

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. 1950 July, August, September.

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

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

The third quarter for 1950 contains 279 epicentres, 215 of which are repetitions from previously adopted epicentres.

Cases of deep focus are noted below :—

July	5d.	8h.	42.5N.	144.4E.	0.010
	9d.	4h.	8.2S.	71.0W.	0.100
	9d.	4h.	8.2S.	71.0W.	0.100
	9d.	9h.	8.2S.	71.0W.	0.100
	9d.	16h.	36.7N.	70.5E.	0.030
	10d	13h.	20.5S.	179.0W.	0.080
	12d	11h.	37.3N.	141.3E.	0.005
	12d	11h.	20.0S.	175.0W.	0.005
	12d.	17h.	37.7N.	141.8E.	0.015
	12d.	18h.	17.0N.	93.9W.	0.030
	12d.	21h.	45.6N.	144.4E.	0.040
	13d.	4h.	28.0N.	139.6E.	0.080
	17d.	20h.	22.0S.	171.7E.	Suggested Deep.
	17d.	21h.	29.5S.	71.5W.	0.005
	20d.	0h.	Undetermined shock.		Probably Deep.
	20d.	3h.	26.0S.	70.2W.	0.015
	21d.	4h.	39.9S.	174.2E.	0.025
	21d.	8h.	8.2S.	71.0W.	0.100
	27d.	17h.	17.8S.	178.8W.	0.080
	29d.	16h.	2.2N.	126.9E.	0.010
	29d.	23h.	6.5S.	155.0E.	0.010

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Aug.	3d. 6h.	18·1N.	99·9W.	0·010
	3d. 15h.	39·9N.	142·4E.	0·010
	7d. 2h.	6·2N.	125·6E.	0·015
	7d. 10h.	41·6N.	45·3E.	Suggested Deep.
	8d. 2h.	18·5S.	178·0W.	0·070
	11d. 3h.	50·8N.	154·2E.	0·015
	14d. 22h.	28·0S.	63·5W.	0·090
	17d. 16h.	22·3S.	179·2W.	0·090
	17d. 23h.	33·9N.	139·6E.	0·010
	22d. 2h.	35·2N.	132·7E.	Suggested Deep.
	22d. 10h.	35·8N.	140·1E.	0·005
	24d. 6h.	31·0N.	138·5E.	0·040
	26d. 7h.	Undetermined shock		Suggested Deep.
	28d. 17h.	36·8N.	71·4E.	0·015
	31d. 7h.	5·5N.	126·0E.	0·010
Sept.	4d. 11h.	41·0N.	143·3E.	0·010
	4d. 14h.	41·9N.	143·6E.	0·010
	7d. 14h.	32·5S.	179·0W.	0·005
	8d. 6h.	21·0S.	178·0W.	0·080
	10d. 3h.	35·5N.	140·4E.	Suggested Deep.
	10d. 15h.	14·9S.	167·1E.	0·015
	14d. 7h.	19·3S.	63·8W.	0·090
	14d. 9h.	0·2N.	125·2E.	0·010
	14d. 9h.	0·2N.	125·2E.	0·010
	15d. 14h.	25·3S.	175·4W.	0·010
	15d. 19h.	15·4S.	174·6W.	0·030
	16d. 12h.	32·7N.	131·5E.	0·015
	16d. 21h.	52·0N.	177·1E.	0·010
	18d. 19h.	8·2S.	71·0W.	0·090
	20d. 0h.	Undetermined shock.		Suggested Deep.
	20d. 3h.	15·0N.	93·8W.	0·020
	22d. 1h.	47·7N.	153·0E.	0·020
22d. 23h.	17·6S.	177·1W.	0·060	

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

KEW OBSERVATORY,  
Richmond,  
SURREY.

June, 1958



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## 1950 JULY, AUGUST, SEPTEMBER.

July 1d. 0h.-1h. Undetermined shock.

Apia eP? = 48m.12s., eS = 49m.14s.  
 Brisbane iPZ = 58m.14s.  
 Kaimata NE = 59m.  
 Lick iPZ = 67m.27s., iZ = 67m.38s.  
 Shasta Dam eP = 67m.32s.  
 Mount Wilson ePZ = 67m.32s., epP?Z = 67m.43s.  
 Riverside ePZ = 67m.33s., epP?Z = 67m.44s.  
 Mineral ePZ = 67m.34s., eZ = 67m.44s.  
 Palomar iPZ = 67m.35s., ipP?Z = 67m.46s.  
 Tinemaha iPZ = 67m.37s.  
 China Lake iPZ = 67m.38s., ipP?Z = 67m.48s.  
 Boulder City eP = 67m.47s.  
 Overton ePZ = 67m.49s.  
 Pierce Ferry eP = 67m.50s.  
 Tucson eP = 67m.54s.  
 Collmberg eZ = 74m.12s., 74m.22s., and 74m.28s.  
 Jena ePKP?EN = 74m.15s., eE = 74m.26s.  
 Basle i = 74m.20s.  
 Stuttgart ePKP?Z = 74m.20s., eZ = 74m.34s.  
 Trieste i = 74m.23s.  
 Strasbourg iPKP = 74m.25s., i = 74m.36s., e = 74m.49s.  
 Zürich i = 74m.26s., e = 74m.37s.  
 Paris iPKP = 74m.29s., ipPKP? = 74m.39s.  
 Besançon ePKP = 74m.30s., e = 74m.41s.  
 Algiers Univ. ePKPZ = 74m.41s.  
 Tamanrasset ePKPZ = 74m.43s., ePKP<sub>2</sub>Z = 75m.47s.  
 Clermont-Ferrand e = 82m.31s. and 82m.48s.  
 Long waves were recorded at Scoresby Sund.

July 1d. 12h. 19m. 43s. Epicentre 37°·0N. 2°·7W. (as on 1947, June 9d.).

Intensity VI at Gergal ; III at Almeria.

J. Rodriguez-Navarro and J. M. Bonelli.

El Terremoto de Gergal de I de Julio, 1950. Instituto Geografico y Catastral, Madrid, 1951, 34 pages 30 figs., and 2 separate macroseismic charts. Suggested epicentre 37°6'N. 2°33'W. Depth 11km.

$$A = +.7997, B = -.0377, C = +.5992; \quad \delta = -2; \quad h = -1;$$

$$D = -.047, E = -.999; \quad G = +.599, H = -.028, K = -.801.$$

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	
	°	°	m. s.	s.	m. s.	s.	m. s.	
Granada	0.7	284	0 16 <sub>a</sub>	- 1	1 0 31	+ 3	0 19	P <sub>g</sub>
Malaga	z. 1.4	259	1 0 28 <sub>k</sub>	+ 1	1 0 47	+ 1	0 34	P <sub>g</sub>
Alicante	2.2	53	0 43	P <sub>g</sub>	1 15	S <sub>g</sub>	—	—
Toledo	3.1	342	e 1 0	P <sub>g</sub>	1 1 37	S <sub>g</sub>	—	—
Tortosa	4.6	32	—	—	e 1 58	- 9	1 2 59	S <sub>g</sub>

Additional readings :—  
 Granada S = 34s. and 37s.  
 Malaga iPSZ = 54s.  
 Alicante P<sub>g</sub> = 47s.?

July 1d. 23h. 19m. 33s. Epicentre 46°·0N. 12°·2E. (as on 1946, December 25d.).

$$A = +.6814, B = +.1473, C = +.7170; \quad \delta = +9; \quad h = -4;$$

$$D = +.211, E = -.977; \quad G = +.701, H = +.152, K = -.697.$$

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Triest	1.1	108	1 0 22	0	1 0 37	- 2	1 0 25	P <sub>g</sub>
Chur	2.0	295	1 0 41 <sub>k</sub>	P <sub>g</sub>	e 1 11	S <sub>g</sub>	—	—
Ravensburg	2.5	315	e 0 58?	P <sub>g</sub>	e 1 27	S <sub>g</sub>	—	—
Zürich	2.8	299	e 0 51	P <sub>g</sub>	e 1 34	S <sub>g</sub>	—	—
Stuttgart	z. 3.4	325	e 0 59	+ 4	e 1 35	- 2	e 1 9	P <sub>g</sub>

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	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Basle	3.5	298	—	—	e 1 43	+ 3	e 2 0	S <sub>g</sub>
Strasbourg	4.0	313	—	—	e 2 14	S*	—	e 2.5
Prague	4.3	18	e 1 3	- 5	e 2 1	+ 1	e 1 26	P <sub>g</sub>
Besançon	4.5	288	—	—	e 2 30	S <sub>g</sub>	—	—
Jena	E. 4.9	356	—	—	e 2 11	- 4	e 2 42	S <sub>g</sub>
Collmberg	Z. 5.3	5	e 1 21	- 1	e 2 48	S*	e 2 52	S <sub>g</sub>

Additional readings :—

Triest iS<sub>g</sub> = 44s.

Ravensburg e = 1m.32s.

Zürich eP<sub>g</sub> = 55s.

Stuttgart eS = 1m.38s., eSZ = 1m.51s., e = 1m.54s., iS<sub>g</sub>Z = 1m.58s., iZ = 2m.3s.

Prague e = 1m.7s., 1m.15s., and 2m.4s.

Jena eS<sub>g</sub>?N = 2m.14s., eE = 2m.36s., eN = 2m.39s.

Collmberg eZ = 1m.24s.

July 1d. Readings also at 0h. (Overton and College), 3h. (near Prague (2), Triest, and Taranto), 6h. (Tamanrasset, Fort de France, Cleveland, Pennsylvania, Philadelphia, Washington, Palomar, Riverside, China Lake, Boulder City, Overton, Pierce Ferry (2), Hungry Horse, College, and near Tucson (2) ), 7h. (Harvard, Weston, Washington, and Scoresby Sund), 8h. (Mizusawa), 9h. (near Obi-garm), 10h. (Boulder City, Overton, College, near Prague, and near Przhvevsk), 11h. (near Obi-garm), 12h. (Stalinabad), 13h. (La Paz, Tamanrasset, Tucson, and Pierce Ferry), 14h. (Mount Wilson, Palomar, Riverside, China Lake, Tinemaha, Tucson, Overton, and Pierce Ferry), 17h. (Timisoara), 20h. (Pierce Ferry), 21h. (Frunse, Obi-garm, Stalinabad, Tashkent, near Almata, Andijan, Fergana, Naryn, and Przhvevsk), 22h. (Ashkabad, Fergana, Frunse, Kulyab, Obi-garm, near Almata, Andijan, and Przhvevsk), 23h. (Collmberg, Prague, Tacubaya, Overton, and Pierce Ferry).

July 2d. 22h. 49m. 25s. Epicentre 4°·2N. 73°·7W.

Felt strongly throughout Central and Southern Columbia. Epicentre suggested 4°N. 73°·5W. (U.S.C.G.S.).

Monthly Seismological Bulletin, Bogota, July, 1950, p.1.

$$A = +.2799, B = -.9573, C = +.0728; \quad \delta = +7; \quad h = +7;$$

$$D = -.960, E = -.281; \quad G = +.020, H = -.070, K = -.997.$$

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Bogota	0.5	319	i 0 11	- 3	i 0 19	- 4	—	—
Chinchina	2.1	292	i 0 37	0	i 1 3	- 1	—	—
Galerazamba	6.7	347	i 1 45	+ 3	i 3 10	+10	—	—
Balboa Heights	7.5	309	e 2 13	P*	—	—	—	—
San Juan	15.9	27	e 3 43	- 4	e 6 43	- 1	—	e 7.7
Roosevelt Roads	16.0	29	e 3 57	+ 9	—	—	—	—
Fort de France	16.2	49	e 3 49	- 1	e 7 8	+17	—	—
Huancayo	16.2	186	i 3 49	- 1	i 7 9	+18	i 4 25	PPP e 8.0
Swan Island	16.5	323	e 4 3	+ 9	e 7 27	+29	—	—
La Paz	21.3	164	i 4 51k	+ 1	i 8 52	+ 9	5 21	PP 11.2
Miami	22.5	346	i 4 56	- 6	i 9 23	+18	—	—
Bermuda	29.3	17	e 6 25	+19	e 10 30	-29	e 7 5	PP e 11.8
Columbia	30.4	349	—	—	e 11 17	+ 1	—	e 15.6
Washington	34.7	357	e 6 56	+ 2	—	—	—	e 26.8
Philadelphia	35.6	0	e 7 2	+ 1	e 12 36	- 2	—	e 15.8
City College	36.5	2	e 7 10	+ 1	e 13 0	+ 9	—	e 17.3
Fordham	36.5	2	e 7 14	+ 5	e 12 52	+ 1	—	e 17.4
Pennsylvania	36.6	356	i 7 13	+ 3	e 12 50	- 3	i 8 32	PP —
St. Louis	37.4	340	e 7 15	- 1	i 17 26	L	—	(i 17.4)
Cleveland	37.8	351	i 7 22	+ 2	e 13 11	0	e 8 51	PP e 17.0
Weston	38.1	4	e 7 21	- 1	e 13 11	- 5	e 8 46	PP —
Harvard	38.2	4	i 7 25	+ 2	e 13 33	+16	—	e 19.1
Lubbock	39.3	323	7 33	+ 1	—	—	—	—
Chicago	39.4	344	e 7 34	+ 1	e 12 46	-49	e 9 12	PP e 15.7
Ottawa	Z. 41.1	359	e 7 49	+ 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.
Seven Falls	E.	42.8	4	—	—	e 14 28	+ 2	—	—
Tucson		44.6	314	i 8 15	- 1	e 14 30	-22	—	e 17.1
Pierce Ferry		48.8	317	i 8 48	- 1	—	—	—	—
Boulder City		49.3	316	e 8 52	- 1	—	—	—	—
Overton	z.	49.3	317	i 8 52	- 1	e 16 7	+ 8	i 10 7	P <sub>c</sub> P
Riverside	z.	50.2	312	e 9 1	+ 1	—	—	—	—
Logan		50.5	324	e 9 3	+ 1	e 17 51	?	e 11 1	PP
Pasadena	z.	50.9	312	e 9 4	- 1	—	—	—	—
China Lake	z.	51.2	315	1 9 6	- 1	—	—	—	—
Tinemaha	z.	52.2	316	e 9 17	+ 2	—	—	—	—
Fresno	z.	53.2	315	e 9 21	- 1	—	—	—	—
Lick	z.	54.8	314	e 9 33 <sub>a</sub>	- 1	—	—	i 10 35	P <sub>c</sub> P
Berkeley		55.5	314	e 9 43 <sub>a</sub>	+ 4	e 20 46	SS	e 23 18	SSS
Hungry Horse		55.8	330	e 9 41	0	—	—	e 11 38	PP
Shasta Dam		56.8	318	e 9 55	+ 7	—	—	—	—
Seattle		60.0	325	e 11 1	P <sub>c</sub> P	—	—	e 12 17	PP
Victoria	z.	61.1	325	e 10 18	0	—	—	—	—
Granada		71.6	52	11 27 <sub>a</sub>	+ 2	20 41	- 3	14 20	PP
Rathfarnham Castle		73.3	35	e 11 30 <sub>?</sub>	- 5	e 21 37	+33	e 16 7	PPP
Alicante		74.2	51	11 56	+16	21 16	+ 2	14 36	PP
Tortosa		75.3	49	—	—	e 22 9	+43	—	—
Kew		76.4	38	e 11 52	- 1	—	—	—	e 33.6
Paris		77.8	42	i 11 56	- 5	—	—	e 33 54	Q
Clermont-Ferrand		77.8	44	e 12 0	- 1	e 21 54	+ 1	—	40.6
Tamanrasset	z.	78.5	67	i 12 6 <sub>k</sub>	+ 2	—	—	e 12 15	P <sub>c</sub> P
College		79.5	336	e 12 7	- 3	e 22 5	- 6	—	e 40.2
De Bilt		79.9	38	e 11 41	-31	e 22 5	-11	—	e 35.6
Strasbourg		81.2	42	e 12 20	+ 1	e 22 24	- 5	e 12 56	P <sub>c</sub> P
Stuttgart		82.2	42	e 12 22	- 2	e 22 35	- 4	e 28 5	SS
Copenhagen		84.4	35	—	—	22 56	- 5	24 13	PPS
Rome		84.4	49	e 12 37 <sub>a</sub>	+ 1	e 22 23	-38	e 15 53	PP
Collmberg	z.	84.7	40	e 12 37 <sub>?</sub>	0	—	—	—	—
Potsdam	z.	84.7	38	e 12 40	+ 3	—	—	—	43.6
Prague		85.6	40	e 12 44	+ 3	e 23 20	+ 7	e 15 53	PP
Taranto		88.0	50	—	—	e 24 35	PS	—	—
Warsaw		89.6	38	—	—	e 23 46	- 5	e 23 21	SKS
Istanbul		96.8	48	e 18 35 <sub>?</sub>	?	—	—	—	e 51.6

Additional readings :—

Galerazamba i = 1m.57s. and 3m.27s.  
 Fordham e = 12m.57s.  
 Cleveland eSS?E = 16m.3s.  
 Tucson i = 8m.51s., e = 14m.48s.  
 Pierce Ferry i = 9m.4s.  
 Overton iZ = 8m.57s. and 9m.28s., iPPZ = 11m.12s.  
 Pasadena eZ = 9m.31s.  
 China Lake eZ = 9m.32s.  
 Tinemaha eZ = 9m.34s.  
 Lick iZ = 10m.4s. and 10m.17s.  
 Berkeley eN = 26m.11s.  
 Granada PPP = 15m.55s., SS = 25m.52s.  
 Alicante PPP? = 16m.26s., SS = 25m.46s., SSS = 28m.46s., Q = 31m.0s.  
 Paris i = 12m.3s. and 12m.8s., e = 12m.59s.  
 Tamanrasset eZ = 12m.36s., ePPZ = 15m.6s.  
 Strasbourg e = 14m.21s., eS = 22m.27s.  
 Stuttgart e = 13m.46s.  
 Copenhagen 26m.8s. and 31m.59s.  
 Warsaw ePPS = 25m.28s.  
 Long waves were also recorded at Scoresby Sund and Malaga.

July 2d. Readings also at 0h. (Almata, Kulyab, Obi-garm, Stalinabad, Tashkent, near Andijan, Fergana, Naryn, and Przhevalsk), 2h. (near Messina), 5h. (Ksara, Nanking, and near Tacubaya), 6h. (Hungry Horse and College), 8h. (Istanbul, Almata, Frunse, Przhevalsk, Samarkand, near Andijan, Fergana, Kulyab, Naryn, Obi-garm, Stalinabad, and Tashkent), 9h. (Nanking, Andijan, Fergana, Frunse, Kulyab, Obi-garm, Przhevalsk, Samarkand, Stalinabad, Tashkent, and near Taranto), 10h. (College, Stuttgart (2), Paris, Tamanrasset, and near Prague (2)), 11h. (Pretoria), 12h. (near Istanbul), 13h. (Ksara, Collmberg, Tucson, Overton, and College), 14h. (near Fort de France), 16h. (near Obi-garm (2)), 18h. (Hungry Horse), 19h. (near Mizusawa), 20h. (Tamanrasset), 23h. (Boulder City and near Fort de France).

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July 3d. 2h. Undetermined shock.

Tuai eN = 2m.18s.  
 Kaimata eP?NE = 2m.57s.?  
 Brisbane ePZ = 3m.18s., eN = 3m.25s., iSN = 6m.43s.  
 Christchurch eP = 3m.27s., eSEN = 6m.15s.  
 Wellington eP = 2m.36s., i = 3m.46s., eL = 6.0m.  
 Riverview P?Z = 3m.54s., iSN = 7m.26s., eQN = 7.6m., ePZ = 8.5m.  
 Riverside ePZ = 12m.25s.  
 China Lake ePZ = 12m.29s.  
 College eP? = 12m.59s.  
 Collmberg eZ = 19m.15s. and 19m.23s.  
 Stuttgart eZ = 19m.17s.?, 19m.40s., and 19m.50s.  
 Tamanrasset ePKPZ = 19m.38s., ePKP<sub>2</sub>Z = 20m.33s., ePP?Z = 23m.57s.  
 Long waves were also recorded at Auckland.

July 3d. 10h. 3m. 34s. Epicentre 8°·5N. 141°·5E.

A = -·7741, B = +·6158, C = +·1468;  $\delta = -1$ ;  $h = +7$ ;  
 D = +·622, E = +·783; G = -·115, H = +·092, K = -·989.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Guam	5.9	32	1 32	+ 1	2 25	-15	—	—
Miyazaki	25.1	340	i 5 27 <sub>a</sub>	- 1	e 9 52	+ 1	i 6 0	PP 11.8
Siomisaki	25.4	350	e 5 30	- 1	e 10 2	+ 6	—	e 11.0
Muroto	25.5	346	5 36	+ 4	—	—	—	e 11.1
Owase	25.9	351	e 5 33	- 2	10 14	+10	—	11.0
Kōti	26.0	345	e 5 42	+ 6	e 10 10	+ 4	e 6 16	PP 11.2
Kumamoto	26.2	341	e 5 37	- 1	e 10 58	SS	—	e 13.8
Sumoto	26.4	349	i 5 40 <sub>k</sub>	0	10 16	+ 4	i 6 14	PP 12.1
Matuyama	26.5	344	5 38	- 3	e 10 18	+ 4	i 11 16	SS —
Kameyama	26.6	353	5 40	- 2	10 23	+ 7	—	11.9
Osaka	26.6	350	e 5 41	- 1	e 10 24	+ 8	e 6 19	PP —
Kobe	26.7	350	e 5 40	- 3	e 10 27	+10	e 6 27	PP e 11.9
Nagoya	26.9	354	e 5 40	- 5	e 10 53	+33	e 11 51	SSS e 13.0
Yokohama	26.9	358	5 46	+ 1	10 17	- 3	—	12.5
Hukuoka	27.0	340	e 5 40 <sub>k</sub>	- 5	e 10 3	-19	e 6 12	PP 12.3
Hunatu	27.0	356	i 5 45 <sub>k</sub>	0	—	—	—	14.9
Gihu	27.1	354	5 46	0	10 18	- 6	—	11.5
Hikone	27.1	353	e 5 47	+ 1	e 10 25	+ 1	—	—
Hirosima	27.1	344	e 6 41	PP	—	—	e 8 29	? e 11.5
Tokyo	27.1	358	e 5 48	+ 2	i 10 27	+ 3	e 6 49	PP e 11.8
Kumagaya	27.6	357	e 5 39	-12	—	—	—	e 11.4
Hamada	z.	27.7	343	5 48	- 4	e 10 31	- 2	—
Mito	27.8	358	e 5 51	- 2	10 32	- 3	—	—
Matusiro	28.1	356	e 5 51	- 4	e 10 34	- 6	e 6 41	PP 12.8
Nagano	28.2	356	e 5 57	+ 1	—	—	6 13	pP 16.2
Onahama	28.3	359	e 5 47	-10	e 10 53	+10	i 16 58	ScS —
Toyama	28.3	354	e 5 55	- 2	e 10 35	- 8	6 43	PP e 13.3
Hokusima	29.1	359	6 3	- 1	10 50	- 6	—	e 13.5
Sendai	29.6	0	e 6 7	- 2	e 11 15	+11	—	e 13.5
Akita	30.6	359	e 6 22	+ 4	e 11 45	+25	e 6 53	? e 15.8
Nanking	31.5	321	i 6 27	+ 1	(10 41)	-53	—	10.7
Hatinohe	31.9	0	6 26	- 3	11 44	+ 4	7 37	PP 14.6
Sapporo	34.4	0	i 6 50	- 1	e 12 18	- 1	e 15 26	Q e 16.9
Nemuro	34.9	6	e 6 55	0	—	—	—	16.0
Vladivostok	35.5	349	i 6 58	- 2	i 12 34	- 2	i 8 17	PP —
Bandong	E.	37.1	248	e 7 15	+ 1	e 13 0	- 1	—
Djakarta	37.5	249	i 7 16	- 1	e 12 55	-12	—	—
Brisbane	37.5	163	i 7 17	0	i 13 9	+ 2	i 8 42	PP —
Riverview	43.1	168	8 6	+ 2	i 14 34	+ 4	i 9 51	PP e 19.4
Perth	47.1	210	11 1	PPP	15 28	0	—	22.6
Apia	51.4	115	e 9 3	- 6	—	—	e 9 12	P e 25.4
Irkutsk	53.1	333	9 20	- 1	20 26	SS	—	—
Kaimata	N.E.	57.7	154	e 10 9	+14	—	—	—
Wellington	58.2	151	—	—	e 17 51	- 8	e 22 6	SS 24.1
Christchurch	59.0	154	i 10 10	+ 6	e 18 22	+12	22 11	SS e 29.4

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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.	
Honolulu	59.4	70	e 10 10	+ 4	e 18 11	- 4	e 21 40	SS	e 24.7
Colombo	61.1	273	10 20	+ 2	18 45	+ 8	—	—	30.6
Dehra Dun	62.9	300	e 10 20	-10	—	—	—	—	—
Kodaikanal	63.1	278	i 10 33	+ 1	i 19 3	+ 1	12 58	PP	29.0
New Delhi	63.4	298	e 10 37	+ 3	i 19 10	+ 4	23 5	SS	25.9
Przhevalsk	64.5	314	i 10 41	0	i 19 21	+ 2	—	—	—
Almata	65.8	315	i 10 47	- 2	—	—	—	—	—
Naryn	66.1	302	i 10 47	- 4	i 19 32	- 7	—	—	—
Poona	66.2	287	e 10 47	- 5	i 19 34	- 6	23 43	SS	30.9
Bombay	67.2	287	10 52	- 6	e 19 42	-10	13 17	PP	—
Frunse	67.4	313	e 10 57	- 2	—	—	—	—	—
Andijan	68.7	311	e 11 6	- 1	i 20 9	- 1	—	—	—
Fergana	69.1	310	i 11 7	- 3	e 20 13	- 2	—	—	—
Kulyab	70.4	308	i 11 14	- 4	e 20 26	- 4	—	—	—
Obi-garm	70.5	309	i 11 18	0	i 20 30	- 2	—	—	—
Tashkent	71.1	311	i 11 20	- 2	i 20 34	- 4	—	—	—
Stalinabad	71.2	309	i 11 21	- 2	i 20 38	- 2	—	—	—
Samarkand	72.7	309	e 11 30	- 2	e 20 54	- 3	—	—	—
College	74.2	25	e 11 39	- 1	i 21 11	- 3	e 14 28	PP	e 31.1
Mary	76.7	308	e 12 2	+ 7	—	—	—	—	—
Sverdlovsk	77.9	327	i 11 59	- 2	i 21 50	- 4	—	—	—
Sitka	79.2	34	e 12 10	+ 2	e 22 12	+ 4	e 27 16	SS	e 33.3
Ashkabad	79.4	307	12 12	+ 3	22 12	+ 2	—	—	—
Baku	85.8	311	e 12 45	+ 3	e 23 10	[+ 4]	e 23 20	SeS	—
Victoria	87.1	42	i 12 51k	+ 2	23 30	+ 2	25 0	PPS	—
Seattle	87.9	43	e 13 5k	+12	e 23 42	+ 7	e 24 36	PS	e 36.4
Grozny	88.4	314	e 12 56	+ 1	23 31	{+ 1}	—	—	—
Ukiah	88.8	51	e 13 10	+13	e 23 50	+ 6	—	—	e 36.3
Shasta Dam	89.1	49	i 13 3	+ 5	e 23 34	{- 1}	e 16 46	PP	—
Tiflis	89.4	312	—	—	23 42	- 7	—	—	—
Berkeley	89.7	52	i 13 2k	+ 1	e 23 52	0	e 16 39	PP	e 36.6
Branner	89.9	52	e 13 11a	+ 9	—	—	—	—	—
Santa Clara	90.1	52	—	—	e 24 27	?	e 35 29?	?	e 43.2
Leninakan	90.2	312	e 13 17	+13	—	—	—	—	—
Lick	90.3	52	e 13 8a	+ 4	—	—	—	—	—
Moscow	90.7	327	13 2	- 4	23 37	[ 0]	16 32	PP	—
Abastumanj	90.8	312	e 13 12	+ 6	e 23 48	{ 0}	—	—	—
Fresno	91.9	52	e 13 16	+ 5	—	—	e 16 56	PP	—
Tinemaha	93.0	52	e 13 21	+ 4	—	—	i 13 36	pP	—
Pulkovo	93.1	331	13 15	- 2	i 23 48	[- 3]	e 16 9	?	—
Hungry Horse	93.2	40	i 13 20	+ 3	e 23 55	[+ 4]	e 17 0	PP	—
Pasadena	93.7	54	i 13 23	+ 3	e 24 36	+ 9	e 13 37	pP	—
China Lake	93.8	52	i 13 23	+ 3	—	—	i 13 38	pP	—
Riverside	94.4	54	i 13 26	+ 3	—	—	i 13 41	pP	—
Butte	94.8	42	e 13 51	+26	e 24 16	{- 1}	—	—	e 42.7
Helsinki	95.4	334	—	—	e 24 3	[ 0]	e 25 58	PS	43.4
Boulder City	96.0	52	e 13 35	+ 5	—	—	—	—	—
Overton	96.1	51	i 13 35	+ 4	e 25 29	+41	—	—	—
Yalta	96.2	316	e 13 28	- 3	e 24 7	[- 1]	—	—	—
Saskatoon	96.4	35	—	—	e 24 54	+ 4	—	—	—
Logan	96.6	46	e 13 38	+ 5	e 24 52	0	e 17 35	PP	e 38.5
Pierce Ferry	96.6	52	i 13 37	+ 4	—	—	e 17 31	PP	—
Salt Lake City	96.9	47	e 13 9	-25	—	—	e 17 35	PP	42.1
Ksara	98.1	306	e 14 8?	+28	26 58	PS	17 46	PP	—
Upsala	98.7	335	e 14 52	?	e 24 13	[- 8]	e 19 46	PPP	e 45.4
Tucson	100.2	55	e 13 54	+ 5	e 23 57	[-31]	e 17 46	PP	i 40.6
Scoresby Sund	100.4	355	13 44	- 6	i 24 31	[+ 2]	i 24 57	SKKS	48.4
Istanbul	100.9	315	13 49?	- 3	24 32	[+ 1]	—	—	—
Warsaw	101.1	327	e 18 1	PP	e 24 31	[- 1]	e 25 7	SKKS	e 46.4
Bucharest	101.6	319	e 16 44	?	e 24 34	[- 1]	e 18 8	PP	—
Helwan	102.9	303	e 17 41	PP	32 50	SS	20 47	PPP	—
Bergen	103.1	339	e 28 16	PPS	e 33 6?	SS	—	—	47.4
Skalnate Pleso	103.1	325	e 17 13	?	e 24 53	[+11]	e 18 10	PP	—
Copenhagen	103.4	333	27 23	PS	25 33	-16	28 12	PPS	47.4
Timisoara	104.1	320	e 18 26?	PP	—	—	—	—	56.4

