 14	34	pP
Paris		107.9	42	e 14	9	P	i 24	49	[+ 2]	i 14	35	pP 50.2
Kew		108.0	39	i 14	16	P	e 25	14	SKKS	i 18	43	PKP e 43.2
Reykjavik		108.0	20	i 18	45	PP	e 28	20	PPS	—	—	e 53.2
Besançon		109.0	45	i 14	23	P	—	—	—	—	—	—
Oropa		109.2	48	i 14	23	P	e 27	50	PS	e 18	32	PP e 44.2

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		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Durham	E.	109.3	35	i 18 55	PP	—	—	—	—
Edinburgh	E.	109.3	34	e 18 12	[-10]	24 31	[-22]	18 52	PP
Neuchatel		109.4	45	e 14 22	P	e 26 19	S	—	—
Pavia		109.7	48	e 14 40	P	e 26 43	S	e 18 58	PP
Basle		110.0	45	e 14 25	P	e 18 50	PP	e 17 37	?
Rome		110.0	53	i 14 25	P	e 26 39	S	i 18 58	PP
Uccle		110.0	40	e 14 26	P	e 25 0	[+ 4]	e 18 6	PKP
Messina	E.	110.1	57	e 14 23	P	i 24 59	[+ 3]	i 18 56	PP
Reggio Calabria		110.1	57	e 18 28	[+ 4]	—	—	—	—
Rocca di Papa		110.1	53	e 17 59	[-25]	e 28 36	PS	e 19 2	PP
Florence		110.2	50	i 14 26 <sub>a</sub>	P	i 28 36	PS	i 19 0	PP
Prato		110.2	50	i 14 0	P	i 28 7	PS	—	—
Aberdeen	N.	110.5	33	i 19 5	PP	e 27 2	S	e 21 36	PPP
Chur		110.5	46	e 17 39	?	—	—	—	—
Zürich		110.5	45	e 14 28 <sub>k</sub>	P	e 18 56	PP	e 17 53	PKP
Bologna		110.6	49	e 18 48	PP	e 27 30	S	e 20 28	?
Salo		110.7	48	e 15 38	?	e 28 36	PS	i 19 3	PP
Strasbourg		110.7	44	e 14 25	P	i 25 12	[+13]	e 18 10	PKP
De Bilt		111.2	40	i 14 35 <sub>k</sub>	P	e 25 10	[+ 9]	e 18 29	PKP
Karlsruhe		111.3	44	e 14 31 <sub>k</sub>	P	e 24 58	[- 3]	e 18 21	PKP
Perth		111.5	188	19 15	PP	i 25 28	[+26]	28 38	PS
Stuttgart		111.6	45	e 14 30	P	e 25 10	[+ 7]	e 18 0	PKP
Resolute Bay		111.7	354	e 15 33	P	i 27 54	S	e 21 15	PPP
Witteveen	Z.	112.3	39	e 18 28	[ 0]	—	—	i 19 12	PP
Taranto		112.4	56	e 17 58	?	28 48	PS	e 31 38	?
Scoresby Sund		112.7	16	e 14 42	P	i 25 10	[+ 3]	i 19 20	PP
Triest		112.7	49	e 14 37	P	e 25 9 <sub>?</sub>	[+ 2]	e 18 13	PKP
Cheb		114.0	44	i 14 48	P	i 25 23	[+11]	e 18 36	PKP
Jena		114.0	44	e 14 43	P	e 25 19	[+ 7]	e 18 49	PKP
Collmberg		114.4	43	e 14 49	P	25 39	[+26]	e 18 24	PKP
Prague		115.2	45	e 18 38	[+ 4]	i 25 25	[+ 9]	e 19 6	pPKP
Bergen		115.5	32	e 18 30	[- 5]	e 25 10 <sub>?</sub>	[- 8]	e 19 37	PP
Potsdam		115.5	42	e 14 54	P	i 25 22	[+ 4]	e 18 37	PKP
Vienna		115.5	47	e 18 38	[+ 3]	e 29 12	PS	e 19 37	PP
Athens		115.6	61	e 18 21	[-14]	i 25 24	[+ 6]	e 18 50	pPKP
Kalossa		116.3	50	e 18 43	[+ 7]	25 29	[+ 8]	e 20 6	PP
Ogyalla		116.4	49	e 19 2	[+26]	e 25 30	[+ 9]	e 19 35	PP
Belgrade		116.5	53	e 18 41 <sub>a</sub>	[+ 4]	i 29 43	PS	i 19 47	PP
College		116.6	333	e 14 53	P	i 18 35	PKP	e 15 21	pP
Copenhagen		116.7	39	e 15 0	P	25 10	[-12]	22 22	PPP
Budapest	E.	116.8	50	e 18 34	[- 3]	25 44	[+22]	19 44	PP
	N.	116.8	50	e 18 44	[+ 7]	25 34	[+12]	22 22	PPP
Kecskemet		116.9	51	18 31	[- 6]	29 39	PS	19 39	PP
Szeged		116.9	50	18 43	[+ 6]	29 36	PS	19 51	PP
Raciborz		117.4	46	e 18 40	[+ 2]	e 25 28	[+ 3]	e 19 59	PP
Timisoara		117.4	51	e 18 45	[+ 7]	e 29 8	PS	e 22 32	PPP
Helwan		117.5	72	e 15 4	P	25 32	[+ 7]	18 39	PKP
Sofia		117.5	56	e 18 17	[-21]	i 25 32	[+ 7]	i 20 15	PP
Skalnate Pleso		118.2	48	e 18 48	[+ 8]	e 25 45	[+18]	e 19 19	pPKP
Uzhgorod		119.3	52	i 18 42	[ 0]	25 40	[+ 9]	20 7	PP
Campulung		119.7	53	e 18 45	[+ 2]	e 29 23	PS	e 30 33	?
Bucharest		120.0	55	i 18 40	[- 3]	i 29 13	PS	i 22 50	PPP
Lwow		120.8	48	i 18 44	[- 1]	e 25 41	[+ 5]	i 20 12	PP
Upsala		120.9	36	e 18 43	[- 2]	i 25 39	[+ 2]	i 20 15	PP
Focsani		121.2	54	e 18 28	[-18]	e 29 17	PS	e 31 46	PPS
Iasi		122.0	51	e 18 49	[+ 2]	e 29 21	PS	e 20 25	PP
Ksara		122.7	70	i 18 52	[+ 3]	30 36	PS	20 24	PP
Kishinev		122.8	53	15 27	P	30 25	PS	i 18 48	PKP
Kiruna		124.3	27	i 18 49	[- 3]	i 25 55	[+ 7]	i 20 40	PP
Helsinki		124.5	36	i 20 36	PP	e 27 36	SKKS	i 23 18	PPP
Yalta		125.4	57	15 32	P	e 25 49	[- 2]	e 18 50	PKP
Simferopol		125.6	56	e 15 34	P	e 25 50	[- 1]	e 18 52	PKP
Theodosia		126.4	57	e 15 37	P	e 25 58 <sub>?</sub>	[+ 5]	e 18 54	PKP
Pulkovo		127.0	38	i 18 55	[- 2]	e 25 57	[+ 1]	i 22 32	PKS
Sotchi		129.0	59	e 15 52	P	e 26 9	[+ 8]	e 18 59	PKP

Continued on next page.

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	$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.	
	°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.	
Moscow	129.9	44	i 19	1	[- 1]	e 28	0	SKKS	i 21	11	PP	—
Zugdidi	130.2	61	19	8	[+ 5]	—	—	—	e 21	12	PP	—
Abastumanj	130.7	63	e 19	3	[- 1]	22	34	PKS	e 21	21	PP	—
Akalkalaki	131.1	64	19	10	[+ 5]	—	—	—	—	—	—	—
Borzhomi	131.1	63	19	4	[- 1]	—	—	—	21	20	PP	—
Leninakan	131.1	65	19	12	[+ 7]	—	—	—	22	38	PKS	—
Erevan	131.4	65	i 19	6	[+ 1]	22	36	PKS	21	24	PP	—
Piatigorsk	131.4	59	19	5	[ 0]	i 22	32	PKS	21	26	PP	—
Gori	131.7	64	19	6	[ 0]	—	—	—	21	28	PP	—
Tiflis	132.1	64	18	53?	[-14]	—	—	—	e 21	11?	PP	—
Goris	132.6	66	e 15	33?	P	25	27?	[-43]	18	31?	PKP	—
Grozny	133.2	62	i 19	8	[- 1]	—	—	—	i 21	21	PP	—
Lenkoran	134.2	68	i 19	12	[+ 2]	e 22	40	PKS	e 21	43	PP	—
Makhach-Kala	134.3	61	e 19	2	[- 9]	—	—	—	i 21	55	PP	—
Shemakla	134.6	65	i 19	13	[+ 2]	—	—	—	—	—	—	—
Baku	135.5	67	i 19	18	[+ 5]	—	—	—	i 21	52	PP	—
Bandung	136.8	181	e 19	19	[+ 4]	e 23	1	PKS	—	—	—	e 68.0
Djakarta	137.5	180	e 19	13 <sub>a</sub>	[- 4]	i 22	52	PKS	i 19	59	pPKP	e 58.2
Klyuchi	139.4	317	i 19	23	[+ 3]	i 22	57	PKS	22	24	PP	—
Guam	139.5	245	e 19	30	[+10]	e 22	59	PKS	—	—	—	—
Petropavlovsk	141.0	313	e 16	58	P	22	33	PP	19	26	PKP	—
Ashkabad	141.3	73	i 19	18	[- 5]	i 22	54	PKS	i 22	30	PP	—
Kodaikanal	142.4	126	19	11	[-14]	42	20	SSP	36	50	PPS	—
Sverdlovsk	142.9	41	e 16	58	P	e 26	8	[-19]	i 19	20	PKP	—
Magadan	143.9	324	i 19	23	[- 5]	—	—	—	22	52	PKS	—
Bairam-Ali	144.1	75	i 19	25	[- 3]	—	—	—	—	—	—	—
Bombay	145.0	111	i 19	29	[- 1]	33	3	PS	22	50	PP	68.2
Poona	145.5	113	i 19	28	[- 3]	23	2?	PP	25	38?	PPP	—
Quetta	145.9	88	i 19	31 <sub>k</sub>	[- 1]	i 25	56	[-36]	i 19	54	pPKP	—
Hyderabad	147.3	119	19	37	[+ 3]	30	21	SKKS	23	5	PP	—
Samarkand	148.2	72	i 19	35	[ 0]	—	—	—	—	—	—	—
Kurilsk	148.5	301	19	34	[- 2]	33	22	PS	23	9	PP	—
Stalinabad	149.4	74	i 19	35	[- 2]	—	—	—	e 23	10	PP	—
Kulyab	150.1	76	e 19	37	[- 1]	23	21	PP	19	47	PKP <sub>2</sub>	—
Nemuro	150.1	297	e 19	44	[+ 6]	e 30	6	SKKS	e 42	40	sSS	e 70.0
Lunacharskoe	150.1	68	e 19	41	[+ 3]	(26 36)	[- 2]	—	e 26	36	PPP	—
Tashkent	150.1	68	e 19	37	[- 1]	—	—	—	e 19	44	PKP <sub>2</sub>	—
Tchimkent	150.4	66	i 19	38	[- 1]	—	—	—	i 23	24	PP	—
Garm	150.7	73	19	38	[- 1]	—	—	—	e 19	46	PKP <sub>2</sub>	—
Warsak Dam	150.7	83	e 19	44	[+ 5]	i 36	28	PPS	i 19	56	pPKP	—
Khorog	151.5	77	i 19	43	[+ 3]	e 23	32	PP	i 20	4	PKP <sub>2</sub>	—
Namangan	151.9	70	i 19	40	[- 1]	e 33	48	PS	i 20	4	PKP <sub>2</sub>	—
Uglegorsk	151.9	308	19	38	[- 3]	30	12	SKKS	23	12	PKS	—
Yuzno-Sakhlinsk	151.9	303	19	38	[- 3]	30	10	SKKS	23	13	PP	—
Fergana	152.0	71	i 19	41	[ 0]	—	—	—	i 23	32	PP	—
Urakawa	152.2	295	i 19	47	[+ 6]	e 30	23	SKKS	e 33	3	PS	—
Andijan	152.4	70	i 19	41	[- 1]	i 27	4	PPP	i 19	52	PKP <sub>2</sub>	—
Miyako	152.7	289	e 19	39	[- 3]	e 33	18	PS	e 24	0	pPKP	69.9
Mizusawa	153.2	286	19	56	[+13]	29	17	?	29	48	?	—
Sapporo	153.2	297	e 19	37	[- 6]	i 30	18	SKKS	e 19	56	PKP <sub>2</sub>	e 70.8
Onahama	153.2	281	e 20	0	[+17]	30	9	SKKS	e 34	33	PS	e 42.8
New Delhi	153.4	98	19	44	[+ 1]	26	59	[+17]	23	44	PP	70.0
Sendai	153.4	284	e 19	54	[+11]	e 43	16	SS	e 23	51	PP	i 70.7
Aomori	153.7	290	e 19	22	[-21]	i 26	18	[-24]	e 19	47	pPKP	—
Hokusima	153.7	284	e 19	56	[+13]	30	27	SKKS	24	7	PP	71.1
Mori	153.8	294	19	47	[+ 4]	44	36	SS	49	46	SSS	74.0
Tokyo	153.9	278	e 19	46	[+ 2]	e 30	25	SKKS	e 24	3	PP	e 70.6
Utunomiya	154.0	280	e 20	3	[+19]	26	24	[-18]	23	42	PP	e 72.7
Frunse	154.1	66	i 23	40	PP	—	—	—	e 27	14	PPP	—
Maebasi	154.6	279	e 19	48	[+ 3]	e 29	39	SKKS	e 23	59	PP	e 71.8
Shizuoka	154.8	277	e 19	47	[+ 2]	e 30	56	SKKS	e 24	38	PP	—
Naryn	155.2	69	i 19	45	[ 0]	i 23	41	PP	i 20	13	PKP <sub>2</sub>	—
Rybach'e	155.2	66	i 19	44	[- 1]	i 23	46	PP	i 20	17	PKP <sub>2</sub>	—
Matusiro	155.3	282	e 19	42	[- 3]	30	36	SKKS	20	18	PKP <sub>2</sub>	71.3
Sempalatinsk	156.0	45	19	45	[- 1]	—	—	—	23	54	PP	—

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		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.	
		°	°	m. s.	s.	m. s.	s.	m. s.	m.	
Kameyama		156.4	276	19 47	[ 0]	e 30 22	SKKS	20 22	PKP <sub>2</sub>	72.6
Kurmenty		156.8	64	e 19 50	[+ 2]	—	—	—	—	—
Baguio		156.8	214	e 19 58	[+10]	30 20	SKKS	e 20 8	PKP <sub>2</sub>	74.2
Przhevalsk		156.9	65	i 19 54	[+ 6]	i 24 3	PP	i 20 22	PP	—
Takamatu		158.2	272	20 15	PKP <sub>2</sub>	30 50	SKKS	44 44	SSP	72.6
Calcutta	F.	158.4	125	i 19 56	[+ 6]	34 19	PS	20 29	PKP <sub>2</sub>	—
Koti		158.4	269	e 23 44	PP	e 30 44	SKKS	—	—	—
Hirosima		159.5	272	e 19 45	[- 6]	e 30 3	SKKS	e 20 31	PKP <sub>2</sub>	e 74.2
Vladivostok		160.1	296	i 19 49	[- 2]	—	—	—	—	—
Chatra		160.3	113	e 19 49	[- 3]	26 48	[- 1]	24 18	PP	74.6
Hukuoka		161.0	268	e 19 49	[- 3]	e 31 32	SKKS	e 20 30	PKP <sub>2</sub>	—
Shillong		162.8	125	19 54	[ 0]	26 3	[-48]	24 26	PP	76.8
Kabansk		164.4	2	i 19 52	[- 4]	i 35 4	PS	i 20 52	PKP <sub>2</sub>	—
Hong Kong		164.7	204	e 20 10	[+14]	32 23	SKKS	30 1	pPPP <sub>2</sub>	—
Irkutsk		164.9	7	19 53	[- 3]	e 26 52	[ 0]	20 51	PKP <sub>2</sub>	—
Kyakhta		166.1	3	i 19 55	[- 2]	—	—	20 59	PKP <sub>2</sub>	—
Zô-Sè		167.4	249	i 19 55 <sub>a</sub>	[- 3]	—	—	i 25 8	PP	—
Nanking	z.	169.6	248	i 19 58 <sub>a</sub>	[- 2]	—	—	i 25 22	PP	—

May 7d. 11h. 58m. Epicentre 36°·6N. 71°·1E. Depth of focus 120km.  
 . Bulletin of Seismo. stations of U.S.S.R. for April-June, 1953, Moscow, 1954, p. 92.

May 7d. 12h. 53m. Epicentre 40°·75N. 143°·5E. (C.M.O.).  
 Intensity II-III at Hatinohe and Miyako  
 Seismo. Bull. Cent. Met. Obs., Japan, for May, 1953, Tokyo, 1953, p. 12, with macroseismic chart.

May 7d. 16h. 32m. Epicentre 39°·9N. 68°·9E.  
*Loc. cit.* 11h.

May 7d. 17h. 56m. 36s. Epicentre 56°·5S. 124°·8W.

A = -·3165, B = -·4553, C = -·8322;  $\delta = +3$ ;  $h = -8$ ;  
 D = -·821, E = +·571; G = +·475, H = +·683, K = -·554.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
La Paz	E.	58.2	70	9 59	+ 1	17 52	- 7	—	—
Huancayo		58.3	61	e 10 0	+ 1	e 18 3	+ 2	—	e 27.8
Chinchina		73.2	52	e 11 30	- 5	—	—	—	—
Bogota		73.5	53	i 11 33	- 3	i 21 5	- 1	—	—
Barratt	z.	89.1	7	i 12 58	0	—	—	i 13 5	PcP
Riverside	z.	90.4	6	i 13 4	0	e 13 9	PcP	e 13 23	?
Pasadena	z.	90.5	5	i 13 4	- 1	i 13 12	PcP	i 13 35	?
China Lake	z.	92.2	6	i 13 11	- 2	e 13 18	PcP	—	44.8
Tinemaha	z.	93.4	5	i 13 18	0	—	—	i 13 46	?
Lick	z.	93.5	2	e 13 19 <sub>k</sub>	0	—	—	e 13 26	PcP
Berkeley		94.0	2	e 13 21	0	e 31 24	SSP	—	e 43.4
Fayetteville		95.8	25	i 13 28	- 1	—	—	—	—
Mineral	z.	96.5	2	e 15 30 <sub>a</sub>	?	—	—	—	—
Shasta	z.	96.9	1	e 13 33 <sub>a</sub>	- 1	—	—	e 13 40	PcP
M'Bour		111.7	96	—	—	33 24?	SS	—	—
Tamanrasset	z.	130.7	112	e 19 16	[+ 3]	—	—	i 19 24	?
Resolute Bay		132.4	10	e 19 17 <sub>a</sub>	[ 0]	—	—	—	—
Clermont-Ferrand		146.4	85	e 19 44	[+ 2]	—	—	—	—
Chambon-la-Forêt		147.3	81	i 19 47	[+ 4]	—	—	i 19 54	PKP <sub>2</sub>
Kew		147.7	75	e 19 46	[+ 2]	—	—	—	—
Paris		147.8	80	i 19 47	[+ 3]	i 19 55	PKP <sub>2</sub>	i 20 29	?
Helwan	z.	148.5	137	e 19 50	[+ 5]	—	—	e 20 41	?
Besançon		148.9	85	e 19 50	[+ 4]	—	—	—	—
Florence		149.6	95	e 19 55	PKP <sub>2</sub>	e 22 13	?	e 22 35	?
Basle		149.9	86	e 19 43 <sub>k</sub>	[+ 6]	—	—	—	—

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	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Zürich	150.4	86	e 19 54 <sub>k</sub>	[+ 6]	—	—	—	—
Strasbourg	150.6	84	e 19 51	[+ 3]	e 21 10	?	e 23 28	PP
Karlsruhe	151.2	83	e 19 56 <sub>a</sub>	[+ 7]	20 14	?	20 24	?
Stuttgart	151.5	86	e 19 50?	[ 0]	c 20 3	PKP <sub>2</sub>	e 23 40	PP
Witteveen	z. 152.2	74	e 19 58	[+ 7]	—	—	—	—
Quetta	z. 152.4	205	19 54?	[+ 3]	—	—	—	—
Jena	z. 154.0	83	e 20 2	[+ 9]	—	—	e 20 10	PKP <sub>2</sub>
Collmberg	154.9	83	e 19 55	[+ 1]	—	—	e 20 17	PKP <sub>2</sub>
Uppsala	z. 160.1	64	i 20 7	[+ 6]	—	—	i 20 39	PKP <sub>2</sub>

May 7d. 20h. 33m. 22s. Epicentre 41°·6N. 142°·0E. Depth of focus 0·005.  
(as on 1952, October 16d.).

Intensity IV at Hatinohe; II-III at Urakawa, Aomori, Mori, Tomakomai, Miyako, Obihiro, Kusiro, and Nemuro. Epicentre 41°·6N. 142°·2E. Depth 40km.  
Seismo. Bull. Cent. Met. Obs., Japan, for May, 1953, Tokyo, 1953, p. 13-14, with macro-seismic chart p. 13.

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

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	
	$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	
Urakawa	N. 0.8	47	e 0 21	+ 4	0 35	+ 6	—	—
Hakodate	1.0	281	e 0 18	- 1	0 32	- 1	—	—
Tomakomai	E. 1.0	341	i 0 26	+ 7	0 40	+ 7	—	—
Hatinohe	1.1	198	i 0 19 <sub>a</sub>	- 1	0 29	- 7	—	—
Aomori	1.2	229	i 0 22	0	0 38	0	—	—
Mori	N. 1.2	295	i 0 22	0	0 42	+ 4	—	—
Sapporo	1.6	342	i 0 28 <sub>k</sub>	+ 1	0 47	0	—	—
Miyako	1.8	180	0 29	- 1	0 51	- 1	0 49	S
Suttsu	1.8	313	e 0 29	- 1	—	—	—	—
Morioka	2.0	198	e 0 31	- 1	0 55	- 2	—	—
Asahigawa	2.2	7	e 0 40	+ 5	1 7	+ 5	—	—
Kusiro	2.3	52	e 0 38	+ 1	1 3	- 1	—	—
Akita	2.4	229	e 0 38	0	1 10	+ 3	—	—
Mizusawa	N. 2.6	195	0 42	+ 1	1 23	+11	—	—
Nemuro	3.2	57	e 0 47	- 2	1 19	- 8	—	—
Sakata	3.2	211	e 1 8	+19	1 48	+21	—	—
Sendai	N. 3.4	194	0 54	+ 2	1 30	- 2	—	—
Yamagata	3.6	201	c 0 58	+ 3	1 35	- 2	—	—
Hukusima	4.0	198	e 1 12	+11	1 57	+10	—	—
Inawasiro	E. 4.3	200	e 1 7	+ 2	2 1	+ 7	—	—
Niigata	4.3	213	e 1 28	+23	2 27	+33	—	—
Aikawa	4.6	220	e 1 9	0	—	—	—	—
Shirakawa	4.7	198	e 1 12	+ 2	2 6	+ 2	—	—
Onahama	4.8	192	e 1 24	+12	2 7	0	—	—
Mito	5.4	195	e 1 25	+ 5	2 25	+ 3	—	—
Utunomiya	5.4	200	c 1 19	- 1	—	—	—	—
Kakioka	5.5	194	e 1 25	+ 4	2 36	+12	—	—
Tukubasan	5.6	196	e 1 28	+ 5	—	—	—	—
Maebasi	z. 5.7	205	e 1 27	+ 3	2 31	+ 2	—	—
Kumagaya	5.8	201	c 1 32	+ 7	2 38	+ 6	—	—
Nagano	N. 5.8	213	e 0 59	-26	2 48	+16	—	—
Wazima	N. 5.8	225	1 24	- 1	2 36	+ 4	—	—
Matusiro	5.9	211	e 1 22	- 5	2 28	- 6	—	—
Oiwake	5.9	208	c 1 34	+ 7	2 44	+10	—	—
Kashiwa	N. 6.0	196	1 38	+10	2 43	+ 6	—	—
Titibu	6.1	203	e 1 46	PP	2 43	+ 4	—	—
Matumoto	N. 6.2	212	1 42	PP	2 52	SS	—	—
Tokyo	N. 6.2	198	1 35	+ 4	2 56	SS	—	—
Toyama	6.2	218	e 1 31	0	3 2	SS	—	—
Hunatu	N. 6.6	203	e 1 46	PP	3 4	SS	—	—

Continued on next page.

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		$\Delta$	Az.	P.		O-C.	S.	O-C.	Supp.	
		°	°	m.	s.	s.	m.	s.	m.	s.
Kohu	N.	6.6	204	1	43	+ 6	2	55	—	—
Iida		6.9	209	e 2	3	+22	—	—	—	—
Misima	E.	6.9	201	e 1	56	PP	3	22	SS	3 33
Nagoya	E.	7.5	213	e 2	14	PPP	—	—	—	—
Kameyama		8.0	215	e 1	48	— 8	3	24	— 2	—
Resolute Bay		58.1	15	e 9	47k	— 2	—	—	—	—
Quetta	z.	60.0	285	i 10	1	— 1	—	—	—	—
Kiruna	z.	62.4	338	e 10	23	+ 5	i 11	24	?	i 10 51
Tinemaha	z.	72.8	56	e 11	44	PcP	—	—	—	—
China Lake	z.	74.0	56	e 11	30	0	—	—	—	e 11 50
Collmberg		77.4	330	e 11	49	— 1	—	—	—	—
Stuttgart		80.9	330	e 12	8	— 1	—	—	—	e 12 27
Fayetteville	z.	87.1	42	e 12	40	0	—	—	—	—
Harvard		91.0	24	e 12	58	0	—	—	—	—

May 8d. 1h. 14m. Epicentre 37°·8N. 70°·4E.

Seismo. Bulletin of stations of U.S.S.R., 1953, April-June, Moscow, 1954, pp. 92-93.

May 8d. 3h. 54m. 43s. Epicentre 35°·4N. 34°·5W.

A = +.6733, B = -.4627, C = +.5767;  $\delta = +1$ ;  $h = 0$ ;  
D = -.566, E = -.824; G = +.475, H = -.327, K = -.817.

		$\Delta$	Az.	P.		O-C.	S.	O-C.	Supp.		L.
		°	°	m.	s.	s.	m.	s.	m.	s.	m.
Angra do Heroismo		6.6	59	—	—	—	i 3	5	+ 7	—	i 4.6
Halifax		24.0	301	e 5	16 <sub>a</sub>	— 1	9	32	0	5 59	PP
Malaga		24.3	76	i 5	20	0	e 9	50	+13	e 6 6	PPP
Toledo		24.5	70	i 5	24	+ 2	—	—	—	—	—
Granada		24.9	75	5	27k	+ 1	11	0	SS	5 57	PP
Almeria		25.9	76	5	59	+24	10	27	+23	7 3	?
Alicante		27.3	72	e 5	51	+ 3	10	31	+ 4	6 37	PP
Weston		29.3	295	i 6	11 <sub>a</sub>	+ 5	e 10	40	-19	—	—
Harvard		29.5	295	e 6	7	— 1	—	—	—	i 6 12	?
Seven Falls	E.	29.5	305	e 6	18	+10	12	1	+59	—	—
Chambon-la-Forêt		29.9	52	e 6	13	+ 1	—	—	—	—	—
Clermont-Ferrand		30.1	57	e 6	15	+ 2	—	—	—	—	16.3
Paris		30.2	51	e 6	13	— 1	—	—	—	e 6 18	?
Besançon		32.3	55	e 6	32	— 1	—	—	—	—	—
Karlsruhe	z.	34.1	51	e 6	48	0	—	—	—	—	—
Stuttgart		34.6	52	e 6	52?	— 1	—	—	—	e 7 0	?
Jena		36.4	49	e 7	7	— 1	e 7	50	?	e 7 16	?
Tamanrasset	z.	36.9	99	i 7	12k	0	e 8	35	PP	i 7 18	?
Collmberg		37.3	49	e 7	13	— 3	—	—	—	—	—
Prague		38.1	50	e 7	19	— 3	—	—	—	e 7 30	?
Upsala	z.	41.3	36	e 7	47	— 2	—	—	—	—	—
Kiruna	z.	44.6	26	i 8	14	— 2	i 8	22	?	i 8 27	?
Resolute Bay		48.5	343	e 8	44	— 2	—	—	—	—	—
Hungry Horse		58.1	309	i 10	0	+ 2	—	—	—	—	—
Tucson		62.0	291	e 10	27	+ 3	—	—	—	—	—
Boulder City		63.4	297	e 10	34	0	—	—	—	i 10 39	?
Nelson		63.5	297	e 10	32	— 2	—	—	—	e 10 54	?
Reno	z.	65.3	302	e 10	51	+ 5	—	—	—	—	—
Tinemaha	z.	65.3	299	e 10	51	+ 5	—	—	—	—	—
China Lake	z.	65.4	298	e 10	50	+ 3	—	—	—	—	—
Riverside	z.	66.1	296	e 10	56	+ 5	—	—	—	e 11 4	?
Mineral	z.	66.2	303	e 10	55 <sub>a</sub>	+ 3	—	—	—	—	—
College		67.5	335	e 10	58	— 2	—	—	—	—	—
Lick	z.	67.6	301	e 11	2 <sub>a</sub>	+ 1	i 11	10	?	i 11 24	?

May 9d. 19h. 17m. Epicentre 36°·9N. 71°·1E. Depth of focus 200km.

Seismo. Bulletin of stations of U.S.S.R. April-June, 1953, Moscow, 1954, p. 93.

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May 9d. 20h. 58m. Epicentre 36°·9N. 70°·4E. Depth of focus 160km.  
*Loc. cit.* 19h.

May 10d. 1h. 17m. Epicentre 36°·7N. 70°·8E. Depth of focus 200km.  
Bulletin of Seismo. Stations of the U.S.S.R. for April-June, 1953, Moscow, 1954, p. 94.

May 10d. 3h. 56m. Epicentre 36°·3N. 139°·8E. Depth of focus 60km.  
Intensity V at Tukubasan; IV at Kakioka, Kashiwa, Mito, and Utunomiya; II-III at Kumagaya, Maebasi, Tokyo, Titibu, Onahama, Kohu, and Ajiro.  
Seismo. Bull. Cent. Met. Obs., Japan, for May, 1953, Tokyo, 1953, p. 14-15, with macro-seismic chart.

May 10d. 5h. 10m. 45s. Epicentre 18°·0S. 167°·7E. (as on 1951, March 28d.).

A = -·9299, B = +·2027, C = -·3071;  $\delta = +11$ ;  $h = +5$ ;  
D = +·213, E = +·977; G = +·300, H = -·065, K = -·952.

	$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.	
	°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.	
Brisbane	16·5	232	i 3	56	+ 2	i 7	4	+ 6	e 4	12	PP	—
Apia	20·2	82	i 4	45	+ 6	—	—	—	—	—	—	—
Karapiro	N. 21·0	163	4	43	- 4	—	—	—	—	—	—	—
Riverview	21·6	219	e 4	57	+ 3	i 8	57	+ 8	i 5	7	pP	e 10·4
Cobb River	E. 23·4	170	e 5	13	+ 2	—	—	—	—	—	—	—
Wellington	24·0	167	5	17	0	—	—	—	—	—	—	—
Christchurch	25·8	171	—	—	—	e 11	15?	SSS	—	—	—	—
Baguio	57·6	304	i 9	58	+ 4	—	—	—	—	—	—	—
Lick	Z. 86·2	48	e 12	43 <sub>a</sub>	- 1	—	—	—	i 12	56	?	—
Shasta	Z. 87·2	45	e 12	47 <sub>a</sub>	- 2	—	—	—	—	—	—	—
Fresno	Z. 87·3	50	e 12	47 <sub>a</sub>	- 3	—	—	—	e 13	1	?	—
Pasadena	Z. 87·5	53	i 12	52	+ 1	—	—	—	—	—	—	—
Riverside	Z. 88·0	53	e 12	53	0	—	—	—	—	—	—	—
Reno	Z. 88·5	48	e 12	54 <sub>a</sub>	- 2	—	—	—	—	—	—	—
College	89·3	17	i 12	57	- 2	—	—	—	—	—	—	—
Nelson	90·6	52	i 13	2	- 3	—	—	—	i 13	15	?	—
Boulder City	90·7	52	i 13	4	- 2	—	—	—	—	—	—	—
Tucson	92·5	56	e 13	12	- 2	—	—	—	—	—	—	—
Kiruna	126·0	346	i 19	3	[- 1]	—	—	—	—	—	—	e 63·2
Scoresby Sund	127·1	5	e 19	4	[- 2]	—	—	—	—	—	—	61·2
Upsala	Z. 133·0	340	e 21	3	?	—	—	—	—	—	—	—
Ksara	134·3	299	e 19	26	[+ 6]	—	—	—	—	—	—	—
Collmberg	141·2	334	e 19	29	[- 4]	—	—	—	—	—	—	—
Jena	Z. 142·0	334	e 19	33?	[- 1]	—	—	—	e 19	36	PKP	—
Rathfarnham C.	Z. 144·5	354	i 19	36	[- 2]	—	—	—	e 19	49	?	—
Stuttgart	144·7	335	i 19	39 <sub>a</sub>	[ 0]	e 19	51	?	e 21	21	?	—
Karlsruhe	Z. 144·8	337	e 19	38 <sub>a</sub>	[- 1]	—	—	—	e 20	0	?	—
Triest	Z. 145·0	328	i 19	38 <sub>a</sub>	[- 1]	e 20	0	?	e 22	59	PP	—
Kew	Z. 145·3	347	i 19	38	[- 2]	—	—	—	e 19	52	?	—
Strasbourg	145·4	335	i 19	41	[+ 1]	e 19	52	?	e 21	22	?	—
Zürich	146·0	335	e 19	41	[ 0]	—	—	—	—	—	—	—
Basle	146·3	335	e 19	44	[+ 3]	—	—	—	—	—	—	—
Paris	147·0	342	i 19	45	[+ 2]	—	—	—	—	—	—	—
Besançon	147·2	337	i 19	46	[+ 3]	—	—	—	—	—	—	—
Florence	147·5	328	e 19	49	[+ 6]	—	—	—	e 20	21	?	—
Chambon-la-Forêt	147·8	342	i 19	48	[+ 4]	—	—	—	—	—	—	—
Rome	148·2	323	e 19	51	[+ 6]	—	—	—	—	—	—	—
Clermont-Ferrand	149·5	338	e 19	53	[+ 6]	—	—	—	—	—	—	—
Alicante	157·3	337	19	56	[- 2]	27	2	[ 0]	20	28	PKP <sub>2</sub>	74·4
Tamanrasset	Z. 162·7	290	e 20	4	[ 0]	i 20	56	PKP <sub>2</sub>	e 24	39	PP	—

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May 10d. 19h. 49m. 15s. Epicentre 36°·1N. 141°·2E. Focus at Base of Superficial Layers.  
(as on 1952, October 15d.).

Intensity V at Mito, Tsubasan, and Kakioka; IV at Tyosi, Onahama, Utunomiya, Kashiwa, Shirakawa, Tokyo, Kumagaya, Maebasi, and Hokusima; II-III at Yokohama, Titibu, and Kohu. Epicentre 36°·2N. 141°·1E. Depth of focus 40km.  
Seismo. Bull. Cent. Met. Obs., Japan, for May, 1953, Tokyo, 1953, p. 15-17, with macro-seismic chart.

A = -·6312, B = +·5075, C = +·5866;  $\delta = +7$ ;  $h = 0$ ;  
D = +·627, E = +·779; G = -·457, H = +·368, K = -·810.

		$\Delta$	Az.	P.		O-C.	S.		O-C.		Supp.		L.
				m.	s.	s.	m.	s.	m.	s.	m.	m.	
Tyosi	N.	0·4	216	0	13	+ 4	0	20	+ 4	—	—	—	
Mito		0·7	296	0	11	- 2	0	19	- 4	—	—	—	
Kakioka		0·8	279	e 0	13	- 2	—	—	—	—	—	—	
Onahama		0·9	344	i 0	15 <sub>a</sub>	- 1	0	25	- 3	—	—	—	
Tsubasan		0·9	277	0	12 <sub>k</sub>	- 4	0	22	- 6	—	—	—	
Kashiwa	N.	1·0	256	i 0	17 <sub>k</sub>	- 1	—	—	—	—	—	—	
Tokyo		1·2	251	i 0	21	+ 1	0	37	+ 1	—	—	—	
Utunomiya	Z.	1·2	293	i 0	18 <sub>k</sub>	- 2	0	30	- 6	—	—	—	
Shirakawa		1·3	322	i 0	21 <sub>k</sub>	- 1	0	34	- 4	—	—	—	
Yokohama		1·4	242	0	25 <sub>k</sub>	+ 2	0	43	+ 2	—	—	—	
Kumagaya		1·5	272	i 0	24	0	0	40	- 4	—	—	—	
Mera		1·6	223	0	33 <sub>a</sub>	+ 7	1	1	+15	—	—	—	
Inawasiro	E.	1·7	329	e 0	28	0	0	46	- 3	—	—	—	
Titibu		1·7	266	i 0	27	- 1	0	48	- 1	—	—	—	
Hokusima		1·8	340	i 0	29 <sub>k</sub>	0	0	47	- 4	—	—	—	
Maebasi		1·8	280	i 0	27 <sub>k</sub>	- 2	0	46	- 5	—	—	—	
Ajiro		2·0	237	e 0	33	+ 1	1	0	+ 4	—	—	—	
Hunatu	N.	2·0	253	0	35 <sub>k</sub>	+ 3	—	—	—	—	—	—	
Osima		2·0	228	e 0	34	+ 2	1	2	+ 6	—	—	—	
Kohu		2·1	258	i 0	34	+ 1	1	10	+11	—	—	—	
Misima		2·1	242	0	34	+ 1	1	6	+ 7	—	—	—	
Oiwake		2·1	276	0	33	0	0	57	- 2	—	—	—	
Sendai		2·2	354	e 0	34	- 1	0	59	- 2	—	—	—	
Isinomaki		2·3	2	e 0	37	+ 1	—	—	—	—	—	—	
Yamagata		2·3	342	e 0	37	+ 1	1	0	- 4	—	—	—	
Matusiro		2·4	281	i 0	38	0	1	7	+ 1	—	—	—	
Nagano		2·5	283	i 0	47 <sub>k</sub>	+ 8	1	7	- 2	—	—	—	
Niigata		2·5	317	0	44	+ 5	1	18	+ 9	—	—	—	
Matumoto	E.	2·6	273	i 0	41	0	1	13	+ 2	—	—	—	
Shizuoka		2·6	244	e 0	41	0	1	12	+ 1	—	—	—	
Takada		2·6	293	0	41	0	1	13	+ 2	—	—	—	
Iida		2·8	258	i 0	45	+ 2	1	17	+ 1	—	—	—	
Omaesaki		2·9	239	e 0	49	+ 4	1	24	+ 5	—	—	—	
Mizusawa		3·0	359	0	49	+ 3	1	24	+ 2	e 1 28	S	—	
Sakata		3·0	339	e 0	53	+ 7	1	39	+17	—	—	—	
Aikawa		3·1	309	e 0	45	- 3	1	19	- 5	—	—	—	
Hatidyozima		3·2	201	e 0	54	+ 5	1	58	+31	—	—	—	
Takayama	N.	3·2	272	e 0	45	- 4	1	20	- 7	—	—	—	
Toyama		3·3	280	e 0	49	- 2	1	21	- 8	—	—	—	
Miyako		3·6	11	e 0	58	+ 3	—	—	—	—	—	—	
Morioka		3·6	0	e 0	56	+ 1	1	38	+ 1	—	—	—	
Nagoya	E.	3·6	256	e 0	57	+ 2	1	44	+ 7	—	—	—	
Akita		3·7	347	e 1	2	+ 6	1	46	+ 7	—	—	—	
Gihu		3·7	260	e 0	57	+ 1	1	44	+ 5	—	—	—	
Kanazawa		3·7	278	e 0	57	+ 1	—	—	—	—	—	—	
Wazima		3·7	292	e 0	55	- 1	1	47	+ 8	—	—	—	
Hukul		4·0	271	e 0	59	- 1	—	—	—	—	—	—	
Ibukisan		4·0	261	e 1	4	+ 4	1	58	+11	—	—	—	
Hikone		4·1	260	1	3	+ 1	1	53	+ 4	—	—	—	
Kameyama		4·1	253	1	7	+ 5	1	59	+10	—	—	—	

Continued on next page.

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		$\Delta$ °	Az. °	P.		O-C. s.	S.		O-C. s.	Supp.		L. m.
				m.	s.		m.	s.		m.	s.	
Tu		4.1	251	1	3	+ 1	2	9	+20	—	—	—
Tsuruga	E.	4.2	264	1	3	0	1	50	- 2	—	—	—
Hatinohe		4.4	4	e 1	7	+ 1	1	57	0	—	—	—
Kyoto		4.6	258	e 1	10	+ 1	2	4	+ 2	—	—	—
Owase		4.6	245	c 1	14	+ 5	2	20	+18	—	—	—
Aomori		4.7	356	1	15	+ 5	2	8	+ 3	—	—	—
Maizuru		4.7	264	e 1	2	- 8	2	12	+ 7	—	—	—
Osaka		4.9	254	e 1	15	+ 2	2	11	+ 1	—	—	—
Kobe		5.1	256	e 1	5	-11	2	42	+27	—	—	—
Siomisaki		5.2	241	e 1	21	+ 3	2	51	+34	—	—	—
Toyooka		5.2	266	e 1	16	- 2	2	24	+ 7	—	—	—
Wakayama		5.3	251	e 1	19	0	2	3	-17	—	—	—
Sumoto		5.5	253	e 1	23	+ 1	2	44	+19	—	—	—
Torisima		5.7	188	1	27	+ 3	2	34	+ 4	—	—	—
Mori	N.	6.0	356	1	36	+ 7	2	44	+ 7	—	—	—
Takamatu		6.1	255	e 1	34	+ 4	2	52	+12	—	—	—
Urakawa		6.2	11	e 1	35	+ 3	2	52	+10	—	—	—
Muroto		6.4	246	e 1	38	+ 4	3	8	+21	—	—	—
Saigo	E.	6.4	273	e 1	34	0	2	41?	- 6	—	—	—
Tomakomai		6.4	3	e 1	58	+24	3	7	+20	—	—	—
Koti		6.8	250	e 1	39	- 1	—	—	—	—	—	—
Obihiro		7.0	12	—	—	—	e 2	58	- 4	—	—	—
Sapporo		7.0	1	e 1	47	+ 4	3	1	- 1	—	—	—
Matuyama		7.3	254	e 2	0	+13	3	8	- 2	—	—	—
Hirosima		7.4	259	e 1	35	-13	3	49	+37	—	—	—
Hamada		7.5	263	e 1	59	+ 9	3	38	+23	—	—	—
Simidu	E.	7.6	246	e 1	50	- 1	—	—	—	—	—	—
Asahigawa		7.7	6	—	—	—	e 3	26	+ 6	—	—	—
Nemuro		8.0	24	—	—	—	c 3	18	- 9	—	—	—
Simonoseki		8.7	258	e 4	8	S	(e 4	8)	+23	—	—	—
Miyazaki		9.1	245	e 2	14	+ 2	4	7	+13	—	—	—
Hukuoka		9.2	257	e 2	15 <sup>a</sup>	+ 2	4	35	+38	—	—	—
Kumamoto		9.3	252	e 2	10	- 5	—	—	—	—	—	—
Saga	E.	9.4	256	e 2	34	+18	5	8	+66	—	—	—
Ituhara		9.9	262	—	—	—	e 4	45	+31	—	—	—
Kagosima		9.9	246	e 2	33	+10	5	53	?	—	—	—
Zô-Sô		17.4	290	4	1 <sup>k</sup>	- 1	7	19	+ 7	—	—	—
Nanking		19.0	295	4	20 <sup>k</sup>	- 2	e 7	57	+ 9	—	—	—
Baguio		26.8	229	i 5	31	- 8	—	—	—	—	—	—
Hong Kong		27.2	247	—	—	—	e 11	45	SS	—	—	—
College		50.0	31	e 8	54	+ 1	—	—	—	—	—	—
Quetta	z.	61.0	288	i 10	11	- 1	—	—	—	i 10	27	pP
Resolute Bay		63.5	14	e 11	28	+59	—	—	—	—	—	—
Kiruna		67.3	338	e 10	53	0	e 20	9	sS	i 11	16	PcP
Shasta	z.	71.8	53	e 11	22	+ 1	—	—	—	e 11	35	pP
Hungry Horse		72.6	42	i 11	27	+ 1	—	—	—	—	—	—
Upsala	z.	73.7	334	i 11	31	- 1	i 11	49	sP	i 12	22	?
Lick	z.	74.1	56	e 11	44 <sup>k</sup>	+ 9	—	—	—	c 11	50	pP
Reno	z.	74.1	53	e 11	49	pP	—	—	—	—	—	—
Butte		74.8	44	e 11	39	0	—	—	—	—	—	—
Boulder City		79.4	53	i 12	19	pP	—	—	—	—	—	—
Collmberg	z.	81.8	330	e 12	16	- 1	—	—	—	—	—	—
Jena		82.7	331	e 12	20	- 2	—	—	—	c 12	32	pP
Stuttgart		85.3	331	e 12	34	- 1	c 22	55	[+ 1]	c 12	44	pP
Fayetteville		91.6	42	i 13	6	+ 1	—	—	—	—	—	e 45.8
Alicante		97.9	331	e 17	39	PP	c 25	3	+ 9	c 19	46	PPP
Tamanrasset	z.	108.0	317	e 18	19	[- 5]	—	—	—	—	—	—

May 11d. 5h. 50m. Epicentre 36°·1N. 69°·4E. Depth of focus 160km.  
Seismo. Bulletin of the stations of U.S.S.R. for 1953, April to June, Moscow, 1954, p. 94.

May 11d. 9h. 14m. Provisional epicentre 39°·6S. 174°·1E. Depth of focus 190km.  
Magnitude 5.3. Felt in parts of southern Hawke's Bay, Manawatu, and Wellington regions.  
Seismological Observatory Bulletin No. E132 for April, May, June, 1953, Wellington, N.Z., 1955, p. 7.



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May 11d. 10h. 16m. 40s. Epicentre 21°·7S. 169°·3E.

A = -·9138, B = +·1727, C = -·3676;  $\delta = -1$ ;  $h = +4$ ;  
D = +·186, E = +·983; G = +·361, H = -·068, K = -·930.

		$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		I.
				m.	s.		m.	s.		m.	s.	
Auckland	N.	15·8	164	3	52	+ 7	e 8 18	Q	—	—	e 10·5	
Brisbane		15·9	245	i 3	42	- 5	e 6 41	- 3	i 3	52	PP	i 7·4
Karapiro	N.	17·0	163	e 4	2	+ 1	e 7 24	+14	e 4	48	?	e 9·2
New Plymouth	E.	17·8	167	e 4	11	0	e 7 55	+27	—	—	—	—
Tongariro	Z.	18·3	163	e 4	14	- 3	7 50	+11	i 5	15	?	e 9·5
Tuai	N.	18·3	160	e 4	16	- 1	e 7 47	+ 8	—	—	—	e 9·3
Cobb River	E.	19·6	172	e 4	31	- 1	e 8 21	+13	e 5	2	PPP	e 10·3
Apia		19·7	69	e 4	30?	- 4	(e 8 0?)	-10	—	—	—	e 8·0
Riverview		20·1	229	i 4	36	- 2	i 8 24	+ 5	i 4	59	PP	e 9·7
Wellington		20·1	168	4	34	- 4	e 8 18	- 1	e 5	17	PPP	e 11·5
Kaimata	N.E.	20·8	175	e 4	47	+ 2	e 8 32	- 1	e 5	2	PP	e 11·0
Christchurch		21·9	174	i 4	55	- 2	8 56	+ 2	e 5	34	PPP	e 10·2
Melbourne	E.	26·4	227	e 5	43	+ 3	i 10 12	0	i 6	15	PP	14·1
Guam		42·5	323	i 7	57	- 2	e 14 20	- 2	—	—	—	—
Perth		48·4	247	9	10	+24	18 50	SS	20	0	SSS	i 21·8
Baguio		60·9	305	i 10	13	- 4	i 18 35	+ 1	—	—	—	—
Bandung		61·2	275	10	20	+ 1	e 18 46	+ 8	e 22	50	SS	e 32·6
Djakarta		62·2	275	i 10	22k	- 4	i 18 50	- 1	—	—	—	e 29·8
Mera		62·9	333	e 10	30	0	e 19 8	+ 8	e 15	31	?	—
Osima		62·9	333	e 10	30	0	—	—	—	—	—	—
Omaesaki		63·3	332	e 10	6	-27	—	—	e 10	54	?	—
Misima		63·4	333	e 10	32	- 2	(e 18 53)	-13	e 13	46	PPP	e 18·9
Shizuoka		63·5	332	10	35	+ 1	e 19 16	+ 9	e 11	41	?	—
Tokyo		63·6	334	i 10	35	0	19 15	+ 7	e 13	17	PP	—
Hunatu		63·8	333	e 10	36	0	—	—	—	—	—	—
Kohu		64·0	333	e 10	36	- 2	—	—	—	—	—	—
Kumagaya		64·1	334	10	37	- 1	20 18	+64	—	—	—	—
Titibu		64·1	334	i 10	38	0	e 19 23	+ 9	—	—	—	—
Iida		64·2	332	e 10	38	- 1	—	—	—	—	—	—
Nagoya	E.	64·3	332	e 10	41	+ 2	—	—	—	—	—	—
Simidu		64·3	327	e 10	38	- 1	e 19 22	+ 5	—	—	—	—
Utunomiya		64·3	334	e 10	38	- 1	e 19 18	+ 1	e 13	12	PP	—
Maebasi		64·5	334	e 10	39	- 2	e 19 22	+ 3	e 13	14	PP	—
Oiwake		64·6	333	e 12	28	?	e 19 9	-12	—	—	—	—
Shirakawa		64·6	335	e 10	42	+ 1	—	—	—	—	—	—
Koti		64·7	327	e 10	40	- 2	e 19 22	0	—	—	—	—
Matumoto		64·8	332	10	45	+ 2	e 19 37	+14	—	—	—	—
Matusiro		64·9	333	i 10	42	- 1	i 19 29	+ 5	12	56	PP	26·8
Inawasiro	E.	65·0	335	e 10	49	+ 5	—	—	—	—	—	—
Takamatu		65·0	328	e 10	43	- 1	e 19 26	0	—	—	—	—
Hokusima		65·1	335	e 10	45	0	e 19 29	+ 2	—	—	—	—
Nagano		65·1	333	e 10	45	0	e 19 24	- 3	—	—	—	—
Sendai		65·3	336	e 10	45	- 1	e 19 31	+ 2	e 11	39	PcP	—
Toyama		65·5	333	e 10	47	0	e 19 40	+ 8	e 11	58	PcP	—
Yamagata		65·5	337	e 10	46	- 1	—	—	—	—	—	—
Toyooka		65·6	330	i 10	47	- 1	e 19 37	+ 4	—	—	—	—
Niigata		65·8	334	e 10	55	+ 6	e 19 46	+11	11	29	PcP	—
Mizusawa	N.	66·0	337	10	50	0	e 19 43	+ 5	—	—	—	—
Miyako		66·1	338	e 10	45	- 6	e 19 45	+ 6	—	—	—	—
Wazima		66·2	333	e 10	52	0	e 19 43	+ 3	—	—	—	—
Hukuoka		66·3	325	i 10	51	- 1	19 43	+ 1	—	—	—	—
Sakata		66·3	335	e 10	57	+ 5	—	—	—	—	—	—
Hamada		66·5	327	10	51	- 3	19 42	- 2	20	12	PS	e 30·8
Akita		66·9	336	e 10	57	+ 1	19 55	+ 6	e 12	6	?	—
Hatinohe		67·1	338	e 10	55	- 2	—	—	—	—	—	—

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		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Aomori		67.6	338	e 10 46	-15	—	—	—	—
Urakawa		68.1	340	e 11 5	+1	e 20 2	-1	e 13 28	PP
Obihiro		68.7	340	e 11 19	+12	—	—	—	e 30.2
Mori	N.	68.8	338	e 11 10	+2	20 16	+5	—	—
Tomakomai		68.8	338	e 10 50	-18	—	—	—	—
Hong Kong		69.3	306	11 9	-2	e 20 20	+3	e 13 40	PP
Kurilsk		69.4	343	11 11	-1	i 20 21	+3	—	—
Sapporo		69.4	339	e 11 11	-1	e 20 22	+4	e 11 25	PcP
Zō-Sō		69.9	318	i 11 13k	-2	20 22	-2	—	—
Nanking		72.0	316	i 11 26k	-2	e 20 48	-1	—	—
Yuzno-Sakhlinsk		72.4	341	i 11 30	0	i 20 58	+5	—	—
Vladivostok		73.1	332	i 11 32	-2	i 21 2	+1	—	—
Uglegorsk		74.5	343	i 11 41	-1	i 21 20	+3	—	—
Petropavlovsk		75.1	353	i 11 43	-3	i 21 24	0	—	—
Klyuchi		78.0	356	i 12 0	-2	i 21 58	+3	—	—
Santa Clara		87.3	48	e 12 52	+2	e 23 13	[-3]	e 27 35	?
Berkeley		87.4	48	e 12 50k	0	i 23 39	+9	i 23 18	SKS
Lick	Z.	87.5	48	e 12 51k	0	e 12 57	PcP	i 13 58	?
Pasadena		88.5	52	i 12 54k	-2	i 23 23	[-1]	e 16 25	PP
Fresno		88.6	49	e 12 54k	-2	e 23 48	+6	e 38 57	P'P'
Shillong	E.	88.6	298	e 12 54	-2	e 24 4	+22	16 17	PP
Shasta		88.7	45	e 12 55k	-2	e 23 21	[-4]	e 16 36	PP
Barratt	Z.	89.0	54	i 12 57	-1	—	—	i 13 6	PcP
Riverside	Z.	89.0	52	i 12 57k	-1	—	—	i 13 4	PcP
Mineral		89.1	46	e 12 58	0	—	—	—	—
Tinemaha	Z.	89.8	50	i 13 2	0	—	—	i 13 9	PcP
Reno		89.9	47	e 13 2k	0	e 23 35	[+3]	e 16 34	PP
Corvallis		90.1	42	e 13 4	+1	e 23 32	[-1]	—	—
Sitka		91.1	27	e 13 15	+7	i 23 44	[+5]	—	—
Kabansk		91.4	327	i 13 7	-2	i 24 6	-1	i 23 42	SKS
Nelson		91.7	51	i 13 8	-2	e 23 45	[+2]	i 16 48	PP
Boulder City		91.8	51	i 13 10	-1	—	—	i 13 33	PcP
Colombo	E.	92.0	277	e 13 10	-2	e 23 41	[-3]	—	51.2
Victoria		92.1	38	13 12	0	—	—	—	—
Seattle	Z.	92.2	39	i 13 12	-1	e 16 34	PP	i 13 18	PcP
College		92.4	16	i 13 10	-4	e 24 12	-4	e 16 51	PP
Irkutsk		92.8	326	13 14	-2	23 58	{-4}	—	e 37.1
Chatra		92.9	297	e 13 16	0	e 23 47	{-3}	—	—
Tucson		93.2	56	i 13 17	0	i 25 40	PS	e 17 2	PP
Kodaikanal	E.	95.4	279	i 13 54	+26	e 24 6	[+3]	—	—
Hyderabad		97.0	286	e 13 32	-3	24 12	[0]	17 26	PP
Butte		97.5	43	e 13 37	0	—	—	—	46.9
Hungry Horse		97.5	40	e 13 35	-2	e 24 16	[+2]	i 17 38	PP
Bozeman		98.3	44	—	—	e 24 20	[+1]	—	—
Tacubaya		98.3	72	e 13 35	-6	e 24 22	[+3]	e 25 59	PS
Poona	E.	101.5	285	e 12 52	-63	—	—	18 17	PP
Dehra Dun	N.	101.7	298	17 33	PP	24 36	[+1]	20 3	PPP
Bombay		102.6	285	i 14 0	0	i 25 52	+10	i 17 53	PP
Almata		106.2	311	—	—	e 28 3	PS	—	—
Naryn		106.4	308	i 18 39	PP	i 24 50	[-7]	i 21 47	PKS
Fayetteville		107.5	58	i 14 31	P	i 29 42	PPS	e 18 42	PKP
Frunse		107.8	309	e 18 28	[-1]	e 28 11	PS	i 18 47	PP
Warsak Dam	E.	108.0	301	e 18 53	[+24]	e 28 6	PS	e 40 25	?
Huancayo		108.3	111	e 18 3	[-27]	i 26 5	{+12}	e 18 57	PP
Andijan		108.9	307	e 14 27	P	i 28 33	PS	i 18 49	PP
Fergana		109.3	306	e 19 20	PP	—	—	—	—
Namangan		109.5	307	i 14 30	P	e 28 12	PS	e 19 2	PP
Quetta		110.8	292	18 20f	[-15]	—	—	—	—
Mobile		111.2	64	e 19 12	[+36]	26 18	{+5}	—	—
Stalinabad		111.2	305	e 18 27	[-9]	27 1	{+48}	—	—

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	$\Delta$	Az.	P.		O-C.	S.	O-C.	Supp.		L.
	°	°	m.	s.	s.	m.	s.	m.	s.	m.
Lunacharskoe	111.3	307	e 18	20	[-16]	—	—	—	—	—
Tashkent	111.3	307	e 14	38	P	e 28 38	PS	e 18 52	PP	—
La Paz	112.1	119	e 18	31	[-6]	e 28 56	PS	e 19 27	PP	e 59.0
Resolute Bay	112.3	16	e 18	41	[+3]	e 26 24	{+3}	i 19 20	PP	e 57.6
Samarkand	112.8	305	e 18	34	[-5]	—	—	—	—	—
Chinchina	115.1	95	e 18	42	[-1]	e 25 32	[0]	e 19 44	PP	59.3
Bairam-Ali	116.2	302	i 18	46	[+1]	e 25 43	[+7]	e 19 56	PP	—
Bogota	N. 116.4	96	e 20	7	PP	e 25 22	[-15]	e 29 48	PS	—
Sverdlovsk	118.1	323	e 15	10	P	e 25 31	[-12]	i 18 47	PKP	—
Cleveland	118.2	53	e 18	56k	[+7]	e 25 45	[+1]	e 20 8	PP	—
Ashkabad	119.2	302	i 18	51	[0]	e 29 58	PS	20 21	PP	—
Kimberley	z. 119.3	216	e 18	50	[-1]	—	—	—	—	—
Buffalo (Larkin)	120.4	52	i 20	19	PP	—	—	—	—	—
Kizyl-Arvat	120.9	304	i 19	6?	[+11]	e 25 51?	[-2]	e 30 9?	PS	—
Ottawa	122.5	49	e 18	56k	[-2]	e 25 38	[-20]	e 20 25	PP	—
Fordham	123.9	54	e 18	59	[-1]	e 27 41	{+1}	—	—	—
Palisades	123.9	54	i 15	39	P	e 26 6	{+3}	i 18 58	PKP	e 58.3
Harvard	125.6	52	e 18	55a	[-9]	—	—	e 20 47	PP	e 66.0
Seven Falls	E. 125.8	46	e 20	21	PP	e 26 11	{+3}	e 27 51	SKKS	—
Weston	125.8	57	e 19	2	[-2]	—	—	i 21 2	PP	e 66.4
Baku	125.9	305	e 19	6	[+2]	e 21 0	PP	e 23 32	PPP	—
Shemakla	126.8	305	i 19	5	[-1]	e 28 2	{+3}	i 21 22	PP	—
San Juan	128.1	83	i 19	7	[-1]	—	—	e 21 6	PP	—
Goris	128.6	304	e 16	9	P	e 22 42	PKS	e 19 9	PKP	—
Grozny	128.8	308	i 19	8	[-2]	—	—	—	—	—
Tiflis	129.7	307	i 19	11	[0]	e 22 34	PKS	i 21 26	PP	—
Erevan	130.0	305	i 19	10	[-2]	e 22 34	PKS	e 21 26	PP	—
Kiruna	130.0	345	i 19	11k	[-1]	e 26 22?	{+2}	i 21 20	PP	e 58.3
Gori	130.1	307	e 19	14	[+2]	—	—	—	—	—
Leninakan	130.4	305	e 19	20	[+7]	—	—	—	—	—
Piatigorsk	130.6	310	19	12	[-1]	e 22 38	PKS	i 21 15	PP	—
Borzhom	130.7	306	i 19	12	[-1]	i 22 40	PKS	e 21 27	PP	—
Scoresby Sund	130.7	5	i 19	12	[-1]	e 26 26	{+4}	e 24 28	PPP	—
Tsikhlis-Dzhvari	130.7	306	19	14	[+1]	e 22 39	PKS	—	—	—
Moscow	130.8	326	i 19	12	[-2]	i 22 46	PKS	—	—	—
Abastumanj	131.1	306	e 19	19	[+5]	—	—	—	—	—
Halifax	131.1	49	i 19	14k	[0]	e 28 26	{-1}	e 21 29	PP	—
Bermuda	131.2	65	e 19	10	[-4]	e 28 30	{+3}	i 22 40	PKS	e 61.8
Fort de France	131.7	90	i 22	43	PKS	—	—	—	—	—
Zugdidi	131.7	309	e 19	20	[+5]	—	—	—	—	—
Pulkovo	132.2	333	i 19	14	[-2]	i 22 42	PKS	e 21 41	PP	—
Sotchi	133.1	310	e 19	17	[-1]	i 22 46	PKS	e 21 37	PP	—
Helsinki	134.1	336	i 22	47	PKS	—	—	—	—	—
Theodosia	135.8	313	e 19	20	[-3]	e 22 54	PKS	e 22 0	PP	—
Yalta	136.8	312	e 19	24	[-1]	e 26 26	[-8]	i 22 8	PP	—
Upsala	136.9	339	i 19	24	[-1]	i 22 55	PKS	i 22 10	PP	e 67.3
Ksara	137.4	296	e 19	28	[+2]	—	—	e 22 31	PP	—
Bergen	139.7	348	e 19	53	[+23]	e 22 50	PKS	e 22 19	PP	e 71.3
Cernauti	140.5	321	e 19	30	[-1]	—	—	—	—	—
Helwan	z. 141.4	291	e 19	26	[-7]	e 22 29	PP	e 21 11	?	—
Istanbul	141.4	309	19	32	[-1]	e 26 41	[0]	e 22 35	PP	—
Copenhagen	141.9	339	i 19	28	[-6]	e 26 3	[-39]	e 22 34	PP	61.3
Bucharest	142.2	316	e 19	28	[-6]	e 32 30	PSKS	e 19 32	PKP	—
Uzhgorod	142.4	324	19	31	[-4]	e 26 38	[-5]	e 22 41	PP	—
Skalnate Pleso	143.2	326	e 19	27	[-9]	e 23 6	PKS	e 22 37	PP	—
Raciborzu	143.7	328	e 19	37	[0]	e 23 39	PKS	e 22 52	PP	—
Aberdeen	E. 144.0	352	i 23	23	PKS	i 32 43	PSKS	e 41 38	SS	e 73.8
Potsdam	144.3	336	i 19	36k	[-2]	i 22 48	?	i 23 1	PP	e 69.3
Timisoara	N. 144.6	320	e 19	40	[+2]	—	—	e 20 37	?	—
Sofia	144.7	315	i 19	38	[-1]	—	—	i 20 31	?	—

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		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.	
		°	°	m. s.	s.	m. s.	s.	m. s.	m.	
Kecskemet		144.8	323	19 40	[+ 1]	—	—	22 59	PP	—
Budapest	E.	144.9	324	19 37	[- 2]	e 42 4	SS	e 22 56	PKS	—
	N.	144.9	324	i 19 40	[+ 1]	e 26 31	[-16]	e 22 37	PP	—
Szeged	N.	145.0	322	19 42	[+ 3]	e 21 6	?	22 43	PP	—
Ogyalla		145.1	325	19 40 <sub>a</sub>	[+ 1]	e 26 35	[-12]	e 22 50	PP	—
Collnberg		145.2	333	i 19 38	[- 2]	—	—	—	—	—
Kalossa		145.5	323	e 19 40	[0]	i 19 55	?	i 20 19	?	—
Prague		145.5	331	i 19 39 <sub>k</sub>	[- 1]	e 26 26	[-22]	e 23 5	PKS	—
Belgrade		145.6	319	i 19 41 <sub>k</sub>	[+ 1]	e 29 34	[-14]	e 23 3	PP	e 53.9
Jena		146.0	333	e 19 40	[- 1]	i 19 46	PKP <sub>2</sub>	e 22 57	PP	—
Witteveen	z.	146.2	342	i 19 43 <sub>k</sub>	[+ 2]	—	—	—	—	—
Athens		146.3	306	e 19 41 <sub>k</sub>	[0]	e 23 16	PP	e 23 9	PP	—
Cheb	N.	146.3	333	e 19 48	[+ 7]	e 26 45	[- 4]	e 22 49	PP	—
De Bilt		147.3	342	i 19 43 <sub>k</sub>	[0]	i 23 16	PP	e 26 2	PPP	e 78.3
Uccle		148.6	342	e 19 44	[- 1]	e 29 30	[-41]	e 23 22	PP	e 76.3
Stuttgart		148.7	334	i 19 44 <sub>k</sub>	[- 1]	e 27 44	[+52]	e 22 55	PP	—
Karlsruhe		148.8	336	i 19 45	[0]	e 22 56	?	e 23 25	PP	—
Triest		148.8	326	i 19 44 <sub>k</sub>	[- 1]	e 29 37	[-35]	e 23 14	PP	—
Kew		149.2	347	i 19 44 <sub>k</sub>	[- 2]	e 23 15	PP	e 49 30	SSS	e 71.3
Strasbourg		149.4	336	i 19 45	[- 1]	e 36 20	PPS	e 23 25	PP	67.9
Chur		150.0	331	e 19 46 <sub>k</sub>	[- 1]	—	—	i 19 53	?	—
Zürich		150.0	334	e 19 47 <sub>a</sub>	[0]	—	—	e 20 49	?	—
Basle		150.3	334	e 19 47	[- 1]	e 23 27	PKS	e 22 5	?	—
Salo		150.5	328	e 19 46 <sub>k</sub>	[- 2]	e 23 15	PKS	i 20 7	PKP <sub>2</sub>	—
Bologna		150.9	326	e 19 50	[+ 1]	e 31 33	?	e 23 49	PP	—
Neuchatel		151.0	334	e 19 48	[- 1]	—	—	—	—	—
Paris		151.0	342	i 19 49	[0]	e 23 15	PKS	i 20 12	pPKP	e 71.3
Besançon		151.2	335	e 19 48	[- 1]	—	—	—	—	—
Florence		151.4	325	e 19 46 <sub>k</sub>	[- 3]	e 30 35	(+ 9)	e 23 56	PP	74.6
Pavia		151.4	329	e 19 48 <sub>k</sub>	[- 1]	e 23 21	PKS	i 20 8	PKP <sub>2</sub>	—
Prato		151.4	325	i 19 50	[+ 1]	e 30 38	(+12)	—	—	—
Jersey	E.	151.7	348	e 20 2	[+12]	—	—	—	—	—
Chambon-la-Forêt		151.8	342	i 19 44	[- 6]	i 19 51	?	i 20 0	PKP <sub>2</sub>	—
Rocca di Papa		151.9	321	e 19 48	[- 2]	e 23 20?	PKS	e 21 14	?	—
Rome	z.	152.0	321	i 19 48 <sub>k</sub>	[- 2]	i 23 30	PKS	i 23 58	PP	—
Messina		152.1	312	i 19 48 <sub>k</sub>	[- 3]	e 23 20	PKS	i 20 24	PKP <sub>2</sub>	—
Reggio Calabria		152.1	312	e 19 50	[- 1]	—	—	—	—	—
Clermont-Ferrand		153.5	338	i 19 52	[0]	e 30 45	(+ 7)	i 20 23	PKP <sub>2</sub>	73.3
Tortosa		158.7	335	i 19 58	[- 1]	—	—	i 24 21	PP	—
Algiers Univ.	z.	160.8	323	e 20 0	[- 2]	e 31 16	(- 1)	e 20 45	PKP <sub>2</sub>	—
Toledo		161.0	343	e 20 3	[+ 1]	24 30	PP	e 20 48	PKP <sub>2</sub>	—
Alicante		161.2	335	19 56	[- 6]	27 1	[- 5]	24 27	PP	76.4
Almeria		163.3	336	i 20 4	[0]	31 20	(- 9)	i 20 52	PKP <sub>2</sub>	88.8
Granada		163.4	339	i 20 7 <sub>a</sub>	[+ 3]	26 39	[-28]	i 24 39	PP	i 86.3
Malaga		164.0	340	i 20 7	[+ 2]	i 24 54	PP	i 21 8	PKP <sub>2</sub>	89.1
Tamanrasset	z.	164.9	277	i 20 7	[+ 1]	e 24 46	PP	i 21 2	PKP <sub>2</sub>	—
Averroes		168.1	347	i 20 14	[+ 6]	e 25 10	PP	e 21 20	PKP <sub>2</sub>	103.3
M'Bour		170.6	140	i 20 12	[+ 2]	e 27 1	[-11]	i 21 26	PKP <sub>2</sub>	—

May 11d. 22h. 48m. Epicentre 38°·7N. 26°·5E. (Strasbourg).

Intensity IV at Neochorion in Chios ; III at Mytilini, Plomarion in Lesbos.

A. Galanopoulos.

Seismological Institute Bulletin for 1953, Athens, 1954, p. 61.

May 12d. 1h. 37m. Epicentre 43°·5N. 141°·9E. Depth 240km.

Seismo. Bull Cent. Met. Obs., Japan, for May, 1953, Tokyo, 1953, p. 17-18

May 12d. 7h. 11m. Epicentre 36°·7N. 70°·8E. Depth of focus 200km.

Bulletin of Seismo. stations of U.S.S.R. for 1953, April-June, Moscow, 1954, p. 96.

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May 12d. 12h. 39m. 6s. Epicentre 52°·3N. 177°·3W. Depth of focus 0·010.  
(as on 1952, September 27d.).

Felt at Adak and Great Sitkin.  
Epicentre 52°·25N. 176°·75W. (Strasbourg). Depth 100km.

L. M. Murphy and W. K. Cloud.  
United States Earthquakes, 1953, U.S.C.G.S., Serial 785, Washington, 1955, p. 26.

A = -·6134, B = -·0289, C = +·7892;  $\delta = -7$ ;  $h = -6$ ;  
D = -·047, E = +·999; G = -·788, H = -·037, K = -·614.

		$\Delta$ °	Az. °	P.		O-C. s.	S.		O-C. s.	Supp.	
				m.	s.		m.	s.		m.	s.
Adak		0·6	136	i 0	12	- 5	i 0	19	-10	—	—
College		19·6	39	i 4	22	- 1	—	—	—	—	—
Victoria		34·0	74	e 6	35	- 1	—	—	—	—	—
Shasta	z.	38·6	85	e 7	14k	- 1	i 7	18	P	e 7	39
Mineral	z.	39·3	85	e 7	20a	- 1	e 8	29	?	i 7	42
Hungry Horse		39·4	70	i 7	22	0	i 13	12	- 4	—	—
Reno	z.	40·9	84	e 7	35	+ 1	e 7	39	?	e 7	58
Lick	z.	41·2	88	e 7	35a	- 1	—	—	—	—	pP
Butte		41·5	71	e 7	39	0	e 9	38	PcP	—	—
Tinemaha	z.	43·4	86	i 7	54	0	—	—	—	i 8	11
China Lake	z.	44·6	87	i 8	3	- 1	—	—	—	e 8	19
Pasadena	z.	45·4	89	i 8	8	- 2	i 7	59	?	e 8	20
Riverside	z.	46·0	89	e 8	12	- 3	—	—	—	e 8	28
Nelson		46·4	85	i 8	16	- 2	—	—	—	i 8	33
Barratt	z.	47·3	90	i 8	23	- 3	—	—	—	e 8	40
Tucson		51·2	85	i 8	54	- 2	—	—	—	i 9	11
Fayetteville		58·5	71	i 9	45	- 3	—	—	—	—	—
Kiruna	z.	59·5	352	i 10	0	+ 5	—	—	—	i 10	17
Morgantown		63·9	58	i 10	24	- 1	—	—	—	—	—
Harvard		65·9	51	i 10	38a	0	—	—	—	—	—
Weston		66·1	51	i 10	38a	- 1	—	—	—	—	—
Quetta	z.	80·5	308	i 12	8	+ 5	—	—	—	—	—
San Juan		87·9	63	i 12	41	+ 1	—	—	—	—	—
Pietermaritzburg	z.	149·5	307	e 19	43	PKP <sub>2</sub>	—	—	—	—	—
Kimberley	z.	151·3	316	e 19	41	[+ 5]	—	—	—	i 19	47

May 13d. 4h. 16m. 29s. Epicentre 52°·5N. 174°·2E. Depth of focus 0·005.  
(as on 1952, December 7d.).

A = -·6081, B = +·0618, C = +·7914;  $\delta = -8$ ;  $h = -6$ ;  
D = +·101, E = +·995; G = -·787, H = +·080, K = -·611.

		$\Delta$ °	Az. °	P.		O-C. s.	S.		O-C. s.	Supp.		L. m.	
				m.	s.		m.	s.		m.	s.		
College		22·9	42	e 5	1	+ 2	(e 9	3)	+ 3	e 8	42	PcP	e 9·0
Victoria		38·8	70	e 7	22	+ 2	—	—	—	—	—	—	—
Resolute Bay		40·5	25	e 7	34k	0	e 13	33	- 5	e 17	21	ScS	—
Shasta	z.	43·8	79	e 8	3	+ 2	e 13	49	PcS	e 9	49	PP	—
Hungry Horse		44·2	66	i 8	6	+ 2	e 18	2	ScS	i 9	50	PP	—
Mineral	z.	44·5	79	e 8	9k	+ 2	—	—	—	i 8	55	?	—
Reno	z.	46·1	78	e 8	29	+10	e 13	46	PcS	e 9	2	?	—
Lick	z.	46·4	82	e 8	31a	+ 9	—	—	—	i 9	53	PcP	—
Fresno	z.	47·9	81	e 8	43	+ 9	—	—	—	—	—	—	—
Tinemaha	z.	48·6	80	i 8	42	+ 3	e 9	9	sP	i 9	26	?	—
China Lake	z.	49·8	80	e 8	51	+ 3	i 14	2	PcS	i 9	1	pP	—
Pasadena		50·6	82	e 9	1	+ 7	i 9	6	?	i 9	24	?	e 22·6
Riverside	z.	51·2	82	i 9	6	+ 7	—	—	—	i 10	22	PcP	—
Boulder City		51·4	79	i 9	3	+ 3	—	—	—	i 9	10	?	—
Nelson		51·5	79	i 9	3	+ 2	—	—	—	i 9	30	sP	—

Continued on next page.



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		$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.
		$^{\circ}$	$^{\circ}$	m.	s.	s.	m.	s.	s.	m.	s.	m.
Palomar	z.	51.9	82	i 9	6	+ 2	—	—	—	i 9	58	?
Barratt	z.	52.5	83	e 9	10	+ 1	—	—	—	i 9	19	?
Tucson		56.3	79	e 9	38	+ 2	—	—	—	—	—	—
Scoresby Sund		56.8	7	i 9	36 <sub>a</sub>	- 4	e 17	32	+ 6	e 19	7	ScS
Kiruna		58.4	349	i 9	48 <sub>a</sub>	- 3	e 17	45	- 2	e 13	18	PPP
Kirkland Lake	z.	61.5	47	e 10	12	0	—	—	—	—	—	—
Reykjavik		63.0	9	i 10	23 <sub>a</sub>	+ 1	—	—	—	—	—	—
Fayetteville		63.3	65	i 10	24 <sub>a</sub>	0	—	—	—	i 10	59	PcP
Ottawa		65.6	47	e 10	38 <sub>k</sub>	- 1	—	—	—	—	—	—
Cleveland		65.9	53	i 10	42 <sub>k</sub>	+ 1	e 19	30	+ 8	—	—	—
Shawinigan Falls	N.	65.9	44	e 10	40	- 1	—	—	—	—	—	—
Upsala		66.4	348	i 10	41 <sub>a</sub>	- 3	i 11	14	PcP	i 11	46	?
Chatra	z.	67.4	285	i 10	46	- 5	—	—	—	—	—	e 30.5
Morgantown		68.0	54	e 10	55	+ 1	—	—	—	—	—	—
Harvard		69.7	46	i 11	5 <sub>a</sub>	0	—	—	—	—	—	—
Palisades		69.8	48	i 11	5	0	—	—	—	e 40	29	?
Weston		69.9	46	i 11	6 <sub>k</sub>	0	—	—	—	i 12	14	?
Copenhagen		71.1	350	e 11	11	- 2	20	49	SP	—	—	35.5
Halifax		71.2	40	i 11	15 <sub>a</sub>	+ 1	—	—	—	—	—	—
Tacubaya		72.8	81	e 11	26	+ 3	—	—	—	—	—	—
Witteveen	z.	74.5	353	11	34 <sub>k</sub>	+ 1	—	—	—	—	—	—
Collmberg		75.4	348	e 11	36	- 2	—	—	—	—	—	—
Raciborz	z.	75.8	344	e 11	39	- 2	—	—	—	—	—	—
Jena		75.9	349	e 11	40	- 1	—	—	—	e 11	57	pP
Quetta	z.	76.1	302	i 11	39	- 3	i 14	29	PP	i 12	10	pP
Prague		76.4	347	e 11	43	- 1	e 12	46	?	e 12	12	pP
Stuttgart	z.	78.3	350	e 11	53	- 2	—	—	—	—	—	—
Strasbourg		78.6	351	e 11	55	- 1	—	—	—	—	—	—
Paris		78.8	355	i 11	57	0	—	—	—	i 12	7	PcP
Chambon-la-Forêt		79.6	355	i 12	1	- 1	—	—	—	—	—	e 37.5
Besançon		80.1	352	e 12	3	- 1	—	—	—	—	—	—
Triest	z.	80.8	347	e 12	6	- 2	—	—	—	e 12	40	?
Istanbul	z.	82.0	334	e 12	13	- 1	22	43	ScS	—	—	—
Florence	z.	83.0	348	i 12	19 <sub>a</sub>	- 1	e 12	47	?	—	—	—
Rome		84.7	346	e 12	26	- 2	e 22	56	+ 7	e 28	46	SS
Alicante		89.4	356	9	43	?	e 23	23	-11	e 16	18	PP
Algiers Univ.	z.	90.8	353	e 12	56	- 1	—	—	—	—	—	—
San Juan		92.2	56	i 13	6	+ 2	—	—	—	—	—	—
Tamanrasset	z.	104.4	349	e 17	7	?	—	—	—	e 18	5	PP
Kimberley	z.	147.2	304	i 19	35	[+ 1]	—	—	—	—	—	—

May 13d. 5h. 10m. Epicentre 38°·5N. 73°·9E. Depth 160km.  
Bulletin of Seismo. Stations of the U.S.S.R. for April-June, 1953, Moscow, 1954, p. 96-97.

May 13d. 9h. 19m. Epicentre 39°·6N. 71°·3E.  
Bulletin of Seismo. Stations of the U.S.S.R. for April-June, 1953, Moscow, 1954, p. 97.

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May 13d. 11h. 52m. 59s. Epicentre 28°·5S. 175°·9W. (as on 1951, June 7d.).

A = -·8779, B = -·0629, C = -·4747;  $\delta=0$ ;  $h=+2$ ;  
D = -·071, E = +·997; G = +·473, H = +·033, K = -·880.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Karapiro	N.	11·8	215	e 3 22	?	—	—	—	c 8·0
Tuai	N.	11·8	208	e 2 53	0	c 4 46	-20	—	—
Tongariro	Z.	12·8	211	e 3 1?	- 5	—	—	—	—
Wellington		14·9	208	e 3 35	+ 1	5 56	-24	e 6 35	SS
Apia		15·1	16	e 3 29?	- 7	e 6 7	-18	(e 6 31?)	S
Cobb River	E.	15·6	213	e 3 55	PP	c 6 13	-24	—	—
Christchurch		17·6	207	—	—	c 7 11	-12	—	e 8·6
Brisbane		27·4	264	e 5 49	0	e 10 28	0	i 6 28	PP
Riverview		28·6	250	e 6 0	0	e 10 47	- 1	i 12 34	SSS
Baguio		75·9	297	e 11 12	-38	e 22 31	PPS	—	e 40·0
Pasadena		82·8	45	i 12 33	+ 6	i 12 46	?	i 12 54	?
Santa Clara	E.	82·8	40	e 34 23	PKKS	—	—	—	e 38·8
Lick	Z.	82·9	40	e 12 29 <sub>a</sub>	+ 1	—	—	e 12 45	?
Berkeley		83·0	40	e 12 30 <sub>a</sub>	+ 2	e 22 51	+ 4	e 34 25	PKKS
Palomar	Z.	83·1	46	i 12 31	+ 2	—	—	i 12 34	PcP
Riverside	Z.	83·2	45	i 12 30	+ 1	—	—	i 12 35	PcP
Fresno	Z.	83·6	42	e 12 33 <sub>k</sub>	+ 2	—	—	—	—
Yuzno-Sakhlinsk		83·9	332	e 12 31	- 2	e 22 55	- 1	—	—
China Lake	Z.	84·3	44	e 12 34	- 1	—	—	i 12 40	PcP
Petropavlovsk		84·3	344	12 32	- 3	—	—	—	—
Tinemaha	Z.	84·4	43	i 12 38	+ 2	i 12 43	PcP	i 12 55	?
Shasta	Z.	84·9	37	e 12 35	- 3	—	—	e 14 8	?
Mineral	Z.	85·1	38	e 12 38 <sub>a</sub>	- 1	—	—	i 12 56	?
Reno		85·5	40	e 12 40 <sub>a</sub>	- 1	e 23 19	+ 7	e 15 37	PP
Klyuchi		86·8	347	e 12 49	+ 2	—	—	—	—
Bogota	N.	102·6	91	e 27 46	PS	c 32 56	SS	—	—
Bermuda		121·5	67	e 19 6	[+10]	e 37 25	SSP	e 40 21	?
Andijan		123·8	301	e 18 56	[- 4]	e 20 47	PP	e 23 12	PPP
Dzhergetal		124·4	300	e 19 6	[+ 5]	—	—	—	—
Namangan		124·4	301	e 20 32	PP	e 30 41	PS	e 23 18	PPP
Quetta	Z.	125·8	288	i 19 3	[- 1]	—	—	—	—
Sverdlovsk		131·6	322	e 21 21	PP	38 55	SS	i 22 39	PKS
Scoresby Sund		135·5	12	e 19 18	[- 4]	39 57	SS	e 22 58	PKS
Kiruna		139·4	350	i 19 29	[ 0]	e 40 36	SS	e 23 7	PKS
Goris		143·6	299	e 19 33	[- 4]	—	—	—	e 63·0
Moscow		143·7	328	e 19 32	[- 5]	—	—	e 22 43	PP
Tiflis		144·5	303	e 19 33	[- 5]	e 33 6	SKSP	—	—
Gori		145·0	303	e 19 36	[- 3]	—	—	—	—
Piatigorsk		145·3	307	e 19 45	[+ 5]	—	—	i 22 48	PP
Akhalkalaki		145·5	303	19 40	[ 0]	—	—	—	—
Borzhomi		145·5	303	i 19 38	[- 2]	—	—	—	—
Tsikhlis-Dzhvari		145·5	303	e 19 40	[ 0]	—	—	—	—
Abastumanj		146·0	303	e 19 40	[- 1]	—	—	—	—
Upsala		147·3	348	i 19 43	[ 0]	i 19 52	PKP <sub>2</sub>	i 20 31	?
Sotchi		147·8	308	e 19 44	[ 0]	—	—	—	e 90·0
Theodosia		150·2	312	e 19 45	[- 3]	—	—	—	—
Yalta		151·3	312	e 19 46	[- 3]	—	—	e 23 29	PP
Copenhagen		152·2	351	i 19 55	[+ 4]	—	—	23 33	PP
Ksara		152·4	289	e 19 54	[+ 3]	e 22 37	?	e 34 4	SKSP
Istanbul	Z.	156·1	309	19 50	[- 6]	29 57? {-55}	?	23 43	PP
Collmberg		156·2	346	e 26 6	?	e 26 15	?	—	—
Helwan	Z.	156·2	280	e 20 5	[+ 9]	e 20 21	PKP <sub>2</sub>	e 24 0	PP
De Bilt		156·4	358	e 20 1	[+ 5]	—	—	—	e 82·0
Jena	Z.	156·9	348	e 19 57	[ 0]	e 20 16	?	e 20 34	PKP <sub>2</sub>
Stuttgart		159·4	351	e 20 1	[+ 1]	c 38 13	PPS	e 24 17	PP

Continued on next page.

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	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Paris	159.7	3	e 20 3	[+ 3]	e 20 41	PKP <sub>2</sub>	e 24 17	PP e 88.0
Strasbourg	159.7	353	e 20 2	[+ 2]	e 24 18	PP	e 27 51	PPP 83.0
Besançon	161.2	355	e 20 10	[+ 8]	—	—	e 20 43	PKP <sub>2</sub> —
Triest	z. 161.3	339	e 20 3	[+ 1]	e 20 42	PKP <sub>3</sub>	e 21 24	? —
Pavia	162.9	348	e 20 10	[+ 6]	e 34 56	PS	e 25 24	PP —
Florence	z. 163.7	341	e 20 7	[+ 2]	e 27 44	[+36]	e 21 34	? —
Rome	165.0	336	e 28 36	PPP	—	—	—	—
Messina	N. 166.4	319	—	—	e 26 50	[-19]	—	—
Algiers Univ.	z. 171.7	—	e 20 10	[ 0]	e 36 12	SKSP	e 25 24	PP —
Tamanrasset	z. 174.2	—	e 20 12	[+ 1]	e 32 29	{+ 6}	e 25 36	PP —

May 13d. 13h. 14m. Epicentre 36°·5N. 141°·3E. Depth 20km.