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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.
Sofia	104.2	318	e 16 41	?	—	—	—	—
Ogyalla	104.9	324	e 22 52	?	e 24 35	[-15]	e 29 47	?
Potsdam	105.1	330	e 14 20	+ 9	e 24 53	[+ 2]	i 18 43	PP 54.4
Collmberg	105.8	328	e 14 14?	P	e 33 26	SS	e 18 36	PP e 48.4
Prague	105.8	328	e 14 17	P	e 24 58	[+ 4]	e 18 28	PP e 43.4
Jena	106.7	329	e 14 31?	P	—	—	e 18 49	PP —
Cheb	E. 106.9	329	e 18 44	PP	e 25 4	[+ 5]	e 27 50	PS —
Lincoln	E. 107.5	42	e 18 39	PP	e 38 39	SSS	—	—
Aberdeen	108.1	340	e 17 52	[-37]	e 25 53	{+ 1}	e 20 54	PPP e 48.4
Triest	108.7	324	e 18 33	[+ 3]	i 25 6	[- 1]	e 18 56	PP e 50.4
De Bilt	109.0	333	e 18 59	PP	e 25 10	[+ 2]	e 21 5	PPP e 50.4
Taranto	109.2	318	19 31	PP	—	—	—	51.4
Stuttgart	109.3	328	e 17 48	[-44]	e 25 8	[- 1]	e 14 33?	P 54.4
Edinburgh	E. 109.4	340	e 29 26	PPS	—	—	—	—
Durham	N. 109.8	338	i 18 12	[-21]	—	—	i 19 1	PP —
Strasbourg	110.1	329	e 14 34	P	e 25 41	[+28]	e 19 7	PP e 48.6
Zürich	110.5	328	e 19 10 <sub>a</sub>	PP	—	—	e 21 15	PPP —
Bologna	z. 110.7	324	e 19 20	PP	—	—	—	—
Basle	110.9	328	e 17 53	[-42]	e 28 26	PS	e 29 41	PPS e 53.4
Florence Arc.	111.2	323	e 19 43	PP	e 27 26	S	—	—
Florence Xim	111.2	323	e 19 16	PP	—	—	—	e 53.4
Prato	111.2	323	e 19 16	PP	e 33 59	SS	—	—
Rome	111.5	321	e 14 34	P	e 26 46	S	e 19 16	PP —
Kew	111.8	335	e 17 23	[-74]	e 34 47	SS	i 19 18	PP e 55.4
Besançon	111.9	328	e 14 45	P	—	—	e 19 13	PP —
Paris	112.5	332	e 18 19?	[-19]	i 28 56	PS	i 19 25	PP 54.4
Rathfarnham Castle	112.6	339	e 19 26?	PP	e 35 18	SS	e 21 24	PPP e 51.4
Chicago	112.8	38	e 19 33	PP	e 27 12	S	—	e 44.8
St. Louis	112.9	41	e 19 20	PP	e 35 18	SS	i 29 34	PS —
Clermont-Ferrand	114.4	329	e 19 36	PP	e 25 45	[+15]	e 29 25	PS 55.4
Cleveland	116.5	35	e 20 9	PP	e 27 8	{+18}	e 29 57	PS —
Ottawa	z. 116.8	28	e 18 53	[+ 6]	—	—	e 20 0	PP —
Seven Falls	E. 117.6	23	e 20 10	PP	—	—	—	—
Pennsylvania	119.0	32	e 20 1	PP	e 27 44	S	e 29 56	PS —
Tortosa	119.2	326	i 19 44	PP	—	—	—	47.9
Washington	120.8	34	e 19 3	[+ 9]	—	—	—	e 59.8
Harvard	121.0	27	e 19 6	[+11]	e 30 11	PS	—	e 51.9
City College, N.Y.	121.1	30	e 20 37	PP	e 30 1	PS	e 41 46	SSS e 46.0
Fordham	121.1	30	e 20 10	PP	e 26 12	[+18]	e 37 6	SS —
Philadelphia	121.1	32	e 20 28	PP	e 30 19	PS	e 36 23	SS e 50.6
Weston	121.2	27	e 18 56	[+ 1]	e 37 10	SS	e 20 24?	PP —
Alicante	121.5	325	19 23	[+27]	26 23	[+28]	20 59	PP e 54.8
Toledo	122.3	329	e 19 7	[+10]	37 10	SS	e 20 35	PP 53.8
Granada	124.0	326	19 6 <sub>a</sub>	[+ 6]	e 26 33	[+30]	i 20 42	PP i 56.4
Malaga	z. 124.8	326	i 19 7 <sub>a</sub>	[+ 5]	i 24 59	[-66]	i 20 51	PP —
Lisbon	125.7	332	20 55 <sub>a</sub>	PP	—	—	56 8	Q 59.7
Tamanrasset	z. 126.9	307	e 19 7	[+ 1]	e 26 18	[+ 6]	e 20 59	PP —
Bermuda	132.3	30	i 23 1	PKS	e 27 8	[+42]	—	e 54.8
Chinchina	140.7	70	i 19 36	[+ 4]	e 23 18	SKP	—	e 65.8
San Juan	141.8	45	e 19 37	[+ 3]	e 41 12	SS	e 22 36	PP e 56.8
Bogota	142.2	70	e 19 58	[+24]	e 23 23	PKS	e 22 21	PP 66.4
Huancayo	143.6	99	e 19 42	[+ 5]	i 41 56	SS	e 23 2	PP i 67.7
La Paz	150.0	108	e 19 50	[+ 3]	i 26 50	[- 4]	42 32	SS 72.4

Additional readings :—

Miyazaki iSS? = 10m.53s.

Kôti e = 6m.38s.

Kobe ePP?E = 6m.31s., ePPP?E = 6m.52s., iEN = 7m.7s.

Hukuoka eSS = 11m.11s.

Tokyo eE = 5m.53s., 10m.2s., and 10m.25s.

Nagano PP = 7m.2s., PPP = 7m.29s., e = 11m.12s., SS = 13m.37s.

Toyama PP = 6m.58s., esS = 11m.16s., eSS = 12m.19s.

Nanking iP? = 5m.35s., PP = 6m.0s., iS = 9m.54s. ; true S is given as i and remainder of readings wrongly identified.

Vladivostok iPPP = 8m.42s., iP<sub>c</sub>P = 9m.18s., iSS = 15m.10s., iSSS = 16m.2s., iS<sub>c</sub>S = 16m.59s.

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Riverview iPNZ = 8m.9s. a, iPPPN = 10m.26s., iSSZ = 17m.41s., iScSN = 17m.59s.  
 Christchurch eZ = 10m.41s., ePPZ = 12m.41s., eQEN = 24m.56s.  
 Kodaikanal PcPE = 11m.18s., PPPE = 14m.25s., PSE = 19m.24s., PPSE = 19m.33s.,  
 ScSE = 20m.18s., SSE = 23m.11s.  
 New Delhi iPSN = 19m.23s., iScSN = 20m.21s., iN = 24m.2s.  
 Poona PSN = 19m.57s., PPSN = 20m.9s., SKSN = 21m.0s., SSSN = 26m.29s.  
 Bombay iE = 21m.0s., SSE = 23m.53s.  
 College i = 12m.45s. and 15m.11s., ePPP = 16m.12s., eSS = 26m.10s., eSSS = 29m.4s.,  
 ePKP, PKP = 39m.8s., eSKP, PKP = 42m.42s.  
 Victoria SE = 23m.40s.  
 Seattle eS = 23m.56s., eSS = 29m.40s. and other unidentified e readings.  
 Shasta Dam i = 13m.16s.  
 Berkeley ePPSEZ = 25m.24s., eSKP, PKPZ = 42m.36s. and other unidentified readings.  
 Lick iZ = 13m.13s., 13m.23s., 13m.45s., and 14m.8s.  
 Moscow PPP = 18m.22s., SKKS = 23m.46s., PS = 25m.1s., SS = 29m.54s.  
 Fresno e = 13m.26s., eZ = 15m.10s. and 16m.9s.  
 Tinemaha iZ = 13m.27s.  
 Hungry Horse eS = 24m.55s., ePKKP = 30m.16s.  
 Pasadena iZ = 13m.29s. and 13m.44s., ePPZ = 17m.17s.  
 Helsinki eN = 29m.54s. and 30m.46s.  
 Boulder City e = 13m.50s.  
 Overton iZ = 14m.46s.  
 Logan i = 18m.1s., ePPS = 26m.37s., eSS = 31m.30s.  
 Pierce Ferry i = 13m.51s., iPP = 17m.44s.  
 Upsala eN = 15m.57s., eE = 16m.46s., eN = 21m.6s., eSKKSN = 24m.45s., e = 30m.26s.?,  
 eSSSN = 35m.11s., eSSSE = 35m.26s.  
 Tucson eSS = 33m.41s.  
 Scoresby Sund 17m.52s. and 19m.50s., PS = 26m.53s., SS = 32m.20s.  
 Warsaw eSKSN = 24m.24s., ePS = 27m.25s., ePPS = 28m.16s., ePKKP = 29m.13s.,  
 eSS = 33m.0s., eSSS = 37m.16s. and numerous unidentified e readings.  
 Helwan eZ = 19m.50s., eE = 24m.44s.  
 Skalnate Pleso ePP = 18m.37s., ePS = 27m.32s., ePPS?E = 28m.39s., eSS = 33m.26s. and  
 other unidentified e readings.  
 Potsdam eEZ = 17m.14s., eZ = 18m.32s., iZ = 20m.42s., eN = 21m.38s.  
 Collmberg ePKPZ = 17m.16s.?, ePPZ = 18m.20s.  
 Prague ePPP = 20m.46s., eSKKS = 25m.34s., ePS = 27m.56s., ePPS = 28m.39s., eSS =  
 33m.26s., eSSS? = 37m.32s. and numerous unidentified e readings.  
 Jena ePKP?E = 17m.35s., ePKP?N = 17m.43s., ePPN = 18m.56s., eN = 19m.34s.  
 Cheb eE = 21m.38s. and 25m.32s., eSKKS = 25m.44s., eE = 26m.56s., ePPSE = 28m.44s.,  
 eSSE = 33m.50s.  
 Aberdeen ePPEN = 19m.36s., SN = 26m.51s., PSN = 28m.52s.  
 Trieste eS = 26m.40s., eSS = 33m.54s.  
 De Bilt eS = 26m.44s., ePS = 28m.22s., eSS = 34m.26s.?, eSSS = 38m.26s.?.  
 Stuttgart ePPZ = 18m.46s. and 18m.58s., iPP = 19m.4s., e = 19m.31s. and 20m.33s.,  
 ePPP = 21m.40s., eSKKS = 25m.56s., eSPZ = 28m.23s., ePKKP = 29m.34s., e =  
 30m.38s. and 31m.44s., eSS? = 34m.26s., e = 44m.56s., eQ = 49.4m.  
 Strasbourg e = 17m.52s., 18m.14s., and 19m.28s., ePPP = 21m.16s., eS = 26m.39s.,  
 ePS = 28m.32s., e = 28m.50s., eSS = 34m.29s. and 34m.46s., eSSS = 38m.43s. and  
 38m.56s., e = 42m.14s. and 45m.7s.  
 Zürich e = 20m.52s.  
 Rome ePSN = 27m.44s., eSSN = 34m.38s.  
 Kew ePPP = 21m.27s., eEN = 45m.49s., eQEN = 49.4m.  
 Besançon e = 18m.56s.  
 Paris e = 19m.54s., i = 20m.13s., ePPP = 21m.53s., e = 23m.53s., i = 29m.45s., ePKKS? =  
 33m.6s., eSS = 35m.3s., eSSS = 38m.51s.?.  
 Rathfarnham Castle eEN = 44m.20s.  
 St. Louis e = 36m.18s.  
 Clermont-Ferrand ePPS? = 30m.30s., eSS = 35m.55s., eSSS = 40m.26s., Q = 52.4m.  
 Cleveland ePPZ = 20m.12s., eE = 27m.25s. and 29m.29s., ePSE = 30m.52s., eSSSE =  
 41m.38s.  
 Philadelphia e = 44m.31s.  
 Weston ePS = 30m.41s.  
 Alicante PKS = 22m.31s., PPP = 23m.29s., SKKS = 27m.55s., PS = 30m.47s., SS =  
 37m.13s., SSP = 37m.37s., SSS = 41m.49s., Q = 50m.43s.  
 Granada PPP = 23m.14s., PS = 30m.18s., PPS = 31m.51s., SS = 37m.12s., SSS = 41m.27s.  
 Tamanrasset iZ = 19m.14s., eZ = 19m.27s. and 21m.43s., ePKSZ = 22m.46s., ePPPZ =  
 23m.42s., eSKKSZ = 27m.45s., ePPSZ = 32m.30s.  
 Huancayo e = 21m.5s.  
 La Paz iZ = 20m.0s., iNZ = 20m.49s., iPPZ = 23m.24s., iNZ = 26m.2s., iPPS = 35m.56s.  
 Long waves were also recorded at Auckland, Columbia, Ivigtut, Chur, Neuchatel, and  
 Karlsruhe.

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July 3d. 12h. 29m. 9s. Epicentre 24°·5S.. 176°·0W.

Given by Strasbourg.

A = -·9088, B = -·0636, C = -·4124;  $\delta = +4$ ;  $h = +3$ ;  
D = -·070, E = +·998; G = +·411, H = +·029, K = -·911.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Apia		11·4	21	e 2 41	- 6	e 4 35	-21	—	—
Tuai	N.	15·4	201	e 4 15	+35	—	—	e 5 51?	?
Wellington		18·4	204	e 4 17	- 1	—	—	e 8 51?	P <sub>c</sub> P
Kaimata	N.E.	20·8	208	3 51?	?	—	—	—	—
Christchurch		21·1	203	—	—	e 8 31	- 8	—	e 10·6
Brisbane	z.	28·0	257	i 5 54k	- 1	—	—	—	—
Riverview		30·0	245	i 7 22	PPP	—	—	—	e 14·2
Berkeley		80·0	41	e 12 14 <sub>a</sub>	+ 1	—	—	e 38 13	Q
Lick	z.	80·0	41	i 12 15 <sub>a</sub>	+ 2	—	—	—	—
Pasadena	z.	80·1	46	i 12 14	+ 1	—	—	—	—
Fresno		80·7	43	e 12 19	+ 3	—	—	e 15 22	PP
China Lake	z.	81·5	45	i 12 22	+ 1	—	—	—	—
Shasta Dam		81·8	39	e 12 23	+ 1	—	—	—	—
Tinemaha	z.	81·9	44	e 12 25	+ 2	—	—	—	—
Boulder City		83·4	46	e 12 33	+ 3	—	—	e 13 43	?
Overton	z.	84·0	46	i 12 37	+ 4	—	—	—	—
Pierce Ferry		84·0	46	i 12 36	+ 3	—	—	i 13 35	?
Tucson		84·1	51	i 12 36	+ 2	—	—	e 13 26	?
Seattle		86·5	34	e 12 57	+11	—	—	—	—
Victoria	z.	86·7	33	e 12 49	+ 2	—	—	—	—
Logan		88·7	43	e 12 59	+ 2	—	—	—	—
Hungry Horse		91·2	36	i 13 9	+ 1	—	—	—	—
College		91·7	12	i 13 10	0	e 24 11	+1	e 17 8	PP
Copenhagen		148·2	350	i 19 50	[+ 5]	—	—	—	—
Ksara		150·7	294	e 19 55	[+ 7]	—	—	23 39	PP
Potsdam	z.	151·3	348	e 19 57	[+ 8]	—	—	—	—
Raciborzu		152·2	340	i 20 0	[+ 9]	—	—	e 20 20	PKP <sub>2</sub>
Collmburg	z.	152·4	347	e 19 53	[+ 2]	—	—	e 20 0	PKP <sub>2</sub>
De Bilt		152·4	357	e 19 55	[+ 4]	—	—	—	—
Jena	N.	153·0	348	e 20 2	[+10]	—	—	e 20 23	PKP <sub>2</sub>
Prague		153·2	345	e 19 56	[+ 4]	e 33 15	SKSP	e 20 43	pPKP
Stuttgart	z.	155·4	351	e 19 57	[+ 2]	—	—	e 20 22	pPKP
Paris		155·7	3	e 19 50	[- 5]	—	—	i 20 24	PKP <sub>2</sub>
Strasbourg		155·8	353	e 20 8	[+12]	—	—	i 20 25	PKP <sub>2</sub>
Besançon		157·2	354	e 20 30	PKP <sub>2</sub>	—	—	—	—
Triest		157·5	341	e 20 0	[+ 2]	—	—	i 20 31	PKP <sub>2</sub>
Clermont-Ferrand		158·8	2	e 20 37	PKP <sub>2</sub>	—	—	—	—
Tortosa		163·5	8	e 37 51?	PPS	—	—	—	—
Granada		165·8	27	21 9 <sub>a</sub>	PKP <sub>2</sub>	31 49	{+ 7}	i 24 55	PP
Malaga	z.	165·8	29	i 20 9 <sub>k</sub>	[+ 2]	—	—	i 21 11	PKP <sub>2</sub>
Tamanrasset	z.	177·8	—	i 20 17 <sub>a</sub>	[+ 5]	e 33 10	{+30}	e 22 4	PKP <sub>2</sub>

Additional readings :—

Lick iZ = 12m.18s., 12m.25s., 12m.47s., and 13m.27s.

Pasadena eZ = 12m.25s., iZ = 12m.29s.

Fresno eZ = 12m.29s. and 14m.11s.

China Lake iZ = 12m.34s.

Overton iZ = 13m.1s., 13m.36s., and 13m.56s.

Raciborzu eZ = 20m.30s.

Jena eN = 20m.35s., eE = 20m.42s.

Prague ePKP<sub>2</sub> = 20m.20s., esPKP = 21m.3s., epPKP<sub>2</sub> = 21m.8s., esPKP<sub>2</sub> = 21m.37s.,

ePP = 23m.45s. and other unidentified e readings.

Stuttgart eZ = 20m.7s.

Paris e = 20m.14s.

Strasbourg e = 20m.15s.

Granada PPP = 28m.1s., SS = 44m.10s.

Malaga iPPZ = 24m.57s.

Tamanrasset eZ = 20m.44s., iZ = 22m.16s., ePPZ = 25m.56s., eZ = 26m.17s.,

eP<sub>c</sub>P, PKP<sub>2</sub>Z = 29m.1s., eZ = 30m.10s., ePPPZ = 30m.24s.

Long waves were also recorded at Auckland, Cleveland, Harvard, Weston, Warsaw, and Kew.

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July 3d. Readings also at 0h. (Tucson, near Pierce Ferry, and Boulder City), 3h. (Huancayo, Tucson and China Lake), 4h. (Nanking, La Paz, College, and Overton), 5h. (Hungry Horse), 6h. (near Ashkabad), 7h. (near Rocca di Papa, near Clermont-Ferrand, and Tortosa), 10h. (Upsala, College, near Apia, and near Ashkabad), 11h. (near Istanbul), 16h. (Overton and Pierce Ferry), 19h. (near Mizusawa), 20h. (Overton, Bermuda, and near Ashkabad), 21h. (College, Hungry Horse, and Pierce Ferry), 22h. (near Malaga), 23h. (Frunse, and near Przhivalsk).

July 4d. Readings at 0h. (near Athens), 1h. (Scoresby Sund, College, Naryn, Obi-garm, Samarkand, near Andijan, and Fergana), 2h. (Ksara), 4h. (Granada), 5h. (Ashkabad and near Bogota), 7h. (Messina, near Rome, and near Ashkabad), 8h. (Collmberg, Stuttgart, and Tacubaya), 10h. (Andijan, Samarkand, Stalinabad, near Kulyab, Obi-garm, and near Huancayo), 11h. (Pretoria), 12h. (Huancayo, and near Ashkabad), 13h. (near Ashkabad), 14h. (near Oaxaca), 15h. (near La Paz and near Przhivalsk), 16h. (Pasadena, Riverside, China Lake, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Shasta Dam, Harvard, Ottawa, Tamanrasset, Guam, and near Obi-garm), 17h. (Messina and Brisbane), 18h. (Obi-garm and near Bogota), 20h. (near Victoria and near Bandung), 22h. (Paris), 23h. (near Obi-garm).

July 5d. 3h. 34m. 58s. Epicentre  $19^{\circ}8'S$ .  $168^{\circ}5'E$ . (as on 1950, May 27d.).

A = -0.9227, B = +0.1877, C = -0.3367;  $\delta = -3$ ;  $h = +5$ ;  
D = +0.199, E = +0.980; G = +0.330, H = -0.067, K = -0.942.

	$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.
	$^{\circ}$	$^{\circ}$	m.	s.	s.	m.	s.	s.	m.	s.	m.
Brisbane	16.1	239	i 3	48	- 1	e 6	49	0	—	—	e 8.7
Auckland	N. 17.9	163	e 4	2	-10	—	—	—	—	—	e 9.0
Apia	19.8	76	e 4	30	- 5	—	—	—	—	—	e 11.0
Riverview	20.8	224	i 4	45k	0	i 8	42	+ 9	i 4	58	pP e 10.1
Wellington	22.1	169	—	—	—	e 8	58	0	—	—	e 12.0
Christchurch	23.9	174	—	—	—	e 9	14	-16	—	—	—
Vladivostok	71.1	332	e 11	24	+ 2	i 20	48	+10	—	—	—
Berkeley	86.7	48	e 12	48k	+ 1	—	—	—	—	—	e 40.7
Lick	z. 86.8	48	i 12	49k	+ 2	—	—	—	i 15	33	PP
Fresno	z. 87.9	49	e 12	54	+ 1	—	—	—	e 15	38	PP
Shasta Dam	87.9	46	i 12	53	0	—	—	—	—	—	—
Mount Wilson	z. 88.1	53	i 12	53	- 1	—	—	—	—	—	—
Riverside	z. 88.5	53	i 12	54	- 2	—	—	—	—	—	—
Palomar	z. 88.6	54	i 12	55	- 1	—	—	—	—	—	—
China Lake	z. 89.1	51	i 12	58	0	—	—	—	—	—	—
Tinemaha	z. 89.1	50	i 12	58	0	—	—	—	—	—	—
College	90.8	17	e 13	6	0	e 23	29	[- 9]	e 24	13	S e 44.5
Boulder City	91.2	52	e 13	10	+ 2	—	—	—	—	—	—
Overton	z. 91.7	52	i 13	12	+ 2	—	—	—	—	—	—
Pierce Ferry	91.9	53	i 13	12	+ 1	—	—	—	—	—	—
Tucson	92.8	57	e 13	16	0	—	—	—	e 39	15	P'P' e 46.7
Ottawa	z. 121.8	48	e 18	56	[ 0]	—	—	—	—	—	—
Scoresby Sund	128.9	5	21	20	PP	—	—	—	22	29	PKS 61.0
Ksara	135.8	298	e 19	27?	[+ 4]	—	—	—	23	5	PP
Warsaw	138.9	330	e 23	4	PP	e 24	4	?	—	—	e 76.0
Istanbul	139.6	311	e 19	2?	[-28]	e 26	2?	[-36]	—	—	—
Copenhagen	139.9	340	e 22	32	PKS	—	—	—	—	—	73.0
Helwan	z. 140.0	293	e 19	36	[+ 5]	—	—	—	e 22	36	PKS
Potsdam	z. 142.3	336	e 19	31	[- 4]	—	—	—	—	—	e 82.0
Collmberg	z. 143.1	334	e 19	35	[- 1]	—	—	—	e 46	32	SSS
Prague	143.4	332	e 19	38	[+ 2]	—	—	—	e 23	8	PP
Jena	N. 144.0	334	e 19	40	[+ 3]	—	—	—	—	—	—
De Bilt	145.2	342	i 19	43 <sub>a</sub>	[+ 3]	—	—	—	—	—	e 75.0
Rathfarnham Castle	146.3	354	i 19	46	[+ 5]	—	—	—	23	33	PP e 74.0
Stuttgart	146.6	335	e 19	46	[+ 4]	—	—	—	e 23	12	PP
Kew	147.2	347	e 19	49	[+ 6]	e 28	19	?	e 23	13	PP e 78.0
Strasbourg	147.4	336	e 19	49	[+ 6]	42	21	SS	—	—	—
Zürich	148.0	335	e 19	48	[+ 4]	—	—	—	e 23	32	PP
Basle	148.3	335	e 19	50	[+ 5]	—	—	—	—	—	—
Paris	148.9	342	e 19	2?	[-44]	—	—	—	—	—	—

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.
Besançon	149.1	337	e 19 54	[+ 8]	—	—	—	—
Rome	150.0	324	e 19 50	[+ 3]	e 42 10	SS	e 23 12	PP
Clermont-Ferrand	151.4	338	e 19 58	[+ 8]	e 25 8	?	e 23 40	PP
Alicante	159.2	336	19 26	[-34]	26 29	[-35]	—	—
Tamanrasset	z. 163.9	283	e 20 6	[+ 1]	—	—	e 21 1	PKP <sub>s</sub>

Additional readings:—

Brisbane iZ = 6m.33s., iE = 6m.36s., iN = 7m.5s., eE = 7m.14s.

Apia e = 4m.36s. and 4m.50s.

Riverview iZ = 5m.3s., iP<sub>c</sub>P = 8m.46s., iSSN = 9m.21s.

Lick iZ = 11m.53s. and 11m.58s.

College ePKP, PKP = 39m.41s.

Boulder City e = 13m.34s.

Tucson e = 16m.1s.

Warsaw e = 23m.11s.

Prague ePKP<sub>s</sub>N = 19m.47s., e = 20m.7s., 20m.25s., 20m.50s., 21m.12s., 22m.10s., and

22m.25s., ePPP = 25m.56s.

Jena eN = 19m.50s., eE = 20m.7s.

Rathfarnham Castle eZ = 20m.11s.

Stuttgart eZ = 19m.57s. and 20m.8s.

Strasbourg i = 19m.52s. and 19m.59s., e = 20m.13s.

Besançon e = 19m.59s.

Tamanrasset iZ = 21m.21s.

Long waves were also recorded at Honolulu and other American stations.

July 5d. 8h. 6m. 44s. Epicentre 42°·5N. 144°·4E. Depth of focus 0·010.

(as on 1949, May 4d.).

Intensity V at Kusiro ; IV at Hatinohe and Urakawa ; II-III at Nemuro, Miyako, Morioka, and Mito.

Epicentre 42°·4N. 144°·5E. Depth of focus 60km. Macroseismic radius >300km.

Seismo. Bull. Cent. Met. Obs., Japan, for 1950. Tokyo, 1952, pp. 29, 30, with macroseismic chart.

A = -·6013, B = +·4305, C = +·6731 ;  $\delta$  = -4 ; h = -3 ;

D = +·582, E = +·813 ; G = -·547, H = +·392, K = -·740.

	$\Delta$ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	Supp. m. s.	L. m.
Nemuro	1.2	46	0 21	- 2	0 54	+14	—	—
Sapporo	2.3	284	0 38	+ 1	1 6	+ 1	—	—
Hatinohe	2.9	228	0 44	- 1	1 16	- 3	—	—
Mori	2.9	262	0 46	+ 1	1 20	+ 1	—	—
Aomori	3.2	238	0 50	0	1 27	0	—	—
Miyako	3.4	214	0 52	0	1 27	- 5	—	—
Morioka	3.7	222	0 57	+ 1	1 38	- 1	—	—
Mizusawa	E. 4.2	218	1 5	+ 2	1 33	-18	—	—
Akita	4.3	231	1 10	+ 5	1 58	+ 4	—	—
Sendai	5.0	214	1 17	+ 3	2 9	- 2	—	—
Hokusima	5.6	214	1 21	- 1	2 18	- 8	—	—
Onahama	6.2	207	1 30	0	2 34	- 7	—	—
Mito	6.8	208	1 38	- 1	—	—	—	—
Utunomiya	6.9	213	1 44	+ 4	—	—	—	—
Tukubasan	7.1	210	1 45	+ 2	—	—	—	—
Kumagaya	7.4	213	1 52	+ 5	3 8	- 2	—	—
Maebasi	7.4	216	1 51	+ 4	3 5	- 5	—	—
Nagano	7.5	222	1 56	+ 8	3 14	+ 2	—	—
Tokyo	7.7	210	1 54	+ 3	3 12	- 5	—	—
Wazima	7.7	231	2 3	+12	3 17	0	—	—
Yokohama	7.9	209	2 48	+54	—	—	—	—
Toyama	8.0	226	2 18	+23	3 24	- 1	—	—
Hunatu	8.3	214	2 15	+16	3 29	- 3	—	—
Mera	8.4	207	2 16	+16	3 28	- 6	—	—
Misima	8.5	212	2 26	+24	3 31	- 6	—	—
Osima	8.7	209	2 9	+ 4	—	—	—	—
Vladivostok	9.2	278	e 2 13	+ 2	e 3 54	0	—	—
Nagoya	9.3	221	2 40	+27	—	—	—	—
Kameyama	9.8	222	2 48	+28	—	—	—	—
Osaka	10.5	224	2 52	+23	—	—	—	—

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.
Sumoto	11.0	226	2 30	- 6	—	—	—	—
College	43.3	35	e 7 53	- 1	e 14 11	- 2	—	e 17.7
Sverdlovsk	52.7	317	9 6	- 1	e 16 29	+ 4	—	—
Fergana	52.9	294	e 9 9	+ 1	—	—	—	—
Moscow	64.3	323	e 10 27	0	—	—	—	—
Shasta Dam	66.1	57	e 11 9	+ 30	—	—	—	—
Hungry Horse	66.3	46	e 10 40	0	—	—	e 11 6	pP
China Lake	z. 72.0	58	e 11 25	+ 10	—	—	e 11 36	pP
Overton	z. 73.5	56	e 11 34	+ 10	—	—	—	—
Boulder City	73.6	56	e 11 55	+ 31	—	—	—	—
Tucson	78.6	57	e 11 57	+ 4	—	—	—	—
Stuttgart	z. 80.9	332	e 12 7	+ 2	—	—	—	—

July 5d. 18h. 30m. 11s. Epicentre 62°·5N. 154°·0W.

A = -·4172, B = -·2035, C = +·8857;  $\delta$  = -7;  $h$  = -10;  
D = -·438, E = +·899; G = -·796, H = -·388, K = -·464.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
College	3.6	47	i 1 0	+ 2	e 1 48	+ 6	—	e 2.3
Sitka	10.8	112	—	—	e 4 39	- 3	—	e 5.6
Seattle	23.1	114	e 5 9	+ 1	e 9 19	+ 3	—	e 12.8
Hungry Horse	26.3	103	i 5 37	- 2	—	—	—	—
Shasta Dam	28.9	123	i 6 1	- 2	—	—	—	—
Berkeley	z. 31.4	126	e 6 23k	- 2	—	—	—	—
Tinemaha	z. 33.6	122	i 6 43	- 1	—	—	—	—
China Lake	z. 35.0	122	i 6 54	- 2	—	—	—	—
Boulder City	35.6	118	e 7 3	+ 2	—	—	—	—
Pierce Ferry	36.1	117	i 7 5	0	—	—	—	—
Pasadena	z. 36.2	123	i 6 59	- 7	—	—	—	—
Riverside	z. 36.6	123	i 7 8	- 2	—	—	—	—
Palomar	z. 37.4	122	i 7 15	- 1	—	—	—	—
Tucson	40.8	116	e 7 45	0	—	—	—	—
Cleveland	z. 46.4	81	i 8 30	0	—	—	—	—
Weston	50.3	72	i 8 58	- 2	—	—	—	e 25.9
Sverdlovsk	58.0	339	10 1	+ 4	—	—	—	—
Collmberg	z. 66.1	9	e 10 53	+ 2	—	—	—	—
Paris	67.5	17	e 11 1	+ 1	—	—	—	—
Strasbourg	68.3	13	e 11 6	+ 1	—	—	—	—
Stuttgart	z. 68.3	12	e 11 6	+ 1	—	—	—	—
Tamanrasset	z. 93.5	19	e 13 20	+ 1	—	—	—	—

Additional readings:—

Seattle e = 6m.15s. and 10m.17s.

Berkeley iZ = 6m.26s.

Tucson e = 8m.33s.

Cleveland iPZ = 8m.33s.

Collmberg eZ = 11m.21s.

Long waves were also recorded at Saskatoon, Harvard, Pennsylvania, Washington, New Plymouth, Kaimata, Tuai, and Wellington.

July 5d. Readings also at 0h. (College, Brisbane, and Tamanrasset), 3h. (Mount Wilson, Palomar, Riverside, China Lake, Tinemaha, Besançon, Paris, Strasbourg, Stuttgart, and Tamanrasset), 4h. (Collmberg), 6h. (Wellington and near Zürich), 7h. (Mount Wilson, Riverside, Tucson, Boulder City, Overton, Pierce Ferry (2), Hungry Horse, Merida, Puebla, Tacubaya, near Oaxaca, and Vera Cruz), 8h. (College), 9h. (Collmberg, Durham, Samarkand, near Andijan, Kulyab, Obi-garm, and Stalinabad), 10h. (Pierce Ferry, near Bandung, Djakarata, and near Obi-garm), 11h. (Brisbane, China Lake, Pasadena, and Riverside), 15h. (Brisbane), 16h. (Auckland, Christchurch, Wellington, Shasta Dam, and Stuttgart), 17h. (near Athens), 18h. (Mary, Shemakla, and near Ashkabad), 20h. (Ashkabad and Brisbane), 21h. (College and Tamanrasset), 22h. (Boulder City, Pierce Ferry, Shasta Dam, and Scoresby Sund), 23h. (Basle, Zürich, Stuttgart, Collmberg, and College).



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July 6d. 4h. South America.

La Paz iPZ = 5m.47s.k, iS = 6m.21s., iS\* = 6m.27s., iS<sub>r</sub> = 6m.33s.  
 Weston iP = 15m.5s.  
 Harvard iP = 15m.7s.  
 Ottawa eZ = 15m.26s.  
 Tucson eP = 15m.33s.  
 Mount Wilson ePZ = 15m.57s., eZ = 16m.40s.  
 Shasta Dam eP = 16m.46s., e = 17m.19s.  
 Hungry Horse eP = 16m.52s., e = 17m.25s.  
 Tamanrasset ePZ = 17m.23s., ipPZ = 17m.59s.

July 6d. 7h. 3m. 28s. Epicentre 39°·3N. 73°·3E.

A = +·2230, B = +·7432, C = +·6308;  $\delta = -2$ ;  $h = -1$ ;  
 D = +·958, E = -·287; G = +·181, H = +·604, K = -·776.

	$\Delta$	Az.	P.	O - C.	S.	O - C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Andijan	1·6	334	i 0 29	- 1	e 0 52	+ 1	—	—
Fergana	1·6	313	i 0 28	- 2	e 0 49	- 2	—	—
Obi-garm	2·9	258	i 0 51	+ 3	1 41	S <sub>r</sub>	—	—
Naryn	3·0	44	i 0 50	0	i 1 30	+ 3	—	—
Kulyab	3·1	243	i 0 54	+ 3	—	—	—	—
Stalinabad	3·6	261	1 0	+ 2	i 2 4	S <sub>r</sub>	—	—
Frunse	3·7	14	e 1 0	0	i 1 52	S <sub>r</sub> *	—	—
Tashkent	3·7	305	i 1 0	0	i 1 48?	+ 3	—	—
Almata	4·8	33	i 1 17	+ 2	i 2 15	+ 3	—	—
Samarkand	4·9	276	i 1 18	+ 1	i 2 17	+ 2	—	—
Przhevalsk	5·0	49	i 1 19	+ 1	—	—	—	—
Mary	9·1	263	e 2 14?	0	e 3 55	- 5	—	—
New Delhi	N. 11·2	162	e 2 33	-11	e 4 48	- 4	2 43	PP
Semipalatinsk	12·1	21	—	—	e 5 12	- 2	—	—
Baku	18·0	282	e 4 12	- 1	e 7 24	- 8	—	—
Sverdlovsk	19·4	339	i 4 31	+ 1	8 4	0	—	—
Grozny	21·0	290	4 46	- 1	8 50	+13	—	—
Calcutta	E. 21·1	138	—	—	e 8 53	+14	—	—
Tiflis	21·8	286	e 5 14?	+18	e 9 2?	+10	—	—
Leninakan	22·6	284	e 5 4?	+ 1	—	—	—	—
Irkutsk	25·0	47	e 5 27?	0	—	—	—	—
Moscow	28·7	317	5 59	- 2	—	—	—	—
Ksara	30·4	271	e 6 18	+ 2	e 12 52	SS	—	—
Istanbul	33·6	288	—	—	e 14 32?	SS	—	—
Pulkovo	33·8	322	e 6 43	- 3	—	—	—	—
Warsaw	37·9	308	—	—	e 13 12	- 1	—	e 20·5
Prague	42·2	306	e 7 53	- 3	—	—	e 9 47	PP
Potsdam	42·7	309	—	—	e 17 32	SS	—	e 22·5
Collmberg	z. 42·9	306	e 7 59	- 3	—	—	—	—
Stuttgart	45·8	304	e 8 24	- 1	e 18 38	SS	e 22 32	Q e 24·5
Strasbourg	46·8	304	e 8 31	- 2	e 18 53	SS	e 10 19	PP e 24·5
Clermont-Ferrand	50·6	302	e 14 52	P <sub>c</sub> S	e 16 32	+15	e 19 39	SS
Kew	51·0	310	—	—	—	—	e 20 26	SS e 26·5
Tamanrasset	z. 59·1	275	e 10 2	- 2	—	—	—	—
College	71·3	18	e 11 19	- 4	—	—	—	e 38·5
Hungry Horse	92·5	5	e 13 11	- 3	—	—	—	—

Additional readings :—

New Delhi iN = 3m.6s., SSSN = 5m.21s.  
 Warsaw eE = 14m.27s., eN = 15m.1s., eE = 15m.22s., e = 16m.15s., 17m.11s., and 18m.33s.  
 Prague e = 8m.21s., 10m.29s., and 10m.40s.  
 Clermont-Ferrand eSSS = 22m.1s., e = 23m.34s.  
 College e = 12m.11s.  
 Long waves were also recorded at Scoresby Sund and other European stations.



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July 6d. Readings also at 3h. (Baku, Grozny, Piatigorsk, Zugdidi, near Erevan, Leninakan Shemakla, and Tiflis), 7h. (Frunse, Kulyab, Naryn, Obi-garm, near Andijan, and Fergana), 10h. (Frunse, Naryn, Obi-garm, Samarkand, Stalinabad, near Andijan (2), Fergana, and near La Paz), 11h. (Apia, Arapuni, Cobb River, Kaimata, New Plymouth, Tuai, Wellington, Palomar, Pasadena, Riverside, Tinemaha, Tucson, Pierce Ferry, College (2), Collmberg, Tamanrasset, and near Malaga), 14h. (College, Samarkand, near Andijan, Fergana, Obi-garm, near Granada (2), Malaga (2), and Toledo), 15h. (near Stuttgart, and near Andijan), 17h. (Bandong and Djakarta), 18h. (Overton, Pierce Ferry, and near Mizusawa), 21h. (Frunse, Kulyab, Naryn, Przhevalsk, Samarkand, Tashkent, near Andijan, Fergana, and Obi-garm), 22h. (Timisoara and College), 23h. (Almata, Frunse, Naryn, Obi-garm, Przhevalsk, Samarkand, Mary, near Andijan, Fergana, Kulyab, Stalinabad, and Tashkent).

July 7d. 16h. 46m. 54s. Epicentre  $11^{\circ}2'S$ .  $163^{\circ}9'E$ . (as on 1945, August 28d.).

A = -0.9427, B = +0.2721, C = -0.1930;  $\delta = -3$ ;  $h = +6$ ;  
D = +0.277, E = +0.961; G = +0.185, H = -0.054, K = -0.981.

		$\Delta$	Az.	P.		O-C.		S.		O-C.		Supp.		L. m.
				m.	s.	s.	m.	s.	s.	m.	s.			
Brisbane		19.2	211	i 4	25	- 3	i 8	5	+ 6	i 4	37	PP		
Apia		23.9	99	e 5	17	+ 1	e 10	39	SS				e 12.1	
Riverview		25.4	204	i 5	30k	- 1	e 9	45	-11	i 5	42	pP	e 11.6	
Tuai	N.	29.9	158	e 7	24	PPP								
Guam		31.0	322	6	22	+ 1								
Wellington		31.5	163	i 6	26	0	e 11	30	- 4	7	36	PP	13.7	
Christchurch		33.1	168	i 6	40	0	e 11	51	- 8	7	54	PP	15.8	
Perth		48.8	237				i 15	46	- 6	i 19	56	SS	i 24.1	
Honolulu		49.6	49				e 15	56	- 7	e 19	29	SS	e 20.4	
Tokyo		51.9	335	9	11	- 1	16	30	- 5	17	54	S <sub>c</sub> S	24.2	
Hunatu		52.2	334	e 9	10	- 5	e 16	36	- 3					
Kumagaya		52.5	335	e 9	28	+11	e 16	39	- 4					
Utunomiya		52.6	336	e 9	14	- 4	e 16	30	-14					
Nagoya		52.7	334	e 9	24	+ 6	e 16	34	-12					
Maebasi		52.8	335	e 9	15	- 4								
Osaka		52.9	330	e 9	32	+12	e 16	33	-15					
Gihu		53.0	334	e 9	19	- 2	e 16	15	-35				e 24.1	
Matusiro		53.3	335				e 17	54	+60					
Nagano		53.4	334	e 9	23	- 1	e 16	44	-11				24.2	
Sendai	E.	53.7	338	e 9	29	+ 3	e 16	40	-19				e 24.4	
Toyama		53.9	334	e 9	24	- 3								
Hukuoka		54.8	326	e 9	30	- 4	e 17	3	-11				e 24.4	
Nanking		60.9	316	9	25	-52	e 17	35	-59					
Vladivostok		61.5	334	i 10	17	- 4	i 18	39	- 3					
Calcutta	E.	81.2	294				e 21	0	?					
Irkutsk		81.2	327	e 12	14	- 5	e 22	22?	- 7					
College		84.0	18	i 12	29	- 4	e 22	52	- 5	e 28	10	SS	e 34.8	
Ukiah		84.1	48	e 12	42	+ 8	e 23	5	+ 7	e 29	30	SSP	e 34.2	
Sitka		84.2	28	e 12	39	+ 5	e 23	0	+ 1	e 28	40	SS	e 38.4	
Berkeley		84.4	49	i 12	32 <sub>a</sub>	- 4	e 23	6	+ 5	i 15	53	PP	e 35.0	
Santa Clara		84.4	49	e 12	33	- 3	e 23	8	+ 7	e 19	58	PPP	e 41.7	
Lick	Z.	84.7	49	i 12	39 <sub>a</sub>	+ 2								
Shasta Dam		85.2	47	i 12	40	+ 1								
Fresno	Z.	85.9	51	i 12	41 <sub>a</sub>	- 2				e 16	11	PP	e 42.8	
Pasadena		86.4	54	i 12	45 <sub>a</sub>	0	e 23	12	[+ 2]				e 38.5	
Riverside		87.0	54	i 12	48 <sub>a</sub>	0								
Halwee	Z.	87.1	52	e 12	50	+ 1								
Tinemaha	Z.	87.2	51	i 12	50	+ 1								
Victoria		87.2	39	e 12	48	- 1	23	22	- 6	16	13	PP		
Seattle		87.5	40	e 12	52 <sub>k</sub>	+ 1	e 23	41	+10	e 16	26	PP	e 39.1	
Boulder City		89.5	53	e 13	1	+ 1				e 16	32	PP		
Overton		90.0	53	i 13	3	0				i 16	35	PP		
Pierce Ferry		90.2	53	i 13	4	0				i 16	37	PP		
Tucson		91.9	57	e 13	12	+ 1	e 24	17	+ 6	e 16	42	PP	e 41.2	
New Delhi	N.	92.4	299				e 24	4	{+ 5}	e 31	23	SS		

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.
Salt Lake City	92.9	49	e 13 18	+ 2	e 23 54	[+ 4]	—	e 44.8
Hungry Horse	93.1	41	i 13 15	- 2	—	—	—	—
Logan	93.1	48	e 13 17	0	e 24 29	+ 7	e 23 50	SKS e 48.5
Butte	93.5	43	e 14 37	+78	e 24 29	+ 4	e 23 37	SKS e 40.1
Przhevalsk	94.2	312	e 13 18	- 4	—	—	—	—
Bozeman	94.5	45	e 13 37	+14	e 24 10	{- 4}	e 31 20	SS e 38.6
Bombay	94.6	288	e 14 42	+78	e 24 34	- 1	—	i 50.2
Almata	95.4	313	e 13 23	- 5	—	—	—	—
Naryn	95.8	311	e 13 24	- 5	—	—	—	—
Saskatoon	98.4	38	—	—	e 26 36	PS	e 33 56	PSS 39.6
Fergana	98.8	310	e 13 41	- 2	—	—	—	—
Obi-garm	100.2	308	e 13 50	+ 1	e 25 38	+16	—	—
Tashkent	100.7	310	e 13 50	- 2	i 24 31	[+ 1]	e 26 58	PS —
Stalnabad	100.9	308	e 18 2	PP	i 24 32	[+ 1]	e 27 3	PS —
Samarkand	102.4	308	e 18 3	PP	—	—	—	—
Lincoln	104.4	50	e 21 42	?	e 27 52	PS	e 34 36	SSP e 42.6
Mary	106.2	307	e 22 19	PKS	—	—	—	—
Sverdlovsk	106.6	326	e 14 14	- 3	e 24 58	[ 0]	e 18 46	PP —
St. Louis	109.3	53	e 18 41	[+ 9]	e 26 5	{+ 5}	e 18 59	PP —
Chicago	111.1	49	—	—	e 24 25	[-52]	e 28 45	PS e 51.4
Cincinnati	113.7	52	i 19 31	PP	—	—	—	—
Baku	115.4	310	e 19 16	PP	e 26 10	{-33}	—	e 56.1
Cleveland	115.7	49	—	—	e 25 36	[+ 1]	e 26 52	SKKS e 47.3
Huancayo	116.8	110	e 29 48	PS	e 30 53	PPS	e 36 36	SS e 63.2
Pennsylvania	118.6	49	—	—	e 27 55	{+51}	e 35 26	SS —
Tiflis	119.0	312	e 20 12	PP	—	—	—	—
Ottawa	119.1	44	—	—	e 26 8	[+21]	—	66.1
Moscow	119.2	329	20 11	PP	e 27 10	{+ 2}	e 22 16	PKS —
Pulkovo	120.6	335	e 20 29	PP	e 30 2	PS	e 36 58	SS —
Philadelphia	120.7	51	—	—	e 35 28	SS	—	e 53.5
Scoresby Sund	120.7	2	20 15	PP	i 30 14	PS	36 57	SS 59.1
City College, N.Y.	121.5	48	e 30 23	PS	—	—	—	—
Fordham	121.5	48	—	—	e 25 56	[+ 1]	e 37 30	SS 61.4
La Paz	121.6	118	i 18 44	[-12]	i 25 52	[- 3]	i 20 50	PP 61.6
Seven Falls	121.9	41	e 20 29	PP	e 27 25	{- 1}	—	55.5
Harvard	122.8	46	—	—	e 27 46	{+13}	e 30 16	PS e 59.1
Weston	123.0	46	i 18 22	[-36]	—	—	—	—
Ivigut	124.9	18	—	—	37 30	SS	—	60.1
Upsala	125.3	340	e 24 38	?	e 30 42	PS	e 42 30	SSS e 64.1
Yalta	125.7	317	e 20 50	PP	—	—	—	—
Ksara	127.6	304	e 19 17	[+10]	e 38 46	SS	i 21 28	PP —
Warsaw	129.3	332	e 19 40?	[+29]	26 13	[- 5]	21 20	PP e 65.1
Copenhagen	130.3	340	21 25	?	22 37	PKS	42 55	SSS 67.1
Istanbul	130.5	316	e 22 6?	PKS	e 29 6?	PKKP	—	—
Bermuda	130.7	57	e 21 26	PP	e 28 34	{+10}	e 22 46	PKS e 54.8
Bucharest	131.0	321	e 21 48	PP	—	—	e 22 40	PKS —
Skalnate Pleso	131.6	328	e 21 31	PP	e 26 24	[ 0]	e 22 42	PKS —
San Juan	132.0	275	i 22 40	PKS	e 23 39	?	—	e 52.8
Helwan	132.2	300	e 19 15	[- 1]	e 22 48	PKS	21 36	PP —
Aberdeen	132.9	350	e 20 57	?	i 22 42	PKS	i 21 43	PP e 76.5
Timisoara	133.2	323	22 54	PKS	—	—	—	—
Collmberg	133.5	334	e 19 17?	[- 2]	e 29 13?	{+31}	e 21 53?	PP e 70.1
Ogyalla	133.5	328	e 22 44	PKS	e 26 12	[-16]	e 32 46	PS —
Prague	133.8	333	e 19 28?	[+ 9]	e 26 31	[+ 2]	e 21 48	PP —
Jena	134.4	335	e 21 48?	PP	e 22 44	PKS	—	—
Cheb	134.7	335	—	—	e 32 30	PS	—	—
De Bilt	135.7	341	e 19 23	[ 0]	e 26 28	[- 4]	i 21 59	PP e 63.1
Stuttgart	137.0	336	e 19 17?	[- 8]	e 28 19	[-44]	e 23 6	PKS e 72.1
Rathfarnham Castle	137.3	351	e 22 14	PP	e 32 48	PS	e 24 37	PPP e 65.1
Kew	137.8	345	e 19 25	[- 2]	e 29 29	{+21}	e 22 5	PP e 63.1

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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.
Strasbourg	137.8	337	e 19 29	[+ 2]	e 29 33	{+ 25}	e 22 7	PP e 66.1
Taranto	138.6	321	19 27	[- 1]	e 27 57	?	—	54.8
Paris	139.4	342	e 19 30	[+ 1]	e 40 58	SS	i 22 24	PP e 67.1
Rome	z. 140.5	323	e 19 30	[- 1]	e 29 31	{+ 7}	e 22 28	PP —
Messina	141.0	319	e 17 10?	?	e 21 15	?	—	—
Clermont-Ferrand	141.9	339	e 19 36	[+ 2]	e 23 14	PKS	e 22 34	PP 59.1
Tortosa	147.1	336	i 19 56	[+ 13]	—	—	—	e 79.1
Toledo	z. 149.5	342	e 19 51	[+ 4]	—	—	e 23 16	PP 78.5
Alicante	149.6	336	19 49	[+ 2]	26 55	{+ 2}	20 9	PKP <sub>2</sub> e 70.2
Granada	151.8	340	20 14	[+ 24]	30 14	{- 14}	24 24	PP 85.5
Malaga	z. 152.5	339	i 19 49 <sub>a</sub>	[- 2]	30 55	{+ 23}	i 23 42?	PP 70.6
Tamanrasset	z. 156.4	303	e 19 56	[ 0]	e 27 15	{+ 14}	i 20 28	PKP <sub>2</sub> —

Additional readings :—

Riverview iPPNZ = 6m.4s., iN = 9m.56s., iSSSN = 10m.57s.

Wellington PKKP?Z = 32m.3s.

Christchurch P<sub>c</sub>PZ = 9m.16s., eN = 11m.21s., eSE = 12m.2s., eSSEZ = 13m.36s., eQN = 13m.46s.

College i = 12m.38s., e = 12m.50s.

Sitka e = 24m.11s.

Berkeley iZ = 12m.35s. and 12m.51s., eZ = 19m.42s., iZ = 19m.52s. and 19m.55s., eN = 21m.38s., eZ = 23m.38s., eSSNZ = 29m.0s., eSKP, PKPZ = 42m.24s.

Santa Clara ePKKPE = 30m.25s.

Fresno eE = 13m.46s., eZ = 20m.0s.

Victoria PS = 24m.37s., SS = 29m.30s.

Seattle e = 13m.24s. and 16m.37s., eSKS = 23m.21s., e = 24m.11s., ePKKP = 30m.30s., e = 37m.16s.

Tucson eSS? = 30m.57s.

New Delhi iN = 24m.19s., eN = 36m.47s.

Logan e = 13m.35s. and 25m.42s., eSS? = 31m.38s.

Stalinabad eSS = 32m.48s.

Sverdlovsk ePS = 28m.4s.

St. Louis ePS = 28m.31s.

Cleveland ePSE = 29m.31s., eSS?E = 36m.28s.

Huancayo e = 30m.53s., eQ = 47m.43s.

Scoresby Sund 22m.48s., 30m.28s., 33m.0s., 41m.44s., 44m.12s., and 49m.6s.

Harvard eSS = 37m.46s.

Upsala ePSN = 30m.47s., eE = 33m.55s. and 48m.34s., eN = 49m.36s.

Ksara e = 33m.34s.

Warsaw SKP = 22m.36s., PPP = 23m.54s., PKKP = 28m.51s., e = 29m.40s., eN = 30m.22s., eE = 30m.49s., PSZ = 31m.19s., PPS = 32m.53s., SS = 38m.44s., e = 46m.3s.

Bermuda ePPS = 33m.6s., eSS = 38m.46s.

Skalnate Pleso e = 23m.50s. and 30m.11s., eE = 31m.45s., ePSE = 32m.17s., eE = 33m.19s., ePPSE = 33m.35s., eSS = 39m.11s.

Helwan eZ = 23m.15s., 29m.6s., and 32m.6s., eN = 46m.36s.

Aberdeen iPPPE = 24m.42s., eSN = 30m.7s., iSSE = 39m.40s.

Ogyalla e = 29m.45s., ePPS = 33m.48s.

Prague eSKKS = 26m.41s., ePS = 31m.59s., ePPS = 33m.16s., eSS = 39m.30s., eSSS? = 45m.24s.

De Bilt iPPP = 24m.57s., eSKKS = 29m.17s., eSS = 39m.6s.?, eSSS = 45m.6s.?

Stuttgart ePKPZ = 19m.24s., eZ = 19m.45s., ePP = 22m.6s., ePPP = 25m.41s., e = 29m.43s., eS = 30m.30s., ePPS = 34m.0s., eZ = 36m.48s., eSS = 39m.36s.

Rathfarnham Castle eEN = 28m.5s., 42m.16s., and 52m.38s.

Kew eZ = 19m.46s., e = 31m.13s., eSKSP? = 33m.1s., eSS?Z = 43m.11s., e = 52m.41s.

Strasbourg e = 23m.10s. and 23m.39s., ePPP = 25m.15s., e = 28m.41s., eS? = 30m.15s., ePS = 32m.32s., e = 33m.27s., ePPS = 34m.0s., eSS = 40m.12s.