Intensity II-III at Utunomiya.

Seismo. Bull. Cent. Met. Obs., Japan, for May, 1953, Tokyo, 1953, p. 18-19, with macro-seismic chart p. 18.

May 14d. 7h. 41m. 43s. Epicentre 50°·0N. 129°·7W.

A = -·4122, B = -·4965, C = +·7639;  $\delta = -4$ ;  $h = -6$ ;  
D = -·769, E = +·639; G = -·488, H = -·588, K = -·645.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Alberni	3.3	102	0 53	0	1 37	+ 2	—	—
Victoria	4.4	108	i 1 9k	- 1	(1 53)	- 9	—	— 1.9
Seattle	z. 5.5	114	i 1 25	0	e 2 59	- 3 <sub>r</sub>	—	e 3.8
Hungry Horse	10.4	93	i 2 33	- 1	—	—	—	e 5.4
Shasta	10.6	148	e 2 37k	+ 1	—	—	e 8 5	? —
Mineral	z. 11.2	146	e 2 43k	- 1	i 3 47	?	e 8 11	? —
Butte	12.2	103	i 2 56	- 2	—	—	—	—
Reno	z. 12.6	142	e 3 5a	+ 2	—	—	e 4 0	? —
Santa Clara	E. 13.8	153	—	—	e 6 4	+10	—	—
Lick	z. 13.9	152	e 3 19k	- 2	e 3 36	PPP	e 4 11	? —
Logan	14.9	117	e 3 37	+ 3	—	—	—	—
Fresno	z. 15.1	148	e 3 36 <sub>a</sub>	0	—	—	e 4 0	PPP —
Tinemaha	z. 15.4	143	e 3 39	- 1	—	—	i 3 45	? —
China Lake	z. 16.7	144	e 3 58	+ 1	—	—	i 4 2	? —
Boulder City	17.7	136	e 4 13	+ 3	—	—	e 4 36	PPP —
College	17.7	334	e 4 10	0	i 7 37	+11	—	— e 8.4
Nelson	17.9	136	e 4 13	+ 1	—	—	i 4 38	PPP —
Pasadena	z. 18.0	146	e 4 14	+ 1	—	—	i 4 25	PP —
Riverside	z. 18.4	145	e 4 18	0	i 4 25	?	i 4 34	PP —
Palomar	z. 19.1	144	i 4 29	+ 2	—	—	—	—
Barratt	z. 19.8	146	i 4 35	0	—	—	i 4 41	? —
Tucson	22.6	135	e 5 3	0	—	—	—	—
Resolute Bay	28.7	17	e 6 9	+ 8	—	—	—	— e 14.5
Fayetteville	29.2	103	i 6 3	- 2	—	—	—	— e 16.2
Kirkland Lake	z. 32.1	73	e 6 30	- 1	—	—	—	—
Ottawa	36.0	75	e 7 3	- 2	—	—	8 47	PPP 18.4
Morgantown	36.2	87	i 7 5	- 1	—	—	e 8 25	PP —
Washington	38.4	85	e 7 24	- 1	—	—	—	—
Palisades	39.3	80	e 7 30	- 2	—	—	—	e 18.8
Harvard	40.0	77	e 7 37	- 1	—	—	e 21 14	Q e 24.2
Weston	40.2	77	i 7 39k	- 1	—	—	—	— e 24.2
Scoresby Sund	49.2	25	—	—	e 16 5	+ 7	19 53	SS 24.3
Kiruna	60.4	12	e 10 5	- 8	—	—	—	e 31.3
Alicante	81.3	38	12 21	+ 1	e 22 33	+ 3	17 21	PPP 38.8

May 14d. 9h. 36m. Epicentre 35°31'N. 121°17'W. (U.S.C.G.S.).

Intensity V at Bryson.

L. M. Murphy and W. K. Cloud.

United States Earthquakes, 1953, U.S.C.G.S., Serial 785, Washington, 1955, p. 14.

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May 14d. 13h. 0m. Epicentre 38°·7N. 26°·5E. (Strasbourg).

After-shock of earthquake on May 2d. at 18h. Felt in the islands of Lesbos (intensity IV-V at Skopelos and Plomariion; IV at Mytilini and Eressos), in Chios (intensity IV-V at Neochorion and Nenita), in Ikaria (intensity IV at Hag. Kiryx), and in Samos (intensity III at Vathy). Felt also at Izmir and Foça in Turkey.

A. Galanopoulos.

Seismological Institute Bulletin, 1953, Athens, 1954, p. 61.

Bulletin séismique mensuel d'Istanbul, mai, 1953.

May 14d. 18h. 27m. 40s. Epicentre 50°·0N. 129°·7W. (as at 7h.).

		△	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Alberni		3·3	102	0 57	+ 4	1 36	+ 1	—	—
Victoria		4·4	108	1 12	+ 2	(1 56)	- 6	—	1·9
Seattle	z.	5·5	114	i 1 28	+ 3	e 2 54	+ 7*	e 2 14	? e 3·2
Corvallis		6·9	139	e 1 42	- 3	e 5 2	?	—	—
Hungry Horse		10·4	93	i 2 35	+ 1	—	—	—	e 5·6
Shasta		10·6	148	e 2 32 <sub>a</sub>	- 4	e 4 42	+ 5	e 2 38	P e 6·4
Mineral	z.	11·2	146	e 2 42 <sub>k</sub>	- 2	—	—	i 2 51	PP
Butte		12·2	103	e 2 57	- 1	—	—	—	—
Reno	z.	12·6	142	e 3 2 <sub>k</sub>	- 1	e 3 17	PP	e 4 14	? —
Berkeley		13·3	153	—	—	e 5 43	+ 1	—	—
Santa Clara	E.	13·8	153	—	—	e 6 0	+ 6	—	— e 7·3
Lick	z.	13·9	152	i 3 17 <sub>a</sub>	- 4	—	—	—	—
Logan		14·9	117	e 3 37	+ 3	—	—	—	—
Fresno	z.	15·1	148	e 3 32	- 4	—	—	—	—
Tinemaha	z.	15·4	143	i 3 46	+ 6	—	—	i 4 4	PPP
China Lake	z.	16·7	144	e 3 55	- 2	—	—	—	—
Boulder City		17·7	136	e 4 13	+ 3	—	—	e 5 22	? —
College		17·7	334	e 4 14	+ 4	i 7 47	SS	—	— e 8·5
Nelson		17·9	136	i 4 57	?	—	—	—	—
Pasadena		18·0	146	i 4 11	- 2	—	—	i 4 21	PP
Riverside	z.	18·4	145	e 4 15	- 3	i 4 22	?	i 4 40	PPP
Palomar	z.	19·1	144	e 4 25	- 2	—	—	i 4 48	PPP
Barratt	z.	19·8	146	e 4 32	- 3	—	—	e 4 22	? —
Tucson		22·6	135	e 5 4	+ 1	e 9 8	+ 1	e 6 41	? e 12·7
Resolute Bay		28·7	17	e 6 2	+ 1	e 11 1	+11	—	— e 14·8
Fayetteville		29·2	103	i 6 6	+ 1	—	—	—	— e 15·9
Ottawa		36·0	75	e 7 6	+ 1	e 15 24	SSS	—	— 18·4
Palisades		39·3	80	—	—	e 16 32	SS	e 18 53	Q e 20·0
Scoresby Sund		49·2	25	—	—	e 16 13	+15	20 2	SS 24·3
Kiruna		60·4	12	—	—	e 18 40	+12	—	— e 29·3
Alicante		81·3	38	12 21	+ 1	31 13	SSS	—	— 38·8

May 15d. 5h. 11m. Pamir region. Epicentre 39°·6N. 71°·4E.

Seismological Bulletin of the U.S.S.R. for April-June, 1953, p. 98.

May 15d. 11h. 21m. Pamir region. Epicentre 37°·6N. 69°·7E.

Seismological Bulletin of the U.S.S.R. for April-June, 1953, p. 99.

May 16d. 2h. 52m. Epicentre 35°·1N. 26°·9E.

Intensity IV at Karpathos.

A. Galanopoulos.

Seismological Institute Bulletin, 1953, Athens, 1954, p. 62.

May 16d. 21h. 20m. Epicentre 35°·1N. 132°·6E. Depth of focus 40km.

Intensity IV at Matsue, Hamada, Yonago, Tottori, Matunaga, and Sakai; II-III at Hirosima, Okayama, and Maizuru.

Seismo. Bull. Cent. Met. Obs., Japan, for May, 1953, Tokyo, 1953, p. 19-20, with macroseismic chart.

May 17d. 2h. 33m. Vrancea in Rumania.

Suggested epicentre 45°·9N. 26°·6E., with depth of focus 150km. (Strasbourg), 46°·0N. 26°·5E. (U.S.S.R.).

Annales de l'Institut de Physique du Globe de Strasbourg, Nouvelle Série, Tome XVIII, Deuxième Partie, Séismologie, Strasbourg, 1959, p. 45.

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May 17d. 13h. 11m. 33s. Epicentre 5°·8S. 102°·2E.

A = -·2102, B = +·9725, C = -·1004;  $\delta = +2$ ;  $h = +7$ ;  
D = +·977, E = +·211; G = +·021, H = -·098, K = -·995.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Djakarta		4·6	95	1 12	0	i 3 37	?	i 6 32	?
Bandung	E.	5·5	102	1 23	- 2	i 3 53	?	i 4 27	?
Baguio		28·6	38	e 5 59 <sup>k</sup>	- 1	e 10 49	+ 1	—	—
Madras	E.	28·8	311	e 6 8	+ 6	—	—	—	—
Kodaikanal	E.	29·3	303	i 6 35	PP	—	—	—	—
Hong Kong		30·3	22	—	—	11 22	+ 7	—	—
Calcutta	E.	31·3	335	e 7 33	PP	i 11 34	+ 3	—	—
Shillong	E.	32·8	344	e 6 34	- 3	e 11 48	- 6	—	—
Hyderabad		32·9	315	e 6 49	+11	i 11 56	0	14 8	SS
Chatra	Z.	35·6	336	i 7 3	+ 2	—	—	—	—
Bombay		38·0	311	e 7 39	+18	e 13 19	+ 5	8 54	PP
Nanking		40·8	21	7 46	+ 1	—	—	—	—
Zô-Sê	Z.	40·9	25	i 7 46 <sup>a</sup>	0	—	—	—	—
New Delhi	N.	41·8	326	e 7 51	- 2	e 14 9	- 2	—	—
Dehra Dun	N.	42·7	329	8 1	+ 1	14 26	+ 2	—	—
Warsak Dam	E.	49·1	327	e 8 56	+ 5	e 15 50	- 6	—	e 29·4
Quetta		49·2	319	i 8 47	- 5	—	—	—	—
Khorog		51·6	330	9 11	+ 1	i 16 32	+ 1	—	—
Przhevalsk		52·7	339	9 19	+ 1	16 50	+ 4	—	—
Brisbane	N.	52·8	120	e 11 45	PP	i 16 42	- 5	—	—
Naryn		52·8	335	e 9 17	- 2	16 49	+ 2	—	—
Kulyab		52·9	328	9 19	- 1	16 46	- 2	—	—
Dzhergetal		53·2	330	i 9 25 <sup>?</sup>	+ 3	i 16 54 <sup>?</sup>	+ 2	—	—
Riverview		53·2	128	i 9 46 <sup>k</sup>	+24	i 16 48	- 4	i 16 57	PS
Rybach'e		53·6	336	i 9 24	- 1	i 16 57	- 1	—	—
Andijan		53·8	332	i 9 25	- 1	—	—	—	—
Fergana		53·8	332	e 9 26	0	e 17 1	0	—	—
Almata		53·9	338	e 9 27	0	e 17 6	+ 4	—	—
Stalinabad		53·9	328	e 9 24	- 3	i 16 59	- 3	—	—
Namangan		54·3	332	9 30	0	i 17 9	+ 2	—	—
Frunse		54·6	335	i 9 31	- 1	i 17 13	+ 2	—	—
Vladivostok		55·6	26	e 9 36	- 4	—	—	—	—
Lunacharskoe		55·7	331	e 9 39	- 1	—	—	—	—
Samarkand		55·7	327	9 37	- 3	—	—	—	—
Kyakhta		56·1	3	9 43	0	—	—	—	—
Tchimkent		56·3	332	i 9 35	-10	—	—	—	—
Bairam-Ali		57·1	322	9 50	0	17 46	+ 1	—	—
Kabansk		57·8	3	i 9 54	- 1	—	—	—	—
Irkutsk		57·9	2	e 9 55	- 1	—	—	—	—
Semipalatinsk		59·1	344	e 10 3	- 1	—	—	—	—
Ashkabad		59·6	321	i 10 9	+ 1	i 18 20	+ 3	—	—
Kizyl-Arvat		61·6	321	—	—	i 18 43	0	—	—
Yuzno-Sakhlinsk		63·6	30	e 10 32	- 3	—	—	—	—
Baku		66·4	319	e 10 56	+ 3	e 19 47	+ 4	—	—
Shemakla		67·4	318	—	—	19 58	+ 3	—	—
Goris		68·4	317	i 11 6	0	i 20 7	0	—	—
Makhach-Kala		69·3	321	i 11 11	0	i 20 17	0	—	—
Erevan		69·9	317	e 11 15	0	20 23	- 1	—	—
Tiflis		70·4	318	e 11 17 <sup>?</sup>	- 1	e 20 31	+ 1	—	—
Grozny		70·6	320	e 11 22	+ 3	20 32	- 1	—	—
Leninakan		70·7	317	11 25	+ 5	—	—	—	—
Sverdlovsk		71·0	337	i 11 19	- 3	—	—	—	—
Borzhomi		71·4	317	—	—	i 20 42	0	—	—
Piatigorsk		72·6	320	e 11 32	+ 1	e 20 56	0	—	—
Ksara		73·9	307	e 11 43	+ 4	e 21 39	PS	—	—
Sotchi		74·6	319	e 11 44	+ 1	—	—	—	—
Petropavlovsk		75·5	31	i 11 45	- 3	—	—	—	—
Helwan	Z.	76·5	303	e 11 55	+ 1	—	—	e 16 54	PPP
Theodosia		78·0	318	e 11 59	- 3	—	—	—	—
Yalta		78·7	317	e 12 6	0	e 21 58	- 5	—	—

Continued on next page.



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		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Moscow		80.9	329	e 12 17	0	22 24	- 2	22 31	—
Istanbul		81.2	313	12 18	- 1	22 34	+ 5	e 12 25	PcP
Pulkovo		86.0	331	e 12 46	+ 3	i 23 25	ScS	—	—
Uzhgorod		87.7	320	e 12 56	+ 4	—	—	—	—
Messina	N.	90.9	308	—	—	e 24 6	+ 3	—	—
Kiruna		92.2	337	i 13 13	0	e 24 15	+ 1	e 30 46	SS
Upsala	Z.	92.2	330	e 13 13	0	—	—	—	—
Potsdam	N.	94.0	322	—	—	e 24 33	+ 3	—	e 55.4
Copenhagen		94.6	325	—	—	24 3	[+ 4]	—	—
Pavia		96.2	315	—	—	e 26 9	PS	—	—
Stuttgart		96.3	318	e 17 42	PP	—	—	—	e 56.4
Scoresby Sund		106.4	343	29 15	PPS	34 9	SSP	38 9	SSS
Shasta	Z.	127.2	41	e 19 9	[+ 2]	—	—	e 21 6	PP
Mineral	Z.	127.9	41	e 19 15k	[+ 7]	—	—	—	—
Reno	Z.	129.5	41	e 19 8k	[- 3]	e 22 31	PKS	e 22 8	?
Fresno	Z.	130.8	45	—	—	e 22 34	PKS	e 22 58	?
China Lake	Z.	132.8	45	e 19 25	[+ 8]	e 22 44	PKS	—	—
Harvard		143.0	352	e 19 31	[- 5]	—	—	—	—
Weston		143.1	352	i 19 33a	[- 3]	—	—	—	—
Palisades		144.8	354	i 19 37	[- 2]	—	—	e 22 53	PP
Fayetteville		146.3	23	i 19 41	[ 0]	—	—	—	e 74.3

May 17d. 18h. 26m. Epicentre 36°·2N. 69°·3E.

Bulletin of Seismo. Stations of the U.S.S.R. for April-June, 1953, Moscow, 1954, p. 100.

May 17d. 22h. 12m. 9s. Epicentre 34°·4N. 139°·5E. Depth of focus 0·015.

(as on 1944, December 7d.).

Intensity V at Osima and Ajiro; III-IV at Mera, Yokohama, Tokyo, Hunatu, Kakioka, Hatidyozima, and Utunomiya; II-III at Misima, Kohu, Kashiwa, Tyosi, Kumagaya, Maebasi, Tukubasan, Mito, Onahama, and Hukusima.

Epicentre 34°·7N. 139°·7E. Depth of focus 110km.

Seismo. Bull. Cent. Met. Obs., Japan, for May, 1953, Tokyo, 1953, p. 20-22, with macro-seismic chart.

$$A = -0.6287, B = +0.5370, C = +0.5624; \quad \delta = -7; \quad h = 0;$$

$$D = +0.649, E = +0.760; \quad G = -0.428, H = +0.365, K = -0.827.$$

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Osima	E.	0.4	345	i 0 17	- 2	0 29	- 4	—	—
Mera		0.6	28	i 0 19	- 1	0 31	- 4	—	—
Ajiro		0.7	333	i 0 19	- 2	0 33	- 3	—	—
Misima		0.9	328	i 0 21	- 1	0 35	- 4	—	—
Omaesaki		1.1	281	i 0 25k	+ 1	0 42	- 1	—	—
Shizuoka		1.1	302	i 0 25a	+ 1	0 42	- 1	—	—
Yokohama		1.1	7	i 0 21a	- 3	0 35	- 8	—	—
Hatidyosima		1.3	168	i 0 30a	+ 4	0 50	+ 4	—	—
Hunatu	N.	1.3	332	i 0 24a	- 2	0 41	- 5	—	—
Tokyo	Z.	1.3	9	i 0 24a	- 2	0 41	- 5	—	—
Kohu		1.4	328	i 0 25a	- 3	0 44	- 4	—	—
Hamamatu		1.5	282	e 0 31	+ 2	0 52	+ 2	—	—
Kashiwa	N.	1.5	15	e 0 27	- 2	0 45	- 5	—	—
Titibu		1.6	348	i 0 28a	- 2	0 47	- 5	—	—
Tyosi	N.	1.7	40	0 28k	- 3	0 47	- 7	—	—
Iida		1.8	309	i 0 34a	+ 2	0 56	0	—	—
Kumagaya		1.8	357	i 0 29a	- 3	0 50	- 6	—	—
Kakioka		1.9	17	e 0 29	- 4	0 49	- 9	—	—
Tukubasan		1.9	15	0 33	0	0 55	- 3	—	—
Maebasi		2.0	350	i 0 32a	- 2	0 55	- 6	—	—
Mito		2.1	21	0 33	- 3	0 57	- 6	—	—
Oiwake		2.1	338	0 35	- 1	1 0	- 3	—	—
Matumoto	E.	2.2	326	i 0 37	0	1 4	- 1	—	—
Nagoya	Z.	2.2	290	i 0 38k	+ 1	1 5	0	—	—
Utunomiya	Z.	2.2	8	i 0 33	- 4	0 55	-10	—	—

Continued on next page.

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		$\Delta$	Az.	P.		O - C.	S.		O - C.	Supp.		L. m.
				m.	s.		m.	s.		m.	s.	
Matusiro		2.4	334	i 0	39	- 1	1	3	- 7	—	—	—
Gihu		2.5	294	i 0	41k	0	1	8	- 4	—	—	—
Kameyama		2.5	280	i 0	43k	+ 2	1	12	0	—	—	—
Nagano		2.5	335	0	39	- 2	1	8	- 4	—	—	—
Takayama		2.5	314	e 0	42	+ 1	—	—	—	—	—	—
Tu		2.5	278	i 0	50	+ 9	1	20	+ 8	—	—	—
Ibukisan	E.	2.7	291	i 0	45	+ 1	1	20	+ 3	—	—	—
Hikone		2.8	288	0	47	+ 2	—	—	—	—	—	—
Onahama		2.8	24	e 0	43	- 2	1	8	-11	—	—	—
Owase		2.8	263	0	46	+ 1	1	22	+ 3	—	—	—
Shirakawa		2.8	12	e 0	41	- 4	—	—	—	—	—	—
Takada		2.9	340	0	45	- 1	1	17	- 4	—	—	—
Toyama		2.9	321	e 0	47	+ 1	1	23	+ 2	—	—	—
Hukui	E.	3.1	303	i 0	51k	+ 2	1	23	- 3	—	—	—
Kanazawa		3.1	313	e 0	51	+ 2	1	29	+ 3	—	—	—
Tsuruga	N.	3.1	295	0	51	+ 2	1	29	+ 3	—	—	—
Inawasiro	E.	3.2	9	e 0	47	- 3	1	21	- 7	—	—	—
Kyoto		3.2	283	e 0	51	+ 1	1	26	- 2	—	—	—
Siomisaki		3.2	255	i 0	53k	+ 3	1	33	+ 5	—	—	—
Osaka		3.3	276	i 0	54k	+ 2	—	—	—	—	—	—
Hukusima		3.4	13	0	50	- 3	1	26	- 7	—	—	—
Niigata		3.5	354	e 1	6	+12	1	33	- 3	—	—	—
Kobe		3.6	276	i 0	56k	0	1	43	+ 5	—	—	—
Wakayama		3.6	269	i 0	58	+ 2	1	43	+ 5	—	—	—
Wazima		3.6	325	0	55k	- 1	1	34	- 4	—	—	—
Aikawa		3.8	344	e 0	55	- 3	1	35	- 8	—	—	—
Sumoto		3.8	270	i 1	1k	+ 3	1	44	+ 1	—	—	—
Yamagata		3.9	10	—	—	—	1	57	+12	2	38	?
Sendai	Z.	4.0	16	e 0	55	- 6	1	37	-10	—	—	—
Torisima		4.0	171	1	1	0	1	34	-13	—	—	—
Toyooka		4.0	288	e 1	1	0	1	47	0	—	—	—
Himeji		4.2	273	e 1	4	+ 1	1	41	-11	—	—	—
Isinomaki		4.3	20	e 1	4	- 1	1	43	-12	—	—	—
Sakata		4.5	3	e 1	14	+ 6	2	5	+ 6	—	—	—
Takamatu		4.5	270	i 1	12k	+ 4	1	59	0	—	—	—
Muroto		4.6	257	i 1	11k	+ 2	2	3	+ 1	—	—	—
Mizusawa		4.9	15	1	8	- 5	2	10	+ 1	e 2	7	S
Koti		5.0	262	1	18	+ 4	2	16	+ 4	—	—	—
Akita	Z.	5.3	5	e 1	15	- 3	—	—	—	—	—	—
Saigo	E.	5.3	291	e 1	17	- 1	2	23	+ 4	—	—	—
Matsue		5.4	283	1	12	- 8	2	31	+10	—	—	—
Morioka		5.4	13	e 1	15	- 5	2	13	- 8	—	—	—
Matuyama		5.6	266	i 1	25	+ 3	2	14	-12	—	—	—
Miyako		5.6	20	e 1	22	0	—	—	—	—	—	—
Simidu		5.7	255	i 1	26	+ 2	2	30	+ 2	—	—	—
Hirosima		5.8	272	i 1	29	+ 4	2	37	+ 6	—	—	—
Hamada		6.1	277	i 1	33a	+ 4	2	46	+ 8	—	—	—
Hatinohe		6.3	14	e 1	26	- 6	2	31	-12	—	—	—
Aomori		6.5	8	e 1	39	+ 4	2	49	+ 1	—	—	—
Ooita		6.7	262	e 1	40	+ 3	—	—	—	—	—	—
Simonoseki		7.1	269	1	44	+ 1	—	—	—	—	—	—
Miyazaki		7.2	252	e 1	49	+ 5	—	—	—	—	—	—
Kumamoto		7.5	260	e 1	54	+ 6	—	—	—	—	—	—
Hukuoka		7.6	266	e 1	52k	+ 3	—	—	—	—	—	—
Mori	E.	7.7	6	e 1	55	+ 4	3	18	+ 1	—	—	—
Kagosima		8.0	252	e 2	2	+ 7	—	—	—	—	—	—
Urakawa		8.2	18	e 1	51	- 6	3	16	-13	—	—	—
Tomakomai		8.3	11	e 1	58	- 1	—	—	—	—	—	—
Sapporo		8.8	9	e 2	10	+ 5	—	—	—	—	—	—
Obihiro		9.0	18	—	—	—	e 3	31	-17	—	—	—
Nemuro		10.1	26	—	—	—	e 3	58	-16	—	—	—
Abashiri		10.3	20	—	—	—	e 4	3	-16	—	—	—
Z0-Sè	Z.	15.8	263	i 3	38k	+ 2	e 6	59	SS	—	—	—
Nanking	E.	17.5	269	i 4	0	+ 3	—	—	—	—	—	—
Baguio		24.7	228	i 5	11	+ 1	—	—	—	—	—	—

Continued on next page.

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		$\Delta$ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	Supp. m. s.	L. m.
Chatra	z.	45.3	276	e 8 6	- 1	—	—	—	—
College		52.1	31	i 8 58	- 1	—	—	i 9 12	pP
Resolute Bay		65.5	14	e 10 31k	- 1	—	—	e 11 1	pP
Kiruna	z.	68.4	339	i 10 48k	- 2	i 13 20	PP	i 11 15	pP
Corvallis	z.	71.4	49	e 11 9	+ 1	—	—	—	—
Shasta	z.	73.9	52	i 11 23 <sub>a</sub>	0	e 14 7	PP	e 12 9	sP
Mineral	z.	74.6	52	i 11 27 <sub>a</sub>	0	i 11 45	PcP	i 14 0	PP
Scoresby Sund		74.6	354	e 11 25	- 2	e 20 54	+ 4	e 11 55	pP
Upsala	z.	74.6	334	i 11 27	0	i 14 13	PP	i 11 56	pP
Hungry Horse		74.8	42	i 11 28	0	—	—	—	—
Berkeley	z.	75.5	54	i 11 33 <sub>a</sub>	+ 1	e 11 39	?	e 12 3	pP
Lick	z.	76.2	54	e 11 37 <sub>a</sub>	+ 1	—	—	e 12 6	pP
Reno	z.	76.2	52	i 11 37 <sub>a</sub>	+ 1	e 11 55	?	e 12 3	pP
Butte		77.0	43	i 11 41	+ 1	—	—	i 12 12	pP
Fresno	z.	77.8	54	e 11 45 <sub>a</sub>	+ 1	e 13 45	?	e 12 17	pP
Tinemaha		78.6	53	i 11 50	+ 1	i 13 7	?	i 12 16	pP
Copenhagen		79.5	333	i 11 54	0	—	—	—	—
China Lake	z.	79.8	53	i 11 56	+ 1	e 12 11	PcP	e 12 29	pP
Logan		79.9	46	i 11 58	+ 2	—	—	—	—
Pasadena	z.	80.3	55	i 11 58k	0	—	—	—	—
Istanbul	z.	81.4	315	12 4	0	—	—	e 15 12	PP
Nelson		81.7	52	i 12 5	- 1	—	—	e 12 35	pP
Palomar	z.	81.7	55	i 12 7	+ 1	i 13 7	?	i 12 37	pP
Collmberg		82.6	329	e 12 9	- 1	e 15 19	PP	e 12 39	pP
Jena	E.	83.5	330	e 12 15	0	e 12 26	?	e 13 10	?
Stuttgart		86.1	330	e 12 27	- 1	—	—	e 13 6	pP
Tucson		86.4	53	i 12 30	+ 1	—	—	—	—
Fayetteville		93.8	40	i 13 4	0	—	—	—	—
Ottawa		94.4	24	e 13 7k	+ 1	—	—	—	—
Harvard		98.4	23	i 12 29k	-56	—	—	—	—
Weston		98.5	23	i 13 26k	+ 1	—	—	—	—
Alicante		98.6	330	13 4	-21	e 24 9	SKKS	17 1	PP
Tamanrasset	z.	108.3	316	e 18 10	[- 2]	17 43	?	e 18 39	pPKP

May 18d. 8h. 12m. 11s. Epicentre 28°·7N, 43°·6W. (as on 1952, May 1d.).

A = +·6362, B = -·6058, C = +·4777;  $\delta$  = -6;  $h$  = +2;  
D = -·690, E = -·724; G = +·346, H = -·329, K = -·879.

		$\Delta$ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	Supp. m. s.	L. m.
Angra do Heroismo		16.8	50	—	—	i 7 28	SS	—	i 9.0
Bermuda		18.5	286	i 4 18	- 1	i 8 0	SS	—	e 8.4
Halifax		22.5	321	i 5 5 <sub>a</sub>	+ 3	9 10	+ 5	5 33	PP
San Juan		23.0	248	i 5 6	- 1	e 11 19	L	—	(e 11.3)
Ciudad Trujillo		26.1	255	5 54	+17	e 10 22	+15	—	—
Weston		26.2	309	i 5 39	+ 1	—	—	—	—
Harvard		26.4	309	e 5 41	+ 1	e 10 21	+ 9	i 5 45	P e 13.6
Fordham		27.5	305	e 5 51	+ 1	e 12 49	PcS	—	—
Palisades		27.6	305	i 5 53	+ 2	i 10 37	+ 5	—	e 12.5
Seven Falls	E.	28.1	319	e 6 9	+14	10 47	+ 7	—	13.0
Shawinigan Falls N.		28.9	307	e 6 4	+ 1	—	—	—	—
Washington		29.5	300	e 6 8	0	—	—	—	—
Ottawa		30.3	313	e 6 16 <sub>a</sub>	+ 1	11 19	+ 4	—	—
Cleveland		33.3	303	e 6 40 <sub>a</sub>	- 1	e 12 4	+ 2	e 14 8	SS
Malaga		33.8	65	i 6 46	0	i 11 14	-56	9 3	PcP 15.9
Kirkland Lake	z.	34.1	315	e 6 48 <sub>a</sub>	0	—	—	e 9 11	PcP
Toledo		34.3	60	6 41	- 9	—	—	—	15.3
Granada		34.4	64	i 6 53 <sub>a</sub>	+ 2	i 12 17	- 2	8 18	PP i 16.2
Galerazamba		34.6	246	e 8 12	PP	e 12 40	+18	—	—
Cincinnati		35.2	299	i 6 58	0	—	—	—	—
Almeria		35.3	65	i 7 10	+11	i 12 46	+13	13 30	PcS 17.8
Rathfarnham Castle		36.7	37	e 7 12	+ 2	e 12 56	+ 2	e 15 9	SS e 17.8
Alicante		36.9	63	e 6 59	-13	e 12 48	-10	8 29	PP 16.5
Bogota		37.5	236	e 7 39	+22	e 13 1	- 6	e 15 43	SS 17.8
Jersey	E.	37.6	45	—	—	e 13 17	+ 9	—	e 18.8

Continued on next page.

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		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Tortosa		37.8	59	7 19	- 1	13 8	- 3	—	—
Reykjavik	z.	38.1	15	e 7 16	- 6	—	—	i 7 26	P
Chinchua		38.4	237	e 7 21	- 4	e 13 18	- 2	e 15 33	SS
Mobile		38.5	285	i 7 2	-24	—	—	—	e 18.8
Kew		39.4	42	e 7 53	+20	e 13 50	+15	—	e 17.8
Algiers Univ.	z.	39.7	66	e 7 37	+ 1	—	—	e 9 10	PP
Durham		39.9	38	—	—	i 13 49	+ 6	—	—
Chambon-la-Forêt		40.1	48	i 7 42	+ 3	—	—	—	—
Clermont-Ferrand		40.3	52	e 7 44	+ 4	e 13 54	+ 5	e 9 15	PP
Uccle		42.0	43	e 8 10	+16	e 14 16	+ 2	e 17 31	SS
Besançon		42.5	50	e 8 1	+ 2	—	—	—	—
Fayetteville		43.0	293	i 8 1k	- 2	e 14 31	+ 2	e 9 49	PP
Scoresby Sund		43.6	11	e 8 8	0	e 14 43	+ 5	e 18 8	ScS
Oropa		43.7	53	e 8 31	+23	e 15 32	+53	—	—
Strasbourg		43.8	48	e 8 19	+10	e 14 44	+ 4	e 10 0	PP
Witteveen	z.	43.9	40	i 8 14k	+ 4	—	—	e 8 23	?
Zürich		44.2	50	e 8 4	- 8	—	—	—	—
Karlsruhe	z.	44.3	47	e 8 19	+ 6	e 10 8	PP	i 8 24	?
Tamanrasset	z.	44.4	85	e 8 16	+ 2	e 14 48	- 1	e 10 1	PP
Pavia		44.5	53	e 8 28	+13	e 14 57	+ 6	e 18 27	ScS
Stuttgart		44.8	48	e 8 19	+ 2	e 15 1	+ 6	e 10 20	PP
Florence		45.9	55	e 8 25	- 1	e 15 21	+10	—	—
Bologna		46.0	55	e 8 44	+17	—	—	—	—
Jena		46.6	46	e 8 34	+ 2	e 10 28	PP	e 8 40	?
Rome		46.9	57	e 8 36	+ 2	e 15 30	+ 5	—	—
Collnberg		47.5	45	e 8 39	+ 1	e 16 38	?	—	—
Potsdam		47.7	43	e 8 49	+ 9	e 15 45	+ 9	e 10 35	PP
Triest		47.7	52	i 8 41k	+ 1	e 15 37	+ 1	e 10 31	PP
Copenhagen		47.8	39	e 8 54	+13	e 15 45	+ 7	—	—
Prague		48.3	46	e 8 53	+ 8	e 15 54	+ 9	e 10 13	PcP
Messina	E.	49.5	62	e 8 58	+ 4	—	—	—	—
Huancayo		50.8	222	e 9 8	+ 4	e 16 27	+ 7	—	—
La Paz		50.8	211	e 8 59	- 5	i 16 24	+ 4	11 2	PP
Upsala	z.	51.3	35	e 9 10	+ 2	—	—	—	—
Skalnate Pleso	E.	52.1	48	e 9 15	+ 1	e 16 43	+ 5	e 12 11	PPP
Belgrade		52.5	53	e 13 5a	?	e 16 12	-31	e 14 9	?
Resolute Bay		52.7	345	e 9 18a	0	e 16 53	+ 7	e 11 31	PP
Kiruna		54.0	25	e 9 35	+ 7	e 17 6	+ 3	e 20 32	SS
Athens		55.9	62	e 9 32	-10	—	—	e 9 41	P
Logan		55.9	303	e 9 41	- 1	—	—	—	—
Hungry Horse		56.5	311	e 9 44	- 2	—	—	—	—
Tucson		57.2	292	i 9 51	0	e 18 1	+15	e 11 52	PP
Istanbul	z.	59.3	56	e 10 6?	0	—	—	—	—
Boulder City		59.4	297	e 10 7	+ 1	—	—	—	—
Nelson		59.5	297	e 10 6	- 1	—	—	i 10 14	?
China Lake	z.	61.6	298	e 10 24	+ 2	—	—	e 10 27	P
Barratt	z.	61.8	295	e 10 23	0	—	—	i 10 28	P
Palomar	z.	61.8	295	e 10 24	+ 1	i 10 49	?	i 11 19	PcP
Tinemaha	z.	61.8	299	e 10 23	0	—	—	e 10 28	P
Riverside	z.	62.0	296	e 10 26	+ 2	—	—	e 10 30	P
Reno	z.	62.3	302	e 10 25a	- 1	—	—	e 10 50	?
Pasadena		62.6	297	e 10 29	+ 1	—	—	e 10 33	P
Fresno	z.	63.1	300	e 10 31a	- 1	—	—	—	e 30.8
Mineral	z.	63.4	303	i 10 32k	- 2	e 20 24	ScS	e 11 9	PcP
Shasta	z.	63.9	304	e 10 33k	- 4	—	—	—	—
Helwan	z.	64.2	68	10 40	+ 1	e 14 34	PPP	e 15 7	?
Lick	z.	64.3	301	e 10 38a	- 1	—	—	e 10 57	?
Santa Clara	z.	64.5	301	e 10 44	+ 3	e 25 43	?	—	—
Berkeley	z.	64.6	301	e 10 43	+ 2	—	—	—	—
Ksara		66.5	63	e 10 56	+ 2	e 19 42	- 2	—	—
College		70.1	335	i 11 14	- 2	—	—	—	—
Bombay	E.	102.5	60	e 14 8	+ 8	24 18	[-21]	20 36	PPP
Melbourne	E.	168.4	216	e 20 30	[+22]	e 31 43	[-12]	—	—

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May 18d. 8h. 15m. 23s. Epicentre 5°·8S, 102°·2E. (as on 17d.).

		$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.	
		°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.	
Djakarta		4·6	95	i 1	10	- 2	i 3	35	?	—	—	i 4·7	
Bandung	E.	5·5	102	i 1	23	- 2	i 3	30	?	—	—	—	
Colombo	E.	25·6	298	e 5	31	- 1	10	16	+17	—	—	14·4	
Baguio		28·6	38	i 6	2 <sub>a</sub>	+ 2	i 10	53	+ 5	—	—	—	
Madras	E.	28·8	311	i 6	5	+ 3	i 10	56	+ 5	7	4	PP	14·0
Perth		29·0	155	—	—	—	i 12	2	SS	—	—	i 14·0	
Kodaikanal	E.	29·3	303	i 6	20	+14	e 11	11	+12	12	47	SSS	13·9
Shillong	E.	32·8	344	e 6	37	0	e 11	52	- 2	7	46	PP	—
Hyderabad		32·9	315	e 6	35	- 3	11	56	0	14	4	SS	16·6
Chatra		35·6	336	i 7	2	+ 1	i 12	40	+ 2	9	33	PcP	16·8
Poona		37·0	312	7	1	-12	i 13	7	+ 8	8	30	PP	17·2
Bombay		38·0	311	e 7	26	+ 5	i 13	14	0	8	56	PP	17·6
Nanking	Z.	40·8	21	i 7	46 <sub>a</sub>	+ 1	e 13	44	-12	—	—	—	—
Zô-Sè	Z.	40·9	25	i 7	47 <sub>a</sub>	+ 1	—	—	—	—	—	—	—
New Delhi		41·8	326	e 7	51	- 2	i 14	8	- 3	9	30	PP	20·1
Warsak Dam	E.	49·1	327	i 8	51	0	i 15	53	- 3	—	—	—	e 22·6
Quetta		49·2	319	i 8	50	- 2	i 15	56	- 2	i 8	59	?	—
Brisbane		52·8	120	—	—	—	i 16	39	- 8	(e 20	43)	SS	e 20·7
Riverview		53·2	128	i 9	26 <sub>k</sub>	+ 4	i 16	47	- 5	i 18	7	?	e 22·3
Pietermaritzburg	Z.	71·3	241	—	—	—	23	7	?	—	—	—	—
Wellington		73·1	131	—	—	—	e 27	19	?	—	—	—	e 36·5
Kimberley	Z.	76·2	242	e 11	46	- 6	e 23	13	?	—	—	—	—
Istanbul	Z.	81·2	313	12	17	- 2	—	—	—	e 12	25	PcP	—
Belgrade		88·2	315	—	—	—	e 23	37	- 1	e 26	46	?	—
Kiruna		92·2	337	i 13	11	- 2	i 24	12	- 2	e 23	38?	SKS	e 50·6
Upsala		92·2	330	i 13	14	+ 1	e 24	17	+ 3	e 12	56	?	e 52·6
Prague		93·0	320	e 13	2	-15	e 17	12	PP	e 22	12	?	—
Jena		94·8	320	e 17	15	PP	—	—	—	e 18	10	?	—
Stuttgart		96·3	318	e 17	37?	PP	—	—	—	—	—	—	—
Tamanrasset	Z.	98·4	292	e 26	31	PS	e 24	39	{ - 4}	e 27	55	?	—
Aberdeen	E.	102·6	327	i 17	7	?	—	—	—	—	—	—	—
College		103·7	24	e 18	19	PP	—	—	—	—	—	—	—
Scoresby Sund		106·4	343	e 18	43	PP	—	—	—	—	—	—	—
Shasta	Z.	127·2	41	e 19	7	[ 0]	—	—	—	e 20	59	PP	—
Hungry Horse		127·6	29	i 19	6	[ - 1]	—	—	—	e 28	53	PKKP	—
Mineral	Z.	127·9	41	e 19	6 <sub>a</sub>	[ - 2]	—	—	—	e 19	17	?	—
Lick	Z.	129·2	45	e 19	20 <sub>k</sub>	[ + 10]	—	—	—	—	—	—	—
Reno	Z.	129·5	41	e 19	9	[ - 2]	—	—	—	e 19	19	?	—
Butte		129·9	30	e 19	10	[ - 2]	—	—	—	e 19	18	?	—
Fresno	Z.	130·8	45	e 19	22	[ + 8]	—	—	—	e 19	36	?	—
Tinemaha	Z.	131·8	44	e 19	23	[ + 8]	—	—	—	e 22	39	PKS	—
China Lake	Z.	132·8	45	e 19	17	[ 0]	—	—	—	e 21	38	PP	—
Logan		133·1	34	e 19	16	[ - 2]	—	—	—	—	—	—	—
Pasadena		133·2	47	e 19	25	[ + 7]	e 22	49	PKS	—	—	—	—
Riverside	Z.	133·9	47	e 19	19	[ 0]	—	—	—	—	—	—	—
Nelson		134·8	43	e 19	20	[ - 1]	—	—	—	i 19	30	?	—
Barratt	Z.	135·0	48	e 19	28	[ + 7]	—	—	—	—	—	—	—
Halifax		139·4	344	e 22	25	PP	—	—	—	—	—	—	—
Tucson		139·5	44	e 19	31	[ + 1]	—	—	—	e 22	19	PP	—
Ottawa		140·5	358	e 19	39	[ + 8]	—	—	—	22	29	PP	—
Harvard		143·0	352	e 19	29	[ - 7]	—	—	—	—	—	—	—
Weston		143·1	352	i 19	31 <sub>a</sub>	[ - 5]	—	—	—	—	—	—	—
Lubbock		144·5	35	e 19	37	[ - 1]	—	—	—	—	—	—	—
Palisades		144·8	354	i 20	27	?	—	—	—	—	—	—	—
Fordham		144·9	354	i 19	37	[ - 2]	—	—	—	i 19	45	PKP <sub>2</sub>	—
Cincinnati		146·3	9	i 19	40	[ - 1]	—	—	—	—	—	—	—
Fayetteville		146·3	23	i 19	41	[ 0]	—	—	—	e 23	6	PP	—
Washington		147·0	358	e 19	43	[ 0]	—	—	—	i 19	53	PKP <sub>2</sub>	—
La Paz	N.	155·9	205	20	3	[ + 7]	—	—	—	—	—	—	—
San Juan		163·1	319	e 20	9	[ + 5]	—	—	—	—	—	—	—
Chinchina		177·7	—	e 20	16	[ + 4]	e 32	58	{ + 18}	—	—	—	—



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May 18d. 9h. 52m. Provisional epicentre 38°·3S. 176°·2E.  
Depth ca. 200km. Magnitude ca. 5·0.  
Seismological Observatory Bulletin E—132, April-June, 1953, Wellington, 1955, p. 8.

May 18d. 22h. 19m. 41s. Epicentre 41°·4N. 142°·1E. Depth of focus 40km.  
Intensity II-III at Hatinohe.  
Seismo. Bull. Cent. Met. Obs., Japan, for May, 1953, Tokyo, 1953, p. 22, with macro-seismic chart.

May 18d. 23h. 23m. Hindu Kush. Epicentre 36°·8N. 71°·0E. Depth 220km.  
Bulletin Seismo. Stations of the U.S.S.R. for April-June, 1953, Moscow, 1954, pp. 100-101.

May 19d. 3h. 11m. 9s. Epicentre 51°·9N. 159°·9E. (as on May 2d.).

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Nemuro		12·9	234	e 3 8	+ 1	e 5 59	SSS	—	e 7·9
Abashiri		13·1	239	e 3 16	+ 6	—	—	e 6 59	e 8·4
Wakkanai	E.	13·7	248	e 3 13	- 5	—	—	—	—
Kusiro	N.	13·8	236	e 4 15	+56	—	—	—	7·9
Obihiro		14·4	238	e 3 47	PPP	—	—	—	—
Urakawa		15·2	237	e 3 25	-13	e 5 51	?	6 58	SSS e 10·2
Sapporo		15·3	242	e 3 37	- 2	e 6 34	+ 4	e 6 47	SS e 9·1
Tomakomai		15·6	240	e 3 33	-10	—	—	—	—
Mori		16·4	241	e 3 47	- 6	7 18	SS	—	8·9
Hatinohe		17·0	236	e 3 48?	-13	e 7 41	SSS	e 6 46	?
Aomori		17·2	238	e 4 7	+ 4	5 9	?	—	—
Miyako		17·5	232	e 4 1	- 6	e 7 16?	- 5	—	—
Morioka		17·8	334	e 3 57	-14	—	—	—	—
Mizusawa		18·3	233	4 13	- 4	e 7 36	- 3	e 7 47	S 11·2
Akita		18·4	234	e 4 12	- 6	e 7 54	+13	e 4 56	PPP e 9·2
Sakata		19·1	234	e 4 27	0	—	—	—	—
Sendai		19·1	231	e 4 20	- 7	e 7 31	-26	e 4 56	PPP e 9·8
Hukusima		19·7	232	e 4 27	- 7	e 8 26	SS	—	10·9
Onahama		20·1	228	e 4 31	- 7	e 8 21	+ 2	—	e 10·9
Niigata		20·2	234	e 4 37	- 2	8 45	SS	5 7	PP
Shirakawa		20·3	231	e 4 33	- 7	e 8 24	+ 1	—	—
Aikawa		20·6	235	e 5 11	PPP	—	—	—	e 12·3
Mito		20·8	228	e 4 42	- 3	—	—	—	10·8
Utunomiya		20·9	232	e 4 39	- 7	e 8 38	+ 3	—	—
Maebasi		21·4	231	e 4 46	- 5	e 8 43	- 2	e 5 26	PPP e 13·2
Kumagaya		21·5	232	e 4 47	- 5	8 51	+ 4	—	—
Matusiro		21·7	235	i 4 48	- 7	i 8 53	+ 2	i 9 59	SSS e 11·1
Nagano		21·7	233	e 4 50	- 5	e 8 51	0	e 5 32	PPP e 11·8
Oiwake		21·7	232	e 4 52	- 3	8 53	+ 2	—	e 12·7
Tokyo		21·7	229	4 51	- 4	e 8 53	+ 2	5 28	PPP e 11·6
Wazima		21·8	238	e 4 51	- 5	e 8 52	0	e 5 25	PP e 11·5
Yokohama		21·9	229	e 5 15	+18	—	—	—	—
Toyama		22·1	235	4 53	- 6	9 1	+ 3	e 9 10	S e 12·4
Hunatu		22·3	229	e 4 59	- 2	—	—	—	—
Kohu		22·3	231	e 4 56	- 5	e 8 56	- 6	—	—
Mera		22·3	227	5 6	+ 5	e 9 26	+24	—	—
Kanazawa		22·5	236	e 4 59	- 3	—	—	—	11·6
Misima		22·5	228	e 4 58	- 4	e 9 17	+12	e 5 25	PP
Osima		22·6	229	e 4 57	- 6	—	—	—	—
Iida		22·7	230	e 4 57	- 7	—	—	—	—
Shizuoka		22·9	231	5 3	- 3	e 9 15	+ 2	5 14	pP 11·4
Omaesaki		23·3	231	e 5 3	- 7	9 23	+ 3	i 5 26	PP 13·7
Gihu		23·4	233	e 5 10	- 1	—	—	—	—
Nagoya	E.	23·5	233	5 10	- 2	—	—	e 5 55	PPP
Hikone		23·7	234	5 11	- 3	e 9 20	- 7	—	—
Kameyama		23·9	233	5 15	- 1	(e 9 9)	-21	e 7 21	? e 9·2
Tu		24·0	233	e 5 13	- 4	—	—	—	—
Kyoto		24·2	235	e 5 15	- 4	e 9 32	- 3	—	e 13·0
Toyooka		24·3	236	e 5 15	- 5	e 9 37	0	e 9 43	S e 12·6
Osaka		24·6	235	e 5 21	- 2	—	—	e 6 44	? e 13·7

Continued on next page.

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		$\Delta$	Az.	P.	O - C.	S.	O - C.	Supp.	I.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Kobe		24.7	235	e 5 22	- 2	e 9 59	+15	—	—
Sumoto		25.1	235	i 5 24	- 4	10 11	+20	—	13.2
Takamatu		25.6	237	e 5 25	- 7	e 9 52	- 7	(11 50)	SSS 11.8
Hamada		26.2	240	5 34	- 4	9 57	-12	i 10 30	? e 12.2
Hirosima		26.4	238	e 5 37	- 3	e 10 29	+17	(e 11 55)	SSS e 11.9
Koti		26.4	236	e 5 52	+12	e 10 12	0	—	— 12.8
Muroto		26.4	235	e 5 23	-17	e 10 5	- 7	—	— e 14.1
Matuyama		26.7	238	e 5 39	- 4	e 10 29	+12	e 6 56	PPP e 12.9
Simidu		27.4	236	e 5 50	+ 1	e 10 42	+14	—	— e 14.1
Ooita		27.7	238	e 5 57	+ 5	—	—	—	—
Hukuoka		28.1	241	e 5 51	- 4	e 11 19	+39	7 40	? e 14.3
Miyazaki		28.8	237	e 5 35	-27	e 10 49	- 2	—	— e 13.1
College		29.3	44	e 6 19	+13	i 11 3	+ 4	—	— i 11.6
Kagosima		29.6	238	e 6 11	+ 2	—	—	—	—
Zô-Sè	z.	35.1	249	i 6 54 <sub>a</sub>	- 3	e 12 26	- 4	—	—
Nanking		35.8	253	i 6 59 <sub>a</sub>	- 4	e 12 36	- 5	—	—
Sitka		36.7	55	e 7 15	+ 5	—	—	9 1	PPP
Guam		40.3	203	e 8 28	+48	—	—	—	—
Resolute Bay		44.5	22	e 8 16 <sub>k</sub>	+ 1	i 14 57	+ 6	e 10 4	PP i 18.0
Baguio		47.1	237	e 8 31	- 4	e 15 22	- 6	—	—
Hungry Horse		52.2	58	e 9 10	- 5	—	—	—	—
Mineral	z.	53.1	70	e 9 1 <sub>a</sub>	-20	i 9 29	P'	e 11 45	PP
Saskatoon		53.5	69	9 27	+ 3	17 1	+ 4	—	—
Berkeley		54.3	73	e 9 35	+ 5	e 17 15	+ 8	e 10 35	PcP e 23.4
Reno		54.7	69	e 9 36 <sub>k</sub>	+ 3	e 17 19	+ 6	e 9 49	? —
Santa Clara		54.9	73	e 9 43 <sub>k</sub>	+ 8	e 17 23	+ 7	—	—
Lick	z.	55.0	73	e 9 38 <sub>a</sub>	+ 3	i 9 53	? —	e 12 59	PPP —
Fresno	z.	56.5	72	e 9 49 <sub>k</sub>	+ 3	—	—	e 10 3	? —
Kiruna	z.	56.8	344	i 9 47 <sub>a</sub>	- 1	i 10 0	? —	i 10 59	? —
Shillong	E.	56.9	271	e 9 44	- 5	e 11 24	? —	e 11 55	PP —
Tinemaha	z.	57.2	71	e 9 54	+ 3	—	—	i 10 8	? —
Logan		57.7	62	e 9 59	+ 4	—	—	—	—
Scoresby Sund		57.9	2	i 8 57	-59	i 18 1	+ 6	i 19 51	ScS 26.8
China Lake	z.	58.5	71	e 10 2	+ 2	i 10 17	? —	e 39 58	P'P' —
Chatra		58.9	275	i 9 59	- 4	e 20 6	? —	e 33 51	? —
Pasadena		59.3	73	e 10 7	+ 1	i 18 19	+ 5	e 39 39	P'P' e 27.8
Palomar	z.	60.6	73	e 10 17	+ 2	—	—	i 10 32	? —
Barratt	z.	61.2	73	e 10 21	+ 2	i 10 35	? —	i 10 30	? —
Calcutta	E.	61.3	271	i 15 0	PcS	—	—	—	—
Dehra Dun	N.	61.9	284	e 14 7	PPP	18 59	+12	—	—
New Delhi		63.7	284	e 10 33	- 3	e 19 8	- 2	15 10	PcS 29.7
Reykjavik	z.	64.3	2	e 10 40	+ 1	—	—	i 10 54	? —
Upsala		64.5	340	i 10 40 <sub>a</sub>	- 1	i 19 22	+ 3	i 13 3	PP e 30.8
Tucson		64.9	70	e 10 46	+ 3	e 19 24	0	e 13 26	PP e 23.2
Bergen	N.	66.2	347	—	—	19 56?	+16	20 54	ScS e 32.3
Kirkland Lake	z.	67.9	39	e 11 3 <sub>a</sub>	+ 1	—	—	—	—
Qnetta		68.5	292	i 11 2	- 4	i 20 8	0	i 39 27	P'P' —
Lubbock		69.0	61	11 16	+ 7	—	—	—	—
Copenhagen		69.4	342	i 11 12	0	e 20 21	+ 3	e 13 27	? 36.8
Aberdeen	E.	70.3	350	i 14 18	PP	i 20 36	+ 7	i 21 16	PPS 32.4
Fayetteville		71.2	56	i 11 23	0	e 20 23	-17	e 21 27	ScS e 37.1
Hyderabad		71.2	275	i 11 19	- 4	e 20 35	- 5	21 31	ScS —
Ottawa		71.9	38	i 11 26 <sub>k</sub>	- 1	20 47	- 1	14 8	PP —
Shawinigan Falls	N.	72.0	36	e 11 28	0	—	—	—	—
Seven Falls	E.	72.2	34	21 39	PPS	e 20 59	+ 8	29 24	SSS 34.7
Potsdam		72.4	340	e 11 29	- 1	i 20 57	+ 4	e 14 13	PP e 34.8
Cleveland		72.8	44	i 11 33 <sub>k</sub>	+ 1	e 20 56	- 2	—	—
Iasi		73.1	330	e 11 33	- 1	—	—	—	—
Poona	z.	73.2	279	i 11 19	-16	21 14	+12	21 38	PS —
Witteveen	z.	73.2	344	i 11 36 <sub>a</sub>	+ 1	e 11 45	PcP	i 14 54	? —

Continued on next page.

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		$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.
		$\circ$	$\circ$	m.	s.	s.	m.	s.	s.	m.	s.	m.
Raciborzu	Z.	73.3	336	e 11	36	+ 1	e 11	45	PcP	e 13	14	?
Cincinnati		73.4	47	i 11	36	0	—	—	—	—	—	—
Collmborg		73.4	339	i 11	35	- 1	e 21	3	- 2	e 14	53	?
Djakarta		73.4	236	i 12	33 <sup>k</sup>	+57	e 21	3	- 2	—	—	e 29.6
Madras	E.	73.5	271	e 11	32	- 4	—	—	—	—	—	—
Bombay		73.6	280	e 11	35	- 2	e 21	4	- 3	21	53	PPS
Skalnate Pleso		73.6	334	e 11	32	- 5	e 11	55	PcP	e 21	54	PPS
Jena		74.1	340	i 11	39	- 1	e 21	16	+ 4	e 14	36	PP
De Bilt		74.2	345	i 11	42 <sup>a</sup>	+ 2	i 21	21	+ 7	e 25	51	SS
Prague		74.2	338	e 11	41	+ 1	e 21	23	+ 9	e 22	6	PPS
Pittsburgh		74.3	43	i 11	34	- 7	i 21	10	- 5	—	—	—
Rathfarnham Castle		74.5	352	i 11	42 <sup>a</sup>	0	e 21	16	- 1	e 21	41	SKS
Cheb	N.	74.7	340	e 11	46	+ 3	e 21	25	+ 6	e 22	14	PPS
Morgantown		75.0	45	i 11	47	+ 2	e 21	26	+ 3	—	—	—
Ogyalla		75.3	335	e 11	50	+ 3	e 21	31	+ 5	e 14	39	PP
Budapest	E.	75.4	334	11	47	0	e 21	34	+ 7	16	26	PPP
	N.	75.4	334	11	48	+ 1	e 21	31	+ 4	14	40	PP
Kew		75.6	348	e 11	55	+ 7	e 22	10	PS	—	—	e 40.8
Uccle		75.6	345	e 11	47	- 1	e 21	29	0	e 14	38	PP
Harvard		75.9	37	i 11	51 <sup>k</sup>	+ 1	e 21	32	0	i 12	17	pP
Bucharest		76.1	328	e 11	47	- 4	i 21	36	+ 1	e 25	58	SS
Weston		76.1	37	i 11	53 <sup>a</sup>	+ 2	e 21	37	+ 2	i 15	9	PP
Kalossa		76.3	334	e 11	56	+ 4	—	—	—	e 11	59	PcP
Palisades		76.3	39	i 11	53	+ 1	e 21	36	- 1	e 21	52	SKS
Szeged	E.	76.3	333	11	52	0	21	35	- 2	22	39	PPS
Timisoara		76.4	332	e 11	56	+ 3	e 21	42	+ 4	e 22	51?	PPS
Fordham		76.5	39	i 11	53	- 1	e 21	39	0	—	—	—
Karlsruhe	Z.	76.5	341	e 11	53 <sup>a</sup>	- 1	—	—	—	—	—	—
Stuttgart		76.6	341	i 11	54 <sup>a</sup>	0	e 21	44	+ 4	e 12	6	PcP
Halifax		76.8	31	e 11	57	+ 2	21	41	- 1	30	13	SSS
Strasbourg		77.1	342	i 11	56	- 1	e 21	49	+ 3	e 22	4	SKS
Kodaikanal	E.	77.4	270	e 10	27	-91	—	—	—	—	—	—
Belgrade		77.5	332	e 11	57	- 2	e 21	45	- 5	e 14	56	PP
Paris		77.8	345	i 12	1	0	e 21	55	+ 2	i 12	11	PcP
Istanbul	Z.	78.0	325	11	58	- 4	23	0	PPS	e 12	10	PcP
Basle		78.1	341	e 12	4	+ 2	—	—	—	—	—	—
Zürich		78.1	341	e 12	4 <sup>a</sup>	+ 2	e 21	57	+ 1	—	—	—
Chur		78.4	340	e 12	3 <sup>a</sup>	- 1	—	—	—	—	—	e 49.4
Sofia		78.5	329	e 12	7	+ 3	—	—	—	—	—	—
Triest		78.5	337	i 12	3	- 1	e 22	0	- 1	e 15	2	PP
Chambon-la-Forêt		78.6	345	i 12	0	- 5	—	—	—	—	—	—
Besançon		78.7	342	i 12	6	0	—	—	—	—	—	—
Neuchatel		78.7	342	e 12	6	0	e 22	8	+ 5	—	—	—
Brisbane		79.3	186	—	—	—	e 22	8	- 1	—	—	—
Salo	N.	79.3	339	e 12	13	+ 4	e 22	30	ScS	—	—	—
Oropa		79.9	341	e 12	15	+ 3	e 22	34	ScS	e 28	26	?
Pavia		80.0	340	i 12	14 <sup>a</sup>	+ 1	e 22	27	[+ 1]	e 15	14	PP
Bologna		80.2	338	e 12	19	+ 5	e 22	41	ScS	e 23	33	PPS
Clermont-Ferrand		80.7	314	i 12	18	+ 2	e 22	7	-17	i 12	29	PcP
Prato		80.8	338	e 12	21	+ 4	e 22	27	+ 2	—	—	—
Florence		80.9	338	e 12	16 <sup>a</sup>	- 1	i 22	33	[ 0]	e 23	32	PPS
Siena		81.3	338	e 12	31	+11	23	48	PPS	—	—	42.8
Ksara		81.6	316	i 12	22	+ 1	e 22	43	[+ 5]	—	—	—
Tacubaya		81.7	69	e 12	40	+18	e 22	53	+19	e 13	47	?
Rocca di Papa		82.4	336	e 12	28	+ 3	e 22	52	+11	—	—	—
Rome		82.4	336	12	24	- 1	e 22	40	- 1	23	36	PS
Taranto		82.4	333	e 18	51 <sup>f</sup>	?	—	—	—	—	—	—
Athens		82.6	327	e 12	24 <sup>a</sup>	- 2	e 22	37	- 6	e 23	40	PS
Messina		85.0	333	i 12	37 <sup>k</sup>	- 1	e 23	4	- 3	e 28	50	SS
Riverview		85.7	188	i 12	46 <sup>k</sup>	+ 4	e 22	57	[- 8]	e 27	52	?

Continued on next page.

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	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Tortosa	85.9	345	i 12 51	+ 8	23 23	+ 7	—	—
Helwan	86.9	318	i 12 47 <sup>k</sup>	- 1	23 27	+ 1	16 24	PP
Bermuda	87.4	36	i 12 51	+ 1	e 23 34	+ 4	—	e 39.4
Toledo	87.5	348	c 13 3	+12	23 43	+12	e 15 53	?
Coimbra	87.7	351	—	—	23 33	0	—	49.8
Alicante	88.5	346	c 12 57	+ 1	23 47	+ 6	16 31	PP
Granada	90.1	348	i 13 23 <sup>a</sup>	+20	i 24 6	+11	16 44	PP
Almeria	90.2	347	i 13 18	+14	23 48	- 8	16 52	PP
Malaga	90.6	348	i 13 6	+ 1	i 23 56	- 4	25 15	PS
Wellington	93.7	169	31 27	SSP	—	—	—	e 43.2
Christchurch	95.7	171	e 26 3	PS	—	—	—	e 55.8
Galerazamba	101.6	55	—	—	e 25 16	-18	—	—
Tamanrasset	z. 102.3	336	e 13 58	- 1	e 25 2	{- 9}	e 18 13	PP
Chinchina	106.4	58	—	—	e 25 12	{+15}	—	—
Bogota	107.5	57	e 28 39	PS	e 25 5	{+ 3}	e 26 5	SKKS
Huancayo	120.5	69	—	—	e 40 21	SSS	—	—
La Paz	128.2	65	e 19 19	{+10}	e 28 15	{+ 7}	i 38 31	SS

May 19d. 5h. 16m. Epicentre 41°3N, 20°6E. (Strasbourg).

Intensity V at Struga; IV at Malo Crsko, Debar, Velgasti, etc.

M. D. Uzclac.

Annuaire macroséismique de l'Institut séismologique de Beograd, Année 1953, Skoplje 1957, p.76-77.

May 19d. 15h. 49m. 55s. Epicentre 1.0N, 98°5E. Depth of focus 0.005 (as on 1950, June 28d.).

A = -0.1478, B = +0.9889, C = +0.0173;  $\delta = +7$ ;  $h = +7$ ;  
D = +0.989, E = +0.148; G = -0.003, H = +0.017, K = -1.000.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Djakarta	11.0	131	—	—	e 4 42	+ 3	e 5 2	SS
Colombo	E. 19.5	289	e 4 14	-10	7 44	-12	—	9.7
Madras	E. 21.7	306	i 4 42	- 5	i 8 32	- 6	5 4	PP
Shillong	E. 25.2	350	e 5 21	0	e 9 38	- 1	5 51	PP
Hyderabad	E. 25.6	310	e 5 22	- 3	i 9 42	- 4	—	12.0
Hong Kong	26.1	35	—	—	e 10 5	+11	—	—
Baguio	26.6	53	i 5 46 <sup>a</sup>	+12	i 10 40	SS	e 6 32	PP
Chatra	27.9	339	i 5 45	- 1	10 25	+ 2	6 25	PP
Poona	29.8	308	i 5 28	-35	11 54	SS	—	—
Bombay	30.8	307	e 6 15	+ 3	i 11 6	- 3	e 13 8	SS
New Delhi	34.2	326	e 6 36	- 5	e 11 53	- 9	14 27	SS
Quetta	z. 41.7	317	i 7 41	- 3	—	—	—	i 15.1
Tananarive	53.8	246	e 9 17	- 1	e 12 18	PPP	e 9 36	pP
Ksara	66.9	306	e 10 51	+ 4	—	—	e 21 24	?
Helwan	69.8	302	c 11 3	- 2	e 12 5	?	e 11 10	pP
Istanbul	73.9	313	11 28	- 2	e 20 44?	-11	—	—
Kimberley	z. 76.2	240	i 11 44	+ 1	—	—	—	30.1
Upsala	z. 84.5	330	i 12 28	+ 1	i 12 35	PcP	e 15 29	PP
Kiruna	z. 84.6	338	i 12 29 <sup>a</sup>	+ 1	—	—	i 15 31	PP
Collmberg	86.4	321	e 12 37	+ 1	—	—	—	—
Potsdam	N. 86.4	323	—	—	e 23 8	+ 3	—	e 47.1
Copenhagen	86.9	326	—	—	23 14	+ 4	—	45.1
Jena	z. 87.3	320	e 12 41	0	—	—	e 12 56	pP
Pavia	88.8	316	—	—	i 24 31	SP	e 25 59	?
Stuttgart	88.8	319	e 12 49	+ 1	—	—	—	—
Tamanrasset	z. 92.4	293	i 13 6 <sup>k</sup>	+ 1	e 13 13	PcP	i 16 8	?
Paris	93.2	318	e 13 11	+ 3	—	—	—	—
Chambon-la-Forêt	93.4	318	e 13 11	+ 2	—	—	i 13 33	pP
Scoresby Sund	98.9	343	32 11	PSS	e 24 15	{+10}	25 18	ScS
Tinemaha	z. 129.1	38	e 19 9	{+ 8}	e 22 48	PKS	e 30 59	SKSP
China Lake	z. 130.3	38	e 19 12	{+ 9}	e 22 34	PKS	31 14	SP
Riverside	z. 131.6	40	—	—	e 31 30	SP	—	—
Palomar	z. 132.3	40	—	—	e 31 40	SP	—	—
Palisades	137.6	350	e 22 3	PP	—	—	e 50 55	?
Fayetteville	141.3	15	i 19 25	{+ 2}	—	—	e 22 27	PP

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May 20d. 4h. 55m. Epicentre  $36^{\circ}2'N$ ,  $140^{\circ}9'E$ . Depth of focus 30-40km.  
Intensity IV at Tukubasan, Mito, and Kakioka; II-III at Utunomiya and Shirakawa.  
Seismo. Bull. Cent. Met. Obs., Japan, for May, 1953, Tokyo, 1953, p. 23-24, with macro-seismic chart.

May 20d. 5h. 54m. Pamir region. Epicentre  $38^{\circ}8'N$ ,  $71^{\circ}1'E$ .  
Bulletin of Seismo. Stations of the U.S.S.R. for April-June, 1953, Moscow, 1954, p. 101.

May 20d. 7h. 45m. 24s. Epicentre  $53^{\circ}2'S$ ,  $134^{\circ}0'W$ .

A = -0.4179, B = -0.4328, C = -0.7988;  $\delta = +4$ ;  $h = -7$ ;  
D = -0.719, E = +0.695; G = +0.555, H = +0.575, K = -0.602.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Christchurch		36.0	263	e 7 3	- 2	e 12 42	- 2	e 8 26	PP e 15.6
Wellington		36.0	268	7 4	- 1	e 12 46	+ 2	e 8 26	PP e 15.6
Tuai	N.	36.1	273	—	—	e 14 36?	SS	—	—
Kaimata	N.E.	37.3	264	e 8 36?	PP	—	—	e 16 36	Q e 18.6
Karapiro	N.	37.7	273	e 6 36?	-43	—	—	—	—
New Plymouth	E.	37.8	271	e 6 36?	-44	—	—	—	e 20.4
Auckland	N.	38.8	274	e 7 31	+ 3	e 16 21	SS	—	—
La Plata	E.	55.0	102	—	—	16 54	-23	23 6	SSS 24.1
	N.	55.0	102	—	—	17 0	-17	23 0	SSS 24.1
Riverview		55.0	259	i 9 34k	- 1	e 17 14	- 3	e 17 26	PS e 24.4
Brisbane		58.5	265	i 9 59	- 1	e 17 59	- 4	—	—
Huancayo		61.9	71	i 10 27	+ 3	e 18 54	+ 7	—	e 28.0
La Paz		62.5	80	e 10 24	- 4	i 18 56	+ 2	i 12 42	PP 29.0
Chinchina		75.8	61	e 11 49	- 1	e 21 43	+12	—	37.6
Bogota		76.3	62	e 11 56	+ 4	e 21 33	- 4	e 26 18	SS 37.6
Tacubaya		78.3	33	e 12 3	0	e 22 6?	+ 7	—	—
Barratt	Z.	86.8	14	e 12 45	- 2	i 12 55	?	i 13 3	? —
Tucson		87.4	19	e 12 48	- 2	e 23 42	+12	—	—
Palomar	Z.	87.5	14	e 12 49	- 2	—	—	—	—
Pasadena		88.1	13	e 12 54	0	i 23 49	+12	e 29 42	SS e 39.9
Nelson		90.1	15	e 13 2	- 1	—	—	—	—
Fresno	Z.	90.4	11	e 13 9	+ 5	—	—	—	—
Lick	Z.	90.8	9	e 13 6	0	—	—	—	—
Tinemaha	Z.	90.9	13	e 13 6	- 1	—	—	—	—
Berkeley		91.3	9	—	—	e 24 9	+ 3	e 29 30	? e 42.5
Mineral	Z.	93.8	9	e 13 23	+ 3	—	—	—	—
Shasta	Z.	94.1	8	e 13 25	+ 3	—	—	—	—
Fayetteville		95.4	31	e 13 32	+ 4	—	—	—	—
Bermuda		104.2	55	—	—	e 24 51	[+ 4]	e 33 39	SS e 49.6
Cleveland		104.6	38	e 26 11	S	e 24 52	[+ 3]	e 33 34	SS —
Philadelphia		105.8	43	—	—	e 24 52	[- 2]	—	—
Fordham		107.0	43	—	—	e 25 6	[+ 7]	—	—
Palisades		107.2	43	e 18 43	PP	e 25 2	[+ 2]	e 28 20	PS e 47.1
Weston		109.4	44	—	—	e 28 34	PS	—	e 53.5
College		118.2	353	e 18 44	[- 5]	—	—	—	—
Resolute Bay		130.2	12	—	—	e 39 4	SS	—	e 58.1
Tamanrasset	Z.	136.9	118	e 19 20	[- 5]	e 28 26	{-36}	e 22 8	PP —
Bombay		140.0	222	—	—	e 29 3	{-18}	e 23 25	PKS —
Malaga		141.6	94	i 19 0	[-33]	26 2	[-40]	i 22 9	PP 66.4
Granada		142.4	94	20 1a	[+26]	26 46	[+ 3]	33 28	SKSP 65.8
Almeria		142.9	96	19 42	[+ 6]	26 49	[+ 5]	29 53	SKKS 76.6
Kyakhta		143.5	291	e 19 32	[- 5]	—	—	—	—
Kabansk		144.1	293	i 19 35	[- 3]	—	—	—	—
Alicante		145.0	95	19 40	[+ 1]	29 56	{+ 6}	23 4	PP 68.9
Irkutsk		145.5	293	19 38	[- 2]	—	—	—	—
Scoresby Sund		145.9	33	e 19 36	[- 5]	e 42 1	SS	47 42	SSS —
Algiers Univ.	Z.	146.1	102	e 19 36	[- 5]	e 29 30	{-27}	e 23 6	PP —
Tortosa		147.2	94	e 19 44	[+ 1]	—	—	—	e 67.6
Rathfarnham C.	Z.	149.3	68	i 19 51	[+ 5]	—	—	e 19 56	PKP, —
Clermont-Ferrand		151.5	88	e 20 44	[+54]	—	—	—	74.6

Continued on next page.



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	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Kew	152.0	75	e 19 45	[ - 5 ]	e 23 47	PP	e 20 12	PKP <sub>2</sub> e 73.6
Chambon-la-Forêt	152.1	82	e 19 55	[ + 4 ]	—	—	—	—
Quetta	z. 152.4	223	i 20 0	[ + 9 ]	—	—	e 16 8	?
Paris	152.6	81	e 19 58	[ + 7 ]	e 30 40	{ + 7 }	e 23 42	PP e 70.6
Warsak Dam	E. 153.6	236	e 15 47	?	—	—	—	—
Messina	154.2	113	e 19 55?	[ + 2 ]	e 37 26?	PPS	—	—
Helwan	z. 154.3	150	e 19 56	[ + 2 ]	e 20 18	PKP <sub>2</sub>	e 21 57	?
Oropa	154.4	91	e 20 7?	[ + 13 ]	—	—	—	—
Uccle	E. 154.5	77	—	—	e 44 46	SSP	e 49 59	SSS e 69.6
Pavia	154.9	93	e 20 3	[ + 9 ]	e 30 59	{ + 14 }	e 20 28?	PKP <sub>2</sub>
Rome	154.9	103	e 20 1	[ + 7 ]	—	—	—	—
Florence	z. 155.3	98	e 20 16	PKP <sub>2</sub>	—	—	e 23 57	PP
De Bilt	155.4	75	e 20 4	[ + 9 ]	e 30 54	{ + 6 }	e 23 46	PP e 69.6
Strasbourg	155.6	85	e 20 4	[ + 9 ]	e 43 51	SS	e 24 1	PP e 69.6
Bologna	155.8	96	e 20 14	[ + 18 ]	—	—	e 22 57	?
Stuttgart	156.6	86	e 19 59	[ + 2 ]	e 31 6	{ + 11 }	e 24 6	PP
Triest	157.8	97	e 20 0	[ + 2 ]	e 27 16	[ + 14 ]	e 24 6	PP
Jena	z. 158.8	83	e 20 5?	[ + 6 ]	e 20 31	PKP <sub>2</sub>	e 24 18?	PP
Namangan	158.8	245	e 20 7	[ + 8 ]	—	—	e 28 26	PKKP
Ksara	159.3	155	e 20 33	PKP <sub>2</sub>	—	—	24 20	PP
Collnberg	159.8	82	e 20 1	[ 0 ]	e 20 43	PKP <sub>2</sub>	e 21 6	?
Potsdam	160.2	78	e 20 12	[ + 11 ]	e 31 22	{ + 9 }	i 29 39	?
Tashkent	160.3	243	e 20 9	[ + 8 ]	e 27 11	[ + 6 ]	e 31 12	SKKS e 71.6
Copenhagen	160.4	68	e 20 15	[ + 14 ]	44 48	SS	24 6	PP
Kiruna	z. 160.9	30	e 20 46	PKP <sub>2</sub>	—	—	—	—
Istanbul	z. 163.1	130	e 20 9?	[ + 5 ]	e 36 36	?	e 29 6	PPP
Upsala	163.1	55	e 20 56	PKP <sub>2</sub>	e 32 19	{ + 51 }	e 59 8	Q e 80.6
Uzhgorod	164.4	97	e 21 2	PKP <sub>2</sub>	—	—	24 47	PP
Goris	166.3	181	e 20 18	[ + 11 ]	—	—	—	—
Baku	166.9	193	e 20 19	[ + 12 ]	—	—	e 25 7	PP
Erevan	166.9	175	e 20 14	[ + 7 ]	27 16	[ + 6 ]	25 20	PP
Kishinev	167.4	112	e 20 17	[ + 9 ]	—	—	—	—
Borzhomei	168.5	170	e 20 9	[ + 1 ]	—	—	i 25 7	PP
Tiflis	168.5	176	e 20 10	[ + 2 ]	—	—	e 25 2	PP
Zugdidi	169.0	164	e 20 22	[ + 13 ]	—	—	—	—
Pulkovo	169.1	46	e 20 22	[ + 13 ]	e 32 27	{ + 29 }	e 46 12	SS
Makhach-Kala	169.7	186	e 20 32	[ + 23 ]	—	—	—	—
Grozny	170.1	—	e 20 10	[ + 1 ]	—	—	—	—
Piatigorsk	170.6	—	—	—	i 32 17	{ + 11 }	—	—
Sverdlovsk	170.8	—	e 20 18	[ + 8 ]	e 31 56	{ - 11 }	e 25 22	PP
Moscow	174.5	—	e 20 10	[ - 1 ]	e 32 38	{ + 14 }	e 30 10	PPP

May 20d. 7h. 59m. Pamir region. Epicentre 37°·5N. 69°·5E.  
Bulletin of Seismo. Stations of the U.S.S.R. for April-June, 1953, Moscow, 1954, p. 102.

May 20d. 10h. 43m. 50s. Epicentre 0°·4N. 123°·7E. Depth of focus 0·010.  
(as on 1951, May 20d.).

$$A = -0.5548, B = +0.8319, C = +0.0070; \quad \delta = -9; \quad h = +7;$$

$$D = +0.832, E = +0.555; \quad G = -0.004, H = +0.006, K = -1.000.$$

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Baguio	16.2	349	i 3 50	+ 7	i 6 56	+ 17	—	9.0
Bandung	E. 17.6	246	e 3 53	- 7	i 7 7	- 4	i 4 32	PPP
Djakarta	18.1	248	e 4 4	- 2	i 7 27	+ 5	e 4 25	PP
Hong Kong	23.7	337	e 5 6	+ 2	e 9 21	+ 13	—	—
Zô-Sè	z. 30.6	356	i 6 10 <sub>a</sub>	+ 3	—	—	—	—
Nanking	31.8	351	i 6 20 <sub>a</sub>	+ 3	e 11 22	+ 3	i 7 10	pP
Koti	E. 34.3	14	e 6 43	+ 4	—	—	—	—
Matuyama	34.7	13	e 6 39	- 3	e 12 1	- 3	e 8 1	PP
Takamatu	35.1	14	e 6 47	+ 1	e 12 12	+ 2	—	—
Sumoto	35.4	16	i 6 50	+ 2	12 18	+ 3	—	—

Continued on next page.

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	$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.
	$^{\circ}$	$^{\circ}$	m.	s.	s.	m.	s.	s.	m.	s.	m.
Kyoto	36.2	16	e 6	54	- 1	—	—	—	—	—	—
Kameyama	36.3	17	e 6	58 <sub>a</sub>	+ 2	12	32	+ 3	—	—	—
Hikone	36.5	16	7	1	+ 3	e 12	36	+ 4	—	—	—
Omaesaki	36.6	20	7	4	+ 6	e 12	38	+ 5	—	—	—
Shizuoka	37.0	20	7	4	+ 2	12	45	+ 5	—	—	—
Misima	37.4	20	e 7	6	+ 1	—	—	—	e 8	44	PP
Hunatu	37.6	19	e 7	9	+ 2	—	—	—	—	—	—
Kohu	37.7	19	e 7	9	+ 1	e 12	53	+ 3	—	—	—
Titibu	38.2	19	i 7	14	+ 2	—	—	—	—	—	—
Tokyo	38.2	21	e 7	46	+34	e 13	26	+28	e 8	21	? 16.6
Oiwake	38.3	18	7	17	+ 5	—	—	—	—	—	—
Kumagaya	38.4	19	e 7	19	+ 6	—	—	—	—	—	—
Matusiro	38.4	18	i 7	14 <sub>a</sub>	+ 1	i 13	0	- 1	15	48	SS 17.7
Nagano	38.5	18	e 7	18	+ 4	e 13	3	+ 1	7	44	pP
Maebasi	38.6	19	e 7	16	+ 1	e 13	25	+21	e 7	49	pP
Wazima	38.8	16	e 7	19	+ 2	e 12	9	-58	—	—	—
Utunomiya	39.0	20	e 7	17	- 1	e 13	3	- 7	17	18	ScS
Brisbane	39.5	137	e 8	23	+61	i 13	25	+ 8	i 16	9	SS
Shillong	39.6	312	e 7	26	+ 3	e 13	51	sS	8	53	PP
Shirakawa	39.6	19	e 7	26	+ 3	e 13	17	- 2	—	—	—
Onahama	39.7	20	e 7	29	+ 5	e 13	21	+ 1	—	—	—
Niigata	39.9	18	e 7	30	+ 4	i 8	17	sP	e 10	41	? 17.7
Inawasiro	40.0	19	e 7	32	+ 5	—	—	—	—	—	—
Hukusima	40.3	19	e 7	13	-16	13	24	- 5	—	—	—
Yamagata	40.7	18	e 7	35	+ 3	—	—	—	—	—	—
Sendai	40.9	19	e 7	36	+ 2	e 8	19	sP	e 8	5	pP
Mizusawa	41.7	21	7	48	+ 7	13	58	+ 8	—	—	—
Akita	41.9	18	7	45	+ 3	e 13	56	+ 3	e 16	18	? 17.7
Riverview	42.7	146	i 7	50 <sub>k</sub>	+ 1	i 14	5	0	i 8	39	pP
Aomori	43.1	18	e 7	57	+ 5	—	—	—	—	—	—
Vladivostok	43.2	9	i 7	54	+ 1	—	—	—	—	—	—
Chatra	43.9	310	e 7	59	0	e 14	25	+ 3	17	40	SS 18.6
Mori	44.2	17	e 8	5	+ 4	e 14	29	+ 3	—	—	—
Madras	44.9	288	i 8	5	- 2	i 14	35	- 2	13	32	ScP 18.7
Urakawa	45.0	18	e 8	11	+ 4	e 14	39	+ 1	(e 18	0)	SS e 18.0
Sapporo	45.3	17	i 8	15	+ 5	e 14	49	+ 7	—	—	—
Obihiro	45.8	18	e 8	26	+12	—	—	—	—	—	—
Kodaikanal	47.0	284	e 8	31	+ 8	—	—	—	—	—	—
Hyderabad	47.6	294	i 8	29	+ 1	i 15	16	+ 1	10	20	PP
Yuzno-Sakhlinsk	49.2	16	i 8	41	+ 1	15	45	+ 8	—	—	—
Kurilsk	49.5	22	8	44	+ 2	15	50	+ 9	—	—	—
Kyakhta	51.9	346	9	1	0	—	—	—	—	—	—
Poona	52.1	294	i 8	48	-14	—	—	—	—	—	—
New Delhi	52.5	306	e 9	3	- 2	i 16	19	- 4	i 17	4	sS
Dehra Dun	52.6	309	i 9	6	0	i 16	25	+ 1	i 17	0	sS
Bombay	53.2	294	e 8	48	-22	e 16	30	- 2	17	4	PPS
Irkutsk	54.2	345	9	17	- 1	—	—	—	—	—	—
Kurmenty	58.7	322	i 9	51	+ 1	—	—	—	—	—	—
Warsak Dam	59.1	310	e 9	47	- 5	e 17	49	- 1	—	—	e 26.2
Naryn	59.3	319	i 9	53	- 1	i 17	58	+ 5	i 10	24	pP
Almata	59.7	322	i 9	57?	0	e 18	0	+ 2	—	—	—
Rybach'e	59.8	320	i 9	56	- 1	i 18	2	+ 3	—	—	—
Auckland	60.0	133	—	—	—	e 18	8	+ 6	e 19	45	ScS
Petropavlovsk	60.0	23	10	0	+ 1	e 18	8	+ 6	—	—	—
Kaimata	60.5	141	e 10	40?	PcP	e 18	0	- 8	e 19	40	ScS
Khorog	60.5	313	10	2	0	e 18	10	+ 2	—	—	—
Cobb River	60.6	138	—	—	—	e 18	10	0	e 19	59	ScS
Frunse	60.9	321	i 10	5	0	i 18	19	+ 6	i 10	33	pP
Andijan	61.4	317	i 10	7	- 1	18	21	+ 1	i 10	36	pP
Quetta	61.4	304	i 10	6	- 2	i 18	20	0	i 10	46	pP
Dzhergetal	61.5	315	10	9	0	18	23	+ 2	—	—	—
Fergana	61.6	317	i 10	7	- 3	e 18	21	- 1	e 10	35	pP
Christchurch	61.8	141	—	—	—	i 18	26	+ 1	—	—	—
Namangan	61.9	317	i 10	11	- 1	e 18	26	0	—	—	—
Garm	62.0	315	e 10	11	- 1	e 18	29	+ 2	—	—	—

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	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Kulyab	62.0	313	10 11	- 1	—	—	—	—
Wellington	62.0	138	10 8	- 4	18 19	- 8	e 11 15	sP
Obi-garm	62.3	314	i 10 13	- 1	—	—	—	—
Stalinabad	62.9	314	i 10 16	- 2	i 18 40	+ 1	10 46	pP
Klyuchi	63.2	22	e 10 21	+ 1	e 18 49	+ 7	—	—
Lunacharskoe	63.7	317	e 10 23	0	—	—	—	—
Tashkent	63.7	317	i 10 23	0	e 18 47	- 1	—	—
Tchimkent	63.9	318	i 10 24	- 1	i 18 53	+ 2	—	—
Samarkand	64.7	314	e 10 29	- 1	18 59	- 2	—	—
Bairam-Ali	67.5	311	i 10 46	- 2	—	—	—	—
Ashkabad	70.5	310	—	—	i 20 10	0	—	—
Sverdlovsk	75.2	330	e 11 32	- 2	e 20 59	- 4	—	—
Tananarive	77.0	251	i 11 42	- 2	—	—	—	—
Baku	77.4	312	i 11 48	+ 2	e 21 31	+ 4	—	—
Shemakla	78.4	312	i 11 51	- 1	—	—	i 12 3	PcP
Makhach-Kala	79.6	314	i 11 58	0	—	—	—	—
Goris	80.0	310	e 11 59	- 1	e 21 53	- 2	—	—
Grozny	81.0	314	i 12 4	- 2	i 22 2	- 3	—	—
Tiflis	81.4	312	i 12 7	- 1	e 22 8	- 1	—	—
Erevan	81.5	310	i 12 6	- 2	22 20	ScS	i 12 42	sP
Gori	82.0	311	e 12 13	+ 2	—	—	—	—
Leninakan	82.1	311	e 12 12	+ 1	—	—	—	—
Borzhomi	82.5	311	i 12 14	+ 1	e 22 30	ScS	—	—
Abastumanj	82.9	311	e 12 14	- 1	—	—	—	—
Zugdidi	84.2	313	12 21	- 1	22 32	- 5	—	—
Sotchi	85.4	314	e 12 25	- 3	e 22 43	[+ 3]	—	—
Moscow	87.4	325	12 36	- 1	e 22 54	[+ 1]	e 13 7	pP
Ksara	88.0	303	i 12 41	+ 1	23 26	+12	i 13 12	pP
College	89.0	25	i 12 44	- 1	—	—	—	—
Yalta	89.4	314	e 12 40	- 7	e 23 30	+ 3	e 23 10	SKS
Pulkovo	91.4	329	e 25 5	PS	23 15	[- 3]	23 40	S
Helwan	z. 91.8	300	12 58	0	e 13 40	sP	i 16 40	PP
Istanbul	z. 93.2	311	12 1?	-64	e 25 10	PS	e 16 34	PP
Pretoria	z. 95.1	245	e 13 13	0	—	—	—	—
Uzhgorod	97.2	319	e 13 23	0	—	—	—	—
Upsala	97.7	331	i 13 23	- 2	e 24 33	- 6	e 17 25	PP
Copenhagen	101.5	328	e 17 57	PP	24 10	[- 1]	27 16	PS
Resolute Bay	101.6	10	e 14 20	pP	e 17 45	?	e 17 55	PP
Potsdam	102.1	325	e 18 4	PP	—	—	—	e 48.2
Collnberg	102.5	323	16 52	?	—	—	18 5	PP
Jena	103.5	323	e 18 11	PP	e 19 37	?	e 18 50	sPP
Triest	z. 103.6	317	e 18 11	PP	e 19 12	?	e 20 24	PPP
Bologna	105.5	317	e 18 49	pPP	—	—	—	—
Stuttgart	105.6	322	e 18 25?	PP	—	—	e 20 43	PPP
Scoresby Sund	105.7	349	e 18 25	PP	24 25	[- 6]	34 4	SS
Florence	z. 105.8	316	e 18 56?	pPP	—	—	e 19 31	?
Karlsruhe	z. 106.0	323	e 18 29	PP	—	—	—	—
De Bilt	106.8	326	e 18 30	PP	—	—	—	e 53.2
Pavia	106.8	318	e 18 42	PP	e 33 37	SS	—	—
Shasta	z. 107.7	47	e 18 16	PKP	e 18 38	PP	e 17 21	?
Uccle	E. 107.8	325	—	—	e 28 15	PS	—	e 52.2
Mineral	z. 108.4	48	e 18 44k	PP	—	—	e 18 53	PP
Lick	z. 109.2	50	e 18 31k	?	—	—	e 18 52	PP
Reno	z. 109.9	48	e 18 22k	PKP	e 19 4	PP	e 19 38	sPP
Kew	110.1	327	e 19 46	sPP	—	—	—	e 56.2
Hungry Horse	110.5	37	i 18 23	[+ 2]	—	—	e 14 25	P
Clermont-Ferrand	110.6	321	—	—	e 28 40	PS	—	56.2
Fresno	z. 110.8	50	e 18 22	[ 0]	—	—	—	—
Tinemaha	z. 111.8	50	e 18 27	[+ 3]	—	—	e 19 11	PP
Butte	112.5	39	c 18 27	[+ 2]	—	—	—	—

Continued on next page.

The scanned images of the 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 collected by SGA Storia Geofisica Ambiente (Bologna) on behalf of the Istituto Nazionale di Geofisica e Vulcanologia (Rome), in the frame of the EUROSEISMOS project.

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		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.	
		$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.	
China Lake	z.	112.7	51	e 18 29	[+ 4]	e 19 23	PP	e 19 50	pPP	—
Pasadena	z.	112.8	53	i 18 28	[+ 2]	—	—	—	—	—
Riverside	z.	113.5	53	c 18 28	[+ 1]	—	—	—	—	—
Algiers Univ.	z.	113.9	311	18 51	pPKP	—	—	e 19 48	pPP	—
Palomar	z.	114.0	53	e 18 31	[+ 3]	—	—	—	—	—
Barratt	z.	114.4	54	e 18 31	[+ 2]	—	—	e 19 29	PP	—
Nelson		114.9	50	i 18 31	[+ 1]	—	—	i 18 59	pPKP	—
Tamanrasset	z.	115.6	297	e 18 31	[ 0]	e 29 6	SP	e 19 19	pPKP	—
Alicante		115.9	315	19 33	PP	25 5	[- 7]	—	—	49.7
Granada		118.7	314	19 44	PP	25 44	[+ 22]	27 47	S	61.9
Tucson		119.2	52	e 18 39	[+ 1]	—	—	e 20 10	PP	—
Kirkland Lake	z.	127.4	20	e 18 55 <sub>a</sub>	[+ 1]	—	—	—	—	—
Fayetteville		129.4	40	i 17 58	[- 60]	i 22 12	SKP	i 21 8	PP	—
Shawinigan Falls	N.	131.0	15	—	—	c 22 17	SKP	c 22 36	SKP	—
Ottawa		131.3	18	e 19 1	[ 0]	i 22 17	SKP	i 19 52	pPKP	—
Cincinnati		132.9	30	e 19 5	[+ 1]	i 22 24	SKP	—	—	—
Tacubaya		133.6	63	e 19 11	[+ 5]	—	—	—	—	—
Halifax		134.7	7	i 19 10	[+ 3]	22 32	SKP	—	—	—
Harvard		135.1	16	e 19 8	[ 0]	e 22 30	SKP	—	—	—
Weston		135.3	16	i 16 6 <sub>k</sub>	[- 3]	—	—	—	—	—
Palisades		135.8	19	e 19 3	[- 6]	c 22 32	SKP	i 21 48	PP	e 65.2
Fordham		135.9	19	—	—	i 22 34	SKP	—	—	—
Washington		136.5	23	e 19 12	[+ 1]	i 22 36	SKP	—	—	—
Bermuda		146.4	13	i 19 33	[+ 5]	—	—	—	—	—
Huancayo		157.8	123	e 19 59	[+ 14]	—	—	e 20 24	pPKP	—
San Juan		159.0	27	i 19 48	[+ 2]	—	—	20 24	pPKP	—
Chinchina		160.0	73	i 19 52	[+ 5]	—	—	c 20 37	PKP <sub>2</sub>	—
La Paz		160.2	145	i 19 50	[+ 2]	i 30 49	SKKS	24 18	PP	—
Bogota	N.	161.6	73	e 19 58	[+ 9]	—	—	—	—	—

May 20d. 23h. 6m. 38s. Epicentre 36°·2N. 139°·9E. Depth of focus 0·005.  
(as on 1952, Nov. 18d.).

Intensity V-VI at Tukubasan ; V at Kakioka, Utunomiya, Mito, and Kumagaya ; IV at Tokyo, Titibu, Maebasi, Tyosi, Yokohama, Osima, and Onahama ; II-III at Shirakawa, Kohu, Mera, Inawasiro, Ajiro, and Hukushima.

Epicentre as adopted. Depth of focus 60km.

Seismo. Bull. Cent. Met. Obs., Japan, May, 1953, Tokyo, 1953, p.24-26, with macroseismic chart.

$$A = -.6187, B = +.5210, C = +.5880 ; \delta = -3 ; h = 0 ;$$

$$D = +.644, E = +.765 ; G = -.450, H = +.379, K = -.809.$$

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.	
		$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.	
Kakioka		0.2	82	e 0 10	- 1	0 16	- 3	—	—	—
Tukubasan		0.2	84	0 10	- 1	0 16	- 3	—	—	—
Utunomiya	z.	0.3	356	i 0 11 <sub>k</sub>	- 1	0 18	- 2	—	—	—
Kumagaya		0.4	263	i 0 12 <sub>k</sub>	0	0 20	- 2	—	—	—
Mito		0.5	68	i 0 12	- 1	0 20	- 3	—	—	—
Tokyo	z.	0.5	192	i 0 13 <sub>a</sub>	0	0 23	0	—	—	—
Maebasi		0.7	287	i 0 15 <sub>k</sub>	0	0 26	- 1	—	—	—
Titibu		0.7	252	i 0 15	0	0 26	- 1	—	—	—
Yokohama		0.8	195	i 0 18	+ 1	0 29	0	—	—	—
Shirakawa		0.9	15	i 0 17	- 1	0 29	- 2	—	—	—
Tyosi	E.	0.9	121	i 0 16 <sub>a</sub>	- 2	0 27	- 4	—	—	—
Oiwake		1.1	277	0 24	+ 4	0 36	0	—	—	—
Onahama		1.1	48	i 0 18 <sub>a</sub>	- 2	0 32	- 4	—	—	—
Hunatu	N.	1.2	233	e 0 24	+ 2	0 39	+ 1	—	—	—
Kohu		1.2	242	i 0 23	+ 1	0 43	+ 5	—	—	—
Ajiro		1.3	210	0 24 <sub>a</sub>	+ 1	0 41	+ 1	—	—	—
Mera		1.3	182	i 0 23 <sub>k</sub>	0	0 42	+ 2	—	—	—
Misima	z.	1.3	215	i 0 24	+ 1	0 42	+ 2	—	—	—
Inawasiro		1.4	7	i 0 23	- 1	0 42	- 1	—	—	—
Matusiro		1.4	284	i 0 24 <sub>k</sub>	0	0 42	- 1	—	—	—

Continued on next page.

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		$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.
		°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.
Nagano	N.	1.4	289	e 0	26	+ 2	0	46	+ 3	—	—	—
Osima		1.5	196	i 0	25 <sup>k</sup>	- 1	0	43	- 2	—	—	—
Hokusima		1.6	16	i 0	27 <sup>k</sup>	0	0	48	+ 1	—	—	—
Matumoto	N.	1.6	271	i 0	28 <sup>k</sup>	+ 1	0	47	0	—	—	—
Shizuoka		1.7	225	0	32	+ 4	0	52	+ 2	—	—	—
Iida		1.8	248	i 0	32	+ 2	0	55	+ 3	—	—	—
Niigata		1.9	339	e 0	33	+ 2	—	—	—	—	—	—
Omaesaki		2.1	221	e 0	40	+ 6	1	6	+ 7	—	—	—
Takayama	N.	2.1	269	e 0	38	+ 4	1	8	+ 9	—	—	—
Yamagata		2.1	10	e 0	34	0	1	0	+ 1	—	—	—
Aikawa		2.2	324	i 0	36	+ 1	1	18	+16	—	—	—
Sendai	Z.	2.2	21	e 0	35	0	1	2	0	—	—	—
Toyama	Z.	2.2	283	0	37	+ 2	0	58	- 4	—	—	—
Hamamatu		2.3	230	e 0	56	S	(e 0	56)	- 8	—	—	—
Isinomaki		2.5	27	e 0	44	+ 5	1	18	+ 9	—	—	—
Kanazawa		2.6	277	e 0	45	+ 4	—	—	—	—	—	—
Nagoya	E.	2.6	247	e 0	44	+ 3	1	22	+10	—	—	—
Gihu		2.7	253	e 0	46	+ 4	1	17	+ 3	—	—	—
Sakata		2.7	359	e 0	49	+ 7	1	22	+ 8	—	—	—
Wazima		2.7	296	e 0	42	0	—	—	—	—	—	—
Hukui		2.9	267	e 0	57	+12	—	—	—	—	—	—
Ibukisan	E.	3.0	255	e 0	44	- 3	—	—	—	—	—	—
Hatidyosima		3.1	181	0	47	- 1	1	22	- 2	—	—	—
Hikone		3.1	253	e 0	46	- 2	1	26	+ 2	—	—	—
Kameyama		3.1	244	0	55	+ 7	1	37	+13	—	—	—
Mizusawa		3.1	18	e 0	48	0	1	37	+13	0 52	P	—
Tu		3.1	242	0	58	+10	1	42	+18	—	—	—
Akita	Z.	3.5	3	e 0	54	0	1	41	+ 7	—	—	—
Kyoto		3.6	251	e 1	8	+13	1	56	+19	—	—	—
Morioka		3.6	16	e 0	57	+ 2	—	—	—	—	—	—
Maizuru		3.7	259	e 1	32	S	(e 1	32)	- 7	—	—	—
Owase		3.7	237	e 1	12	+16	2	4	+25	—	—	—
Miyako	N.	3.8	24	e 0	58	0	—	—	—	—	—	—
Osaka		3.9	248	e 1	16	+17	2	1	+17	—	—	—
Kobe		4.2	248	e 0	42	-21	—	—	—	—	—	—
Toyooka		4.2	261	e 1	5	+ 2	2	9	+17	—	—	—
Wakayama		4.3	245	e 1	21	+16	2	6	+12	—	—	—
Siomisaki		4.4	233	e 1	42	S	(e 1	42)	-15	—	—	—
Hatinohe		4.5	16	e 1	13	+ 6	2	10	+11	—	—	—
Sumoto		4.5	247	1	13	+ 6	2	12	+13	—	—	—
Aomori		4.7	9	e 1	13	+ 3	2	5	+ 1	—	—	—
Takamatu	E.	5.2	250	e 1	18	+ 1	2	34	+17	—	—	—
Koti		5.9	245	e 1	55	+28	3	7	+33	—	—	—
Mori	N.	5.9	5	1	47	+20	2	54	+20	—	—	—
Urakawa		6.3	20	e 1	27	- 5	2	44	0	—	—	—
Hirosima		6.4	255	e 1	47	+13	2	56	+10	—	—	—
Matuyama		6.4	249	e 1	36	+ 2	—	—	—	—	—	—
Hamada		6.5	261	e 1	51	+16	3	21	+32	—	—	—
Sapporo		6.9	8	e 2	2	+21	2	24	-35	2 27	?	—
Nemuro		8.4	30	—	—	—	e 3	23	-13	—	—	—
Quetta	Z.	60.0	288	i 10	1	- 1	—	—	—	—	—	—
Resolute Bay		63.7	14	e 10	24	- 3	(e 23	4)	SS	—	—	23.1
Kiruna	Z.	66.9	339	e 10	44	- 3	—	—	—	i 13	13	PP
Upsala	Z.	73.2	334	i 11	24	- 2	—	—	—	i 11	38	pP
Mineral	Z.	73.3	52	i 11	45 <sup>k</sup>	pP	—	—	—	—	—	—
Lick	Z.	74.9	54	e 11	41 <sup>a</sup>	+ 5	—	—	—	e 12	5	sP
Fresno	Z.	76.5	54	e 12	4 <sup>a</sup>	pP	—	—	—	—	—	—
Collmberg	Z.	81.2	329	e 12	9	- 1	—	—	—	—	—	—
Jena		82.1	329	e 12	14	- 1	—	—	—	—	—	—
Stuttgart		84.7	330	e 12	27 <sup>†</sup>	- 1	—	—	—	—	—	—
Tucson		85.1	53	e 12	30	0	—	—	—	—	—	—
Triest	Z.	85.2	326	e 12	25	- 6	—	—	—	e 12	58	sP
Fayetteville		92.3	41	—	—	—	e 25	26	PS	e 25	58	PPS
La Paz	E.	148.3	58	19	46	PKP <sub>2</sub>	—	—	—	—	—	—



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May 20d. 23h. 14m. 23s. Epicentre 50°·0N. 129°·7W. (as on 14d.).

		$\Delta$	Az.	P.		O-C.	S.	O-C.	Supp.		L.
		°	°	m.	s.	s.	m.	s.	m.	s.	m.
Alberni		3·3	102	0	9	-44	0	35	-60	—	—
Victoria		4·4	108	1	10	0	—	—	—	—	
Seattle	z.	5·5	114	e 1	35	- 2*	—	—	1	42	P <sub>g</sub>
Hungry Horse		10·4	93	i 2	34	0	e 5	17	L	—	(e 5·3)
Shasta	z.	10·6	148	e 2	39 <sub>a</sub>	+ 3	—	—	—	—	—
Mineral	z.	11·2	146	e 2	47 <sub>a</sub>	+ 3	—	—	—	—	e 6·5
Butte		12·2	103	e 3	0	+ 2	—	—	—	—	—
Berkeley		13·3	153	e 3	13	0	e 6	11	SSS	e 3	31
Lick	z.	13·9	152	e 3	22 <sub>a</sub>	+ 1	—	—	—	—	—
Fresno	z.	15·1	148	e 3	38 <sub>a</sub>	+ 2	—	—	—	—	—
Tinemaha	z.	15·4	143	e 3	43	+ 3	—	—	i 3	48	PP
China Lake	z.	16·7	144	e 4	1	+ 4	—	—	—	—	—
Boulder City		17·7	136	e 4	12	+ 2	—	—	14	40	PPP
College		17·7	334	e 4	0	-10	i 7	29	+ 3	—	e 8·6
Nelson		17·9	136	e 4	13	+ 1	—	—	—	—	i 10·6
Pasadena		18·0	146	e 4	26	+13	e 7	47	+15	e 7	58
Palomar	z.	19·1	144	e 4	31	+ 4	—	—	—	—	SS
Barratt	z.	19·8	146	i 4	35	0	—	—	—	—	—
Tucson		22·6	135	—	—	—	e 9	26	SS	—	e 11·7
Fayetteville		29·2	103	i 6	5	0	e 11	12	+14	—	e 16·0
Cleveland	z.	34·2	85	e 6	47 <sub>k</sub>	- 2	—	—	—	—	—
Ottawa		36·0	75	e 7	2 <sub>a</sub>	- 3	12	51	+ 7	—	—
Morgantown		36·2	87	i 7	4	- 2	—	—	—	—	e 18·8
Seven Falls	E.	38·2	70	—	—	—	e 13	27	+10	—	e 19·2
Tacubaya		39·0	129	e 9	0	PP	—	—	—	—	19·7
Palisades		39·3	80	e 9	2	PP	e 13	39	+ 5	e 19	5
Harvard		40·0	77	i 7	46	+ 8	—	—	—	—	Q
Weston		40·2	77	i 7	47 <sub>a</sub>	+ 7	—	—	—	—	e 19·6
Halifax		43·8	70	—	—	—	e 14	57	PPS	—	e 24·3
Scoresby Sund		49·2	25	e 8	48	- 4	e 16	1	+ 3	19	55
Bermuda		50·4	84	—	—	—	e 20	5	SS	—	—
Kiruna		60·4	12	i 10	7	- 6	e 18	27	- 1	e 12	7
Bogota		64·9	114	e 10	53	+10	—	—	—	—	PP
Upsala	z.	67·3	18	i 10	54 <sub>k</sub>	- 5	—	—	—	—	e 24·7
Paris		73·3	31	i 11	32	- 3	—	—	—	i 11	39
Stuttgart		75·5	27	e 11	42	- 6	—	—	—	—	?
Prague		75·7	23	i 11	50	+ 1	e 13	3	?	e 15	20
Triest		79·6	25	e 12	3	- 7	e 22	13	+ 1	e 13	25
Florence	z.	80·6	27	e 12	44	+28	—	—	—	—	?
Granada		81·0	41	i 12	17 <sub>k</sub>	- 1	e 22	1	-26	—	—
Malaga		81·1	42	i 12	0	-18	—	—	—	i 15	21
Alicante		81·3	38	—	—	—	22	46	+16	—	—
Almeria		81·8	40	12	20	- 2	—	—	—	—	—
Rome		82·7	27	e 12	37?	+10	—	—	—	—	—
Algiers Univ.	z.	84·1	36	e 12	30	- 4	—	—	—	—	—
Istanbul	z.	87·6	16	12	46	- 5	—	—	—	—	—
Quetta	z.	98·8	345	i 17	34	PP	—	—	—	—	—

May 21d. 0h. 36m. Epicentre 37°15'N. 14°49'E.  
Intensity V at Vizzini (province of Catania, Sicily).  
Seismological Bulletin of the I.N.G., Rome, for May, 1953, p. 17.

May 21d. 1h. 56m. Off south coast of Guatemala.  
Suggested epicentres: 14°N. 92°W.; depth 200km. (Strasbourg).  
14°31'N. 92°19'W.; depth 100km. (Tacubaya).  
Magnitude 5·75 (Tacubaya).

May 21d. 18h. 44m. Hindu Kush. Epicentre 36°·5N. 68°·8E.  
Bulletin of Seismo. Stations of the U.S.S.R. for April-June, 1953, Moscow, 1954, p. 104.

The scanned images of the 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 collected by SGA Storia Geofisica Ambiente (Bologna) on behalf of the Istituto Nazionale di Geofisica e Vulcanologia (Rome), in the frame of the EUROSEISMOS project.

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May 22d. 20h. 14m. 28s. Epicentre 17°·8S. 178°·8W. Depth of focus 0·090.  
(as on 1953, January 23d.).

A = -·9526, B = -·0199, C = -·3038 ;  $\delta = +14$ ;  $h = +5$ ;  
D = -·021, E = +1·000 ; G = +·304, H = +·006, K = -·953.

		$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.	
		°	°	m.	s.	s.	m.	s.	s.	m.	s.
Apia		7·9	60	i 1	54	- 5	i 3	24	-10	—	—
Auckland	N.	19·8	195	e 3	42	-11	e 5	40	?	—	—
Wellington		24·0	192		5 50	?	e 8	6	- 2	e 6	21
Cobb River	E.	24·3	196		5 56	?	e 8	9	- 3	—	—
Kaimata	N.E.	26·0	197	e 6	22	?	—	—	—	—	—
Christchurch		26·7	193	e 6	28	?	e 9	2	+12	e 7	46
Brisbane		27·7	245	i 5	4	+ 1	i 9	9	+ 4	i 12	9
Riverview		31·2	233	i 5	36k	+ 3	i 10	3	+ 4	i 15	4
Baguio		68·7	297	i 10	4	- 2	—	—	—	i 11	49
Berkeley	Z.	76·7	44	e 10	52a	+ 1	—	—	—	e 12	55
Lick	Z.	76·8	43	e 10	54a	+ 2	—	—	—	i 12	57
Pasadena		77·4	48	i 10	55	0	i 13	53	sP	i 12	57
Barratt	Z.	77·7	50	i 10	57	0	—	—	—	e 12	58
Fresno	Z.	77·7	45	e 10	57a	0	—	—	—	e 13	0
Palomar	Z.	77·9	50	i 10	59a	+ 1	i 13	50	sP	i 13	1
Riverside	Z.	77·9	48	i 10	59	+ 1	—	—	—	i 13	1
Shasta	Z.	78·3	41	e 11	0k	0	—	—	—	e 13	4
Mineral	Z.	78·6	42	e 11	1a	- 1	i 14	15	PP	e 13	4
China Lake	Z.	78·7	47	i 11	3	+ 1	—	—	—	i 13	6
Tinemaha	Z.	78·9	45	i 11	4	+ 1	e 14	12	sP	i 13	7
Reno	Z.	79·2	43	e 11	6a	+ 1	—	—	—	e 13	9
Nelson		80·6	48	i 11	12	0	—	—	—	i 13	16
Tucson		81·9	52	e 11	21	+ 3	e 20	49	+ 6	—	—
Logan		85·6	43	e 11	38	+ 1	—	—	—	e 13	45
College		85·7	12	i 11	37	0	—	—	—	i 13	45
Butte		87·2	40	i 11	45	+ 1	—	—	—	i 13	53
Hungry Horse		87·4	37	e 11	45	0	e 21	19	[+ 4]	i 13	53
Fayetteville		96·1	54	i 14	35	pP	—	—	—	i 16	24
Quetta	Z.	119·3	295	18	32?	[+50]	—	—	—	—	—
Scoresby Sund		125·5	10	e 19	52	PP	—	—	—	—	—
Witteveen	Z.	144·8	354	e 18	34	[+ 4]	—	—	—	e 20	50
Ksara		145·1	303	i 18	38	[+ 8]	e 21	52	sPKP	—	—
Collmberg		145·3	349	e 18	33	[+ 3]	e 21	9	?	e 20	51
Jena		145·9	348	e 18	36	[+ 5]	e 21	28	PP	e 20	54
Prague		146·1	345	e 18	40	[+ 9]	e 22	1	sPKP	e 20	56
Stuttgart		148·4	352	e 18	42	[+ 7]	—	—	—	e 21	0
Strasbourg		148·8	352	e 21	1	pPKP	—	—	—	e 21	15
Paris		149·0	358	e 21	0	pPKP	e 21	5	?	e 21	16
Chambon-la-Forêt		149·9	359	e 18	44	[+ 7]	i 21	6	?	e 20	58
Helwan	Z.	150·0	299	i 18	46a	[+ 9]	e 18	56	PKP <sub>2</sub>	e 21	2
Besançon		150·4	354	e 21	5	pPKP	—	—	—	—	—
Clermont-Ferrand		152·1	356	e 21	5	pPKP	—	—	—	—	—
Granada		160·2	11	19	41a	PKP <sub>2</sub>	—	—	—	23	29
Tamanrasset	Z.	173·6	—	e 21	23	pPKP	e 30	16	SKKS	e 24	24

May 24d. 1h. 19m. 40s. Epicentre 55°·5S. 29°·0W. (as on 1949, February 28d.).

A = +·4977, B = -·2759, C = -·8223 ;  $\delta = 0$ ;  $h = -7$ ;  
D = -·485, E = -·875 ; G = -·719, H = +·399, K = -·569.

		$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.
		°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.
Buenos Aires		29·1	305	6	7	+ 3	10	58	+ 2	—	—	—
Concepción	N.	34·5	285	e 5	26	?	13	10	+50	6	35	P
Santa Lucia	N.	36·3	290	e 7	5	- 2	e 12	45	- 3	e 8	25	PP
Grahamstown	Z.	44·0	83	i 8	10	- 1	—	—	—	—	—	e 20·4
Kimberley	Z.	46·5	77	i 8	29	- 2	—	—	—	—	—	—

Continued on next page.

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		$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.
		°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.
Pietermaritzburg	z.	49.0	83	i 8	29	?	—	—	—	—	—	—
La Paz		49.0	308	i 8	50 <sup>k</sup>	0	i 15	54	- 1	i 10	48	PP 24.3
Pretoria	z.	50.7	78	i 9	1	- 2	—	—	—	—	—	—
Huancayo		56.4	302	i 9	48	+ 3	i 17	41	+ 5	i 10	47	PcP e 23.9
Tananarive		67.0	90	e 10	58	+ 1	e 19	53	+ 3	20	59	ScS 31.3
M'Bour		70.3	2	i 10	20	-57	i 21	8	ScS	—	—	—
Bogota		70.4	312	i 11	13	- 5	i 20	27	- 3	i 13	47	PP 34.3
Chinchina		71.4	312	i 11	20	- 4	e 20	47	+ 5	i 14	19	PP 34.3
Fort de France		75.0	328	e 11	44	- 1	e 21	20	- 3	—	—	—
Galerazamba		76.5	313	c 12	9	+15	e 21	40	+ 1	e 19	15	? 35.3
San Juan		80.0	325	i 12	10	- 3	e 19	38	?	—	—	—
Tamanrasset	z.	83.3	32	i 12	30	0	e 22	53	+ 3	e 15	36	PP 37.5
Averroes		90.4	18	i 13	1	- 3	—	—	—	—	—	43.3
Bermuda		92.7	330	i 13	18	+ 3	c 23	48	[ 0]	e 17	6	PP e 42.0
Malaga		94.1	20	i 13	22	0	c 24	29	- 2	17	18	PP 44.2
Almeria		94.7	21	i 13	24	0	24	22	-14	23	54	SKS 48.0
Granada		94.8	20	i 13	28 <sup>k</sup>	+ 3	24	46	+10	30	25	SS 41.7
Tacubaya		95.1	296	e 13	30	+ 4	—	—	—	—	—	—
Algiers Univ.	z.	95.9	25	e 13	29	- 1	e 24	46	0	c 17	23	PP e 45.3
Alicante		96.6	22	e 13	31	- 2	e 24	37	-15	e 19	19	PPP 44.6
Toledo		97.4	18	e 13	40	+ 3	24	35	{- 1}	17	34	PP 43.8
Tortosa		99.2	22	—	—	—	i 25	20	+ 6	—	—	e 44.3
Helwan	z.	99.4	50	e 13	53	+ 7	e 25	32	+17	e 17	46	PP —
Mobile		99.6	311	14	44	+58	24	24	[- 1]	—	—	—
Messina		100.8	34	e 17	49	PP	e 24	24	[- 7]	e 32	28	SS —
Washington		102.6	324	i 18	12	PP	—	—	—	—	—	—
Philadelphia		102.9	325	e 18	0	PP	—	—	—	—	—	—
Rome		103.2	30	e 18	4	PP	c 24	38	[- 4]	e 25	52	S —
Fordham		103.3	327	e 17	47	PKP	e 24	35	[- 8]	—	—	—
Palisades		103.4	327	e 14	0	- 4	24	36	[- 7]	e 20	48	PPP e 48.7
Taranto		103.4	34	e 20	44	PPP	—	—	—	—	—	—
Weston		103.9	329	i 18	26 <sup>a</sup>	PP	24	40	[- 6]	e 33	22	SS 54.4
Halifax		104.0	335	e 18	25	PP	25	46	- 8	24	36	SKS 40.4
Harvard		104.1	329	e 18	33	PP	e 24	39	[- 7]	e 33	47	SS e 54.4
Morgantown		104.2	322	i 18	28	PP	—	—	—	—	—	—
Florence	z.	104.6	28	e 18	33	PP	—	—	—	—	—	—
Ksara		104.7	51	e 17	59	PKP	e 27	57	PS	—	—	—
Cincinnati		105.4	319	i 14	15	+ 2	—	—	—	—	—	—
Pavia		105.4	27	e 18	34	PP	e 28	11	PPS	e 33	9	SS e 48.1
Chambon-la-Forêt		106.4	21	e 18	35	PP	—	—	—	—	—	—
Cleveland		106.4	321	e 18	31 <sup>k</sup>	PP	24	49	[- 8]	e 28	0	PS —
Fayetteville		106.8	312	e 14	26	P	e 26	0	-17	e 18	38	PP e 51.8
Triest		107.0	29	e 18	42	PP	e 25	45	{+ 1}	e 28	2	PS 48.6
Paris		107.2	21	c 18	24	[- 4]	e 27	31	PS	e 18	44	PP e 50.3
Kodaikanal	F.	107.7	97	—	—	—	e 27	57	PS	—	—	—
Ottawa		108.0	328	e 18	30	[+ 1]	24	58	[- 6]	e 18	52	PP 41.5
Seven Falls	F.	108.1	332	e 19	6	PP	25	2	[- 2]	26	32	S 44.8
Strasbourg		108.2	24	e 18	37	[+ 7]	e 26	33	S	e 21	14	PPP e 46.3
Stuttgart		108.7	25	e 14	35 <sup>?</sup>	P	e 26	40	S	e 19	2	PP 53.3
Kew		109.3	18	—	—	—	e 26	54	S	e 28	40	PS e 42.3
Uccle	E.	109.5	21	e 28	37	PS	e 26	48	S	e 34	39	SSP e 46.3
Bucharest		109.9	38	e 19	9	PP	c 28	54	PS	—	—	—
Ogyalla	N.	110.3	32	e 22	34	PKS	e 26	57	S	28	55	PS 56.8
Cheb		110.7	27	e 26	55	S	e 28	54	PS	e 29	41	PPS —
De Bilt		110.9	21	e 19	2	PP	e 26	50	S	e 28	50	PS e 52.3
Jena	z.	111.3	27	e 19	10	PP	e 20	28	?	e 20	47	? —
Prague	N.	111.3	28	c 19	34	PP	e 22	9	PKS	e 28	52	PS e 56.6
Tucson		111.6	295	e 18	37	[+ 1]	e 24	58	[-21]	e 29	2	PKKP —
Uzhgorod		111.7	34	e 19	17	PP	—	—	—	—	—	—
Kirkland Lake	z.	111.8	326	e 19	22	PP	—	—	—	—	—	—

Continued on next page.

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	$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.	
	$^{\circ}$	$^{\circ}$	m.	s.	s.	m.	s.	s.	m.	s.	m.	
Bombay	112.0	88	e 19	27	PP	e 28	51	PS	e 34	56	SS	—
Collmberg	112.0	27	e 18	14?	[ -23]	—	—	—	—	—	—	—
Skalnate Pleso	112.1	32	e 20	13	PP	e 28	58	PS	e 29	46	PPS	—
Potsdam	113.0	26	e 19	27	PP	e 27	20	S	e 29	14	PS	e 50.3
Yalta	113.0	43	e 19	22	PP	—	—	—	e 21	50	PPP	—
Kishinev	113.1	38	e 19	25	PP	e 26	23	{ -4}	—	—	—	—
Theodosia	113.9	44	e 19	31	PP	e 25	22	{ -6}	—	—	—	—
Goris	114.2	55	i 19	43	PP	e 22	42	PKS	—	—	—	—
Aberdeen	114.4	16	—	—	—	e 27	1	{ +25}	i 39	50	SSS	e 61.8
Sotchi	114.5	48	e 19	36?	PP	e 25	22	{ -8}	—	—	—	—
Tsikhli-Dzhvari	114.6	52	e 18	44	[ + 2]	—	—	—	—	—	—	—
Zugdidi	114.6	50	—	—	—	e 25	26	{ -4}	—	—	—	—
Borzhomi	114.7	52	e 18	40	[ - 2]	e 26	28	{ -10}	—	—	—	—
Barratt	115.0	291	e 18	42	[ - 1]	—	—	—	i 19	42	PP	—
Palomar	115.6	291	i 19	5	[ + 21]	—	—	—	i 19	57	PP	—
Copenhagen	115.9	24	e 19	47	PP	26	38	{ - 8}	29	35	PS	—
Shemakla	116.1	56	e 18	56	[ + 11]	—	—	—	—	—	—	—
Nelson	116.4	295	i 18	47	[ + 1]	—	—	—	—	—	—	—
Baku	116.6	56	e 19	51	PP	e 25	37	[ - 1]	—	—	—	—
Grozny	116.9	52	e 18	46	[ - 1]	i 25	27	[ - 12]	—	—	—	—
Pasadena	116.9	291	i 18	47	[ 0]	e 19	2	?	i 20	7	PP	e 56.9
Makhach-Kala	117.4	53	e 18	50	[ + 2]	—	—	—	—	—	—	—
Quetta	117.6	76	i 18	49	[ + 1]	i 25	38	[ - 4]	i 26	58	SKKS	e 54.6
China Lake	117.9	294	e 18	49	[ 0]	—	—	—	i 20	3	PP	—
Ashkabad	118.1	65	e 18	52	[ + 3]	e 25	34	[ - 9]	i 20	11	PP	—
Kizyl-Arvat	118.6	62	e 20	11	PP	—	—	—	—	—	—	—
Bergen	118.7	18	—	—	—	e 29	24	PS	—	—	—	—
Tinemaha	119.2	293	e 18	54	[ + 3]	—	—	—	e 20	14	PP	—
Logan	119.5	301	e 18	52	[ 0]	—	—	—	i 20	11	PP	—
Fresno	119.7	292	e 18	54 <sub>a</sub>	[ + 2]	e 21	14	?	e 20	34	PP	—
Bairam-Ali	120.6	68	e 18	55	[ + 1]	—	—	—	i 20	23	PP	—
Upsala	120.8	25	i 18	52	[ - 2]	e 28	50	?	e 20	28	PP	e 59.3
Lick	121.2	291	e 18	56	[ + 1]	—	—	—	e 20	25	PP	—
Reno	121.8	294	e 18	58 <sub>a</sub>	[ + 2]	e 19	24	?	e 20	32	PP	—
Berkeley	121.9	291	e 18	57 <sub>k</sub>	[ + 1]	e 30	44	PS	e 20	44	PP	e 60.7
Butte	123.0	305	i 18	58	[ 0]	—	—	—	e 20	42	PP	—
Warsak Dam	123.0	76	e 18	54	[ - 4]	e 25	53	[ - 7]	e 20	50	PP	e 63.3
Moscow	123.4	38	e 18	56	[ - 3]	—	—	—	—	—	—	—
Mineral	123.7	293	e 18	59 <sub>a</sub>	[ - 1]	e 32	31	PPS	e 20	52	PP	—
Shasta	124.0	294	e 19	0 <sub>a</sub>	[ 0]	—	—	—	e 19	22	?	—
Pulkovo	124.2	32	e 19	1	[ 0]	e 27	28	{ -14}	e 20	40	PP	—
Samarkand	124.7	69	e 18	53	[ - 9]	—	—	—	—	—	—	—
Stalinabad	124.8	71	e 19	3	[ + 1]	e 29	3	?	—	—	—	—
Kulyab	124.9	72	e 19	4	[ + 2]	—	—	—	i 20	52	PP	—
Hungry Horse	125.4	305	i 19	3	[ 0]	e 32	11	PPS	e 20	56	PP	—
Khorog	125.6	74	e 19	11	[ + 7]	—	—	—	—	—	—	—
Scoresby Sund	125.8	2	e 19	4	[ 0]	29	3	PKKP	38	13	SS	58.3
Garm	125.9	71	e 19	5	[ + 1]	e 22	34	PKS	e 21	0	PP	—
Chatra	126.4	93	e 19	4	[ - 1]	—	—	—	—	—	—	—
Dzhergetal	126.6	71	e 19	6	[ + 1]	—	—	—	i 21	7	PP	—
Tashkent	127.1	68	e 19	4	[ - 2]	i 27	53	{ - 8}	e 21	8	PP	—
Fergana	127.7	72	e 19	7	[ - 1]	—	—	—	e 21	10	PP	—
Tchimkent	127.9	68	i 19	7	[ - 1]	e 28	0	{ - 6}	21	3	PP	—
Namangan	128.1	71	19	8	[ 0]	27	44	{ - 24}	i 21	14	PP	—
Andijan	128.3	72	i 19	8	[ - 1]	i 28	6	{ - 3}	i 21	18	PP	—
Kiruna	128.3	22	e 15	49	P	27	59	{ - 10}	i 19	7	PKP	e 59.3
Seattle	128.9	300	i 19	13	[ + 3]	—	—	—	—	—	—	—
Victoria	130.0	300	19	12	[ 0]	—	—	—	—	—	—	—
Naryn	130.8	74	e 19	14	[ 0]	—	—	—	e 21	30	PP	—
Frunse	131.0	71	i 19	14	[ 0]	e 28	22	{ - 4}	e 21	25	PP	—

Continued on next page.

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	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.	
	$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.	
Rybach'e	131.5	72	e 19 20	[+ 5]	i 28 25	{- 4}	i 21 36	PP	—
Almata	132.5	72	e 19 14	[- 3]	e 22 40	PKS	—	—	—
Sverdlovsk	133.2	48	e 19 17	[- 1]	28 35	{- 4}	i 21 40	PP	—
Baguio	134.6	137	e 19 22	[+ 1]	e 22 44	PKS	(23 50)	?	23.8
Resolute Bay	137.0	340	e 19 15	[-10]	e 22 51	PKS	i 19 23	PKP <sub>2</sub>	e 64.3
Semipalatinsk	138.8	66	e 19 21	[- 7]	—	—	—	—	—
Nanking	z. 147.5	122	i 19 43	[ 0]	i 29 59	{- 5}	—	—	—
Zó-Sè	z. 147.8	127	e 19 46	[+ 2]	—	—	—	—	—
College	149.4	313	i 19 42	[- 4]	e 43 37	SSP	i 19 49	PKP	—
Irkutsk	152.7	76	19 50	[- 1]	30 26	{- 7}	e 23 48	PP	—
Kyakhta	153.0	81	19 50	[- 2]	e 30 26	{- 9}	20 16	PKP <sub>2</sub>	—
Kabansk	153.9	78	i 19 52	[- 1]	i 30 33	{- 6}	i 20 9	PKP <sub>2</sub>	—
Yuzno-Sakhlinsk	170.0	145	20 8	[- 1]	—	—	25 23	PP	—
Ulegorsk	171.6	136	20 8	[- 2]	25 26	PP	29 20	PPP	—
Klyuchi	174.4	—	e 20 8	[- 3]	25 37	PP	21 45	PKP <sub>2</sub>	—
Petropavlovsk	174.9	—	i 20 10	[- 1]	25 40	PP	e 30 0	PPP	—

May 24d. 2h. 54m. Epicentre 40°·5N. 111°·5W.

Intensity V at Salt Lake City, Utah.

L. M. Murphy and W. K. Cloud.

United States Earthquakes, 1953, U.S.C.G.S. Serial No. 785, Washington, 1955, p.9.

May 24d. 23h. 26m. Epicentre 37°·4N. 71°·6E. Depth of focus 100km.

Seismo. Bulletin of Stations of U.S.S.R. for 1953, April-June, Moscow, 1954, pp.106-107.

May 25d. Three Californian shocks.

0h. 23m. 20s. Epicentre 36°49'N. 121°28'W. Intensity V at Hollister; IV at Gilroy, Morganhill, San Juan Baptista, etc.

3h. 24m. 1s. Epicentre 35°00'N. 119°01'W. Intensity VI at Caswell; V at Taft; IV at Arroyo Granda, Bakersfield, Huasna, Los Angeles, etc.

4h. 8m. 0s. Epicentre 39°22'N. 123°16'W. Intensity VI at Calpella and Ukiah; V at Potter Valley; IV at Hopland, Lakeport, Upper Lake, and Willits.

L. M. Murphy and W. K. Cloud.

United States Earthquakes, 1953, U.S.C.G.S., Serial 785, Washington, 1955, p.14.

May 25d. 12h. 38m. 14s. Epicentre 3°·1S. 101°·5E.

A = -·1991, B = +·9785, C = -·0537;  $\delta = -1$ ;  $h = +7$ ;  
D = +·980, E = +·199; G = +·011, H = -·053, K = -·999.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.	
	$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.	
Djakarta	6.1	120	i 1 34	0	i 2 46	+ 1	i 3 3	S*	—
Bandong	7.2	122	e 1 55	+ 6	i 3 31	- 7*	i 15 37	ScS	—
Colombo	E. 23.8	264	i 5 16	+ 1	e 9 36	+ 8	—	—	17.6
Madras	E. 26.5	308	i 5 43	+ 2	i 10 12	- 2	6 33	PPP	12.8
Baguio	27.1	43	i 5 47 <sub>a</sub>	+ 1	i 11 16	SS	—	—	15.5
Kodaikanal	E. 27.2	300	i 5 50	+ 3	10 32	+ 7	—	—	—
Shillong	E. 30.0	345	e 6 12	0	e 11 1	- 9	12 47	SS	—
Hyderabad	30.5	313	i 6 15	- 2	11 15	- 3	—	—	15.0
Chatra	E. 32.8	337	e 6 37	0	—	—	—	—	—
Poona	z. 34.7	310	i 6 53	- 1	12 20	- 4	8 3	PP	15.9

Continued on next page.



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	$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.	
	°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.	
Bombay	35.7	309	e 7	3	+ 1	e 12	38	- 1	8	25	PP	16.3
Nanking	38.6	23	i 7	28 <sub>a</sub>	+ 2	13	22	- 1	i 9	0	PP	—
Zó-Sè	38.8	27	i 7	32 <sub>a</sub>	+ 4	13	32	+ 6	—	—	—	—
New Delhi	39.2	325	e 7	30	- 1	i 13	25	- 7	13	41	PcS	—
Dehra Dun	40.1	328	e 7	41	+ 2	—	—	—	—	—	—	—
Warsak Dam	46.5	326	i 8	26	- 5	i 15	11	- 8	e 16	45	?	—
Quetta	46.7	318	i 8	32 <sub>k</sub>	0	i 15	16	- 6	i 8	41	pP	—
Naryn	50.0	336	i 8	57	- 1	i 16	6	- 3	i 9	12	pP	—
Przhevalsk	50.0	339	i 8	57	- 1	i 16	7	- 2	i 9	10	pP	—
Kulyab	50.3	327	i 8	58	- 2	—	—	—	—	—	—	—
Garm	50.8	329	e 9	2	- 2	—	—	—	—	—	—	—
Rybach'e	50.8	336	i 9	4	0	i 16	20	0	9	17	pP	—
Obi-garm	50.9	328	i 9	2	- 3	i 16	12	- 9	—	—	—	—
Andijan	51.1	332	i 9	6	0	i 16	21	- 3	—	—	—	—
Fergana	51.1	331	i 9	5	- 1	e 16	19	- 5	e 9	18	pP	—
Almata	51.2	337	i 9	7	0	i 16	24	- 1	—	—	—	—
Stalinabad	51.3	328	i 9	4	- 4	i 16	17	- 9	—	—	—	—
Namangan	51.6	331	i 9	10	0	i 16	27	- 4	i 9	24	pP	—
Fabrichnaya	51.8	337	i 9	6	- 6	—	—	—	—	—	—	—
Frunse	51.8	335	i 9	11	- 1	e 16	30	- 3	i 9	25	pP	—
Samarkand	53.1	326	9	18	- 3	16	42	- 9	—	—	—	—
Kyakhta	53.4	3	9	23	- 1	e 16	53	- 2	—	—	—	—
Tchimkent	53.6	331	i 9	25	0	i 16	55	- 3	—	—	—	—
Bairam-Ali	54.5	322	—	—	—	i 17	7	- 3	—	—	—	—
Tananarive	55.0	249	e 9	38	+ 3	—	—	—	e 9	50	?	—
Kabansk	55.1	3	i 9	35	- 1	i 17	17	- 1	—	—	—	—
Irkutsk	55.2	2	9	36	- 1	e 17	18	- 2	e 9	48	pP	—
Semipalatinsk	56.3	344	e 9	39	- 6	—	—	—	—	—	—	—
Ashkabad	57.1	320	i 9	49	- 1	i 17	40	- 5	—	—	—	—
Yuzno-Sakhlinsk	61.6	30	i 10	21	- 1	—	—	—	—	—	—	—
Baku	64.0	318	i 10	38	0	e 19	9	- 4	—	—	—	—
Shemakla	64.9	318	i 10	42	- 1	—	—	—	—	—	—	—
Goris	66.0	316	i 10	48	- 2	i 19	32	- 6	—	—	—	—
Makhach-Kala	66.8	321	i 10	54	- 2	i 19	42	- 6	—	—	—	—
Erevan	67.5	316	i 10	56?	- 4	i 19	52?	- 4	—	—	—	—
Tiflis	68.0	318	i 11	2	- 1	i 19	58	- 4	—	—	—	—
Grozny	68.1	320	i 11	2	- 2	i 19	55	- 8	—	—	—	—
Sverdlovsk	68.3	338	i 11	3	- 2	19	58	- 8	i 11	17	pP	—
Gori	68.6	317	11	4	- 3	e 20	4	- 5	—	—	—	—
Tsikhlis-Dzhvari	68.9	317	11	8	- 1	—	—	—	—	—	—	—
Borzhomi	69.0	317	i 11	9	0	—	—	—	—	—	—	—
Abastumanj	69.3	317	11	11	0	—	—	—	—	—	—	—
Piatigorsk	70.1	319	11	14	- 2	i 20	23	- 4	i 11	27	pP	—
Zugdidi	70.3	318	i 11	17	0	i 20	25	- 4	—	—	—	—
Ksara	71.7	307	e 11	24?	- 2	—	—	—	e 17	12?	?	—
Sotchi	72.2	318	i 11	27	- 2	e 20	43	- 8	e 11	42	pP	—
Petropavlovsk	73.5	31	i 11	35	- 1	e 21	4	- 2	—	—	—	—
Pretoria	73.6	244	11	37	0	—	—	—	—	—	—	—
Theodosia	75.6	318	e 11	47	- 1	e 21	22	- 7	e 12	3	pP	—
Yalta	76.2	317	i 11	50	- 2	i 21	28	- 8	e 12	6	pP	—
Kimberley	76.9	241	e 11	52	- 4	—	—	—	—	—	—	—
Moscow	78.2	329	12	1	- 2	21	50	- 7	e 12	16	pP	—
Istanbul	78.9	313	i 12	5	- 2	15	7	PP	e 12	20	pP	37.8
Kishinev	80.5	318	e 12	13	- 2	—	—	—	—	—	—	—
Pulkovo	83.3	331	e 12	29	- 1	e 22	43	- 7	12	42	pP	—
Lwow	84.3	320	e 12	33	- 2	e 22	52	- 8	—	—	—	—
Uzhgorod	85.2	319	i 12	39	0	e 23	7	- 2	12	55	pP	—
Belgrade	85.8	315	e 12	43 <sub>a</sub>	+ 1	e 16	6	PP	e 12	58	pP	—
Skalnate Pleso	86.7	320	e 12	33	- 14	e 23	13	- 11	e 24	28	PS	—
Budapest	87.2	318	e 12	54	+ 5	e 23	25	- 4	e 15	57	PP	—

Continued on next page.

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		$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.
		<sup>e</sup>	<sup>e</sup>	m.	s.	s.	m.	s.	s.	m.	s.	m.
Raciborzu		88.2	321	c 12	53k	- 1	e 13	31	?	c 13	45	?
Messina	z.	88.7	308	i 12	57k	0	c 23	59?	+16	i 13	16	?
Kiruna		89.5	338	i 12	59 <sub>a</sub>	- 1	e 23	48?	- 2	i 16	31	PP
Upsala		89.6	329	i 13	0	- 1	e 23	53	+ 2	i 16	24	PP
Prague		90.4	320	e 13	6	+ 2	e 16	57	PP	e 15	23	?
Triest	z.	90.6	316	i 13	5 <sub>a</sub>	0	e 16	56	PP	e 13	20	?
Rome		91.3	312	c 13	8	- 1	e 24	0	- 6	—	—	—
Collmberg		91.5	321	e 13	7	- 3	e 16	45	PP	e 13	24	?
Potsdam		91.5	322	e 13	9	- 1	e 24	5	- 3	e 24	28	?
Cheb		91.8	320	e 25	15	PS	e 24	3	- 8	e 24	29	?
Copenhagen		92.2	325	e 13	12	- 1	e 24	11	- 3	—	—	51.8
Florence		92.3	313	e 13	12	- 1	e 23	55	{- 3}	—	—	—
Jena		92.3	320	e 13	12	- 1	e 17	8	PP	e 18	6	?
Pavia		93.8	315	c 14	12?	+52	—	—	—	—	—	—
Stuttgart		93.8	318	e 13	19	- 1	e 24	26	- 2	e 17	6	PP
Besançon		96.0	317	e 17	31	PP	—	—	—	e 17	42	?
Tamanrasset	z.	96.6	293	e 13	33	0	e 26	10	PS	e 17	25	PP
Paris		98.3	318	e 16	56	?	—	—	—	—	—	e 50.8
Chambon-la-Forêt		98.5	318	e 13	41	- 1	—	—	—	—	—	—
Kew		99.8	322	e 17	46	PP	—	—	—	—	—	e 61.8
Alicante		101.3	308	13	57	+ 3	e 25	39	+ 8	20	23	PPP
College		101.5	24	e 13	55	0	—	—	—	—	—	—
Rathfarnham Castle		103.1	324	e 20	49	PPP	e 25	41	- 5	e 35	47	?
Scoresby Sund		103.6	343	e 18	19	PP	—	—	—	—	—	—
Victoria		120.7	33	18	53	[- 1]	—	—	—	—	—	—
Hungry Horse		125.6	28	i 19	2	[- 2]	—	—	—	e 20	56	PP
Shasta	z.	125.6	40	e 19	2 <sub>a</sub>	[- 2]	—	—	—	e 20	46	PP
Mineral	z.	126.3	40	e 19	4 <sub>a</sub>	[- 1]	—	—	—	—	—	—
Lick	z.	127.8	43	e 19	10k	[+ 2]	—	—	—	i 20	27	?
Reno		127.9	39	e 19	10k	[+ 2]	e 21	57	?	e 19	23	?
Butte		128.0	29	e 19	9	[+ 1]	—	—	—	—	—	—
Fresno	z.	129.4	42	e 19	12k	[+ 1]	e 22	28	PKS	e 21	36	PP
Tinemaha		130.3	41	e 19	14	[+ 1]	i 22	51	PKS	e 21	39	PP
Logan		131.3	32	e 19	14	[ 0]	i 22	36	PKS	—	—	—
China Lake	z.	131.4	42	i 19	16	[+ 1]	i 22	56	PKS	e 21	33	PP
Pasadena		131.9	44	i 19	17	[+ 1]	i 22	57	PKS	i 22	38	?
Riverside	z.	132.5	44	i 19	17	[ 0]	i 22	59	PKS	i 22	38	?
Boulder City		133.2	40	i 19	20	[+ 2]	—	—	—	—	—	—
Palomar	z.	133.2	44	i 19	20	[+ 2]	i 23	0	PKS	i 23	41	?
Nelson		133.3	40	e 19	9	[- 9]	i 22	41	?	i 23	31	?
Barratt	z.	133.7	46	i 19	21	[+ 2]	i 23	1	PKS	e 22	43	?
Kirkland Lake	z.	135.1	1	e 21	52	PP	—	—	—	—	—	—
Tucson		138.0	42	e 19	18	[- 9]	e 22	58	PKS	—	—	—
Harvard		140.3	352	i 19	34k	[+ 3]	—	—	—	—	—	—
Fayetteville		143.5	21	i 19	30	[- 7]	i 23	5	PKS	—	—	—
Morgantown		143.6	2	i 19	32	[- 5]	—	—	—	e 21	42	?
Washington		144.3	357	i 19	37	[- 1]	—	—	—	i 21	22	?
Tacubaya		154.1	49	e 20	36	?	—	—	—	—	—	—
La Paz	N.	158.0	208	e 20	8	[+10]	—	—	—	—	—	—
San Juan		160.6	323	e 20	13	[+12]	—	—	—	—	—	—
Huancayo		164.6	192	e 20	25	[+20]	—	—	—	—	—	—
Bogota	N.	175.3	289	e 21	32	PKP <sub>2</sub>	e 26	46	[-27]	—	—	—
Chinchina	z.	176.6	302	e 20	9	[- 3]	e 25	47	PP	e 21	51	PKP <sub>2</sub>

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May 25d. 17h. 40m. 32s. Epicentre 51°·3N. 159°·3E. (as on 1953, March 17d.).

$\Delta = -0.5873$ ,  $B = +0.2219$ ,  $C = +0.7783$ ;  $\delta = -9$ ;  $h = -6$ ;  
 $D = +0.353$ ,  $E = +0.935$ ;  $G = -0.728$ ,  $H = +0.275$ ,  $K = -0.628$ .

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Nemuro		12.2	235	e 3 48	?	e 7 2	?	—	e 8.6
Wakkanai	E.	13.1	250	e 8 43	PcP	—	—	—	e 6.4
Urakawa		14.5	237	e 3 50	PPP	e 7 2	L	e 8 43	(e 7.0)
Sapporo		14.7	243	e 3 53	PPP	e 7 39	L	e 8 41	e 10.1
Miyako		16.8	233	e 4 4	+ 6	—	—	—	—
Morioka		17.2	235	e 4 9	+ 6	—	—	—	—
Akita	Z.	17.7	237	e 4 15	+ 5	—	—	—	—
Sendai		18.4	231	e 4 21	+ 3	e 7 30	-11	e 7 57	SS e 8.3
Yamagata		18.7	232	e 4 26	+ 4	—	—	—	—
Hokusima		19.0	231	e 4 29	+ 3	8 14	SS	—	—
Utunomiya		20.2	231	e 4 42	+ 3	e 8 48	SS	5 4	PP 12.5
Kumagaya		20.8	232	e 4 50	+ 5	e 8 49	+16	—	—
Maebasi		20.8	234	e 4 48	+ 3	e 8 45	+12	—	—
Tokyo		21.0	229	e 5 2	PP	e 8 56	SS	e 5 36	?
Matusiro		21.1	234	i 4 51 <sub>a</sub>	+ 3	i 8 51	+12	i 9 2	PcP 10.9
Oiwake		21.1	233	4 55	+ 7	e 8 53	+14	—	—
Toyama		21.5	236	e 4 53	+ 1	—	—	e 5 33	PPP
Kohu		21.6	232	e 4 58	+ 4	e 9 2	+13	—	—
Mera		21.6	229	e 5 2	+ 8	—	—	—	—
Misima	E.	21.8	230	e 4 59	+ 3	e 9 9	+17	—	—
Osima		21.9	229	e 4 56	- 1	—	—	—	—
Iida		22.1	231	e 5 4	+ 5	—	—	—	—
Shizuoka		22.2	230	e 5 2	+ 2	e 9 13	+13	—	—
Omaesaki		22.6	230	e 5 12	+ 9	—	—	—	—
Gihu		22.7	232	e 5 15	+11	—	—	—	—
Nagoya		22.8	232	e 5 10	+ 5	—	—	e 5 23	?
Ibukisan	E.	22.9	232	e 5 6	0	—	—	—	—
Kameyama		23.3	232	e 5 7	- 3	—	—	—	—
Kyoto		23.5	232	e 5 16	+ 4	e 10 8	SS	—	—
Osaka		23.9	234	e 5 24	+ 8	—	—	e 5 46	PP
Kobe	N.	24.1	234	e 5 42	PP	—	—	—	—
Sumoto		24.5	234	e 5 10	-12	e 10 2	+22	—	—
Takamatu		24.9	236	e 5 30	+ 4	e 9 26	-21	—	e 15.9
Hamada		25.6	239	e 5 43	+11	e 11 48	SSS	—	17.0
Koti		25.8	236	e 5 38	+ 4	e 10 20	+18	e 6 0	?
Matuyama		26.0	238	e 5 44	+ 8	—	—	e 5 59	?
Kagosima		28.9	237	e 6 13	+10	—	—	—	—
College		30.1	42	e 6 9	- 4	e 10 55	-17	i 6 29	? e 12.5
Zô-Sô	Z.	34.5	249	i 6 55 <sub>a</sub>	+ 3	—	—	—	—
Nanking		35.3	253	i 7 0 <sub>a</sub>	+ 1	e 12 38	+ 5	—	—
Resolute Bay		45.2	20	i 8 18 <sub>a</sub>	- 2	e 14 52	- 9	—	—
Baguio		46.5	236	i 8 33	- 2	i 15 18	- 1	—	e 26.0
Victoria		47.7	61	8 38	- 2	—	—	—	23.1
Seattle	Z.	48.8	61	e 8 56	+ 7	—	—	e 9 59	?
Corvallis	Z.	50.0	66	e 13 16	?	—	—	—	—
Hungry Horse		52.8	55	e 9 6	-13	—	—	—	—
Shasta	Z.	53.0	68	e 9 18 <sub>k</sub>	- 3	—	—	e 9 36	?
Mineral	Z.	53.7	68	e 9 23 <sub>a</sub>	- 3	i 9 30	?	i 9 39	?
Berkeley		54.9	70	e 9 32	- 3	e 17 30	+14	e 17 42	PS e 23.6
Butte		55.1	57	e 9 40	+ 4	—	—	—	—
Reno	Z.	55.2	67	e 9 36	- 1	e 9 43	?	e 9 59	?
Lick	Z.	55.6	70	e 9 38 <sub>k</sub>	- 2	—	—	e 9 49	?
Shillong	E.	56.5	270	i 9 48	+ 2	—	—	e 10 35	PcP
Fresno	Z.	57.1	69	e 9 48 <sub>a</sub>	- 2	—	—	e 10 2	?
Kiruna		57.3	342	i 9 50 <sub>a</sub>	- 2	e 17 45	- 2	e 16 25	? e 27.0
Tinemaha	Z.	57.8	69	e 9 54	- 1	—	—	e 10 18	?
Logan		58.3	61	e 10 0	+ 1	—	—	—	—
Scoresby Sund		58.5	0	e 9 57	- 3	e 18 3	0	20 23	?
China Lake	Z.	59.0	69	e 10 1	- 3	—	—	i 10 18	?
Pasadena		59.8	72	i 10 9	0	—	—	i 10 52	PcP

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		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		<sup>o</sup>	<sup>o</sup>	m. s.	s.	m. s.	s.	m. s.	m.
Boulder City		60.5	67	e 10 13	- 1	—	—	e 10 29	?
Nelson		60.7	67	i 10 13	- 2	—	—	—	—
Barratt	z.	61.8	72	i 10 23	0	—	—	i 10 35	?
Warsak Dam	E.	63.0	292	—	—	e 19 1	0	—	e 35.5
Upsala		65.0	340	i 10 43 <sub>a</sub>	- 1	e 19 28?	+ 2	e 20 45	ScS e 37.5
Tucson		65.5	68	e 10 46	- 1	—	—	e 11 2	?
Quetta		68.4	292	i 11 6 <sub>k</sub>	0	e 20 9	+ 2	—	—
Kirkland Lake	z.	68.7	38	e 11 10	+ 3	—	—	—	—
Lubbock		69.6	61	e 11 6	- 7	—	—	—	—
Copenhagen		69.9	341	i 11 14	- 1	20 26	+ 2	—	37.5
Fayetteville		71.8	54	i 11 24	- 2	—	—	—	—
Ottawa		72.7	36	e 11 37	+ 5	—	—	—	—
Shawinigan Falls	N.	72.7	34	e 11 46	PcP	—	—	—	—
Potsdam		72.8	339	e 11 33	+ 1	e 21 16?	PS	e 11 44	PcP e 38.5
Poona	z.	73.0	278	i 11 34	+ 1	—	—	i 11 45	PcP
Bombay		73.3	279	e 11 38	+ 3	e 21 16	+12	—	—
Cleveland	z.	73.5	42	i 11 41 <sub>k</sub>	+ 5	—	—	—	—
Iasi		73.5	328	i 11 37	+ 1	—	—	—	—
Raciborzu		73.7	335	e 11 38	0	e 12 32	?	e 11 50	PcP
Witteveen	z.	73.7	343	e 11 40 <sub>a</sub>	+ 2	—	—	e 11 51	PcP
Collmberg		73.9	339	e 11 37	- 2	e 12 31	?	e 11 51	PcP
Skalnate Pleso		74.0	334	e 12 6	?	e 13 6	?	e 12 17	?
Jena		74.5	338	e 11 42	0	e 22 6	PPS	e 14 40	PP
De Bilt		74.7	344	e 11 44	+ 1	e 21 25	+ 6	—	e 30.5
Prague		74.7	337	e 11 43	0	e 14 51	PP	e 11 56	PcP e 42.5
Cheb	N.	75.1	340	—	—	e 22 10	PPS	—	—
Rathfarnham C.	z.	75.1	351	i 11 46 <sub>k</sub>	0	—	—	i 12 22	?
Morgantown		75.7	43	e 11 45	- 4	—	—	—	—
Ogyalla	N.	75.7	334	e 11 56	+ 7	e 21 33	+ 3	e 14 51	PP
Budapest		75.8	333	e 11 51	+ 1	e 21 38	+ 7	e 12 2	PcP
Uccle		76.1	345	e 11 51	0	e 21 31	- 4	e 26 42	SS e 37.5
Kew		76.2	347	e 11 50	- 2	—	—	—	e 44.5
Bucharest		76.4	327	e 11 57	+ 4	e 21 52	+14	—	—
Harvard		76.6	35	i 11 54 <sub>k</sub>	0	—	—	—	—
Weston		76.9	35	i 11 54 <sub>k</sub>	- 2	i 23 3	PPS	i 23 6	?
Stuttgart		77.1	340	e 11 57	0	e 21 48	+ 2	e 27 16	?
Halifax		77.5	29	e 11 57	- 2	—	—	—	e 41.5
Strasbourg		77.6	341	e 11 59	- 1	e 21 52	+ 1	e 12 11	PcP e 41.5
Belgrade	z.	77.9	331	e 12 18	PcP	—	—	—	—
Istanbul	z.	78.3	324	12 3	0	22 10	+11	e 12 16	PcP e 39.7
Paris		78.3	344	i 12 3	0	e 22 0	+ 1	e 22 44	SP
Zürich		78.5	340	e 12 4 <sub>a</sub>	0	—	—	—	—
Triest		79.0	336	e 12 8	+ 1	e 22 54	PS	e 12 19	PcP
Chambon-la-Forêt		79.1	344	e 12 8	0	i 12 20	PcP	i 12 12	P
Besançon		79.2	341	e 12 9	+ 1	—	—	—	—
Neuchatel		79.2	341	e 12 8	0	—	—	—	—
Salo		79.8	338	e 12 16	+ 4	—	—	e 13 23	?
Pavia		80.5	339	e 12 22	PcP	e 22 44	ScS	—	e 39.8
Bologna		80.6	338	e 12 36	+20	e 22 14	- 9	e 23 11	PS
Clermont-Ferrand		81.2	343	i 12 19	0	e 22 36	ScS	—	—
Florence		81.3	337	e 12 20	0	e 22 39	ScS	—	—
Ksara		81.8	315	e 12 20?	- 2	e 22 40?	+ 5	—	—
Rome		82.8	336	e 12 28	+ 1	e 22 38	- 7	—	—
Taranto		82.8	332	e 12 18	- 9	—	—	—	—
Messina		85.4	332	e 12 39	- 1	e 23 16	+ 5	—	—
Bermuda		88.1	35	—	—	e 23 36	- 1	—	e 43.9
Alicante		89.0	344	12 58	0	23 48	+ 3	16 32	PP 42.6
Granada		90.6	347	e 14 28 <sub>a</sub>	?	—	—	—	50.0
Malaga		91.2	347	e 16 51	PP	e 28 2	?	e 22 46	? 48.3
Tamanrasset	z.	102.7	335	e 14 0	0	e 18 15	PP	e 17 22	?
Pretoria	z.	135.1	286	e 19 23	[+ 1]	—	—	—	—

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May 26d. 1h. 18m. Provisional Epicentre 37°·6S. 176°·6E. Depth of focus 320km.

Magnitude 5·75. Felt at Wellington.

Bulletin of Seismological Observatories, New Zealand Department of Scientific and Industrial Research, No.E-132, Geophysics Division, 1953, April, May, June, Wellington, 1955, p.9.

May 26d. 1h. 43m. 11s. Epicentre 41°·8N. 143°·0E. Focus at Base of Superficial Layers. (as on 1951, Oct. 24d.).

Intensity V at Urakawa, Obihiro; IV at Kusiro, Hatinohe, Hakodate, Mori, Aomori, Morioka; II-III at Sapporo, Miyako, Nemuro, Hukushima, and Abasiro. Epicentre 41°·8N. 143°·1E. Depth 40km.

Seismo. Bull. Cent. Met. Obs., Japan, May, 1953, Tokyo, 1953, pp.26-28, with macroseismic chart.

A = -·5971, B = +·4500, C = +·6641;  $\delta = +6$ ;  $h = -2$ ;  
D = +·602, E = +·799; G = -·530, H = +·400, K = -·748.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Urakawa		0·4	330	i 0 11	+ 2	0 18	+ 2	—	—
Obihiro		1·1	8	i 0 25	+ 6	0 41	+ 8	—	—
Kusiro	E.	1·6	41	i 0 28k	+ 2	0 46	0	—	—
Hakodate		1·7	270	i 0 29	+ 1	—	—	—	—
Hatinohe		1·7	221	i 0 29k	+ 1	0 48	- 1	—	—
Sapporo		1·8	316	i 0 30k	+ 1	0 52	+ 1	—	—
Aomori		1·9	240	i 0 34k	+ 3	0 59	+ 5	—	—
Mori	E.	1·9	279	i 0 31k	0	0 54	0	—	—
Miyako		2·3	200	e 0 37	+ 1	1 3	- 1	—	—
Suttsu		2·3	296	i 0 31	- 5	0 59	- 5	—	—
Nemuro		2·4	51	i 0 42k	+ 4	1 7	+ 1	—	—
Morioka		2·5	213	i 0 40a	+ 1	1 11	+ 2	—	—
Akita		3·0	227	0 48	+ 2	1 26	+ 4	—	—
Mizusawa		3·0	208	0 49	+ 3	1 24	+ 2	1 27	S
Isinomaki		3·6	202	e 1 0	+ 5	1 39	+ 2	—	—
Sakata		3·8	221	e 1 6	+ 8	1 53	+ 11	—	—
Sendai	E.	3·9	205	1 0k	+ 1	1 43	- 1	—	—
Yamagata		4·1	211	e 1 2	0	1 50	+ 1	—	—
Hukushima		4·5	207	e 1 8	0	1 59	- 1	—	—
Inawasiro		4·8	209	e 1 13	+ 1	2 15	+ 8	—	—
Kurilsk		4·9	44	i 1 15	+ 2	i 2 14	+ 4	—	—
Niigata		4·9	220	e 1 23	+ 10	2 22	+ 12	—	—
Onahama		5·1	199	e 1 16	0	2 18	+ 3	—	—
Aikawa		5·2	226	e 1 19	+ 1	2 40	+ 23	—	—
Shirakawa		5·2	206	e 1 20	+ 2	2 17	0	—	—
Yuzno-Sakhlinsk		5·2	358	i 1 20	+ 2	2 21	+ 4	—	—
Mito		5·8	201	e 1 38	+ 12	2 30	- 2	—	—
Utunomiya	E.	5·8	206	e 1 25	- 1	2 26	- 6	—	—
Kakioka		6·0	202	e 1 26	- 3	2 31	- 6	—	—
Takada		6·0	220	e 1 33	+ 4	2 41	+ 4	—	—
Tukubasan		6·0	203	e 1 30	+ 1	2 33	- 4	—	—
Maebasi		6·2	211	e 1 32	0	2 42	0	—	—
Kumagaya		6·3	207	e 1 35	+ 2	2 41	- 4	—	—
Nagano	N.	6·3	218	e 1 36	+ 3	2 45	0	—	—
Tyosi	E.	6·3	196	e 1 33	0	2 40	- 5	—	—
Matusiro		6·4	217	i 1 35a	+ 1	2 46	- 1	—	—
Oiwake		6·5	214	e 1 40	+ 4	3 23	+ 33	—	—
Titibu		6·5	209	e 1 43	+ 7	2 5	?	—	—
Wazima		6·5	229	e 1 37	+ 1	2 46	- 4	—	—
Tokyo	Z.	6·6	204	e 1 35	- 2	2 50	- 2	—	—
Matumoto	E.	6·8	217	1 43	+ 3	3 15	+ 18	—	—
Toyama	Z.	6·8	223	i 1 39a	- 1	2 51	- 6	3 1	S
Yokohama		6·9	203	e 1 45	+ 4	2 57	- 3	—	—
Hunatu	N.	7·1	209	e 1 58	+ 14	3 15	+ 10	—	—
Kohu		7·1	211	e 1 44	0	3 19	+ 14	—	—

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		$\Delta$	Az.		P.		O - C.	S.		O - C.	Supp.		L.
			m.	s.	m.	s.	s.	m.	s.	s.	m.	s.	m.
Kanazawa		7.2	225	e 1	49	+ 3	—	—	—	—	—	—	—
Takayama		7.2	220	e 1	49	+ 3	3	27	+20	—	—	—	—
Mera		7.3	201	e 1	45	- 2	—	—	—	—	—	—	—
Uglegorsk		7.3	355	i 1	48	+ 1	3	13	+ 3	—	—	—	—
Ajiro		7.4	206	e 2	3	+15	—	—	—	—	—	—	—
Misima	N.	7.4	207	e 1	51	+ 3	—	—	—	—	—	—	—
Iida		7.5	214	e 1	54	+ 4	3	59	+44	—	—	—	—
Osima		7.5	203	e 1	50	0	3	9	- 6	—	—	—	—
Shizuoka		7.7	209	e 2	0	+ 7	—	—	—	—	—	—	—
Hukui		7.8	225	e 1	54	0	—	—	—	—	—	—	—
Gihu		8.0	219	e 1	58	+ 1	—	—	—	—	—	—	—
Nagoya	N.	8.1	218	e 2	1	+ 3	3	39	+ 9	—	—	—	—
Omaesaki		8.1	209	e 2	3	+ 5	3	48	+18	—	—	—	—
Hamamatu		8.2	212	e 2	18	+18	4	11	+39	—	—	—	—
Hikone		8.4	221	2	3	+ 1	—	—	—	—	—	—	—
Kameyama		8.6	219	2	7	+ 2	3	42	0	—	—	—	—
Tu		8.7	218	i 2	9	+ 3	4	17	+32	—	—	—	—
Kyoto		8.9	223	e 2	7	- 2	4	18	+29	—	—	—	—
Toyooka		8.9	228	e 2	10	+ 1	4	0	+11	—	—	—	—
Hatidyozima		9.0	197	e 2	8	- 3	3	31	-21	—	—	—	—
Osaka		9.2	222	e 2	25	+12	4	10	+13	—	—	—	—
Kobe		9.4	223	e 2	11	- 5	4	31	+29	—	—	—	—
Owase		9.4	217	e 2	38	+22	4	21	+19	—	—	—	—
Saigo	E.	9.4	237	e 2	13	- 3	—	—	—	—	—	—	—
Wakayama		9.7	222	e 2	28	+ 8	4	17	+ 8	—	—	—	—
Sumoto		9.8	223	2	27	+ 5	4	23	+11	—	—	—	—
Siomisaki		10.1	217	e 2	44	+18	4	58	L	—	—	—	(5.0)
Takamatu		10.3	226	e 2	22	- 6	4	29	+ 5	—	—	—	—
Hamada		11.0	235	2	38	0	4	42	+ 1	—	—	—	—
Muroto		11.0	222	e 2	37	- 1	5	0	+19	—	—	—	—
Hirosima		11.1	232	e 2	33	- 7	4	53	+10	—	—	—	—
Koti		11.1	225	e 2	44	+ 4	5	10	+27	—	—	—	—
Matuyama		11.3	229	e 2	43	+ 1	5	24	L	—	—	—	(5.4)
Simidu		12.0	225	e 2	47	- 5	—	—	—	—	—	—	—
Ooita		12.4	230	e 2	54	- 3	—	—	—	—	—	—	—
Hukuoka		12.9	235	e 3	4 <sub>a</sub>	0	6	5	L	—	—	—	(6.1)
Miyazaki		13.5	227	e 3	23	+11	6	20	L	—	—	—	(6.3)
Kagosima		14.3	228	e 3	23	+ 1	7	4	L	—	—	—	(7.1)
Yakusima		15.2	226	e 3	24	-10	7	30	L	—	—	—	(7.5)
Petropavlovsk		15.5	38	e 3	44	+ 6	—	—	—	—	—	—	—
Klyuchi		18.5	32	e 4	20	+ 5	—	—	—	—	—	—	—
Zò-Sè	Z.	20.5	247	i 4	33 <sub>a</sub>	- 5	e 8	8	-12	—	—	—	i 8.9
Nanking		21.6	253	i 4	44 <sub>a</sub>	- 5	e 8	37	- 4	1	5	12	PP
Kyakhta		26.5	303	i 5	34	- 2	10	5	- 1	—	—	—	—
Kabansk		26.6	306	i 5	34	- 3	i 10	7	- 1	—	—	—	—
Irkutsk		28.0	307	5	48	- 2	10	30	0	—	—	—	—
Hong Kong		31.0	241	e 6	16	- 1	e 11	18	0	—	—	—	—
Baguio		31.8	224	e 6	26	+ 2	e 11	47	+17	—	—	—	—
College		44.4	35	i 8	9	0	i 14	6	-35	1	8	57	? c 18.0
Shillong	E.	44.9	267	e 8	9	- 4	i 14	57	+ 9	e 8	55	?	—
Chatra		47.7	271	i 8	34	- 1	e 15	34	+ 6	—	—	—	c 28.8
Rybach'e		48.4	296	i 8	38	- 3	—	—	—	1	8	57	pP
Naryn		48.9	293	i 8	42	- 3	—	—	—	—	—	—	—
Frunse		49.3	296	i 8	45	- 3	—	—	—	1	9	5	pP
Andijan		51.7	295	i 9	3	- 3	—	—	—	—	—	—	—
Namangan		52.0	295	i 9	7	- 1	—	—	—	—	—	—	—
Fergana		52.2	295	i 9	8	- 2	—	—	—	—	—	—	—
Sverdlovsk		52.5	317	i 9	10	- 2	i 16	32	- 3	1	9	28	pP
Tchimkent		52.9	298	i 9	11	- 4	—	—	—	—	—	—	—
Dzhergetal		53.1	294	i 9	17	+ 1	—	—	—	—	—	—	—

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	$\Delta$	Az.	P.	O - C.	S.	O - C.	Supp.	I.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Tashkent	53.5	297	e 9 17	- 2	e 16 47	- 1	—	—
Khorog	53.7	291	e 9 19	- 2	—	—	—	—
Garm	53.9	294	e 9 19	- 3	—	—	—	—
New Delhi	54.2	279	i 9 22	- 2	i 17 21	+23	21 8	SS
Kulyab	54.8	293	9 28	- 1	—	—	—	—
Stalinabad	55.1	294	i 9 30	- 1	—	—	—	—
Warsak Dam	E. 55.4	289	e 9 30	- 3	e 16 55	-19	e 20 30	SS e 29.8
Samarkand	55.8	296	e 9 36	0	17 17	- 2	—	—
Resolute Bay	57.7	16	e 9 46	- 4	e 17 41	- 3	e 21 1	SS e 23.3
Djakarta	58.1	224	e 9 51 <sub>a</sub>	- 1	e 17 42	- 8	i 10 7	pP
Hyderabad	N. 59.7	267	—	—	18 36	+26	—	— 30.2
Bairam-Ali	60.2	296	10 5	- 2	—	—	—	—
Quetta	60.7	287	i 10 7 <sub>k</sub>	- 3	e 18 13	-10	i 10 28	pP
Victoria	62.3	49	10 21	0	—	—	—	—
Ashkabad	62.5	298	i 10 20	- 2	—	—	—	—
Kiruna	62.5	338	i 10 19	- 3	i 18 44	- 2	i 10 59	PcP 30.8
Poona	Z. 62.5	271	i 10 19	- 3	—	—	—	—
Bombay	63.0	272	i 10 45	+19	i 19 17	+25	14 44	PPP
Moscow	64.2	324	i 10 31	- 3	e 19 4	- 3	—	—
Pulkovo	64.7	330	e 10 34	- 3	e 19 10	- 3	—	—
Kodakanal	E. 65.0	262	—	—	e 19 19	+ 2	—	—
Makhach-Kala	66.5	309	i 10 47	- 1	—	—	—	—
Shemakla	67.2	306	i 10 51	- 2	—	—	—	—
Grozny	67.3	309	i 10 52	- 1	—	—	—	—
Shasta	67.3	55	e 10 54 <sub>k</sub>	+ 1	e 19 47	+ 2	e 11 12	pP
Hungry Horse	67.5	45	i 10 55	0	—	—	i 11 8	pP
Scoresby Sund	67.5	355	i 10 52	- 3	i 19 45	- 2	i 20 9	PS 29.8
Mineral	Z. 68.0	55	i 10 59 <sub>a</sub>	+ 1	e 12 53	?	i 11 11	pP
Platigorsk	68.5	311	e 10 56	- 5	—	—	—	—
Tiflis	68.9	308	i 11 2	- 1	i 20 1	- 3	—	—
Berkeley	69.1	58	i 11 5 <sub>a</sub>	0	e 20 10	+ 4	i 11 22	pP e 32.2
Gori	69.1	309	11 5	0	—	—	—	—
Upsala	69.2	335	i 11 2	- 3	e 19 59	- 9	i 11 26	PcP e 32.8
Goris	69.3	305	i 11 5	- 1	—	—	—	—
Borzhomi	69.6	309	i 11 8	0	i 20 14	+ 2	—	—
Reno	Z. 69.6	55	e 11 9	+ 1	—	—	e 11 25	pP
Santa Clara	E. 69.6	58	—	—	e 20 15	+ 3	—	—
Butte	69.7	46	i 11 9	+ 1	—	—	—	—
Tsikhlis-Dzhvari	69.7	309	i 11 8	0	—	—	—	—
Lick	Z. 69.8	58	e 11 9 <sub>a</sub>	0	i 11 49	?	i 11 26	pP
Abastumanj	70.0	309	e 11 9	- 1	—	—	—	—
Erevan	70.0	307	i 11 9	- 1	i 20 15	- 2	—	—
Zugdidi	70.1	310	11 13 <sub>?</sub>	+ 2	e 20 18 <sub>?</sub>	0	—	—
Sotchi	70.6	312	e 11 13	- 1	—	—	—	—
Fresno	Z. 71.3	57	e 11 19 <sub>a</sub>	+ 1	—	—	—	—
Theodosia	72.1	316	e 11 21	- 2	—	—	—	—
Tinemaha	72.1	57	i 11 24	+ 1	—	—	i 11 41	pP
Yalta	73.1	315	i 11 27	- 2	e 20 47	- 6	—	—
China Lake	Z. 73.3	57	i 11 31	+ 1	—	—	i 11 44	pP
Reykjavik	Z. 73.7	354	i 11 33 <sub>a</sub>	+ 1	—	—	—	—
Kishinev	74.0	321	i 11 32	- 2	e 21 0	- 3	—	—
Pasadena	74.0	59	i 11 34	0	i 21 4	+ 1	e 11 48	pP e 34.3
Copenhagen	74.2	334	i 11 34	- 1	21 3	- 2	21 27	sS 35.8
Cernauti	74.5	322	11 38	+ 1	—	—	—	—
Iasi	74.5	322	e 11 37	0	e 21 31	+23	—	—
Boulder City	74.9	55	e 11 40	+ 1	—	—	i 11 58	pP
Nelson	75.1	55	i 11 41	+ 1	—	—	—	—
Barratt	Z. 75.9	60	i 11 49	+ 4	—	—	—	—
Uzhgorod	75.9	325	e 11 43	- 2	—	—	—	—
Skalnate Pleso	76.4	327	e 12 20	pPcP	e 22 23	PS	e 25 43	SS e 40.8
Raciborzu	76.5	327	e 11 49	+ 1	e 13 29	?	e 12 5	pP
Potsdam	76.7	332	i 11 48 <sub>a</sub>	- 2	i 21 32	- 1	i 21 56	sKS e 36.8
Bucharest	77.2	320	e 11 56	+ 4	e 21 40	+ 2	i 22 6	?
Collmberg	77.6	331	e 11 52	- 2	e 22 3	sCs	e 26 40	SS e 38.3
Prague	78.0	330	i 11 57	0	e 21 46	- 1	e 12 7	PcP

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		$\Delta$ °	Az. °	P.		O-C. s.	S.		O-C. s.	Supp.		L. m.	
				m.	s.		m.	s.		m.	s.		
Budapest		78.2	325	e 11	57	- 1	e 21	42	- 7	22	18	PS	e 41.8
Istanbul	z.	78.2	316		57	- 1	21	49?	0	12	11	pP	38.8
Ogyalla	N.	78.3	327	e 12	0	+ 2	e 22	11	ScS	e 12	15	pP	e 43.2
Jena		78.4	331	e 11	57	- 2	e 22	10	ScS	e 12	20	pP	—
Witteveen	z.	78.5	336	i 12	0 <sub>a</sub>	+ 1	—	—	—	—	—	—	—
Cheb		78.8	331	e 12	20	pP	e 22	15	ScS	e 28	12	SSP	e 38.8
Ksara		79.4	306	i 12	6?	+ 2	22	33?	ScS	—	—	—	—
Belgrade		79.6	323	—	—	—	e 22	27	ScS	e 24	10	?	e 45.1
De Bilt		79.6	336	i 12	5	0	e 22	4	0	e 22	19	ScS	e 36.8
Tucson		79.9	56	e 12	9	+ 2	e 21	59	- 8	—	—	—	e 37.0
Stuttgart		81.0	332	i 12	12 <sub>a</sub>	- 1	e 22	16	- 2	e 12	33	PcP	41.8
Uccle		81.0	336	e 12	11	- 2	e 22	13	- 5	e 22	38	SKS	e 36.8
Karlsruhe	z.	81.1	333	e 12	11 <sub>a</sub>	- 2	—	—	—	—	—	—	—
Rathfarnham Castle		81.6	343	i 12	17	+ 1	e 22	48	+24	e 12	29	pP	—
Strasbourg		81.7	332	e 12	14	- 3	e 22	17	- 8	e 12	30	pP	e 37.8
Kew		81.8	338	i 12	18	+ 1	e 22	25	- 1	e 15	22	PP	e 36.8
Triest		81.9	327	i 12	15 <sub>k</sub>	- 3	e 22	45	+17	e 23	31	PS	43.0
Chur		82.5	330	e 12	21	0	—	—	—	—	—	—	—
Zürich		82.5	331	e 12	19 <sub>a</sub>	- 2	e 22	35	+ 1	—	—	—	—
Basle		82.7	332	e 12	20	- 2	e 14	36	?	e 13	7	?	—
Kirkland Lake	z.	82.7	28	e 12	23	+ 1	—	—	—	—	—	—	—
Salo		83.2	328	e 12	23	- 1	e 23	58	PPS	—	—	—	—
Paris		83.3	336	i 12	24	- 1	e 22	36	- 6	i 12	38	pP	—
Besançon		83.5	332	e 12	25	- 1	—	—	—	—	—	—	—
Bologna		83.8	328	e 12	54	+27	e 23	35	+48	—	—	—	—
Chambon-la-Forêt		84.1	336	i 12	29	0	—	—	—	—	—	—	—
Pavia		84.1	329	e 12	31	+ 2	e 22	55?	+ 5	e 33	25	?	e 39.5
Lubbock		84.2	50	e 12	29	0	—	—	—	—	—	—	—
Oropa		84.2	331	e 12	27	- 2	e 23	15	+24	—	—	—	—
Jersey	E.	84.3	338	—	—	—	e 23	19	+27	—	—	—	—
Florence		84.4	328	i 12	29 <sub>a</sub>	- 1	e 23	16	+23	i 13	7	?	—
Taranto		84.5	322	—	—	—	e 22	49	- 5	—	—	—	—
Rome		85.5	326	e 12	33	- 3	e 23	23	+20	e 29	49	SS	—
Clermont-Ferrand		85.8	333	i 12	38	+ 1	e 23	2	- 4	e 29	27	SS	37.8
Shawinigan Falls	N.	86.4	24	e 12	48	+ 8	—	—	—	—	—	—	—
Fayetteville		86.5	43	i 12	41	0	e 23	9	- 4	e 12	55	pP	e 52.3
Ottawa		86.6	27	e 12	40	- 1	23	10	- 4	i 12	54	pP	—
Messina		87.1	322	e 12	41	- 3	e 23	40	+21	e 16	7	PP	—
Cleveland		87.8	33	e 12	49	+ 2	e 23	22	- 4	e 13	0	pP	—
Morgantown		90.0	33	i 12	59	+ 2	—	—	—	i 13	13	pP	—
Harvard		90.5	25	i 13	1 <sub>k</sub>	+ 1	—	—	—	i 13	14	pP	—
Halifax		90.7	19	e 13	1	0	23	48	- 4	i 13	16	pP	—
Weston		90.7	25	i 13	1 <sub>a</sub>	0	—	—	—	—	—	—	—
Tortosa		91.0	333	—	—	—	23	55	0	—	—	—	e 44.8
Palisades		91.1	27	e 13	2	- 1	e 23	52	- 4	e 13	18	pP	e 44.4
City College, N.Y.		91.2	27	e 13	10	+ 7	—	—	—	—	—	—	—
Philadelphia		91.5	28	—	—	—	e 23	56	- 3	—	—	—	—
Toledo		93.4	335	i 13	14	+ 1	e 24	5	-11	e 17	28	PP	49.4
Alicante		93.6	333	13	11	- 3	24	4	-13	18	49	PPP	44.4
Almeria		95.6	333	13	15	- 8	24	20	-14	17	4	PP	52.2
Granada		95.7	334	e 12	46 <sub>a</sub>	-38	e 24	24	-11	17	18	PP	i 52.4
Malaga		96.4	334	i 13	27	0	e 25	33	PS	19	15	PPP	50.4
Bermuda		101.9	25	—	—	—	e 25	30	PS	e 27	23	PPS	e 50.5
Tamanrasset	z.	104.6	320	e 14	2	- 2	e 25	55	+ 5	e 18	22	PP	—
Bogota	N.	122.8	46	—	—	—	e 30	37	PS	—	—	—	—
Huancayo		135.3	60	e 19	22	[+ 5]	—	—	—	—	—	—	e 64.2
La Paz		143.3	55	e 19	39	[+ 8]	28	55	S	—	—	—	69.8

May 27d. 0h. 59m. Epicentre 41°-2N. 45°-3E.