Taranto e = 30m.17s. and 47m.27s.

Paris e = 19m.42s. and 21m.46s., ePPP = 25m.30s., i = 30m.20s., ePPS = 34m.39s., e = 41m.36s., eSSS? = 45m.58s.,

Rome eSSE = 40m.19s.

Messina e = 17m.32s.?

Clermont-Ferrand ePPP? = 25m.32s., ePS = 32m.50s., ePPS = 34m.33s., eSS? = 40m.35s.

Alicante PP = 23m.27s., PPP = 26m.31s., PPS = 36m.5s., SS = 42m.33s., SSP = 43m.27s., Q = 62m.27s.

Malaga PPPZ = 27m.17s., QZ = 62m.27s.

Tamanrasset eZ = 20m.6s., ePPZ = 24m.8s., ePPPZ = 27m.38s., eSKKSZ = 30m.42s., eSKSP?Z = 34m.8s.

Long waves were also recorded at Kaimata, Kodaikanal, Halifax, Washington, Budapest, Helsinki, and Bergen.

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July 7d. 16h. 54m. 11s. Epicentre 11°·2S. 163°·9E. (as at 16h. 46m.).

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Brisbane	z.	19·2	211	i 4 25 <sub>a</sub>	- 3	e 8 10	+11	—	—
Apia		23·9	99	e 5 17	+ 1	e 10 44	+74	—	e 12·8
Riverview		25·4	204	i 5 35 <sub>a</sub>	+ 4	i 9 54	- 2	—	—
Bandong		55·7	269	e 10 0	+20	e 18 9	+43	—	—
College		84·0	18	e 12 28	- 5	—	—	—	—
Lick	z.	84·7	49	e 12 37 <sub>k</sub>	0	—	—	—	—
Shasta Dam		85·2	47	i 12 40	+ 1	—	—	—	—
Pasadena		86·4	54	i 12 45	0	—	—	—	—
Riverside		87·0	54	i 12 47	- 1	—	—	—	—
Haiwee	z.	87·1	52	i 12 50	+ 1	—	—	—	—
Tinemaha		87·2	51	i 12 50	+ 1	—	—	—	—
Victoria	z.	87·2	39	e 12 8	-41	—	—	—	—
Seattle		87·5	40	e 12 52	+ 1	—	—	—	—
Boulder City		89·5	53	i 13 2	+ 2	—	—	e 16 31	PP
Overton	z.	90·0	53	i 13 3	0	—	—	i 16 35	PP
Pierce Ferry		90·2	53	i 13 4	0	—	—	i 16 37	PP
Tucson		91·9	57	e 13 16	+ 5	—	—	—	—
Hungry Horse		93·1	41	i 13 15	- 2	—	—	—	—
Logan		93·1	48	e 13 18	+ 1	—	—	—	—
Timisoara	E.	133·2	323	i 22 9	PP	—	—	—	—
Collmberg	z.	133·5	334	e 19 19?	[ 0]	—	—	—	—
Prague	z.	133·8	333	e 19 28	[+ 9]	—	—	—	—
Stuttgart	z.	137·0	336	e 19 24	[- 1]	—	—	—	—
Toledo	z.	149·5	342	i 19 51	[+ 4]	—	—	—	—

Additional readings :—

Brisbane iZ = 4m.36s.  
 College i = 12m.39s., e = 13m.31s.  
 Lick iZ = 12m.41s., eZ = 13m.11s.  
 Seattle e = 13m.19s. and 13m.31s.  
 Timisoara ePN = 22m.12s.

July 7d. Readings also at 0h. (Lick and Tamanrasset), 1h. (Almata, Samarkand, Stalinabad, near Andijan, Fergana, Frunse, Kulyab, Naryn, Obi-garm, Przhevalsk (2), and Tashkent), 2h. (Brisbane, Overton, and Tamanrasset), 3h. (Mount Wilson, Palomar, Riverside, Tinemaha, Tucson, Overton, Pierce Ferry, Frunse, Kulyab, Samarkand, near Andijan, Fergana, Naryn, Obi-garm, and Przhevalsk), 4h. (near Overton and Pierce Ferry), 5h. (Palomar (2), Tinemaha (2), Tucson (2), Overton (2), Pierce Ferry (2), Berkeley (2), Seattle, and Hungry Horse), 10h. (Samarkand, Stalinabad, near Andijan, Fergana, Kulyab, Obi-garm, and near Huancayo), 11h. (Barcelona, Boulder City, near Overton, and Pierce Ferry, Frunse and near Andijan), 13h. (Mizusawa), 14h. (Pierce Ferry), 15h. (Apia, and Pierce Ferry), 16h. (Prague, College, Overton, Pierce Ferry, near Obi-garm (2), and near Apia), 17h. (Brisbane (2), Mount Wilson, Riverside, Tinemaha, Pierce Ferry, and near Athens), 20h. (Brisbane, and Pierce Ferry), 22h. (Overton, College, Kulyab (2), near Obi-garm (2), and near Apia), 23h. (Almata, Frunse, Kulyab, Samarkand, Mary, near Andijan, Fergana, Obi-garm, Stalinabad, Tashkent, Boulder City, near Oaxaca, Puebla, Tacubaya, and Vera Cruz).

July 8d. 3h. 31m. 34s. Epicentre 33°·5S. 179°·0W. (as on 1949, October 30d.).

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

		$\Delta$	Az.	P.	O-C.	S.	O-C.
		°	°	m. s.	s.	m. s.	s.
Tuai	N.	6·2	209	1 37	+ 2	2 38	-10
New Plymouth	E.	7·9	223	1 56	- 3	—	—
Wellington		9·2	211	2 14	- 2	3 45	-18
Cobb River	E.	10·0	218	e 2 33	+ 6	e 4 3	-19
Kaimata	N.E.	11·8	217	e 2 54	+ 1	e 4 54	-12
Brisbane	z.	24·8	277	e 5 25	0	—	—
Pasadena	z.	88·2	46	i 13 0 <sub>a</sub>	+ 6	—	—
Lick	z.	88·4	42	e 13 1 <sub>k</sub>	+ 6	—	—
Palomar	z.	88·5	48	i 13 3 <sub>a</sub>	+ 7	—	—
Riverside	z.	88·6	46	i 13 2 <sub>a</sub>	+ 6	—	—

Continued on next page.

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		$\Delta$	Az.	P.	O-C.	S.	O-C.
		°	°	m. s.	s.	m. s.	s.
Tinemaha	z.	90.2	44	i 13 7	+ 3	—	—
Shasta Dam		90.4	39	e 13 11	+ 7	—	—
Boulder City		91.5	46	e 13 17	+ 7	—	—
Tucson		91.6	51	e 13 17	+ 7	—	—
Overton	z.	92.1	46	i 13 20	+ 8	—	—
Pierce Ferry		92.1	47	i 13 19	+ 7	—	—
Tamanrasset	z.	168.6	200	e 20 13	[+ 5]	—	—

Additional readings :—

Tuai S reading has been reduced by 5m.

Kalmata eNE = 4m.43s.

Brisbane iZ = 5m.58s.

Pasadena eZ = 13m.19s.

Palomar iZ = 13m.24s.

Riverside eZ = 13m.23s.

July 8d. 7h. 7m. 25s. Epicentre 39°·3N. 25°·8E.

Sensible in the Island of Lesbos. Intensity VII at Vatoussa; VI at Eressos and Scalochori; V-VI at Petra and Molyvdos; IV-V at Phylia and Stypsi. Epicentre as adopted.

A. Galanopoulos.

Seismo. Instit. Bull., 1950, Athens, 1951, p. 19, with separate macroseismic chart.

A = +·6986, B = +·3377, C = +·6308;  $\delta = -1$ ;  $h = -1$ ;  
D = +·435, E = -·900; G = +·568, H = +·275, K = -·776.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Athens		2.1	231	e 0 39	+ 2	e 1 8	+ 4	e 1 12	S <sub>g</sub>
Istanbul		3.0	55	e 0 43	- 7	i 1 29	+ 2	—	—
Sofia		3.9	332	e 0 59	- 3	e 2 4	S <sub>g</sub>	e 1 21	P <sub>g</sub>
Timisoara		7.3	334	e 0 35?	?	—	—	—	e 3.9
Budapest		9.5	331	e 5 7	S <sub>g</sub>	—	—	—	e 5.8
Ksara		9.8	121	4 52?	S*	e 6 17	L	—	— (e 6.3)
Prague		13.4	327	e 3 20	+ 6	e 5 56?	+11	—	—
Stuttgart		15.2	314	e 3 41	+ 3	—	—	—	e 8.3
Strasbourg		15.9	312	e 3 53?	+ 6	—	—	e 4 0	PP e 8.6
Clermont-Ferrand		17.9	298	e 4 16	+ 4	e 5 54	?	—	—
Tamanrasset	z.	23.8	232	e 5 15	0	—	—	e 5 50	PP
Hungry Horse		85.7	335	i 12 37	- 5	—	—	—	—

Additional readings :—

Athens i = 0m.45s. and 1m.15s.

Budapest eE = 5m.30s.

Strasbourg e = 4m.5s.

Tamanrasset iPZ = 5m.18s., eZ = 5m.35s. and 5m.44s.

Long waves were also recorded at Rome, Warsaw, Paris, De Bilt, Kew, and Scoresby Sund.

July 8d. Readings also at 0h. (Tucson), 1h. (La Paz and Harvard), 2h. (near Obi-garm), 4h. (Collimberg, Prague, Stuttgart, Kulyab, near Obi-garm, Stalinabad, and near Balboa Heights), 5h. (Obi-garm, Stalinabad, and near Kulyab), 9h. (Almata, Frunse, Naryn, Przhevalsk, Samarkand, near Fergana, Murgab, Kulyab, Obi-garm, Stalinabad, and Tashkent), 10h. (Lick), 11h. (Nanking), 13h. (Upsala, Frunse, Mary, Naryn, Przhevalsk, near Andijan, Fergana, Kulyab (2), Murgab (2), Obi-garm (3), Samarkand, Stalinabad, and Tashkent), 15h. (La Plata), 16h. (Ottawa), 17h. (Pierce Ferry, College (2), and near Apia), 18h. (Christchurch, Wellington, La Paz, Mount Wilson, Palomar, Riverside, Tinemaha, Tucson, Pierce Ferry, Shasta Dam, Hungry Horse, Tamanrasset, Frunse, Mary, Naryn, near Andijan, Fergana, Kulyab, Murgab, Obi-garm, Samarkand, Stalinabad, and Tashkent), 19h. (Brisbane, Riverview, New Delhi, Almata, Ashkabad, Frunse, Mary, Naryn, Tashkent, near Andijan, Fergana, Kulyab, Murgab, Obi-garm, Samarkand, and Stalinabad), 20h. (Christchurch, Wellington, Palomar, Pasadena, Riverside, Pierce Ferry, Lick (2), Shasta Dam, Hungry Horse, and College), 21h. (Collimberg, Jena, Prague, Stuttgart, Granada, and near Trieste), 22h. (Stuttgart), 23h. (Overton, Prague, Almata, Frunse, Mary, near Andijan, Fergana, Kulyab, Murgab, Obi-garm, Samarkand, Stalinabad, and Tashkent)



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July 9d. 0h. 3m. 2s. Epicentre 10°·0S. 161°·1E. (as on 1947, February 7d.).

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

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Brisbane	19·0	202	i 4 22	- 4	i 8 3	+ 8	—	—
Riverview	25·4	199	i 6 11	PP	i 10 2	+ 6	i 11 7	SSS e 12·5
Apia	26·8	99	e 5 4?	-40	—	—	—	e 13·3
Guam	28·4	323	6 2	+ 4	—	—	—	—
Wellington	33·4	162	—	—	e 11 55	- 8	—	e 17·0
Christchurch	34·9	165	—	—	e 13 13	?	e 15 13	SSS —
Perth	47·1	235	—	—	i 18 33	SS	—	—
College	83·8	19	i 12 30	- 2	e 22 52	- 3	—	e 33·2
Sitka	84·5	29	—	—	e 23 8	+ 6	—	e 34·7
Berkeley	85·7	50	i 12 43 <sub>a</sub>	+ 1	e 23 10	- 4	e 36 34	Q e 41·6
Lick	z. 86·1	50	e 12 45 <sub>k</sub>	+ 1	—	—	—	—
Shasta Dam	86·4	47	e 12 46	+ 1	—	—	—	—
Fresno	z. 87·3	52	e 12 52 <sub>a</sub>	+ 2	—	—	—	—
Pasadena	z. 88·0	54	i 12 55	+ 2	—	—	—	e 42·0
Victoria	88·0	40	—	—	e 23 40	+ 4	—	—
Seattle	88·4	41	—	—	e 23 23	[ 0]	e 23 48	S e 42·0
Haiwee	z. 88·6	52	i 12 59	+ 3	—	—	—	—
Riverside	z. 88·6	54	i 12 57	+ 1	—	—	—	—
Tinemaha	z. 88·6	51	i 12 58	+ 2	—	—	—	—
Palomar	z. 88·9	56	i 13 0	+ 2	—	—	—	—
Boulder City	91·1	53	e 13 8	0	—	—	e 16 39	PP —
Overton	z. 91·5	53	i 13 11	+ 1	—	—	i 16 55	PP —
Pierce Ferry	91·7	53	i 13 7	- 3	—	—	e 16 50	PP —
Tucson	93·6	57	e 13 23	+ 4	—	—	—	e 42·9
Hungry Horse	94·0	41	e 13 21	0	—	—	—	—
Scoresby Sund	119·5	2	—	—	27 10	{ 0}	—	—
Ksara	124·6	304	e 20 50	PP	—	—	—	—
La Paz	124·6	118	e 19 4	[+ 2]	26 10	[+ 5]	i 27 42	SKKS —
Istanbul	127·7	315	e 20 58	PP	—	—	e 23 58?	PPP —
Helwan	z. 129·3	301	e 21 16	PP	—	—	—	—
Prague	131·5	332	e 21 38	PP	—	—	e 24 48	PPP —
Alicante	147·3	333	19 31	[-12]	35 35	PPS	47 21	SSS e 67·4
Granada	149·6	340	19 58 <sub>k</sub>	[+11]	37 45	?	43 10	SSP 59·1
Tamanrasset	z. 153·4	302	e 19 49	[- 3]	—	—	e 19 32	? —

Additional readings :—

Riverview ISS?N = 11m.10s.

Apia eE = 6m.4s.?

Berkeley eZ = 12m.53s.

Lick iZ = 12m.48s. and 13m.32s.

Boulder City e = 14m.32s.

La Paz PPZ = 20m.16s., PKS = 22m.49s.

Helwan eZ = 21m.22s.

Prague e = 23m.31s.

Tamanrasset ePKP<sub>2</sub>Z = 21m.9s.

Long waves were also recorded at Honolulu, Philadelphia, Seven Falls, and Bermuda.

July 9d. 0h. 28m. 21s. Epicentre 24°·9N. 63°·5E. (as on 1949, April 9d.).

A = +·4052, B = +·8127, C = +·4187;  $\delta = -2$ ;  $h = +3$ ;  
D = +·895, E = -·446; G = +·187, H = +·375, K = -·908.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Bombay	N. 10·5	123	e 2 55	+20	e 5 12	+37	—	6·7
Poona	E. 11·5	121	e 3 8	+20	i 5 35	+36	—	—
Mary	12·7	354	e 3 12	+ 7	—	—	—	—
New Delhi	E. 12·8	70	i 3 3 <sub>k</sub>	- 3	5 26	- 4	5 52	SS 5·2
Ashkabad	13·7	343	e 3 21	+ 3	6 3	+11	—	—
Kulyab	14·0	20	e 3 23	+ 1	—	—	—	—
Stalinabad	14·3	17	i 3 27	+ 1	i 6 20	+14	—	—
Obi-garm	14·7	19	i 3 31	0	i 6 25	+ 9	—	—
Samarkand	15·0	10	e 3 36	+ 1	e 6 34	+11	—	—
Murgab	16·1	31	3 50	+ 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.
Fergana		16.9	22	i 3 58	- 1	—	—	—	—
Tashkent		17.1	15	i 4 0	- 2	i 7 18	+ 6	—	—
Andijan		17.4	23	i 4 6	0	7 25	+ 6	—	—
Baku		19.2	327	e 4 29?	+ 1	—	—	—	—
Naryn		19.5	30	i 4 31	0	i 7 9	-57	—	—
Kodaikanal	E.	19.7	135	4 57	PP	8 56	SSS	10 9	11.2
Shemakla		20.0	327	i 4 36	- 1	i 8 12	- 5	i 5 34	PPP
Frunse		20.1	24	e 4 40	+ 2	—	—	—	—
Almata		21.4	27	i 4 53	+ 2	8 48?	+ 3	—	—
Przhevalsk		21.4	31	i 4 54?	+ 3	8 58?	+13	—	—
Erevan		22.0	319	e 4 59	+ 1	—	—	—	—
Leninakan		22.8	319	e 5 12?	+ 7	—	—	—	—
Tiflis		22.8	322	i 5 6	+ 1	i 9 14	+ 3	—	—
Calcutta	E.	22.9	90	i 5 14k	+ 8	i 9 30	+17	e 5 51	PPP
Gori		23.4	322	5 14	+ 3	e 9 26	+ 5	—	—
Grozny		23.4	326	5 12	+ 1	e 9 23	+ 2	—	—
Borzhom		23.7	322	5 17	+ 3	—	—	—	—
Colombo	E.	23.8	137	e 5 35	+20	9 51	+23	—	13.0
Abastumanj		24.0	321	5 17	0	—	—	—	—
Zugdidi		25.0	321	5 32	+ 5	—	—	—	—
Piatigorsk		25.3	324	5 28	- 2	—	—	—	—
Ksara		25.6	297	i 5 30	- 2	10 27	+28	—	—
Sotchi		26.9	320	e 5 48	+ 3	e 10 21	+ 1	—	—
Sempalatinsk		28.6	23	e 5 58	- 2	—	—	—	—
Helwan		28.9	288	6 3	0	10 51	- 2	6 24	pP
Theodosia		30.3	319	e 6 15?	0	—	—	—	—
Yalta		30.8	317	6 17	- 3	11 16	- 7	—	—
Sverdlovsk		32.0	357	i 6 29	- 1	11 41	- 1	—	—
Istanbul		32.8	308	e 6 34	- 3	—	—	—	—
Kishinev		35.3	319	i 6 56	- 3	—	—	—	—
Bucharest		36.0	313	e 6 57	- 8	e 12 51	+ 7	e 7 4	P
Moscow		36.2	336	7 4	- 2	12 40	- 7	—	—
Timisoara		39.7	312	7 45	+ 9	—	—	—	—
Irkutsk		41.2	38	7 51	+ 3	e 14 5	+ 3	—	—
Skalnate Pleso		41.4	318	e 7 52	+ 2	e 14 5	0	e 9 35	PP
Taranto		41.4	304	e 9 18	PP	e 13 43	-22	—	—
Pulkovo		41.8	337	i 7 51	- 2	e 14 12	+ 1	—	—
Warsaw		42.1	322	e 7 56k	+ 1	14 14	- 2	9 34	PP
Raciborz	Z.	43.0	319	e 7 55	- 8	—	—	—	e 22.6
Triest		44.8	311	e 8 16	- 1	i 14 46	- 9	e 8 24	pP
Rome		45.2	306	e 8 19a	- 1	i 14 55	- 6	e 9 56	PP
Prague		45.3	318	e 8 21	0	e 14 56	- 6	e 10 0	PP
Tananarive		46.2	202	—	—	14 59	-16	—	—
Bologna		46.3	310	e 8 29	0	—	—	e 8 57	?
Florence Arc.		46.3	308	e 8 28	- 1	e 15 6	-10	e 10 36	PP
Florence Xim		46.3	308	e 8 27	- 2	e 15 15	- 1	—	—
Prato		46.4	308	e 8 31	+ 1	e 15 32	+14	—	—
Cheb		46.5	317	e 8 28	- 3	e 15 8	-11	e 10 6	PP
Collenberg		46.5	319	e 8 30	- 1	e 15 17	- 2	e 10 23	PP
Potsdam		46.7	320	e 8 39	+ 7	—	—	—	e 27.6
Upsala		47.1	330	i 8 34	- 1	e 15 21	- 7	e 10 22	PP
Jena	E.	47.3	318	e 8 36	- 1	e 15 23	- 8	e 10 30	PP
Copenhagen		48.1	324	e 8 43	0	15 38	- 4	10 39	PP
Stuttgart		48.4	315	e 8 43a	- 3	e 15 38	- 8	e 10 37	PP
Zürich		48.6	313	e 8 44a	- 3	e 15 39	-10	e 10 38	PP
Basle		49.3	313	e 8 53	0	—	—	e 10 50	PP
Strasbourg		49.3	315	e 8 49	- 4	e 15 55	- 4	e 10 43	PP
Besançon		50.3	312	e 8 59	- 1	—	—	e 10 10	PcP
De Bilt		51.4	319	e 9 8	- 1	e 16 25	- 3	e 11 12	PP
Clermont-Ferrand		52.2	310	e 9 15	0	e 16 36	- 3	e 20 26	SS
Algiers Univ.	Z.	52.5	298	e 9 14	- 3	—	—	—	—
Tamanrasset	Z.	52.7	282	e 9 18	0	e 16 42	- 4	e 11 15	PP
Paris		52.8	314	i 9 16	- 3	e 16 42	- 5	i 9 26	pP
Tortosa		54.1	303	i 9 21	- 8	i 17 1	- 4	—	—
Kew		54.7	317	e 9 32	- 1	e 17 8	- 5	e 10 33	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.
Alicante		55.1	301	e 9 32	- 4	i 17 28	+10	17 46	PPS e 27.7
Durham	E.	55.7	321	—	—	e 17 22	- 4	e 17 51	PPS —
Aberdeen	E.	56.3	324	—	—	e 17 37	+ 3	—	e 34.6
Granada		57.7	300	9 56k	+ 1	e 18 26	PPS	10 41	PcP —
Vladivostok		58.0	54	i 9 56	- 1	—	—	—	—
Malaga	z.	58.4	300	i 9 58k	- 2	e 19 20	S <sub>c</sub> S	—	— 34.5
Pretoria	z.	60.8	217	i 10 19	+ 3	—	—	—	—
Pietermaritzburg	z.	62.8	212	e 9 32	-58	—	—	—	—
Scoresby Sund		65.3	339	i 10 49	+ 3	i 19 31	+ 2	14 41	PPP 37.6
College		87.3	13	i 12 50	0	e 23 13	[- 3]	e 16 15	PP e 34.3
Hungry Horse		106.3	358	e 18 47	PP	—	—	—	—
Tucson		122.9	353	e 19 2	[+ 4]	—	—	—	—

Additional readings :—

Poona SSE = 5m.45s., SSSE = 5m.59s.  
 Kodaikanal iE = 5m.39s.  
 Calcutta iSSE = 10m.15s.  
 Helwan iZ = 7m.50s., eZ = 8m.51s., iEN = 11m.19s., sSN = 11m.33s., iZ = 12m.21s.  
 Skalnat Pleso e = 10m.20s.  
 Warsaw PPP = 10m.7s., SS = 17m.27s.  
 Trieste ePP = 10m.6s., iPS = 15m.7s.  
 Rome eSSN = 18m.13s.  
 Prague e = 8m.24s., 8m.43s., and 9m.12s., ePPP = 10m.21s., e = 10m.55s. and 13m.56s., eSS = 18m.24s.  
 Cheb eS = 14m.59s., eSS = 18m.3s.  
 Collimberg ePZ = 8m.39s., eZ = 9m.3s., eSE = 15m.11s., eSSN = 18m.25s.  
 Upsala ePPPE = 11m.18s., eSS = 18m.39s.?  
 Copenhagen 18m.48s.  
 Stuttgart e = 8m.51s., 9m.35s., and 15m.52s., eSS = 18m.33s., eQ = 25.6m.  
 Strasbourg i = 9m.0s., e = 9m.52s., eS<sub>c</sub>S = 18m.45s., eSS = 19m.11s., e = 19m.45s.  
 Besançon e = 9m.6s.  
 De Bilt eSS = 20m.29s.  
 Clermont-Ferrand e = 9m.23s.  
 Algiers Univ. eZ = 9m.23s.  
 Tamanrasset eZ = 11m.0s., eP<sub>c</sub>SZ = 14m.22s.  
 Paris i = 10m.4s., iP<sub>c</sub>P = 10m.39s.  
 Kew eS<sub>c</sub>SEN = 19m.36s., eSSEN = 21m.4s.  
 Alicante PPP = 10m.16s., S<sub>c</sub>S = 19m.0s., SS = 21m.26s., SSS = 23m.46s.  
 Granada PP = 12m.14s.  
 Malaga PPZ = 12m.40s., eP<sub>c</sub>SZ = 14m.32s.  
 Pretoria eZ = 10m.26s.  
 Pietermaritzburg iZ = 9m.41s.?  
 College i = 13m.0s. and 13m.24s.  
 Tucson e = 19m.11s.  
 Long waves were also recorded at Bergen and Seattle.

July 9d. 1h. 39m. 29s. Epicentre 33° 0S. 111° 5W. (as on 1950, February 18d.).