Bulletin of Seismo. Stations of the U.S.S.R. for April-June, 1953, Moscow, 1954, p. 109.

May 27d. 12h. 53m. Epicentre 37°-0N. 71°-0E.

Bulletin of Seismo. Stations of the U.S.S.R. for April-June, 1953, Moscow, 1954, p. 109-110.

The scanned images of the 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 collected by SGA Storia Geofisica Ambiente (Bologna) on behalf of the Istituto Nazionale di Geofisica e Vulcanologia (Rome), in the frame of the EUROSEISMOS project.

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May 27d. 18m. 16m. 51s. Epicentre 30°·0S. 177°·5W.

A = -·8667, B = -·0378, C = -·4975 ;  $\delta = +10$  ;  $h = +2$  ;  
D = -·044, E = +·999 ; G = +·497, H = +·022, K = -·867.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Karapiro	N.	9·8	214	e 2 37	+13	e 4 15	- 2	—	—
Tuai	N.	9·8	205	—	—	e 3 58	-19	—	—
Wellington		12·9	207	—	—	e 5 3	-30	—	e 6·2
Cobb River	E.	13·6	213	—	—	e 5 24	-26	—	—
Kaimata	N.E.	15·4	212	e 3 35	- 5	e 6 13	-19	—	—
Christchurch		15·6	208	—	—	e 6 8	-29	—	—
Brisbane		25·9	268	i 5 35	0	e 10 4	0	i 5 57	PP e 12·0
Riverview	z.	26·8	253	i 5 56	+12	—	—	—	e 12·0
Pasadena		84·9	46	i 12 39	+ 1	—	—	—	e 47·2
Berkeley		85·0	41	e 24 13	PS	e 22 43	[-18]	e 23 20	S 40·2
Lick	z.	85·0	41	e 12 39k	+ 1	—	—	i 12 53	? —
Riverside	z.	85·3	46	i 12 42	+ 2	—	—	—	—
Fresno	z.	85·6	43	e 12 44	+ 3	—	—	—	—
China Lake	z.	86·3	45	e 12 46	+ 1	—	—	e 12 59	? —
Tinemaha	z.	86·8	44	e 12 50	+ 3	—	—	—	—
Shasta	z.	86·9	38	e 12 49k	+ 1	—	—	e 13 2	? —
Mineral	z.	87·1	39	e 12 45a	- 4	—	—	—	—
Reno	z.	87·5	41	e 12 52	+ 1	—	—	—	—
Nelson		88·0	46	i 12 55	+ 2	—	—	—	—
Tucson		88·5	51	i 12 58	+ 2	—	—	16 32	PP —
College		97·3	12	e 13 35	- 1	—	—	—	—
Ottawa		118·5	51	e 18 49	[- 1]	—	—	—	—
Quetta	z.	124·9	289	i 19 2	[ 0]	—	—	—	—
Halifax		126·8	55	e 19 7	[+ 1]	—	—	—	—
Kiruna	z.	140·7	349	e 19 27	[- 5]	—	—	—	—
Upsala	z.	148·5	346	e 19 45	[ 0]	e 19 54	PKP <sub>2</sub>	e 21 19	? —
Helwan	z.	155·0	277	e 17 3	?	—	—	e 20 18	PKP <sub>2</sub> —
Istanbul	z.	155·8	305	e 19 56?	[ 0]	—	—	e 24 6	PP —
Collmberg	z.	157·3	343	e 19 55	[- 3]	—	—	e 20 29	PKP <sub>2</sub> —
Jena		158·0	345	e 20 33	PKP <sub>2</sub>	—	—	e 24 37?	PP —
Stuttgart		160·6	347	e 20 44	PKP <sub>2</sub>	—	—	e 24 42	PP —
Granada		171·2	—	e 20 26a	[+16]	—	—	—	93·0
Malaga		171·2	—	e 21 12	[+62]	27 9	[- 3]	(52 10)	SSS 52·2
Tamanrasset	z.	172·4	—	e 20 11?	[ 0]	i 21 33?	PKP <sub>2</sub>	e 25 26?	PP —

May 27d. 18h. 59m. Epicentre 20°N. 144°E. Marianas Islands.  
Seismo. Bull. Cent. Met. Obs., Japan, for May, 1953, Tokyo, 1953, p. 43.

May 28d. 13h. 54m. Kermadec Is. region.  
Provisional epicentre 32°·5N. 179°W. Depth of focus 400-500km. Magnitude 5.7.  
Seismological Observatory Bulletin E.132 for April-June, 1953, Wellington, 1955, p. 10

May 29d. 21h. 26m. Epicentre 36°·8N. 71°·0E. Depth of focus 200km.  
Bulletin of Seismo. Stations of the U.S.S.R. for April-June, 1953, Moscow, 1954, p. 110.

May 30d. 13h. 3m. Epicentre 36°·5N. 136°·1E. Depth of focus 10km.  
Intensity II-III at Kanazawa, Hukui, and Wazima.  
Seismo. Bull. Cent. Met. Obs., Japan, for May, 1953, Tokyo, 1953, p. 28-29, with macro-seismic chart.

May 30d. 14h. 37m. Epicentre 34°·2N. 133°·2E. Depth of focus 20km.  
Intensity V at Matuyama and Koti; IV at Hiroshima, Takamatu, Uwazima, Hamada, Tokushima, Matsue, Yonaga, Simidu, and Matunaga; II-III at Okayama, Himeji, Muroto, and Sumoto.  
Seismo. Bull. Cent. Met. Obs., Japan, for May, 1953, Tokyo, 1953, p. 30-31, with macro-seismic chart.

May 30d. 18h. 50m. Tien Shan mountains. Epicentre 43°·1N. 78°·2E.  
Bulletin of Seismo. Stations of the U.S.S.R. for April-June, 1953, Moscow, 1954, p. 110.

May 30d. 20h. 37m. Provisional epicentre 37°S. 175·5W. Magnitude about 5·3.  
Seismological Observatory Bulletin E. 132 for April-June, 1953, Wellington, 1955, p. 10.

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May 31d. 4h. 8m. 30s. Epicentre 36°·4N. 136°·2E. (as on 1952, September 12d.).

Intensity IV at Kanazawa, Hukui, and Wazima; II-III at Maizuru and Kameyama.  
Epicentre 36°·7N. 136°·0E. Depth of focus 20km.

Seismo. Bull. Cent. Met. Obs., Japan, for May, 1953, Tokyo, 1953, p. 32-33, with macro-seismic chart.

$$A = -.5823, B = +.5584, C = +.5908; \quad \delta = -7; \quad h = 0;$$

$$D = +.692, E = +.722; \quad G = -.426, H = +.409, K = -.807.$$

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	s.
Hukui	N.	0·4	171	i 0 13k	0	0 20	- 1	—	—
Kanazawa		0·4	70	i 0 11k	+ 1*	0 17	+ 1*	—	—
Toyama		0·8	71	0 18 <sub>a</sub>	0	0 31	0	—	—
Tsuruga	N.	0·8	188	0 20	+ 2	—	—	—	—
Takayama	N.	0·9	106	e 0 20	0	0 34	0	—	—
Ibukisan	E.	1·0	172	e 0 28	+ 7	0 44	+ 8	—	—
Gihu		1·1	155	c 0 26	+ 4	0 39	0	—	—
Hikone		1·1	178	0 26	+ 4	0 45	+ 6	—	—
Maizuru		1·1	212	i 0 24 <sub>a</sub>	+ 2	0 40	+ 1	—	—
Wazima		1·1	30	i 0 23 <sub>a</sub>	+ 1	0 38	- 1	—	—
Kyoto	N.	1·4	195	i 0 30 <sub>a</sub>	+ 2 <sub>g</sub>	0 52	+ 6	—	—
Matumoto	N.	1·4	97	0 30	+ 2 <sub>g</sub>	0 52	+ 6	—	—
Nagoya	N.	1·4	153	0 30	+ 2 <sub>g</sub>	0 51	+ 5	—	—
Toyooka		1·4	232	e 0 28	0 <sub>g</sub>	0 47	+ 1	—	—
Iida		1·6	124	e 0 38	+ 6 <sub>g</sub>	—	—	—	—
Kameyama		1·6	172	0 33	+ 1 <sub>g</sub>	0 56	+ 3 <sub>g</sub>	—	—
Matusiro		1·6	85	0 31	- 1 <sub>g</sub>	0 59	+ 6 <sub>g</sub>	—	—
Tu		1·7	171	i 0 36	+ 2 <sub>g</sub>	1 1	+ 5 <sub>g</sub>	—	—
Osaka		1·8	197	e 0 38	+ 2 <sub>g</sub>	1 10	+ 10 <sub>g</sub>	—	—
Takada		1·8	67	0 35	+ 1*	0 58	+ 1*	—	—
Tottori	N.	1·8	241	i 0 36	0 <sub>g</sub>	0 56	0	—	—
Kobe		1·9	234	i 0 37	- 1 <sub>g</sub>	1 7	+ 4 <sub>g</sub>	—	—
Oiwake		1·9	92	e 0 38	0 <sub>g</sub>	1 2	- 1 <sub>g</sub>	—	—
Hamamatu		2·1	144	e 0 43	+ 1 <sub>g</sub>	1 12	+ 3 <sub>g</sub>	—	—
Kohu		2·1	112	e 0 41	- 1 <sub>g</sub>	—	—	—	—
Aikawa		2·3	45	e 0 38	- 2	1 12	0*	—	—
Hunatu	N.	2·3	113	e 0 44	- 2 <sub>g</sub>	1 11	- 1*	—	—
Maebasi	Z.	2·3	90	e 0 45	- 1 <sub>g</sub>	1 20	+ 4 <sub>g</sub>	—	—
Owase		2·3	180	e 0 47	+ 1 <sub>g</sub>	1 16	0 <sub>g</sub>	—	—
Saigo	E.	2·3	265	e 0 42	0*	1 25?	+ 9 <sub>g</sub>	—	—
Shizuoka		2·3	129	e 0 45	- 1 <sub>g</sub>	1 15	- 1 <sub>g</sub>	—	—
Sumoto		2·3	208	0 44	- 2 <sub>g</sub>	1 19	+ 3 <sub>g</sub>	—	—
Wakayama		2·3	201	e 0 43	+ 1*	1 22	+ 6 <sub>g</sub>	—	—
Himeji		2·4	218	e 0 39	- 2	1 6	- 6	—	—
Omaesaki		2·4	138	0 54	+ 6 <sub>g</sub>	1 24	+ 5 <sub>g</sub>	—	—
Titibu		2·4	100	i 0 48	0 <sub>g</sub>	—	—	—	—
Kumagaya		2·6	96	e 0 51	- 1 <sub>g</sub>	1 12	- 5	—	—
Misima		2·6	120	0 54	+ 2 <sub>g</sub>	1 38	+ 12 <sub>g</sub>	—	—
Niigata		2·7	56	e 0 54	0 <sub>g</sub>	1 34	+ 5 <sub>g</sub>	—	—
Takamatu		2·7	220	e 0 51	+ 2*	1 31	+ 2 <sub>g</sub>	—	—
Tokusima		2·7	210	e 0 50	+ 1*	1 32	+ 3 <sub>g</sub>	—	—
Siomisaki		3·0	187	e 0 53	- 1*	1 33	0*	—	—
Tokyo	Z.	3·0	104	1 0	0 <sub>g</sub>	1 39	0 <sub>g</sub>	1 44	?
Utunomiya	E.	3·0	87	e 0 58	- 2 <sub>g</sub>	—	—	—	—
Yokohama		3·0	109	e 0 56	+ 2*	1 36	+ 3*	—	—
Osima		3·1	122	e 1 2	0 <sub>g</sub>	1 46	+ 4 <sub>g</sub>	—	—
Mera		3·3	115	1 7	+ 1 <sub>g</sub>	—	—	—	—
Shirakawa		3·3	77	e 1 10	+ 4 <sub>g</sub>	—	—	—	—
Inawasiro	N.	3·4	68	e 0 57	+ 2	—	—	—	—
Mito		3·4	89	e 1 7	- 1 <sub>g</sub>	—	—	—	—
Muroto		3·5	209	e 1 2	- 1*	1 51	+ 3*	—	—
Kotl		3·6	219	e 1 11	- 1 <sub>g</sub>	1 58	- 1 <sub>g</sub>	—	—
Hamada		3·7	248	e 1 2	+ 2	1 57	+ 3*	—	—
Hirosima		3·7	238	e 1 1	+ 1	1 54	0*	—	—
Hukusima		3·7	67	e 1 6	0*	—	—	—	—

Continued on next page.



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		$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.	
		$^{\circ}$	$^{\circ}$	m.	s.	s.	m.	s.	s.	m.	s.
Matuyama		3.8	229	e 1	2	+ 1	2	0	+ 3*	—	—
Onshama		3.8	80	e 0	48	-13	—	—	—	—	—
Sakata		3.8	48	—	—	—	c 1	47	0	—	—
Yamagata		3.8	59	e 1	1	0	—	—	—	—	—
Sendai	E.	4.2	62	e 1	12	- 3*	2	4?	- 5*	—	—
Akita	Z.	4.5	42	e 1	12	+ 1	—	—	—	—	—
Ooita		4.9	232	e 1	24	- 3*	2	37	- 5 <sub>g</sub>	—	—
Morioka		5.1	48	e 1	16	- 4	—	—	—	—	—
Hukuoka		5.5	241	e 1	39	+ 2*	—	—	—	—	—
Aomori		5.7	37	e 1	30	+ 2	—	—	—	—	—
Miyazaki		5.9	223	c 2	4	+ 6 <sub>g</sub>	3	12	- 3 <sub>g</sub>	—	—
College		51.9	31	i 9	11	- 1	—	—	—	—	—
Kiruna	Z.	65.6	337	i 10	45	- 3	—	—	—	—	—
Upsala	Z.	71.6	332	i 11	22	- 3	—	—	—	—	—
Hungry Horse		75.0	40	i 11	45	0	—	—	—	—	—
Reno	Z.	77.1	50	e 11	57k	0	—	—	—	c 12	26 ?
Butte		77.3	41	e 11	58	0	—	—	—	—	—
Collmberg		79.5	327	e 12	7	- 2	—	—	—	—	—
Tinemaha	Z.	79.6	51	e 11	57	-13	—	—	—	—	—
Jena	Z.	80.4	327	e 12	14	- 1	—	—	—	—	—
China Lake	Z.	80.7	51	e 12	13	- 3	—	—	—	—	—
Nelson		82.5	51	i 12	16	-10	—	—	—	—	—
Stuttgart		83.0	327	e 12	26	- 2	—	—	—	—	—
Barratt	Z.	83.3	54	e 12	28	- 2	—	—	—	—	—
Fayetteville		94.0	38	i 13	20	- 1	—	—	—	—	—

May 31d. 5h. 0m. 15s. Epicentre 8°·5S, 118°·3E. Depth of focus 0·005.

A = -·4690, B = +·8709, C = -·1468;  $\delta = -2$ ;  $h = +6$ ;  
D = +·880, E = +·474; G = +·070, H = -·129, K = -·989.

		$\Delta$	Az.	P.		O-C.	S.		P-C.	Supp.		L.
		$^{\circ}$	$^{\circ}$	m.	s.	s.	m.	s.	s.	m.	s.	m.
Djakarta		11.6	281	i 2	45 <sub>a</sub>	0	i 5	17	SS	i 2	58	PP
Perth		23.5	185	5	5	0	9	12	+ 2	5	28	pP
Baguio		24.9	5	i 5	20 <sub>a</sub>	+ 2	i 9	52	+18	—	—	11.2
Hong Kong		30.9	353	e 7	45	PPP	e 11	22	+11	—	—	—
Guam		34.2	50	8	3	PP	e 21	43	?	—	—	—
Brisbane		37.9	124	i 7	10	- 3	i 12	59	0	i 7	35	pP
Melbourne	E.	37.9	144	e 7	14	+ 1	e 13	1	+ 2	e 15	44	SS
Riverview		39.4	134	i 7	23 <sub>k</sub>	- 2	i 13	21	- 1	i 7	43	pP
Nanking		40.3	0	i 7	36 <sub>a</sub>	+ 4	i 13	47	+12	9	13	PP
Colombo	E.	41.3	291	e 7	37	- 4	14	20	sS	—	—	19.8
Shillong	E.	42.5	325	e 7	53	+ 2	e 13	53	-15	9	26	PP
Calcutta	E.	42.6	318	e 7	58	+ 7	14	25	+16	8	55	?
Madras	E.	43.5	300	i 7	58	- 1	e 14	26	+ 4	13	16	ScP
Kodaikanal	E.	44.7	295	e 10	35	PPP	—	—	—	—	—	19.9
Chatra		46.3	321	e 8	23	+ 2	e 15	7	+ 5	e 10	15	PP
Hyderabad	N.	47.1	304	e 8	23	- 4	e 14	47	-27	17	47	SS
Poona	Z.	51.4	302	e 9	0	0	16	17	+ 3	16	28	PS
New Delhi	N.	54.2	315	e 9	19	- 2	e 16	51	- 1	11	30	PP
Dehra Dun	N.	54.6	318	i 9	34	+10	i 17	23	sS	19	3	ScS
Cobb River	E.	57.9	133	e 9	47	- 1	e 17	45	+ 4	e 9	51	? c
Christchurch		58.6	136	—	—	—	e 17	53	+ 3	e 24	33	Q
Yuzno-Sakhlinsk		59.3	19	i 9	58	+ 1	e 18	8	+ 9	—	—	e 27.0
Wellington		59.4	133	e 9	59	+ 1	e 18	2	+ 2	e 24	50	Q
Kyakhta		59.5	351	e 9	59	0	18	7	+ 5	—	—	e 26.4
Uglegorsk		61.0	18	i 10	9	0	e 18	32	+11	—	—	—
Kabansk		61.1	352	i 10	11	+ 1	e 18	31	+ 9	—	—	—
Warsak Dam	E.	61.2	317	e 10	12	+ 2	e 18	22	- 1	—	—	e 33.8
Irkutsk		61.7	350	10	15	+ 1	e 18	40	+10	—	—	—
Quetta		62.5	311	i 10	17	- 2	e 18	36	- 4	i 10	39	pP
Naryn		63.0	326	e 10	22	0	e 18	53	+ 7	—	—	—

Continued on next page.

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	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Rybach'e	63.7	327	i 10 26	- 1	e 18 56	+ 1	—	—
Almata	63.8	328	i 10 29	+ 1	—	—	—	—
Dzhergetal	64.5	321	e 10 32	0	—	—	—	—
Kulyab	64.6	319	10 30	- 3	—	—	—	—
Andijan	64.7	323	i 10 34	+ 1	e 19 10	+ 3	—	—
Fergana	64.8	322	e 10 22?	-12	—	—	—	—
Frunse	64.8	326	i 10 34	0	e 19 17	+ 9	—	—
Obi-garm	65.1	321	i 10 35	- 1	—	—	—	—
Namangan	65.3	323	e 10 37	0	—	—	—	—
Stalinabad	65.7	320	i 10 39	- 1	—	—	—	—
Tashkent	66.9	322	e 10 48	+ 1	—	—	—	—
Semipalatinsk	67.3	336	e 10 50	0	—	—	—	—
Samarkand	67.4	319	10 51	0	—	—	—	—
Bairam-Ali	69.6	316	i 11 6	+ 2	—	—	—	—
Petropavlovsk	70.3	24	i 11 8	- 1	i 20 23	+ 9	—	—
Ashkabad	72.4	315	i 11 23	+ 2	20 47	+ 9	—	—
Klyuchi	73.5	23	i 11 28	0	e 21 6	SP	—	—
Baku	79.4	314	e 12 4	+ 3	—	—	—	—
Sverdlovsk	80.3	332	i 12 5	0	22 1	+ 3	—	—
Shemakla	80.4	313	e 12 8	+ 2	—	—	—	—
Goris	81.7	313	i 12 14	+ 1	22 34	ScS	23 18	PS
Makhach-Kala	82.0	316	e 12 17	+ 3	—	—	—	—
Erevan	83.3	313	i 12 22	+ 1	22 58	pS	—	—
Grozny	83.3	316	i 12 21	0	—	—	—	—
Tiflis	83.5	314	e 12 23	+ 1	e 22 43	+ 6	—	—
Leninakan	83.9	313	e 12 27	+ 3	—	—	—	—
Pietermaritzburg	84.0	241	e 12 31	+ 6	—	—	—	—
Tsikhlis-Dzhvari	84.5	313	i 12 31	+ 4	e 23 7	pS	—	—
Borzhomi	84.6	313	i 12 28	0	e 22 51	+ 3	—	—
Abastumanj	84.9	313	e 12 30	+ 1	—	—	—	—
Zugdidi	85.8	314	e 12 35	+ 1	23 3	+ 3	—	—
Pretoria	z. 86.5	245	e 12 37	0	—	—	—	—
Grahamstown	z. 86.8	237	i 12 40	+ 2	—	—	—	—
Sotchi	87.6	315	e 12 43	+ 1	e 23 7	SKKS	i 23 26	ScS
Ksara	88.4	304	i 12 50?	+ 4	23 58?	sS	16 30?	PP
Kimberley	z. 89.0	241	e 12 50	+ 1	—	—	—	—
Helwan	z. 91.6	300	13 2	+ 1	e 24 9	pS	e 17 8	PP
Yalta	91.7	315	e 13 2	0	e 23 32	[+ 5]	e 24 0	ScS
Moscow	91.7	326	e 13 1	- 1	e 23 29	[+ 2]	—	—
Istanbul	z. 94.9	311	13 15	- 1	e 25 56	PS	e 17 25	PP 39.8
Pulkovo	96.3	330	e 17 21	PP	e 23 51	[- 1]	e 24 40	S
Athens	98.8	307	e 13 38	+ 4	—	—	—	—
College	99.3	26	e 13 35	- 1	e 25 35	sS	e 31 22	SS e 36.2
Kiruna	100.2	338	i 13 44	+ 4	e 24 19	[+ 7]	e 38 29	P'P' e 44.8
Uzhgorod	100.3	319	—	—	26 26	SP	—	—
Upsala	102.7	329	e 17 30	?	e 24 15	[- 9]	i 18 18	PP e 47.8
Ogyalla	103.0	317	e 18 34	pPP	e 24 26	[+ 1]	e 27 5	SP
Taranto	103.9	310	—	—	e 24 26	[- 3]	e 27 56	pPS e 41.3
Messina	105.2	308	e 18 33	PP	e 24 23	[-12]	e 38 36	P'P' 52.6
Prague	105.4	320	e 18 24	PP	e 24 51	[+15]	e 18 40	pPP e 53.2
Copenhagen	105.9	326	28 15	pPS	24 50	[+12]	33 3	SS 53.8
Potsdam	106.0	323	e 18 39	PP	e 24 45	[+ 6]	e 29 39	PKKP e 48.8
Collnberg	106.2	321	e 18 19	PKP	—	—	e 17 12	?
Cheb	106.7	320	e 18 34	PP	e 26 10	+9	e 28 15	pPS e 52.2
Jena	z. 107.1	320	e 18 17?	PKP	e 29 36?	PKKP	e 18 59	pPP
Rome	107.4	312	e 38 45?	P'P'	e 24 55	[+11]	e 28 7	PS e 43.8
Florence	z. 108.1	314	e 18 36	PP	—	—	i 19 11	sPP
Stuttgart	108.9	319	e 18 21	PKP	e 25 5	[+14]	e 28 15	PS 60.8
Pavia	109.5	316	e 21 35	PPP	e 30 5	?	—	—
Strasbourg	109.9	319	e 21 10	PPP	—	—	—	e 54.8
De Bilt	110.8	323	e 19 3	PP	e 25 15	[+16]	e 28 45	PS e 48.8
Uccle	E. 111.6	322	e 19 16	PP	—	—	—	e 54.8
Scoresby Sund	113.2	347	e 18 33	[+ 3]	e 25 14	[+ 5]	e 21 41	PPP 53.8
Paris	113.3	320	e 29 0	PS	e 37 47	?	e 30 51	? e 54.8
Clermont-Ferrand	113.6	317	—	—	e 29 7	PS	e 40 40	Q 56.8

Continued on next page.

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		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.	
		°	°	m. s.	s.	m. s.	s.	m. s.	m.	
Tamanrasset	z.	114.2	292	e 18 36	[+ 4]	e 25 16	[+ 3]	e 20 2	PPP	—
Kew		114.3	324	e 20 5	PPP	—	—	e 22 15	PPP	e 49.8
Shasta	z.	117.6	48	e 19 46	PP	—	—	e 20 57	?	—
Alicante		117.7	310	18 50	[+11]	26 0	sSKS	—	—	56.3
Berkeley		118.3	52	e 20 15	pPP	e 26 14	sSKS	—	—	—
Mineral	z.	118.3	49	e 18 42k	[+ 2]	—	—	e 20 18	pPP	—
Santa Clara	E.	118.7	52	—	—	e 26 13	sSKS	—	—	—
Lick	z.	118.9	52	e 18 45k	[+ 4]	—	—	e 19 56	PP	—
Almeria		119.6	308	19 1	pPKP	26 13	sSKS	20 31	pPP	70.1
Reno	z.	119.8	49	e 18 46k	[+ 3]	—	—	e 20 7	PP	—
Granada		120.4	309	19 2k	pPKP	29 44	SP	37 11	SS	71.2
Fresno	z.	120.5	52	e 18 47k	[+ 3]	—	—	—	—	—
Hungry Horse		120.8	38	e 18 47	[+ 2]	—	—	e 20 14	PP	—
Tinemaha	z.	121.6	52	e 18 50	[+ 4]	—	—	e 19 57	?	—
Pasadena		122.3	55	i 18 51	[+ 3]	—	—	i 18 56	?	e 55.8
China Lake	z.	122.4	53	e 18 52	[+ 4]	—	—	e 20 40	PP	—
Butte		122.7	39	i 18 51	[+ 2]	—	—	—	—	—
Palomar	z.	123.6	55	i 18 53	[+ 3]	—	—	i 19 26	sPKP	—
Barratt	z.	123.9	57	i 18 54	[+ 3]	—	—	e 20 49	PP	—
Boulder City		124.6	52	i 18 56	[+ 4]	—	—	—	—	—
Nelson		124.6	52	i 18 55	[+ 3]	—	—	—	—	—
Tucson		128.8	55	e 19 3	[+ 3]	e 23 0	sPKS	e 21 19	PP	e 58.0
Lubbock		135.4	50	e 19 3	[-10]	—	—	—	—	—
M'Bour		135.8	283	i 19 16	[+ 3]	i 22 45	SKP	—	—	—
La Plata	E.	136.7	186	—	—	39 57	SS	—	—	57.2
	N.	136.7	186	—	—	40 15	SS	—	—	65.2
Kirkland Lake	z.	137.5	18	e 19 18	[+ 1]	e 22 49	SKP	—	—	—
Fayetteville		139.6	42	i 19 15	[- 5]	—	—	i 22 16	PP	—
Seven Falls	E.	140.7	10	e 23 14	PKS	39 55	SS	44 52	SSS	—
Shawinigan Falls	N.	140.9	12	e 19 26	[+ 3]	e 23 2	PKS	e 19 53	sSKS	—
Ottawa		141.3	16	e 19 19	[- 4]	22 55	SKP	e 19 53	sPKP	—
Cleveland		142.7	25	i 19 26k	[ 0]	e 34 45	PPS	e 25 12	?	—
Cincinnati		143.3	30	i 19 25	[- 2]	—	—	—	—	—
Halifax		144.0	2	e 19 28	[ 0]	—	—	—	—	—
Harvard		145.0	12	i 19 29k	[- 1]	e 26 44	[+13]	i 22 11	?	e 78.6
Morgantown		145.0	25	i 19 29	[- 1]	—	—	i 21 17	?	—
Weston		145.2	12	i 19 29 <sub>a</sub>	[- 1]	26 43	[+12]	41 43	SS	59.4
Palisades		145.9	15	i 19 30	[- 2]	e 41 57	SS	i 19 34	?	e 70.1
Philadelphia		146.4	18	e 19 36	[+ 4]	—	—	—	—	—
Washington		146.7	21	i 19 36	[+ 3]	—	—	—	—	—
Mobile		146.9	45	e 19 41	[+ 8]	—	—	—	—	—
La Paz		154.4	167	i 19 49	[+ 5]	31 15	sSKKS	i 20 17	PKP <sub>2</sub>	74.4
Huancayo		155.5	147	e 19 53	[+ 7]	e 44 26	SSP	i 20 18	PKP <sub>2</sub>	e 60.5
Bermuda		156.1	6	i 19 50	[+ 3]	—	—	—	—	e 75.6
Chinchina		165.7	103	e 19 58	[+ 1]	e 20 54	PKP <sub>2</sub>	e 24 56	PP	78.8
Bogota		167.1	107	e 20 4	[+ 6]	e 37 39	PSKS <sub>2</sub>	e 21 8	PKP <sub>2</sub>	80.5
San Juan		169.3	23	i 21 15	PKP <sub>2</sub>	—	—	—	—	—

May 31d. 19h. 36m. 14s. Epicentre 17°-8S. 178°-8W. Depth of focus 0.090.  
(as on 22d.).

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.
		°	°	m. s.	s.	m. s.	s.	m. s.
Karapiro	N.	20.6	193	4 0	0	—	—	—
New Plymouth	E.	22.1	194	e 3 46?	-28	—	—	—
Wellington		24.0	192	4 28	-3	—	—	—
Cobb River	E.	24.3	196	e 4 31	-3	e 8 11	-1	—
Kaimata	N.E.	26.0	197	e 4 53	+ 5	—	—	e 5 40 PPP
Christchurch		26.7	193	e 4 46?	- 8	—	—	—
Baguio		68.7	297	i 10 8 <sub>a</sub>	+ 2	—	—	—
Berkeley	z.	76.7	44	i 10 56 <sub>a</sub>	+ 5	e 11 18	?	e 11 52 ?
Lick	z.	76.8	43	i 10 53 <sub>a</sub>	+ 1	i 11 2	PcP	e 12 54 pP
Pasadena		77.4	48	i 10 56 <sub>a</sub>	+ 1	i 10 59	?	i 11 18 ?

Continued on next page.

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		$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		
		$^{\circ}$	$^{\circ}$	m.	s.	s.	m.	s.	s.	m.	s.	
Barratt	z.	77.7	50	i 10	57 <sub>a</sub>	0	—	—	—	i 11	5	PcP
Fresno	z.	77.7	45	e 10	57 <sub>a</sub>	0	e 11	38	?	e 12	57	pP
Palomar	z.	77.9	50	i 10	59 <sub>a</sub>	+ 1	i 11	8	PcP	e 13	0	pP
Riverside	z.	77.9	48	i 10	58 <sub>a</sub>	0	i 11	36	?	e 12	59	pP
Shasta		78.3	41	i 11	0 <sub>a</sub>	0	e 11	34	?	e 13	2	pP
Mineral	z.	78.6	42	i 11	6 <sub>a</sub>	+ 4	i 11	20	?	e 13	3	pP
China Lake	z.	78.7	47	i 11	3 <sub>a</sub>	+ 1	i 11	10	PcP	e 13	5	pP
Tinemaha		78.9	45	i 11	4 <sub>a</sub>	+ 1	i 11	17	PcP	e 13	6	pP
Nelson		80.6	48	i 11	13	+ 1	—	—	—	e 13	10	pP
Boulder City		80.7	48	i 11	14	+ 2	—	—	—	—	—	—
Tucson		81.9	52	i 11	20	+ 2	—	—	—	e 13	26	pP
Seattle	z.	82.4	36	i 11	22	+ 1	—	—	—	—	—	—
Victoria		82.4	35	i 11	21 <sub>a</sub>	0	—	—	—	—	—	—
College		85.7	12	i 11	36	- 1	—	—	—	i 13	42	pP
Butte		87.2	40	i 11	44	0	—	—	—	—	—	—
Hungry Horse		87.4	37	i 11	45	0	—	—	—	—	—	—
Fayetteville		96.1	54	i 12	26	+ 1	—	—	—	—	—	—
Terre Haute		102.1	52	e 17	16	PP	—	—	—	—	—	—
Scoresby Sund		125.5	10	e 20	52	?	—	—	—	—	—	—
Kiruna	z.	128.5	350	i 18	0	[ 0]	—	—	—	i 20	30	pPKP
Upsala	z.	136.3	349	i 18	15	[+ 1]	i 20	56	SKP	i 18	3	?
Iasi		143.5	330	e 18	29	[+ 2]	—	—	—	—	—	—
Potsdam	z.	144.2	349	i 18	30 <sub>a</sub>	[+ 2]	—	—	—	—	—	—
Witteveen	z.	144.8	354	i 18	33	[+ 3]	—	—	—	—	—	—
Raciborzu	z.	145.0	342	i 18	32 <sub>a</sub>	[+ 2]	—	—	—	—	—	—
Collmberg		145.3	349	i 18	37	[+ 7]	e 21	19	SKP	—	—	—
Jena		145.9	348	e 18	33	[+ 2]	i 18	36	PKP <sub>2</sub>	e 20	56	pPKP
Prague		146.1	345	i 18	36	[+ 5]	e 22	8	PP	e 21	4	pPKP
Istanbul	z.	146.7	319	e 18	37	[+ 5]	—	—	—	e 20	44	pPKP
Karlsruhe	z.	148.3	352	e 18	38	[+ 3]	—	—	—	i 18	42	PKP <sub>2</sub>
Stuttgart	z.	148.4	352	e 18	36	[+ 1]	i 18	42	PKP <sub>2</sub>	e 20	53	pPKP
Paris		149.0	358	e 18	37	[+ 1]	i 18	42	?	i 18	48	PKP <sub>2</sub>
Basle		149.9	351	e 18	36	[- 1]	—	—	—	e 19	42	?
Chambon-la-Forêt		149.9	359	e 18	40	[+ 3]	i 18	46	PKP <sub>2</sub>	i 18	53	?
Zürich		149.9	351	e 18	48	PKP <sub>2</sub>	—	—	—	—	—	—
Helwan		150.0	299	18	40	[+ 3]	—	—	—	e 18	46	PKP <sub>2</sub>
Chur		150.2	349	e 18	28	[- 9]	—	—	—	e 18	46	PKP <sub>2</sub>
Besançon		150.4	354	i 18	46	PKP <sub>2</sub>	—	—	—	—	—	—
Clermont-Ferrand		152.1	356	i 18	50	PKP <sub>2</sub>	—	—	—	—	—	—
Tamanrasset	z.	173.6	—	i 19	3 <sub>k</sub>	[+ 3]	i 24	31	PP	i 20	37	PKP <sub>2</sub>

May 31d. 19h. 58m. 39s. Epicentre 19°·4N. 70°·4W. Focus at Base of Superficial Layers. (as on 1951, September 21d.).

Intensity V at Port de Paix, Pilate, and La Chevalerie; III-IV at Port-au-Prince; II at Cap Haitien, etc.; felt with same intensity at Ciudad Trujillo.  
Bulletin annuel de l'Observatoire météorologique du Petit Séminaire, Collège St. Martial, Port-au-Prince, Haiti, 1953, p. 58.

$$A = +.3166, B = -.8892, C = +.3302; \quad \delta = -6; \quad h = +5;$$

$$D = -.942, E = -.335; \quad G = +.111, H = -.311, K = -.944.$$

		$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.
		$^{\circ}$	$^{\circ}$	m.	s.	s.	m.	s.	s.	m.	s.	m.
San Juan		4.2	103	i 0	57	- 6	i 1	53	+ 1	—	—	—
Kingston		6.2	258	i 1	41 <sub>?</sub>	+ 9	i 1	58	?	i 2	16	?
Galerazamba		9.8	209	e 2	24	+ 2	i 4	11	- 1	—	—	i 5.2
Fort de France		10.0	116	e 2	24	0	i 4	27	SS	—	—	—
Balboa Heights		13.7	222	i 3	18	+ 4	e 5	50	+ 4	—	—	—
Bermuda		13.9	21	i 3	8	- 9	e 5	36	-15	e 5	33	?
Bogota		15.1	194	i 3	36	+ 4	i 6	23	+ 4	—	—	—
Chinchina		15.2	200	i 3	29	- 5	i 6	41	SS	—	—	—
Merida		18.1	278	i 4	13 <sub>k</sub>	+ 3	e 7	42	+14	e 8	15	SSS e 10.2
Mobile		19.6	309	4	28	0	8	10	+ 8	—	—	—

Continued on next page.

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	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Washington	20.3	347	i 4 32	- 4	i 8 8	- 8	—	—
Fordham	21.6	353	i 4 46	- 3	i 8 36	- 5	—	—
Palisades	21.7	353	i 4 46	- 4	i 8 36	- 7	i 4 50	pP
Morgantown	21.8	340	i 4 48	- 3	e 8 41	- 4	—	—
Weston	22.9	359	i 5 3 <sub>a</sub>	+ 1	i 9 14	+ 9	—	—
Cincinnati	23.1	333	e 5 3	- 1	—	—	i 5 8	?
Harvard	23.1	359	i 4 59 <sub>k</sub>	- 5	i 9 2	- 7	—	—
Cleveland	24.0	339	e 5 10	- 2	e 9 30	+ 6	i 5 18	pP
Vera Cruz	24.3	274	i 5 18 <sub>k</sub>	+ 3	e 10 3	SS	e 7 57	?
Buffalo (Larkin)	24.4	345	i 5 14	- 2	—	—	—	—
Oaxaca	25.1	271	e 5 25	+ 2	e 9 43	0	e 10 5	sS
Vermont	25.1	356	e 5 22	- 1	i 10 0	sS	—	—
Halifax	25.8	12	i 5 27 <sub>k</sub>	- 3	10 3	+ 9	6 16	PP
St. Louis	25.8	322	e 5 27	- 3	e 9 52	- 2	—	—
Puebla	26.2	275	e 5 37	+ 4	e 10 17	sS	e 7 24	?
Ottawa	26.3	352	i 5 31 <sub>k</sub>	- 3	10 7	+ 4	6 22	PP
Chicago	26.7	331	e 5 39	+ 1	i 10 12	+ 3	—	—
Fayetteville	26.7	315	i 5 37	- 1	e 10 11	+ 2	i 6 19	PP
Tacubaya	27.1	275	i 5 42 <sub>k</sub>	0	i 10 8	- 8	i 6 4	sP
Shawinigan Falls	27.2	358	e 5 38	- 5	10 27	+10	6 37	PP
Kirkland Lake z.	29.7	347	e 6 1	- 4	e 10 48	-10	—	—
Guadalajara	30.9	279	e 6 49	+33	e 11 10	- 6	—	—
Huancayo	31.6	189	i 6 24	+ 2	i 11 45	sS	i 6 52	?
Chihuahua	33.8	293	i 6 38 <sub>k</sub>	- 3	e 12 8	+ 6	e 14 24	SSS
La Paz	35.8	175	i 6 57	- 1	i 12 38	+ 6	i 17 3	ScS
Tucson	38.4	298	i 7 21	+ 1	e 13 10	- 2	e 17 4	ScS
Angra do Heroismo	41.9	53	i 7 58	+ 9	i 14 16	+11	i 9 44	PcP
Nelson	42.2	303	i 7 53	+ 2	—	—	i 40 46	P <sub>2</sub> 'P <sub>2</sub> '
Boulder City	42.3	303	i 7 53	+ 1	i 9 35	PP	i 40 57	P <sub>2</sub> 'P <sub>2</sub> '
Bozeman	42.5	318	e 8 6	pP	e 14 1	-12	—	—
Barratt z.	43.3	297	i 8 1 <sub>a</sub>	+ 1	—	—	i 8 17	sP
Palomar z.	43.5	299	i 8 3 <sub>a</sub>	+ 1	—	—	i 8 9	pP
Butte	43.6	318	i 8 3	0	e 14 32	+ 2	—	—
Riverside	44.0	300	i 8 7 <sub>a</sub>	+ 1	i 10 50	PPP	i 8 20	pP
China Lake z.	44.5	302	i 8 11 <sub>a</sub>	+ 1	—	—	—	—
Pasadena	44.7	300	i 8 12 <sub>a</sub>	0	i 14 54	+ 9	e 18 15	SS
Tinemaha	45.2	303	i 8 17 <sub>a</sub>	+ 1	i 15 7	PS	i 8 30	pP
Hungry Horse	45.4	320	e 8 15	- 2	—	—	—	—
Fresno z.	46.3	303	e 8 25 <sub>a</sub>	+ 1	—	—	e 8 29	?
Reno	46.8	308	e 8 27	- 1	e 9 24	?	e 10 48	PPP
Lick	47.9	304	i 8 38 <sub>a</sub>	+ 1	i 11 11	PPP	e 31 3	PKKP
Santa Clara	48.1	304	e 8 58 <sub>k</sub> ?	+20	e 15 58	+24	—	—
Mineral	48.3	308	i 8 48 <sub>k</sub>	+ 8	—	—	—	—
Berkeley	48.5	304	e 8 42	0	i 15 49	+10	e 10 3	PcP
Shasta	49.0	308	i 8 43 <sub>k</sub>	- 2	e 18 25	ScS	e 9 5	sP
Arcata	50.3	307	e 9 12	sP	—	—	—	—
Corvallis z.	50.4	312	e 8 56	0	—	—	—	e 25.4
Seattle z.	50.4	317	e 8 54	- 2	e 10 7	PcP	i 9 3	pP
M'Bour	51.2	86	i 9 7	+ 5	i 16 22	+ 5	i 9 21	pP
Victoria	51.4	317	9 1	- 3	—	—	—	—
Santa Lucia	52.5	180	e 9 17	+ 5	17 21?	?	22 21?	SSS
Buenos Aires	54.9	167	9 26	- 4	17 55	?	—	—
Reykjavik	55.2	23	e 9 30	- 2	e 17 22	+11	i 9 39	pP
La Plata	55.3	167	9 39	+ 7	17 9	- 3	23 15	SSS
	55.3	167	9 33	+ 1	17 9	- 3	11 33	PP
Lisbon	55.9	56	—	—	17 27	+ 6	—	—
Coimbra	56.5	54	9 46	+ 5	17 30	+ 2	23 51	Q
Resolute Bay	56.9	353	e 9 40	- 4	i 17 36	+ 2	—	—
Averroes	57.4	92	e 9 36	-12	17 28	-12	e 10 2	pP
Scoresby Sund	58.6	17	e 9 57	+ 1	i 18 1	+ 5	e 12 4	PP

Continued on next page.



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	$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.	
	$^{\circ}$	$^{\circ}$	m.	s.	s.	m.	s.	s.	m.	s.	m.	
Rathfarnham Castle	59.2	38	i 10	3 <sub>a</sub>	+ 3	i 18	4	0	e 12	1	PP	e 27.5
Malaga	59.7	58	i 10	1	- 3	i 18	22	+12	12	24	PP	27.4
Toledo	59.9	54	i 10	4	- 1	i 18	14	+ 1	10	50	PcP	26.0
Granada	60.3	58	i 10	3 <sub>a</sub>	- 5	i 18	23	+ 5	10	9	pP	i 28.6
Sitka	60.5	326	e 10	26	sP	i 18	29	+ 8	—	—	—	—
Almeria	61.2	58	i 10	14	0	i 18	34	+ 5	10	52	PcP	29.0
Edinburgh	E. 61.4	37	—	—	—	e 18	32	0	—	—	—	—
Jersey	E. 61.4	44	e 10	25?	pP	e 19	1?	PPS	—	—	—	32.4
Aberdeen	62.2	35	i 10	24	+ 4	i 18	41	- 1	i 22	41	SS	28.8
Durham	E. 62.2	38	i 10	26	+ 6	i 18	45	+ 3	i 19	4	sS	—
Alicante	62.7	56	e 10	29	+ 5	18	55	+ 6	14	12	PPP	28.8
Kew	62.7	41	i 10	26	+ 2	e 19	22	PPS	e 20	18	ScS	e 29.4
Tortosa	63.4	53	i 10	30	+ 2	i 18	59	+ 2	—	—	—	—
Chambon-la-Forêt	64.3	45	e 10	31	- 3	i 10	50	sP	i 10	42	pP	—
Barcelona	64.5	52	—	—	—	19	16	+ 5	—	—	—	30.5
Paris	64.5	45	e 10	31	- 5	i 19	13	+ 2	i 10	41	pP	e 29.4
Clermont-Ferrand	64.9	48	e 10	35	- 3	i 19	22	+ 6	i 10	46	pP	29.4
Algiers Univ.	Z. 65.6	57	e 10	40	- 3	e 19	31	+ 7	e 39	17	P'P'	30.9
Uccle	E. 65.6	42	e 10	43	0	e 19	28	+ 4	e 19	45	sS	i 30.4
De Bilt	66.1	40	e 10	50 <sub>a</sub>	+ 4	i 19	36	+ 6	e 20	32	ScS	e 30.4
Bergen	66.3	31	e 10	51	+ 4	i 19	33?	0	e 23	33?	SS	e 28.2
Besançon	66.9	46	e 10	46	- 5	e 39	21	P'P'	i 10	56	pP	—
Witteveen	Z. 67.0	39	e 10	48	- 4	—	—	—	—	—	—	—
College	67.3	334	i 10	51	- 2	i 19	42	- 3	i 20	46	ScS	e 26.4
Neuchatel	67.5	46	e 10	52	- 3	e 19	50	+ 3	—	—	—	—
Basle	67.9	46	e 11	3	+ 6	e 19	58	+ 6	—	—	—	—
Strasbourg	67.9	44	i 11	2	+ 5	i 19	55	+ 3	e 13	30	PP	31.8
Karlsruhe	68.3	43	e 10	58 <sub>a</sub>	- 2	i 19	59	+ 2	i 24	46	sSS	e 32.8
Oropa	68.4	48	i 11	9	+ 9	i 20	36	PPS	i 25	7	?	e 36.4
Zürich	68.6	46	e 11	8	+ 6	e 20	8	+ 7	—	—	—	—
Stuttgart	68.9	44	e 10	59	- 4	e 20	0	- 4	e 11	15	pP	e 32.4
Chur	69.3	47	e 11	6	0	e 20	12	+ 3	—	—	—	e 33.4
Pavia	69.3	47	i 11	10 <sub>a</sub>	+ 4	e 20	17	+ 8	i 20	41	PS	e 32.0
Salo	E. 70.1	47	e 11	14	+ 3	e 20	21	+ 3	e 20	40	sS	—
Copenhagen	70.2	37	e 11	9	- 2	e 20	21	+ 2	21	18	ScS	32.4
Jena	70.2	42	e 11	8	- 3	e 20	15	- 4	i 11	17	pP	e 31.4
Tamanrasset	Z. 70.2	72	i 11	9 <sub>a</sub>	- 2	e 20	29	+10	e 13	46	PP	32.2
Cheb	70.8	42	i 11	20	+ 5	e 20	32	+ 6	e 11	41	PcP	e 30.8
Prato	70.8	49	i 11	27	pP	e 20	21	- 5	—	—	—	—
Bologna	70.9	48	e 11	28	pP	e 20	51	PS	e 13	3	?	e 34.3
Florence	70.9	49	i 11	10 <sub>a</sub>	- 6	i 20	33	+ 5	i 11	23	pP	34.2
Potsdam	70.9	40	e 11	14	- 2	i 20	32	+ 4	e 11	23	pP	e 32.4
Collmberg	71.0	41	e 11	12	- 4	e 20	34	+ 5	e 11	23	pP	e 32.8
Prague	72.1	42	e 11	24	+ 1	e 20	36	- 5	i 14	27	PPP	e 33.8
Rome	72.1	52	i 11	32 <sub>a</sub>	pP	i 20	47	+ 6	21	27	PPS	—
Rocca di Papa	72.3	52	e 11	41	sP	—	—	—	—	—	—	e 34.4
Triest	72.4	47	e 11	27	+ 2	i 20	46	+ 1	e 15	58	PPP	34.2
Kiruna	72.5	23	i 11	22	- 3	i 20	47	+ 1	i 11	31	pP	e 33.4
Upsala	72.5	32	i 11	22	- 3	i 20	45	- 1	e 11	33	pP	e 32.4
Raciborzu	74.5	42	e 11	32	- 5	e 24	19	?	e 11	44	pP	33.8
Ogyalla	75.0	44	e 11	51	pP	e 21	11	- 3	e 21	45	SP	e 36.4
Messina	75.2	54	e 11	45	+ 4	i 21	22	+ 6	26	29	sSS	—
Budapest	E. 75.6	44	e 11	45	+ 2	21	24	+ 3	12	0	pP	37.4
	N. 75.6	44	e 11	45	+ 2	21	59	PS	12	5	sP	e 34.8
Kalossa	75.8	45	11	54	pP	e 21	28	+ 5	e 14	29	PP	—
Helsinki	76.0	30	—	—	—	e 21	33	+ 8	—	—	—	—
Skalnate Pleso	76.0	42	e 11	53	pP	e 21	29	+ 4	e 22	6	PS	—
Szeged	E. 76.6	46	12	0	pP	22	3	SP	26	8	SS	e 37.4
	N. 76.6	46	e 11	46	- 3	e 21	31	- 1	14	48	PP	e 37.4
Belgrade	77.2	47	e 12	11 <sub>k</sub>	sP	e 21	40	+ 2	e 14	49	PP	e 35.9
Uzhgorod	77.4	43	i 11	53	0	e 21	48	+ 8	—	—	—	—
Timisoara	77.5	46	e 11	57	+ 3	e 21	46	+ 5	e 22	14	SP	e 36.4
Lwow	78.2	41	e 11	56	- 2	e 21	50	+ 1	—	—	—	—
Pulkovo	78.7	31	e 11	58	- 2	i 21	53	- 1	—	—	—	—
Sofia	79.8	48	e 12	8	+ 2	22	11	+ 5	—	—	—	40.3

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		$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		I.	
				m.	s.		m.	s.		m.	s.		
Bucharest		81.2	46	e	12 19	+ 5	i	22 25	+ 5	i	15 13	PP	39.4
Iasi		81.2	44	e	12 21	+ 7	c	22 33	+13				
Athens		81.4	53	e	12 18 <sup>k</sup>	+ 3	c	22 15	- 7	e	15 30	PP	
Kishinev		82.1	43	i	12 24	+ 5	i	22 34	+ 4	i	23 21	PS	
Moscow		83.9	33	e	12 25	- 3		23 1	ScS		28 15	SS	
Istanbul	z.	84.3	48		12 29	- 1		22 49	- 3	c	12 39	pP	40.4
Yalta		86.5	44	c	12 38	- 3		23 3	[+ 1]		23 18	ScS	
Theodosia		87.1	43	e	12 43	- 1	i	23 26	ScS				
Helwan		90.2	58		13 1	+ 3		23 32	[+ 7]		16 33	PP	
Sotchi		90.5	43	c	12 58	- 2	i	23 57	ScS				
Ksara		92.1	54	i	13 15?	+ 8		24 18?	+14		16 48?	PP	
Platigorsk		92.4	41		13 10	+ 1		23 44	[+ 7]	i	16 50	PP	
Zugdidi		92.4	42	e	13 14	+ 5	i	23 38	[+ 1]	i	25 28	PS	
Klyuchi		93.2	333	e	13 16?	+ 4	i	25 41?	PS	i	16 58?	PP	
Abastumanj		93.4	43	e	13 16	+ 3							
Borzhomi		93.7	43	e	13 18	+ 4	c	23 46	[+ 2]	i	13 22	PcP	
Sverdlovsk		93.7	24	e	13 15	+ 1		23 49	[+ 5]		24 29	ScS	
Tsikhlis-Dzhvari		93.8	43		13 25	pP		23 55	[+10]				
Gori		94.1	43	e	13 21	+ 5							
Grozny		94.5	40	e	13 21	+ 3							
Tiflis		94.7	42	e	13 23	+ 4	i	23 53	[+ 3]	i	25 49	PS	
Erevan		95.3	44	i	13 28	+ 6		23 58	[+ 5]				
Makhach-Kala		95.7	40	e	13 29	+ 5	c	24 2	[+ 6]				
Petropavlovsk		96.3	332	e	12 55?	-31	c	23 27?	[-32]	e	17 0?	PP	
Goris		96.9	43	i	13 33	+ 4	i	24 11	[+ 9]		24 25	SKKS	
Shemakla		97.7	42	c	13 36	+ 3		24 14	[+ 8]				
Baku		98.7	41	e	13 51	pP	i	24 21	[+10]				
Kizyl-Arvat		103.4	39	e	18 27	PP	i	24 38	[+ 4]				
Kimberley	z.	103.5	116	e	14 13	pP				e	18 14	PP	
Ashkabad		105.4	39					24 56	[+13]				
Pretoria	z.	105.7	111		14 33	+25					18 33	PP	
Warsak Dam	E.	105.7	34	e	19 37	?							e 52.4
Semipalatinsk		105.8	18	e	14 13	P							
Uglegorsk		106.0	337	e	18 39	PP							
Yuzno-Sakhlinsk		107.5	336				i	24 58	[+ 6]				
Bairam-Ali		107.8	37		18 57	PP		25 3	[+ 9]		28 5	PS	
Tchimkent		108.4	29				i	25 5	[+ 9]				
Irkutsk		108.5	3	e	14 31?	pP	c	26 23?	S	c	18 52?	PP	
Kabansk		108.8	1	e	14 3	P	i	25 16	sSKS	i	21 16	PPP	
Samarkand		109.0	34					25 7	[+ 8]				
Tashkent		109.0	31	e	18 41	pPKP	e	25 6	[+ 7]	c	28 19	PS	
Frunse		110.1	26	e	19 12	PP	i	25 14	[+11]	i	28 32	PS	
Namangan		110.4	29	e	18 23	[- 5]	e	28 21	PS		14 31	P	
Kyakhta		110.5	2		18 44	pPKP		25 16	[+11]	c	26 44	S	
Almata		110.8	24	c	18 16	[-13]	i	28 38	PS				
Stalinabad		110.8	32	e	18 59	PP	i	28 38	PS				
Andijan		110.9	29	e	18 19	[-10]				i	19 14	PP	
Rybach'e		111.1	25	e	18 35	[+ 5]	e	25 1	[- 6]	i	28 39	PS	
Obi-garm		111.2	31				e	25 15	[+ 7]				
Kulyab		111.8	32		19 19	PP		28 47	PS				
Naryn		111.9	26	e	18 40	[+ 9]	i	25 19	[+ 9]	c	19 24	PP	
Khorog		113.1	31	e	19 31	PP							
Quetta		115.9	40	i	18 34	[- 5]	i	25 34	[+ 8]	i	35 57	PSS	
Christchurch		122.6	230	e	30 45	PKKP	e	26 8	sSKS	e	38 21	SSP	e 57.8
Nanking	z.	128.1	350	e	19 9	[+ 6]							
Poona	z.	128.5	44	i	19 6	[+ 2]							
Chatra		129.1	24	e	19 8	[+ 3]							e 74.4
Hyderabad	N.	132.3	41					22 43	PKS				
Calcutta	E.	133.4	27	i	29 0	PKKP	i	39 28	SS	e	22 45	SKP	
Kodaikanal	E.	136.8	49	e	22 4	PP							
Hong Kong		138.3	353				e	23 21	sPKS				
Riverview		140.4	240	i	19 30 <sup>a</sup>	[+ 4]	i	29 32	SKKS	i	22 29	PP	e 67.0
Colombo	E.	140.8	51					23 1	PKS				74.7
Baguio		142.8	342	e	19 28	[- 2]							



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June 1d. 0h. 13m. Epicentre 36°·6N. 70°·0E. Depth of focus 140km.  
Bulletin of Seismo. stations of U.S.S.R. for 1953, April-June, Moscow, 1954, p. 114.

June 1d. 20h. 17m. Epicentre 37°·6N. 20°·5E. (Strasbourg).  
Intensity IV at Lechaena; and III in the island of Zante.  
A. Galanopoulos.  
Seismological Institute Bulletin, 1953, Athens, 1954, p. 64.

June 2d. 9h. 11m. Epicentre 38°·7N. 70°·4E.  
*Loc. cit.*, 1d. 0h.

June 2d. 13h. 26m. Epicentre 46°34'N. 8°15'E. (Zürich).  
Intensity IV at Halistal and Grindelwald. Macro seismic radius 10km.  
Dr. E. Wanner.  
Jahresbericht des Erdbebendienstes der Schweiz im Jahre 1953, Zürich, 1954, p. 3. Macro seismic chart, fig. 2.

June 2d. 17h. 50m. 12s. Epicentre 29°·9N. 142°·1E.

Epicentre 30°·5N. 142°·E. Depth 60km.  
Seismo. Bull. Cent. Met. Obs., Japan, for June, 1953, Tokyo, 1953, p. 9-10.

A = -·6852, B = +·5334, C = +·4960;  $\delta = +3$ ;  $h = +2$ ;  
D = +·614, E = +·789; G = -·391, H = +·305; K = -·868.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Torisima		1·7	290	0 39 <sup>a</sup>	+ 5 <sub>g</sub>	0 56	0 <sub>g</sub>	—	—
Hatidyozima		3·7	329	e 1 12	- 2 <sub>g</sub>	—	—	—	—
Mera		5·3	340	e 1 21	- 1	—	—	—	—
Osima		5·4	335	e 1 23	- 1	2 20	- 8	—	—
Ajiro		5·7	335	e 1 28	0	2 24	-11	—	—
Omaesaki		5·7	326	e 1 34	+ 6	2 33	- 2	—	—
Misima		5·8	334	1 32	+ 3	2 34	- 4	—	—
Shizuoka		5·9	329	1 35	+ 4	2 42	+ 2	—	—
Yokohama		5·9	340	1 30	- 1	2 35	- 5	—	—
Hamamatu		6·1	323	e 1 44	- 3*	2 50	+ 5	—	—
Tokyo	z.	6·1	342	i 1 32	- 2	2 32	-13	—	—
Kohu		6·4	334	1 37	- 1	2 54	+ 1	—	—
Siomisaki		6·4	305	e 1 46	+ 8	—	—	—	—
Kakioka		6·5	346	e 1 33	- 6	—	—	—	—
Iida		6·6	328	e 1 47	+ 6	3 4	+ 6	—	—
Kumagaya		6·6	341	1 40 <sup>a</sup>	- 1	2 53	- 5	—	—
Mito		6·6	348	e 1 39	- 2	—	—	—	—
Titibu		6·6	338	i 1 39	- 2	2 51	- 7	—	—
Tu		6·7	317	e 1 45	+ 3	3 2	+ 2	—	—
Kameyama		6·8	317	1 35	- 9	—	—	—	—
Nagoya	N.	6·8	322	e 1 43	- 1	3 7	+ 4	—	—
Utunomiya		6·9	345	e 1 40	- 5	2 52	-13	—	—
Maebasi	z.	7·0	339	e 1 44	- 2	3 2	- 6	—	—
Gihu		7·1	322	e 1 47	- 1	—	—	—	—
Onahama		7·1	352	e 1 41	- 7	2 55	-15	—	—
Matumoto	E.	7·2	332	1 51	+ 2	—	—	—	—
Hikone		7·3	319	1 37	-13	—	—	—	—
Osaka		7·3	313	e 2 1	+11	3 26	+11	—	—
Kyoto		7·4	315	e 1 54	+ 2	3 20	+ 2	—	—
Matusiro		7·4	335	1 49	- 3	3 9	- 9	—	—
Shirakawa		7·4	348	e 1 44	- 8	3 4	-14	—	—
Nagano	N.	7·5	335	e 1 53	0	3 16	- 4	—	—
Kobe	E.	7·6	311	1 49	- 6	3 30	+ 7	—	—
Inawasiro	E.	7·8	348	e 1 54	- 4	—	—	—	—
Hokusima		7·9	351	e 1 55	- 4	3 23	- 7	—	—

Continued on next page.

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		$\Delta$	Az.	P.		O - C.	S.		O - C.	Supp.		L.
		°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.
Toyama		7.9	330	e 1	53	- 6	3	15	-15	—	—	—
Takamatu	E.	8.1	305	2	3	+ 1	3	27	- 8	—	—	—
Koti		8.2	299	e 2	17	+14	4	16	+38	—	—	—
Niigata		8.4	343	e 2	10	+ 4	3	30?	-13	—	—	—
Sendai		8.4	353	1	57	- 9	3	28	-15	—	—	—
Wazima	E.	8.6	331	e 2	9	0	—	—	—	—	—	—
Hirosima		9.3	301	e 2	11	- 6	—	—	—	—	—	—
Mizusawa		9.3	355	2	17	0	4	20	+15	—	—	—
Miyako		9.7	359	e 2	16	- 6	—	—	—	—	—	—
Hamada		9.8	303	e 2	14	-10	4	25	+ 8	—	—	—
Morioka		9.8	356	e 2	18	- 6	—	—	—	—	—	—
Akita		9.9	351	e 2	34	+ 9	4	20	0	—	—	—
Kagosima		10.1	282	e 2	39	+10	—	—	—	—	—	—
Aomori		10.9	355	2	45	+ 5	—	—	—	—	—	—
Yuzno-Sakhlinsk		17.0	1	i 3	58	- 3	—	—	—	—	—	—
Zô-Sè		18.1	280	4	16 <sup>a</sup>	+ 2	7	43	+ 8	—	—	—
Ulegorsk		19.2	0	i 4	27	- 1	8	3	+ 4	—	—	—
Nanking		20.1	282	4	38 <sup>a</sup>	0	8	22	+ 3	—	—	—
Baguio		23.9	241	i 5	17 <sup>a</sup>	+ 1	i 9	37	+ 7	—	—	—
Hong Kong		26.2	290	e 5	48?	+10	—	—	—	—	—	—
Petropavlovsk		26.2	21	i 5	34	- 4	—	—	—	—	—	—
Klyuchi		29.5	20	e 6	6	- 2	—	—	—	—	—	—
Magadan		30.2	8	6	11	- 3	—	—	—	—	—	—
Kyakhta		33.6	318	i 6	43	- 1	12	8	+ 2	—	—	—
Kabansk		34.2	321	i 6	49	0	12	15	- 1	—	—	—
Irkutsk		35.6	320	7	1	0	e 12	37	- 1	—	—	—
Chatra		48.1	281	e 8	42	- 1	e 15	39	- 3	e 31	48	PKKP
Semipalatinsk		50.0	313	e 8	56	- 2	—	—	—	—	—	—
Przhevalsk		51.8	303	e 9	14	+ 2	—	—	—	—	—	—
Almata		52.8	304	i 9	19	0	—	—	—	—	—	—
Rybach'e		53.5	303	i 9	24	0	—	—	—	—	—	—
Naryn		53.7	301	i 9	26	0	—	—	—	—	—	—
Frunse		54.5	303	i 9	32	0	e 17	10	0	—	—	—
College		54.9	28	i 9	32	- 3	—	—	—	—	—	—
New Delhi		55.9	286	e 9	42	0	e 17	25	- 4	17	40	PS
Andijan		56.6	301	i 9	46	- 1	e 17	39	+ 1	—	—	—
Dzhergetal		57.8	300	i 9	56	+ 1	e 17	51	- 3	—	—	—
Khorog		57.9	298	9	56	0	17	57	+ 2	—	—	—
Tchimkent		58.2	304	i 9	59	+ 1	e 18	0	+ 1	—	—	—
Garm		58.5	300	e 10	1	+ 1	—	—	—	—	—	—
Lunacharskoc		58.7	303	i 10	1	- 1	—	—	—	—	—	—
Tashkent		58.7	303	e 10	2	0	e 18	6	0	—	—	—
Obi-garm		59.1	300	i 10	5	+ 1	e 18	9	- 2	—	—	—
Stalinabad		59.8	300	i 10	9	0	18	21	+ 1	—	—	—
Samarkand		60.8	301	10	16	0	18	30?	- 3	—	—	—
Sverdlovsk		61.0	322	i 10	16	- 2	18	32	- 3	—	—	—
Bairam-Ali		65.1	301	i 10	44	- 1	—	—	—	—	—	—
Ashkabad		67.8	302	i 11	3	+ 1	19	56?	- 4	—	—	—
Kizyl-Arvat		68.9	304	i 11	7	- 2	i 20	13	0	—	—	—
Resolute Bay		69.4	14	i 11	9 <sup>a</sup>	- 3	—	—	—	—	—	—
Baku		72.9	307	e 11	34	+ 1	—	—	—	—	—	—
Kiruna		73.4	340	i 11	34	- 2	e 21	4	- 1	i 14	16	PP
Makhach-Kala		73.4	310	e 11	39	+ 3	—	—	—	—	—	e 39.8
Moscow		73.4	325	—	—	—	e 21	4	- 1	—	—	—
Grozny		74.4	311	e 11	42	0	i 21	14	- 2	—	—	—
Pulkovo		74.6	331	e 11	42	- 1	e 21	15	- 3	—	—	—
Shasta	Z.	75.0	51	i 11	44 <sup>k</sup>	- 1	e 11	55	PcP	e 12	22	?
Goris		75.7	307	e 11	50	+ 1	e 21	31	+ 1	—	—	—
Mineral	Z.	75.7	51	e 11	47 <sup>k</sup>	- 2	—	—	—	—	—	—
Tiflis		75.7	310	11	49	0	21	32	+ 2	—	—	—
Berkeley		76.4	54	e 11	51 <sup>k</sup>	- 2	—	—	—	—	—	e 34.2
Borzhomi		76.6	310	i 11	56	+ 2	21	45?	+ 5	—	—	—
Tsikhlis-Dzhvari		76.6	310	e 11	57	+ 3	—	—	—	—	—	—
Erevan		76.7	309	i 11	54	- 1	21	42	+ 1	—	—	—
Hungry Horse		76.7	41	i 11	53	- 2	—	—	—	—	—	—

Continued on next page.



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	$\Delta$ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	Supp. m. s.	L. m.
Leninakan	76.8	310	e 11 54	- 1	—	—	—	—
Abastumanj	77.0	310	e 11 58	+ 2	—	—	—	—
Lick	z. 77.1	54	e 11 57k	0	e 12 10	PcP	—	—
Reno	z. 77.3	51	e 11 57k	- 1	e 12 9	PcP	—	—
Zugdidi	77.3	312	e 12 6?	+ 8	e 21 51?	+ 3	—	—
Sotchi	78.1	314	e 12 2	0	e 21 57	+ 1	—	—
Fresno	z. 78.6	54	e 12 4k	- 1	—	—	—	—
Butte	78.7	42	i 12 5	- 1	—	—	—	—
Tinemaha	z. 79.6	53	i 12 10	0	e 12 38	?	—	—
Upsala	z. 79.6	335	i 12 8	- 2	i 12 21	PcP	i 15 9	PP
Theodosia	80.1	316	e 12 13	0	e 22 17	- 1	—	—
Pasadena	z. 81.1	56	i 12 17	- 1	—	—	—	—
Yalta	81.1	316	e 12 17	- 1	e 22 26	- 2	—	—
Riverside	z. 81.7	56	i 12 20	- 2	e 12 38	?	—	—
Palomar	z. 82.4	56	i 12 24	- 1	i 12 52	?	—	—
Boulder City	82.5	53	i 12 26	0	—	—	—	—
Nelson	82.6	53	i 12 26	0	—	—	—	—
Kishinev	82.7	322	e 12 26	- 1	—	—	—	—
Barratt	z. 82.9	56	i 12 27	- 1	e 13 17	?	—	—
Copenhagen	84.5	334	i 12 36	0	e 23 2	0	—	44.8
Reykjavik	z. 85.4	353	e 12 41	+ 1	—	—	—	—
Ksara	85.8	307	i 12 48?	+ 6	e 15 23?	?	e 21 40?	?
Istanbul	86.1	316	12 44	0	e 13 47	?	e 21 48?	?
Raciborzu	z. 86.1	328	e 12 45	+ 1	e 16 43	?	e 16 4	PP
Potsdam	86.8	332	—	—	e 23 26	+ 1	—	48.8
Tucson	87.3	54	e 12 50	0	—	—	—	e 46.9
Collmberg	87.6	330	e 12 50	- 1	e 13 9	?	e 16 15	PP
Prague	N. 87.9	329	e 16 8	PP	—	—	e 18 10	PPP
Jena	88.4	330	e 12 51	- 4	e 31 21	?	e 16 16	PP
Stuttgart	91.1	331	e 13 7	- 1	e 24 10	+ 6	e 16 43	PP
Helwan	z. 91.2	305	18 8	?	e 18 19	?	e 18 42	PPP
Karlsruhe	z. 91.2	332	e 13 6	- 2	—	—	e 16 47	PP
Fayetteville	z. 95.7	42	i 13 28k	- 1	—	—	—	—
Ottawa	97.6	26	e 13 36 <sub>a</sub>	- 2	—	—	—	—
Tamanrasset	z. 113.0	317	19 0	?	e 25 34	[+10]	i 19 29	PP
Kimberley	z. 126.0	255	e 19 7	[+ 3]	—	—	—	—
La Paz	z. 149.3	70	19 56	PKP <sub>2</sub>	—	—	—	—

June 2d. 19h. 45m. Epicentre 39°.1N. 70°.9E.

Bulletin of Seismo. stations of U.S.S.R. for April-June, 1953, Moscow, 1954, pp. 115, 116.

June 2d. 19h. 52m. Epicentre 39°.6N. 71°.3E.

Loc. cit., p. 116.

June 2d. 22h. 15m. 53s. Epicentre 19°.4N. 70°.4W. (as on May 31d.).

Near to the coast N. of the Dominican Republic. Felt at la Chevalerie. See "Le Bulletin annuel de l'Observatoire météorologique de Port au Prince," Haïti.

	$\Delta$ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	Supp. m. s.	L. m.
Ciudad Trujillo	1.1	154	i 0 19	- 3	0 47	+ 8	—	—
San Juan	4.2	103	i 1 6	- 1	e 1 51	- 6	—	—
Kingston	6.2	258	—	—	e 2 43	- 5	i 3 36	?
Galerazamba	9.8	209	e 3 59	?	e 6 30	?	—	7.1
Fort de France	10.0	116	e 2 43	+16	e 4 38	+16	—	—
Bermuda	13.9	21	i 3 14	- 7	i 5 31	-26	—	e 5.7
Bogota	15.1	194	i 3 44	+ 8	i 6 38	SS	—	9.1
Chinchina	15.2	200	i 3 44	+ 6	e 6 47	SS	—	—
Mobile	19.6	309	—	—	e 8 17	+ 9	e 8 27	SS
Washington	20.3	347	e 4 39	- 1	—	—	i 4 42	P

Continued on next page.

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	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Philadelphia	20.9	351	e 4 40	- 6	e 8 35	0	—	—
Fordham	21.6	353	e 4 52	- 2	e 8 56	+ 7	—	—
Morgantown	21.8	340	i 4 56	0	i 8 53	+ 1	—	—
Pittsburgh	22.5	342	—	—	i 9 10	+ 5	—	—
Weston	22.9	359	i 5 9 <sub>a</sub>	+ 3	i 9 3	-10	—	—
Harvard	23.1	359	i 5 7 <sub>a</sub>	- 1	i 9 4	-12	—	—
Cleveland	24.0	339	e 5 16	- 1	i 9 36	+ 4	i 5 19	P
Buffalo (Larkin)	24.4	345	e 5 12	- 9	e 9 41	+ 2	—	—
Halifax	25.8	12	i 5 33 <sub>k</sub>	- 1	10 11	+ 9	11 20	SSS
Ottawa	26.3	352	i 5 39 <sub>k</sub>	0	10 14	+ 3	—	—
Chicago	26.7	331	—	—	e 10 31	SS	—	—
Fayetteville	z. 26.7	315	i 5 44	+ 1	—	—	—	e 14.4
Tacubaya	27.1	275	e 6 8	+22	—	—	e 6 30	PP
Shawinigan Falls	N. 27.2	358	5 45	- 2	—	—	—	—
Seven Falls	E. 27.7	0	—	—	e 11 4	+31	—	12.4
Kirkland Lake	z. 29.7	347	e 6 7	- 3	—	—	—	—
Huancayo	31.6	189	i 6 30	+ 4	e 11 44	+ 9	—	e 16.8
La Paz	35.8	175	e 7 2	- 1	i 12 39	- 2	8 28	PP
Tucson	38.4	298	e 7 30	+ 5	e 13 34	+14	—	e 18.2
Logan	41.5	312	e 7 52	+ 2	—	—	—	—
Nelson	42.2	303	i 7 59	+ 3	—	—	—	—
Boulder City	42.3	303	e 8 0	+ 3	—	—	—	—
Palomar	z. 43.5	299	i 8 22	+15	—	—	—	—
Butte	43.6	318	i 8 11	+ 3	—	—	—	e 22.4
Riverside	z. 44.0	300	e 8 13	+ 2	—	—	—	—
China Lake	z. 44.5	302	e 8 16	+ 1	—	—	—	—
Mount Wilson	z. 44.6	300	e 8 22	+ 6	—	—	—	—
Tinemaha	z. 45.2	303	e 8 22	+ 2	—	—	i 8 28	P
Hungry Horse	45.4	320	i 8 22	0	—	—	—	—
Fresno	z. 46.3	303	e 8 31	+ 2	—	—	e 9 20	?
Reno	z. 46.8	308	8 56	+23	—	—	—	—
Lick	z. 47.9	304	e 8 44 <sub>k</sub>	+ 2	e 9 0	?	e 9 27	?
Mineral	z. 48.3	308	e 8 48 <sub>a</sub>	+ 3	—	—	i 9 13	?
Shasta	z. 49.0	308	e 8 49 <sub>a</sub>	- 1	—	—	i 8 55	P
Victoria	51.4	317	9 5	- 4	—	—	—	—
Resolute Bay	56.9	355	—	—	e 17 32	-10	—	e 28.2
Granada	60.3	58	e 10 41 <sub>k</sub>	+28	—	—	—	28.8
Alicante	62.7	56	e 10 25	- 4	e 24 11	?	12 45	PP
Chambon-la-Forêt	64.3	45	e 10 35	- 4	—	—	—	—
Paris	64.5	45	e 10 42	+ 1	—	—	—	e 30.1
College	67.3	334	e 10 55	- 4	—	—	—	e 30.4
Jena	70.2	42	e 16 12	?	—	—	e 16 28	?
Tamanrasset	z. 70.2	72	e 11 19	+ 2	e 11 42	PcP	e 13 55	PP
Florence	70.9	49	e 11 25	+ 4	e 20 17	-19	—	—
Triest	72.4	47	e 11 18	-12	e 20 21	-32	e 21 4	PS
Kiruna	72.5	23	e 11 30	0	e 20 55	+ 1	i 11 56	PcP
Istanbul	84.3	48	12 37	+ 2	—	—	—	e 33.1
Bombay	E. 127.5	44	i 17 21	?	—	—	—	—

June 3d. 16h. 5m. 24s. Epicentre 40°·1N. 28°·8E.

Epicentre given by Istanbul with magnitude 6. Felt at Gelibolu, Canakkale, Kütahya, Sile, and Istanbul.

$$A = +.6722, B = +.3695, C = +.6416; \quad \delta = +3; \quad h = -2;$$

$$D = +.482, E = -.876; \quad G = +.562, H = +.309, K = -.767.$$

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Istanbul	1.0	12	i 0 24 <sub>k</sub>	+ 3	0 37	+ 1	i 0 29	?
Athens	4.5	244	i 1 9	- 2	i 1 59	- 6	i 1 21	P*
Bucharest	E. 4.7	336	e 1 10	- 4	i 2 20	+10	i 1 49	P <sub>g</sub>
	N. 4.7	336	e 1 17	+ 3	i 2 27	+17	i 1 45	P <sub>g</sub>
Focsani	5.7	349	e 1 37	+ 9	2 55	+ 2*	—	—

Continued on next page.

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		$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.
		°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.
Campulung		5.9	333	e 1	32	+ 1	e 2	38	- 2	e 1	59	—
Iasi		7.2	353	e 1	46	- 3	e 3	4	- 9	e 3	33	—
Belgrade		7.8	310	i 1	52 <sub>a</sub>	- 6	i 4	4	-14 <sub>g</sub>	i 3	52	—
Timisoara		7.9	318	i 1	56 <sub>a</sub>	- 3	e 3	20	-10	e 2	34	e 4.2
Ksara		8.4	136	e 1	22	-44	i 2	40?	-63	—	—	—
Szeged		8.8	317	2	11	0	3	47	- 6	2	52	—
Taranto		8.8	276	e 1	58	-13	—	—	—	—	—	—
Kecskemet		9.5	319	e 2	57	P*	4	11	+ 1	e 5	6	—
Kalossa	N.	9.6	315	e 2	22	+ 1	e 4	26	+14	3	12	—
Budapest		10.2	320	e 2	34	+ 3	4	37	+10	e 5	17	e 5.9
Helwan	Z.	10.4	168	e 2	39	+ 5	5	8	S*	2	51	—
Reggio Calabria		10.4	263	e 2	37	+ 3	e 4	34	+ 2	e 4	19	—
Messina	Z.	10.5	264	e 2	32	- 3	i 4	33	- 2	i 3	1	i 5.5
Ogyalla		10.9	319	e 2	39	- 1	e 4	39	- 5	e 6	3	e 6.4
Triest		12.3	302	i 2	56 <sub>k</sub>	- 3	e 5	0	-18	e 3	46	i 6.5
Rome		12.4	284	e 3	1	0	e 5	29	+ 8	e 3	43	i 7.4
Raciborzu		12.5	327	e 2	55?	- 7	i 5	50	SS	e 3	15	e 6.2
Padova		13.3	295	3	15	+ 2	5	52	+10	—	—	—
Siena		13.4	290	e 2	36	-38	e 4	24	?	—	—	i 6.9
Florence		13.6	291	e 3	15 <sub>a</sub>	- 2	e 5	39	-11	—	—	e 7.5
Bologna		13.7	294	e 3	16	- 2	e 6	52	+60	e 3	46	e 7.5
Prato		13.7	292	e 3	31	+13	i 6	20	+28	—	—	—
Prague		14.2	319	e 3	23	- 1	e 5	58	- 6	e 3	41	e 7.3
Salo		14.5	298	e 3	19	- 9	e 5	25	?	e 4	45	e 7.6
Cheb		15.3	316	e 3	53	+14	e 6	48	+18	e 5	11	e 8.1
Pavia		15.3	296	e 3	47	+ 8	e 6	38	+ 8	e 4	28	e 8.8
Chur		15.5	302	e 3	45 <sub>k</sub>	+ 3	—	—	—	—	—	e 8.0
Collmberg		15.7	321	e 3	41	- 3	e 7	8	+29	e 3	59	e 8.8
Jena		16.2	318	e 3	47	- 3	e 6	54	+ 3	e 4	6	—
Oropa		16.2	297	e 3	25	-25	e 5	24	?	e 3	51	—
Zürich		16.3	303	e 3	50	- 2	e 6	55	+ 2	—	—	—
Potsdam		16.4	324	e 3	55	+ 2	e 7	5	+ 9	—	—	e 7.6
Stuttgart		16.4	308	e 3	47?	- 6	e 6	46	-10	e 4	5	e 8.1
Basle		17.0	303	e 4	0	- 1	—	—	—	—	—	e 9.2
Karlsruhe		17.0	308	e 4	0 <sub>k</sub>	- 1	e 6	50	-20	e 4	13	e 8.1
Neuchatel		17.2	301	e 4	2	- 1	—	—	—	—	—	e 9.0
Strasbourg		17.2	307	e 4	1	- 2	e 7	15	+ 1	i 4	19	e 8.6
Copenhagen		19.0	331	e 4	23	- 3	—	—	—	i 4	33	9.6
Clermont-Ferrand		19.6	295	e 4	28	- 4	e 8	41	+33	i 5	0	e 9.5
Witteveen	Z.	19.8	319	i 4	44	+ 9	—	—	—	i 5	7	—
Uccle		20.1	310	e 4	36	- 2	e 8	14	- 5	e 4	50	e 10.6
De Bilt		20.2	315	e 4	39	0	e 8	20	- 1	—	—	e 9.6
Helsinki		20.2	354	—	—	—	e 8	36	+15	—	—	—
Algiers Univ.	Z.	20.4	267	e 4	39	- 2	7	16	?	e 4	58	—
Chambon-la-Forêt		20.6	301	i 4	38	- 5	—	—	—	i 4	44	—
Paris		20.6	303	i 4	40	- 3	i 8	33	+ 4	i 4	46	e 10.6
Upsala		21.0	344	i 4	45	- 2	e 8	35?	- 2	i 5	4	i 11.0
Alicante		22.7	275	e 4	56	- 8	9	1	- 8	e 5	38	10.9
Kew		23.1	310	e 5	9	+ 1	e 9	20	+ 4	—	—	e 11.6
Almeria		24.6	272	i 5	26	+ 3	9	48	+ 6	6	3	14.3
Toledo		25.1	279	e 5	27	- 1	e 9	48	- 3	—	—	—
Granada		25.4	274	i 5	37 <sub>k</sub>	+ 6	i 10	59	+63	11	48	14.3
Malaga		26.2	274	i 5	40	+ 2	i 10	18	+ 9	—	—	17.1
Tamanrasset	Z.	26.2	235	e 5	40	+ 2	e 10	6	- 3	e 6	16	e 13.2
Rathfarnham Castle		27.1	331	i 5	50 <sub>a</sub>	+ 4	i 6	22	PP	e 6	38	e 13.9
Kiruna		28.2	354	i 5	56	0	e 10	36?	- 5	i 6	55	i 14.9
Chatra	Z.	49.6	86	e 9	1	+ 6	—	—	—	—	—	—
Halifax		64.8	308	i 10	42 <sub>a</sub>	- 1	—	—	—	—	—	—
Pretoria	Z.	65.5	181	i 10	52	+ 5	—	—	—	—	—	—
Kimberley	Z.	68.6	184	i 11	10	+ 3	—	—	—	—	—	—
Ottawa		71.3	314	i 11	30	+ 7	—	—	—	—	—	—
Kirkland Lake	Z.	71.6	318	e 11	32	+ 7	—	—	—	—	—	—
College		75.3	358	11	49	+ 2	—	—	—	—	—	—
Hungry Horse		86.0	336	i 12	45	+ 2	—	—	—	—	—	—
Butte		87.6	334	e 12	56	+ 5	—	—	—	—	—	—

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June 3d. 17h. 51m. 47s. Epicentre 51°·9N. 159°·9E. (as on 1953, May 19d.).

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		o	o	m. s.	s.	m. s.	s.	m. s.	m.
Mizusawa	E.	18·3	233	4 22	+ 5	4 55	PP	—	—
College		29·3	44	i 6 6	0	—	—	—	—
Hungry Horse		52·2	58	e 9 15	0	—	—	—	—
Shasta	Z.	52·4	70	e 9 17 <sub>a</sub>	+ 1	e 9 31	?	e 9 45	?
Mineral	Z.	53·1	70	e 9 24 <sub>k</sub>	+ 3	—	—	i 9 53	?
Butte		54·4	59	e 9 32	+ 1	—	—	—	—
Reno	Z.	54·7	69	e 9 35	+ 2	—	—	e 9 47	?
Lick	Z.	55·0	73	i 9 37 <sub>a</sub>	+ 2	—	—	—	—
Fresno	Z.	56·5	72	e 9 49	+ 3	—	—	—	—
Kiruna		56·8	344	i 9 45	- 3	e 17 37	- 4	i 10 30	PcP e 27·2
Tinemaha	Z.	57·2	71	i 9 55	+ 4	—	—	e 10 20	PcP
China Lake	Z.	58·5	71	e 10 1	+ 1	e 10 14	?	e 10 19	?
Chatra	Z.	58·9	275	e 9 58	- 5	—	—	—	—
Mount Wilson	Z.	59·3	73	e 10 8	+ 2	—	—	—	—
Pasadena	Z.	59·3	73	e 10 18	+12	—	—	i 10 25	?
Riverside	Z.	59·9	73	e 10 11	+ 1	—	—	—	—
Boulder City		60·0	69	i 10 12	+ 1	—	—	—	—
Nelson		60·1	69	i 10 13	+ 2	—	—	—	—
Upsala	Z.	64·5	340	i 10 38 <sub>a</sub>	- 3	—	—	i 12 51	PP
Tucson		64·9	70	e 10 45	+ 2	—	—	—	—
Kirkland Lake	Z.	67·9	39	e 11 1	- 1	—	—	—	—
Quetta	Z.	68·5	292	e 10 59	- 7	—	—	—	—
Copenhagen		69·4	342	i 11 10	- 2	—	—	—	40·2
Fayetteville	Z.	71·2	56	i 11 22 <sub>a</sub>	- 1	—	—	—	—
Ottawa		71·9	38	e 11 38	+11	—	—	e 11 45	PcP
Potsdam		72·4	340	e 11 30	0	—	—	—	e 38·2
Witteveen	Z.	73·2	344	i 11 35	0	—	—	—	—
Collmberg		73·4	339	e 11 34	- 2	—	—	e 11 49	PcP
Jena		74·1	340	e 11 38	- 2	—	—	e 11 58	PcP
Prague	N.	74·2	338	e 11 39	- 1	e 12 27	?	e 12 7	PcP
Karlsruhe	Z.	76·5	341	e 11 48 <sub>k</sub>	- 6	—	—	—	—
Stuttgart		76·6	341	e 11 53	- 1	e 24 49	?	e 12 8	PcP e 43·2
Strasbourg		77·1	342	i 11 57	0	—	—	—	—
Paris		77·8	345	e 12 1	0	i 12 8	PcP	—	e 38·2
Istanbul		78·0	325	12 0	- 2	—	—	—	—
Chambon-la-Forêt		78·6	345	e 12 2	- 3	—	—	—	—
Ksara		81·6	316	e 11 25	-56	—	—	e 16 43	PP
Tamanrasset	Z.	102·3	336	e 13 58	- 1	e 17 46	?	e 18 8	PP
Pretoria	Z.	135·3	289	e 19 24	[+ 2]	—	—	—	—
Kimberley	Z.	139·5	287	e 19 33	[+ 3]	—	—	—	—

June 3d. 19h. 39m. Epicentre 35°·6N. 140°·5E. Depth of focus 50km.  
Intensity IV at Osima ; II-III at Tokyo, Tukubasan, Utunomiya, Ajiro, and Kashiwa.  
Seismo. Bull. Cent. Met. Obs., Japan, 1953, June, Tokyo, 1953, p.10, with macroseismic chart.

June 5d. 6h. 52m. Epicentre 43°·1N. 78°·2E.  
Bulletin of Seismo. Stations of U.S.S.R. for April-June, 1953, Moscow, 1954, p.116.

June 5d. 18h. 15m. 50s.  
Felt at Marmalade in Dominican Republic. Repetition of shock of May 31d. 19h.  
Bulletin annuel de l'Observatoire météorologique de Port au Prince for 1953.

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June 6d. 1h. 10m. 18s. Epicentre 11°·0N. 93°·0E. Depth of focus 0·005.

*Not an approximate determination.*

A = -·0514, B = +·9805, C = +·1896;  $\delta = -3$ ;  $h = +6$ ;  
D = +·999, E = +·052; G = -·010, H = +·189, K = -·982.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Calcutta	N.	12·3	339	e 2 54	0	i 5 10	0	—	—
Madras	E.	12·7	280	i 2 56	- 4	i 5 3	-17	3 4	PP
Shillong		14·5	356	e 3 25	+ 2	e 6 0	- 3	3 35	PP
Kodaikanal	E.	15·3	269	i 3 33	0	—	—	—	e 7·6
Hyderabad	N.	15·5	296	—	—	i 6 12	-14	—	—
Chatra		16·7	342	e 3 51	0	e 6 52	- 1	—	—
Poona		20·0	294	i 4 29	- 1	i 7 45	-21	i 5 42	PPP
Bombay		21·0	294	i 4 52	+12	e 8 36	+11	5 17	PP
Djakarta	E.	21·9	139	e 5 28	+39	e 9 40	SS	e 6 8	?
New Delhi		22·9	323	e 5 1	+ 2	e 9 5	+ 5	5 28	PP
Hong Kong		23·1	57	—	—	e 8 42?	-21	—	—
Warsak Dam	E.	30·1	323	e 6 50	+44	i 12 32	SS	i 12 18	?
Quetta		30·8	313	i 6 12	0	e 11 11	+ 2	i 6 26	sP
Khorog		32·6	328	e 6 22	- 6	—	—	—	—
Naryn		33·8	337	e 6 38	0	i 11 58	+ 2	—	—
Kulyab		33·9	326	6 38	- 1	11 58	0	—	—
Przhevalsk		33·9	342	6 39	0	12 2	+ 4	—	—
Dzhergetal		34·1	330	6 51	+11	—	—	—	—
Garm		34·4	329	e 6 42	- 1	—	—	—	—
Kurmenty		34·4	342	e 6 44	+ 1	—	—	—	—
Obi-garm		34·6	328	e 6 44	- 1	—	—	—	—
Rybach'e		34·6	338	e 6 41	- 4	i 12 10	+ 2	e 6 59	pP
Andijan		34·8	332	i 6 47	+ 1	12 15	+ 3	i 7 2	pP
Fergana		34·8	332	e 6 46	0	e 12 14	+ 2	i 7 2	pP
Almata II		34·9	340	e 6 44	- 3	—	—	—	—
Stalinabad		35·0	327	e 6 47	- 1	—	—	e 7 2	pP
Almata		35·1	340	e 6 50	+ 1	i 12 19	+ 3	i 7 8	pP
Namangan		35·3	332	i 6 52	+ 1	e 12 20	+ 1	i 7 7	pP
Frunse		35·6	337	e 6 54	+ 1	e 12 26	+ 2	i 7 10	pP
Ili		35·6	341	e 6 51	- 2	—	—	—	—
Samarkand		36·7	326	e 7 4	+ 2	—	—	—	—
Lunacharskoe		36·7	330	e 7 2	0	—	—	i 7 19	pP
Tashkent		36·7	330	e 7 3	+ 1	e 12 39	- 2	i 7 18	pP
Tchimkent		37·3	331	i 7 7	- 1	i 12 52	+ 2	—	—
Bairam-Ali		38·3	318	e 7 15	- 1	—	—	7 31	pP
Ashkabad		41·0	317	e 7 38	0	e 13 52	+ 6	7 54	pP
Kizyl-Arvat		43·0	319	i 8 0	+ 5	—	—	—	—
Goris		50·1	313	e 8 56	+ 5	—	—	—	—
Grozny		52·0	318	e 9 4	- 1	i 16 29	+ 7	—	—
Tifis		52·0	315	e 9 5	0	e 16 28	+ 6	—	—
Sverdlovsk		52·1	338	e 9 4	- 2	—	—	i 9 20	pP
Akhalkalaki		52·8	314	e 9 12	+ 1	—	—	—	—
Borzhomi		53·0	314	e 9 14	+ 2	e 16 42	+ 6	9 30	pP
Tsikhlis-Dzhvari		53·0	314	9 11	- 1	e 16 44	+ 8	—	—
Zugdidi		54·3	316	e 9 21	- 1	e 16 58	+ 5	—	—
Sotchi		56·2	316	e 9 36	0	—	—	e 9 55	pP
Ksara		56·7	303	e 9 54	pP	—	—	e 11 2	?
Theodosia		59·6	317	e 9 58	- 1	—	—	—	—
Helwan	z.	60·1	298	10 2	- 1	—	—	e 10 17	pP
Yalta		60·3	315	e 10 4	0	—	—	—	—
Moscow		61·8	328	e 10 14	0	e 18 34	+ 3	i 10 31	pP
Istanbul		63·2	311	10 22	- 2	—	—	e 10 34	pP
Kishinev		64·5	317	e 10 30	- 2	—	—	—	—
Uzhgorrod		69·1	318	e 11 3	+ 2	—	—	—	—
Raciborzu		71·9	320	e 11 20	+ 2	—	—	e 12 13	?

*Continued on next page.*



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		$\Delta$ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	Supp. m. s.	L. m.
Pretoria	z.	72.8	239	e 11 24	+ 1	—	—	—	—
Upsala		73.2	330	i 11 24	- 2	e 21 2	+15	i 11 41	pP
Kiruna		73.3	338	i 11 25	- 1	i 20 50	+ 1	i 14 8	PP
Messina	z.	73.5	307	e 11 22	- 6	—	—	—	e 36.7
Prague		74.3	319	e 11 34	+ 2	e 21 9	+ 9	e 11 48	PcP
Triest	z.	74.7	315	e 11 32	- 2	e 12 17	?	e 11 57	PcP
Potsdam	z.	75.2	322	e 11 53	pP	—	—	—	—
Collmberg		75.3	320	e 11 38	0	e 11 54	PcP	e 11 49	pP
Jena		76.1	320	e 11 43	+ 1	e 14 42	PP	e 11 55	pP
Florence	z.	76.5	313	e 11 33	-12	—	—	e 12 13	PcP
Kimberley	z.	76.7	236	i 11 45	- 1	—	—	—	—
Chur		77.6	316	e 11 50	- 1	—	—	—	—
Stuttgart		77.7	318	e 11 51	0	e 22 12	ScS	e 12 8	PcP
Zürich		78.2	317	e 11 56 <sub>a</sub>	+ 2	—	—	e 12 13	pP
Strasbourg		78.7	318	e 11 56	- 1	e 14 11	PP	i 12 12	pP
Basle		78.9	317	e 11 55	- 3	—	—	—	—
Witteveen	z.	79.1	323	e 11 59	0	—	—	—	—
Clermont-Ferrand		82.1	315	e 12 35 <sup>?</sup>	pP	—	—	—	—
Paris		82.2	318	i 12 15	0	e 12 31	PcP	e 12 27	pP
Chambon-la-Foret		82.4	317	i 12 19	+ 3	—	—	—	—
Algiers Univ.	z.	83.5	306	e 12 21	- 1	e 15 24	PP	e 12 41	pP
Tamanrasset	z.	83.5	292	i 12 24 <sub>a</sub>	+ 2	e 15 39	PP	e 12 40	pP
Scoresby Sund		87.7	343	e 13 15	pP	—	—	—	47.7
College		91.9	22	i 13 2	0	—	—	—	49.7
Resolute Bay		94.3	2	e 13 14 <sub>a</sub>	+ 1	—	—	i 13 30	pP
Hungry Horse		116.2	19	e 18 32	[- 4]	e 29 9	PS	—	—
Butte		118.8	20	e 19 56	PP	—	—	—	—
Tinemaha	z.	123.9	30	e 18 53	[+ 2]	—	—	e 19 13 <sup>*</sup>	pPKP
China Lake	z.	125.2	30	e 18 57	[+ 4]	—	—	e 19 16	pPKP
Mount Wilson	z.	126.2	32	e 18 52	[- 3]	—	—	—	—
Nelson		126.6	28	e 18 56	[ 0]	—	—	i 19 14	pPKP
Palomar	z.	127.5	31	e 18 59	[+ 1]	—	—	—	—
Barratt	z.	128.1	32	e 19 1	[+ 2]	—	—	—	—
Tucson		131.3	27	e 19 8	[+ 3]	i 22 26	PKS	—	—
Fayetteville	z.	132.7	7	i 19 9	[+ 1]	i 22 30	PKS	—	—
San Juan		144.3	325	e 19 28	[- 1]	—	—	—	—
Huancayo		168.5	264	e 20 5	[+ 6]	—	—	—	—

June 6d. 6h. 6m. 13s. (I) ) Epicentre 56°0N. 35°0W.  
12h. 6m. 13s. (II) ; (as on 1952, October 6d.).

A = +.4602, B = -.3222, C = +.8273;  $\delta = +2$ ;  $h = -8$ ;  
D = -.574, E = -.819; G = +.678, H = -.474, K = -.562.

		$\Delta$ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	Supp. m. s.	L. m.
I Reykjavik		10.5	33	e 2 36	+ 1	—	—	i 2 44	? e 6.4
II		10.5	33	i 2 44	+ 9	—	—	—	e 6.3
I Scoresby Sund		15.6	16	e 3 53	+10	e 7 8	SS	—	8.3
II		15.6	16	e 3 49	+ 6	e 7 10	SS	—	8.5
II Durham	N.	18.9	79	—	—	i 8 5	+12	—	—
I Kew		20.9	87	e 4 44	- 2	e 8 45	+10	—	e 10.8
II		20.9	87	i 4 48	+ 2	e 8 48	+13	—	e 11.8
I Halifax		21.3	250	e 4 49	- 1	8 44	+ 1	—	10.6
II		21.3	250	e 4 48	- 2	8 42	- 1	i 4 53	P 10.6
I Paris		23.7	92	e 5 13	- 1	e 5 46	PP	e 5 58	PPP e 10.8
II		23.7	92	e 5 15	+ 1	e 9 30	+ 3	e 8 33	? e 10.8
I Seven Falls	E.	23.7	264	e 5 18	+ 4	9 34	+ 7	—	11.9
I Chambon-la-Foret		24.0	93	e 5 21	+ 4	—	—	—	—
I Shawinigan Falls	N.	25.2	265	e 5 29	0	—	—	—	—
II		25.2	265	e 5 26	- 3	—	—	—	—
I Ottawa		27.5	266	e 5 48	- 2	10 23	- 7	i 5 53	P 13.1
II		27.5	266	e 5 48	- 2	10 24	- 6	—	13.0

Continued on next page.

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		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
I Kiruna		27.6	42	e 6 7	+16	e 10 42	+10	e 6 28	? e 12.8
II		27.6	42	e 7 21	?	e 10 30	- 2	e 11 26	? e 12.8
I Upsala	Z.	27.6	60	e 5 51	0	—	—	—	—
II	Z.	27.6	60	i 9 15	PcP	—	—	—	—
I Malaga		28.2	119	e 6 38	PP	—	—	—	13.2
I Kirkland Lake	Z.	28.3	274	e 5 56	- 1	—	—	—	—
II	Z.	28.3	274	e 5 56	- 1	—	—	—	—
I Collmberg	Z.	28.4	79	e 5 59	+ 1	—	—	—	—
II	Z.	28.4	79	e 5 58	0	—	—	—	—
I Resolute Bay		29.3	333	—	—	e 11 8	+ 9	—	e 15.7
II		29.3	333	—	—	e 10 58	- 1	—	e 16.8
I Pavia		29.6	91	—	—	e 11 43	?	—	—
II		29.6	91	—	—	e 12 20	SS	—	e 18.2
I Triest		31.9	87	e 6 26	- 3	—	—	e 7 6	PP e 14.1
I Messina	E.	37.8	96	e 7 55	+35	e 13 10	- 1	—	e 18.6
II		37.8	96	e 8 48	PP	e 13 13	+ 2	—	e 18.3
I Istanbul	Z.	43.4	81	8 4	- 2	—	—	—	—
I Tamanrasset	Z.	44.5	121	e 8 11	- 4	—	—	—	—
II	Z.	44.5	121	e 8 12	- 3	e 9 51	PP	e 8 42	? —
I Hungry Horse		46.6	296	e 8 29	- 3	—	—	—	—
II		46.6	296	e 8 31	- 1	—	—	—	—
I Butte		47.3	293	e 8 41	+ 4	—	—	—	—
II		47.3	293	e 8 38	+ 1	—	—	—	—
I College		49.1	330	i 8 52	+ 1	—	—	—	—
II		49.1	330	i 8 52	+ 1	—	—	—	—
I Reno	Z.	55.7	292	e 9 39	- 1	—	—	—	—
II	Z.	55.7	292	e 9 38	- 2	—	—	—	—
I Nelson		55.8	285	e 9 41	0	—	—	—	—
II		55.8	285	e 9 41	0	—	—	—	—
I Mineral	Z.	56.0	294	e 9 41	- 2	—	—	—	—
II	Z.	56.0	294	e 9 42 <sup>a</sup>	- 1	—	—	—	—
I Tucson		56.2	280	e 9 43	- 1	—	—	—	—
I Tinemaha	Z.	56.7	289	e 9 47	- 1	—	—	—	—
II	Z.	56.7	289	e 9 46	- 2	—	—	—	—
I China Lake	Z.	57.3	287	e 9 51	- 1	—	—	—	—
II	Z.	57.3	287	e 9 50	- 2	—	—	—	—
I Fresno	Z.	57.7	290	e 9 57	+ 2	—	—	—	—
II	Z.	57.7	290	e 9 55 <sup>a</sup>	0	—	—	—	—
I Woody	Z.	58.0	288	e 9 54	- 3	—	—	—	—
II	Z.	58.0	288	e 9 42	-15	—	—	—	—
I Lick	Z.	58.3	292	e 9 59 <sup>k</sup>	0	—	—	—	—
II	Z.	58.3	292	e 9 59 <sup>a</sup>	0	—	—	—	—
I Mount Wilson	Z.	58.7	287	e 10 19	+17	—	—	—	—
II	Z.	58.7	287	e 10 1	- 1	—	—	—	—
I Palomar	Z.	58.7	285	i 10 4	+ 2	—	—	i 10 12	? —
I Barratt	Z.	59.1	285	e 10 2	- 2	—	—	—	—
II	Z.	59.1	285	e 10 6	+ 2	—	—	—	—
I Huancayo		75.7	221	e 11 49	0	—	—	—	—
II		75.7	221	e 11 48	- 1	—	—	—	—

June 6d. 11h. 21m. Epicentre 43°·2N. 78°·2E.

Bulletin of Seismo. stations of U.S.S.R. for April-June, 1953, Moscow, 1954, p. 117.

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June 6d. 12h. 55m. 39s. Epicentre 12°·8N, 145°·4E. Depth of focus 0·005.  
(as on 1951, June 1d.).

A = -·8029, B = +·5539, C = +·2201;  $\delta = -10$ ;  $h = +6$ ;  
D = +·568, E = +·823; G = -·181, H = +·125, K = -·975.

		$\Delta$ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	Supp. m. s.	L. m.
Guam		0·9	316	0 18	0	0 25	- 6	—	—
Osima		22·5	346	e 5 12	+17	—	—	—	—
Mera		22·6	346	e 5 6	+10	—	—	—	—
Misima	E.	23·0	347	e 4 57	- 3	e 9 15	+13	e 5 20	PP
Miyazaki		23·0	327	e 4 54	- 6	—	—	—	—
Shizuoka		23·0	345	e 4 50	-10	e 8 53	- 9	—	—
Koti		23·3	333	e 5 18	+15	e 9 29	+22	—	—
Kameyama		23·4	343	e 4 49	-15	—	—	e 5 24	PP
Tokyo		23·4	349	e 4 56	- 8	e 9 5	- 4	e 5 32	PP
Kohu		23·6	346	e 5 0	- 6	—	—	—	—
Gihu		23·8	343	e 5 23	+15	—	—	—	—
Kyoto		23·8	342	e 5 21	+13	—	—	—	—
Takamatu		23·8	336	e 5 3	- 5	e 9 41	SS	e 5 21	pP
Kumagaya		23·9	348	e 5 11	+ 2	e 9 44	+27	—	—
Matuyama		23·9	333	e 5 4	- 5	e 9 14	- 3	e 5 38	PP
Maebasi		24·2	348	e 5 12	+ 1	e 9 47	+25	e 5 24	pP
Oiwake		24·2	347	e 5 11	0	—	—	—	—
Utunomiya		24·2	349	i 5 26	+15	—	—	—	—
Baguio		24·3	282	i 5 11 <sub>a</sub>	- 1	i 10 3	SS	—	—
Matumoto	N.	24·3	344	e 5 55	+43	e 9 54	+30	—	—
Matusiro		24·5	347	5 4	-10	9 13	-14	5 46	PP e 11·3
Nagano	N.	24·6	347	e 5 16	+ 1	—	—	—	—
Shirakawa		24·7	350	e 5 20	+ 4	e 9 39	+ 8	—	—
Hokusima		25·2	350	e 5 22	+ 1	—	—	—	—
Wazima		25·6	344	e 5 26	+ 1	—	—	—	—
Nanking	Z.	31·0	312	e 6 31	+17	—	—	—	—
Mitchell Field		49·6	28	e 8 46	- 1	—	—	—	—
Chatra	Z.	56·1	294	i 9 31	- 4	—	—	—	—
Karapiro	N.	57·8	152	e 9 52	+ 5	—	—	—	—
Tongariro	Z.	58·9	152	i 9 21?	-34	—	—	—	—
Tuai	N.	59·3	151	e 10 2	+ 5	—	—	—	—
Kaimata	N.E.	60·0	157	e 10 27	pP	—	—	—	—
Wellington		60·3	154	e 10 8	+ 4	—	—	—	—
College		68·7	25	i 10 55	- 4	e 20 20	+25	—	—
Poona	Z.	68·7	285	i 10 56	- 3	—	—	—	—
Quetta	Z.	73·7	298	i 11 25	- 4	—	—	i 11 58	?
Shasta		83·4	50	e 12 22 <sub>k</sub>	0	e 22 35	- 1	e 12 44	pP
Berkeley	Z.	84·1	53	i 12 27 <sub>a</sub>	+ 2	—	—	i 12 48	pP
Mineral	Z.	84·1	50	i 12 25 <sub>k</sub>	0	e 16 1	PP	i 12 49	pP
Lick	Z.	84·7	53	e 12 29 <sub>a</sub>	+ 1	e 16 6	PP	i 12 52	pP
Resolute Bay		85·2	13	e 12 26	- 5	—	—	—	—
Reno		85·6	50	e 12 33 <sub>k</sub>	0	e 22 58	0	e 12 56	pP
Fresno	Z.	86·3	53	e 12 37 <sub>a</sub>	+ 1	e 14 20	?	e 12 59	pP
Woody	Z.	87·2	54	i 12 42	+ 2	i 13 17	sP	i 13 4	pP
Hungry Horse		87·4	41	i 12 43	+ 2	e 15 27	?	i 13 14	pP
Tinemaha		87·4	53	i 12 42	+ 1	e 23 15	0	i 13 5	pP
Pasadena		88·1	55	i 12 46 <sub>a</sub>	+ 1	e 23 34	+13	i 13 8	pP
China Lake	Z.	88·2	53	i 12 46 <sub>a</sub>	+ 1	i 13 15	sP	i 13 8	pP
Riverside	Z.	88·8	55	i 12 49	+ 1	—	—	i 13 12	pP
Palomar	Z.	89·4	56	i 12 52	+ 1	i 13 20	sP	i 13 12	pP
Barratt	Z.	89·7	56	e 12 53	+ 1	i 13 23	sP	i 13 16	pP
Nelson		90·4	53	i 12 57	+ 2	—	—	e 16 48	PP
Kiruna		90·5	342	i 12 51	- 5	e 23 10	[-10]	i 13 14	pP e 43·4
Tucson		94·6	55	e 13 17	+ 2	—	—	—	—
Upsala	Z.	96·4	336	e 13 17	- 6	—	—	i 16 49	PP

Continued on next page.

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	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Ksara	98.6	307	e 15 11?	?	—	—	e 18 29?	PP
Potsdam	103.2	333	—	—	i 24 25	[- 1]	—	—
Collmberg	z. 104.0	332	e 18 30	PP	—	—	—	e 53.4
Jena	104.9	331	e 18 39	PP	—	—	e 18 59	pPP
Triest	z. 107.3	327	e 18 16	[- 2]	e 18 36	PP	e 18 55	pPP
Stuttgart	107.5	332	e 18 36?	PP	—	—	e 18 56	pPP
Kimberley	z. 122.8	244	e 18 45	[- 4]	—	—	—	—
Tamanrasset	z. 127.1	312	e 18 59	[+ 2]	e 22 20	PKS	e 19 25	pPKP
Huancayo	140.2	93	e 19 29	[+ 8]	—	—	—	—

June 6d. 17h. 7m. 6s. Epicentre 49°·5N. 156°·2E. (as on 1953, March 8d.).

A = -·5966, B = +·2631, C = +·7582;  $\delta$  = +2; h = -5;  
D = +·404, E = +·915; G = -·694, H = +·306, K = -·652.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
College	32.7	40	i 6 35	- 1	—	—	—	—
Nanking	z. 32.8	253	e 6 47	+10	—	—	—	—
Hungry Horse	55.5	54	e 9 38	- 1	—	—	—	—
Shasta	z. 55.5	66	e 9 39 <sub>a</sub>	0	—	—	—	—
Mineral	z. 56.2	66	e 9 44 <sub>k</sub>	0	—	—	e 10 22	PcP
Reno	z. 57.8	65	e 9 56	+ 1	—	—	—	—
Lick	z. 58.1	68	e 9 58 <sub>a</sub>	0	—	—	—	—
Kiruna	58.4	342	i 9 58	- 2	—	—	i 10 4	? e 28.9
Fresno	z. 59.6	67	e 10 8 <sub>k</sub>	0	—	—	e 10 18	?
Tinemaha	z. 60.3	68	e 10 14	+ 1	—	—	—	—
Woody	z. 60.8	69	e 10 16	0	—	—	—	—
China Lake	z. 61.5	68	e 10 21	0	—	—	e 10 40	?
Pasadena	z. 62.3	70	e 10 21	- 5	—	—	e 10 34	?
Nelson	63.3	66	e 10 34	+ 1	—	—	i 10 39	?
Palomar	z. 63.6	70	e 10 35	0	—	—	—	—
Barratt	z. 64.2	71	e 10 40	+ 1	—	—	—	—
Upsala	z. 65.9	339	i 10 54	+ 4	—	—	—	—
Tucson	68.0	67	e 11 9	+ 6	—	—	—	—
Bombay	N. 71.6	278	e 12 15	+50	e 20 38	- 6	—	—
Fayetteville	z. 74.5	53	i 11 43	+ 1	—	—	—	—
Collmberg	74.8	337	e 11 44	0	—	—	—	—
Jena	z. 75.5	338	e 11 48	0	—	—	e 12 39	?
Prague	N. 75.5	336	e 11 57	+ 9	e 13 16	?	e 12 17	PcP
Stuttgart	78.1	339	e 12 2	0	—	—	e 12 19	PcP
Morgantown	78.4	41	i 12 22	+18	—	—	—	—
Paris	79.5	344	i 12 10	0	—	—	i 12 17	pP
Zürich	79.5	339	e 12 16 <sub>a</sub>	+ 6	—	—	—	—
Basle	79.6	340	e 12 18	+ 8	—	—	—	—
Chambon-la-Forêt	80.3	343	e 12 15	+ 1	—	—	i 12 22	pP

June 7d. 0h. 3m. Provisional Epicentre 38°·3S. 176°·0E. Depth of focus 160km.  
Magnitude 5.

Seismo. Observatory Bulletin for April, May, June, 1953, No. E.132, Wellington, 1955, p.11.

June 7d. 4h. 57m. Provisional Epicentre 28°·0S. 180°·0E. Magnitude 5.75.  
Loc. cit. 0h.

June 7d. 12h. 24m. Epicentre 20°·0N. 70°·0W. Magnitude 5.5.  
Intensity III at Port au Prince, La Chevalerie, and Marmalade.  
Bulletin annuel de l'Observatoire météorologique du Petit Séminaire, Collège St. Martial,  
Port au Prince, Haïti, 1953, p.58.

June 7d. 13h. 53m. Epicentre 36°·0N. 26°·9E.  
Felt in the Island of Karpathos. Intensity IV at Messochori; III at Karpathos.  
A. Galapoulos.  
Seismo. Institute Bulletin for 1953, Athens, 1954, p. 66.

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June 7d. 20h. 49m. Epicentre 44°·75N. 6°·5E.

Intensity V at Argentière, Freissinières, St. Martin de Queyrières, Vallouise; IV at Vigneau; III at Arvieux, Orres, Prelvoux, Puy St. Vincent, Roche de Rocme, and St. Crepin.

Annales de l'Institut de Physique du Globe de Strasbourg Nouvelle Série Tome XVIII, partie II Séismologie 1953, p. 52.

June 8d. 9h. 22m. Epicentre 38°·0N. 69°·0E.

Bulletin of the Seismo. Stations of U.S.S.R. for April-June, 1953, Moscow, 1954, p.117.

June 8d. 11h. 40m. 29s. Epicentre 52°·7N. 159°·4E. (as on 1953, March 22d.).

A = -·5696, B = +·2141, C = +·7935;  $\delta = -7$ ;  $h = -6$ ;  
D = +·352, E = +·936; G = -·743, H = +·279, K = -·609.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Petropavlovsk		0·6	314	i 0 26	+11	i 0 42	+16	—	—
Klyuchi		3·7	12	1 6	+ 6	1 58	+13	—	—
Magadan		8·4	329	2 15	+ 9	—	—	—	—
Uglegorsk		11·5	259	i 2 55	+ 7	i 5 10	+11	—	—
Nemuro		13·2	230	e 3 21	+10	e 6 39	+59	—	e 8·3
Wakkanai		13·7	245	e 3 29	+11	—	—	—	e 8·5
Mitchell Field		14·7	83	i 3 26	- 5	e 6 3	-13	—	—
Sapporo		15·4	239	e 3 44	+ 4	e 6 39	+ 7	e 4 6	PP e 8·6
Urakawa		15·4	233	e 3 38	- 2	e 7 6	+34	e 7 55	Q e 8·4
Miyako		17·7	232	e 4 10	0	—	—	—	—
Mizusawa	E.	18·5	230	4 25	+ 6	4 48	PP	—	—
Akita		18·6	231	e 4 8	-13	—	—	—	—
Sendai	Z.	19·3	228	e 4 27	- 2	—	—	—	—
Yamagata		19·6	230	e 4 33	+ 1	—	—	—	—
Hokusima		19·9	232	e 4 34	- 2	—	—	—	—
Inawasiro	E.	20·3	228	e 4 42	+ 2	—	—	—	—
Shirakawa		20·6	228	e 4 34	- 9	—	—	—	—
Aikawa		20·8	232	e 4 24	-21	e 8 35	+ 2	—	10·9
Utunomiya		21·2	232	e 4 46	- 3	e 8 49	+ 8	—	—
Maebasi	E.	21·7	231	e 4 57	+ 2	—	—	—	—
Nagano	N.	21·9	233	e 4 59	+ 2	e 8 49	- 5	—	—
Matusiro		22·0	235	e 4 57	- 1	e 8 48	- 8	—	e 11·7
Oiwake		22·0	231	e 4 55	- 3	e 9 4	+ 8	—	—
Tokyo		22·0	227	e 5 11	+13	e 5 19	?	e 5 36	PP
Matumoto	N.	22·3	234	e 5 3	+ 2	—	—	—	—
Toyama		22·3	233	e 4 4	-57	—	—	—	—
Kohu		22·6	229	e 5 6	+ 3	e 9 9	+ 2	—	—
Misima	E.	22·8	226	e 5 8	+ 3	—	—	—	—
Shizuoka		23·2	227	e 5 16	+ 7	—	—	—	—
Gihu		23·6	230	e 5 16	+ 3	—	—	—	—
Nagoya	E.	23·7	230	e 4 53	-21	—	—	—	—
Kyoto		24·4	232	e 5 23	+ 2	e 9 29	-10	—	e 11·4
Kobe		24·9	232	e 5 29	+ 3	—	—	—	—
Sumoto	E.	25·3	235	i 5 38	+ 8	—	—	—	—
Takamatu		25·8	234	e 5 33	- 1	e 9 57	- 5	—	12·1
Hamada		26·3	238	e 5 43	+ 4	e 10 12	+ 1	—	—
College		29·3	44	i 6 0	- 6	i 10 48	-11	e 10 35	? e 11·7
Kabansk		31·6	291	i 6 28	+ 2	—	—	—	—
Irkutsk		32·9	292	6 38	0	—	—	—	—
Zó-Sò		35·1	248	i 6 58 <sub>a</sub>	+ 1	e 12 32	+ 2	e 8 13	PP
Nanking		35·8	253	i 7 1 <sub>a</sub>	- 2	e 12 41	0	—	—
Sitka		36·3	56	e 7 16	+ 9	e 12 51	+ 3	—	—
Resolute Bay		43·9	22	e 8 9 <sub>k</sub>	- 1	i 14 42	0	—	e 18·0
Hong Kong		45·9	247	e 8 27	+ 1	e 15 9	- 2	—	—
Sempalatinsk		46·9	301	e 8 34	0	—	—	—	—
Baguio		47·3	235	i 8 36 <sub>k</sub>	- 1	i 15 28	- 3	—	—
Hungry Horse		52·0	58	e 9 11	- 2	—	—	—	—
Sverdlovsk		52·3	317	i 9 16	+ 1	e 16 40	0	—	—
Shasta	Z.	52·4	70	e 9 13 <sub>a</sub>	- 3	—	—	e 10 41	PcP
Ili		52·6	296	i 9 16	- 2	—	—	—	—

Continued on next page.



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		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Przhevalsk		52.8	294	9 20	+ 1	—	—	—	—
Almata		53.1	295	i 9 21	0	—	—	—	—
Mineral	z.	53.1	70	e 9 18 <sub>a</sub>	- 3	—	—	i 9 35	?
Fabrichnaya		53.5	296	i 9 24	0	—	—	—	—
Rybach'e		54.1	296	i 9 27	- 1	—	—	—	—
Butte		54.3	59	e 9 27	- 3	—	—	—	—
Berkeley		54.4	73	e 9 35	+ 4	e 17 6	- 3	—	e 26.0
Frunse		54.7	297	i 9 33	0	—	—	—	—
Reno	z.	54.7	69	e 9 31	- 2	—	—	—	—
Naryn		54.9	295	e 9 36	+ 1	—	—	—	—
Santa Clara	E.	54.9	73	—	—	e 17 17	+ 1	—	—
Lick	z.	55.1	73	e 9 33 <sub>a</sub>	- 3	—	—	i 10 50	PcP
Kiruna		56.5	344	i 9 42 <sub>a</sub>	- 4	e 17 31?	- 6	i 10 40	PcP
Fresno	z.	56.6	72	e 9 51 <sub>a</sub>	+ 4	—	—	e 10 40	PcP
Shillong	E.	56.6	269	e 9 46	- 1	e 17 36	- 2	—	31.0
Scoresby Sund		57.1	2	i 9 50	0	i 17 47	+ 2	21 13	SS
Tinemaha	z.	57.2	71	e 9 47	- 4	—	—	—	—
Andijan		57.3	295	i 9 52	0	—	—	—	—
Namangan		57.5	297	i 9 54	+ 1	—	—	—	—
Fergana		57.9	296	e 9 55	- 1	—	—	—	—
Woody	z.	57.9	72	i 9 52	- 4	—	—	—	—
Chatra	z.	58.5	275	i 9 44	-16	—	—	—	e 34.0
China Lake	z.	58.5	71	e 9 59	- 1	—	—	i 10 23	?
Lunacharskoe		58.6	298	e 10 0	- 1	—	—	—	—
Tashkent		58.6	298	e 10 1	0	—	—	—	—
Dzhergetal		59.0	296	e 10 4	0	—	—	—	—
Pasadena		59.3	73	i 10 2	- 4	i 18 9	- 5	i 10 29	?
Garm		59.7	297	e 10 8	- 1	—	—	—	e 27.9
Boulder City		60.0	69	e 10 7	- 4	—	—	i 10 11	P
Khorog		60.1	294	e 10 11	0	—	—	—	—
Nelson		60.2	69	i 10 7	- 5	—	—	i 10 16	?
Obi-garm		60.2	297	e 10 13	+ 1	—	—	—	—
Pulkovo		60.6	334	i 10 15	0	e 18 34	+ 4	—	—
Kulyab		60.8	294	10 14	- 2	—	—	—	—
Stalinabad		60.8	296	i 10 16	0	—	—	—	—
Samarkand		61.0	299	e 10 17	- 1	—	—	—	—
Barratt	z.	61.3	73	e 10 23	+ 3	—	—	—	—
Moscow		61.8	327	i 10 23	0	—	—	—	—
Warsak Dam	E.	62.6	291	e 10 23	- 5	e 18 56	0	—	e 28.5
New Delhi		63.2	283	e 10 33	+ 1	e 19 3	0	19 21	PS
Reykjavik	z.	63.5	2	i 10 32	- 2	—	—	i 11 0	PcP
Upsala		63.7	340	i 10 36 <sub>a</sub>	0	i 19 11	+ 1	i 11 11	PcP
Tucson		64.9	69	e 10 40	- 3	—	—	—	e 31.5
Bairam-Ali		65.1	300	i 10 42	- 3	—	—	—	—
Bergen	N.	65.4	347	—	—	e 19 25	- 5	e 20 23?	?
Ashkabad		66.8	303	i 10 56	0	e 19 49	+ 1	—	—
Kizyl-Arvat		67.0	306	i 10 57	0	—	—	—	—
Kirkland Lake	z.	67.5	39	e 10 57	- 3	—	—	—	—
Quetta		68.0	292	i 11 2 <sub>k</sub>	- 1	e 20 2	0	e 39 25	P'P'
Makhach-kala		68.1	314	e 11 4	0	—	—	—	44.3
Copenhagen		68.6	341	i 11 8	+ 1	i 20 14	+ 5	20 32	PS
Grozny		68.6	314	i 11 7	0	—	—	—	—
Lubbock		68.9	62	e 11 7	- 2	—	—	—	—
Baku		69.1	310	i 11 12	+ 2	—	—	—	—
Aberdeen	E.	69.4	350	—	—	i 20 40	PS	—	i 41.0
Shemakla		69.5	311	i 11 12	0	—	—	—	—
Tiflis		70.3	313	i 11 17	0	—	—	—	—
Gori		70.4	315	e 11 20	+ 2	—	—	—	—
Borzhomi		70.9	315	i 11 22	+ 1	i 20 37	+ 1	—	—
Hyderabad		70.9	274	i 11 16	- 5	i 20 34	- 2	—	33.9
Tsikhlis-Dzhvari		70.9	315	11 23	+ 2	—	—	—	—
Zugdidi		70.9	316	i 11 25	+ 4	—	—	—	—
Fayetteville	z.	71.0	56	i 11 17	- 5	e 20 33	- 4	i 11 29	P
Sotchi		71.0	318	i 11 22	0	e 20 38	+ 1	—	e 36.5
Lwow		71.1	333	i 11 21	- 1	e 20 38	0	—	—

Continued on next page.

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	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Abastumanj	71.2	314	e 11 23	0	—	—	—	—
Goris	71.4	312	i 11 26	+ 2	—	—	—	—
Leninakan	71.5	313	c 11 26	+ 2	—	—	—	—
Ottawa	71.5	38	i 11 21 <sub>k</sub>	- 3	20 35	- 8	14 9	PP
Potsdam	71.5	340	i 11 24 <sub>a</sub>	0	i 20 48	+ 5	i 11 39	pP e 36.5
Shawinigan Falls N.	71.5	35	11 22	- 2	—	—	—	—
Theodosia	71.5	322	i 11 24	0	e 20 44	+ 1	—	—
Durham	71.7	349	—	—	e 20 39	- 6	20 49	S
Erevan	71.7	313	i 11 26	0	20 46	+ 1	—	—
Seven Falls E.	71.7	34	e 11 25	- 1	i 20 43	- 2	21 29	PS
Kishinev	72.1	328	i 11 29	+ 1	e 20 51	+ 1	—	—
Iasi	72.3	330	e 11 30	+ 1	—	—	—	—
Cleveland	72.4	44	e 11 27	- 3	e 20 48	- 5	e 24 21	SS
Witteveen Z.	72.4	344	i 11 21 <sub>a</sub>	- 9	—	—	—	—
Yalta	72.4	322	i 11 30	0	e 20 55	+ 2	—	—
Raciborzu	72.5	336	e 11 31	+ 1	e 20 54	0	e 11 55	PcP 30.7
Collmberg	72.6	339	e 11 31	0	e 20 58	+ 2	e 25 41	SS e 35.0
Uzhgorod	72.7	334	i 11 32	0	e 20 59	+ 2	—	—
Poona	72.8	279	i 11 32	0	i 21 1	+ 3	21 34	PS
Cincinnati	73.1	47	i 11 31	- 3	—	—	—	—
Bombay	73.2	279	i 11 35	0	e 21 4	+ 2	e 21 25	PS
Jena	73.2	339	c 11 36	+ 1	e 21 4	+ 2	e 11 50	PcP
Madras E.	73.2	270	e 11 35	0	—	—	—	—
De Bilt	73.3	344	i 11 37	+ 2	e 21 11	+ 7	e 11 52	PcP e 36.5
Prague	73.4	337	e 11 36 <sub>a</sub>	0	c 21 7	+ 2	e 11 49	PcP e 31.5
Rathfarnham Castle	73.7	352	i 11 38 <sub>k</sub>	0	e 21 31	PS	i 11 53	PcP e 46.6
Cheb	73.9	339	e 11 42	+ 3	e 21 16	+ 6	e 21 49	PS e 40.5
Pittsburgh	74.0	43	—	—	i 21 7	- 4	—	—
Ogyalla	74.5	335	e 11 47	+ 5	e 21 43	ScS	e 14 43	PP e 44.0
Budapest E.	74.6	333	11 39	- 4	e 16 18	PPP	11 53	PcP 44.4
N.	74.6	333	c 11 42	- 1	e 21 17	- 1	i 11 59	PcP e 43.5
Morgantown	74.7	44	i 11 54	+11	e 21 24	+ 5	—	—
Uccle	74.7	345	e 11 44	+ 1	e 21 22	+ 3	e 11 57	PcP e 34.5
Kew	74.8	347	i 11 43	- 1	e 21 34	+14	i 12 5	PcP e 39.5
Bucharest	75.3	327	i 11 47 <sub>a</sub>	0	i 21 41	+15	—	—
Szeged	75.4	332	c 11 41	- 6	21 41	+14	14 23	PP e 42.7
Harvard	75.5	36	—	—	e 21 32	+ 4	—	43.2
Kalossa	75.5	324	e 11 51	+ 3	e 12 18	?	e 12 11	PcP e 44.5
Timisoara	75.6	332	e 11 50	+ 2	e 21 43	+14	—	e 39.5
Karlsruhe	75.7	341	e 11 50 <sub>a</sub>	+ 1	e 21 38	+ 8	e 12 36	PcP e 40.5
Weston	75.7	36	i 11 47 <sub>a</sub>	- 2	e 21 23	- 7	—	—
Stuttgart	75.8	340	i 11 50 <sub>a</sub>	0	e 21 35	+ 4	e 12 5	PcP e 39.5
Palisades	75.9	38	i 11 48	- 2	e 21 28	- 4	—	e 38.3
Fordham	76.1	38	—	—	e 21 28	- 7	—	—
Halifax	76.2	31	e 11 50	- 2	21 26	-10	30 49	SSS
Strasbourg	76.2	341	i 11 52	0	e 21 41	+ 5	i 12 7	PcP 40.5
Washington	76.5	42	c 11 48	- 6	—	—	—	—
Belgrade	76.6	331	e 11 57 <sub>a</sub>	+ 3	e 22 2	PS	e 12 17	PcP e 44.7
Paris	77.0	345	i 11 57	+ 1	e 21 44	- 1	i 12 8	PcP e 40.5
Istanbul Z.	77.2	324	11 57	0	21 48	+ 1	12 14	PcP 33.5
Zürich	77.2	340	e 11 58 <sub>a</sub>	+ 1	e 21 51	+ 4	e 12 9	PcP
Basle	77.3	341	e 11 59	+ 1	e 21 40	- 8	e 14 1	?
Chur	77.3	339	e 12 0 <sub>a</sub>	+ 2	—	—	—	—
Triest	77.7	336	i 12 1 <sub>a</sub>	+ 1	i 21 54	+ 2	e 22 36	PS
Chambon-la-Forêt	77.8	345	e 12 1	0	—	—	—	—
Neuchatel	77.9	341	e 12 3	+ 2	e 21 58	+ 4	—	—
Salo	78.5	338	e 12 4	0	i 22 42	PS	e 12 14	PcP
Oropa	79.0	341	i 12 24	+17	e 23 9	+ 3	—	—
Pavia	79.2	339	i 12 11 <sub>k</sub>	+ 3	e 22 26	+18	e 18 1	PPP e 39.7
Bologna	79.4	338	e 12 14	+ 5	e 22 16	+ 6	e 22 59	PS
Clermont-Ferrand	79.8	343	i 12 15	+ 3	e 22 20	+ 6	e 22 33	PS 36.5
Prato	80.0	337	e 12 14	+ 1	e 22 23	+ 6	—	—
Florence	80.1	337	e 12 2 <sub>a</sub>	-11	i 22 22	+ 4	e 15 20	PP
Siena	80.5	337	e 12 11	- 4	—	—	—	—
Ksara	80.8	315	i 12 19	+ 2	23 5?	PS	15 43	PP
Rome	81.5	336	i 12 22	+ 1	e 22 40	+ 8	31 9	SSS

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	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Tacubaya	81.5	70	e 12 14	- 7	—	—	—	—
Taranto	81.6	333	e 14 51	PP	22 42	+ 9	—	44.9
Athens	81.8	326	e 12 21	- 1	i 22 36	+ 1	i 22 52	SKS
Messina	84.2	333	i 12 35	+ 1	i 23 11	+12	32 54	SSS
Tortosa	85.1	344	e 12 34	- 5	i 23 24	+16	—	—
Helwan	86.1	317	i 12 44k	0	23 21	+ 3	16 7	PP
Riverview	86.5	187	—	—	e 23 23	+ 1	c 29 15	SS
Toledo	86.7	348	e 12 47	0	c 23 26	+ 2	17 2	PP
Bermuda	87.0	37	—	—	e 23 25	- 2	—	—
Alicante	87.6	345	12 51	0	23 41	+ 9	—	—
Almeria	89.4	346	i 12 57	- 3	23 41	- 8	16 29	PP
Malaga	89.8	347	i 13 2	0	23 26	[- 6]	16 58	PP
Tamanrasset	z. 101.5	336	e 13 54	- 1	e 19 42	?	e 18 6	PP
Bogota	N. 107.3	57	—	—	e 25 3	[+ 2]	e 28 43	PPS
La Paz	128.2	64	i 24 22	?	30 31	PS	i 38 31	SS
Pretoria	z. 134.8	289	e 19 21?	[ 0]	e 23 8	PKS	—	—
Kimberley	z. 139.0	289	e 19 21	[- 8]	—	—	—	—

June 8d. 13h. 24m. Epicentre  $36^{\circ}4N$ .  $141^{\circ}2E$ .

Intensity V at Hukushima; IV at Kakioka and Mito; II-III at Onahama, Utunomiya, Shirakawa, Inawasiro, and Sendai.

Seismo. Bull. Cent. Met. Obs., Japan, for 1953, June, Tokyo, 1953, p. 11, with macroseismic chart.

June 8d. 13h. 50m. Epicentre  $35^{\circ}0N$ .  $132^{\circ}8E$ .

Intensity V at Hamada; IV at Matsue, Hirosima, Yonago; II-III at Okayama, Matuyama, Tottori, Koti, Tokushima, and Himeji.

Loc. cit. 13h.24m.

June 8d. 20h. 36m. Provisional epicentre  $40^{\circ}25S$ .  $173^{\circ}65E$ . Depth of focus 160km.

Magnitude 6.

Felt extensively from Wanganui and Darnevirke to Nelson, Blenheim, and Cheirot.

Seismological Observatory Bulletin for stations of New Zealand, Bulletin E.132, April-May-June, 1953, Wellington, 1955, p. 11.

June 9d. 1h. 39m. 2s. Epicentre  $53^{\circ}1N$ .  $160^{\circ}9E$ . (as on 1953, February 9d.).

$$A = -.5698, B = +.1973, C = +.7977; \quad \delta = -8; \quad h = -7;$$

$$D = +.327, E = +.945; \quad G = -.754, H = +.261, K = -.603.$$

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Nemuro	14.1	232	e 2 55	-28	e 6 33	+31	—	—
Abashiri	14.2	237	e 3 28	+ 4	—	—	—	9.1
Wakkanai	14.7	246	e 3 44	PP	—	—	—	e 8.4
Obihiro	15.6	236	e 5 6	?	—	—	—	—
Sapporo	16.4	240	e 3 42	-11	e 7 15	SS	e 4 2	PP
Urakawa	16.4	235	e 3 51	- 2	e 7 16	SS	—	—
Miyako	18.7	232	e 4 17	- 5	—	—	—	—
Sendai	20.3	231	e 4 40	0	—	—	—	—
Hukushima	20.9	232	e 4 43	- 3	—	—	—	—
Inawasiro	E. 21.2	231	e 4 46	- 3	—	—	—	—
Shirakawa	21.5	230	e 4 56	+ 4	—	—	—	—
Utunomiya	z. 22.2	230	i 4 55	- 5	c 9 22	SS	—	—
Maebasi	z. 22.6	231	e 5 2	- 1	—	—	—	—
Kumagaya	22.7	230	e 4 16	?	—	—	—	—
Nagano	N. 22.8	233	e 5 12	+ 7	—	—	—	—
Matusiro	22.9	235	e 5 4	- 2	e 9 15	+ 2	—	—
Oiwake	22.9	233	e 5 3	- 3	—	—	—	—
Matumoto	23.3	234	5 10	0	9 20	0	—	—
Toyama	23.3	235	e 5 11	+ 1	—	—	—	—
Kohu	E. 23.5	231	e 5 12	0	e 9 21	- 2	—	—

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		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		<sup>c</sup>	<sup>e</sup>	m. s.	s.	m. s.	s.	m. s.	m.
Misima	E.	23.8	232	e 5 14	- 1	—	—	—	—
Gihu		24.6	233	e 5 19	- 4	—	—	—	—
Nagoya		24.6	234	e 5 41	?	—	—	e 5 55	PP
Kameyama		25.1	233	e 4 30	?	—	—	—	e 14.9
Kyoto		25.4	236	e 5 27	- 4	e 9 31	-25	—	—
Osaka		25.7	235	e 5 42	+ 9	—	—	—	—
Kobe		25.9	236	e 5 34	- 1	—	—	e 4 50	?
Sumoto		26.3	238	e 5 37	- 2	—	—	—	—
Takamatu		26.8	239	e 5 40	- 4	e 10 12	- 7	—	12.1
Hamada		27.3	241	e 5 48	0	e 10 19	- 8	—	e 12.8
Hirosima		27.5	240	e 5 46	- 4	—	—	—	—
Koti		27.6	237	e 5 49	- 2	e 10 28	- 4	—	—
Matuyama		27.8	238	e 5 48	- 5	e 10 28	- 7	e 6 52	PPP
College		28.1	45	e 5 57	+ 2	i 10 42	+ 2	—	e 12.8
Kagosima		30.7	238	e 6 21	+ 2	—	—	—	e 11.2
Zô-Sè	Z.	36.1	248	i 7 3 <sub>a</sub>	- 2	e 12 47	+ 2	—	—
Nanking		36.8	253	i 7 7 <sub>a</sub>	- 4	12 53	- 3	e 15 20	SS
Resolute Bay		43.1	23	i 8 6 <sub>a</sub>	+ 2	i 14 36	+ 6	i 18 3	ScS
Hong Kong		46.9	247	e 8 32	- 2	e 15 20	- 5	—	19.6
Baguio		48.3	237	e 8 42	- 3	e 15 48	+ 3	—	24.0
Hungry Horse		51.0	58	i 9 7	+ 1	—	—	—	—
Shasta	Z.	51.4	71	e 9 10 <sub>a</sub>	+ 1	e 10 49	PP	e 9 23	?
Mineral	Z.	52.1	71	e 9 15 <sub>a</sub>	+ 1	i 9 58	?	e 9 29	?
Saskatoon		52.3	51	—	—	e 16 40	0	e 19 0	ScS
Butte		53.3	60	e 9 24	+ 1	e 19 13	ScS	—	22.9
Berkeley		53.4	74	e 9 30 <sub>a</sub>	+ 6	e 16 59	+ 4	e 20 59	SS
Reno	Z.	53.7	70	i 9 27 <sub>k</sub>	+ 1	—	—	—	e 25.0
Lick	Z.	54.1	74	i 9 30 <sub>k</sub>	+ 1	i 10 1	?	i 9 35	P
Fresno	Z.	55.6	73	e 9 41 <sub>a</sub>	+ 1	e 11 5	?	e 9 56	?
Kiruna		55.8	344	i 9 41 <sub>a</sub>	0	i 17 28	0	e 19 22	ScS
Tinemaha		56.2	72	e 9 47	+ 3	—	—	—	—
Logan		56.6	63	e 9 48	+ 1	—	—	—	—
Scoresby Sund		56.7	2	i 9 48	0	e 17 44	+ 4	e 19 39	ScS
Woody	Z.	56.9	72	i 9 48	- 1	—	—	—	27.0
China Lake	Z.	57.5	72	e 9 54	+ 1	—	—	i 9 59	P
Shillong	E.	57.5	270	e 9 50	- 3	e 10 46	PcP	e 11 49	PP
Pasadena		58.4	74	e 10 0	0	i 18 4	+ 2	e 17 26	?
Boulder City		59.0	71	e 10 4	0	—	—	—	e 24.9
Nelson		59.2	71	i 10 5	0	—	—	—	—
Chatra	Z.	59.4	275	i 10 4	- 2	—	—	—	e 34.7
Palomar	Z.	59.7	73	i 10 9	0	—	—	—	—
Barratt	Z.	60.3	75	e 10 13	0	i 10 45	?	i 10 17	P
Calcutta	E.	61.9	271	e 10 26	+ 2	e 19 17	PPS	—	—
Reykjavik		63.1	2	i 10 33	+ 1	—	—	—	—
Warsak Dam	E.	63.3	292	e 10 28	- 5	e 18 56	- 8	—	e 33.0
Upsala		63.6	341	i 10 35 <sub>a</sub>	0	i 19 7	- 1	i 11 7	PcP
New Delhi	N.	64.0	284	e 10 22	-16	e 19 0	-13	20 31	ScS
Tucson		64.0	71	i 10 37	- 1	e 19 8	- 5	e 12 47	PP
Bergen	N.	65.2	347	—	—	e 19 16	-12	e 20 39	ScS
Kirkland Lake	Z.	66.6	39	e 10 53 <sub>a</sub>	- 1	—	—	—	e 35.4
Lubbock		67.9	62	e 11 3	+ 1	—	—	—	—
Copenhagen		68.5	342	i 11 7	+ 1	i 20 10	+ 2	20 24	PS
Quetta		68.7	292	i 11 4	- 3	e 19 47	-23	i 13 13	PP
Chihuahua		69.4	70	—	—	e 27 43	SSS	—	—
St. Louis		69.9	52	i 11 16	+ 1	i 20 26	+ 2	—	—
Fayetteville	Z.	70.0	56	i 11 14 <sub>a</sub>	- 1	e 20 25	- 1	e 21 15	ScS
Ottawa		70.6	39	i 11 18 <sub>a</sub>	- 1	20 26	- 7	14 2	PP
Shawinigan Falls	N.	70.7	35	e 11 23	+ 3	—	—	—	e 36.0
Seven Falls	E.	70.9	34	e 11 21	0	i 20 38	+ 2	28 9	SSS
Potsdam		71.5	341	i 11 25 <sub>a</sub>	+ 1	i 20 48	+ 5	i 11 34	pP
Hyderabad	E.	71.7	275	i 11 22	- 4	i 20 34	-11	e 11 5	?
Cincinnati		72.2	48	i 11 28	- 1	—	—	—	35.4
Witteveen	Z.	72.3	344	i 11 31 <sub>a</sub>	+ 2	—	—	—	—
Collmberg		72.5	340	i 11 32	+ 2	e 20 56	+ 2	e 14 15	PP
Iasi		72.5	330	e 11 31	+ 1	e 20 54	0	—	e 34.0

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	$\Delta$	Az.	P.	O - C.	S.	O - C.	Supp.	L.
	<sup>o</sup>	<sup>o</sup>	m. s.	s.	m. s.	s.	m. s.	m.
Raciborzu	72.5	336	e 11 32	+ 2	e 21 51	PPS	e 12 24	?
Pittsburgh	73.1	44	e 11 39?	+ 5	i 21 1	0	—	—
De Bilt	73.2	345	e 11 34	- 1	e 21 8	+ 6	e 14 20	PP
Jena	73.2	340	i 11 36	+ 1	e 21 4	+ 2	e 21 27	PS
Prague	73.4	339	i 11 36 <sub>a</sub>	0	e 21 6	+ 1	e 14 15	PP
Rathfarnham Castle	73.4	352	i 11 36 <sub>a</sub>	0	e 21 8	+ 3	i 12 1	?
Morgantown	73.7	45	i 11 54	PcP	—	—	—	—
Poona	73.7	279	i 11 36	- 2	i 21 3	- 5	—	—
Cheb	73.8	340	e 11 40	+ 2	e 21 15	+ 6	e 21 45	ScS
Bombay	74.0	281	i 11 39	0	e 21 11	0	16 15	PPP
Ogyalla	74.5	335	e 11 45	+ 3	e 21 23	+ 6	e 22 13	PPS
Kew	74.6	348	e 11 45	+ 2	e 32 1	Q	—	—
Uccle	74.6	345	e 11 43	0	e 21 23	+ 5	e 14 31	PP
Harvard	74.6	37	i 11 44 <sub>k</sub>	+ 1	—	—	—	—
Weston	74.8	37	i 11 46 <sub>a</sub>	+ 2	e 21 20	0	e 25 56	SS
Palisades	75.0	40	e 11 45	0	e 21 20	- 3	—	—
Fordham	75.2	40	i 11 42	- 4	e 21 24	- 1	—	—
Bucharest	75.4	328	i 11 47 <sub>a</sub>	0	i 21 29	+ 2	i 11 50	P
Halifax	75.4	31	i 11 48?	+ 1	21 28?	+ 1	22 19?	PPS
Szeged	75.5	333	11 34	-14	—	—	e 12 26	?
Karlsruhe	75.6	341	e 11 49 <sub>a</sub>	+ 1	e 21 3	-26	—	—
Washington	75.6	42	e 11 48	0	—	—	—	—
Stuttgart	75.7	341	i 11 50 <sub>a</sub>	+ 1	e 21 32	+ 2	e 22 5	PS
Timisoara	75.7	332	e 11 52	+ 3	e 21 23	- 7	—	—
Strasbourg	76.2	342	i 11 52	0	e 21 33	- 3	e 14 47	PP
Belgrade	76.7	332	e 11 55 <sub>a</sub>	0	e 21 44	+ 3	e 14 32	PP
Paris	76.8	346	i 11 57	+ 2	i 21 47	+ 5	e 14 51	PP
Basle	77.2	342	e 11 57 <sub>a</sub>	0	—	—	—	—
Zürich	77.2	342	e 12 1 <sub>a</sub>	+ 4	e 21 49	+ 2	—	—
Istanbul	z. 77.4	325	11 58	0	21 58?	+ 9	e 17 58?	?
Chur	77.5	340	e 12 0	+ 1	—	—	—	—
Chambon-la-Forêt	77.6	346	i 12 0	0	—	—	—	—
Triest	77.7	337	e 11 58?	- 2	e 21 50	- 2	e 26 52	SS
Neuchatel	77.8	343	e 12 2	+ 1	—	—	—	—
Salo	78.5	339	e 12 7	+ 3	e 22 16	+15	e 13 28	?
Oropa	79.0	341	i 12 14	PcP	e 22 35	ScS	—	—
Colombo	z. 79.1	267	—	—	e 22 0	- 7	e 30 1	SSS
Pavia	79.1	340	i 12 10	+ 2	i 22 13	+ 6	e 15 20	PP
Bologna	79.3	338	e 12 33	?	e 23 18	PPS	e 15 42	?
Clermont-Ferrand	79.7	345	e 12 14	+ 3	e 22 22	+ 7	e 15 16	PP
Florence	80.0	338	e 12 3 <sub>a</sub>	-10	e 22 29	+12	i 12 15	P
Prato	80.0	338	e 12 14?	+ 1	e 22 1?	-16	—	—
Tacubaya	80.5	70	e 12 18	+ 3	e 22 23	+ 1	—	—
Ksara	81.1	317	i 12 22?	+ 4	22 53?	ScS	15 30?	PP
Rome	81.5	337	i 12 20	- 1	e 22 34	+ 2	—	—
Taranto	81.6	333	—	—	e 23 21	PS	—	—
Athens	82.0	327	e 12 21 <sub>a</sub>	- 2	e 22 41	+ 4	i 23 40	PPS
Messina	84.2	333	e 12 33	- 1	e 22 55	- 4	e 29 47	?
Tortosa	84.9	345	i 12 21	-17	23 29	+23	—	—
Bermuda	86.1	38	i 12 39	- 5	i 23 33	ScS	e 29 1	SS
Helwan	86.5	318	i 12 46 <sub>k</sub>	0	e 23 22	0	16 8	PP
Toledo	86.5	349	e 12 39	- 7	23 27	+ 5	16 10	PP
Alicante	87.5	346	12 48	- 3	23 31	0	18 14	PPP
Granada	89.1	348	e 12 54 <sub>a</sub>	- 4	23 54	+ 8	16 24	PP
Almeria	89.3	347	e 13 0	+ 1	23 25	[- 4]	16 34	PP
Malaga	89.6	349	i 13 4	+ 3	25 7	PS	—	—
Tamanrasset	z. 101.5	337	i 13 55 <sub>k</sub>	0	e 18 1	PP	e 20 8	PPP
Chinchina	105.3	60	—	—	e 24 52	[ 0]	—	—
Bogota	106.3	59	e 18 56	PP	e 25 0	[+ 4]	e 28 10	PS
Huancayo	119.6	69	e 20 20	PP	e 36 58	SS	e 30 22	PS
La Paz	128.2	65	e 19 12	[+ 3]	i 26 18	[+ 3]	e 31 28	PS
Pretoria	z. 135.5	289	e 19 24?	[+ 2]	—	—	—	—
Kimberley	z. 139.8	289	e 19 24	[- 6]	—	—	—	—
Grahamstown	z. 142.1	283	e 19 31	[- 3]	—	—	—	—



The scanned images of the 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 collected by SGA Storia Geofisica Ambiente (Bologna) on behalf of the Istituto Nazionale di Geofisica e Vulcanologia (Rome), in the frame of the EUROSEISMOS project.

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1953

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June 9d. 5h. 34m. 49s. Epicentre 31°·0N. 138°·5E. Depth of focus 0·070.  
(as on 1950, Aug. 24d.).

Epicentre 30°·9N. 139°·8E. Depth 400-450km.  
Seismo. Bull. Cent. Met. Obs., Japan, June, 1953, Tokyo, 1953, p.13.

A = -·6431, B = +·5690, C = +·5125;  $\delta = -1$ ;  $h = +2$ ;  
D = +·663, E = +·749; G = -·384, H = +·340, K = -·859.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Torisima		1·6	108	0 52	-10	1 36	-14	—	—
Hatidyozima		2·4	28	e 0 59	- 7	1 51	- 7	—	—
Omaesaki		3·6	356	—	—	e 2 15	+ 2	—	—
Osima		3·8	11	e 1 13	- 3	2 14	- 2	—	—
Ajiro		4·1	7	—	—	e 2 14	- 6	—	—
Misima	E.	4·1	5	e 1 17	- 1	2 21	+ 1	—	—
Mera		4·1	16	e 1 16	- 2	—	—	—	—
Nagoya	E.	4·3	343	—	—	e 2 29	+ 5	—	—
Kohu		4·6	1	e 1 23	0	2 31	+ 3	—	—
Tokyo		4·8	13	e 1 21	- 4	2 30	- 2	—	—
Kumagaya		5·2	8	e 1 28	0	2 38	0	—	—
Oiwake		5·3	1	e 1 39	+10	—	—	—	—
Kakioka		5·4	15	e 1 27	- 3	2 40	- 2	—	—
Maebasi		5·4	5	e 1 32	+ 2	—	—	—	—
Mito		5·6	16	e 1 31	- 1	2 44	- 1	—	—
Utunomiya		5·6	11	e 1 25	- 7	2 43	- 2	—	—
Shirakawa		6·3	13	e 1 36	- 3	2 57	- 1	—	—
Inawasiro	E.	6·7	11	e 1 43	0	3 7	+ 2	—	—
Hokusima		6·9	13	e 1 41	- 5	3 11	+ 2	—	—
Sendai		7·5	15	e 1 56	+ 4	3 21	+ 1	—	—
Mizusawa	E.	8·4	14	—	—	3 43	+ 5	—	—
Morioka		8·9	13	e 2 7	0	—	—	—	—
Baguio		21·9	232	i 4 10	- 8	—	—	—	—
Chatra	Z.	44·8	279	i 7 30	- 2	—	—	—	—
College		55·5	30	8 51	0	—	—	—	—
Quetta	Z.	60·5	291	i 9 21	- 3	—	—	—	—
Kiruna	Z.	71·3	340	i 10 32 <sub>a</sub>	0	—	—	—	—
Shasta	Z.	76·7	51	e 11 2 <sub>a</sub>	0	—	—	—	—
Upsala	Z.	77·3	334	i 11 5	- 1	—	—	—	—
Mineral	Z.	77·4	51	e 11 6 <sub>a</sub>	0	—	—	e 11 22	PcP
Hungry Horse		77·9	41	i 11 10	+ 1	—	—	—	—
Lick	Z.	78·9	54	e 11 14 <sub>a</sub>	0	—	—	i 11 18	P
Butte		80·0	42	i 11 21	+ 1	—	—	—	—
Tinemaha	Z.	81·4	53	i 11 28 <sub>a</sub>	+ 1	—	—	—	—
China Lake	Z.	82·5	53	i 11 31 <sub>a</sub>	- 2	—	—	—	—
Logan		82·9	45	e 11 35	0	—	—	—	—
Pasadena		83·0	55	i 11 35 <sub>a</sub>	0	—	—	—	—
Palomar	Z.	84·3	55	i 11 41 <sub>a</sub>	- 1	—	—	—	—
Nelson		84·4	52	i 11 42	0	—	—	—	—
Barratt	Z.	84·8	56	i 11 44 <sub>a</sub>	0	—	—	—	—
Tucson		89·1	53	e 12 4	0	—	—	—	—
Alicante		101·1	329	17 24	PP	24 54	+61	26 32	PS
Granada		103·5	330	19 7 <sub>k</sub>	?	—	—	—	48·4

June 9d. 7h. 54m.

Suggested epicentres 35°·5S. 177°W. (Wellington).  
34°S. 178°W. (Strasbourg).

Magnitude 5·5 (Wellington).

Seismological Observatory Bulletin E.132, April-June, 1953, Wellington, 1955, pp. 11-12.

June 9d. 9h. 57m. Epicentre 35°·8N. 140°·2E. Depth 70km.

Intensity II-III at Tokyo, Utunomiya, Kakioka, Ajiro, and Kashiwa.

Seismo. Bull. Cent. Met. Obs., Japan, for June, 1953, Tokyo, 1953, p. 14, with macro-seismic chart.

June 9d. 11h. 11m. Hindu Kush. Epicentre 36°·8N. 70°·8E. Depth of focus 180km.

Bulletin Seismo. Stations of the U.S.S.R. for April-June, 1953, Moscow, 1954, p. 119.

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1953

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June 9d. 16h. 28m. 21s. Epicentre 39°·5N. 28°·0E.

Felt in Turkey. Epicentre adopted from Strasbourg.

$$A = +.6831, B = +.3632, C = +.6335; \quad \delta = -14; \quad h = -2;$$

$$D = +.469, E = -.883; \quad G = +.559, H = +.297, K = -.774.$$

		$\Delta$	Az.		P.		O-C.		S.		O-C.		Supp.		L. m.
			°	'	m.	s.	s.	m.	s.	s.	m.	s.			
Istanbul		1·8	27	i 0	33	+ 1	i 1	4	+ 4 <sub>g</sub>	i 0	37		P <sub>g</sub>	—	
Athens		3·7	247	e 0	58 <sub>a</sub>	- 2	i 1	43	- 2	e 1	5		P <sub>g</sub>	—	
Sofia		4·8	314	e 1	18	+ 3	e 2	7	- 5	i 2	36		S <sub>g</sub>	—	
Bucharest		5·1	345	e 1	26	- 4*	i 2	40	+ 5*	e 1	38		P <sub>g</sub>	—	
Campulung		6·2	340	e 1	43	+ 8	—	—	—	—	—		—	3·8	
Focsani		6·2	355	e 1	57	- 7 <sub>g</sub>	e 3	40	+ 15 <sub>g</sub>	—	—		—	—	
Bacau		7·1	354	e 2	9	+ 5*	—	—	—	—	—		—	4·4	
Iasi		7·7	358	e 0	58	- 58	i 3	23	- 2	i 3	30		?	—	
Belgrade		7·7	316	e 1	46 <sub>a</sub>	- 10	e 3	21	- 4	e 4	13		S <sub>g</sub>	—	
Timisoara		8·0	324	e 1	59	- 1	e 3	54	+ 21	e 4	35		S <sub>g</sub>	e 4·9	
Ksara		8·5	129	e 2	5	- 2	i 4	17	+ 1*	—	—		—	—	
Szeged		8·9	322	e 3	34	?	e 4	22	- 6*	4	44		S <sub>g</sub>	—	
Kalossa	E.	9·6	320	—	—	—	e 5	41	?	—	—		—	—	
Kecskemet		9·6	324	—	—	—	e 5	13	- 4 <sub>g</sub>	—	—		—	—	
Messina		9·8	266	e 2	26	+ 2	e 4	6	- 11	e 6	28		?	—	
Helwan	Z.	10·0	163	—	—	—	e 4	26	+ 4	e 4	59		S*	—	
Budapest		10·3	324	e 2	30	- 2	2	58	?	e 3	15		?	e 6·0	
Ogyalla		11·0	323	e 3	23	?	e 5	2	SS	—	—		—	e 5·8	
Triest		12·2	305	e 2	58	0	e 6	36	?	e 3	7		PP	7·5	
Florence		13·2	294	e 4	10	+ 59	e 7	37	?	—	—		—	e 8·2	
Prague		14·3	322	i 3	28	+ 2	e 6	9	+ 3	e 3	59		?	e 8·4	
Chur		15·3	305	e 3	43	+ 4	—	—	—	—	—		—	—	
Collnberg		15·8	323	e 3	47	+ 2	—	—	—	e 4	20		?	—	
Jena		16·2	320	e 3	53	+ 3	e 4	12	PPP	e 3	57		?	—	
Zürich		16·2	306	e 3	49	- 1	e 7	5	SS	e 3	52		P	—	
Stuttgart		16·3	311	e 3	55	+ 3	—	—	—	i 3	59		?	e 7·2	
Potsdam	Z.	16·5	326	e 4	0	+ 6	e 7	28	SS	—	—		—	e 9·6	
Basle		16·9	305	e 4	1	+ 2	—	—	—	—	—		—	e 9·0	
Karlsruhe		16·9	311	e 4	5 <sub>k</sub>	+ 6	e 4	59	?	e 4	8		?	e 8·6	
Strasbourg		17·1	310	i 4	7	+ 5	e 7	34	SS	e 4	21		PP	10·0	
Copenhagen		19·2	333	e 4	31	+ 3	e 8	22	SS	—	—		—	10·6	
Witteveen	Z.	19·8	322	i 4	38 <sub>k</sub>	+ 3	—	—	—	—	—		—	—	
Uccle	E.	20·1	311	e 4	38	0	—	—	—	—	—		—	e 10·6	
De Bilt		20·2	317	e 4	39	0	—	—	—	—	—		—	e 10·6	
Chambon-la-Forêt		20·4	304	i 4	42	+ 1	—	—	—	—	—		—	—	
Paris		20·5	306	e 4	44	+ 2	e 8	45	SS	e 5	12		PP	—	
Upsala		21·4	344	i 4	51	0	e 11	9	?	i 5	7		PP	e 11·8	
Tamanrasset	Z.	25·3	236	e 5	29	- 1	e 10	5	+ 11	e 6	11		PP	12·9	
Kiruna		28·7	355	i 6	0	- 1	e 10	39	- 11	i 6	53		PP	e 14·8	
Scoresby Sund		40·2	336	i 7	40 <sub>a</sub>	0	—	—	—	—	—		—	21·6	
Kimberley	Z.	68·0	184	e 11	2	- 1	—	—	—	—	—		—	—	
Fayetteville	Z.	87·8	317	i 12	51 <sub>a</sub>	- 1	—	—	—	—	—		—	—	

June 9d. 20h. 59m.

Suggested epicentres : 34°·5S. 178°W. (Wellington).

33°·5S. 179°W. (Strasbourg).

Magnitude 5·5 (Wellington).

Loc. cit. 7h., p. 12.

June 10d. 3h. 32m. Provisional epicentre 35°·0S. 177°·5W.

Loc. cit., 9d. 20h.

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1953

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June 10d. 18h. 23m. 46s. Epicentre 4°·0S. 128°·5E. (as on 1950, November 29d.).

A = -·6210, B = +·7807, C = -·0693;  $\delta = -6$ ;  $h = +7$ ;  
D = +·783, E = +·623; G = +·043, H = -·054, K = -·998.

		$\Delta$ °	Az. °	P.		O-C. s.	S.		O-C. s.	Supp.		L. m.	
				m.	s.		m.	s.		m.	s.		
Djakarta		21·7	264	e 4	58	+ 3	i 8	51	0	i 5	10	PP	i 10·8
Baguio		21·8	339	i 4	56	0	i 9	1	+ 9	—	—	—	—
Hong Kong		29·7	332	6	11	+ 1	e 10	51	-15	—	—	—	—
Brisbane		33·1	138	i 6	38	- 2	e 11	51	- 8	e 7	58	PP	e 15·5
Zò-Sè	Z.	35·6	350	i 7	2 <sub>a</sub>	+ 1	12	42	+ 4	—	—	—	—
Riverview		36·4	148	i 7	10 <sub>a</sub>	+ 2	i 12	45	- 5	i 7	24	pP	i 17·5
Simidu	N.	36·8	7	e 7	9	- 2	—	—	—	e 9	6	PPP	—
Melbourne	E.	36·9	158	—	—	—	e 13	7	+ 9	e 13	42	?	e 16·8
Nanking		37·0	346	i 7	14 <sub>a</sub>	+ 1	i 12	59	0	i 7	30	?	—
Koti	N.	37·7	7	e 7	19	0	—	—	—	—	—	—	—
Matuyama		37·9	6	e 7	20	0	e 13	6	- 7	e 9	32	PcP	—
Siomisaki		37·9	9	e 7	21	+ 1	—	—	—	—	—	—	—
Hirosima	Z.	38·4	6	e 7	23	- 2	—	—	—	—	—	—	—
Takamatu	N.	38·5	7	e 7	24	- 2	e 13	19	- 3	—	—	—	—
Sumoto		38·6	10	i 7	26	0	i 13	20	- 3	—	—	—	—
Hamada		38·8	4	7	28	0	e 13	16	-10	—	—	—	—
Osaka		39·0	10	e 7	38	+ 8	e 7	50	?	e 7	58	?	—
Kameyama		39·4	11	e 7	32	- 1	i 13	31	- 4	—	—	—	—
Kyoto		39·4	9	e 7	33	0	—	—	—	—	—	—	—
Nagoya	N.	39·8	11	e 7	35	- 1	—	—	—	—	—	—	—
Toyooka		39·8	7	e 7	36	0	—	—	—	—	—	—	—
Shizuoka		39·9	12	e 8	6	+29	—	—	—	—	—	—	—
Gihu		40·0	11	e 7	39	+ 1	—	—	—	—	—	—	—
Misima	N.	40·1	13	e 7	38	- 1	—	—	—	—	—	—	—
Kohu		40·5	13	e 7	42	0	—	—	—	—	—	—	—
Tokyo		40·9	13	e 8	28	?	e 17	46	ScS	e 15	50	?	—
Oiwake		41·2	11	e 7	48	0	e 13	44	PcS	—	—	—	—
Matusiro		41·3	11	7	29	-20	13	27	-37	e 9	47	PPP	19·4
Toyama		41·3	10	e 7	49	0	—	—	—	—	—	—	—
Maebasi		41·4	12	e 7	51	+ 1	—	—	—	e 8	11	?	—
Nagano		41·5	11	e 7	50	0	e 14	2	- 5	—	—	—	—
Mito	N.	41·7	13	e 7	52	0	—	—	—	—	—	—	—
Wazima	N.	41·9	9	e 7	53	- 1	—	—	—	—	—	—	—
Onahama		42·3	13	e 7	55	- 2	—	—	—	—	—	—	—
Shirakawa		42·3	12	e 7	55	- 2	—	—	—	—	—	—	—
Niigata		42·9	11	e 7	24	-38	—	—	—	e 8	34	?	—
Hokusima		43·0	13	e 8	3	0	e 14	26	- 3	—	—	—	—
Yamagata		43·5	13	e 8	7	0	—	—	—	—	—	—	—
Sendai		43·6	14	e 8	5	- 3	e 14	43	+ 5	e 8	36	?	—
Sakata		43·9	12	e 8	20	+10	—	—	—	—	—	—	—
Mizusawa	E.	44·5	14	8	18	+ 3	e 13	57	PcS	—	—	—	—
	N.	44·5	14	e 8	14	- 1	14	16	-35	—	—	—	—
Aomori		46·0	13	e 8	31	+ 4	—	—	—	e 8	42	?	—
Shillong	E.	46·1	311	e 8	28	0	15	15	+ 1	10	20	PP	—
Mori	N.	47·2	12	e 8	27	- 9	—	—	—	e 8	48	?	—
Calcutta	E.	47·3	306	i 8	39	+ 2	i 19	8	SS	e 20	9	SSS	—
Sapporo		48·3	12	e 8	43	- 2	e 15	49	+ 4	e 9	6	pP	—
Obihiro		48·6	14	e 9	27	+40	—	—	—	—	—	—	—
Colombo	E.	49·7	282	9	10	+14	16	12	+ 8	—	—	—	—
Chatra	Z.	50·3	310	i 9	0	0	—	—	—	—	—	—	—
Madras	E.	50·9	291	i 9	5	0	i 16	32	+11	11	4	PP	—
Kodaikanal	E.	52·8	286	e 10	19	PcP	—	—	—	—	—	—	—
Hyderabad		53·8	295	i 9	24	- 2	i 16	54	- 7	19	9	ScS	—
Kaimata	N.E.	54·1	141	e 9	35	+ 6	—	—	—	—	—	—	—
Cobb River	E.	54·2	139	e 9	30	+ 1	—	—	—	—	—	—	—
Karapiro	N.	54·5	136	e 9	31	- 1	—	—	—	—	—	—	—
Wellington		55·6	139	e 9	33	- 7	—	—	—	—	—	—	e 27·2
Tuai	N.	56·1	135	e 9	48	+ 5	—	—	—	—	—	—	—
Poona		58·3	295	i 9	58	- 1	i 17	59	- 2	19	49	ScS	—
Dehra Dun	N.	59·0	309	i 10	12	+ 8	i 18	6	- 4	18	28	PPS	—

Continued on next page.

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1953		340											
		$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.	
		°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.	
		59.0	307	e 10	2	- 2	i 18	6	- 4	21	59	SS	27.5
		59.3	295	e 10	7	+ 1	e 18	14	0	10	51	PcP	—
	E.	65.6	310	i 10	49	+ 1	e 19	16	-17	—	—	—	27.2
		67.8	305	i 11	0	- 2	e 19	58	- 2	i 39	26	P'P'	—
		72.5	32	e 11	42	+12	—	—	—	—	—	—	—
		90.9	25	e 16	39	PP	e 23	20	[-18]	—	—	—	e 36.8
		94.4	303	i 13	29?	+ 6	—	—	—	17	11?	PP	—
	Z.	98.2	299	13	41	+ 1	26	32	PS	17	44	PP	—
	Z.	99.7	311	13	47	0	e 27	49	PPS	e 17	52?	PP	—
		100.5	338	i 13	47	- 4	e 25	21	- 4	e 17	58	PP	e 49.2
		103.8	331	i 14	4	- 1	e 24	42	[- 3]	i 18	23	PP	—
		105.0	10	e 18	51 <sub>a</sub>	PP	—	—	—	—	—	—	—
	Z.	105.6	315	e 18	43	PP	—	—	—	e 16	43 <sub>k</sub>	?	—
		106.0	321	e 18	4	?	e 18	12	?	e 18	46	PP	—
	Z.	107.1	49	e 14	22 <sub>a</sub>	P	e 14	26	?	e 18	29	PKP	—
		107.6	52	e 18	48	PP	e 28	8	PS	e 20	59	PPP	e 51.7
	Z.	107.7	49	e 18	41 <sub>k</sub>	PP	—	—	—	e 18	54	?	—
		107.8	328	17	50	?	—	—	—	—	—	—	55.2
	Z.	108.2	52	e 18	45 <sub>a</sub>	?	—	—	—	e 18	52	PP	—
		108.4	322	e 18	58	PP	e 21	29	PPP	e 22	21	?	—
		108.5	324	e 21	20?	PPP	—	—	—	—	—	—	e 55.2
		108.9	323	e 19	9	PP	—	—	—	e 17	37	?	—
	Z.	109.2	49	i 19	1 <sub>a</sub>	PP	—	—	—	i 19	8	?	—
		109.6	322	e 18	54	PP	e 25	24	[+13]	e 29	55	PKKP	—
	Z.	109.7	52	e 18	27	[- 6]	—	—	—	e 19	4	PP	—
		109.8	323	e 18	27	[- 6]	e 19	17	PP	e 21	26	PPP	—
		110.0	317	e 18	21	[-12]	e 24	54	[-18]	e 19	14?	PP	—
	Z.	110.7	53	e 18	45?	[+10]	—	—	—	e 19	24	PP	—
		110.9	350	e 19	15	PP	e 28	41	PS	—	—	—	55.2
		111.0	39	i 18	38	[+ 3]	e 29	33	PKKP	e 14	39	P	—
	Z.	111.5	55	e 18	40	[+ 4]	—	—	—	e 19	21	PP	e 52.1
	Z.	111.7	52	e 18	36	[- 1]	—	—	—	e 19	20	PP	—
		112.0	321	e 18	40	[+ 3]	e 30	4	PPS	e 21	52	PPP	e 58.2
	Z.	112.2	55	e 19	27	PP	—	—	—	e 19	20	?	—
	Z.	112.7	56	i 19	26	PP	—	—	—	i 19	48	?	—
	Z.	113.0	56	e 19	26	PP	—	—	—	e 19	17	?	—
		113.0	322	e 18	21	[-18]	e 30	15	PPS	e 19	25	PP	—
		113.1	326	e 19	32	PP	—	—	—	—	—	—	e 56.2
		113.2	318	—	—	—	e 29	23	PS	—	—	—	—
		113.8	52	e 18	43	[+ 2]	—	—	—	e 19	34	PP	—
		113.9	52	e 18	41	[ 0]	—	—	—	—	—	—	—
		116.1	323	e 18	47	[+ 2]	e 29	27	SP	e 19	54	PP	e 56.2
		116.4	327	e 20	7	PP	—	—	—	—	—	—	e 56.2
		116.6	322	e 18	42	[- 4]	e 19	45	?	e 19	52	PP	—
		117.0	320	e 22	36	PPP	e 30	15	PS	—	—	—	—
		117.9	55	e 18	50	[+ 1]	e 29	47	SP	e 20	2	PP	e 53.5
	Z.	120.4	310	e 18	57	[+ 3]	e 28	11	S	e 20	22	PP	—
	Z.	121.9	294	e 18	58	[+ 2]	e 26	28	[+32]	e 20	34	PP	—
		122.4	314	18	53	[- 4]	37	4	SS	37	29	SSP	58.2
		124.3	317	20	47	PP	—	—	—	—	—	—	—
		124.5	313	19	2	[+ 1]	27	42	[- 2]	23	28	PPP	67.0
		125.2	314	e 19	2 <sub>a</sub>	[- 1]	i 26	37	[+31]	21	2	PP	69.1
		125.9	314	i 20	59	PP	e 26	36	[+27]	23	38	PPP	75.9
	Z.	129.4	44	i 19	12	[+ 1]	e 21	17	PP	e 21	32	?	—
	Z.	129.7	24	e 19	11	[ 0]	—	—	—	—	—	—	—
		131.0	68	e 19	59	[+45]	—	—	—	e 24	5	PPP	—
		133.6	23	e 19	19	[ 0]	22	50	PKS	21	52	PP	—
		134.0	31	i 19	20 <sub>k</sub>	[ 0]	i 22	48	PKS	e 32	12	PS	—
		134.0	36	i 19	23	[+ 3]	—	—	—	i 21	46	PP	—
		136.2	32	e 19	29	[+ 5]	—	—	—	e 22	5	PP	—

Continued on next page.

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	$\Delta$ °	Az. °	P. m. s.		O-C. s.	S. m. s.		O-C. s.	Supp. m. s.		L. m.	
Harvard	137.7	21	i 19	30 <sub>a</sub>	[+ 4]	—	—	—	—	—	—	
Palisades	138.0	24	e 19	27	[ 0]	e 23	4	PKS	e 22	16	PP	e 64.6
Halifax	138.2	12	e 19	21?	[- 6]	26	16?	[-20]	40	26?	SS	—
Washington	138.2	29	e 19	27	[ 0]	—	—	—	e 22	18	PP	—
Philadelphia	138.3	27	e 22	6	PP	—	—	—	—	—	—	—
La Plata	140.8	172	22	38	PP	23	14	PKS	(39	38)	?	39.6
M'Bour	144.4	291	i 19	39	[+ 1]	i 20	34	?	i 24	2	?	—
Bermuda	149.2	22	e 19	48	[+ 2]	—	—	—	i 23	23	PP	e 62.2
Huancayo	151.4	124	e 19	55	[+ 6]	e 44	22	SSP	i 20	2	PKP <sub>2</sub>	—
La Paz	153.8	141	i 19	54	[+ 1]	27	14	[+16]	i 20	19	PKP <sub>2</sub>	73.2
Chinchina	155.9	84	e 19	57	[+ 1]	e 23	49	SKP	—	—	—	—
Bogota	157.5	87	e 20	6	[+ 8]	e 40	14	?	e 24	16	PP	—
San Juan	159.8	43	i 20	40	PKP <sub>2</sub>	—	—	—	—	—	—	—

June 10d. 22h. 15m. Epicentre 47°·3N. 11°·6E. (Strasbourg).

Intensity V at Innsbruck; macroseismic area 1200 sq. km.

Jahrbücher der Zentralanstalt für Meteorologie und Geodynamik, Jahrgang 1953, Neue Folge, 90. Band, p. E.6, with macroseismic diagram on p. E.8.