A = - .3080, B = - .7818, C = - .5421;  $\delta = -5$ ;  $h = +1$ ;  
 D = - .930, E = + .367; G = + .199, H = + .504, K = - .840.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Huancayo		39.1	67	i 7 32	+ 1	i 13 34	+ 3	i 9 8	PP i 16.4
La Paz		42.3	78	i 7 59 <sub>a</sub>	+ 2	i 14 19	0	9 39	PP 19.9
Buenos Aires		43.7	107	i 8 12	+ 4	e 14 44	+ 5	—	—
La Plata	E.	44.0	108	8 14	+ 3	14 19	-24	9 55	PcP 22.2
	N.	44.0	108	8 13	+ 2	14 13	-30	18 1	Q 22.1
	Z.	44.0	108	8 26	+15	—	—	—	22.8
Chinchina		50.8	50	i 9 21	+17	i 16 37	+17	e 10 53	PP —
Balboa Heights		51.6	43	e 8 58	-12	—	—	—	—
Bogota		51.6	51	i 9 9	- 1	i 16 32	+ 1	i 11 9	PP —
Puebla		53.3	16	e 9 28	+ 5	—	—	—	e 26.1
Tacubaya		53.4	15	e 9 21	- 3	e 16 58	+ 3	e 11 27	PP e 26.3
Vera Cruz		54.0	18	e 9 17	-11	e 20 53	SS	—	— e 26.4
Galerazamba		55.6	45	i 9 43	+ 3	i 17 30	+ 5	—	— e 25.5
Merida		57.6	25	e 10 0	+ 6	e 18 2	+11	—	—
Apia		57.8	275	i 9 50	- 5	18 19	+25	i 26 4	Q e 27.8
Wellington	z.	58.1	239	i 10 13	+15	—	—	e 8 46	? 24.8

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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.	
Christchurch		58.6	236	e 10 51	+50	18 27	+23	e 12 6	PP	24.2
Tucson		64.9	1	e 10 42	- 1	e 19 12	-12	e 13 11	PP	e 26.9
Miami		65.7	31	i 10 52	+ 4	—	—	—	—	—
Palomar		66.2	356	i 10 51	- 1	—	—	e 39 51	P'P'	—
Riverside		66.9	355	i 10 54 <sub>a</sub>	- 2	—	—	—	—	—
San Juan		67.0	47	e 10 53	- 4	e 19 42	- 8	e 14 1	PP	e 26.9
Pasadena		67.1	355	i 10 55 <sub>a</sub>	- 2	e 19 52	+ 1	e 24 13	SS	e 31.9
Roosevelt Roads		67.2	47	e 10 56	- 2	e 19 50	- 2	—	—	—
Boulder City		68.7	358	e 11 7	0	e 20 11	+ 1	e 13 36	PP	—
Pierce Ferry		68.8	359	i 11 7	- 1	—	—	—	—	—
Haiwee	z.	69.0	356	i 11 10	+ 1	—	—	—	—	—
Overton	z.	69.2	358	i 11 11	+ 1	—	—	—	—	—
Fresno		69.8	354	e 11 14 <sub>k</sub>	0	—	—	—	—	—
Honolulu		70.0	315	i 11 39	P <sub>c</sub> P	e 20 41	+15	—	—	e 30.6
Tinemaha		70.0	355	i 11 16 <sub>a</sub>	+ 1	—	—	—	—	—
Lick	z.	70.6	352	e 11 20 <sub>a</sub>	+ 1	—	—	e 13 46	PP	—
Santa Clara		70.7	352	i 11 20	0	e 21 19	S <sub>c</sub> S	—	—	—
Berkeley		71.2	352	i 11 23 <sub>k</sub>	0	e 20 42	+ 2	e 25 28	SS	e 33.7
Columbia		72.5	27	—	—	e 20 51	- 3	—	—	—
Ukiah		72.6	352	e 11 30	- 1	e 20 57	+ 1	e 25 46	SS	e 33.1
Salt Lake City		73.4	1	e 10 33	-63	e 21 3	- 2	e 14 19	PP	—
St. Louis		74.0	17	e 11 37	- 2	e 21 7	- 4	—	—	—
Shasta Dam		74.0	352	i 11 39	0	—	—	—	—	—
Arcata		74.4	352	e 11 41 <sub>a</sub>	- 1	e 21 19	+ 3	e 12 26	P <sub>c</sub> P	—
Logan		74.4	0	e 11 40	- 2	e 26 15	SS	e 14 48	PP	e 36.7
Lincoln	E.	74.7	12	—	—	e 21 16	- 3	e 29 37	SSS	e 32.7
Cincinnati		76.0	22	i 12 30	+39	—	—	—	—	e 39.6
Chicago		77.6	18	e 11 57	- 3	e 21 47	- 4	e 14 48	PP	e 37.5
Riverview		77.8	238	i 12 22 <sub>k</sub>	P <sub>c</sub> P	i 22 15	S <sub>c</sub> S	i 22 34	PS	—
Bozeman		78.3	1	e 12 3	0	e 21 59	0	e 15 3	PP	e 34.6
Washington		78.4	27	i 12 3	- 1	—	—	—	—	e 42.8
Bermuda		78.6	39	e 12 13	+ 8	e 22 9	+ 7	e 26 55	SS	e 32.7
Butte	N.	78.7	0	e 12 7	+ 1	e 22 2	- 1	e 27 9	SS	e 36.9
Cleveland		79.1	23	e 12 7 <sub>a</sub>	- 1	e 22 4	- 3	i 12 20	pP	—
Pennsylvania	N.	79.7	26	—	—	e 22 9	- 4	—	—	—
Philadelphia		80.0	28	i 12 12	- 1	e 23 15	PPS	e 15 0	PP	e 32.6
Seattle		80.9	353	e 12 19 <sub>k</sub>	+ 2	e 22 16	-10	e 15 8	PP	e 38.5
Hungry Horse		81.0	359	i 12 18	0	—	—	i 15 26	PP	—
Fordham		81.3	29	e 12 18	- 2	e 22 25	- 5	—	—	—
Victoria		81.9	352	e 12 22 <sub>a</sub>	- 1	21 59	-37	27 16	?	38.5
Harvard		83.6	29	i 12 30	- 1	e 22 45	- 8	i 12 43	P <sub>c</sub> P	e 40.5
Weston		83.6	29	i 12 31	0	i 22 51	- 2	—	—	—
Ottawa		84.5	25	i 12 36 <sub>k</sub>	0	23 4	+ 2	15 49	PP	36.6
Seven Falls	E.	87.8	27	12 51	- 1	23 22	{+ 3}	e 24 32	PS	36.7
Sitka		91.9	348	e 13 11	0	e 23 51	{+ 7}	e 30 11	SS	e 39.1
College		102.2	345	e 13 53	- 5	i 24 41	{+ 3}	e 18 3	PP	e 47.4
Scoresby Sund		120.6	23	e 20 14	PP	26 2	{+10}	36 31	SS	56.5
Malaga	z.	121.4	64	e 19 2	{+ 7}	26 0	{+ 5}	i 20 30	PP	57.9
Granada		122.2	64	e 19 3 <sub>k</sub>	{+ 6}	25 45	{-12}	i 20 33	PP	65.2
Toledo	z.	122.7	61	e 20 36	PP	—	—	—	—	—
Tamanrasset	z.	124.1	83	i 19 6 <sub>a</sub>	{+ 5}	e 22 51	PKS	i 20 48	PP	—
Rathfarnham C.	z.	124.5	44	e 21 53	?	e 31 5	PS	—	—	—
Alicante		124.9	63	19 6	{+ 4}	25 54	{-12}	20 50	PP	e 58.3
Tortosa		126.3	61	i 20 58	PP	—	—	—	—	e 65.5
Algiers Univ.	z.	127.1	67	e 19 10	{+ 4}	e 21 42	?	e 20 42	PP	—
Aberdeen	E.	127.3	40	—	—	e 22 28	PKS	i 28 9	?	e 61.3
Durham	E.	127.4	43	—	—	e 22 35	PKS	—	—	e 67.2
Kew		127.8	47	e 19 28	{+20}	e 38 36	SS	e 24 20	PPP	e 60.5
Clermont-Ferrand		129.2	55	e 19 15	{+ 5}	e 22 47	PKS	e 33 15	PPS	66.5
Paris		129.2	51	i 19 14	{+ 4}	e 22 36	PKS	e 21 21	PP	e 70.5
Vladivostok		130.1	58	e 19 32	{+20}	28 31	{+10}	i 21 42	PP	—
Bergen	E.	131.2	35	—	—	e 22 30 <sub>?</sub>	PKS	—	—	—
De Bilt		131.3	47	e 19 18	{+ 4}	e 22 46	PKS	e 21 28	PP	e 60.5
Besançon		131.4	54	e 19 18	{+ 3}	—	—	—	—	—
Basle		132.5	53	e 19 18	{+ 1}	e 22 53	PKS	—	—	—

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.
Strasbourg	132.7	52	e 19 21	[+ 4]	e 22 45	SKP	e 21 35	PP e 61.5
Zürich	133.1	53	e 19 22	[+ 4]	—	—	e 21 40	PP —
Stuttgart	133.7	52	e 19 23 <sub>a</sub>	[+ 4]	e 22 54	SKP	e 39 31	SS e 55.5
Jena	135.2	49	e 19 26	[+ 4]	e 22 58	PKS	—	—
Rome	135.3	61	e 19 26	[+ 4]	e 26 22	[- 9]	i 22 6	PP —
Copenhagen	135.4	41	i 19 25	[+ 3]	—	—	21 55	PP 68.5
Cheb	135.8	49	e 19 41	[+18]	e 26 28	[- 4]	e 22 1	PP —
Collmberg	136.1	48	e 19 27	[+ 4]	e 22 59	PKS	e 22 3	PP —
Triest	136.6	56	e 19 30	[+ 6]	e 23 2	SKP	e 22 6	PP —
Messina	137.1	67	e 21 42	PP	—	—	—	—
Prague	137.1	49	e 19 31	[+ 6]	e 26 45	[+11]	e 22 4	PP —
Upsala	137.4	35	i 19 42	[+16]	e 22 58	PKS	e 22 13	PP e 63.0
Raciborzu	z. 139.5	49	e 19 31	[+ 1]	—	—	—	—
Skalnate Pleso	140.9	50	e 22 35	PP	e 23 27	SKP	e 25 58	PPP —
Warsaw	141.0	45	e 19 30	[- 2]	e 23 13	SKP	e 22 24	PPP e 75.5
Timisoara	141.8	57	20 31?	?	—	—	21 31?	? —
Pulkovo	143.3	31	19 34	[- 2]	—	—	—	—
Bucharest	145.4	58	e 19 42	[+ 2]	—	—	—	—
Kishinev	146.9	52	i 19 46	[+ 4]	—	—	—	—
Istanbul	147.7	64	i 19 38	[- 6]	—	—	e 19 25	? —
Irkutsk	147.8	41	19 49	[+ 5]	30 15	[+ 9]	—	—
Helwan	z. 148.2	86	i 19 50 <sub>a</sub>	[+ 5]	26 46	[- 5]	23 22	SKP —
Moscow	148.8	34	i 19 49	[+ 4]	—	—	i 23 15	PP —
Yalta	151.1	57	19 54	[+ 5]	—	—	23 31	PP —
Theodosia	151.8	55	e 20 0	[+10]	—	—	—	—
Ksara	152.8	80	i 19 58	[+ 6]	—	—	23 21	PP —
Sverdlovsk	155.6	10	i 19 59	[+ 4]	i 27 4	[+ 4]	i 20 15	PKP <sub>2</sub> —
Zugdidi	157.0	58	e 20 7	[+10]	—	—	—	—
Abastumanj	157.9	59	e 20 9	[+11]	—	—	—	—
Gori	158.7	59	e 20 7	[+ 8]	—	—	—	—
Leninakan	158.9	60	e 20 19	[+19]	—	—	—	—
Tiflis	159.3	59	e 20 6	[+ 6]	—	—	i 24 20	PP —
Grozny	159.4	53	e 20 13	[+13]	—	—	—	—
Shemakla	162.4	58	i 20 11	[+ 8]	—	—	—	—
Baku	163.4	58	e 20 13	[+ 9]	—	—	—	—
Bombay	165.4	197	—	—	e 45 31?	SS	—	— e 79.5
Przhevalsk	167.7	34	e 20 14	[+ 6]	—	—	e 25 6	PP —
Almata	167.8	29	20 14	[+ 6]	—	—	—	—
Naryn	169.7	33	i 20 26	[+17]	—	—	—	—
New Delhi	n. 171.3	—	e 25 42	PP	—	—	e 26 52	? —
Andijan	171.7	—	20 15	[+ 5]	—	—	e 25 31	PP —
Tashkent	171.7	—	i 20 17	[+ 7]	e 27 30	[+18]	e 21 36	PKP <sub>2</sub> —
Fergana	172.2	—	i 20 16	[+ 6]	—	—	i 25 27	PP —
Mary	172.9	—	20 29	[+18]	—	—	—	—
Samarkand	173.2	—	e 20 15	[+ 4]	—	—	—	—
Obi-garm	174.2	—	i 20 18	[+ 7]	—	—	e 25 59?	PP —
Stalinabad	174.5	—	20 20	[+ 9]	—	—	21 39	PKP <sub>2</sub> —

Additional readings :—

La Paz PePZ = 9m.53s., iSS = 17m.35s., iScS = 18m.5s.  
 La Plata N = 8m.25s., E = 18m.1s., Q?E = 19m.19s.  
 Chinchina e = 9m.37s., eSS = 20m.13s., eSSS = 21m.50s.  
 Bogota iSSEN = 20m.12s.  
 Puebla eP = 9m.36s.  
 Tacubaya ePPP = 12m.26s., e = 17m.25s.  
 Wellington PPZ = 11m.19s., PPPZ = 12m.26s., ScPZ = 15m.31s., SSZ = 19m.46s.  
 Christchurch eZ = 16m.36s., eEN = 20m.27s., eSS?N = 22m.11s.  
 Tucson e = 12m.37s., ePPP = 14m.48s., eSS = 23m.38s.  
 Miami e = 14m.14s., i = 16m.14s.  
 Pasadena eSSSE = 28m.43s.  
 Boulder City i = 11m.21s.  
 Fresno eN = 11m.55s., eE = 13m.1s., eNZ = 17m.27s., eZ = 22m.44s.  
 Lick iZ = 11m.30s., eZ = 15m.57s.  
 Berkeley iZ = 11m.33s. and 11m.59s., eN = 13m.26s., iZ = 14m.33s., ePPPE = 16m.29s.,  
 eQE = 30m.28s.  
 Salt Lake City eL = 25m.15s.  
 Logan e = 23m.35s.  
 Chicago eSS = 26m.41s.

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Riverview eE = 24m.52s.  
 Bozeman eSS = 27m.3s.  
 Bermuda eSSS = 30m.36s.  
 Cleveland esPE = 12m.27s., eN = 22m.8s., esSN = 22m.25s., iPSE = 22m.43s., esPSE = 23m.7s.  
 Philadelphia e = 24m.5s.  
 Seattle e = 12m.35s., 12m.55s., and 14m.8s., eScS = 22m.29s., ePS = 23m.11s., ePPS = 23m.36s., eSS = 27m.55s.  
 Hungry Horse ePKP, PKP = 39m.7s.  
 Ottawa SKSN = 22m.55s., SS = 28m.29s.  
 Sitka eSSS = 34m.15s.  
 College ePS = 26m.59s., eSS = 32m.41s.  
 Scoresby Sund 23m.13s., 30m.10s.  
 Malaga PPPZ = 22m.52s.  
 Granada SKKS = 27m.42s., PS = 30m.33s., PPS = 31m.42s., iSS = 37m.42s., SSS = 42m.45s.  
 Tamanrasset iZ = 19m.16s., eZ = 20m.42s., ePPPZ = 23m.36s., ePS?Z = 31m.40s., ePPSZ = 32m.36s.  
 Rathfarnham Castle eEN = 34m.37s., eZ = 39m.57s.  
 Alicante PKS = 22m.19s., PPS = 31m.52s., SSP = 37m.6s., Q = 50m.54s.  
 Kew eZ = 20m.32s.  
 Clermont-Ferrand e = 22m.39s., eSKKS? = 29m.25s., eSS? = 41m.15s.  
 Paris i = 19m.29s., e = 20m.12s., 21m.51s., and 25m.9s.  
 Vladivostok ePKS = 22m.46s.  
 De Bilt ePS = 31m.43s., eSS = 39m.31s.?  
 Besançon e = 19m.32s.  
 Strasbourg e = 19m.35s., 23m.2s., 23m.28s., 28m.51s., and 30m.5s., ePS = 31m.40s., ePPS = 33m.38s., e = 34m.38s. and 41m.39s., eSSS = 44m.1s.  
 Zürich iPKP = 19m.35s.  
 Stuttgart eZ = 19m.38s., 20m.45s., and 23m.39s., eSSS = 44m.25s.  
 Jena eN = 19m.40s., ePP?E = 23m.40s.  
 Rome eZ = 20m.43s., iPPE = 22m.21s., iSKPE = 22m.56s., eSKKSE = 29m.2s., eSS?E = 39m.39s.  
 Cheb e = 22m.46s., eSKP = 22m.57s., e = 29m.3s., eSKSP = 32m.25s., e = 33m.47s.  
 Collmburg eZ = 23m.5s.  
 Trieste ePPS = 34m.46s., eSS = 40m.2s.  
 Prague e = 19m.55s., 20m.6s., 20m.43s., and 22m.25s., eSKP? = 23m.15s., e = 23m.48s., ePPP? = 24m.41s., e = 26m.9s., ePS = 32m.49s., eSS = 40m.25s., eSSS = 45m.49s.  
 Upsala ePP?N = 22m.25s., ePPPE = 25m.19s., e = 30m.31s.?, eE = 35m.13s., eSSE = 39m.55s., eN = 53m.31s.?  
 Skalnaté Pleso e = 24m.43s., eN = 26m.45s., eE = 28m.0s., e = 31m.48s., eSKSP = 33m.2s., e = 33m.50s., and 35m.9s.  
 Warsaw ePPP = 25m.32s., eE = 28m.11s., ePKKSE = 31m.3s., ePPS = 35m.4s., e = 38m.12s., eSS = 41m.16s.  
 Helwan iPKP, Z = 20m.13s., eZ = 20m.58s., 21m.37s., 22m.35s., 23m.40s., and 25m.44s.  
 Sverdlovsk iPP = 23m.59s., iSKKS = 30m.51s., eSS = 43m.46s., eSSS = 48m.31s.  
 Tashkent iPP = 25m.24s.  
 Long waves were also recorded at Guadalajara, Potsdam, and Edinburgh.

July 9d. 2h. 35m. 29s. Epicentre 7°·9N. 72°·6W.

Destructive earthquake of intensity X at Arboledas; IX at Cucutilla; VIII at Salazar with much damage and 126 dead and 40 injured; VII at Pamplona, etc.; VI at California; IV-V at Cucuta, San Cristobal, and Bucumaranga.  
 Epicentre 7°38'N. 72°47'W.

J. Ramirez.

El terremoto de Arboledas, Cucutilla y Salazar de las Palmas, 8 de Julio, 1950 (Instituto geofisico de los Andes Colombianos, Serie A Sismologia, Boletin No. 10, Bogota, June, 1953. 92 pp., 44 maps and figures, 2 tables with isoseismic chart p. 14.

$$A = +.2962, B = -.9453, C = +.1366; \quad \delta = -1; \quad h = +7;$$

$$D = -.954, E = -.299; \quad G = +.041, H = -.130, K = -.991.$$

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Bogota	3·6	204	i 0 58	0	i 1 39	- 3	i 1 13	P <sub>g</sub> —
Galerazamba	3·9	317	i 1 6	+ 4	i 1 52	+ 2	i 1 16	P <sub>g</sub> —
Chinchina	4·2	226	i 1 23	P <sub>g</sub>	i 2 12	S*	i 2 27	S <sub>g</sub> —
Balboa Heights	7·0	279	i 1 36	-10	i 2 49	-19	—	—
San Juan	12·2	31	e 2 56	- 2	i 5 46	SSS	—	e 6·7
Fort de France	13·1	58	e 3 12	+ 2	—	—	—	i 6·2
Miami	19·4	341	e 4 36	+ 6	i 8 18	+14	—	—
Huancayo	20·0	188	i 4 38	+ 1	i 8 25	+ 8	i 5 5	PPP —
Merida	20·9	310	i 4 37 <sub>a</sub>	- 9	e 8 35	0	—	—
La Paz	24·6	169	5 17	- 6	i 9 43	+ 1	i 9 7	P <sub>c</sub> P i 12·3

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.	
Vera Cruz	25.5	299	e 5 33	+ 1	e 9 59	+ 2	e 11 4	SS	—
Tacubaya	28.2	297	i 5 58k	+ 2	e 11 18	+37	e 12 56	P <sub>c</sub> S	e 12.9
Washington	31.1	354	i 6 24	+ 2	—	—	—	—	—
Philadelphia	32.0	357	e 6 39	+ 9	e 11 38	- 4	—	—	e 13.6
Fordham	33.4	0	i 6 38	- 4	—	—	—	—	—
Cleveland	34.4	348	i 6 52 <sub>a</sub>	+ 1	e 14 37	SS	i 8 11	PP	e 17.3
Weston	34.4	2	i 6 51	0	e 12 22	+ 3	—	—	—
Harvard	34.5	2	i 6 53	+ 1	e 12 24	+ 4	—	—	e 16.5
St. Louis	34.5	336	i 6 51	- 1	—	—	—	—	e 17.2
Chicago	36.3	340	e 7 5	- 2	—	—	e 8 28	PP	e 15.5
Lubbock	37.2	318	7 15	0	—	—	—	—	—
Ottawa	37.5	357	i 7 18k	+ 1	13 14	+ 7	8 37	PP	20.5
Shawinigan Falls	N. 38.5	0	i 7 27	+ 1	—	—	—	—	—
Seven Falls	E. 39.1	2	e 7 31	0	—	—	—	—	—
Lincoln	E. 39.2	331	e 9 1	PP	e 13 37	+ 5	—	—	e 16.6
Tucson	43.0	310	i 8 2	- 1	e 14 33	+ 4	e 9 42	PP	e 17.7
La Plata	44.8	163	—	—	e 18 49	SSS	—	—	24.3
Pierce Ferry	47.0	313	i 8 35	0	—	—	—	—	—
Overton	z. 47.5	313	i 8 41	+ 3	—	—	—	—	—
Boulder City	47.6	312	i 8 39	0	e 15 29	- 6	e 10 28	PP	—
Salt Lake City	47.8	320	e 8 43	+ 2	e 15 15	-23	e 10 33	PP	e 20.4
Palomar	48.0	309	i 8 43 <sub>a</sub>	0	e 14 3	S <sub>c</sub> P	e 10 35	PP	—
Logan	48.3	321	e 8 44	- 1	e 15 43	- 2	e 10 46	PP	e 19.9
Riverside	z. 48.7	309	i 8 47	- 1	e 14 3	S <sub>c</sub> P	i 10 45	PP	—
Pasadena	49.4	309	i 8 52	- 1	i 14 12	S <sub>c</sub> P	e 10 48	PP	—
Haiwee	z. 49.9	312	i 8 58	+ 1	—	—	—	—	—
Bozeman	50.1	326	i 8 59	0	e 16 13	+ 3	e 19 41	SS	e 21.6
Tinemaha	50.5	312	i 9 3	+ 1	—	—	—	—	—
Butte	N. 51.2	326	e 9 8	+ 1	e 16 27	+ 3	e 19 41	SS	—
Fresno	z. 51.5	312	e 9 7 <sub>a</sub>	- 2	—	—	—	—	—
Lick	z. 53.1	312	e 9 21 <sub>a</sub>	0	—	—	i 11 33	PP	—
Hungry Horse	53.3	328	i 9 22	- 1	e 16 55	+ 1	e 11 27	PP	—
Berkeley	z. 53.8	312	i 9 26k	0	—	—	—	—	—
Shasta Dam	54.9	315	i 9 31	- 4	—	—	e 11 32	PP	—
Arcata	56.2	315	e 9 43	- 1	—	—	—	—	—
Seattle	57.7	323	e 9 54 <sub>a</sub>	- 1	—	—	e 11 53	PP	—
Victoria	z. 58.8	323	i 10 3 <sub>a</sub>	+ 1	—	—	—	—	—
Malaga	z. 67.8	53	i 11 4 <sub>a</sub>	+ 2	e 20 1	+ 1	e 13 42	PP	e 33.5
Toledo	z. 68.5	50	e 11 5	- 1	—	—	—	—	—
Granada	68.6	53	11 3 <sub>a</sub>	- 4	—	—	i 13 8	PP	—
Tortosa	72.1	50	i 10 47	-41	—	—	—	—	—
Paris	74.3	42	i 11 41	0	e 21 15	0	e 14 31	PP	—
Clermont-Ferrand	74.4	45	e 11 41	- 1	—	—	—	—	—
Tamanrasset	z. 76.1	68	i 11 52 <sub>a</sub>	+ 1	e 21 32	- 3	e 14 41	PP	—
Besançon	76.5	43	e 11 51	- 3	—	—	—	—	—
College	76.6	335	i 11 53	- 1	—	—	e 14 42	PP	—
Basle	77.6	43	e 11 59	- 1	—	—	—	—	—
Strasbourg	77.7	42	e 12 0	0	e 21 54	+ 2	e 26 58	SS	—
Zürich	78.3	43	e 12 2 <sub>a</sub>	- 1	e 22 0	+ 1	—	—	—
Stuttgart	z. 78.7	42	e 12 5 <sub>a</sub>	- 1	—	—	—	—	—
Jena	80.3	40	e 12 13	- 1	—	—	e 15 21	PP	—
Collmburg	z. 81.1	39	e 12 19	+ 1	—	—	—	—	—
Rome	81.1	49	e 12 20	+ 2	—	—	—	—	—
Triest	81.9	45	—	—	e 22 38	+ 2	—	—	—
Prague	82.1	41	e 12 24	0	e 22 40	+ 2	e 15 51	PP	—
Skalnate Pleso	85.9	41	e 12 42	- 1	e 23 24	+ 8	e 18 37	PPP	—
Warsaw	86.0	38	e 12 46	+ 3	e 23 23	+ 6	e 16 16	PP	—

Additional readings :—

Bogota iP\*EN = 1m.5s.

Galerazamba i = 1m.36s.

Chinchina iP = 1m.32s., iP<sub>g</sub> = 1m.41s.

La Paz iPZ = 5m.26s., iNZ = 9m.49s.

Cleveland iZ = 6m.58s.

Harvard i = 6m.59s.,

Continued on next page.



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Shawinigan Falls eN = 7m.34s.  
 Boulder City i = 9m.12s., ePPP = 11m.4s.  
 Logan i = 11m.1s.  
 Riverside iZ = 9m.7s.  
 Pasadena iZ = 9m.23s. and 9m.54s.  
 Fresno eZ = 9m.13s., eN = 9m.39s., eE = 9m.57s.  
 Lick iZ = 9m.26s., 9m.36s., and 9m.59s.  
 Berkeley iZ = 9m.30s., eN = 9m.31s., eZ = 9m.48s.  
 Seattle e = 13m.29s., i = 13m.40s.  
 Victoria i = 10m.8s. and 10m.13s.  
 Toledo eZ = 11m.11s.  
 Paris e = 13m.51s., 21m.31s., and 25m.30s.  
 Tamanrasset iZ = 11m.57s., eP<sub>c</sub>PZ = 12m.8s., ePPPZ = 16m.23s.  
 Besançon i = 11m.58s.  
 College iPP = 14m.46s.  
 Strasbourg e = 12m.18s., i = 13m.16s. and 13m.48s.  
 Stuttgart eZ = 12m.10s.  
 Jena eN = 12m.16s. and 13m.20s., eE = 13m.50s.  
 Prague e = 12m.29s., 12m.54s., 14m.4s., and 15m.4s.  
 Long waves were also recorded at Buenos Aires.

July 9d. 3h. 28m. 59s. Epicentre 7°·9N. 72°·6W. (as at 2h.).

	$\Delta$	Az.	P.	O - C.	S.	O - C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Bogota	3·6	204	e 1 3	+ 5	i 1 30	-12	i 1 52 S*	—
Galerazamba	3·9	317	i 1 18	P <sub>g</sub>	i 2 12	S <sub>g</sub>	—	—
Chinchina	4·2	226	i 1 25	P <sub>g</sub>	i 2 14	S*	i 2 25 S <sub>g</sub>	—
Huancayo	20·0	188	e 4 35	- 2	—	—	—	—
La Paz	24·6	169	e 5 25	+ 2	—	—	—	i 12·8
Weston	34·4	2	i 6 50	- 1	—	—	—	—
Tucson	43·0	310	e 8 0	- 3	—	—	—	—
Pierce Ferry	47·0	313	i 8 33	- 2	—	—	—	—
Overton	z. 47·5	313	i 8 37	- 1	—	—	—	—
Boulder City	47·6	312	e 8 38	- 1	—	—	—	—
Palomar	z. 48·0	309	e 8 41	- 2	—	—	—	—
Riverside	z. 48·7	309	e 8 45	- 3	—	—	—	—
Hungry Horse	53·3	328	i 9 20	- 3	—	—	—	—
Shasta Dam	54·9	315	e 9 30	- 5	—	—	—	—
Iviglut	56·2	15	—	—	(19 1?)	S <sub>c</sub> S	—	19·0
Paris	74·3	42	e 11 52	+11	—	—	—	—
Tamanrasset	z. 76·1	68	e 11 49	- 2	—	—	e 14 40	PP
Strasbourg	77·7	42	e 12 3	+ 3	—	—	—	—
Prague	82·1	41	e 12 29	+ 5	e 22 51?	+13	—	—

Additional readings :—

Galerazamba iP = 1m.42s., iS<sub>g</sub>Z = 2m.27s.  
 Paris eP<sub>c</sub>P = 12m.57s., e = 18m.1s.?  
 Long waves were also recorded at San Juan.

July 9d. 3h. 34m. 27s. (i) } Epicentre 40°·7N., 29°·4W.  
 3h. 38m. 33s. (ii) } (as on 1949, December 28d.).

A = +·6624, B = -·3732, C = +·6495;  $\delta$  = -10;  $h$  = -2;  
 D = -·491, E = -·871; G = +·566, H = -·319, K = -·760.