June 13d. 18h. 39m. Epicentre: 38°·2N. 22°·7E. (Strasbourg).

38°·0N. 22°·5E. (U.S.S.R.).

Intensity 5-5-75.

Destructive at Xylokastron with intensity scale VII. Intensity VI-VII at Kiaton; VI at Trikkala, Zevgolatio, and Diakopton; V at Assos, Derveni, Vello, Loutraki, also at Itea Desphina in province of Parnassus and Atlanti in Lokris; IV at Nauplion; III-IV at Lechaena; III at Kalavryta and Aeglion. Felt also throughout parts of Boeotia, Aetolia, Attica, Magnesia, and Trikkala, also the Islands of Euboea and Spetsea. Macro-seismic area 70,000 sq. km.

June 14d. 0h. 13m. Epicentre 43°·5N. 77°·4E.

Bulletin of Seismo. Stations of U.S.S.R., April-June, 1953, Moscow, 1954, p. 119.

June 14d. 4h. 17m.28s. Epicentre 32°50'N. 115°40'W.

Intensity VII in the region of Brawley, Westmorland, causing damage and landslides; VI at Calixto Imperial and Plaster City; V at Calipatria, El Centro, Holtville, and Pine Valley. Macroseismic area 4800 sq. m.

L. M. Murphy and W. K. Cloud.

United States Earthquakes, 1953, U.S.C.G.S., Serial No. 785, Washington, 1955, pp. 15-17, with macroseismic chart.

June 14d. 4h. 29m. 58s. Epicentre 32°50'N. 115°40'W.

Intensity V at El Centro.

L. M. Murphy and W. K. Cloud.

Loc. cit. 4h.17m.

June 14d. 10h. 30m. Epicentre 28°·0N. 140°·5E. Depth of focus 500km.

Seismo. Bull. Cent. Met. Obs., Japan, for June, 1953, Tokyo, 1953, p. 14.

June 14d. 12h. 4m. Epicentre 33°·5N. 138°·0E. Depth of focus 320km.

Seismo. Bull. Cent. Met. Obs., Japan, for 1953, June, Tokyo, 1953, p. 15.

June 15d. 11h. 9m. Epicentre 35°·0N. 132°·8E. Depth of focus 20km.

Intensity II-III at Okayama.

Seismo. Bull. Cent. Met. Obs., Japan, for 1953, June, Tokyo, 1953, p. 16, with macro-seismic chart.



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June 15d. 17h. 47m. 14s. Epicentre 56°·3N. 153°·8W. (as on 1952, December 12d.).

A = -·5001, B = -·2461, C = +·8302;  $\delta$  = -10;  $h$  = -8;  
D = -·442, E = +·897; G = -·745, H = -·367, K = -·557.

	$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.
	°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.
College	9·1	16	i 2	12	- 2	i 4	21	+21	—	—	i 4·4
Sitka	10·2	75	e 2	31	0	i 3	34	-53	—	—	—
Mitchell Field	14·1	261	e 3	26	+ 3	e 6	44	+42	—	—	—
Victoria	20·0	99	i 4	38k	+ 1	8	30	+13	—	—	—
Seattle	z. 21·1	100	i 4	52	+ 4	i 9	15	+36	—	—	—
Corvallis	22·5	108	e 5	3	+ 1	e 9	14	+ 9	—	—	—
Arcata	N. 24·7	116	e 5	27	+ 3	—	—	—	—	—	e 11·7
Klynchi	24·9	290	i 5	25	- 1	—	—	—	—	—	—
Hungry Horse	25·3	90	i 5	31	+ 1	—	—	—	—	—	i 12·7
Shasta	25·7	113	i 5	35k	+ 2	e 9	58	- 3	e 5	42	?
Mineral	z. 26·4	113	i 5	41	+ 1	e 10	35	+23	i 6	10	PP
Petropavlovsk	27·2	285	i 5	38	- 9	—	—	—	—	—	e 12·9
Saskatoon	27·5	78	5	51	+ 1	10	25	- 5	—	—	15·1
Berkeley	27·9	117	e 5	54	0	i 10	32	- 5	e 9	18	PcP
Reno	27·9	111	i 5	55a	+ 1	i 10	44	+ 7	i 9	36	PcP
Bozeman	28·5	93	e 5	59	0	e 10	45	- 1	—	—	—
Lick	z. 28·7	117	i 6	1k	0	—	—	—	i 6	50	PP
Resolute Bay	28·7	29	e 5	55a	- 6	i 11	29	+39	—	—	e 14·7
Magadan	28·9	301	i 5	59	- 4	10	47	- 6	—	—	—
Fresno	30·1	115	i 6	14k	+ 1	e 11	15	+ 3	e 7	5	PP
Tinemaha	30·5	113	i 6	19k	+ 2	i 11	30	+12	i 12	58	PcS
Logan	30·6	100	e 6	20	+ 2	—	—	—	—	—	—
Salt Lake City	31·3	101	e 6	23	- 1	i 11	34	+ 3	—	—	—
China Lake	z. 31·9	113	i 6	29k	0	i 9	28	PP	i 13	2	PcS
Pasadena	32·9	116	i 6	39k	+ 1	i 12	0	+ 4	i 13	6	PcS
Boulder City	33·2	111	i 6	42	+ 2	i 6	49	?	e 7	59	PP
Nelson	33·4	111	i 6	43	+ 1	—	—	—	—	—	—
Riverside	33·4	116	i 6	43k	+ 1	e 12	9	+ 6	i 13	7	PcS
Palomar	z. 34·2	116	i 6	50k	+ 1	—	—	—	i 13	11	PcS
Honolulu	35·1	186	e 6	58	+ 1	e 12	32	+ 2	—	—	—
Kurilsk	37·4	280	i 7	14	- 2	13	3	- 2	—	—	—
Tucson	38·1	110	i 7	26	+ 4	i 13	23	+ 7	i 8	58	PP
Uglegorsk	38·2	288	i 7	22	- 1	i 13	18	+ 1	—	—	e 16·7
Nemuro	39·9	279	e 7	34	- 3	e 13	37	- 6	—	—	—
Kusiro	40·8	279	e 7	22	-23	e 13	37	-19	—	—	—
Lubbock	41·9	99	e 7	54	0	—	—	—	—	—	—
Urakawa	42·2	279	e 7	55	- 1	e 14	17	0	e 18	1	Q
Sapporo	42·4	282	e 7	58	0	i 14	20	0	e 17	58	SSS
Chihuahua	43·5	108	e 8	8	+ 1	e 14	46	+10	e 18	37	SSS
Mori	43·5	281	8	7	0	14	35	- 1	16	56	SS
Kirkland Lake	z. 43·9	68	e 8	11	+ 1	e 14	41	- 1	—	—	—
Aomori	44·2	280	e 8	7	- 5	i 10	30	?	e 9	27	PP
Fayetteville	z. 44·3	91	i 8	14k	+ 1	e 14	46	- 2	—	—	—
Miyako	44·4	277	e 8	10	- 4	e 14	44	- 5	—	—	—
St. Louis	44·7	86	i 8	15	- 1	e 14	32	-22	—	—	—
Morioka	44·8	278	e 8	16	- 1	e 14	53	- 2	—	—	—
Mizusawa	E. 45·2	277	8	21	+ 1	e 15	12	+11	—	—	—
	N. 45·2	277	e 8	26	+ 6	e 14	58	- 3	—	—	—
Akita	45·4	278	e 8	21	- 1	e 15	2	- 2	e 18	22	SS
Sendai	45·9	277	e 8	35	+ 9	e 14	56	-15	e 10	31	PP
Inawasiro	46·1	276	e 8	37	+ 9	—	—	—	—	—	—
Sakata	46·1	278	e 8	30	+ 2	—	—	—	—	—	—
Hokusima	46·7	276	e 8	30	- 2	e 15	13	- 9	—	—	—
Onahama	46·9	275	e 8	32	- 2	e 16	13	+48	—	—	e 20·0
Shirakawa	47·1	276	e 8	32	- 3	e 16	28	+60	e 11	30	PPP
Niigata	47·2	277	e 8	44	+ 8	e 9	36	?	e 10	18	PcP
Cincinnati	47·5	80	i 9	38	+60	i 15	31	- 3	—	—	—
Cleveland	47·5	76	e 8	36a	- 2	e 15	24	-10	e 19	0	SS
Vladivostok	47·5	287	i 8	35	- 3	15	28	- 6	—	—	—
Utunomiya	47·7	275	e 8	38	- 2	e 15	32	- 4	—	—	18·8

Continued on next page.

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		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.	
		°	°	m. s.	s.	m. s.	s.	m. s.	m.	
Ottawa		47.9	68	e 8 42 <sup>k</sup>	0	15 34	- 5	10 12	PcP	25.8
Buffalo (Larkin)		48.1	72	i 8 45	+ 2	—	—	—	—	—
Kumagaya		48.3	275	e 8 43	- 2	e 15 41	- 4	—	—	—
Maebasi		48.3	276	i 8 44	- 1	e 15 44	- 1	—	—	—
Tokyo		48.4	275	i 8 46	0	e 15 46	0	e 18 50	ScS	—
Nagano	N.	48.6	277	e 8 47	0	—	—	—	—	—
Oiwake		48.6	278	e 8 18	-29	e 15 40	- 9	—	—	—
Shawinigan Falls	N.	48.6	65	e 8 47	0	15 32	-17	10 44	PP	26.3
Titibu		48.6	275	i 8 48	+ 1	e 15 50	+ 1	—	—	—
Matusiro		48.7	277	i 8 46	- 2	15 46	- 4	10 38	PP	20.2
Yokohama		48.7	275	e 8 50	+ 2	—	—	—	—	—
Scoresby Sund		48.9	20	i 8 49	- 1	i 15 52	- 1	e 11 27	PPP	23.3
Matumoto	E.	49.0	278	8 51	+ 1	—	—	—	—	—
Mera		49.0	275	e 8 51	+ 1	e 15 52	- 3	—	—	e 20.2
Hunatu		49.1	276	e 8 53	+ 2	e 16 0	+ 4	—	—	—
Kohu		49.1	276	e 8 53	+ 2	e 15 56	0	—	—	—
Pittsburgh		49.1	75	i 8 54	+ 3	i 16 2	+ 6	i 18 39	SS	—
Seven Falls	E.	49.2	64	e 8 54	+ 2	15 56	- 2	10 29	PcP	—
Misima		49.3	275	e 8 55	+ 2	e 16 2	+ 3	e 11 56	PPP	—
Osima		49.3	274	e 8 51	- 2	e 15 38	-21	—	—	e 22.8
Iida		49.6	277	e 8 56	+ 1	—	—	—	—	—
Morgantown		49.7	77	i 8 55	- 1	e 16 4	0	—	—	—
Shizuoka		49.7	276	e 8 56	0	e 16 3	- 1	e 9 32	?	—
Omaesaki		50.1	275	e 9 6	+ 7	—	—	—	—	—
Nagoya	N.	50.4	276	e 9 0	- 1	—	—	—	—	—
Kameyama		50.9	276	e 9 4	- 1	16 20	- 1	—	—	18.5
Kyoto		51.2	277	e 9 9	+ 2	—	—	—	—	—
Toyooka		51.3	279	e 9 7	- 1	e 16 24	- 2	e 18 54	?	e 24.9
Osaka		51.5	278	e 9 12	+ 3	e 16 21	- 8	e 10 59	PP	—
Kobe		51.7	277	e 9 6	- 5	—	—	—	—	—
Mobile		51.7	90	9 13	+ 2	16 33	+ 1	—	—	—
Washington		51.7	75	e 9 11	0	e 16 48	+16	—	—	—
Palisades		51.9	71	e 9 14	+ 2	i 16 37	+ 2	e 9 19	pP	e 20.6
Fordham		52.1	71	e 9 25	+11	—	—	—	—	—
Harvard		52.1	68	i 9 20	+ 6	i 16 37	- 1	—	—	e 20.8
Sumoto		52.1	277	e 9 11	- 3	—	—	i 11 48	PP	e 24.3
Takamatu		52.6	278	e 9 16	- 2	e 16 43	- 1	e 19 6	ScS	24.1
Columbia		53.2	82	i 9 23	+ 1	—	—	—	—	—
Hamada		53.3	280	9 21	- 2	16 51	- 3	e 20 42	SS	—
Muroto		53.3	278	e 9 23	0	e 16 25	-29	—	—	e 25.5
Kabansk		53.4	312	i 9 22	- 2	e 16 54	- 1	—	—	—
Hirosima		53.5	279	e 9 21	- 3	e 16 51	- 6	—	—	—
Koti		53.5	278	e 9 22	- 2	e 16 56	- 1	—	—	—
Matuyama		53.7	279	e 9 25	- 1	e 16 57	- 2	e 19 12	ScS	e 25.7
Irkutsk		54.2	313	i 9 28	- 1	—	—	—	—	—
Reykjavik		54.3	24	i 9 30	0	e 17 11	+ 4	19 44	?	e 31.8
Simidu		54.3	277	e 9 26	- 4	—	—	—	—	—
Halifax		54.6	61	e 9 36 <sup>?</sup>	+ 4	17 10 <sup>?</sup>	- 1	10 51 <sup>?</sup>	PcP	27.3
Tacubaya		54.6	109	i 9 31	- 1	e 17 16	+ 5	e 19 37	ScS	—
Kyakhta		54.7	310	i 9 32	- 1	e 17 12	- 1	—	—	—
Ooita		54.8	279	e 9 38	+ 4	—	—	e 9 50	?	—
Hukuoka		55.2	280	e 8 53	-44	e 18 16	+56	e 19 0	ScS	e 26.9
Puebla		55.4	108	e 9 34	- 4	—	—	—	—	e 29.2
Kiruna		56.1	3	i 9 42 <sup>a</sup>	- 1	i 17 30	- 2	e 11 46 <sup>?</sup>	PP	e 24.8
Vera Cruz		56.4	106	e 9 47	+ 2	e 17 49	+13	—	—	e 30.1
Kagosima		56.6	279	e 9 58	+11	—	—	e 11 1	?	—
Zö-Sè		62.1	284	i 10 23 <sup>a</sup>	- 2	18 45	- 4	—	—	—
Bergen		62.5	12	e 10 27 <sup>k</sup>	- 1	e 18 38 <sup>?</sup>	-16	e 11 20	PcP	e 27.9
Nanking		62.6	288	i 10 27 <sup>a</sup>	- 1	i 18 50	- 6	i 20 17	ScS	—
Bermuda		63.3	71	e 10 34	+ 1	i 19 0	- 4	i 20 24	ScS	e 26.3
Sverdlovsk		63.8	340	i 10 35	- 1	19 5	- 6	—	—	—
Helsinki		63.9	2	i 10 35	- 2	i 19 9	- 3	i 10 43	pP	—
Upsala		64.0	5	i 10 36 <sup>a</sup>	- 2	i 19 11	- 2	i 11 17	PcP	e 28.8
Pulkovo		64.2	358	i 10 39	0	e 19 16	0	—	—	—
Aberdeen		64.6	17	i 10 41	0	i 19 22	+ 1	i 19 50	PS	e 35.9

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	$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.
	°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.
Semipalatinsk	64.6	326	e 10	39	- 2	—	—	—	—	—	—
Edinburgh E.	65.6	18	—	—	—	e 19	31	- 2	—	—	—
Durham	67.0	17	i 10	53	- 4	i 19	50	0	i 15	7	PPP
Rathfarnham Castle	67.6	20	i 11	0 <sub>a</sub>	- 1	e 20	3	+ 6	i 11	15	pP
Copenhagen	67.8	9	i 11	1	- 1	i 20	1	+ 1	24	4	SS
Moscow	67.9	354	i 11	1	- 1	19	59	- 2	—	—	—
Kingston	68.1	90	e 11	39	PcP	e 20	1	- 2	—	—	e 37.5
Witteveen z.	70.1	12	i 11	17 <sub>a</sub>	+ 1	—	—	—	—	—	—
Kew	70.4	17	i 11	18 <sub>a</sub>	0	i 20	32	+ 2	e 11	46	PcP
De Bilt	70.6	14	i 11	20 <sub>a</sub>	+ 1	i 20	38	+ 5	i 11	41	PcP
Potsdam	71.1	9	i 11	23 <sub>a</sub>	+ 1	i 20	42	+ 4	i 11	32	PcP
Ciudad Trujillo	71.5	85	e 11	47	+23	i 21	6	+23	—	—	e 34.8
Kurmenty	71.7	323	e 11	27	+ 1	—	—	—	—	—	—
Uccle	71.7	16	e 11	23	- 3	e 20	45	0	i 11	40	pP
Almata II	71.8	324	e 11	26	0	—	—	—	—	—	e 38.8
Almata	72.0	324	i 11	28	0	i 20	50	+ 1	—	—	—
Collmberg	72.2	8	i 11	28	- 1	e 20	51	0	e 14	10	PP
Przhevalsk	72.2	323	11	29	0	20	52	+ 1	—	—	—
Jersey E.	72.3	19	e 12	25	+56	e 20	54	+ 2	—	—	37.8
Jena	72.5	10	i 11	29	- 1	i 20	50	- 4	e 14	17	PP
Hong Kong	72.8	285	11	33	+ 1	e 20	58	0	—	—	—
Frunse	73.1	325	i 11	34	0	i 21	5	+ 4	—	—	—
Cheb	73.4	10	i 11	37 <sub>k</sub>	+ 1	e 21	3	- 2	e 11	52	PcP
Paris	73.4	17	i 11	37	+ 1	i 21	7	+ 2	i 11	48	PcP
Prague	73.5	8	i 11	36 <sub>k</sub>	0	e 21	7	+ 1	e 11	51	PcP
San Juan	73.6	81	e 11	36	- 1	i 21	5	- 2	—	—	—
Raciborzu	73.8	6	e 11	38	0	e 21	12	+ 3	e 11	48	PcP
Naryn	73.9	323	i 11	39	0	i 21	13	+ 3	—	—	29.1
Karlsruhe	74.0	13	i 11	40 <sub>a</sub>	+ 1	i 21	16	+ 5	i 11	54	PcP
Baguio	74.1	277	e 11	34	- 6	i 21	10	- 2	—	—	e 37.8
Chambon-la-Forêt	74.1	17	i 11	38	- 2	—	—	—	i 11	54	PcP
Lwow	74.2	2	i 11	38	- 2	i 21	13	- 1	—	—	—
Stuttgart	74.3	12	i 11	41 <sub>a</sub>	0	i 21	16	+ 1	i 11	56	PcP
Strasbourg	74.4	13	i 11	41	- 1	i 21	17	+ 1	i 11	56	PcP
Angra do Heroísmo	75.1	41	—	—	—	e 21	31	+ 7	—	—	e 36.8
Tchimkent	75.1	329	i 11	46	0	i 21	26	+ 2	—	—	37.0
Basle	75.4	14	e 11	47 <sub>a</sub>	0	e 22	26	PS	e 12	2	PcP
Uzhgorod	75.4	3	i 11	48	+ 1	e 21	29	+ 2	—	—	—
Andijan	75.7	326	i 11	49	0	i 21	32	+ 2	—	—	—
Namangan	75.7	326	i 11	50	+ 1	e 21	33	+ 3	—	—	—
Zürich	75.7	13	e 11	48 <sub>a</sub>	- 1	e 21	31	+ 1	e 14	34	PP
Neuchatel	75.8	14	e 11	49	- 1	e 21	41	+10	—	—	—
Ogyalla	76.0	6	e 11	53	+ 2	e 22	1	ScS	e 12	9	PcP
Lunacharskoe	76.1	328	e 11	51	0	—	—	—	—	—	e 31.3
Tashkent	76.1	328	i 11	52	+ 1	i 21	33?	- 2	—	—	—
Fergana	76.2	325	i 11	52	0	i 21	37	+ 1	—	—	—
Chur	76.3	12	e 11	52	0	e 21	37	0	—	—	—
Budapest	76.4	6	11	57	+ 4	21	42	+ 4	e 14	7	PP
Clermont-Ferrand	76.5	17	e 11	54	0	i 21	46	+ 7	e 14	47	PP
Iasi N.	76.9	0	e 11	54	- 2	e 21	43	0	—	—	e 42.8
Kishinev	77.0	359	i 11	55	- 1	i 21	42	- 3	—	—	34.1
Oropa	77.3	14	i 11	57	- 1	e 22	23	PS	i 14	52	PP
Dzhergetal	77.5	327	11	59	0	—	—	—	—	—	—
Kalossa E.	77.6	5	e 12	10	PcP	e 21	53	+ 2	e 14	38	PP
N.	77.6	5	e 11	56	- 4	22	2	+11	14	44	PP
Salo	77.6	11	e 14	5	?	e 23	50	?	e 17	26	?
Szeged	77.7	5	e 11	51	- 9	21	51	- 1	15	9	PP
Pavia	77.9	13	i 12	2 <sub>a</sub>	+ 1	e 21	55	+ 1	i 14	58	PP
Triest	77.9	9	e 12	1	0	i 21	48?	- 6	e 14	45	PP
Garm	78.0	327	e 12	2	0	e 21	53	- 2	—	—	42.3
Timisoara	78.2	4	e 12	6	+ 3	e 22	3	+ 6	e 22	27	PS
Samarkand	78.3	330	12	3	0	—	—	—	—	—	—
Obi-garm	78.4	327	i 12	4	0	e 21	59	- 1	—	—	—
Bologna	78.8	11	e 12	8	+ 2	e 22	6	+ 2	e 15	12	PP
Stalinabad	78.8	327	i 12	6	0	i 22	4	0	—	—	—

Continued on next page.

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	$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.
	$^{\circ}$	$^{\circ}$	m.	s.	s.	m.	s.	s.	m.	s.	m.
Theodosia	78.8	354	i 12	5	- 1	e 22	0	- 4	—	—	—
Padova	78.9	10	e 12	0	- 7	e 22	18	+13	—	—	—
Khorog	79.0	325	i 12	6	- 1	e 22	4	- 2	—	—	—
Piatigorsk	79.0	348	12	6	- 1	22	6	0	—	—	—
Belgrade	79.1	4	e 12	7k	- 1	e 22	8	+ 1	e 12	44	PcP e 47.4
Chinchina	79.3	97	e 12	10	+ 1	e 22	8	- 1	e 16	12	PP 38.8
Fort de France	79.3	80	e 12	21	+12	—	—	—	—	—	—
Grozny	79.4	346	i 12	9	0	i 22	9	- 1	—	—	—
Prato	79.4	11	e 11	59	-10	i 22	9	- 1	—	—	—
Yalta	79.4	355	i 12	9	0	e 22	8	- 2	—	—	—
Coimbra	79.5	26	12	9	- 1	22	14	+ 3	—	—	38.8
Florence	79.5	11	i 12	10a	0	i 22	11	0	i 12	27	pP
Bucharest	79.7	0	e 12	11	0	e 21	53	-20	e 15	5	PP
Sotchi	79.8	351	i 12	11	- 1	—	—	—	—	—	—
Barcelona	80.5	19	—	—	—	22	22	0	—	—	e 38.5
Bogota	80.5	96	i 12	35	+20	e 22	17	- 5	e 15	32	PP 38.8
Duzheti	80.7	347	e 12	19	+ 3	—	—	—	—	—	—
Lisbon	80.7	28	12	17a	+ 1	22	25	+ 1	22	42	sS 33.6
Zugdidi	80.7	348	i 12	17	+ 1	22	25	+ 1	—	—	—
Toledo	80.8	24	i 12	18a	+ 1	i 20	23	?	12	33	PcP 37.6
Tortosa	80.8	20	i 12	18	+ 1	i 22	25	0	—	—	—
Gori	80.9	348	e 12	19	+ 2	22	28	+ 2	—	—	—
Tiflis	81.1	347	i 12	19	+ 1	i 22	28	0	—	—	—
Borzhomi	81.2	348	i 12	19	0	i 22	31	+ 2	—	—	—
Abastumanj	81.3	348	12	20	0	—	—	—	—	—	—
Tsikhlis-Dzhvari	81.3	348	i 12	22	+ 2	i 22	33	+ 3	—	—	—
Shillong	81.4	304	e 12	17	- 3	e 22	19	-12	12	21	PcP
Rome	81.5	10	12	18	- 3	i 22	33	+ 1	i 15	28	PP
Akhalkalaki	81.6	348	12	24	+ 3	—	—	—	—	—	—
Bairam-Ali	81.6	332	i 12	23	+ 2	e 22	38	+ 5	—	—	—
Baku	81.6	342	i 12	22	+ 1	i 22	41	+ 8	—	—	—
Shemakla	81.6	344	i 12	18	- 3	e 22	32	- 1	—	—	—
Leninakan	82.1	347	e 12	27	+ 3	e 22	42	+ 4	—	—	—
Ashkabad	82.2	335	12	25	+ 1	22	43	+ 4	—	—	—
Chatra	82.5	308	i 12	26	0	i 22	44	+ 2	15	16	PP 39.3
Erevan	82.6	347	i 12	25	- 1	22	45	+ 2	—	—	—
Alicante	83.0	21	12	32	+ 4	i 22	49	+ 2	15	41	PP 40.0
Goris	83.0	344	i 12	29	+ 1	i 22	50	+ 3	—	—	—
Granada	83.5	24	i 12	34k	+ 3	i 22	57	+ 5	12	47	PcP i 43.0
Malaga	83.7	25	i 12	35	+ 3	i 23	3	+ 9	16	2	PP 43.9
Almeria	84.1	23	i 12	33	- 1	22	57	- 1	15	55	PP 44.6
New Delhi	85.0	317	i 12	38	0	i 23	0	[- 1]	15	42	PP 40.0
Algiers Univ.	85.2	19	e 12	39	0	e 23	2	[ 0]	e 15	57	PP e 42.2
Messina	85.4	9	e 12	41	+ 1	e 23	3	[ 0]	e 16	4	PP
Athens	86.1	3	e 12	36	- 8	e 23	3	[- 5]	e 22	22	?
Averroes	86.3	28	i 12	47	+ 2	—	—	—	e 14	23	? 47.8
Quetta	87.1	326	i 12	49k	0	i 23	30	+ 2	i 16	5	PP 54.7
Huancayo	93.6	107	e 13	52	+33	e 24	29	+ 3	i 23	55	SKS e 40.0
Helwan	94.1	356	13	22	0	e 17	31	PP	e 13	51	?
Hyderabad	94.5	311	17	5	PP	24	32	- 2	23	52	SKS 44.5
Brisbane	94.8	226	—	—	—	e 24	16	[+16]	i 24	40	S
Poona	95.4	315	i 13	27	- 1	24	42	0	17	21	PP 44.8
Bombay	95.5	316	e 13	33	+ 5	24	43	+ 1	17	14	PP
Madras	97.7	308	e 17	49	PP	e 24	14	[- 1]	—	—	—
Tamanrasset	99.3	20	e 13	47	+ 2	e 24	45	[- 4]	e 17	56	PP
La Paz	101.2	103	i 13	46	- 8	i 24	33	[ 0]	i 18	11	PP 50.8
Riverview	101.2	224	—	—	—	i 24	34	[+ 1]	i 25	39	S e 46.6
Colombo	103.2	305	—	—	—	i 24	44	[+ 2]	—	—	58.6
Christchurch	103.4	206	—	—	—	e 25	46?	- 3	e 44	46	? e 48.8
M'Bour	109.2	43	i 19	6	PP	—	—	—	e 42	16	Q 49.8
La Plata	121.3	107	14	40	P	29	4	?	18	16	PKP 72.7
Pretoria	z. 149.5	357	e 19	49?	[+ 2]	—	—	—	—	—	—
Kimberley	z. 152.4	3	i 19	58	[+ 7]	—	—	—	—	—	—

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June 16d. 0h. 11m. Epicentre 42°·8N. 78°·0E.  
Bulletin of Seismological Stations of the U.S.S.R. for April-June, 1953, Moscow, 1954, p.p. 120, 121.

June 16d. 8h. 59m. Epicentre 36°·8N. 70°·9E. Depth of focus 160km.  
Bulletin of Seismological Stations of the U.S.S.R. for April-June, 1953, Moscow, 1954, p.121.

June 16d. 9h. 53m. 8s. Epicentre 30°·8N. 141°·4E.

Intensity IV at Torisima. Epicentre 31°·5N. 142°·0E. Depth of focus 40km.  
Seismo. Bull. Cent. Met. Obs., Japan, June, 1953, Tokyo, 1953, pp.16-18.

A = -·6725, B = +·5368, C = +·5095;  $\delta = 0$ ;  $h = +1$ ;  
D = +·624, E = +·782; G = -·398, H = +·318, K = -·861.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Torisima		1·1	252	0 26	+ 4	0 45	+ 6	—	—
Mera		4·3	343	e 0 54	-14	—	—	—	—
Osima		4·3	337	e 1 10	+ 2	1 58	- 2	—	—
Omaesaki		4·6	326	e 1 17	+ 5	2 7	0	—	—
Ajiro		4·7	336	e 1 18	+ 4	—	—	—	—
Misima	E.	4·8	335	e 1 15	0	2 14	+ 2	—	—
Shizuoka		4·9	329	1 17	0	—	—	—	—
Yokohama		4·9	343	e 1 20	+ 3	2 35	+ 6*	—	—
Hamamatu		5·0	323	e 1 36	- 4 <sub>g</sub>	—	—	—	—
Tokyo	E.	5·1	344	1 20	0	2 15	- 5	—	—
Hunatu	N.	5·2	335	e 1 23	+ 2	2 22	0	—	—
Kohu	N.	5·4	334	e 1 25	+ 1	2 33	+ 5	—	—
Kakioka		5·5	350	e 1 25	0	2 32	+ 2	—	—
Owase		5·5	308	e 1 45	- 5 <sub>g</sub>	—	—	—	—
Siomisaki		5·5	301	e 1 19	- 6*	2 40	- 7*	—	—
Titibu		5·5	340	i 1 27	+ 2	i 2 33	+ 3	—	—
Tukubasan		5·5	349	e 1 17	- 8	2 18	-12	—	—
Iida		5·6	329	e 1 33	+ 6	2 38	+ 5	—	—
Kumagaya		5·6	343	e 1 28	+ 1	2 31	- 2	—	—
Mito		5·6	352	e 1 29	+ 2	2 58	- 7 <sub>g</sub>	—	—
Nagoya	E.	5·7	321	e 1 33	+ 5	—	—	—	—
Tu		5·7	315	e 1 32	+ 4	—	—	—	—
Kameyama		5·8	316	i 1 32 <sub>a</sub>	+ 3	2 40	+ 2	—	—
Maebasi	Z.	5·9	342	e 1 32	+ 1	2 46	+ 6	—	—
Utunomiya		5·9	348	e 1 29	- 2	2 32	- 8	—	—
Gihu		6·0	321	e 1 36	+ 4	—	—	—	—
Oiwake		6·0	338	e 1 44	- 1*	3 4	+ 2*	—	—
Matumoto	N.	6·1	333	e 1 40	+ 6	3 4	- 1*	—	—
Hikone		6·2	317	1 40	+ 5	3 8	0*	—	—
Kyoto		6·3	313	e 1 40	+ 4	—	—	—	—
Matusiro		6·3	336	i 1 38	+ 2	2 49	- 1	2 57	?
Osaka		6·3	309	e 1 29	- 7	3 14	+ 3*	—	—
Nagano	E.	6·4	337	e 1 40	+ 2	3 2	+ 9	—	—
Shirakawa		6·4	351	e 1 39	+ 1	2 47	- 6	—	—
Takayama	N.	6·4	328	e 1 36	- 2	—	—	—	—
Kobe		6·5	308	e 1 43	+ 4	—	—	—	—
Sumoto	E.	6·5	305	i 1 43	+ 4	—	—	—	—
Muroto		6·6	294	e 1 44	+ 3	—	—	—	—
Tsuruga		6·6	319	e 1 58	+ 2*	—	—	—	—
Hukui		6·8	322	e 1 44	0	—	—	—	—
Inawasiro	E.	6·8	351	e 1 43	- 1	3 10	+ 7	—	—
Maizuru		6·8	315	e 1 52	- 7*	—	—	—	—
Takada		6·8	338	e 1 54	- 5*	3 13	+10	—	—
Toyama		6·8	330	e 1 29	-15	—	—	—	—
Hokusima		7·0	354	e 1 43	- 3	3 0	- 8	—	—

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		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.	
		°	°	m. s.	s.	m. s.	s.	m. s.	m.	
Kanazawa		7.0	327	e 1 55	- 7*	—	—	—	—	
Takamatu		7.1	301	e 1 51	+ 3	3 20	+10	—	—	
Koti		7.2	294	e 1 57	+ 8	—	—	—	—	
Toyooka		7.3	312	e 1 52	+ 2	3 18	+ 3	—	—	
Niigata		7.4	345	e 1 59	+ 7	3 21	+ 3	—	—	
Sendai	N.	7.4	357	e 1 49	- 3	3 6	-12	—	—	
Simidu		7.4	288	e 1 59	+ 7	—	—	—	—	
Yamagata		7.5	354	e 1 51	- 2	3 9	-11	—	—	
Matuyama		7.9	295	e 2 3	+ 4	3 51	- 7*	—	—	
Sakata		8.2	351	e 2 11	+ 8	3 47	+ 9	—	—	
Mizusawa		8.3	358	2 5	+ 1	e 3 34	- 6	—	—	
Hirosima	E.	8.4	298	e 2 7	+ 1	—	—	—	—	
Matsue		8.4	306	e 2 9	+ 3	—	—	—	—	
Saigo	N.	8.6	311	e 2 16	+ 7	—	—	—	—	
Ooita		8.7	289	e 2 11	+ 1	3 53	+ 3	—	—	
Miyako	N.	8.8	3	e 2 5	- 6	3 35	-18	—	—	
Hamada		8.9	300	2 18	+ 6	4 11	+16	—	—	
Morioka		8.9	359	e 2 4	- 8	3 42	-13	—	—	
Akita	Z.	9.0	353	e 2 16	+ 3	3 47	-11	—	—	
Kagosima		9.3	277	2 26	+ 9	4 28	-12*	—	—	
Yakusima		9.4	271	e 2 23	+ 5	—	—	—	—	
Hatinohe		9.7	1	e 2 21	- 1	4 19	+ 4	—	—	
Hukuoka		9.7	289	e 2 29	+ 7	4 30	+15	—	—	
Aomori		10.0	357	2 17	-10	—	—	—	—	
Mori	N.	11.3	357	e 2 49	+ 3	5 13	+19	—	—	
Urakawa		11.4	5	e 2 45	- 2	4 45	-11	—	—	
Obihiro		12.2	6	e 3 26	+28	—	—	—	—	
Sapporo		12.2	0	e 3 3	+ 5	5 15	- 1	—	—	
Kusiro	E.	12.4	10	e 3 9	+ 8	—	—	—	—	
Nemuro		12.9	13	e 3 18	+11	—	—	—	—	
Vladivostok		14.4	331	i 3 23	- 4	i 5 53	-16	—	—	
Kurilsk		15.3	18	e 3 32	- 7	i 6 5	-25	—	—	
Zô-Sè		17.3	277	i 4 7 <sup>a</sup>	+ 3	e 7 20	+ 4	—	—	
Ulegorsk		18.3	2	i 4 15	- 2	i 7 24	-15	—	—	
Nanking		19.3	280	i 4 29	0	i 7 55	- 7	—	—	
Baguio		23.8	239	i 5 14	- 1	e 9 32	+ 4	e 9 39	S	
Petropavlovsk		25.6	22	e 5 34	+ 2	i 9 51	- 8	—	—	
Hong Kong		25.7	258	5 33	0	e 10 30	SS	—	—	
Magadan		29.4	19	6 4	- 3	e 10 49	-12	—	—	
Kyakhta		32.5	317	i 6 35	+ 1	e 11 43?	- 6	—	—	
Irkutsk		34.5	320	6 52	0	e 12 14	- 6	—	—	
Shillong	E.	43.7	276	e 8 5	- 3	e 13 27	ScP	e 9 52	PP	
Chatra		47.3	280	e 8 36	- 1	—	—	e 29 52	?	
Calcutta	F.	47.8	274	i 13 37	?	—	—	—	—	
Semipalatinsk		48.9	312	e 8 47	- 3	—	—	—	—	
Kurmenty		50.8	303	e 9 6	+ 2	—	—	—	—	
Przhevalsk		50.8	303	e 9 4	0	—	—	—	—	
Almata		51.8	304	i 9 10	- 2	e 16 23	-10	—	—	
Naryn		52.8	301	i 9 18	- 1	—	—	—	—	
Frunse		53.5	303	i 9 23	- 1	—	—	—	—	
College		54.4	29	i 9 28	- 3	i 17 2	- 7	e 9 52	?	
Andijan		55.6	301	i 9 39	- 1	i 17 29	+ 4	—	e 22.0	
Namangan		56.0	301	i 9 42	- 1	—	—	—	—	
Fergana		56.1	301	e 9 41	- 2	e 17 38	+ 6	—	—	
Dzhergetal		56.8	300	e 9 47	- 1	—	—	—	—	
Khorog		57.0	297	9 50	0	e 17 46	+ 3	—	—	
Tchimkent		57.2	303	i 9 52	+ 1	e 17 48	+ 2	—	—	
Garm		57.6	300	e 9 51	- 3	e 17 53	+ 2	—	—	
Lunacharskoe		57.7	302	i 9 52	- 3	—	—	—	—	
Tashkent		57.7	302	e 9 52	- 3	e 17 48	- 5	—	—	

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		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
			m. s.	m. s.	s.	m. s.	s.	m. s.	m.
Warsak Dam	E.	58.0	294	e 9 54	- 3	e 17 48	- 9	—	e 33.9
Obi-garm		58.1	299	e 9 54	- 4	—	—	—	—
Kulyab		58.2	298	9 58	0	e 18 4	+ 5	—	—
Hyderabad	E.	58.3	273	e 9 3	-56	e 18 28	PPS	—	33.8
Stalinabad		58.8	299	i 10 1	- 1	i 18 11	+ 4	—	—
Brisbane	N.	59.0	168	—	—	e 18 5	- 5	—	—
Samarkand		59.8	301	10 8	- 1	e 18 22	+ 2	—	—
Sverdlovsk		59.9	322	i 10 8	- 2	—	—	—	—
Quetta		62.9	291	i 10 27	- 3	e 18 46	-14	e 17 41	?
Riverview		64.9	171	i 10 42 <sub>a</sub>	- 1	i 19 21	- 3	i 19 47	PS
Ashkabad		66.8	302	10 55	- 1	—	—	—	—
Kizyl-Arvat		67.9	304	i 11 3	+ 1	—	—	—	—
Resolute Bay		68.6	14	e 11 9	+ 2	e 20 1	- 8	e 21 2	ScS
Victoria		70.8	44	11 18	- 2	—	—	—	—
Baku		71.8	307	i 11 27	+ 1	e 20 52	+ 6	—	—
Seattle	Z.	71.8	45	e 11 30	+ 4	—	—	e 18 16	?
Kiruna		72.3	340	i 11 27 <sub>a</sub>	- 2	i 20 50	- 2	e 14 6	PP
Moscow		72.3	325	i 11 27	- 2	e 20 48	- 4	—	—
Shemakla		72.6	308	i 11 29	- 2	e 20 59	+ 3	—	—
Grozny		73.4	311	i 11 34	- 2	i 21 4	- 1	—	—
Pulkovo		73.6	331	i 11 34	- 3	e 21 4	- 3	—	—
Duzheti		74.6	310	e 11 49	+ 6	—	—	—	—
Goris		74.7	307	i 11 43	0	i 21 21	+ 2	—	—
Tiflis		74.7	310	11 43	0	e 21 19	0	—	—
Piatigorsk		74.8	313	11 41	- 3	—	—	—	—
Shasta	Z.	74.9	51	e 11 41	- 3	—	—	i 11 47	PcP
Gori		75.0	310	e 11 46	+ 1	—	—	—	—
Borzhomi		75.6	310	i 11 48	0	—	—	—	—
Mineral	Z.	75.6	51	e 11 44 <sub>k</sub>	- 4	i 12 1	PcP	e 15 4	PP
Tsikhlis-Dzhvari		75.6	310	11 48	0	—	—	—	—
Leninakan		75.8	309	e 11 52	+ 2	—	—	—	—
Abastumanj		76.0	310	e 11 53	+ 2	—	—	—	—
Zugdidi		76.2	312	e 11 54	+ 2	e 21 39	+ 3	—	—
Berkeley		76.3	54	e 11 52	0	e 21 33	- 4	e 26 37	SS
Hungry Horse		76.4	41	i 11 50	- 3	—	—	—	e 33.1
Lick	Z.	77.0	54	i 11 57 <sub>a</sub>	+ 1	—	—	i 12 9	PcP
Sotchi		77.1	313	e 11 55	- 2	e 21 43	- 3	—	—
Reno	Z.	77.2	51	e 11 55	- 2	—	—	i 12 1	PcP
Scoresby Sund		78.3	355	e 12 1	- 2	i 21 58	- 1	i 12 10	PcP
Fresno	Z.	78.6	54	e 12 6	+ 1	—	—	—	38.9
Upsala		78.6	335	i 12 2 <sub>a</sub>	- 3	i 22 6	+ 4	i 12 12	PcP
Theodosia		79.0	316	e 12 6	- 1	e 21 54	-12	—	e 35.9
Tinemaha	Z.	79.5	53	e 12 8	- 2	i 12 15	?	i 12 32	PcP
Bozeman		79.6	43	e 12 12	+ 2	e 22 4	- 8	—	—
Yalta		80.0	316	e 12 12	- 1	e 22 14	- 3	—	—
China Lake	Z.	80.6	53	e 12 13	- 3	e 13 20	?	e 15 22	PP
Pasadena		81.0	55	e 12 15	- 3	e 22 21	- 6	i 12 21	P
Logan		81.3	46	e 12 17	- 3	—	—	i 12 23	?
Kishinev		81.6	321	i 12 21	0	e 22 31	- 2	—	—
Riverside	Z.	81.7	55	i 12 21	- 1	—	—	e 12 15	?
Lwow		82.4	325	i 12 25	0	i 22 39	- 2	—	—
Palomar	Z.	82.4	56	e 12 22	- 3	i 12 27	P	i 12 33	PcP
Nelson		82.6	52	i 12 23	- 3	—	—	—	—
Copenhagen		83.5	334	i 12 30	- 1	22 49	- 3	—	—
Uzhgorod		84.0	325	e 12 34	+ 1	e 22 59	+ 2	—	—
Ksara		84.8	306	i 12 40	+ 3	e 23 7	+ 2	—	—
Istanbul	Z.	85.1	315	12 38	- 1	22 52? [- 9]	—	15 58	PP
Raciborzu		85.1	328	e 12 38	- 1	e 23 10	+ 2	e 15 51	PP
Potsdam		85.7	331	e 12 41	- 1	i 23 11	- 3	i 23 21	ScS
Collnberg	Z.	86.5	340	e 12 44	- 2	e 12 53	PcP	e 16 16	PP
Ogyalla		86.6	326	e 16 1	PP	e 23 26	+ 3	e 24 28	PS
Prague		86.8	329	e 12 55	+ 8	e 23 23	- 2	e 29 12	SS
Aberdeen	E.	87.1	341	e 16 12	PP	i 23 25	- 3	e 29 19	SS
Kalossa		87.1	325	e 13 1	+12	—	—	e 13 48	?
Tucson		87.2	54	e 12 48	- 1	e 23 16 [+ 1]	—	e 28 32	SS

Continued on next page.

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		$\Delta$ °	Az. °	P.		O - C. s.	S.		O - C. s.	Supp.		L. m.
				m.	s.		m.	s.		m.	s.	
Jena		87.4	331	e 12	47	- 3	e 23 25	{+ 2}	e 16 14	PP	—	
Cheb		87.7	330	e 13	5	+13	e 23 31	- 2	e 16 22	PP	—	
Witteveen	z.	87.9	335	e 12	51	- 2	—	—	—	—	—	
De Bilt		89.0	335	i 12	57	- 1	i 23 44	- 1	e 16 25	PP	e 43.9	
Durham		89.0	339	—	—	—	i 23 47	+ 2	e 23 24	SKS	—	
Stuttgart		90.0	331	e 13	0 <sub>a</sub>	- 3	e 23 32	{- 1}	e 23 52	S	—	
Helwan		90.2	305	e 13	1	- 3	e 23 32	{- 2}	e 16 34	PP	—	
Karlsruhe		90.2	331	e 13	7 <sub>k</sub>	+ 3	e 24 0	+ 4	e 16 40	PP	—	
Triest		90.3	326	e 13	10	+ 6	e 23 57	0	e 18 36	PPP	48.4	
Uccle		90.3	335	e 13	2	- 2	e 23 31	{- 4}	e 13 14	pP	e 41.9	
Strasbourg		90.8	331	e 13	4	- 2	e 24 0	- 2	e 23 35	SKS	e 44.1	
Kew		91.4	337	i 13	8	- 1	e 23 37	{- 4}	e 16 44	PP	e 46.9	
Zürich		91.4	330	e 13	7	- 2	—	—	e 16 50	PP	—	
Basle		91.7	330	e 13	6	- 4	e 24 12	+ 2	—	—	—	
Rathfarnham Castle		91.7	341	i 16	44	PP	e 23 42?	{- 1}	—	—	—	
Salo		91.9	328	e 17	36	?	—	—	—	—	—	
Paris		92.7	334	e 13	14	- 1	e 23 48	{0}	e 16 54	PP	e 47.9	
Pavia		92.8	328	e 14	15	+59	—	—	e 17 35	?	—	
Florence		92.9	326	e 13	15	- 1	23 44	{- 5}	i 17 8	PP	—	
Oropa		93.0	329	e 13	22	+ 5	e 23 27	{- 23}	i 30 21	SS	—	
Kirkland Lake	z.	93.1	26	e 13	20	+ 3	—	—	—	—	—	
Chambon-la-Forêt		93.4	334	e 13	17	- 1	—	—	—	—	—	
Rome		93.7	324	e 13	14	- 6	e 23 45	{- 9}	i 17 6	PP	—	
Messina		94.8	320	e 17	12	PP	e 23 50	{- 10}	e 30 51	SS	e 39.4	
Reggio Calabria		94.8	320	e 17	27	PP	—	—	—	—	—	
Clermont-Ferrand		94.9	332	e 13	24?	- 1	e 24 5	{+ 4}	e 24 43	S	46.9	
Fayetteville	z.	95.5	42	i 13	26	- 2	—	—	—	—	—	
St. Louis		95.8	38	i 13	32	+ 3	e 24 22	{- 1}	—	—	—	
Ottawa		97.0	25	e 13	34	- 1	23 56	{- 16}	—	—	—	
Seven Falls	E.	97.2	21	—	—	—	24 8	{- 5}	31 30	SS	—	
Palisades		101.4	26	e 18	7	PP	—	—	—	—	—	
Algiers Univ.	z.	102.3	327	e 18	14	PP	—	—	e 20 36	PPP	—	
Alicante		102.6	330	e 13	39	-21	e 25 6	{- 7}	—	—	46.8	
Almeria		104.7	331	13	59	-10	24 43	{- 6}	18 23	PP	54.8	
Granada		104.8	332	13	53 <sub>k</sub>	-17	24 47	{- 3}	18 35	PP	54.6	
Malaga		105.6	332	i 18	37	PP	—	—	20 46	PPP	59.4	
Tamanrasset	z.	112.0	316	e 18	31	{- 6}	e 25 17	{- 3}	e 19 26	PP	—	
M'Bour		130.5	333	i 21	24	PP	—	—	—	—	—	
Huancayo		141.3	69	e 19	33	{0}	—	—	—	—	e 67.5	
La Paz		149.5	68	i 19	55 <sub>k</sub>	{+ 8}	27 0	{+ 7}	23 24	PKS	72.9	

June 16d. 16h. 2m. 3s. Epicentre 25°0S. 177°5W. Depth of focus 0.010.  
(as on 1952, November 13d.).

A = -0.9065, B = -0.0396, C = -0.4203;  $\delta = -4$ ;  $h = +3$ ;  
D = -0.044, E = +0.999; G = +0.420, H = +0.018, K = -0.907.

		$\Delta$ °	Az. °	P.		O - C. s.	S.		O - C. s.	Supp.		L. m.
				m.	s.		m.	s.		m.	s.	
Apia		12.4	27	i 2	48	- 6	i 4 53	-18	—	—	—	
Auckland	N.	13.5	207	e 3	31	PPP	—	—	—	—	—	
Karapiro	N.	14.2	203	e 3	28	PP	e 5 50	- 3	—	—	—	
Tuai	N.	14.5	197	—	—	—	e 5 44	-16	—	—	—	
Tongariro	z.	15.3	201	3	37?	+ 5	5 18?	-61	—	—	—	
Wellington		17.5	200	e 3	54	- 5	e 6 50	-18	—	—	—	
Kaimata	N.E.	19.7	206	e 4	25	+ 1	7 41	-15	—	—	—	
Christchurch		20.2	201	e 4	26	- 3	e 7 50	-15	(e 8 57?)	SSS	e 9.0	
Brisbane		26.5	258	e 5	25	- 5	e 10 4	+ 9	i 6 4	PP	—	
Riverview		28.6	245	i 5	52 <sub>a</sub>	+ 3	i 16 25	ScS	i 6 10	pP	—	
Kurilsk		76.7	334	e 11	45	+ 3	i 21 24	+ 4	12 14	pP	—	
Petropavlovsk		80.5	345	i 12	3	0	i 22 3	+ 3	12 32	pP	—	
Zô-Sè	z.	80.9	310	i 15	36	pPP	—	—	—	—	—	
Branner	z.	81.0	41	i 12	7 <sub>k</sub>	+ 1	—	—	i 12 35	pP	—	
Berkeley		81.2	41	i 12	8	+ 2	e 22 11	+ 4	i 12 36	pP	—	

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	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	I.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Pasadena	81.4	46	i 12 7	- 1	i 12 13	?	i 12 35	pP
Palomar	81.8	48	i 12 10 <sub>a</sub>	0	i 12 20	PcP	i 12 38	pP
Riverside	81.9	46	i 12 9	- 1	i 12 13	?	i 12 38	pP
Woody	81.9	45	e 12 21	PcP	—	—	—	—
Fresno	82.0	43	e 12 10 <sub>a</sub>	- 1	e 15 13	PP	i 12 39	pP
Uglegorsk	82.1	335	i 12 14	+ 3	i 22 25	+ 9	12 44	pP
China Lake	82.8	45	i 12 15	0	e 38 44	P'P'	i 12 43	pP
Shasta	83.0	39	e 12 15 <sub>a</sub>	- 1	—	—	i 12 44	pP
Klyuchi	83.1	348	i 12 17	+ 1	—	—	i 12 46	pP
Nanking	83.1	310	e 12 24	+ 8	i 22 32	+ 6	—	—
Mineral	83.2	40	e 12 16 <sub>a</sub>	- 1	i 13 0	sP	i 12 45	pP
Tinemaha	83.2	44	i 12 17	0	e 22 34	+ 7	i 12 45	pP
Reno	83.8	41	i 12 20 <sub>a</sub>	0	—	—	—	—
Nelson	84.6	46	i 12 23	- 1	—	—	i 12 51	pP
Tucson	85.3	51	i 12 28	+ 1	—	—	i 12 55	pP
Seattle	87.7	34	i 12 41	+ 2	—	—	i 13 10	pP
Tacubaya	88.0	68	e 12 40	0	—	—	—	—
Logan	90.0	43	i 12 49	- 1	—	—	—	—
Hungry Horse	92.4	38	i 13 1	0	—	—	—	—
College	92.5	12	e 13 1	0	—	—	—	—
Lubbock	92.5	54	e 13 1	0	—	—	—	—
Huancayo	95.7	106	i 13 19	+ 3	e 24 39	+17	e 25 25	sS
Fayetteville	99.3	56	i 13 31	- 1	—	—	e 17 32	PP
Kyakhta	100.5	321	—	—	e 24 5	[- 1]	—	—
Irkutsk	102.6	322	—	—	e 24 17	[+ 1]	—	—
Kirkland Lake	113.0	46	e 19 14	PP	—	—	—	—
Ottawa	115.4	50	i 18 30	[- 1]	e 29 7	PS	—	—
Palisades	115.9	55	e 20 2	PP	e 29 16	PS	e 12 56	? e 53.9
Przhevsk	116.5	308	18 35	[+ 2]	25 19	[+ 4]	—	—
Grahamstown	117.6	203	i 18 35	[ 0]	—	—	—	—
Harvard	117.9	53	i 18 35 <sub>k</sub>	[- 1]	—	—	—	—
Naryn	118.1	305	—	—	i 25 25	[+ 5]	i 26 44	SKKS
Frunse	119.3	307	e 18 39	[ 0]	e 25 28	[+ 4]	—	—
Andijan	120.7	304	i 18 43	[+ 2]	e 25 32	[+ 3]	i 29 58	SKSP
Fergana	121.1	304	e 18 43	[+ 1]	e 25 35	[+ 5]	—	—
Namangan	121.3	304	i 18 44	[+ 2]	e 27 5	SKKS	—	—
Dzhergetal	121.4	302	18 45	[+ 3]	—	—	—	—
Kimberley	122.4	203	i 18 45	[+ 1]	—	—	—	—
Obi-garm	122.5	302	e 18 46	[+ 2]	e 27 12	SKKS	—	—
Tchimkent	122.9	306	i 18 45	[ 0]	i 27 15	SKKS	—	—
Tashkent	123.1	305	—	—	e 25 39	[+ 2]	e 27 14	SKKS
Quetta	123.2	292	i 18 47	[+ 1]	—	—	—	—
Stalinabad	123.2	302	e 18 49	[+ 3]	—	—	—	—
Pretoria	123.8	209	i 18 32 <sub>f</sub>	[-15]	—	—	—	—
Sverdlovsk	127.9	324	i 18 56	[+ 1]	e 25 55	[+ 4]	e 19 26	pPKP
Ashkabad	131.3	300	—	—	22 21	SKP	—	—
Scoresby Sund	132.3	11	e 19 5	[+ 2]	28 15	SKKS	i 22 22	SKP
Kizyl-Arvat	132.9	302	—	—	e 28 16	SKKS	i 22 27	PKS
Kiruna	135.8	350	i 19 2	[- 8]	e 26 12	[+ 3]	i 21 47	PP
Baku	137.8	304	—	—	e 22 45	PKS	—	—
Shemakla	138.7	304	e 19 17	[+ 2]	i 22 53	PKS	—	—
Moscow	140.1	330	e 19 11	[- 6]	28 59	SKKS	e 22 45	SKP
Grozny	140.3	309	e 19 19	[+ 1]	i 29 1	SKKS	i 22 57	PKS
Goris	140.6	303	e 19 24	[+ 6]	—	—	—	—
Tiflis	141.4	307	e 19 13	[- 7]	29 10	SKKS	19 44	pPKP
Gori	141.8	308	e 19 22	[+ 2]	—	—	—	—
Piatigorsk	142.0	312	19 18	[- 3]	i 29 13	SKKS	i 19 49	pPKP
Leninakan	142.2	306	e 19 27	[+ 6]	—	—	—	—
Borzhomi	142.4	307	—	—	i 22 49	SKP	—	—
Abastumanj	142.8	307	i 19 21	[- 1]	—	—	—	—

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	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.	
	$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.	
Zugdidi	143.3	310	i 19 24	[+ 1]	e 29 22	SKKS	i 19 49	pPKP	—
Upsala	143.6	348	i 19 21	[- 3]	e 29 17	SKKS	i 20 6	sPKP	—
Sotchi	144.5	312	e 19 17	[- 8]	—	—	—	—	—
Theodosia	146.8	316	e 19 29	[ 0]	—	—	—	—	—
Yalta	147.8	315	e 19 32	[+ 1]	e 29 47	SKKS	e 20 5	pPKP	—
Copenhagen	148.5	350	e 19 34	[+ 2]	—	—	i 20 6	pPKP	—
Kishinev	149.6	325	i 19 39	[+ 5]	i 29 56	SKKS	—	—	—
Ksara	149.7	295	i 19 38	[+ 4]	e 30 12	SKKS	i 20 9	pPKP	—
Rathfarnham C.	z. 151.0	11	i 19 42	[+ 6]	i 19 48	?	i 20 12	pPKP	—
Potsdam	151.5	348	e 19 38	[+ 2]	i 30 7	SKKS	e 20 8	pPKP	—
Uzhgorod	151.7	334	i 19 39	[+ 2]	e 30 10	SKKS	—	—	—
Witteveen	z. 152.0	355	e 19 39	[+ 2]	i 19 47	?	e 19 57	PKP <sub>2</sub>	—
Raciborzu	152.2	340	e 19 39	[+ 2]	e 20 18	sPKP	e 19 55	PKP <sub>2</sub>	—
Collmberg	152.5	346	e 19 38	[ 0]	e 19 58	PKP <sub>2</sub>	e 23 28	PP	—
Istanbul	z. 152.7	314	e 19 38	[ 0]	e 33 33	SKSP	e 20 0	PKP <sub>2</sub>	—
De Bilt	152.8	357	e 19 40	[+ 2]	—	—	—	—	—
Jena	153.2	347	e 19 40	[+ 1]	e 30 10	SKKS	e 20 17	pPKP	—
Prague	153.3	343	e 19 48	[+ 9]	e 30 17	SKKS	e 20 12	pPKP	—
Kew	z. 153.5	4	e 19 48	[+ 9]	—	—	—	—	—
Helwan	z. 154.0	288	e 19 40	[ 0]	e 19 48	?	i 20 5	pPKP	—
Vienna	154.3	339	i 19 42	[+ 2]	e 30 51	SKKS	e 20 28	pPKP	—
Belgrade	155.4	328	e 19 43 <sub>a</sub>	[+ 1]	e 26 14	[-23]	e 24 10	PP	—
Karlsruhe	z. 155.6	351	i 19 39	[- 3]	e 22 31	?	e 20 11	pPKP	—
Stuttgart	155.7	350	e 19 42	[ 0]	e 30 30	SKKS	e 20 11	pPKP	—
Strasbourg	156.1	352	e 19 44	[+ 1]	e 23 10	SKP	i 20 13	pPKP	—
Paris	156.2	1	e 19 46	[+ 3]	e 36 58	PPS	i 20 13	pPKP	—
Chambon-la-Forêt	157.0	2	e 19 45	[+ 1]	—	—	e 24 28	pPP	—
Basle	157.1	352	e 19 44	[ 0]	—	—	e 20 18	PKP <sub>2</sub>	—
Zürich	157.1	351	e 19 43	[- 1]	—	—	e 20 45	pPKP <sub>2</sub>	—
Triest	z. 157.5	341	e 20 43	pPKP <sub>2</sub>	e 22 5	?	e 22 37	?	—
M'Bour	158.9	115	i 19 54	[+ 8]	i 24 1	PP	i 20 19	pPKP	—
Oropa	158.9	350	i 19 42	[- 4]	i 31 14	SKKS	e 28 29	ppPP	—
Florence	z. 159.9	342	i 19 48	[+ 1]	e 30 52	SKKS	e 19 29	?	—
Rome	161.2	337	i 19 49	[ 0]	i 30 59	SKKS	e 44 17?	SS	—
Messina	162.8	324	e 19 51	[+ 1]	e 31 4	SKKS	e 38 6	PPS	—
Tortosa	164.1	6	i 24 29	PP	(e 36 57?)	?	—	—	e 37.0
Toledo	164.2	19	e 19 52	[ 0]	—	—	e 24 9	PP	—
Alicante	166.4	10	i 19 42	[-12]	26 27	[-19]	28 34	PPP	79.0
Malaga	166.9	25	i 19 55	[+ 1]	i 32 12	?	i 21 31	PKP <sub>2</sub>	88.2
Algiers Univ.	z. 168.2	358	e 19 56	[+ 1]	e 31 23	SKKS	e 20 26	pPKP	—
Tamanrasset	z. 176.5	—	i 20 1k	[+ 3]	e 32 16	SKKS	i 20 27	pPKP	—

June 16d. 19h. 48m. 25s. Epicentre 55°·6N. 160°·4W. Focus at Base of Superficial Layers.  
(as on 1952, Aug. 28d.).

A = -·5347, B = -·1903, C = +·8233;  $\delta = -6$ ;  $h = -8$ ;  
D = -·335, E = +·942; G = -·776, H = -·276, K = -·568.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.	
	$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.	
College	11.2	29	e 2 42	+ 1	(i 5 6)	SS	i 2 59	PP	i 5.1
Sitka	14.0	71	i 3 19	+ 1	i 5 58	+ 5	—	—	—
Klyuchi	21.6	288	e 4 47	- 2	—	—	—	—	—
Victoria	23.6	91	7 8	?	—	—	—	—	—
Petropavlovsk	23.8	282	i 5 7	- 4	—	—	5 23	pP	—
Seattle	z. 24.7	91	i 5 28	pP	e 10 11	SS	—	—	—
Magadan	26.0	300	5 30	- 2	—	—	—	—	—
Hungry Horse	29.0	84	i 5 57	- 2	i 9 5	PcP	i 6 8	pP	i 12.7
Shasta	29.0	103	e 5 53 <sub>a</sub>	- 6	e 10 44	- 2	i 6 5	pP	—
Mineral	z. 29.7	103	—	—	e 12 42k	ScP	—	—	—
Berkeley	31.1	108	e 6 14 <sub>a</sub>	- 3	e 11 15	- 5	i 6 24	pP	—
Resolute Bay	31.1	28	e 6 18 <sub>k</sub>	+ 1	e 11 13	- 7	—	—	e 15.1
Reno	z. 31.2	102	i 6 25 <sub>a</sub>	pP	—	—	—	—	—
Saskatoon	31.2	73	—	—	11 21	0	—	—	14.6
Branner	z. 31.4	108	e 6 17 <sub>k</sub>	- 3	—	—	i 6 27	pP	—

Continued on next page.



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		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.	
		°	°	m. s.	s.	m. s.	s.	m. s.	m.	
Kurilsk		33.8	275	i 6 37	- 4	—	—	6 51	pP	—
Tinemaha		33.9	104	e 6 41	- 1	i 12 20	sS	i 6 49	pP	—
Logan		34.2	92	e 6 44	0	—	—	i 6 53	pP	—
Woody	z.	34.5	105	i 6 54	pP	—	—	—	—	—
Uglegorsk		34.9	284	i 6 48	- 2	—	—	7 4	pP	—
China Lake	z.	35.1	104	i 6 51	- 1	i 9 20	PcP	i 7 0	pP	—
Pasadena		36.1	108	i 7 7	+ 6	e 12 33	- 4	i 7 16	pP	e 16.4
Boulder City		36.5	102	i 7 2	- 2	—	—	—	—	—
Riverside	z.	36.6	108	i 7 2	- 3	i 9 24	PcP	i 7 12	pP	—
Nelson		36.7	102	i 7 3	- 3	—	—	—	—	—
Palomar	z.	37.4	107	i 7 13	+ 1	—	—	e 7 8	?	—
Sapporo		38.8	278	e 7 20	- 3	—	—	—	—	—
Mori	N.	39.9	277	e 7 38	+ 6	—	—	—	—	—
Tucson		41.5	102	e 7 43	- 3	e 13 55	- 4	i 7 55	pP	e 17.0
Akita		41.7	273	e 8 1	pP	—	—	e 10 1	PPP	—
Sendai		42.3	271	e 7 49	- 3	—	—	—	—	—
Niigata		43.6	273	e 8 2	- 1	—	—	e 8 44	?	—
Utunomiya		44.1	271	e 8 4	- 3	—	—	—	—	—
Vladivostok		44.1	283	i 8 4	- 3	13 44	PcS	—	—	—
Maebasi	z.	44.6	272	e 8 9	- 2	—	—	—	—	—
Tokyo		44.7	270	8 14	+ 2	—	—	—	—	—
Nagano	N.	44.9	273	e 8 12	- 1	—	—	—	—	—
Titibu		44.9	272	i 8 12	- 1	—	—	—	—	—
Matusiro		45.0	273	i 8 11	- 3	14 47	- 3	18 8	SS	22.4
Oiwake		45.0	273	e 8 10	- 4	—	—	—	—	—
Mera		45.2	270	e 8 14	- 2	—	—	—	—	—
Hunatu		45.4	271	e 8 15	- 2	—	—	—	—	—
Matumoto	N.	45.4	273	8 20	+ 3	—	—	—	—	—
Kohu	E.	45.5	271	e 8 16	- 2	—	—	—	—	—
Ajiro		45.6	270	e 8 15	- 4	—	—	—	—	—
Misima		45.6	270	e 8 17	- 2	—	—	—	—	—
Osima		45.6	269	e 8 18	- 1	—	—	e 8 32	pP	—
Iida		46.0	271	e 8 20	- 2	—	—	—	—	—
Shizuoka		46.0	270	e 8 21	- 1	—	—	—	—	—
Nagoya	E.	46.7	271	8 26	- 1	—	—	—	—	—
Kameyama		47.2	271	e 8 31	0	—	—	—	—	—
Kirkland Lake	z.	47.5	63	i 8 33 <sub>a</sub>	- 1	e 10 26	PP	i 8 44	pP	—
Kyoto		47.5	272	e 8 34	0	—	—	—	—	—
Toyooka		47.6	274	e 8 33	- 1	—	—	—	—	—
Osaka		47.9	272	e 8 38	+ 1	—	—	—	—	—
Fayetteville	z.	48.1	84	i 8 34	- 4	—	—	—	—	—
St. Louis		48.5	79	i 8 40	- 2	i 15 37	- 2	—	—	—
Siomisaki		48.6	271	e 8 39	- 3	—	—	—	—	—
Takamatu		49.0	273	e 8 43	- 2	e 18 31	ScS	i 8 58	pP	—
Koti		49.8	273	e 8 51	- 1	—	—	—	—	—
Matuyama		50.1	274	e 8 50	- 4	e 9 19	?	e 9 5	pP	—
Scoresby Sund		50.8	17	i 9 0	+ 1	i 9 24	sS	i 9 15	pP	23.6
Cincinnati		51.3	74	i 9 0	- 3	i 16 16	- 2	—	—	—
Cleveland		51.3	70	e 8 59	- 4	e 16 9	- 9	e 19 1	ScS	—
Ottawa		51.6	63	e 9 2 <sub>a</sub>	- 3	16 22	0	11 1	PP	—
Buffalo (Larkin)		51.8	67	i 9 6	- 1	—	—	—	—	—
Irkutsk		51.9	309	9 5	- 2	e 16 30	+ 4	i 9 20	pP	—
Kyakhta		52.2	307	9 10	0	e 16 36	+ 5	i 9 24	pP	—
Shawinigan Falls	N.	52.3	60	e 9 8	- 3	16 32	0	11 8	PP	—
Seven Falls	E.	52.8	58	e 9 16	+ 2	16 44	+ 5	—	—	—
Kagosima		53.0	273	e 9 17	+ 1	—	—	—	—	—
Morgantown		53.4	71	i 9 15	- 4	—	—	i 9 26	pP	—
Washington		55.5	69	i 9 32	- 2	—	—	i 9 43	pP	—
Palisades		55.6	66	i 9 33	- 2	i 17 18	+ 2	e 26 55	Q	e 27.4
Harvard		55.8	63	i 9 35 <sub>k</sub>	- 1	i 17 14	- 5	i 9 50	pP	—

Continued on next page.

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		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Weston		56.0	63	i 9 35 <sub>a</sub>	- 3	17 23	+ 1	—	—
Reykjavik		56.4	20	i 9 41	+ 1	—	—	i 9 56	pP
Kiruna		56.9	359	i 9 43 <sub>a</sub>	- 1	e 17 36?	+ 2	i 9 59	pP
Tacnbaya		58.0	102	i 9 46 <sub>k</sub>	- 6	e 17 45	- 3	—	—
Halifax		58.1	56	e 9 52?	0	17 51?	+ 1	21 48?	SS
Zó-Sè	z.	58.6	280	i 9 53 <sub>a</sub>	- 3	i 17 58	+ 2	—	—
Nanking		59.2	283	9 57	- 3	18 3	- 1	—	—
Semipalatinsk		63.0	321	e 10 23	- 3	—	—	—	—
Sverdlovsk		63.1	336	i 10 26	0	18 56	+ 2	i 10 41	pP
Pulkovo		64.7	354	i 10 37	0	19 16	+ 3	i 10 52	pP
Upsala		64.9	2	i 10 37 <sub>a</sub>	- 1	e 19 13	- 3	i 10 54	pP
Aberdeen	k.	66.2	13	—	—	i 19 39	+ 7	i 22 40	?
Bermuda		67.0	66	e 11 6	pP	e 19 40	- 1	—	—
Moscow		68.1	349	10 58	0	—	—	i 11 13	pP
Copenhagen		68.9	5	i 11 5	+ 2	20 11	+ 7	11 20	pP
Rathfarnham C.	z.	69.4	16	i 11 23	pP	i 11 29	sP	i 11 39	PcP
Kurmenty		69.9	318	i 11 11	+ 1	—	—	—	—
Almata		70.2	320	i 11 12	+ 1	e 20 26	+ 7	—	—
Przhevalsk		70.3	318	11 13	+ 1	—	—	—	—
Baguio		70.4	271	i 11 9 <sub>k</sub>	- 4	e 20 35	+13	—	—
Frunse		71.4	321	i 11 19	0	i 20 41	+ 8	i 11 34	pP
Witteveen	z.	71.4	9	i 11 21 <sub>a</sub>	+ 2	—	—	e 11 33	pP
De Bilt		72.0	9	i 11 25	+ 3	e 20 45	+ 5	i 11 38	pP
Kew		72.0	13	i 11 20	- 2	e 21 45	+65	i 11 49	?
Naryn		72.1	319	i 11 25	+ 2	i 20 46	+ 5	—	—
Potsdam		72.3	5	i 11 25 <sub>a</sub>	+ 1	i 20 49	+ 5	i 11 41	pP
Uccle		73.2	11	i 11 30	+ 1	e 20 56	+ 2	e 11 42	pP
Collmberg	z.	73.3	4	e 11 30	0	—	—	i 11 47	pP
Jena		73.6	5	i 11 33	+ 1	e 21 3	+ 5	i 11 48	pP
Tchimkent		73.7	324	i 11 34	+ 2	e 21 1	+ 2	—	—
Andijan		74.1	321	i 11 35	0	21 10	+ 6	11 51	pP
Namangan		74.1	321	i 11 35	0	e 21 9	+ 5	i 11 50	pP
Fergana		74.6	321	i 11 38	0	—	—	i 11 54	pP
Lunacharskoe		74.6	323	e 11 37	- 1	—	—	—	—
Prague		74.6	3	i 11 38 <sub>k</sub>	0	e 21 12	+ 2	i 11 55	pP
Tashkent		74.6	323	i 11 36	- 2	—	—	i 11 53	pP
Raciborzu		74.7	1	e 11 40	+ 2	e 13 51	?	e 11 54	pP
Lwow		74.9	3	i 11 39	0	e 21 16	+ 3	11 56	pP
Paris		75.0	12	i 11 40	0	e 21 7	- 7	i 11 53	pP
Karlsruhe		75.3	8	i 11 45 <sub>a</sub>	+ 3	e 21 17	0	e 11 57	pP
Stuttgart		75.6	7	i 11 45 <sub>a</sub>	+ 2	e 21 26	+ 5	e 12 0	pP
Chambon-la-Forêt		75.7	12	e 11 45	+ 1	i 12 1	sP	i 11 57	pP
Strasbourg		75.7	8	i 11 45	+ 1	e 21 19	- 3	i 12 0	pP
Dzhergetal		75.8	321	11 45	+ 1	i 21 27	+ 4	—	—
Uzhgorod		76.1	358	i 11 47	+ 1	e 21 30	+ 4	12 3	pP
Garm		76.4	322	e 11 48	0	—	—	—	—
Basle		76.7	9	e 11 50 <sub>a</sub>	0	e 13 16	?	e 13 59	?
Obi-garm		76.8	322	i 11 50	0	—	—	—	—
Samarkand		76.9	325	11 52	+ 1	—	—	—	—
Zürich		77.0	9	e 11 51 <sub>a</sub>	0	e 21 32	- 4	e 12 6	pP
Khorog		77.2	320	11 53	+ 1	e 21 44	+ 6	—	—
Neuchatel		77.2	9	e 11 53	+ 1	—	—	—	—
Budapest		77.3	0	e 11 55	+ 2	—	—	—	—
Stalinabad		77.3	322	i 11 53	0	—	—	—	—
San Juan		77.4	76	i 11 51	- 2	e 21 39	- 1	—	—
Kishinev		77.5	354	i 11 54	0	i 21 45	+ 4	i 12 9	pP
Kulyab		77.5	322	11 55	+ 1	—	—	—	—
Chur		77.6	7	e 11 56	+ 2	—	—	—	—
Clermont-Ferrand		78.1	12	e 11 59	+ 2	e 21 54	+ 6	e 22 35	PS
Kalossa		78.2	1	12 3	+ 5	—	—	e 12 40	?

Continued on next page.

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		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Szeged	E.	78.5	0	e 11 37	-22	—	—	—	—
Shillong	E.	78.6	299	e 11 59	-1	e 22 9	sS	e 22 30	SP
Oropa		78.7	9	i 12 3	+3	i 22 46	PS	—	—
Piatigorsk		78.8	343	12 1	0	—	—	—	e 39.6
Theodosia		78.9	348	e 12 1	-1	e 21 57	+1	12 17	pP
Grozny		79.0	341	i 12 3	+1	—	—	—	—
Triest		79.0	5	e 12 2	0	e 22 5	+8	e 12 18	pP
Pavia		79.2	8	i 12 3	0	e 22 7	+8	e 12 51	pP
Yalta		79.5	349	i 12 6	+1	e 22 7	+4	i 12 22	pP
Sotchi		79.7	345	i 12 7	+1	e 22 8	+3	i 12 22	pP
Belgrade		79.9	359	i 12 9 <sup>a</sup>	+2	e 22 31	sS	i 12 25	pP
Chatra	z.	79.9	303	i 12 5	-2	—	—	—	—
Bologna		80.0	6	e 13 24	?	e 22 57	PS	—	—
Padova		80.1	6	e 12 4	-4	—	—	—	—
Bairam-Ali		80.3	327	i 12 11	+2	—	—	—	—
Duzheti		80.4	342	e 12 19 <sup>?</sup>	+9	—	—	—	—
Zugdidi		80.4	343	e 12 11	+1	22 18	+6	12 30	pP
Gori		80.6	342	e 12 13	+2	—	—	—	—
Kizyl-Arvat		80.7	332	12 12	+1	—	—	—	—
Tiflis		80.7	341	i 12 13	+2	—	—	12 28	pP
Florence		80.8	7	i 12 12 <sup>a</sup>	0	i 22 20	+4	i 12 30	pP
Borzhom		80.9	342	i 12 13	+1	—	—	12 28	pP
Abastumanj		81.0	342	12 17	+4	—	—	—	—
Baku		81.0	337	i 12 10	-3	e 22 21	+3	—	—
Shemakla		81.0	338	i 12 14	+1	—	—	12 29	pP
Tsikhli-Dzhvari		81.0	342	i 12 16	+3	e 22 26	+8	—	—
Ashkabad		81.1	330	12 15	+2	e 22 29	+10	i 12 30	pP
Siena		81.2	7	e 12 23	pP	i 21 21	-59	i 12 41	?
Akhalkalaki		81.3	342	12 17	+3	—	—	—	—
Goris		82.6	338	i 12 22	+1	—	—	—	—
Tortosa		82.6	14	e 11 48	-33	e 23 8	SP	—	—
Rome		82.7	6	i 12 22 <sup>a</sup>	0	i 22 41	+5	i 12 39	pP
New Delhi		82.8	311	e 12 20	-2	e 22 39	+2	i 12 36	pP
Toledo		82.8	18	i 12 24	+2	22 42	+5	i 12 36	pP
Lisbon	z.	82.9	22	i 12 25 <sup>a</sup>	+2	—	—	i 12 41	pP
Chinchina		83.0	91	e 22 20	?	e 22 35	-4	—	—
Istanbul	z.	83.4	353	12 26	+1	e 12 54	sP	e 12 43	pP
Alicante		84.9	16	e 12 26	-7	e 22 48	-10	15 47	PP
Quetta		85.4	321	i 12 34 <sup>k</sup>	-1	i 23 17	sSKS	i 12 52	pP
Granada		85.5	18	i 12 37 <sup>k</sup>	+1	i 23 30	sS	—	—
Malaga		85.8	19	i 12 34	-3	i 23 25	sS	18 8	PPP
Almeria		86.0	18	i 12 42	+4	23 14	+6	16 6	PP
Messina		86.5	3	e 12 40	-1	i 23 14	+1	—	—
Athens		86.7	357	e 12 42	0	—	—	i 12 59	pP
Algiers Univ.	z.	86.9	14	e 12 43	0	—	—	e 16 8	PP
Ksara		89.9	347	i 13 0	+3	e 23 48	+3	i 13 17	pP
Poona	z.	93.1	309	i 13 11	-1	—	—	i 13 31	sP
Huancayo		97.1	101	—	—	e 24 48	+1	e 31 53	SS
Riverview	E.	98.2	219	—	—	i 25 0	+4	—	—
Tamanrasset	z.	101.0	13	e 13 49	+1	e 25 27	+7	e 18 3	PP
La Paz		104.7	97	15 55	?	24 45	[+5]	18 19	PP
Pretoria	z.	149.5	344	e 19 38 <sup>?</sup>	[-3]	—	—	i 19 44 <sup>?</sup>	PKP <sub>2</sub>
Kimberley	z.	152.9	349	e 19 46	[0]	—	—	i 19 54	PKP <sub>2</sub>
Grahamstown	z.	157.2	344	e 19 51	[-1]	—	—	i 20 24	PKP <sub>1</sub>

June 17d. 1h. 36m. Near Fox Island, Aleutians.

U.S.C.G.S. gives epicentre 52°N. 171°W. Widely recorded.

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June 17d. 14h. 8m. 36s. Epicentre 15°·6S. 74°·6W. Depth of focus 0·005.  
(as on 1948, March 22d.).

Felt in Peru intensity V at Chala ; III at Chimbot ; II at Arequipa and Huancabamba.

E. Silgado.

Datos sísmológicos del Perú, 1952-1955.

A = +·2559, B = -·9290, C = -·2673 ;  $\delta$  = -2 ; h = +6 ;  
D = -·964, E = -·266 ; G = -·071, H = +·258, K = -·964.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.	
		°	°	m. s.	s.	m. s.	s.	m. s.	m.	
Huancayo		3·6	350	i 1 2	+ 7	i 1 48	+11	i 1 21	?	—
La Paz		6·3	101	i 1 29	- 3	i 2 34	-10	i 3 22	?	—
Antofagasta	E.	8·9	155	e 2 46	?	e 4 48	?	—	—	—
Santa Lucia	N.	18·1	170	e 3 55	-13	e 7 40	+15	e 4 50	?	—
Bogota		20·1	1	i 4 34	+ 3	e 8 19	+11	e 8 54	SSS	—
Chinchina		20·5	359	i 4 36	+ 1	i 8 27	+11	i 4 57	pP	—
Buenos Aires		23·8	144	e 5 1	- 7	—	—	—	—	—
La Plata		24·4	144	5 12	- 1	9 18	- 8	—	—	12·8
San Juan		34·8	15	i 6 43	- 3	e 12 10	- 2	—	—	—
Tacubaya		42·6	325	e 7 48	- 3	—	—	e 7 58	?	—
Bermuda		48·6	12	e 10 55	PP	e 15 36	+ 1	e 19 39	SS	e 26·2
Washington		54·3	358	i 9 21	- 1	—	—	i 9 33	pP	—
Fayetteville	Z.	54·7	341	i 9 24 <sub>a</sub>	- 1	e 16 54	- 4	i 9 36	pP	—
Morgantown		55·2	355	i 9 28	0	—	—	e 11 23	PP	—
Lubbock		55·4	333	e 9 31	+ 1	—	—	—	—	—
St. Louis		55·9	345	e 9 33	- 1	e 17 19	+ 5	—	—	—
Palisades		56·3	2	—	—	(e 17 35)	+15	—	—	e 17·6
Cleveland		57·2	354	i 9 41 <sub>a</sub>	- 2	e 17 33	+ 1	i 10 1	pP	—
Weston		57·8	4	i 9 47 <sub>k</sub>	0	e 17 42	+ 3	—	—	—
Harvard		57·9	4	i 9 47 <sub>a</sub>	- 1	—	—	i 10 6	pP	—
Buffalo (Larkin)		58·3	357	i 9 50	0	—	—	—	—	—
Tucson		58·9	324	e 9 55	0	—	—	—	—	—
Ottawa		61·1	359	i 10 6 <sub>a</sub>	- 4	18 26	+ 4	10 26	pP	—
Shawinigan Falls	N.	61·9	2	e 10 15	0	—	—	10 44	sP	—
Seven Falls	E.	62·5	3	—	—	e 18 3	-37	23 10	SS	—
Palomar	Z.	63·2	321	i 10 25 <sub>a</sub>	+ 1	i 10 52	?	i 10 37	pP	—
Kirkland Lake	Z.	63·6	357	i 10 25 <sub>a</sub>	- 1	—	—	i 10 39	pP	—
Nelson		63·7	325	i 10 27	0	—	—	i 10 40	pP	—
Boulder City		63·9	325	e 10 29	+ 1	—	—	—	—	—
Riverside	Z.	64·1	321	i 10 30 <sub>a</sub>	0	—	—	e 10 40	pP	—
Pasadena		64·6	321	i 10 34 <sub>a</sub>	+ 1	—	—	i 10 47	pP	—
China Lake	Z.	65·4	323	i 10 39 <sub>a</sub>	+ 1	i 11 12	PcP	i 10 54	pP	—
Woody	Z.	66·0	322	i 10 43 <sub>a</sub>	+ 1	—	—	i 11 27	?	—
Logan		66·6	331	i 10 46	0	—	—	e 11 0	pP	—
Tinemaha	Z.	66·6	323	e 10 47 <sub>a</sub>	+ 1	—	—	—	—	—
Fresno	Z.	67·3	323	e 10 50 <sub>a</sub>	0	e 11 29	?	e 11 2	pP	—
Lick	Z.	68·8	322	i 11 2 <sub>a</sub>	+ 3	—	—	i 11 26	PcP	—
Reno	Z.	69·2	324	e 11 4 <sub>a</sub>	+ 2	—	—	—	—	—
Berkeley	Z.	69·5	321	i 11 5 <sub>a</sub>	+ 1	—	—	e 11 18	pP	—
Butte		70·3	333	i 11 9	0	—	—	i 11 23	pP	—
Mineral	Z.	70·7	324	e 11 12 <sub>a</sub>	+ 1	i 11 38	sP	—	—	—
Shasta	Z.	71·4	324	e 11 14 <sub>a</sub>	- 1	—	—	—	—	—
Hungry Horse		72·7	334	i 11 24	+ 1	—	—	—	—	—
Malaga		84·1	49	i 12 26	+ 1	i 22 53	+10	e 17 47	PPP	41·7
Granada		84·9	49	12 38 <sub>a</sub>	+ 9	23 1	+10	—	—	46·2
Almeria		85·6	50	12 33	0	23 1	+ 3	15 51	PP	46·5
Toledo		85·6	47	i 12 32	- 1	24 2	PS	e 30 46	PKKP	—
Tamanrasset	Z.	87·2	66	i 12 40 <sub>k</sub>	0	e 23 12	- 1	i 12 53	pP	—
Alicante		87·6	49	e 12 35	- 7	e 23 8	- 9	—	—	42·0
Tortosa		89·2	47	e 13 47	+57	i 23 37	+ 5	—	—	—
Rathfarnham C.	Z.	90·0	34	i 12 52 <sub>k</sub>	- 2	—	—	i 13 28	?	—
Resolute Bay		90·3	355	e 12 57	+ 2	—	—	—	—	—
Kimberley	Z.	90·6	120	i 12 52	- 4	—	—	—	—	—
Clermont-Ferrand		92·7	44	e 13 6	0	e 24 3	0	—	—	46·9
Chambon-la-Forêt		92·9	41	i 13 8	+ 1	—	—	—	—	—

Continued on next page.

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	$\Delta$ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	Supp. m. s.	L. m.
Scoresby Sund	93.2	16	—	—	e 24 14	+ 7	—	49.4
Paris	93.3	41	e 13 6	- 3	e 25 20	SP	e 13 20	e 45.4
Pretoria	z. 94.4	118	i 13 10?	- 4	—	—	—	—
Uccle	95.1	38	e 13 14	- 3	e 13 32	sP	e 13 25	e 41.4
De Bilt	96.0	37	e 13 24?	+ 3	—	—	—	e 46.4
Basle	96.2	43	e 13 12	-10	—	—	—	—
Pavia	96.6	45	e 22 38	?	e 27 13	PPS	e 34 28	e 43.6
Strasbourg	96.6	42	e 13 22	- 2	e 17 29	PP	e 13 35	—
College	97.1	336	e 13 26	0	—	—	e 13 41	—
Witteveen	97.1	37	e 13 24	- 2	—	—	—	—
Stuttgart	97.6	41	e 13 26	- 2	—	—	—	—
Florence	z. 97.7	47	e 13 40	pP	—	—	—	—
Rome	98.1	49	i 13 29 <sub>a</sub>	- 2	—	—	—	—
Jena	z. 99.6	40	e 13 36?	- 2	—	—	e 13 46	pP
Collnberg	z. 100.5	40	e 13 40	- 2	—	—	—	—
Copenhagen	101.1	35	—	—	24 46	sSKS	e 25 49	sS 49.4
Kiruna	106.2	24	e 14 3	P	e 27 47	PS	e 18 25?	PP e 51.4
Ksara	115.4	60	e 9 54	?	—	—	—	—
Quetta	z. 142.0	61	i 19 22	[- 3]	—	—	i 19 38	pPKP
Poona	z. 149.7	80	i 19 42	[+ 4]	—	—	—	—

June 17d. 21h. 51m. Provisional epicentre 34°·9S. 180° Depth ca. 350km.

Magnitude 5.6

Seismological Observatory Bulletin No. E-132, April-June, 1953, Wellington, N.Z., 1955, p.13.