	$\Delta$	Az.	P.	O - C.	S.	O - C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
I Lisbon	15·7	91	3 41	- 3	7 51	L	—	(7·8)
II	15·7	91	(3 41)	- 3	3 41	P	—	7·4
I Toledo	z. 19·3	85	e 4 29	0	—	—	—	e 10·0
II	z. 19·3	85	e 4 28	- 1	—	—	—	e 9·8
I Malaga	z. 19·9	93	i 4 38 <sub>a</sub>	+ 2	—	—	5 18	PPP
II	z. 19·9	93	i 4 38	+ 2	—	—	—	12·8
II Rathfarnham C.	20·1	43	i 4 48	+10	e 8 40	SS	e 7 29	?
I Granada	20·4	92	i 4 38 <sub>a</sub>	- 3	—	—	—	—
II	20·4	92	i 4 38 <sub>k</sub>	- 3	—	—	—	—
I Tortosa	22·6	80	i 4 9	-54	—	—	—	i 12·3
I Kew	22·7	52	e 5 9	+ 5	e 8 12	-57	—	—

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		$\Delta$ °	Az. °	P. m. s.	O - C. s.	S. m. s.	O - C. s.	Supp. m. s.	L. m.	
II Durham	E.	23.2	44	e 5 16	+ 7	—	—	e 5 40	PP	—
I Paris		23.9	59	—	—	i 9 31	+ 1	—	—	—
II		23.9	59	i 5 19	+ 3	—	—	e 5 43	PP	—
II Aberdeen	E.	24.1	37	e 4 19	-59	—	—	i 6 9	PPP	—
I Clermont-Ferrand		24.1	67	e 5 18	0	—	—	—	—	—
II		24.1	67	e 5 22	+ 4	—	—	—	—	—
I Algiers Univ.	Z.	25.5	89	9 17	PcP	—	—	—	—	—
II	Z.	25.5	89	e 5 34	+ 2	—	—	—	—	—
I Besançon		26.1	64	e 5 39	+ 2	—	—	—	—	—
II		26.1	64	e 5 38	+ 1	—	—	—	—	—
I De Bilt		26.2	52	(e 5 41)	+ 3	—	—	—	—	—
II		26.2	52	(e 5 39)	+ 1	—	—	—	—	—
II Basle		27.2	63	e 5 48	+ 1	—	—	—	—	—
I Strasbourg		27.4	60	e 5 48	- 1	e 10 26	- 2	e 6 7	PP	e 13.0
II		27.4	60	e 5 50	+ 1	e 10 27	- 1	—	—	—
II Zürich		27.9	63	e 5 55	+ 1	—	—	—	—	—
I Stuttgart	Z.	28.3	60	e 5 58	+ 1	—	—	—	—	—
II	Z.	28.3	60	e 5 58	+ 1	—	—	—	—	—
II Cheb		30.0	57	—	—	e 10 57	-13	—	—	—
I Collmberg	Z.	30.9	56	e 6 22?	+ 2	—	—	—	—	—
II	Z.	30.9	56	e 6 22	+ 2	—	—	—	—	—
II Rome	Z.	31.3	74	e 6 17	- 7	—	—	—	—	—
I Prague		31.8	58	e 6 30	+ 2	e 12 11	+33	e 14 22?	SSS	—
I Tamanrasset	Z.	34.4	111	e 6 50	- 1	—	—	—	—	—
II	Z.	34.4	111	e 6 48	- 3	—	—	e 8 10	PP	—
I Warsaw		35.9	53	e 6 42	-22	—	—	e 9 44	?	—
II		35.9	53	e 10 1	PcP	e 12 57	+15	—	—	e 23.4
I Ksara		51.4	76	8 33?	-36	—	—	—	—	—
II		51.4	76	e 9 9	0	—	—	—	—	—
I Hungry Horse		57.9	309	i 9 53	- 3	—	—	—	—	—
II		57.9	309	e 9 53	- 3	—	—	—	—	—
I Logan		59.6	302	e 10 8	0	—	—	e 13 13	?	—
I Tucson		63.8	292	e 10 35	- 1	—	—	—	—	—
II		63.8	292	e 10 34	- 2	—	—	—	—	e 31.0
I Overton	Z.	64.0	298	i 10 36	- 2	—	—	—	—	—
II	Z.	64.0	298	i 10 36	- 2	—	—	—	—	—
II Pierce Ferry		64.0	297	e 10 35	- 3	—	—	—	—	—
I Boulder City		64.6	297	e 10 40	- 1	—	—	—	—	—
II		64.6	297	e 10 40	- 1	—	—	—	—	—
II Tinemaha	Z.	66.3	300	e 10 52	0	—	—	—	—	—
I Shasta Dam		66.9	305	e 10 56	0	—	—	—	—	—
II		66.9	305	e 10 52	- 4	—	—	—	—	—
I Riverside	Z.	67.4	296	e 10 57	- 2	—	—	—	—	—
II	Z.	67.4	296	e 10 59	0	—	—	—	—	—
I Fresno	Z.	67.5	300	e 10 58 <sup>a</sup>	- 2	—	—	—	—	—
II	Z.	67.5	300	e 10 59	- 1	—	—	—	—	—
I Palomar	Z.	67.5	295	e 10 59	- 1	—	—	—	—	—
II	Z.	67.5	295	e 11 0	0	—	—	—	—	—
II Pasadena	Z.	67.9	296	e 11 2	0	—	—	—	—	—

Additional readings and note :—

Besançon I i = 5m.44s. ; II e = 5m.49s.  
De Bilt readings have been reduced by 9m.  
Strasbourg II e = 5m.54s. and 5m.59s.

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July 9d. 4h. 40m. 8s. Epicentre 8°·2S. 71°·0W. Depth of focus 0·100.

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.	m.	s.	m.	s.	m.
Huancayo		5·7	228	i 1	40	- 2	i 2	54	-10	i 2	24	?	—
La Paz		8·7	162	i 2	7k	- 1	i 3	44	- 6	—	—	—	—
Bogota		13·1	346	i 2	50	+ 1	i 5	24	+19	—	—	—	—
Chinchina		13·9	340	i 3	18	+21	i 5	44	+26	—	—	—	—
Balboa Heights		19·0	335	i 3	35	- 9	i 6	37	- 6	—	—	—	—
Galerazamba		19·3	348	(i 3	50)	+ 3	(i 6	50)	+ 2	(i 4	3)	PP	—
Fort de France		24·8	24	i 4	31	- 4	i 8	9	- 6	—	—	—	—
Port au Prince		26·6	358	e 4	45	- 6	i 8	41	- 2	e 7	33	?	—
Roosevelt Roads		26·8	11	e 4	51	- 2	i 14	45	ScS	e 7	33	?	—
San Juan		26·9	10	e 4	52	- 2	i 8	37	-11	i 7	42	PcP	e 9·0
Buenos Aires		28·7	157	e 5	6	- 3	i 9	9	- 7	—	—	—	—
La Plata	E.	29·1	157	5	11	- 1	i 9	14	- 8	14	35	ScS	—
	N.	29·1	157	5	6	- 6	i 9	13	- 9	7	58	sP	—
	Z.	29·1	157	5	10	- 2	i 9	18	- 4	10	40	sS	—
Merida		34·3	328	e 5	55	- 1	i 10	39	- 2	i 15	6	ScS	—
Miami		35·1	348	e 6	10	+ 8	i 10	57	+ 4	i 14	8	?	—
Oaxaca		35·7	317	e 6	7	+ 0	e 11	6	+ 4	—	—	—	—
Vera Cruz		36·8	319	i 6	17k	+ 1	i 11	20	+ 2	i 15	17	ScS	—
Puebla		38·1	316	i 6	25k	- 2	i 11	37	0	i 15	10	ScS	—
Tacubaya		39·0	316	i 6	36k	+ 2	i 11	58	+ 8	i 15	34	ScS	—
Bermuda		40·8	9	e 6	44	- 4	i 12	12	- 3	e 8	27	pP	—
Guadalajara		42·8	313	e 7	0	- 4	e 12	40	- 4	—	—	—	—
Columbia		43·0	348	e 7	6	0	i 12	48	+ 2	e 10	7	sP	—
Washington		47·2	355	i 7	35	- 3	e 13	36	- 8	e 10	31	sP	—
Philadelphia		48·1	357	i 7	43	- 1	i 14	0	+ 3	e 9	37	pP	e 20·6
Cincinnati		48·7	347	i 7	47	- 2	i 14	0	- 5	i 9	4	pP	—
Fordham		48·9	359	i 7	48	- 2	i 14	6	- 1	—	—	—	—
St. Louis		49·9	341	i 7	55	- 2	i 14	21	0	i 10	5	pP	—
Weston		50·3	1	i 7	59	- 1	i 14	29	+ 3	i 9	9	pP	—
Cleveland		50·4	351	i 8	0	- 1	i 14	22	- 6	i 9	56	pP	—
Harvard		50·5	1	i 8	0	- 2	e 14	26	- 3	e 16	39	sS	—
Lubbock		50·8	328	8	6	+ 2	14	32	- 1	—	—	—	—
Chicago		52·0	345	e 8	8	- 4	e 14	43	- 6	e 17	53	sS	i 21·1
Halifax		53·0	8	8	20	0	15	4	+ 2	10	18	pP	—
Ottawa		53·5	357	i 8	22k	- 1	15	7	- 1	10	17	pP	—
Lincoln	E.	54·2	337	i 8	26	- 2	e 15	10	- 8	e 11	33	sP	e 21·4
Shawinigan Falls	N.	54·5	359	8	29	- 1	15	25	+ 4	e 17	13	ScS	—
Seven Falls	E.	55·1	1	8	32	- 2	i 15	30	+ 1	19	1	sS	—
Tucson		55·3	320	i 8	35	- 1	i 15	34	+ 2	i 10	30	pP	e 18·8
Pierce Ferry		59·8	321	i 9	6	0	i 16	36	+ 8	—	—	—	—
Palomar		60·0	317	i 9	7k	0	e 16	36	+ 5	i 11	13	pP	—
Boulder City		60·2	320	e 9	9	+ 1	e 16	37	+ 3	i 11	9	pP	—
Overton	Z.	60·3	321	i 9	10	+ 1	e 16	44	+ 9	e 11	8	pP	—
Riverside		60·8	317	i 9	11k	- 1	i 16	46	+ 5	i 11	17	pP	—
Pasadena		61·4	317	i 9	16k	0	i 16	50	+ 2	e 11	27	pP	—
Salt Lake City		61·5	327	e 9	18	+ 1	e 16	50	+ 1	e 11	0	pP	e 20·4
Logan		62·2	327	i 9	20	- 1	i 17	1	+ 3	e 11	34	pP	—
Haiwee		62·4	319	i 9	23	+ 1	e 17	6	+ 6	e 11	28	pP	—
Tinemaha		63·1	319	i 9	28k	+ 1	e 17	16	+ 7	i 11	37	pP	—
Fresno	Z.	63·9	318	i 9	31k	- 1	e 17	19	+ 1	—	—	—	—
Bozeman		64·5	331	e 9	35	- 1	e 17	26	+ 1	e 12	46	sP	e 23·3
Butte	N.	65·5	331	e 9	40	- 2	i 17	40	+ 3	e 22	22	SS	e 25·2
Lick		65·5	318	i 9	43	+ 1	e 17	44	+ 7	i 11	53	pP	—
Santa Clara		65·7	318	i 9	47	+ 4	i 17	48	+ 8	—	—	—	—
Berkeley		66·2	318	i 9	47	+ 1	e 17	50	+ 5	i 11	57	pP	—
Ukiah		67·5	319	e 9	56	+ 2	i 18	4	+ 4	e 12	56	sP	e 26·7
Hungry Horse		67·8	331	i 9	56	0	e 18	2	- 2	e 11	59	pP	—
Shasta Dam		67·8	320	i 9	54	- 2	e 18	3	- 1	e 12	1	pP	—
Arcata		69·0	320	e 10	2	- 1	—	—	—	—	—	—	—
Ivigtut		71·5	12	e 10	16	- 2	18	43	- 3	i 12	26	pP	—

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	$\Delta$ °	Az. °	P. m. s.	O - C. s.	S. m. s.	O - C. s.	Supp. m. s.	L. m.
Seattle	71.7	327	i 10 19k	0	i 18 57	+ 9	i 12 24	pP
Victoria	72.8	327	i 10 26k	+ 1	19 4	+ 4	12 37	pP
Lomé	73.4	81	e 18 11	?	e 21 12	?	e 27 52	SSS
Lisbon	73.9	46	10 30 <sub>a</sub>	- 1	19 12	0	12 42	pP
Malaga	z. 76.6	49	i 10 48k	+ 2	i 19 48	+ 8	—	—
Granada	77.4	49	i 10 51 <sub>a</sub>	+ 1	19 54	+ 5	13 2	pP
Toledo	78.0	47	i 10 55	+ 2	i 20 8	+13	i 13 11	pP
Alicante	80.1	49	i 11 7	+ 3	i 20 23	+ 7	13 49	PP
Tamanrasset	z. 80.9	65	i 11 10k	+ 2	e 20 33	+ 9	i 13 22	pP
Reykjavik	81.0	19	i 11 15	+ 6	i 20 34	+ 9	i 13 23	pP
Tortosa	81.6	47	i 11 12	0	i 20 37	+ 6	—	—
Rathfarnham Castle	81.9	33	i 11 12	- 1	e 20 33	- 1	13 27	pP
Algiers Univ.	z. 82.3	51	e 11 16	+ 1	e 20 42	+ 4	i 13 34	pP
Sitka	83.4	331	i 11 24	+ 3	e 20 44	- 4	e 14 36	pP
Edinburgh	E. 84.6	32	11 28	+ 1	20 52	- 8	27 5	SS
Kew	84.6	36	i 11 26k	- 1	i 20 49	[+ 2]	i 13 42	pP
Clermont-Ferrand	84.9	43	i 11 28	0	i 21 0	- 3	i 13 48	pP
Durham	85.1	33	i 11 35	+ 6	i 21 5	+ 1	i 13 47	pP
Scoresby Sund	85.1	15	i 11 30	+ 1	21 11	+ 7	i 24 50	SS
Paris	85.4	39	i 11 30	- 1	i 20 54	[+ 2]	i 13 45?	pP
Aberdeen	E. 85.7	31	i 11 35	+ 3	i 20 59	[+ 5]	i 13 49	pP
Besançon	87.2	42	i 11 39	0	e 21 9	[+ 5]	e 13 54	pP
Neuchatel	87.8	42	e 11 42	0	e 21 12	[+ 5]	—	—
De Bilt	88.0	37	i 11 43k	0	i 21 15	[+ 7]	i 14 1	pP
Basle	88.4	42	e 11 44k	- 1	e 21 15	[+ 4]	e 14 12	pP
Strasbourg	88.7	41	i 11 46k	0	i 21 19	[+ 6]	i 14 3	pP
Pavia	88.9	44	e 11 47	0	i 21 20	[+ 6]	—	—
Zürich	89.0	42	e 11 47k	0	—	—	e 14 3	pP
Karlsruhe	89.2	40	i 11 49	+ 1	i 21 21	[+ 5]	—	—
Chur	89.5	43	e 11 50k	0	e 21 18	[+ 1]	e 14 11	pP
Stuttgart	89.7	41	e 11 50k	- 1	e 21 21	[+ 3]	i 14 9	pP
Prato	89.9	46	e 11 52	+ 1	i 20 41	-67	—	—
Florence Arc.	90.1	46	e 11 55	+ 3	i 21 51	+ 1	14 32	pP
Florence Xim	90.1	46	e 11 58	+ 6	i 21 12	[- 9]	—	—
Bologna	90.3	45	e 11 53k	0	e 22 4	+13	e 14 14	pP
Honolulu	90.3	291	e 11 54	+ 1	e 21 29	[+ 7]	e 14 22	pP
Bergen	90.4	29	11 51?	- 3	21 59	+ 7	14 15	pP
Rome	90.6	48	e 11 55k	0	i 21 33	[+ 9]	i 14 14	pP
Rocca di Papa	90.7	48	e 11 58	+ 3	e 21 29	[+ 5]	e 22 1	S
Jena	E. 91.7	39	e 12 0	0	e 21 32	[+ 2]	e 14 17	pP
College	91.8	335	i 12 0	0	e 21 32	[+ 2]	i 14 16	pP
Grahamstown	91.8	124	i 12 0	0	—	—	i 14 18	pP
Cheb	92.0	39	12 6	+ 5	e 21 36	[+ 5]	i 14 21	pP
Triest	92.1	44	i 12 1	- 1	i 21 37	[+ 5]	i 14 21	pP
Messina	92.3	52	e 12 25	+22	i 21 34	[+ 1]	i 22 18	S
Collmberg	92.6	39	e 12 4	0	e 21 38	[+ 3]	e 14 25	pP
Potsdam	92.8	37	e 12 11	+ 6	i 22 21	+ 8	e 14 27	pP
Copenhagen	93.0	34	i 12 7	+ 1	i 22 21	+ 7	i 14 26	pP
Prague	93.3	39	e 12 9 <sub>a</sub>	+ 2	e 22 21	+ 4	e 14 27	pP
Taranto	93.9	50	e 12 16	+ 6	21 16	[-26]	e 14 46	pP
Vienna	94.3	42	e 12 13	+ 1	e 21 50	[+ 6]	e 16 4	PP
Pretoria	z. 94.7	117	i 12 13	- 1	e 21 52	[+ 6]	e 14 34	pP
Ogyalla	95.5	42	e 12 22?	+ 5	e 21 56	[+ 6]	e 14 28	pP
Raciborzu	95.7	39	e 12 16?	- 2	e 21 55	[+ 4]	e 14 37	pP
Pietermaritzburg	z. 95.8	121	(e 12 20)	+ 2	—	—	(i 14 39)	pP
Kalossa	95.9	43	e 12 26	+ 7	i 22 0	[+ 8]	e 25 53	sSKS
Budapest	96.0	43	e 12 29	+10	i 21 56	[+ 3]	14 39	pP
Upsala	96.3	30	i 12 24	+ 3	21 54?	[0]	i 14 41	pP
Skalnate Pleso	97.0	41	e 12 20	- 4	e 21 59	[+ 1]	e 13 45	pP
Timisoara	97.4	45	e 12 33?	+ 7	i 22 7	[+ 7]	—	—
Warsaw	97.7	38	e 12 31k	+ 4	e 22 5	[+ 4]	14 50	pP
Apia	98.4	255	—	—	e 23 10?	+10	e 26 10?	PPS
Athens	98.7	53	—	—	i 22 7?	[+ 1]	i 23 10?	S
Sofia	98.7	48	e 12 19	-13	i 22 12	[+ 6]	i 16 48	PP
Bucharest	100.8	45	e 12 48	+ 7	i 22 19	[+ 3]	e 17 3	PP

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	$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.	
	°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.	
Wellington	102.3	225	i 12	52	+ 4	23	40	+ 8	e 16	42	PP	49.0
Kishinev	102.7	43		15 10	pP	e 22	25	[ 0]				
Pulkovo	102.7	29	e 12	51	+ 2	i 22	25	[ 0]	e 15	10	pP	
Christchurch	102.9	222	e 12	52	+ 2	e 23	37	0	e 15	12	pP	e 49.9
Istanbul	102.9	49	12	51	+ 1				19	37	PPP	
Helwan	104.7	61	13	4	P	22	42	[+ 8]	15	21	pP	
Yalta	106.5	46	15	28	pP	i 22	48	[+ 6]	17	40	PP	
Theodosia	107.1	45	e 17	48	PP	22	51	[+ 6]				
Moscow	107.2	33	e 13	14	P	i 22	46	[+ 1]	e 15	30	pP	
Ksara	108.5	57	e 13	24	P				i 15	38	pP	
Sotchi	110.6	46	e 18	11	PP	e 23	7	[+ 8]	e 21	1	PKS	
Zugdidi	112.3	48	e 17	25	[+ 3]							
Platigorsk	112.9	45	e 18	25	PP	i 23	13	[+ 5]	i 24	22	SKKS	
Abastumanj	113.0	48	e 17	26	[+ 3]	e 23	16	[+ 8]				
Borzhome	113.6	48				e 23	9	[- 2]				
Tananarive	113.7	114				23	20	[+ 9]	24	31	SKKS	
Gori	114.1	47	e 17	33	[+ 8]	i 23	21	[+ 8]	e 18	35?	PP	
Leninakan	114.1	48	e 18	53?	PP	23	23?	[+10]				
Tiflis	114.6	47	e 17	37	[+ 9]	i 23	21	[+ 6]	i 18	39	PP	
Erevan	114.7	49	e 18	43	PP	e 23	25	[+10]				
Grozny	115.0	45	18	24	PP	i 23	12	[- 4]	i 24	21	SKKS	
Shemakla	117.7	48	17	35	[+ 3]							
Baku	118.7	48	e 17	43	[+ 9]	e 25	7	SKKS	e 19	11	PP	
Sverdlovsk	118.7	27	e 14	7	P	i 23	35	[+ 6]	e 16	25	pP	
Riverview	122.2	221	i 17	46k	[+ 5]	i 25	25	SKKS	i 19	31	PP	
Brisbane	z. 124.6	229	i 17	49	[+ 3]							
Ashkabad	125.7	48	e 17	54	[+ 6]				e 20	25?	pPKP	
Mary	128.4	47	i 18	9	[+16]							
Samarkand	131.1	43	e 18	4	[+ 6]	e 26	19	SKKS	i 20	27	pPKP	
Tashkent	131.8	39	i 18	1	[+ 1]	i 26	24?	SKKS	i 20	30	pPKP	
Stalinabad	132.9	42	i 18	4	[+ 2]				20	33	pPKP	
Obi-garm	133.4	42	i 18	6	[+ 3]				20	37	pPKP	
Fergana	133.9	39	e 17	55	[- 9]	i 24	34	[+22]	i 20	36	pPKP	
Kulyab	133.9	43	e 18	9	[+ 5]				20	38	pPKP	
Andijan	134.1	39	i 18	12	[+ 8]	i 24	7?	[- 5]	i 20	44	pPKP	
Frunse	134.1	35	e 18	8	[+ 4]	i 21	43	PKS	e 20	43	pPKP	
Sapporo	135.2	327	e 18	9	[+ 3]				e 20	55	pPKP	
Irkutsk	135.9	4	i 18	12	[+ 4]	i 21	48	PKS	i 20	39	pPKP	
Naryn	135.9	34	i 18	10	[+ 2]							
Aomori	137.0	324	i 18	19	[+10]	i 31	50	PS				
Sendai	138.5	321	e 18	18	[+ 6]				e 21	0	pPKP	
Hokusima	139.1	320	18	12	[- 1]				e 21	4	pPKP	
Perth	139.6	189	i 21	55	PKS	i 23	50	[-31]	i 36	54	?	
Vladivostok	139.8	333	i 18	13	[- 2]				i 24	19	PPP	
Mito	139.9	319	e 18	15	[ 0]							
Utunomiya	140.2	319	e 18	15	[ 0]							
Kumagaya	140.8	320	e 18	18	[+ 2]				e 21	6	pPKP	
Maebasi	140.8	319	e 18	19	[+ 3]							
Tokyo	140.8	319	e 18	28	[+12]	e 21	56	PKS				
Yokohama	141.0	318	18	30	[+13]							
Matusiro	141.3	322	e 18	12	[- 5]				e 21	42	PP	
Hunatu	141.5	319	e 18	21	[+ 3]							
Toyama	141.8	322	e 17	54	[-25]				e 21	47	PP	
Gihu	142.9	320	18	23	[+ 2]				e 21	53	PP	
Nagoya	142.9	320	e 18	22	[+ 1]				e 21	54	PP	
Bombay	143.4	69	i 18	22	[ 0]				i 24	34	PPP	
Kameyama	143.4	320	e 18	24	[+ 2]				e 21	18	pPKP	
Kyoto	143.8	321	e 18	20	[- 3]				e 18	43	PKP <sub>1</sub>	
New Delhi	143.8	51	e 18	24	[+ 1]	i 24	34	[+ 6]				
Osaka	144.1	321	i 18	27	[+ 4]							
Owase	144.1	320	18	24	[+ 1]							
Kobe	144.3	321	e 18	24	[+ 1]				e 21	44	PP	
Poona	N. 144.4	69	18	32	[+ 9]	28	53	SKKS	i 18	42	PKP <sub>2</sub>	
Kōti	146.1	322	e 18	32	[+ 6]	e 23	17	PKS	e 22	10	PP	
Hukuoka	147.9	325	e 18	33	[+ 5]				e 20	57	pPKP	

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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.
Miyazaki	148.5	320	e 18 30	[+ 1]	—	—	e 21 3	pPKP
Kodaikanal	E. 148.8	82	18 35	[+ 5]	29 41	SKKS	22 30	PP
Hyderabad	N. 148.9	69	21 4	pPKP	28 2	?	40 33	SS
Colombo	E. 151.1	90	18 44	[+11]	e 28 14	?	e 21 4	pPKP
Nanking	z. 154.6	341	i 18 40	[+ 2]	—	—	i 21 10	pPKP
Calcutta	E. 155.6	51	e 18 50	[+11]	29 25	SKKS	22 35	PP
Bandong	164.9	177	e 18 54	[+ 5]	(e 21 32)	pPKP	—	—

Additional readings and notes :—

La Paz i = 2m.12s.  
 Chinchina iZ = 3m.53s., iSS = 6m.18s.  
 Galerazamba readings increased by 1m.  
 San Juan e = 6m.29s., i = 10m.55s., iScS = 14m.27s.  
 La Plata E. PP = 6m.40s., PcS = 11m.34s. and 12m.15s., SS = 13m.4s., sScS = 19m.18s. and 23m.40s.  
 La Plata N. PP = 6m.52s., 9m.36s., SS = 12m.25s., ScS = 14m.28s. and 15m.4s., pScS = 17m.28s., sScS = 19m.16s. and 22m.22s.  
 La Plata z. PcP = 8m.10s., 9m.34s., PcS = 12m.28s., ScS = 15m.12s., 19m.19s., 19m.35s.  
 Merida iP = 6m.1s., i = 7m.54s., 8m.22s., and 10m.33s., iS = 10m.44s.  
 Oaxaca i = 11m.16s.  
 Vera Cruz i = 15m.23s.  
 Tacubaya i = 7m.45s., iScP = 11m.19s., i = 11m.39s. and 13m.25s.  
 Bermuda iP = 6m.57s., esP = 9m.22s., i = 10m.0s., ePPP = 11m.12s., i = 12m.24s., esS = 15m.2s.  
 Guadalajara e = 12m.32s.  
 Columbia ePP = 8m.56s., eScS = 15m.54s.  
 Washington e = 8m.7s.  
 Philadelphia ePcP = 9m.3s., isP = 10m.51s., ePcS = 12m.49s., es = 13m.40s., iScS = 16m.29s.  
 Cincinnati iPP = 9m.45s., i = 12m.55s., iScS = 16m.29s., i = 20m.47s., 23m.57s., and 26m.32s.  
 St. Louis ePcP = 9m.8s., es = 14m.9s., e = 16m.26s., iScS = 16m.40s., isS = 18m.25s.  
 Weston isS = 16m.44s.  
 Cleveland iN = 8m.4s., iZ = 9m.6s., isPN = 11m.8s., iN = 12m.31s., iZ = 12m.37s., iN = 13m.4s., iSE = 14m.25s. and 14m.29s., ipSE = 16m.43s., iSS?E = 17m.48s., isSE = 18m.2s., iE = 24m.24s. and 26m.41s.  
 Harvard iPcP = 9m.4s.  
 Chicago ePcP = 9m.15s., esP = 11m.15s., is = 14m.21s., iScS = 16m.54s.  
 Halifax e = 11m.28s. and 13m.18s., i = 17m.2s., SS = 18m.40s.  
 Ottawa PcP = 9m.21s., PP = 10m.38s., sP = 11m.25s., PcS = 12m.54s., sPP = 13m.29s., i = 15m.13s., e = 15m.56s., ScS = 17m.3s., sS = 18m.44s., PKP,PKP,Z = 37m.56s.  
 Lincoln eScSE = 17m.8s.  
 Seven Falls eE = 8m.42s., ScSE = 17m.12s.  
 Tucson i = 8m.39s., iPcP = 9m.20s., ePP = 10m.56s., i = 11m.46s., iScP = 12m.28s., es = 15m.10s., i = 15m.41s. and 16m.39s., eSS = 19m.32s., ePKP,PKP = 37m.25s., eSKP,PKP = 41m.5s.  
 Palomar iZ = 9m.26s., iNZ = 9m.46s.  
 Boulder City iPcP = 9m.49s., iPP = 11m.35s., esP = 12m.5s., eScP = 12m.52s., eScS = 17m.59s., ePKP = 26m.57s.  
 Riverside iPcPZ = 9m.38s., iZ = 13m.34s., ePKP,PKPZ = 37m.48s.  
 Pasadena iPcPZ = 9m.46s., isP = 12m.27s., epPP?EN = 13m.31s., isPP = 14m.34s., eSP?E = 17m.19s., iE = 17m.33s., esS?EN = 20m.28s., iSS?EN = 22m.13s., esSSZ = 24m.40s., ePKP,PKPZ = 37m.33s., iPKP,PKP,Z = 38m.13s., eSKP,PKPZ = 40m.32s.  
 Salt Lake City iP = 9m.22s., esP = 12m.26s., is = 16m.56s., iScS = 17m.58s.  
 Logan i = 9m.24s. and 11m.41s., esP = 12m.24s., iScP = 12m.53s., iScS = 17m.54s., ePKP,PKP = 37m.33s., iPKP,PKP = 38m.26s., eSKP,PKP = 40m.47s., iSKP,PKP = 40m.53s.  
 Haiwee iPKP,PKPZ = 37m.42s., iPKP,PKP,Z = 38m.17s., eSKP,PKPZ = 40m.48s.  
 Tinemaha iPcPZ = 10m.1s., iZ = 14m.22s., ePKP,PKPZ = 37m.38s., ePKP,PKP,Z = 38m.13s.  
 Fresno iE = 9m.37s. and 9m.42s., eZ = 17m.35s.  
 Bozeman iP = 9m.40s., i = 10m.50s., is = 17m.30s., eScS = 18m.30s., i = 18m.46s., esS = 21m.0s., eSS = 21m.50s.  
 Butte iPN = 9m.45s.  
 Lick iE = 10m.0s. and 10m.14s., iZ = 11m.6s., e = 18m.10s.  
 Berkeley ipPPZ = 13m.4s. and other unidentified readings.  
 Ukiah iP = 9m.59s., i = 19m.56s., esS = 23m.0s.  
 Hungry Horse iS = 18m.7s., ePKP,PKP = 37m.15s., iPKP,PKP = 37m.58s., iSKP,PKP = 40m.30s.  
 Shasta Dam e = 13m.25s. and 15m.35s., iPKP,PKP = 38m.7s.  
 Ivigtut i = 10m.19s., esP = 13m.36s., i = 18m.47s. and 19m.23s., isS = 22m.37s., SS = 23m.37s.  
 Seattle i = 10m.25s. and 10m.28s., iPcP = 10m.50s., i = 11m.16s., iPP = 13m.0s., isP = 13m.42s., iPPP = 15m.3s., isPP = 16m.0s., e = 18m.45s., iSP = 20m.29s., i = 23m.22s., iSS = 23m.47s.