June 17d. 22h. 18m. 30s. Epicentre 41°·6N. 142°·1E. Depth 60-70km.

Intensity II-III at Hatinohe.

Seismo. Bull. Cent. Met. Obs., Japan, June, 1953, Tokyo, 1953, p.18, with macroseismic chart.

June 18d. 5h. 44m. 6s. Epicentre 41°·7N. 26°·6E.

Damage at Andrinople. Felt over a wide area of Bulgaria; Intensity VI-VII at Sladyn, felt also in the regions near Hevros (Intensity VI at N. Vyssa; IV at Souphli), and around Rhodope (Intensity IV at Sappac). Intensity II-III at Istanbul.

Strasbourg gives epicentre as adopted. U.S.S.R. gives 42°·0N. 26°·6E.

K. T. Kirov and Ek. Grigorova.

Tremblements de terre en Bulgarie pendant les années, 1951-1954; Sofia, 1957, p.62-72 and 107, with macroseismic chart between p.106-107.

A. Galanopoulos.

Seismological Institute Bulletin, 1953, Athens, 1954, p.68.; Monthly Seismological Bulletin of Istanbul, for June, 1953.

$$A = +.6696, B = +.3353, C = +.6627; \quad \delta = -4; \quad h = -2;$$

$$D = +.448, E = -.894; \quad G = +.593, H = +.297, K = -.749.$$

	$\Delta$ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	Supp. m. s.	L. m.
Istanbul	2.0	108	i 0 36	+ 1	1 6	0 <sub>g</sub>	i 0 42	P <sub>g</sub>
Sofia	2.6	293	0 46	- 1*	i 1 14	- 3	1 29	S <sub>g</sub>
Bucharest	2.7	352	i 0 48 <sub>k</sub>	+ 3	1 20	+ 1	i 1 30	S <sub>g</sub> ?
Campulung	3.7	343	e 1 2	+ 2	e 2 1	- 1 <sub>g</sub>	i 2 8	—
Focsani	N. 4.0	6	e 1 10	- 1*	i 2 8	- 4 <sub>g</sub>	—	—
Athens	4.3	212	e 1 3	- 5	i 1 53	- 7	i 1 6	P
Bacau	N. 4.9	2	e 1 18	+ 1	e 2 41	- 1 <sub>g</sub>	e 1 49	?
Belgrade	5.4	307	i 1 23 <sub>a</sub>	- 1	i 3 1	+ 3 <sub>g</sub>	i 2 24	S
Iasi	5.5	7	e 1 26	+ 1	i 2 26	- 4	i 2 34	SS
Kishinev	5.5	16	i 1 26	+ 1	i 2 27	- 3	—	—
Timisoara	N. 5.6	318	e 1 27	0	e 3 8	+ 3 <sub>g</sub>	e 2 10	?
Yalta	6.2	61	i 1 34	- 1	i 2 41	- 7	—	—
Szeged	N. 6.5	316	1 44	+ 5	3 14	- 3*	e 2 8	P <sub>g</sub>
Cernauti	6.6	356	1 41	0	—	—	—	—
Theodosia	7.2	60	e 1 48	- 1	i 3 7	- 6	—	—

Continued on next page.



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		$\Delta$	Az.	P.		O - C.	S.		O - C.	Supp.		L.
		$^{\circ}$	$^{\circ}$	m.	s.	s.	m.	s.	s.	m.	s.	m.
Kalossa		7.3	314	e 2	3	- 5 <sub>g</sub>	i 3	9	- 6	2	37	?
Uzhgorod		7.6	338	e 1	52	- 3	3	15	- 8			
Budapest	N.	7.9	320	e 2	6	+ 7	e 4	22	+ 1 <sub>g</sub>	e 4	3	S*
	E.	7.9	320	e 2	16	- 2*	e 3	34	+ 4	4	18	S <sub>g</sub>
Lwow		8.3	348	i 2	4	0						
Ogyalla		8.6	319	e 2	27	P*	e 4	23	+ 4*	e 2	56	P <sub>g</sub>
Messina		9.2	251	e 2	13	- 3	i 3	55	- 8	i 2	19	P
Reggio Calabria		9.2	250	e 2	16	0	i 4	13	+ 10			
Vienna		9.8	316	e 2	22	- 2	e 5	30	+ 6 <sub>g</sub>	e 4	51	S*
Sotchi		9.8	75	e 2	21	- 3	e 4	5	- 12			
Triest		10.1	297	e 2	27	- 2	e 4	30	+ 5	i 5	39	?
Raciborzu		10.2	328	e 2	24?	- 7	e 4	44	SS	e 2	46	PPP
Rocca di Papa		10.4	275	e 2	49	PPP	e 4	52	SSS	e 5	44	?
Rome		10.5	276	e 2	36	+ 1	i 4	36	+ 1	i 2	55	PPP
Ksara		10.8	134	e 2	42	+ 3	e 5	8	SSS			
Siena		11.4	283	e 2	35	- 12						
Bologna		11.5	289	e 3	0	PP	e 4	46	- 13			
Florence		11.5	286	e 2	38	- 10	e 4	37	- 22	e 6	8	S <sub>g</sub>
Prato		11.6	286	e 3	5	PPP	e 6	1	+ 60			
Prague		11.9	319	i 2	53	- 1	e 5	2	- 7	e 3	0	PP
Abastumanj		12.1	84	e 3	2	+ 5						
Piatigorsk		12.3	74	e 2	59	0	i 5	14	- 4			
Salo		12.3	294	e 3	8	PP	e 5	51	SSS	e 4	58	?
Helwan	Z.	12.4	161	2	58	- 3	e 5	24	+ 3	i 3	3	P
Tsikhlis-Dzhvari		12.6	84	e 3	2	- 1						
Cheb	N.	13.0	315				e 5	50	SS			
Pavia		13.1	291	e 3	43	?	e 5	30	- 8	e 4	33	?
Chur		13.3	299	e 3	11	- 2						
Collnberg		13.4	320	e 3	13	- 1	e 6	5	SSS	e 7	26	?
Erevan		13.6	90	i 3	19	+ 2	5	51	+ 1			
Tiflis		13.6	84	e 3	15	- 2						
Jena		13.9	317	e 3	18	- 3	e 6	15	SSS	e 3	27	PP
Oropa		14.1	292	i 3	47	PPP				i 4	52	?
Potsdam		14.1	324	e 3	22	- 1	e 6	18	SS			
Stuttgart		14.1	306	e 3	23	0	e 6	10	+ 8	e 3	30	PP
Basle		14.7	300	e 3	28	- 3	e 6	11	- 5	e 7	18	?
Karlsruhe		14.7	306	3	30	- 1	e 6	47	SS			
Kirovohad		14.9	87	3	36	+ 2						
Neuchatel		15.0	297	e 3	15	- 20						
Strasbourg		15.0	304	e 3	38	+ 3	e 6	28	+ 5	e 3	45	PP
Goris		15.1	92	i 3	40	+ 4	e 6	25	0			
Moscow		15.8	23	e 3	41	- 4	e 6	31	- 11			
Shemakla		16.6	86	e 3	57	+ 1	e 7	24	SS			
Copenhagen		16.8	331	e 3	56	- 2	e 7	6	+ 1			8.9
Clermont-Ferrand		17.4	291	e 4	10	+ 4	e 7	33	SS			9.4
Witteveen	Z.	17.5	318	e 4	5	- 2				i 4	7	P
Baku		17.6	86	i 4	14	+ 6						
Uccle		17.8	308	e 4	10	- 1	e 7	34	+ 6	e 4	41	PPP
De Bilt		17.9	314	i 4	12	0	e 7	38	+ 8	e 7	46	SS
Chambon-la-Forêt		18.3	298	e 4	18	+ 1						
Pulkovo		18.3	6	i 4	11	- 6						
Paris		18.4	300	e 4	16	- 2	e 7	48	+ 7	e 4	43	PP
Helsinki		18.5	356	e 4	15	- 4						
Algiers Univ.	Z.	18.9	262	e 4	24	0	e 8	2	+ 9			
Upsala		19.0	344	i 4	22	- 4	e 8	0	+ 5	i 4	38	PP
Tortosa		19.6	276	e 4	21	- 11	8	11	+ 3			
Kew		20.8	307	e 5	5	PP	e 8	43	+ 10	e 12	27	P <sub>C</sub> S
Alicante		21.0	271	4	46	- 1	8	40	+ 3	5	20	PPP
Jersey	E.	21.4	301	e 4	50	- 1						
Durham		22.7	314	5	2	- 2	9	19	+ 10	9	37	SS
Kizyl-Arvat		22.7	83	i 5	10	+ 6	9	18	+ 9			
Bergen	N.	22.8	333	e 12	48	P <sub>C</sub> S						
Almeria		23.0	268	5	19	+ 12	9	31	+ 17	6	3	PPP
Toledo		23.2	275	5	9	0						
Granada		23.7	269	i 5	14 <sub>a</sub>	0	i 9	33	+ 6	5	30	pP

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		$\Delta$ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	Supp. m. s.	L. m.
Aberdeen	E.	24.0	320	i 5 14	- 3	e 9 34	+ 2	—	i 13.2
Malaga		24.5	269	i 5 23	+ 1	i 9 43	+ 3	8 54	PcP 14.7
Ashkabad		24.6	87	i 5 25	+ 2	—	—	—	—
Rathfarnham Castle		24.8	310	i 5 23k	- 2	e 9 53	+ 7	e 6 16	PPP e 14.1
Tamanrasset	Z.	25.8	230	i 5 36k	+ 2	e 10 18	+16	6 21	PP 13.2
Kiruna		26.4	355	i 5 38k	- 2	i 10 21	+ 9	e 11 23	SS i 13.6
Sverdlovsk		26.5	42	i 5 40	- 1	—	—	—	—
Samarkand		30.5	79	e 6 16	- 1	—	—	—	—
Tashkent		31.7	75	e 6 25	- 2	—	—	—	—
Tchimkent		31.7	73	e 6 26	- 1	—	—	—	—
Lunacharskoe		31.8	75	e 6 21	- 7	—	—	—	—
Stalinabad		32.2	80	i 6 33	+ 1	—	—	—	—
Garm		33.1	79	e 6 41	+ 1	—	—	—	—
Kulyab		33.1	81	e 6 40	0	—	—	—	—
Dzhergetal		33.8	78	e 6 44	- 2	—	—	—	—
Fergana		33.8	77	i 6 47	+ 1	—	—	—	—
Andijan		34.1	76	i 6 49	+ 1	—	—	—	—
Khorog		34.6	81	e 6 54	+ 1	—	—	—	—
Naryn		36.6	73	i 7 11	+ 1	—	—	—	—
Scoresby Sund		37.7	335	e 7 18	- 1	e 13 19	+ 9	e 8 41	PP 21.9
Przhevsk		38.0	70	e 7 22	+ 1	—	—	—	—
Chatra	Z.	51.2	86	i 9 7	0	—	—	—	—
Kabansk		53.0	49	i 9 20	- 1	—	—	—	—
Kyakhta		53.6	51	9 25	0	—	—	—	—
Resolute Bay		57.7	344	e 9 52	- 3	—	—	—	—
Halifax		62.5	306	e 10 35?	+ 7	—	—	—	—
Seven Falls	E.	65.3	312	e 10 44	- 2	—	—	—	—
Harvard		68.4	308	i 11 6	0	—	—	—	—
Weston		68.4	308	i 11 4k	- 2	e 18 18	?	—	—
Ottawa		69.0	312	e 11 9k	0	—	—	—	—
Kirkland Lake	Z.	69.6	316	e 11 12	- 1	—	—	—	—
Morgantown		75.1	310	i 11 46	0	—	—	—	—
Fayetteville	Z.	85.5	316	i 12 40k	- 1	—	—	—	—
Mineral	Z.	93.4	336	i 13 19k	+ 1	—	—	i 13 26	—
Bogota		94.9	280	i 13 45	+20	i 14 14	?	—	—
Tinemaha	Z.	95.3	332	i 13 28	+ 1	—	—	—	—
Chinchina		95.8	281	e 13 40	+11	e 13 54	?	—	—
China Lake	Z.	96.2	331	i 13 30	- 1	—	—	—	—
Riverside	Z.	97.7	331	i 13 38	0	—	—	—	—
Pasadena	Z.	97.9	331	i 13 38	- 1	—	—	—	—

June 18d. 10h. 4m. 49s. Epicentre 6°.5S. 155°.0E. (as on 1952, Dec. 2d.).

A = - .9006, B = + .4200, C = - .1125;  $\delta$  = +14;  $h$  = +7;  
D = + .423, E = + .906; G = + .102, H = - .048, K = - .994.

		$\Delta$ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	Supp. m. s.	L. m.
Brisbane		20.9	187	i 4 43	- 3	i 8 33	- 2	i 5 6	PP i 10.0
Guam		22.3	333	i 4 59	- 2	—	—	—	—
Riverview		27.4	188	i 5 44k	- 5	i 10 23	- 5	i 6 36	PP e 12.6
Melbourne	E.	32.5	195	e 13 7	PcS	i 11 45	- 4	e 14 5	SSS —
Apia		33.5	106	—	—	e 15 11?	SSS	—	—
Auckland	N.	35.2	153	—	—	(e 14 11?)	SS	—	e 14.2
Tuai	N.	37.9	152	e 7 36	+16	e 12 51	-22	—	—
Kaimata	N.E.	38.7	161	e 7 34	+ 7	e 13 18	- 7	e 13 33	ScP e 18.3
Wellington		38.9	157	e 7 25	- 4	e 13 16	-12	(e 15 59)	SS e 16.0
Christchurch		40.0	161	e 7 27	-11	e 13 37	- 7	e 9 23	PP —
Baguio		41.0	304	i 7 49a	+ 3	i 14 1	+ 2	i 17 41	SSS 20.2
Perth		44.4	230	—	—	e 14 56	+ 7	i 18 6	SS 1 22.2
Djakarta		47.9	250	i 8 48k	+ 6	i 15 37	- 2	i 10 42	PP —
Hong Kong		49.2	307	e 8 53	+ 1	16 2	+ 4	—	—
Zô-Sè	Z.	49.4	321	8 53a	0	e 16 3	+ 3	—	—

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	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Nanking	51.6	321	i 9 11 <sup>a</sup>	+ 1	16 33	+ 2	—	—
Kurilsk	51.9	354	i 9 12	0	16 32	- 3	—	—
Vladivostok	53.7	339	i 9 26	0	16 58	- 1	—	—
Ulegorsk	56.5	351	i 9 46	0	e 17 39	+ 2	—	—
Petropavlovsk	59.5	2	i 10 6	- 1	e 18 11	- 5	—	—
Klyuchi	62.8	4	i 10 29	- 1	—	—	—	—
Magadan	65.9	358	10 48	- 2	—	—	—	—
Shillong	E. 69.1	301	i 11 10	0	i 20 15	0	i 21 4	PPS
Kyakhta	70.4	329	11 17	- 1	20 32	+ 2	—	—
Kabansk	71.4	330	i 11 23	- 1	i 20 41	- 1	—	—
Irkutsk	72.7	330	11 31	- 1	e 20 58?	+ 1	—	—
Chatra	73.5	300	11 36	0	e 21 5	- 1	—	—
Hyderabad	79.2	289	e 12 7	- 1	i 22 4	- 4	—	37.7
Dehra Dun	N. 82.1	303	i 12 32	+ 8	i 22 46	+ 8	22 48	ScS
New Delhi	82.5	300	e 12 24	- 2	i 22 36	- 6	—	—
College	82.6	20	i 12 25	- 1	—	—	—	—
Poona	Z. 83.7	290	i 12 32	0	—	—	—	—
Przhevalsk	84.6	314	e 12 37	+ 1	—	—	—	—
Bombay	84.7	290	e 12 36	- 1	i 22 58	- 6	23 53	PS
Almata	85.8	315	i 12 43	+ 1	e 23 19	+ 4	—	38.2
Naryn	86.1	313	i 12 44	0	i 23 17	- 1	—	—
Frunse	87.4	314	e 12 51	+ 1	i 23 34	+ 4	i 24 38	PS
Berkeley	88.2	52	i 12 55 <sup>k</sup>	+ 1	e 23 49	+ 11	e 24 39	PS
Warsak Dam	E. 88.2	304	e 12 57	+ 3	e 23 15	[- 7]	—	e 45.2
Shasta	Z. 88.5	49	i 12 57 <sup>k</sup>	+ 1	—	—	e 13 7	PcP
Andijan	88.6	311	i 12 55	- 1	i 23 43	+ 1	—	—
Lick	Z. 88.6	52	i 12 58 <sup>k</sup>	+ 2	—	—	i 13 52	?
Khorog	88.7	308	e 12 56	- 1	23 41	- 2	—	—
Fergana	89.0	311	e 12 57	- 1	e 23 23	[- 4]	—	—
Mineral	Z. 89.2	49	e 12 58 <sup>a</sup>	- 1	i 13 7	PcP	e 14 33	?
Namangan	89.2	311	i 12 59	0	i 23 48	+ 1	e 33 35	SSS
Dzhergetal	89.3	310	e 13 0	+ 1	—	—	—	—
Garm	89.9	309	e 16 38	PP	e 23 51	- 3	—	—
Fresno	Z. 90.0	53	i 13 3 <sup>k</sup>	0	—	—	e 13 15	PcP
Kulyab	90.2	308	13 3	- 1	23 40	{- 3}	—	—
Reno	Z. 90.4	50	e 13 3	- 1	—	—	—	—
Woody	Z. 90.6	54	e 13 5	0	—	—	—	—
Tchimkent	90.9	312	i 13 7	0	e 24 5	+ 2	—	—
Lunacharskoe	91.0	311	e 13 7	0	i 24 3	0	—	—
Pasadena	91.0	56	i 13 7	0	e 25 26	PS	i 13 17	PcP
Tashkent	91.0	311	e 13 7	0	i 24 3	0	e 16 38	PP
Stalinabad	91.1	309	e 13 7	- 1	23 30	[- 9]	e 18 50	PPP
Tinemaha	91.2	53	e 13 9	+ 1	—	—	e 13 12	PcP
Quetta	91.5	300	i 13 8	- 2	e 24 5	- 3	—	—
Riverside	Z. 91.6	56	i 13 10	0	—	—	—	—
China Lake	Z. 91.7	53	i 13 10	0	i 13 17	PcP	e 16 14	?
Samarkand	92.6	309	e 13 14	- 1	23 41	[- 7]	—	—
Nelson	93.9	54	i 13 21	0	—	—	i 17 5	PP
Hungry Horse	95.5	42	i 13 27	- 1	—	—	e 17 17	PP
Bairam-Ali	96.2	307	i 13 32	+ 1	i 24 3	[- 5]	i 17 25	PP
Butte	96.3	44	e 13 32	0	—	—	—	—
Tucson	96.9	58	e 13 43	+ 9	—	—	17 29	PP
Sverdlovsk	97.8	327	i 13 37	- 1	24 57?	- 5	24 11	SKS
Resolute Bay	101.5	14	e 13 54	- 1	e 24 31	[- 3]	e 27 5	PS
Baku	105.7	310	e 18 35	PP	—	—	—	e 36.1
Shemakla	106.6	311	e 18 41	PP	—	—	—	—
Kirovobad	108.3	310	e 18 51	PP	e 24 47	[- 18]	e 28 12	PS
Grozny	108.4	313	e 19 1	PP	—	—	—	—
Goris	108.5	309	e 14 24	- 2	19 6	PP	21 22	PPP
Tiflis	109.4	312	e 14 29	- 1	25 9	[- 1]	28 28	PS
Gori	109.6	312	e 19 7	PP	—	—	—	—
Erevan	109.8	310	e 19 2	PP	28 44	PS	—	—
Piatigorsk	110.2	314	i 19 11	PP	—	—	—	—
Fayetteville	Z. 110.6	54	e 19 7	PP	—	—	—	—
Moscow	110.6	328	e 14 35	P	e 28 41	PS	e 19 13	PP

Continued on next page.

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		$\Delta$	Az.	P.		O-C.	S.	O-C.	Supp.		L.
		°	°	m.	s.	s.	m.	s.	m.	s.	m.
	Zugdidi	111.4	313	19	13	PP	e 28 50	PS	—	—	—
	Kiruna	111.6	343	i 18	36	[ 0]	e 26 12?	{ - 4}	i 19 20	PP	e 51.2
	Pulkovo	112.5	333	e 19	25	PP	e 26 16	{ - 6}	e 28 50	PS	—
	Sotchi	112.7	315	e 19	23	PP	—	—	—	—	—
	St. Louis	113.3	50	i 29	6	PS	—	—	—	—	—
	Kirkland Lake	z. 117.7	38	e 18	48	[ 0]	—	—	—	—	—
	Ksara	117.7	304	i 20	5	PP	20 33	?	e 23 9	?	—
	Upsala	z. 117.8	338	e 18	50	[ + 2]	—	—	—	—	—
	Helwan	z. 118.6	301	e 18	57	[ + 7]	e 19 17	PP	e 20 35	?	—
	Kishinev	118.9	322	e 20	11	PP	—	—	—	—	—
	Kimberley	z. 120.6	230	e 18	54	[ 0]	—	—	—	—	—
	Istanbul	z. 121.0	315	18	56	[ + 1]	e 32 57	PKKS	20 27	PP	—
	Ottawa	121.5	39	i 18	54	[ - 2]	22 31	PKS	—	—	—
	Uzhgorod	122.1	325	18	58	[ + 1]	30 38	PS	20 34	PP	—
	Copenhagen	122.7	336	e 18	58	[ 0]	—	—	20 35	PP	—
	Seven Falls	E. 123.7	35	e 18	47?	[ - 13]	27 28	{ - 11}	37 36?	SS	—
	Palisades	124.6	44	i 19	2	[ 0]	e 32 8	PPS	i 20 49	PP	e 57.9
	Potsdam	124.6	333	e 19	3	[ + 1]	e 22 23	PKS	e 20 47	PP	e 59.2
	Fordham	124.7	44	e 19	3	[ + 1]	—	—	e 20 46	PP	—
	Collmberg	125.4	332	e 19	3	[ 0]	e 32 25	PPS	e 21 31	?	—
	Harvard	125.5	41	i 19	3k	[ 0]	—	—	—	—	e 60.2
	Prague	125.5	330	e 19	6	[ + 3]	e 22 30	PKS	e 19 19	?	—
	Weston	125.7	41	i 19	5	[ + 1]	e 38 47	SKKKS	—	—	—
	Jena	z. 126.3	311	e 19	5	[ 0]	—	—	e 21 13?	PP	—
	Aberdeen	E. 126.4	345	—	—	—	e 34 51	ScSPKP	e 38 46	SSP	e 69.4
	Cheb	126.5	331	e 21	57	?	e 26 15	[ + 5]	e 22 31	PKS	—
	Huancayo	126.7	110	e 19	19	[ + 13]	e 31 20	PS	e 38 31	SSP	e 52.8
	Witteveen	z. 127.1	337	i 19	9	[ + 3]	—	—	—	—	—
	De Bilt	128.2	337	i 19	11	[ + 2]	e 22 31	PKS	e 21 11	PP	e 55.2
	Durham	128.3	343	i 22	30	PKS	—	—	—	—	—
	Triest	128.6	326	e 19	8	[ - 1]	e 28 31	{ + 20}	i 22 29	PKS	—
	Stuttgart	128.9	331	e 19	10	[ 0]	e 22 31	PKS	e 21 15	PP	e 61.2
	Karlsruhe	z. 129.1	332	e 19	11	[ + 1]	—	—	e 19 37	?	—
	Halifax	129.3	35	e 19	21?	[ + 10]	22 42?	PKS	31 29?	PS	56.3
	Uccle	129.5	337	e 16	5	P	e 28 1	{ - 15}	e 38 46	SS	e 59.2
	Chinchina	129.6	87	e 19	11	[ 0]	e 22 31	SKP	e 31 35	PS	61.2
	Strasbourg	129.7	332	e 19	12	[ + 1]	e 22 34	PKS	e 38 41	SS	e 59.7
	Zürich	130.2	331	e 19	12k	[ 0]	—	—	—	—	—
	Basle	130.5	331	e 19	13	[ 0]	e 22 29	PKS	—	—	—
	Kew	130.7	340	i 19	14	[ + 1]	e 22 38	SKP	—	—	e 60.2
	Rathfarnham Castle	130.9	345	i 19	13	[ - 1]	e 22 34	SKP	—	—	—
	Bogota	N. 131.1	89	e 22	42	PKS	—	—	—	—	—
	Florence	131.1	325	e 19	5	[ - 9]	e 22 37	SKP	e 22 0	PP	—
	Pavia	131.4	328	e 18	35	[ - 40]	e 39 35	PSS	—	—	—
	La Paz	131.6	119	i 19	16k	[ + 1]	e 28 31	{ + 1}	i 26 27	SKS	63.2
	Messina	N. 131.6	317	e 19	12	[ - 3]	i 22 38	SKP	e 21 36	PP	—
	Rome	131.6	323	i 19	15a	[ 0]	i 22 39	SKP	e 21 33	PP	e 60.2
	Oropa	131.7	330	i 20	2	?	i 22 24	SKP	i 21 11	PP	—
	Paris	131.8	336	i 19	18	[ + 3]	i 22 43	PKS	i 21 39	PP	e 61.2
	Chambon-la-Forêt	132.6	335	e 19	19	[ + 2]	—	—	—	—	—
	Clermont-Ferrand	133.9	333	e 19	21	[ + 2]	e 22 55	PKS	e 21 53	PP	65.2
	Bermuda	135.0	50	e 22	18	PP	e 22 50	PKS	—	—	e 50.6
	San Juan	138.3	67	e 19	17	[ - 10]	—	—	—	—	—
	Tortosa	138.9	330	19	34	[ + 5]	i 23 4	PKS	—	—	—
	Algiers Univ.	z. 140.5	323	i 19	32k	[ + 1]	e 23 13	PKS	e 22 33	PP	—
	Alicante	141.3	329	19	33	[ 0]	29 31	{ + 2}	25 49	PPP	67.0
	Toledo	141.8	334	e 19	33	[ - 1]	e 23 13	PKS	—	—	—
	Almeria	143.5	329	i 19	37	[ 0]	26 43	[ - 2]	29 39	SKKS	72.8
	Granada	143.8	331	i 19	35a	[ - 2]	27 44	[ + 59]	35 14	PPS	71.7
	Malaga	144.5	331	i 19	38	[ 0]	26 30	{ - 16}	29 41	SKKS	75.7
	Lisbon	z. 144.9	338	i 19	37a	[ - 2]	—	—	—	—	—
	Tamanrasset	z. 146.4	302	e 19	43	[ + 1]	e 29 39	{ - 19}	e 23 8	PP	—
	Averroes	148.7	331	i 19	47	[ + 2]	—	—	—	—	—
	M'Bour	168.9	315	i 20	9	[ 0]	i 21 22	PKP <sub>2</sub>	i 25 11	PP	—

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June 18d. 16h. 36m. Epicentre 35°·6N. 136°·7E. Depth 10km.  
Intensity IV at Nagoya, Gihu, Kameyama, and Hukui; II-III at Hikone, Takayama, Kyoto, and Ibukiyama.  
Seismo. Bull. Cent. Met. Obs., Japan, for June, 1953, Tokyo, 1953, p. 19, with macro-seismic chart.

June 18d. 18h. 14m. Epicentre 36°·8N. 70°·1E. Depth 220km.  
Bulletin of the Seismo. Stations of the U.S.S.R. for April-June, 1953, Moscow, 1954, p. 127-128

June 18d. 23h. 9m. Epicentre 42°·5N. 44°·8E.  
*Loc. cit.*, 18h., p. 128.

June 19d. 12h. 39m. Ionian islands.  
Intensity IV at Zakynthos on Zante. Epicentre 37°·5N. 20°·25E. (Strasbourg).  
A. Galanopoulos.  
Seismological Institute Bulletin, 1953, Athens, 1954, p. 68.

June 19d. 18h. 43m. Epicentre 35°·75N. 28°·25E.  
*Loc. cit.*, 12h., p. 68.

June 20d. 0h. 20m. Tian-Shan region. Epicentre 42°·9N. 77°·1E.  
Bulletin of Seismo. Stations of the U.S.S.R. for April-June, 1953, Moscow, 1954, p. 128.

June 20d. 6h. 5m. Hindu Kush. Epicentre 36°·8N. 70°·9E. Depth 190km.  
*Loc. cit.*, 0h., pp. 128-129.

June 20d. 13h. 57m. Epicentre 33°·5N. 139°·8E. Depth 110km. Unfelt.  
Seismo. Bull. Cent. Met. Obs., Japan, for June, 1953, Tokyo, 1953, p. 20.

June 21d. 8h. 11m. 26s. Epicentre 37°·5N. 20°·8E. (as on 1952, October 12d.).  
Intensity IV-V at Zakynthos in the island of Zante; IV at Lechaena.  
Epicentre 37°·6N. 20°·6E. (Strasbourg).

A. Galanopoulos.  
Seismological Institute Bulletin, 1953, Athens, 1954, pp. 68-69.

$$A = +.7435, B = +.2824, C = +.6062; \quad \delta = +2; \quad h = -1;$$

$$D = +.355, E = -.935; \quad G = +.567, H = +.215, K = -.795.$$

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.	
		°	°	m. s.	s.	m. s.	s.	m. s.	m.	
Athens		2.4	79	e 0 41	0	i 1 19	0 <sub>g</sub>	i 0 51	P <sub>g</sub>	—
Reggio Calabria	z.	4.1	280	e 1 40	?	i 1 46	- 9	—	—	—
Taranto		4.1	318	1 18	- 4 <sub>g</sub>	2 21	+ 5 <sub>g</sub>	—	—	—
Sofia		5.5	20	e 1 26	+ 1	e 2 51	+ 4*	i 3 25	?	—
Belgrade		7.3	358	e 2 16 <sub>a</sub>	+ 8*	e 3 40	- 1*	e 3 53	S <sub>g</sub>	—
Istanbul	z.	7.3	59	2 0?	- 8*	—	—	e 4 24	?	—
Rome		7.8	307	e 2 23	+ 7*	e 3 32	+ 4	e 3 48	S*	e 4.4
Bucharest		8.0	29	e 2 10	+10	i 4 31	+ 7 <sub>g</sub>	i 4 44	?	—
Timisoara		8.3	2	e 2 43	- 6 <sub>g</sub>	e 4 44	+10 <sub>g</sub>	e 5 36	?	—
Siena		9.3	312	e 2 18	+ 1	—	—	—	—	—
Florence		9.6	314	e 2 19	- 2	e 4 13	+ 1	—	—	i 5.6
Prato		9.7	314	e 3 2	P <sub>g</sub>	e 5 7	-13 <sub>g</sub>	—	—	—
Triest		9.7	329	e 2 18	- 4	e 4 11	- 4	e 3 20	?	5.6
Bologna		10.0	317	e 2 56	?	e 5 3	+ 2*	e 6 24	?	—
Ogyalla		10.5	350	e 3 1	?	e 4 18	?	e 4 52	SS	e 5.9
Helwan	z.	11.6	128	e 2 52	+ 2	e 3 3	PP	e 3 19	?	i 5.9
Raciborzu		12.7	352	e 3 7?	+ 2	e 4 40	?	e 3 28	PPP	7.2
Ksara		12.8	102	e 5 5	?	—	—	—	—	e 7.7
Prague		13.4	342	e 3 11	- 3	e 5 37	- 8	e 3 24	PP	e 6.8
Zürich		13.4	321	e 3 19	+ 5	e 5 39	- 6	—	—	—

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	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.	
	°	°	m. s.	s.	m. s.	s.	m. s.	m.	
Stuttgart	14.1	327	e 3 19	- 4	e 6 24	SSS	e 3 33	PP	—
Strasbourg	14.6	323	e 3 26	- 4	e 6 30	SS	e 3 39	PP	—
Collmberg	14.9	341	e 3 39	+ 5	—	—	—	—	e 8.6
Potsdam	15.8	342	e 3 50	+ 5	i 6 56	SS	e 7 4	SS	e 8.6
Chambon-la-Forêt	17.2	314	e 4 12	PP	—	—	—	—	—
Paris	17.5	316	e 4 7	0	—	—	—	—	e 9.6
Copenhagen	19.1	345	i 4 24	- 3	i 8 1	+ 4	—	—	10.7
Granada	19.4	277	4 31 <sup>a</sup>	+ 1	—	—	—	—	14.2
Tamanrasset	z. 19.7	226	e 4 29	- 5	e 8 15	+ 5	e 4 49	PP	9.6
Malaga	20.1	276	i 5 1	PP	—	—	—	—	10.2
Kew	20.4	320	—	—	e 9 36	?	e 10 53	Q	e 12.6
Upsala	22.5	356	i 4 59	- 3	e 9 3	- 2	i 5 37	PPP	e 13.8
Durham	23.0	326	—	—	9 17	+ 3	—	—	—
Rathfarnham Castle	24.5	320	—	—	e 9 34?	- 6	—	—	e 12.6
Kiruna	30.4	0	e 6 13	- 3	e 11 12	- 4	—	—	e 16.5
Fayetteville	z. 85.2	313	e 12 41	+ 2	—	—	—	—	—

June 21d. 15h. 32m. Epicentre 39°·2N. 71°·2E.

Seismological Bulletin of the U.S.S.R. for April-June, 1953, Moscow, 1954, p. 129.

June 21d. 16h. 3m. Provisional epicentre 22°S. 176°W. Depth ca. 500km.

Magnitude 5.5.5.

Seismological Observatory Bulletin, E.132, April-June, 1953, Wellington, N.Z., 1954, p. 13.

June 21d. 18h. 36m. Epicentre 37°·8N. 69°·5E.

Loc. cit., 15h., pp. 129-130.

June 21d. 23h. 58m. 30s. Epicentre 0°·5S. 91°·4E.

$$A = -0.0244, B = +0.9997, C = -0.0087; \quad \delta = +7; \quad h = +7;$$

$$D = +1.000, E = +0.024; \quad G = 0.000, H = -0.009, K = -1.000.$$

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.	
	°	°	m. s.	s.	m. s.	s.	m. s.	m.	
Djakarta	z. 16.4	110	e 4 33	+40	e 7 22	+26	—	—	—
Madras	E. 17.4	321	i 4 4	- 2	i 7 22	+ 3	4 19	PP	8.3
Kodaikanal	E. 17.5	308	—	—	e 7 30	+ 9	—	—	—
Hyderabad	21.9	324	3 54	-63	8 4	-50	7 52	PcP	10.0
Calcutta	E. 23.1	352	—	—	i 9 34	+18	—	—	—
Poona	N. 25.6	318	i 5 39	+ 7	10 6	+ 7	6 11	PP	12.2
Shillong	E. 25.9	2	e 5 35	0	9 44	-20	6 6	PP	—
Bombay	26.5	317	e 5 43	+ 2	e 10 20	+ 6	—	—	i 12.4
Chatra	27.5	351	i 5 51	+ 1	i 10 4	-26	7 29	PP	13.4
Hong Kong	31.7	42	—	—	e 11 30?	- 7	—	—	—
New Delhi	32.0	335	i 6 30	0	i 11 35	- 7	7 31	PP	15.3
Quetta	z. 38.3	324	i 7 25	+ 1	—	—	i 8 43	PP	—
Warsak Dam	E. 39.0	334	—	—	—	—	e 8 48	PP	e 21.5
Khorog	42.0	337	e 7 56	+ 2	—	—	—	—	—
Kulyab	43.1	334	8 2	- 2	14 27	- 3	—	—	—
Dzhergetal	43.6	337	8 8	0	—	—	—	—	—
Garm	43.8	336	e 8 9	0	—	—	—	—	—
Obi-garm	43.8	336	i 8 8	- 1	e 14 36	- 4	—	—	—
Naryn	44.0	343	i 8 12	+ 1	i 14 46	+ 3	—	—	—
Stalinabad	44.1	334	i 8 10	- 2	i 14 37	- 8	—	—	—
Fergana	44.4	338	i 8 15	+ 1	e 14 48	- 1	—	—	—
Przhevalsk	44.4	347	i 8 15	+ 1	—	—	—	—	—
Andijan	44.6	338	i 8 17	+ 1	—	—	—	—	—
Namangan	45.0	338	i 8 20	+ 1	—	—	—	—	—
Almata	45.5	345	i 8 23	0	—	—	—	—	—
Frunse	45.8	342	i 8 25	0	e 15 8	- 1	—	—	—
Tashkent	46.2	336	e 8 29	+ 1	e 15 11	- 4	—	—	—
Ashkabad	48.9	325	8 50	0	—	—	—	—	—
Kizyl-Arvat	50.8	325	e 9 5	+ 1	—	—	—	—	—
Kyakhta	52.3	11	e 9 16	+ 1	—	—	—	—	—

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	$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.
	°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.
Irkutsk	53.7	9	9	27	+ 1	e 17	1	+ 2	—	—	—
Kabansk	53.9	10	i 9	28	+ 1	i 17	2	0	—	—	—
Shemakla	56.4	321	e 9	47	+ 2	—	—	—	—	—	—
Goris	57.2	320	e 9	50	- 1	—	—	—	—	—	—
Kirovobad	57.9	321	9	55	- 1	17	52	- 3	—	—	—
Erevan	58.8	319	e 10	0	- 2	—	—	—	—	—	—
Tiflis	59.4	321	i 10	7	+ 1	18	13	- 2	—	—	—
Leninakan	59.5	319	e 10	6	- 1	—	—	—	—	—	—
Duzheti	59.7	321	e 10	12	+ 3	—	—	—	—	—	—
Grozny	59.7	323	e 10	8	- 1	—	—	—	—	—	—
Gori	60.0	321	10	9	- 2	—	—	—	—	—	—
Akhalkalaki	60.1	320	10	12	+ 1	—	—	—	—	—	—
Tsikhlis-Dzhvari	60.3	320	i 10	14	+ 1	e 18	24	- 2	—	—	—
Borzhomi	60.4	320	10	13	0	e 18	26	- 2	—	—	—
Abastumanj	60.7	320	e 10	15	0	—	—	—	—	—	—
Zugdidi	61.7	321	e 10	24	+ 2	18	44	0	—	—	—
Ksara	62.2	308	e 10	27	+ 1	e 18	47	- 4	—	—	—
Sverdlovsk	62.3	341	i 11	25	+59	—	—	—	—	—	—
Sochi	63.6	320	e 10	33	- 2	e 19	4	- 4	—	—	—
Helwan	z. 64.6	303	i 10	40k	- 1	—	—	—	—	—	—
Pretoria	z. 65.8	242	i 10	48?	- 1	—	—	—	—	—	—
Theodosia	67.0	320	e 10	56	- 1	e 19	47	- 3	—	—	—
Yalta	67.6	319	e 11	0	- 1	e 19	54	- 3	—	—	—
Grahamstown	z. 68.8	234	e 11	9	+ 1	—	—	—	—	—	—
Kimberley	z. 69.3	239	i 11	12	+ 1	—	—	—	—	—	—
Istanbul	z. 69.8	314	11	12	- 2	—	—	—	e 11	32	PcP
Moscow	70.9	331	11	21	0	20	30	- 6	—	—	—
Kishinev	72.0	320	i 11	22	- 6	—	—	—	—	—	—
Pulkovo	76.3	333	e 11	53	+ 1	—	—	—	—	—	—
Uzhgorod	76.7	321	e 12	9	+14	—	—	—	—	—	—
Belgrade	z. 76.9	316	e 11	40a	-16	—	—	—	e 12	33	PcP
Messina	79.3	309	e 12	9	0	e 22	4	- 5	—	—	e 33.1
Raciborzu	79.7	321	e 12	16	+ 5	e 14	52	PP	e 12	53	?
Prague	82.0	320	e 12	24	+ 1	e 22	32	- 5	e 12	38	PcP
Rome	82.1	312	e 12	22	- 2	e 22	31	- 7	—	—	e 37.0
Upsala	z. 82.3	330	i 12	25	0	—	—	—	e 13	34	?
Collmberg	83.1	321	e 12	31	+ 2	—	—	—	—	—	—
Florence	83.2	314	e 12	34	+ 5	e 22	45	- 4	e 23	33	PS
Potsdam	83.3	323	e 12	30	0	e 22	48	- 2	—	—	e 41.5
Kiruna	83.4	338	i 12	31k	+ 1	e 22	48	- 3	e 23	39	PS
Jena	z. 84.0	321	e 12	34	+ 1	—	—	—	e 12	46	PcP
Copenhagen	84.2	326	i 12	35	+ 1	22	57	- 2	32	0	SSS
Stuttgart	85.2	319	e 12	40	+ 1	—	—	—	e 13	12	?
Zürich	85.5	317	e 12	41	0	—	—	—	—	—	e 46.5
Tamanrasset	z. 86.4	293	e 12	47	+ 2	e 23	22	+ 1	e 18	36	PPP
Scoresby Sund	98.1	342	—	—	—	e 26	28	PS	31	54	SS
College	103.1	22	e 17	56	PKP	—	—	—	—	—	—
Shasta	129.6	33	e 21	10k	PP	—	—	—	—	—	—
Butte	130.0	21	e 21	34	PP	—	—	—	—	—	—
Harvard	135.5	342	i 15	25	P	—	—	—	e 19	20	PKP
Weston	135.5	342	i 15	24k	P	—	—	—	—	—	—
Morgantown	140.3	350	e 19	24	[- 7]	—	—	—	—	—	—
Tucson	142.1	31	e 19	45	[+ 11]	—	—	—	—	—	—
Fayetteville	z. 144.2	7	e 19	40	[+ 2]	—	—	—	e 15	55	?

June 22d. 13h. 45m. Epicentre 39°·2N. 71°·2E.

Bulletin of Seismo. stations of U.S.S.R. for April-June, 1953, Moscow, 1954, p. 131.

The scanned images of the 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 collected by SGA Storia Geofisica Ambiente (Bologna) on behalf of the Istituto Nazionale di Geofisica e Vulcanologia (Rome), in the frame of the EUROSEISMOS project.

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June 23d. 1h. 53m. 10s. Epicentre 35°·7N. 25°·3E. Depth of focus 0·005.  
(as on 1952, December 22d.).

Felt in Crete (intensity V-VI at Ghoniae and Aspritsion; V at Kastellion, Heraklion, Phourni, Rethymnon, etc.). Also intensity IV in islands of Ios, Kythora, Thera (Santorin), Milos, and Pholegandros; and intensity III at Tripolis and Ghythion in the Peloponnese.

Epicentre: 36°·0N. 24°·9E. (Strasbourg).

36°·0N. 25°·0E. (U.S.S.R.).

Depth of focus about 100km. Macroseismic area 280,000 sq. km.

A. Galanopoulos.

Seismological Institute Bulletin, 1953, Athens, 1954, p. 69.

A = +·7359, B = +·3479, C = +·5810;  $\delta$  = +14; h = 0;  
D = +·427, E = -·904; G = +·525, H = +·248, K = -·814.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	I.	
		°	°	m. s.	s.	m. s.	s.	m. s.	m.	
Athens		2·6	331	i 0 43k	+ 2	i 1 9	- 3	i 0 58	?	—
Istanbul	z.	6·1	28	i 1 37	+ 7	e 3 10	+31	e 3 41	?	—
Sofia		7·1	348	1 49	+ 5	3 4	0	—	—	—
Helwan		7·7	137	i 2 0 <sub>a</sub>	+ 8	3 24	+ 5	—	—	—
Taranto		7·9	309	1 49	- 6	3 10	-13	e 3 5	?	—
Reggio Calabria		8·1	290	e 1 54	- 3	e 3 12	-16	e 2 13	?	—
Messina	z.	8·2	291	i 1 58	- 1	i 3 29	- 2	i 1 54k	?	—
Bucharest		8·7	4	e 2 10	+ 4	e 3 45	+ 2	e 3 48	S	—
Ksara		8·9	99	i 2 18	+10	3 55	+ 7	—	—	—
Belgrade	z.	9·8	339	e 2 29	+ 8	e 4 7	- 3	e 3 13	?	—
Szeged		11·2	341	e 2 39	- 1	4 40	- 4	e 2 35	?	—
Rocca di Papa		11·5	305	e 2 43	- 1	e 4 39	-12	e 5 4	SS	—
Rome		11·7	306	e 2 47	+ 1	e 5 1	+ 5	e 5 20	SS	—
Kalossa		11·8	338	—	—	e 4 41	-17	e 6 38	?	—
Ogyalla		13·2	339	e 3 11	+ 5	e 5 31	- 1	e 5 59	SS	—
Triest		13·2	322	e 3 3	- 3	i 5 14	-18	i 6 13	SSS	i 7·0
Florence		13·5	311	e 3 5k	- 5	i 5 20	-19	i 7 4	?	—
Bologna		13·8	314	e 3 14	0	e 6 0	+14	e 4 11	?	—
Salo		14·9	316	e 3 27	- 1	e 6 20	+ 8	e 5 0	?	—
Raciborzu		15·3	342	e 3 28?	- 5	e 6 20	- 1	e 3 52	PP	—
Pavia		15·5	313	e 3 38	+ 2	i 6 34	+ 8	i 7 39	?	—
Chur		16·2	318	e 3 45	0	e 6 27	-15	e 6 3	?	—
Oropa		16·4	312	i 3 46	- 1	i 6 53	+ 6	i 4 24	?	—
Prague		16·4	335	e 3 49	+ 2	i 6 48	+ 1	e 4 2	PP	—
Zürich		17·1	317	e 3 53	- 3	e 6 48	-15	—	—	—
Stuttgart		17·6	323	e 4 1	- 1	e 7 12	- 2	e 7 32	SS	e 9·5
Basle		17·7	317	e 4 2	- 1	e 7 13	- 3	—	—	—
Neuchatel		17·7	316	e 4 2	- 1	e 7 18	+ 2	—	—	—
Collmberg		17·9	333	e 4 5	- 1	e 7 36	+16	e 4 55	?	e 9·9
Algiers Univ.	z.	18·0	279	e 4 6	- 1	e 7 18	- 5	e 4 22	PP	—
Jena		18·2	331	e 4 9	- 1	e 7 26	- 1	e 4 26	PP	—
Karlsruhe		18·2	323	e 4 12	+ 2	e 7 16	-11	i 7 44	SS	e 9·8
Strasbourg		18·2	321	e 4 11	+ 1	e 7 25	- 2	i 4 25	PP	e 9·9
Besançon		18·4	315	e 4 10	- 2	—	—	—	—	—
Potsdam		18·8	336	e 4 32	PP	i 7 41	0	—	—	—
Clermont-Ferrand		19·5	308	e 4 23	- 1	e 7 51	- 5	—	—	—
Tortosa		20·1	292	i 4 30	- 1	8 3	- 5	—	—	—
Alicante		20·7	285	i 4 37	0	i 8 21	+ 1	5 0	PP	10·1
Chambon-la-Forêt		21·0	313	i 4 40	0	—	—	—	—	—
Paris		21·3	315	i 4 42	- 1	i 8 29	- 2	i 5 7	PP	e 10·8
Uccle		21·3	321	4 42	- 1	e 8 28	- 3	e 4 57	pP	e 10·8
Tamanrasset	z.	21·5	238	i 4 48 <sub>a</sub>	+ 3	e 8 34	- 1	e 5 2	pP	9·3
Witteveen	z.	21·6	329	e 4 45	- 1	—	—	—	—	—
Copenhagen		21·8	340	4 48	0	8 36	- 4	5 12	PP	—
De Bilt		21·8	326	e 4 47	- 1	e 8 43	+ 3	—	—	—
Almeria		22·4	282	i 4 53	- 1	9 0	+ 9	5 28	PP	12·5
Granada		23·2	282	i 5 4k	+ 2	9 12	+ 7	5 31	PP	—
Toledo		23·5	288	i 5 6	+ 1	9 14	+ 4	i 5 13	?	—
Malaga		24·0	282	i 5 18	+ 8	9 28	+ 9	12 37	PcS	—
Kew		24·2	319	e 3 39	?	e 9 29	+ 7	—	—	e 12·8

Continued on next page.

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		$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.
		$^{\circ}$	$^{\circ}$	m.	s.	s.	m.	s.	s.	m.	s.	m.
Upsala		24.7	350	i 5	15 <sub>a</sub>	- 1	i 9	30	- 1	i 8	54	PcP
Rathfarnham C.	z.	28.3	319	i 4	48	-62	e 9	19	-69	e 4	59	?
Kiruna		32.3	357	i 6	24 <sub>a</sub>	- 1	i 11	25	- 8	i 9	12	PcP
Quetta		35.2	85	i 6	58	+ 8	i 12	25	+ 7	i 9	17	PcP
New Delhi		44.1	83	e 8	12	+ 8	—	—	—	i 8	18	pP
Chatra	z.	52.9	80	i 9	18	+ 6	—	—	—	—	—	—
Kimberley	z.	64.1	180	i 10	34	+ 4	—	—	—	—	—	—
Halifax		65.3	308	e 10	41?	+ 4	—	—	—	—	—	—
Seven Falls	E.	68.6	313	e 11	0	+ 2	—	—	—	—	—	—
Shawinigan Falls	N.	70.0	313	e 11	14	+ 7	—	—	—	—	—	—
Weston		71.3	309	i 11	14 <sub>a</sub>	- 1	—	—	—	—	—	—
Harvard		71.4	309	i 11	17 <sub>k</sub>	+ 2	—	—	—	—	—	—
Ottawa		72.4	313	i 11	22 <sub>a</sub>	+ 1	—	—	—	—	—	—
Kirkland Lake	z.	73.3	317	i 11	28 <sub>a</sub>	+ 2	—	—	—	—	—	—
Morgantown		78.2	310	i 11	56	+ 2	—	—	—	i 12	15	pP
College		79.6	357	i 12	2	0	—	—	—	—	—	—
San Juan		80.6	286	i 12	9	+ 2	—	—	—	—	—	—
Hungry Horse		88.8	334	i 12	50	+ 2	—	—	—	—	—	—
Fayetteville	z.	89.1	312	i 12	50	+ 1	—	—	—	i 13	16	spP
Butte		90.2	332	i 12	57	+ 2	—	—	—	—	—	—
Nelson		99.8	328	i 13	40	+ 2	—	—	—	—	—	—
China Lake	z.	100.9	330	e 13	45	+ 2	—	—	—	—	—	—
Tucson		100.9	323	e 13	44	+ 1	—	—	—	—	—	—

June 23d. 6h. 34m. Epicentre 38°N. 20°25'E. (B.C.I.S.).

Felt in the island of Zante (intensity IV at Zante) and in the province of Elis (intensity III at Lechaena). Seismo. Institute Bulletin for 1953, Athens 1954, pp. 69, 70.

June 23d. 13h. 53m. 35s. Epicentre 51°·4N. 157°·7E. Focus at Base of Superficial Layers. (as on 1953, Feb. 26d.).

A = -·5796, B = +·2377, C = +·7795;  $\delta = +6$ ;  $h = -6$ ;  
D = +·379, E = +·925; G = -·721, H = +·296, K = -·626.

		$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.
		$^{\circ}$	$^{\circ}$	m.	s.	s.	m.	s.	s.	m.	s.	m.
Nemuro		11.5	230	e 2	55	PP	—	—	—	e 3	8	PPP
Abashiri		11.7	236	e 3	0	PP	—	—	—	—	—	—
Wakkanai	E.	12.2	247	e 3	1	+ 7	e 5	22	+12	—	—	—
Kusiro	N.	12.3	232	e 2	48	- 8	—	—	—	—	—	—
Ashaigawa		12.8	240	e 3	11	+ 9	—	—	—	—	—	—
Obihiro		13.0	235	e 3	19	PP	—	—	—	—	—	—
Urakawa		13.7	234	e 3	12	- 2	e 5	49	+ 3	e 3	26	PP
Sapporo		13.9	239	e 3	25	+ 8	e 6	3	+12	—	—	—
Tomakomai		14.1	237	e 3	21	+ 2	5	58	+ 2	—	—	—
Aomori		15.8	234	e 3	51	+ 9	e 6	31	- 5	e 4	20	?
Miyako		16.1	229	e 3	46	+ 1	e 6	46	+ 4	—	—	—
Morioka		16.4	231	e 3	51	+ 2	—	—	—	—	—	—
Akita		16.9	233	e 3	52	- 3	e 7	20	SS	e 4	49	?
Mizusawa	E.	16.9	230	4	1	+ 6	e 7	15	+14	—	—	—
	N.	16.9	230	3	58	+ 3	e 7	8	+ 7	—	—	—
Sakata		17.7	233	e 4	23	PP	—	—	—	—	—	—
Sendai		17.7	227	e 4	5	- 1	e 7	20	+ 1	e 7	39	SS
Yamagata		18.0	228	e 4	9	0	e 7	35	+ 9	—	—	—
Hokusima		18.3	227	e 4	13	0	e 7	30	- 3	—	—	—
Inawasiro	E.	18.6	227	e 4	14	- 3	—	—	—	e 4	41	PPP
Onahama		18.7	226	e 4	7	-11	e 7	48	+ 6	—	—	—
Niigata		18.8	232	e 4	19	0	e 7	42	- 2	—	—	—
Shirakawa		18.9	227	e 4	22	+ 2	—	—	—	—	—	—
Aikawa		19.1	232	e 4	23	0	e 7	49	- 2	—	—	—
Mito		19.4	225	4	25	- 1	e 8	11	+14	—	—	—
Utunomiya		19.5	227	e 4	26	- 1	e 8	3	+ 3	e 5	1	PPP
Kakioka		19.7	226	e 4	47	PP	—	—	—	—	—	—
Maebasi		20.0	228	e 4	31	- 1	8	15	+ 4	e 5	24	?
Kumagaya		20.1	227	e 4	35	+ 1	8	17	+ 5	—	—	—
Nagano	N.	20.2	230	e 4	37	+ 2	e 8	29	+15	—	—	—

Continued on next page.

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		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Matusiro		20.3	230	i 4 34	- 2	8 17	+ 1	—	10.4
Oiwake		20.3	229	e 4 36	0	e 8 19	+ 3	e 4 54	—
Tokyo		20.3	226	e 4 34	- 2	8 20	+ 4	e 6 0	—
Titibu		20.4	227	i 4 37	0	—	—	—	—
Yokohama		20.6	226	e 4 40	+ 1	—	—	—	—
Matumoto		20.7	229	4 40	0	e 8 32	+ 8	—	—
Toyama		20.7	231	e 4 38	- 2	e 8 29	+ 5	e 8 54	PcP
Hunatu		20.9	227	e 4 43	+ 1	—	—	—	—
Kohu		20.9	227	e 4 42	0	e 8 35	+ 7	e 4 58	PP
Mera		20.9	225	e 4 45	+ 3	—	—	—	—
Ajiro		21.1	226	e 4 43	- 1	—	—	—	—
Misima	E.	21.1	226	e 4 48	+ 4	e 8 40	+ 8	e 4 58	pP
Osima		21.2	226	e 4 41	- 4	e 8 47	+13	e 5 28	PPP
Iida		21.3	228	e 4 49	+ 3	e 8 45	+ 9	—	—
Shizuoka		21.5	227	e 4 48	0	e 8 41	+ 2	e 5 4	pP
Gihu		21.9	228	e 4 54	+ 2	—	—	—	—
Omaesaki		21.9	226	5 0	+ 8	e 8 51	+ 4	—	—
Nagoya	N.	22.0	228	4 55	+ 2	—	—	e 5 19	PP
Kameyama		22.5	228	e 4 40	-18	e 8 59	+ 1	—	e 14.0
Kyoto		22.8	231	e 5 5	+ 4	e 9 14	+11	—	—
Toyooka		22.8	233	e 5 3	+ 2	e 9 9	+ 6	—	—
Takamatu		24.2	232	e 5 15	+ 1	e 9 27	- 1	i 9 51	sS
Koti		25.0	233	i 5 26	+ 4	e 9 47	+ 6	—	—
Matuyama		25.2	234	e 5 24	0	—	—	—	—
Ooita		26.3	234	e 5 40	+ 6	—	—	—	—
Kagosima	Z.	28.1	235	e 5 53	+ 2	—	—	—	—
College		30.6	42	e 6 13	0	e 11 9	- 3	e 11 33	sS
Zô-Sè	Z.	33.6	246	i 6 40 <sub>a</sub>	+ 1	—	—	—	e 12.2
Nanking		34.4	251	i 6 45 <sub>a</sub>	- 1	12 10	- 1	i 9 20	PcP
Hong Kong		44.4	246	e 8 9	0	e 18 25	?	—	—
Resolute Bay		45.4	21	e 8 18 <sub>a</sub>	+ 1	i 14 56	0	e 10 2	PP
Baguio		45.7	234	i 8 19	- 1	i 14 57	- 3	i 8 59	pP
Victoria		48.5	60	8 42	0	—	—	—	—
Seattle	Z.	49.6	60	i 8 52	+ 2	—	—	i 9 5	pP
Hungry Horse		53.6	55	i 9 20	0	—	—	i 9 46	sP
Shasta		53.9	67	i 9 22 <sub>a</sub>	0	e 16 55	+1	i 9 36	pP
Mineral	Z.	54.6	67	e 9 27 <sub>a</sub>	- 1	—	—	i 9 41	pP
Berkeley		55.8	70	e 9 37 <sub>k</sub>	+ 1	e 17 22	+ 3	i 9 50	pP
Reno	Z.	56.1	66	e 9 39 <sub>a</sub>	+ 1	—	—	i 9 53	pP
Santa Clara	E.	56.3	70	—	—	e 16 30	-56	—	e 25.5
Lick	Z.	56.5	70	e 9 41 <sub>a</sub>	0	i 10 4	sP	e 10 24	?
Kiruna		56.9	342	i 9 42 <sub>a</sub>	- 2	e 17 35	+ 1	e 13 13	PPP
Chatra		57.6	273	e 9 48	- 1	—	—	e 38 45?	P'P'
Fresno	Z.	58.0	68	e 9 51 <sub>a</sub>	- 1	—	—	i 9 55	?
Scoresby Sund		58.4	0	e 9 55	0	i 17 55	+ 1	i 18 18	sS
Tinemaha	Z.	58.7	68	i 9 57	0	e 18 0	+ 3	i 10 12	pP
Logan		59.1	59	e 10 1	+ 1	—	—	i 10 15	pP
Woody	Z.	59.3	69	i 9 59	- 2	—	—	i 10 13	pP
Pasadena		60.7	70	i 10 10	0	i 18 26	+ 3	i 10 24	pP
Riverside		61.3	70	e 10 14	0	—	—	e 10 27	pP
Boulder City		61.4	66	i 10 15	0	e 11 47	?	i 10 29	pP
Nelson		61.6	66	i 10 16	0	—	—	—	—
Warsak Dam	E.	62.0	290	e 10 17	- 2	e 18 50	+10	—	e 30.4
Barratt	Z.	62.7	71	e 10 24	0	—	—	i 10 37	pP
Upsala		64.5	339	i 10 35 <sub>a</sub>	- 1	e 19 7	- 4	i 11 10	PcP
Tucson		66.4	67	i 10 47	- 1	e 19 39	+ 5	i 11 1	pP
Quetta	Z.	67.4	290	i 10 53	- 1	—	—	—	e 28.9
Kirkland Lake	Z.	69.2	37	e 11 4 <sub>k</sub>	- 1	—	—	—	—
Copenhagen		69.5	340	e 11 7	0	i 20 10	- 1	21 12	ScS
Hyderabad		69.9	272	11 7	- 3	20 7	- 9	—	32.4
Lubbock		70.5	59	—	—	21 13	PPS	—	—
Poona		71.9	276	—	—	e 20 34	- 5	e 21 42	ScS
Bombay	N.	72.3	278	—	—	i 21 51	ScS	—	i 33.8
Potsdam		72.4	338	e 11 25	0	e 21 25	PS	i 21 44	PPS
Fayetteville	Z.	72.6	53	i 10 25 <sub>a</sub>	-61	i 11 55	?	i 11 38	pP

Continued on next page.



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		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Durham	N.	72.8	348	i 11 28	+ 1	i 20 48	- 1	e 10 50	?
Raciborzu		73.2	334	e 11 28	- 1	e 11 49	sP	e 15 46	PPP
Witteveen	Z.	73.3	342	e 11 32	+ 2	—	—	—	—
Collmberg		73.4	337	e 11 30	0	—	—	e 12 0	?
Seven Falls	E.	73.4	32	e 11 31	+ 1	20 58	+ 2	e 21 17	sS
Cleveland		74.1	42	i 11 34 <sub>a</sub>	- 1	e 21 2	- 2	e 11 47	pP
Jena		74.1	338	e 11 34	- 1	e 20 55?	- 9	e 14 30?	PP
Prague		74.2	337	e 11 34	- 1	e 21 1	- 4	e 21 44	PS
De Bilt		74.3	343	i 11 35 <sub>a</sub>	- 1	i 21 7	+ 1	—	—
Cincinnati		74.8	45	i 11 39	0	—	—	i 11 52	pP
Rathfarnham Castle		74.8	350	i 11 39	0	e 31 32	Q	e 11 53	pP
Ogyalla		75.2	333	e 11 45	+ 4	e 22 47	?	e 12 36	?
Budapest		75.3	332	e 12 12	+30	e 20 55	-22	e 14 40	PP
Pittsburgh		75.6	42	i 11 44	+ 1	e 21 20	- 1	i 21 36	sS
Uccle		75.7	343	e 11 44	0	e 21 42	sS	e 22 11	PPS
Bucharest		75.8	327	e 11 46	+ 2	e 21 55	PS	—	—
Kew		75.8	346	e 11 47	+ 3	e 21 21	- 2	(e 26 25?)	SS
Szeged		76.1	331	e 11 39	- 7	e 21 51	PS	e 14 18	PP
Kalossa		76.2	332	e 11 54	+ 7	e 21 27	0	e 12 6	pP
Morgantown		76.3	42	i 11 47	0	i 21 26	- 2	—	—
Stuttgart		76.6	339	e 11 49 <sub>a</sub>	0	e 21 28	- 4	e 22 35	PPS
Harvard		77.1	44	i 11 52 <sub>a</sub>	0	i 21 43	+ 6	i 12 7	pP
Strasbourg		77.1	340	e 11 51	- 1	e 21 33	- 4	e 12 6	pP
Belgrade		77.3	330	e 11 53 <sub>a</sub>	0	e 21 36	- 3	e 12 10	sP
Weston		77.3	44	i 11 51 <sub>k</sub>	- 2	e 22 5	ScS	e 26 31	SS
Istanbul	Z.	77.6	323	11 55	+ 1	—	—	—	—
Palisades	Z.	77.6	37	i 11 53	- 1	—	—	—	—
Fordham		77.7	37	i 11 56	+ 1	e 21 43	- 1	—	—
Halifax		77.9	28	e 12 1	+ 5	—	—	—	—
Paris		77.9	344	i 11 58	+ 2	e 21 45	- 1	e 22 28	SP
Washington		78.1	40	i 11 56	- 1	—	—	i 12 11	pP
Zürich		78.1	340	e 11 55 <sub>a</sub>	- 2	e 21 48	0	—	—
Basle		78.2	340	e 11 53	- 5	e 21 46	- 3	—	—
Triest		78.4	335	e 11 59	0	e 21 35	-16	e 22 27	PS
Brisbane	N.	78.6	184	i 12 13	pP	i 21 53	0	i 22 9	ScS
Besançon		78.8	340	e 12 0	- 1	—	—	—	—
Neuchatel		78.8	340	e 12 1	0	—	—	—	—
Salo		79.3	337	e 12 24	+20	—	—	e 13 37	?
Oropa		79.9	340	i 11 56	-11	e 22 17	+10	e 24 10	?
Pavia		80.0	338	e 12 11	+ 3	e 22 7	- 1	e 17 11	PPP
Bologna		80.1	336	e 12 34	+26	—	—	—	—
Clermont-Ferrand		80.8	342	e 12 13	+ 1	e 22 18	+ 2	e 15 19	PP
Florence		80.8	335	i 12 9 <sub>a</sub>	- 3	i 22 17	+ 1	e 22 42	sS
Ksara		81.0	314	i 12 14	+ 1	22 43?	sS	—	—
Taranto		82.2	330	—	—	e 31 5	SSS	—	—
Rocca di Papa		82.3	335	e 12 18	- 2	e 22 33	+ 1	—	—
Rome		82.3	335	i 12 20 <sub>a</sub>	0	i 22 32	0	e 27 39	SS
Tacubaya		82.9	67	e 12 26	+ 3	i 22 45	+ 7	i 12 39	pP
Messina		84.8	330	e 12 31	- 1	e 22 48	- 9	e 28 42	SS
Reggio Calabria	N.	84.9	330	e 12 33	0	—	—	—	—
Riverview		85.1	185	e 12 37	+ 3	i 22 55	[+ 3]	i 12 49	pP
Tortosa		86.0	342	e 12 39	+ 1	i 23 2	[+ 3]	—	—
Helwan		86.4	315	i 12 40 <sub>k</sub>	0	23 1	[+ 0]	23 37	sS
Toledo		87.7	346	e 12 37	-10	e 23 15	[+ 6]	e 18 15	PPP
Alicante		88.6	343	i 12 51	0	23 35	+ 2	16 22	PP
Bermuda		88.6	34	i 12 52	+ 1	e 23 35	+ 2	—	—
Algiers Univ.	Z.	89.4	339	—	—	24 13	+33	—	—
Granada		90.3	346	i 13 3 <sub>a</sub>	+ 4	23 28	[+ 3]	30 10	SS
Almeria		90.4	344	e 12 58	- 1	23 24	[- 2]	23 46	S
Malaga		90.8	346	i 13 10	+ 9	23 26	[- 2]	16 52	PP
Wellington		93.5	167	—	—	e 24 19	+ 2	—	—
Tamanrasset	Z.	102.2	335	e 13 53	0	e 18 11	PP	e 19 39	PPP
La Paz		129.7	64	e 19 13	[+ 7]	38 45	SS	i 22 33	SKP
Pretoria	Z.	134.1	285	e 19 14?	[+ 0]	—	—	—	—
Kimberley	Z.	138.4	285	e 19 13	[- 9]	—	—	i 19 24	pPKP

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June 23d. 21h. 28m. Epicentre 38°·7N. 70°·8E.

Bulletin of Seismological Stations of the U.S.S.R. for April-June, 1953, Moscow, 1954, p.131.

June 24d. 12h. 7m. Epicentre 46°·3N. 7°·6E. (Strasbourg).

Intensity V at Montana ; IV at Leukerbad, Chippis, and Sierre.

E. Wanner.

Jahresbericht des Erdbebendienstes der Schweiz im Jahre, 1953, Zürich, 1954, p.3, with macroseismic chart, fig.5, outside the text.

June 24d. 21h. 18m. 46s. Epicentre 46°·7N. 151°·0E. Focus at Base of the Superficial Layers.

A = -·6020, B = +·3337, C = +·7255 ;  $\delta = +11$  ;  $h = -4$  ;  
D = +·485, E = +·875 ; G = -·635, H = +·352, K = -·688.

	$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.
	°	°	m.	s.	s.	m.	s.	s.	m.	s.	n.
Nemuro	5·1	230	e 1	12	- 4	e 2	2	-13	—	—	—
Sapporo	7·8	245	e 1	55	+ 1	i 3	32	+10	—	—	—
Morioka	10·0	229	e 2	18	- 6	i 3	57	-20	—	—	—
Mizusawa	10·5	227	2	32	+ 1	4	5	-24	—	—	—
Hokusima	11·8	225	e 2	48	- 1	4	41	-19	—	—	—
Maebasi	13·6	225	e 3	14	+ 1	5	26	-18	—	—	—
Matsuro	13·9	228	e 4	12	+55	—	—	—	—	—	—
College	37·1	37	i 7	10	+ 1	—	—	—	—	—	—
Resolute Bay	51·3	18	i 9	3 <sub>a</sub>	0	—	—	—	e 10	14	PcP
Frunse	52·4	295	i 9	11	0	—	—	—	—	—	—
Sverdlovsk	52·9	317	i 9	14	- 1	e 16	37	- 3	—	—	—
Victoria	54·8	54	i 9	27 <sub>k</sub>	- 2	—	—	—	—	—	—
Andijan	54·9	295	i 9	30	0	—	—	—	—	—	—
Namangan	55·2	295	i 9	31	- 1	e 17	8	- 3	—	—	—
Fergana	55·5	294	e 9	33	- 1	e 17	12	- 3	—	—	—
Tchimkent	55·7	297	i 9	34	- 1	—	—	—	—	—	—
Dzhergetal	56·5	294	9	41	0	i 17	27	- 1	—	—	—
Tashkent	56·5	297	e 9	40	- 1	—	—	—	—	—	—
Garm	57·2	294	9	45	- 1	—	—	—	—	—	—
Khorog	57·3	292	e 9	47	0	e 17	38	- 1	—	—	—
Kulyab	58·2	293	9	52	- 1	17	47	- 4	—	—	—
Stalinabad	58·4	294	i 9	53	- 2	—	—	—	—	—	—
Samarkand	58·9	297	9	54	- 4	17	53	- 7	—	—	—
Kiruna	59·9	340	i 10	4	- 1	e 18	12	- 1	e 19	43	ScS e 33·2
Shasta	z. 59·9	61	i 10	2 <sub>k</sub>	- 3	—	—	—	—	—	—
Hungry Horse	60·0	50	i 10	4	- 2	—	—	—	i 10	56	PcP
Mineral	z. 60·6	61	i 10	6 <sub>k</sub>	- 4	—	—	—	i 10	12	?
Berkeley	z. 61·7	63	i 10	14 <sub>k</sub>	- 3	—	—	—	e 10	48	PcP
Butte	62·2	51	i 10	19	- 1	—	—	—	—	—	—
Lick	z. 62·4	63	i 10	19 <sub>k</sub>	- 3	i 10	36	sP	e 10	56	PcP
Scoresby Sund	63·0	358	i 10	28	+ 2	—	—	—	—	—	—
Pulkovo	63·4	331	—	—	—	e 18	56	- 1	—	—	—
Fresno	z. 63·9	63	i 10	28 <sub>k</sub>	- 4	—	—	—	—	—	—
Tinemaha	z. 64·7	62	i 10	35	- 2	—	—	—	—	—	—
Quetta	z. 64·8	288	i 10	36	- 2	—	—	—	—	—	—
Woody	z. 65·2	63	i 10	37	- 3	i 11	8	PcP	i 11	51	?
Logan	65·4	54	i 10	40	- 2	—	—	—	—	—	—
Kizyl-Arvat	65·7	303	i 10	45	+ 2	—	—	—	—	—	—
Pasadena	66·6	64	i 10	46	- 3	—	—	—	—	—	—
Riverside	z. 67·2	64	i 10	55	+ 2	—	—	—	i 10	49	?
Upsala	67·2	337	i 10	52	- 1	i 20	39	ScS	e 22	14?	?
Boulder City	67·4	61	i 10	52	- 2	—	—	—	i 13	22	PP
Nelson	67·6	61	i 10	52	- 3	—	—	—	—	—	—
Grozny	68·7	311	e 11	1	- 1	—	—	—	—	—	—
Shemakla	69·0	307	e 11	2	- 2	—	—	—	—	—	—
Piatigorsk	69·5	313	11	16	+ 9	—	—	—	—	—	—
Kirovobad	70·2	308	11	11	0	e 20	19	0	—	—	—
Piflis	70·3	310	e 11	13	+ 1	e 20	19	- 1	—	—	—
Gori	70·5	311	e 11	13	0	—	—	—	—	—	—
Borzhomi	70·9	310	i 11	16	0	—	—	—	—	—	—

Continued on next page.

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	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Tsikhlis-Dzhvari	71.0	310	11 18	+ 2	—	—	—	—
Akhalkalaki	71.2	310	11 19	+ 1	—	—	—	—
Abastumanj	71.3	310	i 11 19	+ 1	—	—	—	—
Erevan	71.5	309	e 11 19	0	20 35	+ 1	—	—
Copenhagen	72.2	337	i 11 23	0	e 20 43	+ 1	21 26 PPS	—
Tucson	72.4	61	i 11 22	- 3	—	—	i 11 31	pP
Lwow	73.5	327	i 11 26	- 5	—	—	—	—
Uzhgorod	75.1	328	e 11 40	0	e 21 17	+ 2	—	—
Kirkland Lake	z. 75.6	32	i 11 41k	- 2	—	—	—	—
Collmberg	75.9	334	e 11 44	- 1	—	—	e 13 10	?
Witteveen	z. 76.3	339	i 11 49k	+ 2	—	—	—	—
Prague	76.5	333	i 11 49	+ 1	e 21 32	+ 1	e 26 10	SS
Jena	76.6	335	e 11 48	- 1	—	—	e 12 4	sP
Rathfarnham Castle	78.5	346	12 27	+ 3	e 24 13	?	e 12 38	?
St. Louis	78.9	44	i 12 0	- 2	—	—	—	—
Fayetteville	z. 79.0	48	i 11 59	- 3	—	—	—	—
Stuttgart	79.3	335	i 12 4k	0	—	—	—	—
Shawinigan Falls	N. 79.5	29	e 12 4	- 1	—	—	—	—
Strasbourg	79.8	336	e 12 6	0	e 12 30	?	e 13 4	?
Cleveland	z. 80.5	37	i 12 9	- 1	—	—	—	—
Triest	z. 80.7	331	e 12 10	- 1	—	—	e 13 32	?
Ksara	80.9	310	e 12 13	+ 1	e 22 21	+ 4	—	—
Paris	81.0	340	i 12 13	0	—	—	e 12 21	pP
Cincinnati	81.2	40	i 12 12	- 2	—	—	i 12 37	?
Besançon	81.6	337	i 12 15	- 1	—	—	—	—
Chambon-la-Forêt	81.8	340	i 12 18	+ 1	—	—	—	—
Florence	83.1	332	e 12 25a	+ 1	e 22 37	- 3	—	—
Harvard	83.5	30	i 12 26k	0	—	—	—	—
Clermont-Ferrand	83.7	338	e 12 28	+ 1	—	—	—	—
Weston	83.7	30	i 12 26k	- 1	—	—	—	—
Palisades	z. 84.0	32	i 12 25	- 3	—	—	—	—
Rome	84.4	330	e 12 30	0	e 22 45	- 8	—	e 40.7
Helwan	z. 86.4	311	e 12 39	- 1	—	—	—	—
Messina	z. 86.5	326	e 12 38	- 3	—	—	—	—
Alicante	91.6	338	e 13 0	- 5	e 24 7	+ 7	16 46	PP
Kimberley	z. 134.8	274	e 19 6	[-10]	—	—	—	—

June 25d. 10h. 43m. 53s. Epicentre 9°·2S. 123°·0E.

(as on 1950, June 26d., and foreshock of succeeding shock).

Magnitude 7 (Pasadena).

A = -·5377, B = +·8280, C = -·1589;  $\delta$  = -5;  $h$  = +7;  
D = +·839, E = +·545; G = +·087, H = -·133, K = -·987.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Djakarta	16.3	280	(i 3 39)	-13	i 3 39	P	i 2 33	?
Perth	23.6	194	i 5 22	+ 9	—	—	i 7 32	?
Baguio	25.6	354	i 5 32	0	i 10 8	+ 9	—	—
Hong Kong	32.5	345	6 36	+ 2	—	—	—	—
Brisbane	33.7	125	i 6 47	+ 2	e 12 12	+ 4	i 7 57	PP
Riverview	35.7	137	i 7 5a	+ 3	i 12 41	+ 2	i 8 25	PP
Miyazaki	41.7	11	i 7 55	+ 3	e 13 41	-29	—	—
Simidu	42.8	12	e 7 59	- 2	e 12 23	?	—	e 17.2
Ooita	43.0	10	e 8 2	- 1	e 14 19	-10	—	—
Hukuoka	43.1	9	e 8 2	- 2	e 15 39	+69	9 53	PP
Muroto	43.5	13	e 8 7	0	e 14 31	- 5	e 9 23	PP
Koti	43.7	12	e 8 10	+ 2	—	—	—	—
Matuyama	43.8	12	e 8 34	+25	—	—	—	—
Siomisaki	44.1	15	e 8 2	-10	e 14 55	+10	—	—
Hirosima	44.2	11	e 8 8	- 4	e 15 25	+39	9 14	PcP

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		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Takamatu		44.5	13	e 8 12	- 3	—	—	—	—
Hamada		44.7	10	8 14	- 2	14 56	+ 2	17 49	SS
Owase		44.8	15	e 8 18	+ 1	—	—	—	—
Sumoto		44.8	14	i 8 15	- 2	14 52	- 3	—	—
Hatidyozima		45.0	20	e 7 39	?	—	—	e 10 49	PPP
Kobe	E.	45.2	14	e 8 20	0	—	—	—	—
Osaka		45.2	14	e 8 18	- 2	—	—	—	—
Tu		45.5	16	e 8 19	- 4	—	—	—	—
Kameyama		45.6	16	i 8 21	- 3	14 50	-16	10 11	PP
Kyoto		45.6	14	e 8 21	- 3	—	—	—	—
Colombo	E.	45.9	289	—	—	18 3	SS	—	—
Omaesaki		45.9	18	8 24	- 2	—	—	i 9 22	?
Toyooka		45.9	13	e 8 24	- 2	—	—	—	—
Hikone		46.0	15	e 8 26	- 1	—	—	—	—
Maizuru		46.0	14	e 8 16	-11	—	—	—	—
Nagoya	E.	46.1	16	e 8 26	- 2	—	—	—	—
Gihu		46.2	16	e 8 20	- 8	—	—	—	—
Shizuoka		46.3	18	e 8 26	- 3	e 15 8	- 8	e 11 4	PPP
Osima		46.4	19	e 8 31	+ 1	—	—	—	—
Calcutta		46.4	314	e 10 0	PcP	—	—	10 47	PP
Ajiro		46.6	18	e 8 27	- 5	—	—	—	—
Iida		46.6	17	e 8 31	- 1	—	—	—	—
Misima	Z.	46.6	18	e 8 28	- 4	—	—	—	—
Hukui		46.7	14	e 8 26	- 6	—	—	—	—
Hunatu		46.9	18	e 8 31	- 3	—	—	—	—
Kohn	N.	47.0	17	e 8 32	- 3	—	—	—	—
Takayama	N.	47.1	16	i 8 31	- 4	—	—	—	—
Kanazawa		47.3	15	e 8 36	- 1	—	—	—	—
Matumoto	N.	47.3	16	8 37	0	15 25	- 6	—	—
Tokyo	N.	47.4	18	e 8 33	- 5	e 15 30	- 2	—	—
Kumagaya		47.7	17	e 8 53	+13	—	—	—	—
Matusiro		47.7	16	i 8 36	- 4	15 3	-33	e 10 47	PP
Maebasi	Z.	47.8	17	e 8 38	- 3	—	—	—	19.8
Nagano	N.	47.8	16	e 8 43	+ 2	e 16 0	+22	e 10 0	PcP
Wazima		48.1	15	e 8 41	- 2	—	—	—	—
Mito	N.	48.2	18	e 8 49	+ 5	—	—	—	—
Utunomiya	N.	48.2	17	e 8 42	- 2	—	—	—	—
Shirakawa		48.8	17	8 48	- 1	—	—	—	—
Onahama		48.9	18	e 8 47 <sup>a</sup>	- 3	—	—	—	—
Aikawa		49.1	15	e 8 48	- 3	—	—	—	—
Inawasiro	E.	49.2	16	e 8 41	-11	—	—	—	—
Niigata	Z.	49.2	16	8 51	- 1	—	—	—	—
Hukusima		49.5	18	e 8 53	- 1	—	—	—	—
Chatra		49.9	317	i 9 5	+ 8	e 16 11	+ 4	—	—
Sendai		50.1	19	e 8 58	- 1	16 5	- 5	—	—
Mizusawa	N.	51.0	18	e 9 5	- 1	—	—	—	—
Akita	Z.	51.2	17	9 5 <sup>a</sup>	- 2	—	—	—	—
Hyderabad		51.4	301	e 9 12	+ 3	i 16 59	+31	—	—
Morioka		51.5	18	e 9 7	- 2	—	—	—	—
Miyako	Z.	51.7	19	e 9 7	- 4	—	—	—	—
Aomori		52.4	17	e 9 17	+ 1	16 33	- 9	11 17	PP
Hatinohe		52.4	18	e 9 14	- 2	—	—	—	21.1
Mori	N.	53.5	17	e 9 19	- 5	—	—	—	—
Kaimata	N.E.	53.7	137	e 9 30	+ 4	e 23 31	Q	10 40	PcP
Cobb River	E.	54.1	134	e 9 31	+ 2	—	—	—	e 28.6
Tomakomai		54.2	16	e 9 29	0	—	—	—	—
Urakawa		54.2	18	e 9 24	- 5	e 17 11	+ 5	e 19 9	ScS
Sapporo		54.7	16	e 9 29 <sup>a</sup>	- 4	—	—	—	—
Christchurch		55.0	138	e 9 40	+ 5	—	—	—	—
Obihiro		55.0	18	e 9 40	+ 5	—	—	—	—

*Continued on next page.*

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		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Karapiro	N.	55.1	131	e 9 40	+ 4	—	—	—	e 27.1
Tongariro	Z.	55.5	132	e 9 43?	+ 4	e 11 56?	PP	—	—
Wellington		55.6	134	e 9 40	0	—	—	e 12 49	PPP
Tuaiti	N.	56.6	131	e 9 52	+ 5	—	—	—	—
Bombay		56.8	299	e 9 53	+ 5	—	—	—	—
Wakkanai	E.	56.9	16	e 10 30	+41	—	—	—	—
Apia		63.9	100	i 10 36	- 1	—	—	—	—
Warsak Dam	E.	65.0	315	i 10 44	0	—	—	—	—
Quetta		66.5	309	i 10 59k	+ 5	—	—	e 39 32	P'P'
Tananarive		73.4	253	i 11 44	+ 8	21 23	+18	e 11 48	PcP
Honolulu		83.4	67	e 12 28	- 2	—	—	—	—
Grahamstown	Z.	90.3	236	i 13 16	+12	—	—	—	—
Pretoria	Z.	90.3	244	i 13 14?	+10	—	—	e 13 42?	?
Kimberley	Z.	92.7	240	i 13 25	+10	—	—	—	—
Helwan	Z.	95.9	299	13 36	+ 6	—	—	e 17 15	PP
College		97.9	25	e 13 35	- 4	e 30 46	SS	e 17 19	PP
Istanbul	Z.	98.9	311	13 47	+ 4	—	—	—	—
Bucharest		101.3	313	e 13 54	0	e 24 36	{+ 3}	e 18 22	PP
Athens		102.9	306	i 18 11	PKP	—	—	e 18 26	PP
Kiruna	Z.	103.2	337	i 14 4	+ 1	—	—	e 18 15	PP
Sofia		103.3	311	e 18 7	PKP	—	—	—	—
Timisoara		104.7	315	16 7	?	—	—	e 20 9	?
Belgrade		105.3	314	e 18 29k	PP	e 25 7	{+15}	e 22 17	PKS
Szeged	N.	105.5	316	e 18 23	PP	e 25 6	{+13}	—	—
Upsala	Z.	105.6	330	e 14 17	+ 4	—	—	i 18 45	PP
Ogyalla		106.7	317	e 18 50	PP	25 37	{- 5}	e 21 22	PPP
Prague		108.9	320	e 19 1	PP	i 21 21	PPP	e 19 6	PP
Reggio Calabria		109.3	307	e 18 58	PP	—	—	—	—
Potsdam		109.4	323	e 19 13?	PP	—	—	—	—
Collmberg	Z.	109.6	321	e 14 36	P	e 28 45	PS	e 19 1	PP
Triest		110.0	316	i 28 46	PS	e 35 19	SSP	—	—
Jena		110.6	321	e 18 25	{- 9}	e 25 18	{+ 3}	e 19 10	PP
Karlsruhe	Z.	113.0	320	e 19 24	PP	—	—	e 20 30	PP
Zürich		113.2	318	e 18 49	{+ 9}	—	—	—	—
Corvallis	Z.	113.3	45	e 18 59	{+19}	e 29 46	PPS	—	—
Seattle	Z.	113.3	42	e 18 42	{+ 21}	e 22 27	PKS	e 20 29	PP
Strasbourg		113.5	320	e 14 51	P	36 19	SS	e 18 45	PKP
Shasta	Z.	114.6	49	e 18 44	{+ 21}	—	—	—	—
Lick	Z.	114.8	54	e 18 48	{+ 51}	—	—	e 16 9k	?
Besançon		114.9	318	e 18 52	{+ 9}	—	—	—	—
Scoresby Sund		114.9	349	e 14 56	P	e 21 47	?	e 18 46	PKP
Uccle		115.0	323	e 19 53	PP	e 29 29	PS	e 35 56	SS
Berkeley		115.1	54	—	—	e 29 43	PS	—	—
Mineral	Z.	115.2	49	e 18 45k	{+ 21}	e 29 31	PS	—	—
Reno	E.	116.7	50	e 19 12	{+26}	—	—	—	—
Paris		116.8	321	e 18 53	{+ 6}	—	—	i 20 0	PP
Chambon-la-Forêt		117.2	320	e 18 54	{+ 71}	—	—	i 20 0	PP
Fresno	Z.	117.2	54	e 18 49a	{+ 21}	—	—	e 20 27	PP
Clermont-Ferrand		117.3	317	e 18 52	{+ 51}	—	—	e 20 7	PP
Woody	Z.	118.1	55	i 18 53	{+ 4}	—	—	e 29 18	PKKP
Tinemaha	Z.	118.4	54	i 18 53	{+ 31}	—	—	i 29 21	PKKP
Hungry Horse		118.5	39	e 15 18	P	e 29 22	PKKP	i 18 52	PKP
Tamanrasset	Z.	118.8	291	15 39	P	e 26 14	{+28}	i 18 58	PKP
Pasadena	Z.	118.9	56	i 18 47	{- 41}	—	—	i 29 17	PKKP
Algiers Univ.	Z.	119.4	307	e 18 58	{+ 61}	e 25 37	{-11}	e 20 19	PP
Riverside	Z.	119.6	56	e 18 55	{+ 31}	—	—	e 29 18	PKKP
Butte		120.2	40	i 18 56	{+ 31}	—	—	—	—
Rathfarnham C.	Z.	120.2	328	e 18 57a	{+ 41}	—	—	—	—
Boulder City		121.3	53	i 19 0	{+ 51}	i 19 32	?	i 29 10	PKKP
Nelson		121.3	53	i 16 34	P	i 29 9	PKKP	i 18 59	PKP

Continued on next page.



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		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Logan		122.1	45	e 19 1	[+ 4]	—	—	—	—
Granada		124.4	309	e 19 16 <sub>a</sub>	[+15]	—	—	—	—
Tucson		125.3	56	e 19 7	[+ 4]	e 31 49	PS	i 21 48	PP
Chihuahua		130.1	60	e 19 20?	[+ 8]	e 28 19	{- 2}	e 23 57	PPP
La Plata		136.1	179	e 19 13	[-10]	28 49	{- 9}	40 31	SS
Kirkland Lake	z.	136.6	22	e 19 25	[+ 1]	—	—	—	—
Fayetteville	z.	136.9	45	e 16 16	P	i 19 15	PKP	i 19 26	PKP <sub>2</sub>
Tacubaya		138.0	71	e 19 31	[+ 4]	26 37	[+ 1]	e 29 0	SKKS
St. Louis		138.2	40	e 19 31	[+ 4]	—	—	i 23 21	PKS
Angra do Heroismo		140.3	322	e 25 29	PPP	—	—	—	—
Seven Falls	E.	140.4	14	e 19 45	[+14]	23 2	PKS	25 26	PPP
Shawinigan Falls	N.	140.4	16	e 19 34	[+ 3]	—	—	23 7	PKS
Ottawa		140.5	20	e 19 28	[- 3]	—	—	23 9	PKS
Vera Cruz		140.9	71	e 19 35	[+ 3]	e 28 11	?	e 25 27	PP
Cleveland		141.2	30	i 19 34 <sub>a</sub>	[+ 1]	e 23 14	PKS	i 19 55	PKP <sub>2</sub>
Cincinnati		141.4	34	e 19 29	[- 4]	—	—	—	—
Buffalo (Larkin)		141.5	25	e 19 27	[- 6]	—	—	—	—
Morgantown		143.4	31	i 19 33	[- 3]	—	—	—	—
Halifax		144.2	8	e 19 38 <sub>a</sub>	[ 0]	33 17	PS	22 49	PP
Harvard		144.4	17	e 19 38 <sub>k</sub>	[ 0]	—	—	i 22 49	PP
Weston		144.6	17	e 19 39 <sub>a</sub>	[+ 1]	—	—	—	—
Antofagasta	E.	144.8	159	e 19 44	[+ 5]	—	—	—	—
Palisades	z.	145.0	21	i 19 38	[- 1]	—	—	—	—
Fordham		145.1	21	i 19 40	[+ 1]	—	—	—	—
Washington		145.4	27	i 19 40	[ 0]	e 27 10	[+23]	—	—
Merida		146.5	65	e 21 23	?	e 23 37	PP	—	—
Columbia		146.9	38	i 19 46	[+ 4]	—	—	—	—
Huancayo		152.1	140	i 20 1	[+10]	—	—	—	—
La Paz	z.	152.2	158	i 19 57 <sub>a</sub>	[+ 6]	—	—	i 20 16	PKP <sub>2</sub>
Bermuda		155.9	16	e 20 0	[+ 4]	—	—	i 20 24	PKP <sub>2</sub>
Chinchina		161.1	100	i 20 7	[+ 5]	—	—	—	—
Bogota	N.	162.5	103	e 20 15	[+12]	—	—	—	—
San Juan		167.3	43	e 20 11	[+ 3]	—	—	—	—

June 25d. 10h. 44m. 56s. Epicentre 9°-2S. 123°-0E. (as at 10h. 43m.).

Magnitude 6.75 (Rome), 6.75-7 (Kiruna), 6.9 (Prague), 7 (Upsala and Wellington), 7.1 (Gutenberg), 7.9 Christchurch).

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Perth		23.6	194	5 29	+16	9 39	+14	10 39	SS
Guam		31.2	43	i 9 6	PcP	—	—	—	—
Hong Kong		32.5	345	6 37	+ 3	—	—	—	—
Brisbane		33.7	125	i 6 42	- 3	i 12 4	- 4	—	—
Riverview		35.7	137	i 7 5 <sub>a</sub>	+ 3	i 12 41	+ 2	i 7 15	pP
Saga	N.	42.8	9	8 2 <sub>a</sub>	+ 1	—	—	e 9 42	PP
Simidu		42.8	12	e 8 0	- 1	—	—	e 9 41	PP
Torisima		42.8	22	e 8 0	- 1	—	—	—	—
Ooita		43.0	10	e 8 1	- 2	e 14 42	+13	—	e 17.3
Hukuoka		43.1	9	i 8 1	- 3	e 15 29	+59	9 43	PP
Muroto		43.5	13	e 8 5	- 2	—	—	e 9 49	PP
Koti		43.7	12	8 6	- 2	e 15 13	+34	10 14	PP
Matuyama		43.8	12	e 8 35	+26	e 14 53	+13	e 10 17	PP
Siomisaki		44.1	15	8 5 <sub>k</sub>	- 7	14 36	- 9	i 9 54	PP
Herosima		44.2	11	e 8 48	+36	e 16 8	?	9 55	PcP
Takamatu		44.5	13	e 8 13	- 2	e 14 43	- 8	10 15	PP
Hamada		44.7	10	8 14	- 2	14 57	+ 3	17 49	SS
Sumoto		44.8	14	i 8 15 <sub>a</sub>	- 2	—	—	i 10 20	PP
Kobe	E.	45.2	14	e 8 22	+ 2	e 15 11	+10	e 12 10	?
Osaka		45.2	14	8 20	0	—	—	—	—

Continued on next page.

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		$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.	
		°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.	
Kameyama		45.6	16	i 8	22	- 2	14	58	- 8	i 10	8	PP	20.3
Kyoto		45.6	14	e 8	19	- 5	—	—	—	e 10	4	PP	e 19.2
Colombo	E.	45.9	289	i 8	33	+ 7	15	21	+10	11	47	PPP	23.2
Omaesaki		45.9	18	8	19	- 7	i 8	48	?	i 8	34	?	—
Toyoooka		45.9	13	8	24	- 2	e 9	58	PcP	e 10	7	PP	—
Nagoya		46.1	16	e 8	24	- 4	15	4	-10	10	30	PP	e 19.9
Shizuoka		46.3	18	e 8	26 <sup>a</sup>	- 3	e 15	5	-11	e 10	48	PP	e 19.5
Osima		46.4	19	e 8	26	- 4	(e 15	18)	0	e 10	28	PP	e 15.3
Calcutta	N.	46.4	314	8	36	+ 6	15	23	+ 5	—	—	—	—
Iida		46.6	17	i 8	34	+ 2	e 15	17	- 4	—	—	—	—
Misima		46.6	18	8	28	- 4	e 10	25	PcP	e 11	33	PPP	—
Mera		46.7	19	e 8	26	- 6	—	—	—	—	—	—	—
Hunatu		46.9	18	i 8	33	- 1	e 15	13	-12	—	—	—	19.0
Kohu		47.0	17	i 8	31	- 4	—	—	—	i 10	26	PP	—
Kanazawa		47.3	15	i 8	37	0	e 15	35	+ 4	—	—	—	—
Matumoto		47.3	16	8	36	- 1	e 14	22	-22	e 10	31	PP	18.5
Tokyo		47.4	18	e 8	28	-10	e 15	33	+ 1	10	41	PP	e 21.2
Kashiwa		47.6	18	e 8	37	- 2	—	—	—	—	—	—	—
Oiwake		47.6	17	e 8	19	-20	e 15	20	-15	—	—	—	—
Matusiro		47.7	16	i 8	38	- 2	i 15	31	- 5	10	38	PP	19.4
Maebasi		47.8	17	i 8	39	- 2	e 15	26	-12	e 10	36	PP	e 19.6
Nagano		47.8	16	e 8	41	0	e 15	33	- 5	—	—	—	—
Madras	E.	47.9	297	e 8	49	+ 7	e 16	3	+24	e 10	46	PP	—
Wazima		48.1	15	e 8	42	- 1	e 14	36	-66	—	—	—	e 19.5
Mito	N.	48.2	18	i 8	44	0	—	—	—	e 10	15	PcP	—
Utunomiya		48.2	17	e 8	41	- 3	e 15	4	-39	e 12	17	?	19.9
Shirakawa		48.8	17	8	48	- 1	e 15	39	-13	—	—	—	—
Onahama		48.9	18	e 8	48	- 2	e 15	48	- 5	—	—	—	e 20.3
Aikawa		49.1	15	e 8	50	- 1	—	—	—	—	—	—	20.1
Inawasiro	N.	49.2	16	i 8	52	0	e 15	50	- 8	—	—	—	—
Niigata		49.2	16	8	54	+ 2	15	48	-10	e 14	40	?	—
Kodaikanal	E.	49.3	293	i 9	2	+ 9	i 16	35	+36	11	2	PP	24.6
Hukushima		49.5	18	e 8	54	0	15	54	- 8	e 10	7	PcP	—
Chatra		49.9	317	i 9	6	+ 9	i 16	19	+12	11	4	PP	23.9
Sendai		50.1	19	e 8	57	- 2	16	2	- 8	e 10	46	PP	20.0
Sakata		50.3	17	e 9	26	+26	e 16	26	+13	—	—	—	—
Mizusawa		51.0	18	—	—	—	e 16	24	+ 2	16	9	?	—
Akita		51.2	17	9	10	+ 3	e 16	26	+ 1	i 17	28	?	—
Hyderabad		51.4	301	i 9	14	+ 5	i 16	46	+18	11	7	PP	24.9
Morioka		51.5	18	e 9	7	- 2	e 16	22	- 7	—	—	—	—
Miyako		51.7	19	e 9	2	- 9	e 16	15	-17	e 9	31	?	—
Aomori		52.4	17	e 9	14	- 2	16	30	-12	11	14	PP	21.0
Hatinohe		52.4	18	e 9	15	- 1	e 16	31	-11	—	—	—	—
Macquarie Is.		53.5	154	i 9	39	+15	e 17	18	+21	i 11	26	PP	23.2
Mori		53.5	17	9	22	- 2	16	49	- 8	e 10	24	PcP	20.3
Cobb River	E.	54.1	134	e 9	32	+ 3	e 17	1	- 4	—	—	—	e 23.1
Auckland	N.	54.2	129	—	—	—	e 17	22	+16	—	—	—	e 24.8
Urakawa		54.2	18	e 9	18	-11	e 16	58	- 8	e 19	45	ScS	e 20.8
New Plymouth	E.	54.4	132	—	—	—	e 11	32	PP	—	—	—	e 31.1
Sapporo		54.7	16	e 9	30	- 3	i 17	8	- 5	—	—	—	—
Christchurch		55.0	138	e 9	39	+ 4	e 17	22	+ 5	e 11	50	PP	e 24.2
Kusiro	N.	55.5	19	e 10	1	+22	—	—	—	—	—	—	—
Tongariro	Z.	55.5	132	—	—	—	17	30?	+ 6	—	—	—	e 31.1
Wellington		55.6	134	e 9	39	- 1	e 17	23	- 2	e 12	50	PPP	e 29.1
Poona		55.8	299	i 9	47	+ 6	e 17	24	- 4	11	3	PcP	26.0
Nemuro		56.2	19	e 9	41	- 3	—	—	—	—	—	—	—
Tuai	N.	56.6	131	e 9	50	+ 3	—	—	—	—	—	—	—
Bombay		56.8	299	i 9	53	+ 5	i 17	46	+ 5	11	53	PP	26.7
Wakkanai		56.9	16	e 10	32	+43	e 18	37	+55	—	—	—	—
New Delhi		58.0	313	i 10	0	+ 3	i 18	0	+ 3	11	7	PcP	27.6

Continued on next page.

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	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Heard Island	59.1	213	e 10 27	+23	e 18 40	+29	—	—
Apia	63.9	100	(e 10 34?)	-3	e 10 34?	P	—	—
Warsak Dam	E. 65.0	315	i 10 45	+1	—	—	—	—
Quetta	66.5	309	i 10 56	+2	i 19 48	+4	i 39 42	P'P'
Tananarive	73.4	253	e 11 48	+12	21 21	+16	—	—
Honolulu	83.4	67	e 12 26	-4	—	—	—	—
Grahamstown	Z. 90.3	236	i 13 16	+12	—	—	—	e 44.0
Kimberley	Z. 92.7	240	e 13 25	+10	—	—	—	—
Ksara	92.7	303	i 13 22	+7	24 17	-1	—	—
Helwan	95.9	299	13 34	+4	e 24 16	[+10]	17 1	PP
College	97.9	25	e 13 36	-3	e 24 32	[+16]	e 17 16	PP
Istanbul	98.9	311	13 47	+4	25 13	+2	17 52	PP
Bucharest	101.3	313	e 13 59	+5	e 24 55	[+22]	e 18 22	PP
Helsinki	101.9	330	e 13 56	-1	e 33 1	SS	e 18 11	PP
Athens	102.9	306	e 18 14	PP	i 22 33	PKS	i 20 25	PPP
Kiruna	103.2	337	i 14 4 <sub>a</sub>	+1	e 21 56	PKS	i 18 22	PP
Sofia	103.3	311	i 18 25	PP	—	—	e 20 21	PPP
Timisoara	104.7	315	e 18 38	PP	—	—	e 19 7	?
Belgrade	105.3	314	i 18 40	PP	e 28 11	PS	e 37 59	SSS
Szeged	E. 105.5	316	18 34	PP	25 50	-16	27 23	PS
Upsala	105.6	330	e 14 15	P	e 25 3	[+10]	i 18 28	PKP
Budapest	E. 106.1	317	e 14 40	P	24 39	[-16]	18 49	PP
Raciborzu	106.5	320	e 14 26	P	i 26 25	+10	e 18 53	PP
Ogyalla	106.7	317	e 18 18	[-9]	e 25 14	[+16]	e 19 4	PP
Taranto	107.9	310	14 28	P	25 28	[+25]	17 58	PKP
Prague	108.9	320	e 14 34	P	e 25 7	[-1]	e 18 12	PKP
Copenhagen	109.1	327	e 14 33	P	e 26 43	S	i 28 29	PS
Messina	109.3	307	e 14 40	P	i 28 43	PS	e 18 4	PKP
Reggio Calabria	109.3	307	e 19 8	PP	—	—	—	—
Potsdam	109.4	323	i 19 16	PP	e 22 1	PKS	i 28 43	PS
Collmberg	Z. 109.6	321	e 14 36	P	e 29 45	PPS	e 19 13	PP
Triest	110.0	316	i 18 6 <sub>k</sub>	[-27]	i 28 40	PS	—	—
Cheb	110.2	321	e 14 41?	P	i 28 52	PS	e 18 19	PKP
Jena	110.6	321	e 14 40	P	e 28 51	PS	e 18 18	PKP
Resolute Bay	111.1	10	e 14 37	P	i 28 39	PS	i 19 13	PP
Rocca di Papa	E. 111.2	311	e 18 19	[-17]	e 29 1	PS	e 19 19	PP
Rome	111.3	311	e 14 43	P	i 26 43	{+29}	e 18 18	PKP
Bergen	111.5	333	19 21	PP	28 50	PS	e 34 58	SS
Bologna	111.8	315	18 27	[-10]	e 29 50	PPS	e 19 27	PP
Florence	112.0	314	e 14 41 <sub>k</sub>	P	e 27 13	S	i 18 24	PKP
Siena	112.0	314	e 18 34	[-3]	e 26 6	{-13}	i 19 30	PP
Prato	112.1	314	e 18 28	[-9]	i 29 8	PS	—	—
Salo	112.2	316	14 25	P	i 29 8	PS	e 18 4	PKP
Stuttgart	112.5	320	e 14 46	P	e 29 4	PS	e 18 18	PKP
Chur	112.7	318	e 18 28	[-10]	e 29 9	PS	e 19 20	PP
Karlsruhe	113.0	320	e 14 52 <sub>a</sub>	P	e 29 5	PS	e 18 21	PKP
Witteveen	Z. 113.1	325	e 14 52	P	—	—	e 19 31	PP
Pavia	113.2	316	e 14 58	P	e 27 30	S	e 18 13	PP
Zürich	113.2	318	e 18 42	[+2]	e 21 59	PPP	e 19 36	PP
Strasbourg	113.5	320	e 14 47	P	e 30 59	PPS	e 18 41	PKP
Oropa	114.0	316	e 14 44	P	e 26 38	{+5}	i 18 39	PKP
De Bilt	114.2	324	e 14 54	P	e 29 32	PS	i 18 49	PKP
Neuchatel	114.4	318	e 18 35	[-7]	e 29 29	PS	—	—
Shasta	114.6	49	e 14 32	P	e 29 18	PS	e 18 46	PKP
Lick	Z. 114.8	54	i 18 48 <sub>k</sub>	[+5]	e 29 24	PS	i 19 46	PP
Scoresby Sund	114.9	349	e 14 55	P	29 10	PS	e 18 35	PKP
Uccle	115.0	323	e 15 0?	P	e 25 18	[-14]	e 19 50	PP
Berkeley	115.1	54	e 14 57 <sub>a</sub>	P	e 29 20	PS	i 19 38	PP
Mineral	Z. 115.2	49	e 18 55 <sub>a</sub>	[+12]	e 29 24	PS	e 19 42	PP
Santa Clara	E. 115.4	54	e 20 4?	PP	e 26 47	{+4}	(e 27 46)	?

Continued on next page.

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		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	I.	
		°	°	m. s.	s.	m. s.	s.	m. s.	m.	
Aberdeen		116.3	331	i 19 57	PP	i 25 59	[+22]	36 4	SS	e 58.2
Reno	z.	116.7	50	e 19 49 <sup>a</sup>	PP	—	—	—	—	—
Paris		116.8	321	e 15 7	P	i 25 37	[-2]	e 18 51	PKP	e 56.1
Durham		117.0	328	e 19 0	[+13]	i 28 52	PS	i 20 5	PP	—
Chambon-la-Forêt		117.2	320	e 18 53	[+6]	—	—	—	—	—
Fresno	z.	117.2	54	e 18 48 <sup>k</sup>	[+1]	—	—	—	—	—
Clermont-Ferrand		117.3	317	i 20 0	PP	i 29 56	PS	e 22 17	PKS	56.6
Edinburgh	E.	117.4	329	20 4	PP	25 40	[-1]	22 25	PKS	—
Kew		117.6	324	e 15 14	P	e 30 9	PS	i 18 53	PKP	e 59.1
Woody	z.	118.1	55	i 18 54	[+5]	i 19 52	PP	i 29 25	PKKP	—
Tinemaha	z.	118.4	54	i 18 53	[+3]	—	—	—	—	—
Hungry Horse		118.5	39	e 15 2	P	e 19 59	PP	i 18 52	PKP	—
Tamanrasset	z.	118.8	291	e 15 47	P	e 26 15	[+29]	i 18 56	PKP	—
Pasadena		118.9	56	i 18 55	[+4]	i 20 24	PP	i 29 18	PKKP	e 47.1
Barcelona		119.1	313	i 20 18	PP	30 11	PS	i 22 57	PPP	e 42.0
Algiers Univ.	z.	119.4	307	e 18 57	[+5]	e 30 18	PS	i 20 19	PP	—
Jersey	E.	119.5	323	e 20 20	PP	—	—	—	—	56.1
Riverside	z.	119.6	56	e 18 57	[+5]	—	—	e 29 18	PKKP	—
Reykjavik		119.8	344	i 20 22	PP	26 2	[+13]	e 21 51	PKS	—
Rathfarnham Castle		120.2	328	i 18 57 <sup>a</sup>	[+4]	e 28 20	S	i 20 25	PP	e 59.1
Tortosa		120.4	312	e 18 34	[-19]	i 25 24	[-27]	—	—	—
Nelson		121.3	53	i 18 57	[+2]	—	—	i 29 8	PKKP	—
Saskatoon		121.3	33	e 20 22	PP	—	—	e 30 16	PKKP	—
Alicante		121.8	310	e 18 57	[+1]	25 57	[+1]	20 39	PP	58.0
Logan		122.1	45	e 18 59	[+2]	—	—	—	—	—
Almeria		123.7	309	i 19 9	[+9]	26 3	[+1]	i 20 43	PP	65.6
Toledo		124.0	313	e 19 6	[+5]	26 24	[+21]	20 50	PP	61.9
Granada		124.4	309	19 7 <sup>k</sup>	[+6]	26 7	[+3]	i 20 52	PP	i 68.2
Malaga		125.2	309	i 19 6	[+3]	25 51	[-15]	i 20 36	PP	—
Tucson		125.3	56	i 19 6	[+3]	e 31 59	PS	e 20 46	PP	e 49.4
Coimbra		127.1	314	21 13	PP	22 52	PKS	43 10	SSS	—
Chihuahua		130.1	60	e 23 49	PPP	e 26 23 <sup>?</sup>	[+3]	—	—	—
Concepción	N.	132.1	163	e 22 33	PKS	31 43	PS	—	—	—
La Plata		136.1	179	22 46	PKS	32 4	PS	24 46	PPP	72.7
Buenos Aires		136.4	179	e 22 27	PKS	—	—	—	—	73.1
Kirkland Lake	z.	136.6	22	e 19 26 <sup>a</sup>	[+2]	—	—	—	—	—
Fayetteville	z.	136.9	45	i 19 26	[+1]	—	—	e 22 1	PP	—
Chicago		137.7	35	e 19 30	[+4]	—	—	—	—	—
Tacubaya		138.0	71	e 19 35	[+8]	e 28 57	[-12]	i 22 5	PP	—
Angra do Heroismo		140.3	322	—	—	e 36 2	PPS	—	—	—
Seven Falls	E.	140.4	14	e 19 44	[+13]	26 57	[+17]	23 4	PKS	—
Shawinigan Falls	N.	140.4	16	e 19 24	[-7]	26 26	[-14]	22 26	PP	—
M' Bour		140.5	282	i 19 36	[+5]	i 22 44	PP	i 25 3	PPP	70.1
Ottawa		140.5	20	i 19 27 <sup>k</sup>	[-4]	26 33	[-7]	22 27	PP	—
Vera Cruz		140.9	71	e 19 37	[+5]	—	—	—	—	—
Cleveland		141.2	30	i 19 36 <sup>k</sup>	[+3]	e 23 10	PKS	e 40 28	SS	—
Cincinnati		141.4	34	i 19 36	[+3]	—	—	—	—	—
Pittsburgh		142.8	29	i 19 36	[+1]	—	—	i 23 20	PKS	—
Morgantown		143.4	31	i 19 34	[-2]	—	—	e 23 54	PKS	—
Halifax		144.2	8	e 19 36 <sup>a</sup>	[-2]	35 14	PPS	e 22 53	PP	—
Harvard		144.4	17	i 19 39	[+1]	e 41 38	SS	i 22 56	PP	—
Weston		144.6	17	i 19 40	[+2]	e 42 14	SS	e 22 58	PP	—
Antofagasta	E.	144.8	159	e 19 52	[+13]	—	—	—	—	—
Palisades		145.0	21	i 19 39	[0]	—	—	—	—	—
Fordham		145.1	21	i 19 40	[+1]	—	—	—	—	—
Washington		145.4	27	i 19 41	[+1]	—	—	—	—	—
Columbia		146.9	38	i 19 47	[+5]	—	—	—	—	—
Huancayo		152.1	140	i 20 2	[+11]	—	—	—	—	—
La Paz		152.2	158	i 20 0 <sup>a</sup>	[+9]	i 30 34	[+4]	i 23 48	PP	73.1
Bermuda		155.9	16	i 19 57	[+1]	e 44 45	SSP	i 23 57	PP	e 75.1
Chinchina		161.1	100	i 20 7	[+5]	—	—	—	—	—
Bogota	N.	162.5	103	e 20 25	[+22]	—	—	—	—	—
San Juan		167.3	43	i 20 9	[+1]	—	—	—	—	—
Fort de France		173.2	36	i 20 12	[+1]	—	—	i 29 29	PPP	—

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June 25d. 21h. 49m. 7s. Epicentre 10°·5N. 62°·6W. Depth of focus 0·015.  
(as on 1951, April 20d.).

A = +·4526, B = -·8732, C = +·1811;  $\delta$  = +12;  $h$  = +6;  
D = -·888, E = -·460; G = +·083, H = -·161, K = -·984.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Fort de France	4·4	19	i 0 57	- 9	i 1 39	-18	—	—
San Juan	8·5	337	i 1 57	- 5	—	—	—	—
Bogota	12·8	244	e 3 7	+ 9	e 5 26	+ 8	e 5 47	SS
Chinchina	14·0	248	e 3 21	+ 7	e 6 9	SS	—	—
Bermuda	21·8	355	i 4 42	- 1	—	—	—	e 9·7
Huancayo	25·7	209	i 5 29	+ 9	—	—	i 6 2	PPP
La Paz	27·4	191	e 5 43	+ 8	i 11 26	SS	6 12	PP
Harvard	32·8	348	i 6 20 <sub>a</sub>	- 3	—	—	—	i 12·7
Morgantown	32·9	335	i 6 22	- 2	—	—	—	—
Halifax	34·0	359	e 6 32 <sub>a</sub>	- 1	—	—	—	—
Tacubaya	36·4	288	e 6 56	+ 2	—	—	e 7 13	P
Ottawa	36·5	345	e 6 52 <sub>a</sub>	- 3	8 24	PP	i 9 15	PcP
Shawinigan Falls N.	37·0	349	e 6 56	- 3	—	—	—	—
St. Louis	37·4	324	i 7 2	0	e 13 33	PcS	—	—
Fayetteville z.	38·3	317	i 7 8	- 2	i 7 40	sP	i 7 27	pP
Kirkland Lake z.	40·3	342	e 7 23 <sub>a</sub>	- 3	—	—	—	—
Tucson	49·4	304	i 8 39	0	—	—	—	—
Nelson	53·4	307	i 9 9	0	—	—	i 9 36	pP
Boulder City	53·5	307	i 9 10	+ 1	—	—	i 9 36	pP
Riverside z.	55·1	305	e 9 21	0	—	—	—	—
Butte	55·2	320	i 9 20	- 2	—	—	—	—
Pasadena	55·8	305	e 9 26	0	—	—	e 9 50	pP
Tinemaha z.	56·5	308	i 9 30	- 1	—	—	e 9 38	P
Hungry Horse	57·0	322	i 9 33	- 1	—	—	—	—
Lick z.	59·2	308	i 9 49 <sub>a</sub>	- 1	e 11 10	PcP	i 10 20	PP
Mineral z.	59·7	311	i 9 52 <sub>a</sub>	- 1	i 9 56	P	e 10 20	pP
Shasta z.	60·4	311	e 9 55	- 3	—	—	—	—
Alicante	61·7	52	e 9 44	-23	21 50	SS	12 2	PP
Rathfarnham C. z.	61·8	34	i 10 5 <sub>a</sub>	- 2	—	—	e 10 37	PcP
Scoresby Sund	65·1	13	i 10 26 <sub>a</sub>	- 3	—	—	—	—
Tamanrasset z.	65·9	70	i 10 34	0	e 13 8	PP	i 11 0	PcP
Besançon	67·8	44	e 10 44	- 2	—	—	—	—
Stuttgart	70·2	42	i 10 58 <sub>a</sub>	- 3	—	—	e 11 26	PP
Jena z.	72·0	40	e 11 10	- 2	—	—	e 11 29	PcP
Collmberg	72·9	40	e 11 15	- 2	—	—	e 12 4	?
Triest	73·0	45	e 11 15	- 2	e 20 21	-11	e 21 1	PS
Prague N.	73·7	41	i 11 21	- 1	—	—	e 11 50	PcP
Upsala z.	76·1	31	i 11 33 <sub>a</sub>	- 2	—	—	—	—
Kiruna z.	77·7	23	i 11 43 <sub>a</sub>	- 1	—	—	i 12 10	pP
College	78·6	335	e 11 47	- 2	—	—	—	—
Kimberley z.	92·7	119	i 13 2?	+ 3	—	—	—	—

June 26d. 3h. 10m. Epicentre 35°·6N. 140°·2E. Depth 65km.

Intensity II-III at Ajiro.

Seismo. Bull. Cent. Met. Obs., Japan, for June, 1953, Tokyo, 1953, p. 21, with macro-seismic chart.



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June 26d. 5h. 42m. 50s. Epicentre 8°·7S. 124°·1E. (as on 1951, Sept. 29d.).

A = -·5543, B = +·8186, C = -·1503;  $\delta$  = -6;  $h$  = +7;  
D = +·828, E = +·561; G = +·084, H = -·124, K = -·989.

		$\Delta$ °	Az. °	P.		O-C. s.	S.		O-C. s.	Supp.		L. m.
				m.	s.		m.	s.		m.	s.	
Djakarta		17·3	278	e 4	3 <sub>a</sub>	- 1	i 7 28	SS	i 4 7	P	e 8·5	
Perth		24·7	197	i 5	30	+ 6	i 9 45	+ 1	5 55	PP	11·9	
Baguio		25·2	352	i 5	29	0	i 10 53	L	—	—	(i 10·9)	
Hong Kong		32·3	343	e 6	33	0	11 45	- 1	e 13 23	SS	—	
Brisbane		33·1	128	i 6	43	+ 3	i 11 59	0	i 7 50	PP	i 15·7	
Melbourne	E.	34·6	150	e 6	41	- 12	e 12 11	- 11	e 8 7	PP	—	
Riverview		35·7	139	i 7	1 <sub>a</sub>	- 1	i 12 35	- 4	i 8 25	PP	i 16·7	
Zô-Sè		39·7	357	i 7	35 <sub>a</sub>	- 1	e 13 39	- 1	—	—	—	
Nanking		40·8	353	i 7	45 <sub>a</sub>	0	i 13 56	0	i 16 50	SS	—	
Shillong	E.	46·3	319	e 8	31	+ 2	e 15 13	- 3	—	—	—	
Colombo	E.	46·7	287	8	30	- 2	15 19	- 3	10 27	PP	24·6	
Madras	F.	48·7	297	i 8	46	- 2	15 47?	- 3	19 18	SS	23·3	
Mizusawa		50·2	17	9	2	+ 2	e 16 10	- 1	—	—	—	
Chatra	E.	50·3	316	i 9	0	0	i 16 11	- 2	16 20	PS	24·1	
Hyderabad		52·1	300	i 9	7	- 7	i 16 29	- 9	11 8	PP	23·7	
Vladivostok		52·1	7	i 9	13	- 1	16 36	- 2	—	—	—	
Kaimata	N.E.	53·4	137	e 9	28	+ 4	—	—	—	—	—	
Auckland	N.	53·7	129	—	—	—	e 17 28	PPS	—	—	e 24·2	
Cobb River	E.	53·7	135	9	28	+ 2	—	—	—	—	e 29·2	
Christchurch		54·6	138	e 9	36	+ 4	e 17 13?	+ 2	e 19 15	ScS	e 21·2	
Karapiro	N.	54·6	131	e 9	38	+ 6	—	—	—	—	—	
Wellington		55·2	135	e 9	39	+ 2	e 17 42	PPS	e 9 44	?	e 23·8	
Tuai	N.	56·1	131	e 9	52	+ 9	e 16 8	- 84	—	—	e 22·2	
Poona		56·5	299	i 9	47	+ 1	17 39	+ 2	17 49	PS	26·3	
Bombay		57·5	298	i 9	53	0	i 17 53	+ 3	21 37	SS	27·2	
Kurilsk		57·8	19	i 9	54	- 1	i 17 53	- 1	—	—	—	
Yuzno-Sakhlinsk		57·8	14	i 9	54	- 1	17 54	0	—	—	—	
New Delhi		58·5	311	i 9	58	- 2	i 17 47	- 16	14 54	PcS	30·1	
Uglegorsk		59·7	13	i 10	6	- 3	i 18 17	- 2	—	—	—	
Kyakhta		60·9	348	10	13	- 4	—	—	—	—	—	
Kabansk		62·3	349	i 10	25	- 1	i 18 49	- 3	—	—	—	
Irkutsk		63·1	347	10	29	- 3	18 59	- 3	—	—	—	
Warsak Dam	E.	65·4	314	i 10	44	- 3	i 19 27	- 3	i 23 51	SS	e 31·2	
Przhevalsk		65·8	325	10	49	0	19 37	+ 2	—	—	—	
Naryn		66·6	323	e 10	55	+ 1	i 19 44	- 1	—	—	—	
Quetta		67·0	307	i 10	55 <sub>k</sub>	- 2	e 19 44	- 6	i 39 27	P'P'	—	
Almata		67·1	326	i 10	59	+ 2	i 19 57	+ 6	—	—	—	
Khorog		67·2	317	i 10	57	- 1	—	—	—	—	—	
Rybach'e		67·2	324	i 10	56	- 2	i 19 52	0	—	—	—	
Petropavlovsk		68·2	21	11	2	- 2	19 58	- 6	—	—	—	
Frunse		68·3	323	i 11	2	- 3	i 20 5	- 1	11 34	pP	—	
Andijan		68·4	320	i 11	4	- 2	i 20 6	- 1	—	—	—	
Dzhergetal		68·4	318	11	5	- 1	—	—	—	—	—	
Fergana		68·6	320	e 11	5	- 2	—	—	—	—	—	
Kulyab		68·6	317	11	5	- 2	19 53	- 16	—	—	—	
Garm		68·9	318	e 11	6	- 3	e 20 7	- 6	—	—	—	
Namangan		69·0	320	e 11	8	- 1	e 20 10	- 4	—	—	—	
Stalinabad		69·7	317	i 11	12	- 2	i 20 17	- 5	—	—	—	
Tashkent		70·7	319	e 11	19	- 1	i 20 32	- 2	—	—	—	
Tchimkent		71·0	320	i 11	20	- 2	i 20 37	0	—	—	—	
Bairam-Ali		73·9	312	i 11	37	- 2	—	—	—	—	—	
Tananarive		74·6	253	i 11	44	+ 1	e 21 18	0	26 6	SS	36·2	
Ashkabad		76·8	312	11	56	+ 1	—	—	—	—	—	
Kizyl-Arvat		78·7	313	i 12	6	0	—	—	—	—	—	
Sverdlovsk		83·3	330	i 12	30	0	22 42	- 8	i 15 54	PP	—	
Baku		83·8	312	i 12	36	+ 4	e 22 49	- 6	—	—	—	
Lenkoran		84·1	310	—	—	—	22 58	0	—	—	—	
Shemakla		84·8	312	i 12	37	0	23 10	ScS	—	—	—	
Goris		86·1	311	i 12	45	+ 1	23 5	[- 3]	23 11	SKKS	—	
Kirovobad		86·5	311	—	—	—	i 23 21	- 1	—	—	—	

Continued on next page.

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	$\Delta$	Az.	P.		O-C.	S.	O-C.	Supp.		L.
	°	°	m.	s.	s.	m.	s.	m.	s.	m.
Nakichevan	86.8	310	i 12	49	+ 2	—	—	—	—	—
Grozny	87.5	314	i 12	51	0	—	—	—	—	—
Erevan	87.7	311	i 12	48	- 4	23 22	[+ 3]	i 13 20	pP	—
Tiflis	87.8	313	i 12	52	0	23 16	[- 3]	i 16 22	PP	—
Duzheti	88.0	313	e 12	55	+ 2	—	—	—	—	—
Leninakan	88.3	312	e 12	57	+ 2	—	—	—	—	—
Tsikhlis-Dzhvari	88.8	312	i 12	59	+ 2	—	—	—	—	—
Borzhom	88.9	312	i 12	57	- 1	—	—	—	—	—
Akhalkalaki	89.0	312	e 13	0	+ 2	—	—	—	—	—
Abastumanj	89.3	312	e 13	1	+ 2	—	—	—	—	—
Piatigorsk	89.6	315	13	15?	+14	—	—	—	—	—
Zugdidi	90.1	313	13	5	+ 2	e 23 31	[- 2]	—	—	—
Grahamstown	z. 91.5	237	e 13	13	+ 3	—	—	—	—	e 44.1
Sotchi	91.9	314	e 13	10	- 1	e 23 39	[- 5]	i 16 56	PP	—
Ksara	93.3	303	13	20	+ 2	25 50	PS	—	—	—
Kimberley	z. 93.9	239	i 13	23	+ 2	—	—	—	—	—
Moscow	95.1	326	13	24	- 2	i 24 4	[+ 2]	13 56	pP	—
Theodosia	95.2	315	e 13	25	- 2	e 23 54	[- 8]	i 26 5	PS	—
Helwan	96.7	299	e 13	31	- 2	e 27 1	PPS	e 17 28	PP	—
College	97.0	26	e 13	32	- 3	e 24 38	{+ 5}	e 17 39	PP	e 38.2
Istanbul	z. 99.4	311	13	43?	- 3	e 26 54	PS	i 17 57	PP	e 48.2
Pulkovo	99.4	329	e 13	46	0	i 18 0	PP	e 20 1	PPP	—
Kishinev	99.9	318	13	45	- 3	24 33	[+ 6]	e 26 46	PS	—
Bucharest	101.7	314	e 17	7	?	i 24 36	[+ 1]	i 18 9	PP	—
Helsinki	102.0	330	e 18	12	PP	e 24 42	[+ 5]	e 33 27	PKKS	—
Lwow	103.1	319	e 14	3	+ 1	27 25	PS	18 19	PP	—
Kiruna	103.2	337	i 14	0	- 3	24 44	[+ 2]	i 25 18	SKKS	e 48.2
Athens	103.5	307	e 17	16	?	e 24 42	[- 2]	e 18 15	PP	—
Sofia	103.8	312	e 18	22	PP	e 27 42	PS	e 26 9	?	62.2
Uzhgorod	104.3	318	e 14	15	+ 7	25 26	{+ 1}	18 32	PP	—
Upsala	105.7	330	i 14	13	- 1	e 24 54	[ 0]	i 20 47	PPP	e 50.2
Belgrade	105.8	314	e 18	17k	[- 3]	e 33 6	SS	e 18 36	PP	e 62.4
Szeged	E. 105.9	316	e 16	58	?	24 52	[- 3]	18 33	PP	—
Budapest	106.5	317	e 14	10	- 7	24 55	[- 2]	e 27 59	PS	e 52.2
Raciborzu	106.8	320	e 14	26	+ 7	e 18 59	PP	e 22 24	?	43.3
Ogyalla	107.1	318	e 18	31	[+ 4]	e 26 20	0	e 34 4	SSP	—
Taranto	108.4	310	e 19	0	PP	28 30	PS	e 32 10	?	54.2
Prague	109.2	321	e 14	37	+ 8	e 25 43	{- 16}	i 19 10	PP	45.2
Copenhagen	109.3	327	e 18	55	PP	26 7	{+ 7}	i 29 35	PPS	—
Potsdam	109.6	323	e 14	30	- 1	e 26 4	{+ 2}	i 29 42	PPS	e 53.2
Reggio Calabria	109.8	308	e 18	57	PP	—	—	—	—	—
Messina	109.9	308	e 18	40	PP	e 25 17	[+ 5]	i 28 43	PS	e 44.4
Resolute Bay	110.4	10	e 14	36	P	i 28 45	PS	e 34 39	SS	—
Triest	110.4	316	i 19	15k	PP	e 29 40	PPS	e 41 30	P'PKS	53.7
Cheb	110.5	321	i 19	14	PP	e 25 21	[+ 7]	i 28 46	PS	—
Jena	110.9	322	e 14	36	P	e 25 3	[- 13]	e 19 18	PP	—
Bergen	111.5	332	e 34	58	SS	e 25 12	[- 6]	39 10?	SSS	e 52.4
Rome	111.7	312	i 19	18	PP	i 30 8	PPS	i 39 17	SSS	e 55.5
Seattle	z. 112.2	42	e 18	44	[+ 6]	—	—	19 22	PP	—
Bologna	112.3	315	e 19	29	PP	e 29 17	PS	—	—	—
Florence	112.4	314	e 18	19	[- 19]	i 29 2	PS	i 35 23	SS	54.2
Prato	112.5	314	e 18	30	[- 8]	i 29 8	PS	—	—	—
Stuttgart	112.8	319	e 14	46	P	e 25 28	[+ 4]	e 19 30	PP	e 57.2
Chur	113.0	317	e 18	50	[+ 11]	e 29 3	PS	—	—	—
Karlsruhe	113.3	320	e 19	34a	PP	e 29 4	PS	e 19 40	?	e 58.2
Witteveen	z. 113.3	325	e 19	40	PP	—	—	e 21 58	PPP	—
Shasta	113.4	49	e 18	46k	[+ 6]	e 37 3	SKKS <sub>2</sub>	e 19 38	PP	—
Pavia	113.6	316	e 19	34	PP	e 25 31	[+ 4]	e 30 18	PPS	—
Strasbourg	113.8	320	e 18	43	[+ 2]	e 29 4	PS	e 14 50	P	53.2
Berkeley	113.9	53	e 18	53	[+ 12]	e 25 24	[- 4]	e 19 37	PP	e 47.2

Continued on next page.

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		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.	
		°	°	m. s.	s.	m. s.	s.	m. s.	m.	
Mineral	z.	114.1	49	e 18 42k	[+ 1]	e 29 30	PKKP	e 19 38	PP	—
De Bilt		114.4	324	e 14 55	P	i 29 19	PS	i 19 44	PP	e 51.2
Oropa		114.4	316	e 19 13	?	e 28 53	PS	e 29 39	PKKP	e 45.4
Lick	z.	114.5	53	i 18 44k	[+ 2]	e 29 30	PKKP	e 19 43	PP	—
Scoresby Sund		114.7	348	e 18 43	[+ 1]	i 25 35	[+ 4]	i 29 19	PS	47.2
Besançon		115.3	319	e 18 44	[ 0]	—	—	—	—	—
Uccle		115.3	323	e 19 45	PP	e 25 39	[+ 6]	e 35 47	SS	e 54.2
Reno	z.	115.6	50	e 18 46k	[+ 2]	—	—	—	—	—
Fresno	z.	116.0	53	e 18 55	[+10]	—	—	—	—	—
Aberdeen		116.4	331	i 19 25	?	i 29 32	PS	i 19 50	PP	e 58.2
Woody	z.	116.9	54	i 18 50	[+ 3]	—	—	e 29 17	PKKP	—
Paris		117.1	321	e 18 50	[+ 3]	e 29 34	PS	e 36 6	SS	e 57.2
Durham		117.2	328	e 18 34	[-13]	19 45	?	i 20 2	PP	—
Tinemaha	z.	117.2	53	i 18 49	[+ 2]	—	—	—	—	—
Hungry Horse		117.4	40	i 18 47	[- 1]	—	—	i 20 4	PP	—
Chambou-la-Forêt		117.5	320	e 18 47	[- 1]	—	—	—	—	—
Edinburgh	E.	117.5	329	e 20 10	PP	25 39	[- 2]	36 6	SS	—
Clermont-Ferrand		117.6	317	e 19 57	PP	e 29 48	PS	e 36 34	SSP	57.2
Pasadena		117.7	56	i 18 49	[+ 1]	i 29 56	SKSP	e 29 15	PKKP	e 47.3
Kew		117.8	325	i 20 10	PP	e 31 7	PPS	e 22 51	PPP	e 42.2
Riverside	z.	118.4	56	e 18 50	[ 0]	e 29 11	PKKP	e 32 42	PKKS	—
Butte		119.1	41	i 18 52	[+ 1]	—	—	i 18 58	?	—
Reykjavik		119.6	344	e 20 24	PP	—	—	22 40	PPP	—
Tamanrasset	z.	119.6	292	e 18 53	[+ 1]	e 25 52	[+ 3]	e 36 34	SS	—
Algiers Univ.	z.	119.9	307	e 18 52	[- 1]	e 30 21	PS	i 20 19	PP	—
Boulder City		120.1	53	i 18 56	[+ 3]	—	—	i 19 7	?	—
Nelson		120.2	53	i 18 54	[+ 1]	—	—	—	—	—
Rathfarnham Castle		120.3	329	e 18 54	[+ 1]	e 26 0	[+ 9]	i 20 25	PP	e 48.2
Saskatoon		120.3	33	e 20 22	PP	e 25 58	[+ 7]	—	—	—
Tortosa		120.9	313	e 18 59	[+ 4]	—	—	i 20 30	PP	—
Alicante		122.3	311	18 56	[- 1]	25 56	[- 2]	20 34	PP	58.0
Tucson		124.1	57	e 19 3	[+ 2]	e 27 55	{+13}	e 30 45	PS	e 49.8
Almeria		124.2	310	i 19 1	[ 0]	26 11	[+ 7]	20 49	PP	64.5
Toledo		124.5	313	19 0	[- 1]	26 0	[- 4]	20 40	PKS	60.0
Granada		125.0	309	19 12k	[+10]	26 24	[+18]	30 54	PS	72.2
Malaga		125.7	309	i 19 6	[+ 2]	26 8	[ 0]	20 57	PP	63.1
Lubbock		131.0	52	e 19 16	[+ 2]	—	—	—	—	—
Kirkland Lake	z.	135.7	23	e 19 17	[- 6]	—	—	e 22 15	PP	—
Fayetteville	z.	135.8	45	i 19 12	[-11]	i 19 24	PKP	e 21 55	PP	—
La Plata		136.6	178	23 28	?	26 40	[+ 6]	32 46	SKSP	61.6
Chicago		136.8	35	e 23 4	PKS	—	—	—	—	—
Tacubaya		136.8	72	e 19 29	[+ 4]	e 26 42	[+ 8]	e 19 6	?	e 73.9
St. Louis		137.1	40	e 18 56	[-29]	i 23 14	PKS	—	—	—
Ottawa		139.6	22	e 19 22	[- 8]	23 4	PKS	i 19 31	PKP	—
Shawinigan Falls	n.	139.6	17	e 19 29	[- 1]	23 2	PKS	e 22 14	PP	—
Seven Falls	E.	139.7	15	e 19 36	[+ 6]	29 19	{ 0}	34 47	PPS	—
Vera Cruz		139.7	70	e 19 28	[- 2]	e 26 40	[+ 1]	e 23 40	?	—
Cleveland		140.3	30	e 19 36a	[+ 5]	e 23 10	SKP	e 22 29	PP	—
Angra do Heroismo		140.6	324	e 35 20	PcSP'	—	—	—	—	—
M'Bour		141.5	283	i 22 36	PP	e 23 20	SKP	e 38 0	SKKKS	—
Pittsburgh		141.8	30	e 19 37	[+ 3]	—	—	i 22 40	PP	—
Morgantown		142.4	31	i 19 30	[- 5]	—	—	e 22 43	PP	—
Halifax		143.6	8	e 19 35a	[- 2]	41 31	SS	22 50	PP	—
Harvard		143.6	19	e 19 34	[- 3]	e 29 36	[- 6]	e 35 34	PPS	—
Weston		143.8	19	i 19 36k	[- 1]	—	—	—	—	—
Palisades		144.1	23	e 19 32	[- 6]	29 47	{+ 2}	e 41 30	SS	e 74.0
Fordham		144.2	23	i 19 37	[- 1]	e 23 19	PKS	—	—	—
Washington		144.4	28	i 19 36	[- 2]	—	—	i 20 33	?	—
Columbia		145.8	38	i 19 43	[+ 2]	—	—	—	—	—
Huancayo		151.7	137	e 19 58	[+ 8]	e 30 32	{+ 4}	34 10	SKSP	—
La Paz		152.2	155	i 19 56k	[+ 5]	i 30 38	{+ 8}	i 23 46	PP	74.2
Bermuda		155.1	18	i 19 57	[+ 2]	e 43 41	SS	e 45 46	?	e 69.3
Chinchina		160.1	99	i 20 3	[+ 2]	e 31 10	[- 3]	i 20 53	PKP <sub>2</sub>	—
Bogota		161.5	101	e 20 6	[+ 2]	e 35 18	PSKS	e 24 40	PP	79.2
San Juan		166.2	44	i 20 14	[+ 7]	—	—	22 28	?	—
Fort de France		172.1	—	e 20 48	[+38]	—	—	i 29 58	PPP	—

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**1953**

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June 26d. 7h. 35m. Epicentre near 24°S. 177°E. Depth 500km. ca.  
Magnitude 5.5.  
Seismo. Bull. for New Zealand No. E.132 for April-June, 1953, Wellington, 1955.

June 26d. 12h. 2m. Epicentre 36°3N. 140°2E. Depth 60-70km.  
Intensity IV at Tukubasan and Kakioka; II-III at Utunomiya, Mito, Titibu, Kumagaya, Kashiwa, and Ajiro.  
Seismo. Bull. Cent. Met. Obs., Japan, for June, 1953, Tokyo, 1953, p. 21-22, with macro-seismic chart, p. 21.

June 26d. 23h. 45m. Epicentre 36°4N. 69°6E. Depth of focus 140km.  
Bulletin of Seismo. Stations of U.S.S.R. for 1953, April-June, Moscow 1954, p. 134.

June 27d. 6h. 41m. Epicentre 35°6N. 140°1E. Depth of focus 70km.  
Intensity II-III at Tokyo, Ajiro, and Kashiwa.  
Seismo. Bull. Cent. Met. Obs., Japan, for June, 1953, Tokyo, 1953, pp. 22-23, with macro-seismic chart.

June 27d. 7h. 43m. 11s. Epicentre 24°5S. 180° Depth of focus 0.090.  
(as on April 7d.).

		$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.	
		°	°	m.	s.	s.	m.	s.	s.	m.	s.
Auckland	N.	13.1	199	e 2	54	+ 5	e 5	21	+15	—	—
Karapiro	N.	13.9	195	e 2	58	+ 1	e 5	35	+15	—	—
Tuai	N.	14.5	189	3	4	+ 1	e 5	34	+ 4	—	—
New Plymouth	E.	15.4	196	i 3	17	+ 5	e 6	3	+17	—	—
Wellington		17.3	193	i 3	29 <sub>a</sub>	- 1	e 6	22	+ 4	—	—
Cobb River	E.	17.6	198	e 3	33	0	e 6	26	+ 2	—	—
Kaimata	N.E.	19.3	198	e 3	48	0	6	53	+ 1	—	—
Christchurch		19.9	195	e 3	56	+ 2	e 7	6	+ 4	e 8	6
Brisbane	N.	24.4	256	—	—	—	i 8	7	- 7	e 10	55
Riverview		26.8	242	i 4	50 <sub>a</sub>	- 5	i 8	47	- 4	i 14	41
Berkeley		82.4	43	e 21	0	ScS	e 20	57	+ 9	e 24	59
Lick	z.	82.4	43	i 11	21 <sub>k</sub>	0	—	—	—	—	—
Pasadena		82.7	48	i 11	22 <sub>k</sub>	0	—	—	—	—	—
Fresno	z.	83.2	45	i 11	25	0	—	—	—	—	—
Riverside	z.	83.2	48	i 11	25 <sub>k</sub>	0	—	—	—	—	—
Woody	z.	83.2	47	i 11	25 <sub>k</sub>	0	—	—	—	—	—
China Lake	z.	84.1	47	i 11	29 <sub>k</sub>	0	—	—	—	—	—
Shasta		84.1	40	e 11	28 <sub>k</sub>	- 1	e 21	13	+ 9	e 13	35
Mineral	z.	84.3	41	i 11	30 <sub>a</sub>	0	—	—	—	—	pP
Tinemaha		84.4	45	i 11	31 <sub>k</sub>	0	—	—	—	e 11	56
Reno	z.	84.9	42	e 11	33 <sub>k</sub>	0	—	—	—	—	—
Nelson		85.9	48	i 11	38	0	—	—	—	—	—
Boulder City		86.0	48	i 11	39	0	—	—	—	—	—
Tucson		86.8	52	i 11	44	+ 2	e 21	45	ScS	e 14	38
Seattle	z.	88.5	35	i 11	51	+ 1	—	—	—	—	—
Tacubaya		89.9	69	e 11	58	+ 1	—	—	—	i 12	7
Logan		91.2	44	i 12	3	0	—	—	—	e 15	49
College		92.5	13	i 12	3	- 6	—	—	—	—	PP
Hungry Horse		93.4	37	i 12	10	- 3	e 15	40	PP	i 29	15
Fayetteville	z.	100.8	55	i 12	46	0	—	—	—	—	PKKP
Ottawa		116.8	49	i 17	36 <sub>k</sub>	[- 1]	—	—	—	—	—
San Juan		118.7	81	i 17	41	[+ 1]	—	—	—	—	—
Harvard		119.4	53	e 17	39 <sub>a</sub>	[- 3]	—	—	—	i 17	42
Weston		119.5	53	i 17	43 <sub>a</sub>	[+ 1]	—	—	—	—	PKP
Quetta	z.	120.9	292	i 17	45	[ 0]	—	—	—	—	—
Scoresby Sund		132.3	10	i 18	6	[- 1]	i 20	41	SKP	—	—
Kiruna	z.	134.9	349	i 18	8	[- 4]	i 20	48	SKP	—	—
Upsala	z.	142.6	346	i 18	18	[- 9]	i 21	10	SKP	—	—
Ksara		147.4	294	i 18	34	[+ 1]	—	—	—	i 20	40
Copenhagen		147.5	346	i 18	34	[ 0]	—	—	—	—	pPKP

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		$\Delta$ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	Supp. m. s.	
Potsdam	z.	150.4	345	e 18 42	[+ 4]	—	—	—	—
Raciborzu		150.8	336	e 18 43k	[+ 4]	—	—	e 19 7	?
Witteveen	z.	151.3	353	e 18 40	[+ 1]	i 18 46	?	e 20 55	pPKP
Collmberg		151.4	343	e 18 38	[- 1]	i 18 54	PKP <sub>2</sub>	e 20 56	pPKP
Helwan	z.	151.7	287	e 18 39	[- 1]	e 19 1	PKP <sub>2</sub>	i 19 51	?
Jena		152.1	342	e 18 47	[+ 7]	e 18 59	PKP <sub>2</sub>	e 21 4	pPKP
Prague		152.1	340	e 18 41	[+ 1]	e 22 24	PKS	e 21 6	pPKP
De Bilt		152.2	353	e 18 40	[ 0]	—	—	e 20 51	pPKP
Karlsruhe	z.	154.7	347	e 18 43k	[- 1]	e 19 7	PKP <sub>2</sub>	e 21 11	pPKP
Stuttgart	z.	154.7	345	e 18 43	[- 1]	e 19 8	PKP <sub>2</sub>	e 20 49	pPKP
Strasbourg		155.2	348	e 18 43	[- 1]	e 19 10	PKP <sub>2</sub>	e 20 53	pPKP
Paris		155.6	355	e 18 44	[- 1]	i 19 13	PKP <sub>2</sub>	e 20 13	?
Triest	z.	156.1	335	e 18 44	[- 2]	e 19 13	PKP <sub>2</sub>	e 21 59	sPKP
Chambon-la-Forêt		156.5	356	i 18 43	[- 3]	i 18 54	?	i 19 13	PKP <sub>2</sub>
Besançon		156.8	350	e 18 46	[- 1]	—	—	—	—
Clermont-Ferrand		158.6	353	e 18 49	[ 0]	—	—	e 19 27	PKP <sub>2</sub>
Granada		167.0	12	20 5k	PKP <sub>2</sub>	—	—	23 52	PP
Tamanrasset	z.	174.7	—	i 19 3	[+ 2]	30 34	SKKS	i 20 38	pPKP

June 27d. 9h. 47m. 57s. Epicentre 4°·5S. 153°·3E. (as on April 23d.).

		$\Delta$ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	Supp. m. s.	L. m.
Brisbane	N.	22.9	182	i 5 4	- 2	i 9 13	0	i 5 47	PPP
Riverview		29.2	184	i 6 18k	+13	e 10 52	- 6	—	e 14.4
Baguio		38.4	303	i 7 24k	- 1	i 13 21	+ 1	—	—
Zô-Sè	z.	46.8	322	e 8 31	- 2	—	—	—	—
Nanking		49.0	320	e 8 48	- 2	—	—	—	—
College		81.4	21	i 12 20	0	—	—	—	—
Shasta	z.	88.6	49	e 12 49	- 7	e 13 0	PcP	e 16 32	PP
Lick	z.	88.8	52	e 12 47a	-10	—	—	e 13 4	PcP
Quetta	z.	89.0	300	i 12 56	- 2	—	—	—	—
Mineral	z.	89.2	50	e 13 1a	+ 2	—	—	—	—
Woody	z.	90.8	54	e 13 8	+ 2	—	—	—	—
Pasadena		91.3	56	e 13 11	+ 2	—	—	—	e 43.4
Tinemaha	z.	91.4	53	e 13 14	+ 5	—	—	—	—
China Lake	z.	91.9	54	e 13 15	+ 4	—	—	e 13 36	?
Riverside	z.	91.9	56	e 13 14	+ 3	—	—	—	—
Boulder City		94.1	55	i 13 25	+ 3	—	—	—	—
Nelson		94.1	55	i 13 47	+25	—	—	—	—
Hungry Horse		95.1	42	i 13 28	+ 2	—	—	—	—
Kiruna		109.2	343	i 18 31	[ 0]	—	—	—	e 55.0
Scoresby Sund		114.0	358	—	—	e 29 3	PS	—	56.0
Upsala	z.	115.3	337	i 18 43	[- 1]	—	—	—	—
Ottawa		121.1	38	i 18 56k	[+ 1]	—	—	—	—
Collmberg		122.8	331	e 18 57	[- 1]	—	—	e 19 15	?
Jena	z.	123.8	332	e 19 0	[ 0]	—	—	—	—
Palisades		124.3	41	e 19 2	[+ 1]	—	—	—	e 58.4
Witteveen	z.	124.6	338	e 19 3	[+ 1]	—	—	—	—
Harvard		125.1	39	i 19 5k	[+ 2]	—	—	—	—
Weston		125.3	39	i 19 1a	[- 2]	—	—	—	—
Stuttgart		126.4	332	e 19 5	[ 0]	—	—	e 19 23	?
Strasbourg		127.2	332	e 19 6	[- 1]	—	—	—	e 65.0
Besançon		128.9	332	e 19 11	[+ 1]	—	—	—	—
Paris		129.3	335	e 19 6	[- 5]	—	—	—	e 72.0
Chambon-la-Forêt		130.0	335	e 19 6	[- 6]	—	—	e 19 9	PKP
Alicante		138.7	329	19 28	[ 0]	26 36	[- 1]	22 22	PP
Granada		141.2	331	19 45k	[+12]	23 6	PKS	—	65.7
Tamanrasset	z.	143.9	304	i 19 34	[- 3]	—	—	e 19 42	?
Fort de France		144.6	71	e 19 41	[+ 3]	—	—	—	—
Averroes		146.2	330	i 19 44	[+ 3]	—	—	—	—



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June 28d. 5h. 37m. 5s. Epicentre 30°·8N. 141°·4E. (as on 16d.).

Intensity II-III at Torisima.  
Epicentre 31°·4N. 142°·1E. Depth of focus 40km.  
Seismo. Bull. Cent. Met. Obs., Japan, for June, 1953, Tokyo, 1953, pp. 23-24.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Torisima		1·1	252	0 31	+ 9	0 52	+13	—	—
Hatidyosima		2·7	330	e 1 4	+10 <sub>g</sub>	—	—	—	—
Mera		4·3	343	e 1 14	- 2*	—	—	—	—
Osima		4·3	337	e 1 13	- 3*	2 9	- 3*	—	—
Omaesaki	z.	4·6	326	e 1 26	+ 4*	2 45	+13 <sub>g</sub>	—	—
Ajiro		4·7	336	e 1 19	- 4*	—	—	—	—
Misima	N.	4·8	335	e 1 19	+ 4	2 14	+ 2	—	—
Tyosi	N.	4·9	355	e 1 21	+ 4	—	—	—	—
Yokohama		4·9	343	1 13	- 4	—	—	—	—
Hamamatu		5·0	323	e 2 0	S	(e 2 0)	-18	—	—
Tokyo		5·1	344	e 1 21	+ 1	2 20	0	—	—
Hunatu		5·2	335	e 1 26	+ 5	—	—	—	—
Kohu	E.	5·4	334	e 1 29	+ 5	2 33	+ 5	—	—
Kakioka		5·5	350	e 1 26	+ 1	2 28	- 2	—	—
Titibu		5·5	340	i 1 29	+ 4	2 32	+ 2	—	—
Kumagaya		5·6	343	e 1 29	+ 2	2 26	- 7	—	—
Mito		5·6	352	e 1 33	+ 6	2 31	- 2	—	—
Nagoya	E.	5·7	321	e 1 43	+ 3*	2 50	- 3*	—	—
Kameyama		5·8	316	e 1 37	- 5*	—	—	—	—
Maebasi	z.	5·9	342	e 1 34	+ 3	2 48	+ 8	—	—
Utunomiya	N.	5·9	348	e 1 28	- 3	2 36	- 4	—	—
Gihu		6·0	321	e 1 39	- 6*	2 56	- 6*	—	—
Oiwake		6·0	338	e 1 39	- 6*	2 45	+ 2	—	—
Matumoto	E.	6·1	333	1 41	- 6*	2 53	+ 8	—	—
Hikone		6·2	317	e 1 45	- 4*	—	—	—	—
Kyoto		6·3	313	e 1 59	- 7 <sub>g</sub>	3 31	+ 3 <sub>g</sub>	—	—
Matusiro		6·3	336	1 39 <sub>a</sub>	+ 3	3 12	+ 1*	—	—
Osaka		6·3	309	e 2 0	- 6 <sub>g</sub>	—	—	—	—
Nagano	N.	6·4	337	e 1 54	+ 2*	3 6	- 8*	—	—
Shirakawa		6·4	351	e 1 38	0	2 45	- 8	—	—
Takayama	N.	6·4	328	1 41	+ 3	—	—	—	—
Kobe	K.	6·5	308	e 1 44	+ 5	—	—	—	—
Sumoto		6·5	305	1 48	- 6*	2 48	- 7	—	—
Muroto		6·6	294	e 1 54	- 2*	—	—	—	—
Hukui		6·8	322	e 2 9	- 7 <sub>g</sub>	—	—	—	—
Inawasiro	E.	6·8	351	e 2 12	- 4 <sub>g</sub>	—	—	—	—
Toyama		6·8	330	e 2 4	+ 5*	3 27	+ 1*	—	—
Hokusima		7·0	354	e 1 45	- 1	3 1	- 7	—	—
Kanazawa		7·0	327	e 1 59	- 3*	—	—	—	—
Takamatu		7·1	301	e 1 55	+ 7	—	—	—	—
Toyooka		7·3	312	e 1 57	+ 7	—	—	—	—
Niigata	N.	7·4	345	e 1 56	+ 4	3 16	- 2	—	—
Simidu		7·4	288	e 2 27	- 1 <sub>g</sub>	—	—	—	—
Yamagata		7·5	354	e 1 52	- 1	3 15	- 5	—	—
Wazima		7·6	332	e 2 0	+ 5	—	—	—	—
Aikawa		7·7	341	e 1 51	- 5	—	—	—	—
Matuyama		7·9	295	e 2 6	+ 7	—	—	—	—
Sakata		8·2	351	e 2 21	P*	—	—	—	—
Mizusawa		8·3	358	e 2 18	P*	3 27	-13	—	—
Hirosima		8·4	298	e 2 24	P*	—	—	—	—
Miyazaki		8·6	280	e 2 24	P*	4 12	- 7*	—	—
Morioka		8·9	359	e 2 11	- 1	3 42	-13	—	—
Akita	z.	9·0	353	e 2 16	+ 3	3 49	- 9	—	—
Kagosima		9·3	277	e 2 36	P*	—	—	—	—
Kumamoto		9·3	285	e 2 51	P <sub>g</sub>	—	—	—	—

Continued on next page.

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		$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.
		°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.
Aomori		10.0	357	e 3	3	P <sub>g</sub>	—	—	—	—	—	—
Urakawa		11.4	5	e 2	50	+ 3	4	43	-13	—	—	—
Sapporo		12.2	0	e 3	15	PPP	—	—	—	—	—	—
Zô-Sô	z.	17.3	277	4	13	+ 9	7	35	+19	i 4	32	PPP
Nanking		19.3	280	4	33?	+ 4	e 8	9	+ 7	i 4	54	PPP
Baguio		23.8	239	i 5	20	+ 5	e 9	57	+29	—	—	—
Hong Kong		25.7	258	e 4	55?	-38	—	—	—	—	—	—
College		54.4	29	e 9	27	- 4	e 17	2	- 7	(e 20	44)	SS
Quetta		62.9	291	i 10	31	+ 1	e 19	9	+ 9	—	—	e 20.7
Resolute Bay		68.6	14	e 11	4	- 3	e 20	4	- 5	—	—	—
Kiruna		72.3	340	i 11	29	0	i 20	52	0	i 14	11	PP
Shasta	z.	74.9	51	e 11	41k	- 3	e 21	49	PS	—	—	e 35.9
Mineral	z.	75.6	51	e 11	49k	+ 1	—	—	—	e 12	35	?
Berkeley		76.3	54	—	—	—	e 21	33	- 4	e 32	37	Q
Hungry Horse		76.4	41	i 11	51	- 2	—	—	—	—	—	e 35.3
Scoresby Sund		78.3	355	e 12	2	- 1	i 21	59	0	e 22	43	PS
Butte		78.5	43	i 12	3	- 1	—	—	—	—	—	37.9
Upsala		78.6	335	i 12	5	0	e 21	58	- 4	i 12	18	PcP
Tinemaha	z.	79.5	53	e 12	8	- 2	—	—	—	—	—	—
Woody	z.	79.8	54	e 12	9	- 3	—	—	—	—	—	—
China Lake	z.	80.6	53	e 12	13	- 3	—	—	—	—	—	—
Pasadena		81.0	55	e 12	42	+24	—	—	—	—	—	e 40.7
Mount Wilson	z.	81.1	55	e 12	17	- 1	—	—	—	—	—	—
Logan		81.3	46	e 12	18	- 2	—	—	—	—	—	—
Riverside	z.	81.7	55	e 12	51	+29	—	—	—	—	—	—
Boulder City		82.4	52	i 12	23	- 2	—	—	—	—	—	—
Nelson		82.6	52	i 12	23	- 3	—	—	—	—	—	—
Copenhagen		83.5	334	e 12	32	+ 1	e 22	54	+ 2	—	—	39.9
Ksara		84.8	306	i 12	16	-21	22	4	-61	—	—	—
Istanbul		85.1	315	12	44	+ 5	e 22	55?	[- 6]	—	—	—
Raciborzu		85.1	328	e 12	32?	- 7	e 23	13	+ 5	e 16	16	PP
Potsdam		85.7	331	e 12	42	0	i 23	17	+ 3	—	—	e 44.9
Collmberg		86.5	340	e 12	46	0	—	—	—	—	—	—
Ogyalla		86.6	326	e 13	4	+18	e 23	30	+ 7	e 24	11	PS
Prague		86.8	329	e 12	49	+ 2	i 23	26	+ 1	e 16	15	PP
Tucson		87.2	54	e 12	47	- 2	—	—	—	—	—	e 42.0
Jena		87.4	331	e 12	50	0	e 13	3	?	e 16	0	PP
Cheb		87.7	330	e 16	33	PP	i 23	37	+ 4	e 24	21	PS
De Bilt		89.0	335	—	—	—	e 23	47	+ 2	—	—	e 46.9
Stuttgart		90.0	331	e 13	3	0	e 23	55	+ 1	e 16	35	PP
Helwan	z.	90.2	305	e 13	6	+ 2	—	—	—	e 13	17	?
Karlsruhe	z.	90.2	331	e 13	3	- 1	—	—	—	e 13	18	?
Uccle		90.3	335	—	—	—	e 23	35	[ 0]	e 23	55	S
Strasbourg		90.8	331	e 13	7	+ 1	e 24	5	+ 3	e 30	7	SS
Kew		91.4	337	e 13	44	+35	e 24	16	+ 9	—	—	e 42.9
Taranto		92.2	321	—	—	—	e 24	10	- 4	—	—	49.9
Besançon		92.6	331	e 13	14	- 1	—	—	—	—	—	—
Paris		92.7	334	e 13	15	0	e 23	47	[- 1]	e 16	55	PP
Pavia		92.8	328	—	—	—	e 24	29	+10	—	—	e 39.8
Oropa		93.0	329	e 16	59	PP	—	—	—	—	—	—
Chambon-la-Forêt		93.4	334	e 13	17	- 1	—	—	—	—	—	—
Rome		93.7	324	i 17	8	PP	e 26	31	PPS	e 30	57	SS
Messina		94.8	320	e 17	16	PP	e 27	56	?	—	—	e 47.4
Clermont-Ferrand		94.9	332	—	—	—	e 24	42	+ 5	—	—	—
Fayetteville	z.	95.5	42	i 13	25	- 3	—	—	—	i 13	47	?
Alicante		102.6	330	14	0	0	e 25	45	+ 3	18	16	PP
Tamanrasset	z.	112.0	316	19	13	?	—	—	—	i 19	27	PP
La Paz	z.	149.5	68	i 19	59	PKP <sub>2</sub>	—	—	—	e 23	33	PP

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June 28d. 14h. 43m. 6s. Epicentre 36°·0N. 137°·6E. Depth of focus 0·040.  
(as on 1952, September 2d.).

Intensity IV at Tokyo, Utunomiya, and Miyako ; II-III at Ajiro, Tukubasan, Shirakawa, Hukusima, Onahama, Kusiro, and Kashiwa.  
Epicentre 36°·1N. 137°·3E. Depth of focus 250km.  
Seismo. Bull. Cent. Met. Obs., Japan, for June, 1953, Tokyo, 1953, p. 25, with macro-seismic chart.

A = -·5988, B = +·5468, C = +·5852 ;  $\delta = +1$  ;  $h = 0$  ;  
D = +·674, E = +·738 ; G = -·432, H = +·395, K = -·811.

		$\Delta$ °	Az. °	P.		O - C.		S.		O - C.		Supp.	
				m.	s.	s.	m.	s.	s.	m.	s.		
Takayama	N.	0·3	298	e 0	35	-	2	1	1	-	5	—	—
Matumoto	N.	0·4	52		0 36	-	1	1	4	-	2	—	—
Iida		0·5	159	e 0	36	-	1	1	2	-	4	—	—
Matusiro	E.	0·7	42		0 36	-	2	1	4	-	4	—	—
Toyama	Z.	0·7	335		0 36	-	2	1	3	-	5	—	—
Nagano		0·8	336	i 0	38 <sup>a</sup>		0	1	6	-	2	—	—
Oiwake		0·8	67	e 0	39	+	1	1	10	+	2	—	—
Gihu		0·9	228	e 0	38	-	1	1	5	-	4	—	—
Kanazawa		0·9	305	e 0	37 <sup>k</sup>	-	2	1	4	-	5	—	—
Kohu	E.	0·9	115	e 0	39		0	1	10	+	1	—	—
Nagoya	N.	1·0	212		0 38 <sup>k</sup>	-	1	1	6	-	4	—	—
Hukui		1·1	273	i 0	36 <sup>k</sup>	-	4	1	3	-	8	—	—
Hunatu	N.	1·1	118		0 41	+	1	1	11		0	—	—
Maebasi		1·2	71	e 0	40		0	1	10	-	2	—	—
Shizuoka		1·2	148		0 41 <sup>k</sup>	+	1	1	12		0	—	—
Takada		1·2	25		0 40		0	1	10	-	2	—	—
Titibu		1·2	91	i 0	42	+	2	1	12		0	—	—
Hamamatu		1·3	176	e 0	40	-	1	1	11	-	2	—	—
Hikone		1·3	236		0 38 <sup>k</sup>	-	3	1	5	-	8	—	—
Tsuruga		1·3	254	i 0	37 <sup>k</sup>	-	4	1	5	-	8	—	—
Misima		1·4	129	i 0	43 <sup>k</sup>	+	1	1	16	+	2	—	—
Kameyama		1·5	219	i 0	40 <sup>k</sup>	-	2	1	11	-	4	—	—
Kumagaya	Z.	1·5	84		0 45	+	3	1	15		0	—	—
Omaesaki		1·5	160		0 43	+	1	1	16	+	1	—	—
Tu		1·5	215	i 0	40	-	2	1	12	-	3	—	—
Wazima	Z.	1·5	338	e 0	40	-	2	1	8	-	7	—	—
Ajiro		1·6	128		0 44 <sup>k</sup>	+	1	1	18	+	2	—	—
Kyoto		1·8	237	e 0	44		0	1	14	-	5	—	—
Maizuru		1·8	253	i 0	40 <sup>k</sup>	-	4	1	10	-	9	—	—
Tokyo	Z.	1·8	100	i 0	45	+	1	1	19		0	—	—
Yokohama		1·8	109		0 44		0	1	20	+	1	—	—
Osima		1·9	130	e 0	46	+	1	1	22	+	2	—	—
Utunomiya	E.	1·9	73	e 0	46	+	1	1	19	-	1	—	—
Tukubasan		2·0	84	e 0	45	-	1	1	19	-	3	—	—
Aikawa		2·1	14	i 0	45	-	2	1	19	-	4	—	—
Kakioka		2·1	84	e 0	47		0	1	20	-	3	—	—
Mera		2·1	121	e 0	49	+	2	1	25	+	2	—	—
Osaka		2·1	231	e 0	46	-	1	1	20	-	3	—	—
Mito	N.	2·3	81		0 50 <sup>k</sup>	+	2	1	26		0	—	—
Owase		2·3	211	e 0	46	-	2	1	21	-	5	—	—
Toyooka		2·3	258	i 0	45 <sup>k</sup>	-	3	1	19	-	7	—	—
Kobe		2·4	236	e 0	46	-	3	1	22	-	6	—	—
Shirakawa		2·4	62	e 0	51	+	2	1	26	-	2	—	—
Inawasiro	E.	2·6	52	c 0	53	+	2	1	30	-	1	—	—
Tyosi	N.	2·7	96		0 53	+	1	1	43	+	10	—	—
Onahama		2·8	71	e 0	54	+	1	1	33	-	2	—	—
Sumoto		2·8	233	i 0	50	-	3	1	29	-	6	—	—
Hukusima		2·9	53	i 0	56 <sup>a</sup>	+	2	1	35	-	1	—	—
Siomisaki		3·0	210		0 54 <sup>a</sup>	-	1	1	36	-	2	—	—
Yamagata		3·1	44		0 56		0	1	39	-	1	—	—
Hatidyosima		3·4	147	e 1	11	+	12	1	49	+	3	—	—
Sakata		3·4	31	i 1	1	+	2	1	48	+	2	—	—
Takamatu		3·4	241	i 0	56 <sup>k</sup>	-	3	1	38	-	8	—	—
Saigo		3·5	275	i 0	55	-	5	1	36	-	12	—	—
Sendai		3·5	48	e 0	59	-	1	1	44	-	4	—	—

Continued on next page.

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		$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		
		°	°	m.	s.	s.	m.	s.	s.	m.	s.	
Matsue		3.7	263	1	0	-3	1	46	-6	—	—	
Isinomaki		3.8	50	e 1	2	-2	1	48	-6	—	—	
Muroto		3.9	227	i 1	2 <sub>a</sub>	-3	1	51	-5	—	—	
Koti		4.1	235	e 1	5	-2	1	54	-6	—	—	
Akita	z.	4.2	27	i 1	9 <sub>a</sub>	+1	2	1	-1	—	—	
Mizusawa	N.	4.2	41	1	9	+1	2	0	-2	—	—	
Hirosima	z.	4.5	251	i 1	8	-4	2	7	-1	—	—	
Matuyama		4.5	243	i 1	8	-4	1	58	-10	—	—	
Hamada		4.6	258	i 1	10 <sub>k</sub>	-3	2	3	-7	—	—	
Morioka		4.6	36	i 1	13 <sub>a</sub>	0	2	7	-3	—	—	
Miyako		5.0	42	i 1	18	0	2	14	-4	—	—	
Simidu		5.0	231	e 1	15	-3	2	14	-4	—	—	
Aomori		5.4	26	i 1	25	+3	2	30	+3	—	—	
Hatinohe		5.5	33	i 1	23 <sub>a</sub>	-1	2	24	-5	—	—	
Ooita		5.6	243	e 1	26	+1	2	7	-24	—	—	
Simonoseki		5.8	252	2	19	S	(2	19)	-16	—	—	
Hukuoka		6.4	250	e 1	32 <sub>k</sub>	-2	2	47	-1	—	—	
Kumamoto		6.5	243	e 2	0	+24	—	—	—	—	—	
Miyazaki		6.5	233	e 1	37	+1	2	47	-4	—	—	
Saga		6.6	248	e 2	50	S	(e 2	50)	-3	—	—	
Tomakomai		7.2	24	i 1	45 <sub>a</sub>	+1	3	8	+2	—	—	
Kagosima		7.3	235	1	46	0	3	9	+1	—	—	
Urakawa	N.	7.3	32	i 1	45	-1	3	4	-4	—	—	
Sapporo		7.6	21	i 1	48 <sub>a</sub>	-1	3	13	-2	—	—	
Obihiro		8.2	30	e 2	7	+10	3	23	-5	—	—	
Kusiro	E.	8.7	35	i 2	1	-2	3	32	-8	—	—	
Abashiri		9.5	31	e 2	12	-1	—	—	—	—	—	
Nemuro		9.6	38	e 2	12	-2	3	50	-10	—	—	
Bagnio		24.7	222	i 4	57	0	—	—	—	—	—	
College		51.6	31	e 8	42	+3	—	—	—	—	—	
Kiruna		66.4	338	i 10	20	0	e 18	47	+1	e 20	33	sS
Upsala	z.	72.5	333	i 10	58	+1	—	—	—	i 12	4	pP
Shasta	z.	74.2	51	e 11	10 <sub>k</sub>	+3	e 11	18	?	e 12	10	pP
Hungry Horse		74.6	41	11	14	+5	—	—	—	—	—	—
Butte		76.8	42	i 11	26	+4	—	—	—	—	—	—
Tincmaha	z.	78.9	52	e 12	37	pP	—	—	—	—	—	—
Woody	z.	79.3	53	i 12	38	pP	—	—	—	—	—	—
Logan		79.9	45	e 11	44	+6	—	—	—	—	—	—
China Lake	z.	80.1	52	e 12	44	pP	—	—	—	—	—	—
Collmberg	z.	80.4	328	e 11	43	+2	—	—	—	e 12	44	pP
Riverside	z.	81.3	54	e 12	49	pP	—	—	—	—	—	—
Boulder City		81.7	51	i 11	53?	+5	—	—	—	—	—	—
Nelson		81.9	51	i 11	33	-16	—	—	—	i 12	2	PcP
Stuttgart		83.9	329	e 12	0	+1	—	—	—	e 13	3	pP
Fayetteville	z.	93.6	39	i 12	48	+3	—	—	—	e 13	54	pP
Ottawa		93.6	23	i 12	47 <sub>k</sub>	+2	—	—	—	—	—	—

June 29d. 3h. 27m. 44s. Epicentre 6°·7N. 82°·5W. (as on 1953, January 29d.).

$\Delta = +.1296$ ,  $B = -.9848$ ,  $C = +.1159$ ;  $\delta = +6$ ;  $h = +7$ ;  
 $D = -.991$ ,  $E = -.131$ ;  $G = +.015$ ,  $H = -.115$ ,  $K = -.993$ .

		$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.
		°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.
Balboa Heights		3.7	52	e 0	55	-5	e 1	43	-2	—	—	—
Chinchina		7.1	104	e 1	47	-1	e 3	5	-5	—	—	—
Bogota		8.6	104	i 2	12	+3	i 3	44	-4	i 4	12	SS
Puebla		19.6	311	e 4	49	PPP	—	—	—	e 5	19	?
San Juan		19.8	51	i 4	31	-4	—	—	—	i 4	47	PP
Huancayo		20.0	159	i 4	37	0	i 8	24	+7	e 4	57	PP
Tacubaya		20.6	310	e 4	32	-11	e 8	49	SS	e 4	49	PP
Fort de France		22.4	68	e 5	4	+2	i 9	16	+12	—	—	e 9.2
La Paz		27.1	147	i 5	46	0	i 10	44	+20	i 6	39	PP
Columbia		27.2	3	e 5	57	+10	—	—	—	—	—	13.4

Continued on next page.

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		$\Delta$ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	Supp. m. s.	L. m.	
Bermuda		30.5	30	e 6 16	- 1	e 11 30	+12	e 12 44	Q	e 14.5
Fayetteville	z.	31.2	343	i 6 20	- 3	—	—	—	—	—
St. Louis		32.6	349	i 6 30	- 5	e 11 48	- 3	—	—	—
Cleveland		34.7	2	e 6 59	+ 5	e 12 27	+ 3	e 14 57	SS	—
Palisades		35.0	13	e 7 3	+ 7	—	—	—	—	e 16.6
Tucson		36.6	318	e 7 9	- 1	e 12 58	+ 5	e 8 34	PP	e 15.7
Weston		36.9	15	e 6 12	-60	—	—	—	—	e 27.4
Harvard		37.0	15	e 7 14	+ 1	—	—	—	—	e 15.8
Ottawa		39.0	8	e 7 26	- 4	—	—	—	—	—
Halifax		41.2	20	e 7 52	+ 4	14 4	+ 2	10 1	PcP	—
Kirkland Lake	z.	41.4	3	e 7 46	- 4	—	—	—	—	—
Nelson		41.4	320	7 46	- 4	—	—	—	—	—
Seven Falls	E.	41.5	13	—	—	e 14 11	+ 4	17 1	SS	18.5
Riverside	z.	42.1	315	e 7 58	+ 3	—	—	—	—	—
Pasadena		42.8	315	e 8 9	+ 8	(e 14 46)	+20	—	—	e 14.8
China Lake	z.	43.3	317	e 8 3	- 2	—	—	—	—	—
Tinemaha	z.	44.4	319	e 8 17	+ 3	—	—	—	—	—
Lick	z.	46.8	317	e 8 36 <sup>a</sup>	+ 3	—	—	e 8 48	?	—
Butte		47.0	332	e 9 31	+53	—	—	—	—	—
La Plata		47.4	151	15 40	?	15 28	- 4	19 28	SSS	25.4
Berkeley		47.5	317	—	—	e 15 45	+11	e 19 26	SS	e 22.4
Mineral	z.	48.4	320	e 8 53 <sup>k</sup>	+ 7	—	—	e 9 13	?	—
Hungry Horse		49.4	333	e 8 51	- 2	—	—	—	—	—
Resolute Bay		68.3	357	—	—	e 20 6	0	—	—	e 27.8
College		73.6	337	e 11 38	+ 1	—	—	—	—	—
Scoresby Sund		74.1	18	—	—	21 10	- 2	—	—	30.3
Malaga		76.5	54	i 11 54	0	—	—	—	—	37.6
Kew		79.9	39	—	—	e 27 16?	SS	—	—	—
Chambon-la-Forêt		81.6	43	e 12 24	+ 3	—	—	—	—	—
Paris		81.7	42	e 12 19	- 3	e 22 38	+ 4	e 21 0	?	e 37.3
Clermont-Ferrand		82.2	45	—	—	e 22 44	+ 5	e 23 40	PS	37.3
De Bilt		83.3	38	—	—	e 22 16?	-34	—	—	—
Strasbourg		85.2	42	e 12 35	- 4	e 23 8	- 1	e 28 34	SS	—
Tamanrasset	z.	85.6	68	e 12 43	+ 2	—	—	e 16 7	PP	—
Stuttgart		86.1	42	e 12 46	+ 2	e 23 16	- 2	e 12 52	PcP	—
Copenhagen		87.3	34	—	—	e 23 37	+ 8	—	—	39.3
Jena	z.	87.4	39	e 12 55	+ 5	—	—	e 13 5	?	—
Potsdam		88.1	37	e 13 4	+10	e 23 40	+ 3	—	—	e 42.3
Collnberg	z.	88.3	39	e 13 7	+12	—	—	—	—	—
Kiruna		88.7	23	e 12 53	- 4	e 23 16	[- 9]	e 29 16	SS	—
Rome		89.3	48	e 13 14	+15	e 23 34	[+ 5]	e 29 59	SS	e 38.3
Triest		89.6	44	—	—	e 23 54	+ 3	e 24 56	PS	—
Messina	E.	92.2	51	—	—	e 23 43	[- 3]	e 30 39	SS	—
Ksara		109.2	52	e 12 1	?	—	—	e 20 7	?	—

June 29d. 5h. 4m. Epicentre 37°·8N. 72°·0E. Depth of focus 110km.  
Bulletin of Seismo. Stations of U.S.S.R., 1953, April-June, Moscow, 1954, p. 134.

June 29d. 11h. 8m. Epicentre 39°43'N. 122°23'W.  
Intensity V at Orland; IV at Willows.  
L. M. Murphy and W. K. Cloud.  
United States Earthquakes, 1953, U.S.C.G.S., Serial 785, Washington, 1955, p. 17.

June 29d. 23h. 27m. Epicentre 29°·2N. 81°·0E. (Shillong).  
Annales de l'Institut de Physique du Globe de Strasbourg, Nouvelle Série, Tome XVIII,  
2e partie, Séismologie, 1953, Strasbourg, 1959, p. 59.

June 30d. 18h. 15m. Epicentre 39°·8N. 72°·1E.  
Bulletin of Seismo. Stations of U.S.S.R. for 1953, April-June, Moscow, 1954, p. 135.



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A digital hypocenter file of the ISS (Villaseñor and Engdahl, 2005) can be obtained from the USGS web site: <http://earthquake.usgs.gov/scitech/iss/>

These data are considered public domain and may be freely distributed or copied for non-profit purposes provided the previous references are quoted.

Villaseñor, A., and E.R. Engdahl, *A digital hypocenter catalog for the International Seismological Summary*, Seism. Res. Lett., vol. 76, no. 5, pp. 554-559, 2005.

Villaseñor, A., E.A. Bergman, T.M. Boyd, E.R. Engdahl, D.W. Frazier, M.M. Harden, J.L. Orth, R.L. Parkes, and K.M. Shedlock, *Toward a comprehensive catalog of global historical seismicity*, Eos Trans. AGU, vol. 78, no. 50, pp. 581, 583, 588, 1997.