Continued on next page,

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Victoria iZ = 11m.20s., PP = 13m.34s., e = 14m.56s., i = 19m.10s., PKKP = 29m.10s.  
Lisbon P = 10m.34s., pP?NZ = 10m.58s., Z = 19m.1s., iSN = 19m.18s., SN = 19m.21s.,  
PS?EN = 19m.46s., SSE = 22m.43s., iL? = 29m.18s.  
Malaga P<sub>c</sub>PZ = 11m.6s., iPPZ = 13m.6s., iPPPZ = 14m.58s., iSSZ = 24m.16s.  
Granada iPP = 14m.6s., pPP = 16m.3s., pS = 23m.42s., SS = 24m.51s., sSS = 27m.54s.,  
SSS = 29m.54s., sSSS = 31m.44s.  
Toledo iZ = 10m.58s., i = 20m.45s., sSE = 23m.54s., eE = 25m.17s., SSE = 25m.47s.,  
SSSE = 29m.53s.  
Alicante PPP = 15m.41s., PS = 21m.7s., SSS = 28m.23s., Q = 30m.11s.  
Tamanrasset iPPZ = 14m.30s., epPPZ = 16m.20s., iZ = 17m.59s., iPKP,PKP?Z =  
37m.47s., iSKP,PKP?Z = 40m.17s.  
Reykjavik eEN = 20m.20s., iE = 24m.30s., iEN = 24m.38s., eN = 28m.2s.  
Rathfarnham Castle i = 11m.26s., isP = 14m.10s., ePP = 14m.35s., i = 16m.8s., eZ =  
17m.11s., eSSEN = 26m.43s.  
Algiers Univ. iZ = 13m.40s., ePPZ = 14m.41s., iZ = 15m.10s., ePPPZ = 16m.39s., iZ =  
19m.36s., iSKSZ = 20m.27s., ePKP,PKPZ = 37m.42s., eSKP,PKPZ = 40m.11s.  
Sitka eSP = 21m.57s., esS = 24m.40s., eSSS = 30m.22s., i = 30m.52s.  
Edinburgh ePE = 12m.30s., S<sub>c</sub>SE = 21m.12s.  
Kew eZ = 17m.46s., eEZ = 18m.45s., eSP = 22m.2s., ePS = 23m.5s., esS = 25m.25s.,  
eSS = 26m.55s., esSS = 30m.25s., iEN = 33m.47s., eEN = 40m.25s.  
Clermont-Ferrand i = 11m.36s., iSKS = 20m.55s., iS = 21m.15s., iSP = 22m.7s., iSS? =  
25m.11s., iSSS = 30m.36s.  
Durham iE = 20m.53s. and 21m.0s., iEN = 21m.11s., iE = 25m.10s.  
Scoresby Sund i = 13m.47s., iSKS = 20m.58s., 22m.1s., 23m.4s., 25m.59s., 27m.3s., and  
33m.50s.  
Aberdeen iSSE = 25m.16s.  
Paris i = 11m.35s., 11m.42s., and 13m.52s., isP = 14m.54s., iPP = 15m.5s., e = 16m.15s.,  
iS = 21m.10s., iSP = 22m.15s.  
Besançon e = 12m.22s., ePP = 15m.7s., eSP = 21m.41s., eSPP = 22m.40s.  
De Bilt iPP = 15m.12s., iN = 21m.38s., esS = 25m.22s., e = 25m.40s.  
Strasbourg i = 12m.16s. and 13m.5s., isP = 15m.6s., ePP = 15m.28s. and 15m.42s., epPP =  
17m.30s., e = 19m.38s., iS = 21m.45s., iSP = 22m.52s. and 23m.3s., i = 24m.53s.,  
isS = 25m.45s., isSP = 26m.31s., iSS = 28m.4s., e = 30m.26s., esSS = 31m.5s.  
Zürich ePP = 14m.47s.  
Chur e = 11m.54s.  
Stuttgart esP?Z = 14m.53s., ePPZ = 15m.37s., epPP? = 17m.52s., iS? = 21m.24s., and  
numerous other unidentified readings.  
Florence Arc. PP = 15m.41s., SKS = 21m.39s., sS = 25m.58s., SS = 28m.15s.  
Bologna eZ = 11m.57s. and 12m.23s., eEZ = 20m.40s., e = 26m.35s.  
Honolulu eS = 22m.2s., e = 23m.26s. and 25m.45s.  
Bergen eN = 21m.29s., PSN = 23m.3s., eE = 23m.38s., eN = 23m.51s.?, sSN = 26m.23s.,  
sPS?EN = 27m.11s., SSEN = 28m.16s., eE = 31m.23s.  
Rome iPPE = 15m.42s., iSN = 22m.2s., isSN = 25m.46s., eSSN = 28m.9s.  
Jena eE = 12m.25s., eN = 12m.34s., ipPEN = 14m.21s., iSKSEN = 21m.38s.  
College e = 15m.2s., iPP = 15m.44s., ePPP = 18m.2s., eS = 21m.59s., iS = 22m.2s., i =  
22m.30s., isS = 26m.4s., isSS = 32m.4s., ePKP,PKP = 39m.15s.  
Grahamstown i = 13m.49s.  
Cheb esPE = 15m.23s., iPPE = 15m.55s., e = 17m.5s., epPP? = 17m.55s., esPP = 18m.55s.,  
e = 20m.25s., iSE = 22m.12s., e = 22m.57s., eSP? = 23m.25s., e = 24m.55s., esS =  
26m.13s., esPS = 27m.6s., e = 27m.48s., eSS = 28m.52s., iE = 31m.36s., esSS = 32m.16s.  
Triest iPP = 15m.53s., iSKKS = 21m.57s., iS = 22m.11s., iSP = 23m.27s., iPPS = 24m.55s.,  
isS? = 26m.21s., iSS = 27m.17s., i = 28m.50s., ipSS = 31m.34s.  
Messina e = 12m.51s. and 14m.54s.  
Collmburg eZ = 12m.8s., ePPE = 16m.1s., iSKSE = 21m.42s., eSEN = 22m.16s., eSPE =  
23m.34s., eSSN = 28m.40s.  
Potsdam ePN = 12m.15s., iSKSEN = 21m.57s., iSN = 22m.26s., isSE = 26m.33s.  
Copenhagen 21m.45s., 23m.31s., and 26m.28s.  
Prague esP = 15m.31s., iPP = 16m.5s., epPP = 17m.55s., esPP = 19m.5s., eSKSZ =  
21m.43s., iSKSEN = 21m.46s., iSP = 23m.41s., eS? = 25m.16s., esSP = 27m.20s.,  
eSS = 29m.2s., eSSS = 33m.8s., and many other unidentified readings.  
Pretoria eZ = 16m.41s.  
Ogyalla e = 14m.0s., 17m.33s., and 19m.27s., eS = 22m.42s., e = 23m.16s., 24m.26s., and  
25m.1s., ePS = 25m.28s., esPS? = 28m.12s., esSS = 32m.42s., eSSS? = 33m.10s.  
Raciborzu ePE = 12m.22s., ePPE = 16m.21s., eSE = 22m.26s., iE = 22m.45s.  
Pietermaritzburg iZ = (16m.23s.) readings increased by 1m.  
Kalossa iN = 23m.16s., eE = 24m.8s. and 24m.21s., eN = 26m.7s.  
Budapest eN = 13m.59s. and 15m.42s., eE = 16m.12s., ePPPE = 16m.39s., eN = 22m.37s.,  
iE = 22m.49s., PSN = 23m.19s., PSE = 23m.22s., PPSE = 24m.8s., ePPSN =  
24m.22s., eSSE = 28m.17s., eSSN = 28m.37s., eSSPE = 28m.57s., eSSSE = 31m.7s.  
Upsala esPN = 15m.25s., ePPE = 16m.25s., ePPPE = 18m.34s., eE = 21m.34s.,  
eS = 22m.43s., iS = 22m.47s., eSPE = 24m.11s., ePSE = 25m.15s., ePSN = 25m.18s.,  
eE = 26m.52s., esPN = 27m.35s., eSSN = 29m.34s., eN = 32m.15s., isSSE =  
32m.48s., eSSSE = 33m.30s., eN = 34m.52s.  
Skalnate Pleso ePP = 16m.28s., epPPE = 18m.19s., esPP = 19m.24s., eS = 22m.52s.,  
eSP = 24m.8s., ePSE = 25m.21s., esPS = 27m.52s., eSS = 29m.46s., eSSS? = 34m.28s.,  
and other unidentified readings.

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Warsaw eZ = 16m.0s., ePP = 16m.40s., ePPPZ = 18m.32s., SKKS = 22m.40s., eS = 23m.2s., iScSEN = 23m.5s., eSP = 24m.27s., eEN = 25m.52s., eE = 26m.25s., eN = 26m.39s., esSPEN = 28m.8s., ePKKP = 28m.45s., iSS = 30m.3s., eEN = 31m.37s., iE = 32m.4s., esSS = 33m.5s.  
 Athens i = 32m.10s.  
 Bucharest iEN = 22m.22s.  
 Wellington PKP = 16m.21s., ePPP = 19m.23s., iZ = 20m.15s., iSZ = 25m.18s., ePSZ = 26m.7s., ePS = 26m.28s., ePPSZ = 27m.39s., ePPPSZ = 27m.52s., e = 28m.16s., eZ = 28m.40s., ePKKS = 30m.3s., eSS = 32m.7s., ePPP( $\Delta > 180^\circ$ ) = 34m.58s., eSSSZ = 36m.58s., eZ = 39m.14s., QZ = 44.8m.  
 Pulkovo iPP = 17m.13s., iSS = 31m.15s.  
 Christchurch iPEZ = 12m.57s., ePKPZ = 16m.32s., ePPEZ = 17m.22s., ePPPEZ = 20m.2s., i = 22m.12s., eSKKSNZ = 24m.20s., iS = 25m.20s., ePS?EN = 26m.17s., iPS = 26m.49s., ePPSEN = 28m.0s., iPPPS?E = 29m.21s., eSSEN = 33m.52s., iN = 34m.46s., eSSSEN = 38m.2s., eSSSS?E = 41m.42s.  
 Helwan sPZ = 16m.24s., PPZ = 17m.33s., eZ = 19m.20s. and 20m.32s., eE = 23m.28s., SN = 24m.4s., eZ = 25m.19s. and 25m.52s., sSN = 28m.16s.  
 Yalta SKKS = 23m.40s.  
 Moscow PP = 17m.46s., iSKKS = 23m.41s., iS = 24m.21s., iPS = 27m.15s., esS = 28m.33s., iSS = 32m.13s.  
 Ksara i = 17m.58s. and 26m.12s.  
 Tananarive PS = 27m.8s., SS = 33m.17s., SSS = 37m.43s.  
 Gori iSKKS = 24m.31s.  
 Grozny iSKSP = 27m.15s.  
 Sverdlovsk iPKP = 17m.35s., iPP = 19m.7s., iPKS = 21m.8s., iSKKS = 25m.2s., iPS = 29m.11s.  
 Riverview iZ = 21m.38s., 22m.51s., and 28m.20s., iPSEN = 29m.39s., iEN = 29m.54s., iE = 32m.31s., iN = 32m.38s., iSS?N = 35m.40s., iEN = 39m.12s.  
 Ashkabad PP = 20m.0s.  
 Tashkent iPKS = 21m.37s.  
 Fergana PKS = 21m.41s., SKKS = 26m.38s.  
 Andijan iPKS = 21m.44s., iSKKS = 26m.41s.  
 Irkutsk iPP = 21m.0s., iPPP = 24m.9s., iSS = 38m.6s.  
 Bombay iPKKPEN = 27m.28s.  
 New Delhi iN = 24m.0s., iPKKPEN = 27m.33s.  
 Osaka iEN = 19m.9s., i = 24m.5s.  
 Owase eNZ = 18m.27s.  
 Kobe iNZ = 18m.28s.  
 Poona PPPN = 25m.14s., PKKPN = 27m.14s., SKKKS = 35m.52s., iN = 39m.45s., SSN = 40m.44s.  
 Kôti e = 19m.38s., 20m.23s., and 25m.37s.  
 Hukuoka e = 22m.13s.  
 Kodaikanal PPPE = 26m.0s., PKKPE = 27m.20s., SKKKSE = 30m.16s., SKSPE = 33m.1s.  
 Nanking iZ = 19m.10s. and 21m.47s., iSPKPZ = 22m.46s.  
 Calcutta PPPE = 26m.5s., PKKPE = 27m.40s., iE = 28m.30s., SKKKSE = 30m.10s., SKSPE = 33m.3s., PPSE = 35m.34s., SSE = 41m.55s.  
 Bandung PPKP given as S.

July 9d. 4h. 50m. 9s. Epicentre  $8^\circ 2'S$ .  $71^\circ 0'W$ . Depth of focus 0-100.  
 (as at 4h. 40m.).

	$\Delta$		Az.		P.		O-C.		S.		O-C.		Supp.		L.
	m.	s.	m.	s.	m.	s.	m.	s.	m.	s.	m.	s.	m.	s.	m.
Huancayo	5.7	228	i 1	41	- 1	—	—	—	—	—	—	—	—	—	—
La Paz	8.7	162	i 1	51	- 17	i 3	54	+ 4	—	—	—	—	—	—	—
Bogota	13.1	346	i 2	50	+ 1	i 5	19	+ 14	—	—	—	—	—	—	—
Chinchina	13.9	340	i 3	15	+ 18	i 5	41	+ 23	—	—	—	—	—	—	—
Balboa Heights	19.0	335	i 3	34	- 10	i 6	36	- 7	—	—	—	—	—	—	—
Fort de France	24.8	24	i 4	19	- 16	i 7	57	- 18	—	—	—	—	—	—	—
San Juan	26.9	10	e 4	53	- 1	i 8	41	- 7	—	—	—	—	—	e 10.3	
Merida	34.3	328	e 5	56	0	i 10	44	+ 3	e 7	16	pP	—	—	e 14.0	
Vera Cruz	36.8	319	i 6	19	+ 3	e 11	10	- 8	—	—	—	—	—	—	
Puebla	38.1	316	i 6	24k	- 3	i 11	34	- 3	i 15	20	ScS	—	—	—	
Tacubaya	39.0	316	i 6	36k	+ 2	i 11	53	+ 3	i 15	31	ScS	—	—	—	
Washington	47.2	355	i 7	37	- 1	e 13	46	+ 2	e 23	34	?	—	—	—	
Philadelphia	48.1	357	i 7	42	- 2	—	—	—	i 10	48	PPP	—	—	—	
City College, N.Y.	48.8	359	i 7	51	+ 2	—	—	—	—	—	—	—	—	—	
St. Louis	49.9	341	i 7	56	- 1	i 14	14	- 7	i 16	36	ScS	—	—	—	
Weston	50.3	1	i 7	59	- 1	—	—	—	—	—	—	—	—	—	
Harvard	50.5	1	i 7	57	- 5	i 14	23	- 6	i 10	53	PPP	—	—	—	
Chicago	52.0	345	i 8	9	- 3	e 14	27	- 22	i 16	50	ScS	e 21.0	—	—	
Halifax	53.0	8	11	15	?	15	1	- 1	18	35	SS	—	—	—	
Ottawa	53.5	357	i 8	22k	- 1	15	7	- 1	10	21	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.	
Lincoln	E.	54.2	337	e 8 29	+ 1	e 15 11	- 7	e 17 7	S <sub>c</sub> S	e 21.2
Shawinigan Falls	N.	54.5	359	8 30	0	—	—	—	—	—
Seven Falls	E.	55.1	1	8 33	- 1	15 26	- 3	11 14	sP	—
Tucson		55.3	320	i 8 35	- 1	e 15 30	- 2	e 10 30	pP	—
Pierce Ferry		59.8	321	i 9 6	0	i 16 31	+ 3	—	—	—
Palomar		60.0	317	i 9 7k	0	—	—	—	—	—
Boulder City		60.2	320	e 9 9	+ 1	e 16 38	+ 4	i 11 4	pP	—
Overton	z.	60.3	321	i 9 10	+ 1	—	—	e 27 51	PKKP	—
Riverside		60.8	317	i 9 11	- 1	e 40 44	SKPP'	e 38 26	P'P'	—
Pasadena		61.4	317	i 9 16k	0	i 16 39	- 9	i 11 19	pP	—
Salt Lake City		61.5	327	e 8 59	-18	e 16 53	+ 4	—	—	—
Logan		62.2	327	e 9 21	0	i 16 54	- 4	e 38 25	P'P'	—
Haiwee	z.	62.4	319	i 9 22k	0	—	—	e 11 27	pP	—
Tinemaha	z.	63.1	319	i 9 28k	+ 1	e 40 38	SKPP'	—	—	—
Fresno		63.9	318	e 9 31k	- 1	e 17 21	+ 3	—	—	—
Lick	z.	65.5	318	i 9 43k	+ 1	—	—	i 11 52	pP	—
Berkeley		66.2	318	i 9 47k	+ 1	i 17 47	+ 2	i 11 55	pP	—
Ukiah		67.5	319	e 9 55	+ 1	e 18 3	+ 3	e 24 17	?	—
Hungry Horse		67.8	331	i 9 56	0	e 18 5	+ 1	e 12 3	pP	—
Shasta Dam		67.8	320	i 9 55	- 1	e 17 43	-21	e 37 41	P'P'	—
Arcata		69.0	320	e 10 3	0	e 18 21	+ 3	e 13 11	sP	—
Ivigtut		71.5	12	10 16	- 2	18 43	- 3	12 26	pP	—
Seattle		71.7	327	i 10 19k	0	i 19 51	+63	i 12 27	pP	—
Victoria		72.8	327	i 10 25k	0	19 5	+ 5	22 39	sS	—
Alicante		80.1	49	11 52	+48	21 8	+52	—	—	—
Tamanrasset	z.	80.9	65	i 11 10 <sub>a</sub>	+ 2	e 20 33	+ 9	i 13 24	pP	—
Reykjavik		81.0	19	—	—	i 20 32	+ 7	—	—	—
Rathfarnham Castle		81.9	33	i 11 15	+ 2	i 20 36	+ 2	i 13 30	pP	—
Algiers Univ.	z.	82.3	51	i 11 17	+ 2	e 20 32	- 6	i 13 33	pP	—
Barcelona		83.0	46	i 10 39	-40	i 20 48	+ 3	21 39	SP	—
Durham		85.1	33	—	—	i 21 5	+ 1	—	—	—
Scoresby Sund		85.1	15	i 11 14	-15	20 44	[- 6]	15 8	PP	—
Paris		85.4	39	i 11 32	+ 1	e 20 52	[+ 0]	i 13 48	pP	—
Aberdeen	E.	85.7	31	—	—	i 20 55	[+ 1]	—	—	—
Besançon		87.2	42	—	—	e 27 27	SS	—	—	—
Strasbourg		88.7	41	i 11 48	+ 2	e 21 47	+10	i 25 47	sS	—
Zürich		89.0	42	e 11 46	- 1	e 21 40	0	e 14 1	pP	—
Chur		89.5	43	e 11 43	- 7	e 21 20	[+ 3]	e 14 10	pP	—
Stuttgart		89.7	41	i 11 49	- 2	e 21 33	-13	e 13 56	pP	—
Bologna		90.3	45	—	—	e 21 51?	0	—	—	—
Honolulu		90.3	291	e 11 55	+ 2	e 21 11	[-11]	e 14 13	pP	—
Bergen		90.4	29	—	—	e 21 55	+ 3	e 26 2	sS	—
Rome		90.6	48	i 11 52 <sub>a</sub>	- 3	i 21 22	[- 2]	i 14 1	pP	—
Jena		91.7	39	e 12 7	+ 7	e 21 34	[+ 4]	e 14 17	pP	—
College		91.8	335	i 12 0	0	e 21 31	[+ 1]	i 14 16	pP	—
Grahamstown		91.8	124	i 12 2	+ 2	—	—	i 14 19	pP	—
Cheb		92.0	39	e 11 53	- 8	i 21 35	[+ 4]	e 14 2	pP	—
Collimberg		92.6	39	e 12 6	+ 2	e 22 13	+ 2	e 14 23	pP	—
Potsdam		92.8	37	i 11 41	-24	i 21 42	[+ 6]	i 22 22	S	—
Copenhagen		93.0	34	e 12 16	+10	i 21 39	[+ 2]	i 22 20	S	—
Prague		93.3	39	e 12 10	+ 3	e 22 16	- 1	e 21 41	SKS	—
Pretoria	z.	94.7	117	e 12 14	0	i 29 9	SS	i 14 32	pP	—
Ogyalla		95.5	42	—	—	e 21 55	[+ 5]	e 22 43	S	—
Raciborzu	N.	95.7	39	e 12 15?	- 3	e 21 56	[+ 5]	—	—	—
Kalossa	N.	95.9	43	i 12 19	0	e 21 56	[+ 4]	e 14 39	pP	—
Upsala		96.3	30	i 12 24	+ 3	i 22 43	+ 1	i 16 19	PP	—
Skalnate Pleso		97.0	41	e 12 35	+11	e 21 59	[+ 1]	e 14 40	pP	—
Bucharest	E.	100.8	45	—	—	i 22 20	[+ 4]	—	—	—
Tananarive		113.7	114	18 18	PP	23 4	[- 7]	21 5	PPP	—
Brisbane	z.	124.6	229	i 17 48	[+ 2]	—	—	—	—	—

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.
Tashkent	131.8	39	i 20 28	PP	—	—	—	—
Obi-garm	133.4	42	i 20 37	PP	e 24 27	[+16]	—	—
Fergana	133.9	39	e 18 6	[+ 2]	i 21 40	PKS	i 20 34	PP
Frunse	134.1	35	e 20 39	PP	e 31 1?	PS	—	—
Sendai	n. 138.5	321	e 18 17	[+ 5]	—	—	—	—
Hukusima	139.1	320	e 18 19	[+ 6]	—	—	e 17 3	?
Nagano	141.2	322	e 18 18	[+ 1]	—	—	e 21 13	PP
Gihu	142.9	320	i 18 24	[+ 3]	—	—	—	—
New Delhi	143.8	51	i 18 25	[+ 2]	i 24 12	[-16]	i 20 48	pPKP
Osaka	144.1	320	e 18 30	[+ 7]	—	—	—	—
Kobe	144.3	321	i 18 25	[+ 2]	—	—	—	—
Kōti	146.1	322	e 18 33	[+ 7]	e 24 25	[- 6]	—	—
Miyazaki	148.5	320	e 18 31	[+ 2]	—	—	e 21 1	pPKP
Nanking	z. 154.6	341	i 18 41	[+ 3]	—	—	i 21 11	pPKP

Additional readings :—

San Juan iScP = 10m.49s., iScS = 14m.21s.

Vera Cruz eS = 11m.33s.

Tacubaya iScP = 11m.19s.

Harvard i = 16m.39s.

Halifax e = 16m.59s.

Ottawa PcP = 9m.18s., PP = 11m.15s., eZ = 15m.18s., ScS = 17m.3s., sS = 18m.42s.,

PKP, PKP<sub>2</sub>, Z = 37m.56s.

Lincoln eE = 17m.54s.

Seven Falls eE = 15m.32s., ScSE = 17m.6s., sSE = 19m.1s.

Tucson iPcP = 9m.27s., i = 9m.43s., esP = 11m.32s., eScP = 12m.21s., eS? = 15m.11s.,

esS = 18m.39s., eSS = 19m.47s., e = 41m.9s.

Pierce Ferry ePKKP? = 27m.12s., eSKKP = 30m.44s., e = 36m.2s., ePKP, PKP =

38m.23s.

Boulder City iPcP = 9m.55s., ePP = 11m.31s., esP = 12m.5s., ePKKP = 27m.50s.,

ePKP, PKP? = 37m.48s., e = 40m.47s.

Overton eZ = 36m.10s., iZ = 39m.9s.

Pasadena ePKP, PKPZ = 37m.44s., ePKP, PKP, Z = 38m.15s., eSKP, PKPZ = 40m.40s.

Logan eSKP, PKP = 40m.53s.

Halwee iPKP, PKPZ = 38m.23s.

Tinemaha iZ = 12m.0s., 12m.41s., and 30m.42s., ePKP, PKPZ = 37m.38s., eZ = 38m.15s.

Fresno eEN = 10m.53s., eE = 12m.37s., eZ = 17m.27s.

Lick iZ = 12m.55s.

Berkeley iEZ = 9m.53s., iZ = 9m.58s., 10m.7s., 11m.26s., 11m.37s., and 12m.24s., iE =

12m.31s., iEZ = 12m.50s., iE = 22m.51s.

Hungry Horse ePKP, PKP = 37m.15s., iPKP, PKP = 37m.58s., iSKP, PKP = 40m.30s.

Ivigutut 19m.21s., sS = 22m.26s.

Seattle e = 19m.41s.

Alicante PP = 14m.46s., PPP = 16m.44s., PS = 22m.42s., SS = 25m.58s., SSS = 27m.38s.

Tamanrasset iPPZ = 14m.29s., eSPZ = 21m.21s., eSSSZ = 29m.45s., ePKP, PKP?Z =

37m.26s., eSKP, PKP?Z = 40m.6s.

Rathfarnham Castle i = 11m.38s., iZ = 11m.58s., ePP?Z = 14m.34s., iZ = 15m.15s.,

eSSSEN = 27m.36s., eSSSEN = 29m.33s.

Algiers Univ. iZ = 11m.32s., ePPZ = 14m.41s., ePPPZ = 16m.31s., ePKP, PKPZ =

37m.46s.

Paris i = 13m.53s., isP = 14m.54s., iPP = 15m.8s., i = 15m.59s., iS = 21m.8s., i = 24m.32s.,

and 31m.2s.?

Besançon iSS = 27m.35s.

Strasbourg e = 15m.14s., ePP = 15m.40s., epPP = 17m.22s., i = 24m.50s., eSS = 27m.55s.,

esSS = 31m.4s.

Zürich ePP = 14m.46s., eSKS = 21m.18s.

Stuttgart ePP = 15m.42s.

Jena eE = 13m.21s. and 16m.5s., eN = 16m.14s. and 16m.58s.

College ePP = 15m.46s., eS = 22m.3s.

Grahamstown i = 19m.14s. and 29m.8s.

Cheb eS? = 22m.10s., esPS?E = 27m.17s., eN = 27m.24s., e = 27m.48s., eSS = 28m.48s.

Collmberg eE = 17m.19s., eSKSE = 21m.40s.

Potsdam eE = 17m.27s., iN = 18m.57s.

Copenhagen 26m.22s. and 27m.51s.

Kalossa iE = 12m.29s., eE = 21m.59s.

Upsala eE = 21m.53s.?

Skalnate Pleso epPN = 14m.43s., ePP = 16m.17s., epPP = 18m.25s., esPP = 19m.25s.,

eS = 22m.54s., epS = 25m.14s.

Fergana PPP = 22m.41s.

New Delhi iEN = 30m.55s., 33m.52s., and 35m.46s.

Kōti e = 19m.3s. and 30m.2s.

Nanking iZ = 19m.11s., isPKP?Z = 22m.44s.



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July 9d. 9h. 45m. 7s. Epicentre 8°·2S. 71°·0W. Depth of focus 0·100 (as at 4h. 50m.).

	Δ	Az.	P.		O-C.	S.		O-C.	Supp.		L. m.	
			m.	s.		m.	s.		m.	s.		
Huancayo	5·7	228	i 1	41	- 1	i 3	5	+ 1	i 2	12	pP	—
La Paz	8·7	162	i 2	11k	+ 3	i 3	45	- 5	—	—	—	—
Bogota	13·1	346	i 2	46	- 3	i 6	8	+63	i 3	25	pP	—
Chinchina	13·9	340	i 3	12	+15	i 5	34	+16	—	—	—	—
Balboa Heights	19·0	335	i 3	34	-10	i 6	34	- 9	—	—	—	—
Fort de France	24·8	24	i 4	35	0	i 8	13	- 2	—	—	—	—
Roosevelt Roads	26·8	11	e 4	52	- 1	i 8	16	-30	—	—	—	—
San Juan	26·9	10	e 4	53	- 1	e 8	26	-22	e 7	40	sP	—
Buenos Aires	28·7	157	e 5	15	+ 6	i 9	40	+24	—	—	—	—
Merida	34·3	328	—	—	—	i 10	39	- 2	i 15	9	S <sub>c</sub> S	—
Vera Cruz	36·8	319	—	—	—	e 11	17	- 1	e 15	15	S <sub>c</sub> S	—
Puebla	38·1	316	e 6	34	+ 7	i 11	30	- 7	i 15	18	S <sub>c</sub> S	—
Tacubaya	39·0	316	i 6	36	+ 2	i 11	50	0	—	—	—	—
Bermuda	40·8	9	e 6	58	+10	i 12	23	+ 8	e 9	53	sP	—
Washington	47·2	355	i 7	35	- 3	—	—	—	—	—	—	—
Philadelphia	48·1	357	i 7	44	0	e 13	39	-18	e 12	59	S <sub>c</sub> P	—
Cincinnati	48·7	347	i 6	57	-52	i 13	59	- 6	i 9	3	pP	—
Fordham	48·9	359	i 7	46	- 4	e 14	7	0	—	—	—	—
St. Louis	49·9	341	i 7	54	- 3	i 14	14	- 7	i 9	4	P <sub>c</sub> P	—
Weston	50·3	1	i 7	57	- 3	e 14	25	- 1	i 9	7	P <sub>c</sub> P	—
Cleveland	50·4	351	i 7	58 <sub>a</sub>	- 3	i 14	22	- 6	i 9	54	pP	—
Harvard	50·5	1	i 7	58	- 4	i 14	25	- 4	i 16	42	S <sub>c</sub> S	—
Lubbock	50·8	328	8	7	+ 3	14	31	- 2	—	—	—	—
Chicago	52·0	345	e 13	11	P <sub>c</sub> S	e 14	39	-10	i 16	53	S <sub>c</sub> S	—
Halifax	53·0	8	—	—	—	e 15	1	- 1	e 16	59	S <sub>c</sub> S	—
Ottawa	53·5	357	e 8	20k	- 3	15	5	- 3	10	19	pP	—
Lincoln	54·2	337	—	—	—	e 15	7	-11	—	—	—	—
Shawinigan Falls	54·5	359	8	30	0	15	18	- 3	e 10	26	pP	—
Seven Falls	55·1	1	8	32	- 2	15	27	- 2	9	23	P <sub>c</sub> P	—
Tucson	55·3	320	e 8	32	- 4	i 15	32	0	e 10	31	pP	e 21·6
Pierce Ferry	59·8	321	i 9	4	- 2	i 16	30	+ 2	—	—	—	—
Boulder City	60·2	320	i 9	6	- 2	e 16	36	+ 2	e 10	54	pP	—
Overton	60·3	321	i 9	8	- 1	e 16	33	- 2	i 11	16	pP	—
Riverside	60·8	317	i 9	9	- 3	e 16	34	- 7	i 11	13	pP	—
Pasadena	61·4	317	i 9	15	- 1	i 16	47	- 1	i 11	17	pP	—
Salt Lake City	61·5	327	e 9	15	- 2	i 16	49	0	i 18	3	S <sub>c</sub> S	—
Logan	62·2	327	e 9	20	- 1	e 16	55	- 3	e 12	14	sP	—
Haiwee	62·4	319	i 9	22	0	e 17	2	+ 2	i 12	15	sP	—
Tinemaha	63·1	319	i 9	25	- 2	e 17	12	+ 3	i 11	28	pP	—
Fresno	63·9	318	e 9	31k	- 1	e 17	13	- 5	e 11	35	pP	—
Bozeman	64·5	331	e 9	47	+11	e 17	25	0	e 18	23	S <sub>c</sub> S	—
Butte	65·5	331	e 9	45	+ 3	e 17	19	-18	—	—	—	—
Lick	65·5	318	i 9	41k	- 1	e 17	49	+12	e 11	46	pP	—
Santa Clara	65·7	318	i 17	45	S	(i 17	45)	+ 5	i 18	38	pS	—
Berkeley	66·2	318	i 9	45k	- 1	e 17	45	0	i 11	50	pP	—
Hungry Horse	67·8	331	i 9	55	- 1	i 18	2	- 2	—	—	—	—
Shasta Dam	67·8	320	i 9	53	- 3	e 18	0	- 4	e 12	2	pP	—
Arcata	69·0	320	e 10	2	- 1	e 18	19	+ 1	e 12	9	pP	—
Ivigtut	71·5	12	i 10	17	- 1	18	45	- 1	22	30	sS	—
Seattle	71·7	327	i 10	20k	+ 1	e 18	51	+ 3	i 12	25	pP	—
Victoria	72·8	327	i 10	23 <sub>a</sub>	- 2	i 19	3	+ 3	i 12	34	pP	—
Lisbon	73·9	46	10	35k	+ 4	19	21	+ 9	23	8	sS	—
Malaga	76·6	49	i 10	49 <sub>a</sub>	+ 3	i 19	51	+11	11	7	P <sub>c</sub> P	32·2
Granada	77·4	49	i 10	50k	0	i 19	55	+ 6	13	7	pP	36·1
Toledo	78·0	47	i 10	57	+ 4	i 20	4	+ 9	—	—	—	—
Alicante	80·1	49	e 11	13	P <sub>c</sub> P	i 20	21	+ 5	14	9	PP	e 36·3
Tamanrasset	80·9	65	i 11	13k	+ 5	e 20	37	+13	e 13	29	pP	—
Tortosa	81·6	47	i 11	15	+ 3	i 20	47	+16	—	—	—	—
Rathfarnham Castle	81·9	33	i 11	15	+ 2	e 20	33	- 1	i 13	34	pP	—
Algiers Univ.	82·3	51	i 11	18 <sub>a</sub>	+ 3	e 40	10	SKP,P'	i 13	36	pP	—
Sitka	83·4	331	e 11	21	0	e 20	43	- 5	e 25	45	SS	e 33·7
Kew	84·6	36	i 11	30k	+ 3	i 21	2	+ 2	i 13	44	pP	e 35·9
Clermont-Ferrand	84·9	43	i 11	32	+ 4	i 21	13	+10	i 13	49	pP	—
Durham	85·1	33	11	31	+ 2	21	4	0	20	49	SKS	—
Scoresby Sund	85·1	15	e 11	32	+ 3	e 21	0	- 4	13	45	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.	
Paris	85.4	39	i 11 31	0	e 20 53	[+ 1]	i 13 50	pP	—
Aberdeen	85.7	31	e 16 6	?	i 21 24	+14	i 17 22	PPP	—
Besançon	87.2	42	i 11 41	+ 2	—	—	i 13 57	pP	—
De Bilt	88.0	37	i 11 46	+ 3	e 21 37	+ 6	e 14 0	pP	—
Basle	88.4	42	e 11 47k	+ 2	e 21 42	+ 7	e 14 4	pP	—
Strasbourg	88.7	41	i 11 49k	+ 3	e 21 46	+ 9	e 14 5	pP	—
Zürich	89.0	42	e 11 48	+ 1	e 21 45	+ 5	e 14 4	pP	—
Stuttgart	89.7	41	e 11 51	0	e 26 41	?	—	—	—
Bologna	90.3	45	e 11 57	+ 4	e 21 55	+ 4	—	—	—
Honolulu	90.3	291	—	—	e 21 13	[- 9]	—	—	—
Rome	90.6	48	e 11 59k	+ 4	—	—	e 14 14	pP	—
Jena	E. 91.7	39	e 12 1	+ 1	—	—	—	—	—
College	91.8	335	i 11 59	- 1	i 22 1	- 3	i 14 15	pP	e 36.1
Grahamstown	91.8	124	i 12 5	+ 5	—	—	—	—	—
Cheb	92.0	39	e 12 4	+ 3	e 21 50?	-16	e 15 22	sP	—
Triest	92.1	44	i 12 5	+ 3	e 22 12	+ 5	e 23 5	SP	—
Collmberg	Z. 92.6	39	e 12 6	+ 2	—	—	e 14 19	pP	—
Potsdam	Z. 92.8	37	e 12 7	+ 2	—	—	i 14 24	pP	53.9
Copenhagen	93.0	34	i 12 11	+ 5	i 22 21	+ 7	14 26	pP	—
Prague	93.3	39	e 12 10	+ 3	e 22 23	+ 6	e 14 27	pP	—
Taranto	93.9	50	e 14 53	?	—	—	—	—	—
Pretoria	Z. 94.7	117	i 12 17	+ 3	—	—	e 14 34	pP	—
Ogyalla	95.5	42	e 13 23	?	e 21 53	[+ 3]	e 15 28	sP	—
Warsaw	97.7	38	e 12 32	+ 5	22 8	[+ 7]	15 45	pP	—
Wellington	102.3	225	—	—	e 50 53?	?	—	—	—
Pulkovo	102.7	29	e 17 14	PP	e 22 27	[+ 2]	—	—	—
Christchurch	102.9	222	—	—	i 22 31	[+ 5]	e 25 23	SP	—
Istanbul	102.9	49	12 53	+ 2	—	—	17 16	PP	—
Helwan	Z. 104.7	61	e 17 11	PKP	e 25 50	SP	e 19 29	pPKP	—
Yalta	106.5	46	e 17 45	PP	—	—	—	—	—
Moscow	107.2	33	e 17 49	PP	e 22 52	[+ 7]	e 20 50	PKS	—
Ksara	108.5	57	e 17 57	PP	i 26 28	SP	i 21 19	pPP	—
Zugdidi	112.3	48	e 17 36	[+14]	—	—	—	—	—
Tiflis	114.6	47	e 18 41	PP	—	—	—	—	—
Shemakla	117.7	48	17 40	[+ 8]	i 23 38	[+12]	—	—	—
Baku	118.7	48	e 19 12	PP	—	—	—	—	—
Sverdlovsk	118.7	27	e 17 38	[+ 4]	e 23 36	[+ 7]	e 19 4	PP	—
Mary	128.4	47	e 21 26	PKS	—	—	—	—	—
Samarkand	131.1	43	e 18 5	[+ 7]	—	—	20 30	pPKP	—
Tashkent	131.8	39	i 18 6	[+ 6]	i 21 33	PKS	20 30	pPKP	—
Stalinabad	132.9	42	i 18 6	[+ 4]	—	—	i 20 42	PP	—
Obi-garm	133.4	42	i 18 9	[+ 6]	—	—	i 20 35	pPKP	—
Kulyab	133.9	43	e 18 11	[+ 7]	—	—	—	—	—
Fergana	133.9	39	i 18 8	[+ 4]	e 26 38	SKKS	i 20 34	pPKP	—
Andijan	134.1	39	e 17 56	[- 8]	i 24 4	[- 8]	e 20 36	PP	—
Frunse	134.1	35	e 18 12	[+ 8]	—	—	e 20 43	PP	—
Almata	135.2	32	e 18 3	[- 3]	—	—	—	—	—
Irkutsk	135.9	4	i 18 13	[+ 6]	i 21 47	PKS	i 20 37	pPKP	—
Przhevalsk	136.5	32	i 18 19	[+11]	—	—	—	—	—
Vladivostok	139.8	333	e 20 41	pPKP	i 21 58	PKS	e 24 17	PPP	—
New Delhi	143.8	51	e 18 27	[+ 4]	—	—	—	—	—
Nanking	154.6	341	i 18 43	[+ 5]	—	—	i 21 10	pPKP	—

Additional readings and note :—

La Paz iZ = 2m.21s., i = 3m.39s.  
Roosevelt Roads i = 7m.22s., e = 11m.26s., i = 14m.22s.  
Vera Cruz e = 16m.15s. and 17m.9s.  
Bermuda ePP = 11m.9s., e = 14m.53s.  
Philadelphia eSS = 17m.34s.  
Cincinnati i = 9m.39s.  
St. Louis eS = 14m.4s., iScS = 16m.36s.  
Cleveland iZ = 9m.7s., iEN = 15m.24s., iE = 16m.40s.  
Harvard i = 14m.31s.  
Ottawa PcP = 9m.20s., PP = 11m.25s., ScS = 17m.4s., sS = 18m.29s.  
Seven Falls ScSE = 17m.14s., sSE = 19m.2s.  
Tucson ePcP = 9m.18s., esP = 11m.36s., iScP = 12m.26s., eS = 15m.26s., eScS = 17m.21s.,  
esS = 18m.19s., eSS = 19m.56s., ePKP, PKP = 38m.19s.  
Boulder City iPcP = 9m.47s., ePP = 11m.8s., iP = 11m.43s., eScS = 17m.31s.

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Overton isPZ = 12m.7s.  
 Riverside iZ = 9m.32s., iP<sub>c</sub>P = 9m.48s., iZ = 9m.59s., isPZ = 12m.7s., iS<sub>c</sub>PZ = 12m.49s., ePKP,PKPZ = 38m.21s.  
 Pasadena eP<sub>c</sub>PZ = 9m.43s., isPZ = 12m.10s., iS<sub>c</sub>PZ = 12m.50s., iS<sub>c</sub>SE = 18m.0s., isSEN = 20m.32s., ePKP,PKPZ = 37m.50s., iPKP<sub>2</sub>PKP<sub>1</sub>Z = 38m.29s.  
 Salt Lake City eSS = 20m.43s.  
 Logan iS = 16m.59s., i = 17m.32s., ePKP,PKP = 38m.16s., iPKP,PKP = 38m.31s.  
 Haiwee iZ = 9m.56s.  
 Tinemaha isPZ = 12m.16s., iS<sub>c</sub>PZ = 12m.51s., ePKP,PKPZ = 38m.25s.  
 Fresno eZ = 9m.43s.  
 Bozeman eSS = 21m.41s.  
 Lick iZ = 9m.53s., eZ = 11m.0s., iZ = 11m.55s.  
 Berkeley i = 9m.49s., iZ = 9m.55s. and 12m.30s., eSE = 17m.38s., eN = 22m.26s.  
 Hungry Horse ePKP,PKP = 37m.21s., iPKP,PKP = 38m.1s., eSKP,PKP = 35m.31s.  
 Shasta Dam iPP = 12m.36s., eS<sub>c</sub>S = 18m.34s., ePKP,PKP = 37m.20s. and 37m.52s., ePKP<sub>2</sub>PKP<sub>1</sub> = 38m.7s., e = 40m.21s.  
 Ivigtut 19m.24s.  
 Seattle iS = 18m.59s., i = 19m.46s.  
 Malaga PPZ = 13m.5s., PPPZ = 14m.5s.  
 Granada PP = 14m.2s., PPP = 15m.40s., pS = 23m.40s., iSS = 25m.1s., SSS = 28m.32s.  
 Alicante PS = 21m.43s., SS = 24m.17s., SSS = 27m.53s., Q = 31m.23s.  
 Tamanrasset eZ = 12m.37s., iPPZ = 14m.30s., ipPPZ = 16m.15s., eSKSZ = 20m.44s., isPZ = 21m.27s., ePKP,PKP?Z = 37m.47s., eZ = 40m.7s., eSKP,PKPZ = 40m.15s.  
 Rathfarnham Castle iP<sub>c</sub>PZ = 11m.28s., iZ = 14m.2s., isP = 14m.27s., ePP = 14m.56s., eEN = 17m.34s., EN = 22m.38s., isS?EN = 24m.30s., eSSEN = 26m.44s., eEN = 29m.34s. and 34m.39s.  
 Algiers Univ. iP<sub>c</sub>PZ = 11m.23s., eZ = 11m.57s., iZ = 12m.11s., ePPZ = 14m.41s.  
 Sitka iS = 20m.53s.  
 Kew isPE = 14m.44s., iSKKSE = 21m.24s., eS = 22m.5s., epSE = 24m.58s., eSS = 30m.28s., eEN = 33m.58s.  
 Clermont-Ferrand iPP = 14m.49s., iSS = 26m.8s.  
 Durham E = 20m.57s.  
 Scoresby Sund 14m.47s., 22m.9s., and 25m.5s., SS = 27m.0s. and 29m.53s.  
 Paris i = 11m.39s., e = 11m.47s., i = 14m.42s., isP = 14m.52s., iPP = 15m.7s., iS = 21m.11s., iSP = 22m.14s., e = 25m.14s. and 25m.52s., eSSS = 31m.4s.  
 Besançon i = 11m.54s.  
 De Bilt eZ = 13m.23s., ePP = 15m.4s., esS = 25m.26s.  
 Strasbourg i = 12m.15s., 13m.3s., and 13m.53s., esP = 15m.4s., iPP = 15m.28s., esPP = 18m.26s., eSP = 22m.50s., e = 24m.25s., esS = 25m.31s., esSP = 26m.37s., eSS = 28m.5s.  
 Zürich eSKS = 21m.21s.  
 Stuttgart eZ = 12m.3s.  
 Rome ePP?Z = 15m.14s.  
 Jena eN = 12m.35s. and 14m.36s.  
 College ePP = 15m.42s., eSKS = 21m.25s., iSKS = 21m.32s., esS = 26m.37s., ePKKP = 29m.16s.  
 Cheb e = 23m.23s., 26m.14s., and 27m.17s.  
 Trieste isSKS = 25m.2s., eSPP = 25m.51s., eSS = 28m.52s.  
 Copenhagen 26m.3s. and 26m.15s.  
 Prague esP = 15m.26s., esPP = 19m.6s., eSKS = 21m.47s., eSS = 28m.29s., and many other unidentified e readings.  
 Pretoria iZ = 13m.8s.  
 Ogyalla e = 18m.11s.  
 Warsaw PPZ = 16m.40s., eZ = 17m.40s., PPPZ = 18m.33s., eZ = 19m.19s., eE = 21m.49s., e = 22m.36s., eS = 23m.4s., e = 25m.56s. and 26m.25s.  
 Christchurch eE = 26m.47s., eL?EZ = 29m.53s.?  
 Helwan eZ = 20m.35s.  
 Moscow eSKKS = 23m.42s., eS = 24m.18s.?, eSP = 26m.8s.?, eSKSP = 27m.33s.  
 Sverdlovsk eSKSP = 29m.11s., PS = 31m.52s.  
 Tashkent ePPP = 21m.55s.  
 Irkutsk iPP = 20m.56s.  
 Nanking i = 19m.8s., isPKP? = 22m.46s.

July 9d. 12h. 34m. 13s. Epicentre 7°·9N. 72°·6W. (as at 3h.28m.).

	Δ	Az.	P.	O - C.	S.	O - C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Bogota	3·6	204	i 0 56	- 2	i 1 36	- 6	i 1 5	P*
Galerazamba	3·9	317	i 1 7	+ 5	i 1 53	+ 3	i 1 24	P*
Chinchina	4·2	226	i 1 22	P*	i 2 11	S*	i 2 27	S*
San Juan	12·2	31	e 2 57	- 1	e 5 30	+14	e 3 22	PPP
Huancayo	20·0	188	e 4 36	- 1	e 8 14	- 3	—	—
La Paz	24·6	169	i 5 22	- 1	i 9 51	+ 9	i 10 57	SSS
Weston	34·4	2	i 6 52	+ 1	—	—	—	—
Harvard	34·5	2	i 6 53	+ 1	—	—	—	—
Tucson	43·0	310	e 8 2	- 1	—	—	i 8 7	P
Pierce Ferry	47·0	313	i 8 35	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.
Overton	z.	47.5	313	i 8 40	+ 2	—	—	—	—
Boulder City		47.6	312	e 8 40	+ 1	—	—	e 10 39	PP
Palomar	z.	48.0	309	i 8 43	0	—	—	i 10 43	PP
Logan		48.3	321	e 8 54	+ 9	—	—	—	—
Riverside	z.	48.7	309	e 8 47	- 1	—	—	e 10 50	PP
Pasadena	z.	49.4	309	i 8 55	+ 2	—	—	—	—
Tinemaha	z.	50.5	312	i 9 1	- 1	—	—	—	—
Fresno	z.	51.5	312	e 9 11 <sup>a</sup>	+ 2	—	—	—	—
Lick	z.	53.1	312	i 9 21	0	—	—	i 9 26	P
Hungry Horse		53.3	328	e 9 22	- 1	—	—	—	—
Berkeley	z.	53.8	312	i 9 26 <sup>k</sup>	0	—	—	—	—
Shasta Dam		54.9	315	e 9 32	- 3	—	—	—	—
Victoria	z.	58.8	323	e 10 1	- 1	—	—	—	—
Tamanrasset	z.	76.1	68	e 11 50	- 1	—	—	e 12 7	P <sub>c</sub> P

Additional readings:—

Galerazamba i = 1m.14s.

Chinchina iP = 1m.34s.

La Paz iZ = 10m.17s.

Palomar iZ = 8m.47s.

Riverside iZ = 8m.51s.

Tinemaha iZ = 9m.6s.

Berkeley iZ = 9m.30s.

Tamanrasset iZ = 11m.56s., eZ = 13m.38s. and 13m.58s.

July 9d. 16h. 10m. 24s. Epicentre 36°·7N. 70°·5E. Depth of focus 0·030.  
(as on 1950 March 31d.).

Felt at Srinagar, Rawalpindi, Kabul, and Patiala.

Epicentre 37°·0N. 70°·0E. Depth 200km.

Government of India Seismological Bulletin, July, 1950, p. 4.

A = +·2683, B = +·7576, C = +·5951;  $\delta$  = +9; h = 0;  
D = +·943, E = -·334; G = +·199, H = +·561, K = -·804.

		$\Delta$ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	Supp. m. s.	L. m.
Kulyab		1.3	335	i 0 38	+ 3	—	—	—	—
Obi-garm		2.1	342	i 0 45	+ 3	1 19	+ 5	—	—
Stalinabad		2.3	323	i 0 45	+ 1	—	—	—	—
Murgab		3.2	59	i 0 48	- 6	1 26	- 9	—	—
Fergana		3.8	15	i 0 58	- 3	e 1 42	- 6	—	—
Samarkand		4.1	319	i 1 4	0	i 1 55	+ 1	—	—
Andijan		4.3	20	i 1 3	- 4	1 52	- 7	—	—
Tashkent		4.7	349	i 1 13	+ 1	i 2 7?	- 1	—	—
Naryn		6.4	41	i 1 25	- 8	—	—	—	—
Frunse		6.9	26	i 1 35	- 5	i 2 47	- 11	—	—
Mary		6.9	280	i 1 48	+ 8	—	—	—	—
Almata		8.2	35	i 1 51	- 6	3 14	- 14	—	—
Przhevsk		8.4	44	i 1 51	- 8	—	—	—	—
Dehra Dun	N.	9.0	133	e 2 33	+ 26	e 4 6	+ 20	—	—
New Delhi		9.8	143	i 2 7	- 10	i 3 51	- 14	—	—
Semipalatinsk		15.4	24	i 3 14	- 13	i 5 57?	- 15	—	—
Baku		16.5	289	e 3 48	+ 8	6 52	+ 16	—	—
Shemakla		17.5	292	i 3 56	+ 5	—	—	—	—
Bombay		17.8	172	e 3 53	- 1	i 6 59	- 4	—	—
Poona		18.3	170	e 3 56	- 4	i 7 12	0	8 20	sS
Grozny		20.0	297	i 4 22	+ 5	i 8 1	+ 17	—	—
Hyderabad		20.4	158	i 4 18	- 3	i 7 46	- 6	i 5 19	sP
Tiflis		20.5	293	i 4 27	+ 5	i 8 9	+ 16	—	—
Erevan		20.6	288	e 4 33	+ 10	—	—	—	—
Calcutta	E.	20.9	128	i 4 21	- 5	i 7 56	- 4	i 4 46	pP
Gori		21.0	295	4 31	+ 4	—	—	—	—
Leninakan		21.1	290	e 4 36	+ 8	—	—	—	—
Sverdlovsk		21.2	345	i 4 29	0	8 13	+ 7	i 5 33	sP
Borzhomi		21.5	293	4 24?	- 8	—	—	—	—
Abastumanj		22.0	293	4 42	+ 5	—	—	—	—

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.
Piatigorsk	22.1	299	4 38	+ 1	—	—	—	—
Sotchi	24.4	297	e 5 8	+ 9	—	—	—	—
Kodaikanal	E. 27.1	166	e 5 46	+22	i 10 28	+44	—	—
Ksara	28.3	275	i 5 38	+ 3	10 26?	+23	i 6 26	pP
Irkutsk	28.4	46	5 31	- 5	9 59	- 6	6 23	pP
Yalta	28.5	298	5 38	+ 1	10 14	+ 8	—	—
Moscow	29.2	322	i 5 44	+ 1	10 25	+ 7	6 36	pP
Colombo	E. 30.9	163	6 58	PP	11 50	sS	—	16.0
Istanbul	32.3	291	e 6 13	+ 3	—	—	i 7 24	PP
Kishinev	32.4	304	6 12	+ 1	—	—	—	—
Helwan	33.3	270	e 6 18	0	11 27	+ 5	7 6	pP
Bucharest	34.3	297	e 6 32	+ 5	e 11 50	+13	e 7 16	pP
Pulkovo	34.5	327	i 6 30	+ 1	i 11 43	+ 3	i 7 40	PP
Sofia	36.4	295	i 6 49	+ 4	i 12 21	+12	i 8 0	PP
Athens	36.9	287	e 6 52	+ 3	e 12 19	+ 2	—	—
Timisoara	E. 37.6	301	e 6 59	+ 4	—	—	—	—
Warsaw	37.8	310	e 6 59? a	+ 3	12 37	+ 7	e 7 44	pP
Skalnate Pleso	38.2	307	e 7 1	+ 1	e 12 39	+ 3	e 7 47	pP
Budapest	39.0	303	i 7 11	+ 5	i 12 57	+ 9	8 26	PP
Raciborz	39.5	308	e 7 12	+ 2	e 15 42	SS	—	—
Ogyalla	39.6	304	e 8 30	sP	e 13 7	+10	e 8 48	PP
Nanking	39.8	83	7 6	- 7	i 12 48	-12	i 7 53	pP
Upsala	40.7	322	i 7 21	+ 1	i 13 15	+ 2	8 2	pP
Vienna	40.8	305	i 7 24	+ 3	—	—	e 8 29	pP
Taranto	41.3	292	7 25?	0	13 37	+15	e 9 42	PPP
Prague	41.9	308	i 7 33 a	+ 3	e 13 36	+ 5	e 8 20	pP
Potsdam	42.7	311	i 7 38 a	+ 1	i 13 49	+ 7	i 8 47	pP
Collnberg	42.8	309	i 7 38	+ 1	e 13 47	+ 3	i 8 30	pP
Triest	42.8	302	i 7 39 a	+ 2	i 13 49	+ 5	i 8 25	pP
Copenhagen	43.0	316	i 7 41	+ 2	i 13 53	+ 6	15 18	sS
Messina	43.1	290	e 7 44	+ 4	e 13 29	-19	i 8 54	PP
Cheb	43.2	308	7 39	- 1	e 13 57	+ 7	e 8 51	sP
Jena	43.7	308	i 7 46	+ 1	e 14 3	+ 6	e 8 38	pP
Rocca di Papa	44.3	296	e 7 55	+ 6	—	—	e 11 4	?
Rome	44.5	296	i 7 52 a	+ 1	i 14 15	+ 7	i 9 3	pP
Bologna	44.7	299	i 7 56 a	+ 4	e 14 33	+22	e 9 7	pP
Florence Arc.	44.9	299	i 7 56 a	+ 2	14 17	+ 3	i 9 8	pP
Florence Xim	44.9	299	i 7 56	+ 2	i 14 26	+12	—	—
Prato	45.0	300	i 7 58	+ 3	i 14 28	+12	—	—
Chur	45.5	303	e 7 59 a	0	e 14 28	+ 5	e 8 48	pP
Stuttgart	45.5	306	i 8 0 a	+ 1	e 14 27	+ 4	i 9 10	pP
Karlsruhe	45.9	308	i 8 4	+ 2	e 14 34	+ 6	—	—
Pavia	Z. 46.1	303	e 8 5	+ 1	—	—	—	—
Zürich	46.1	304	i 8 4 a	0	—	—	e 9 13	pP
Strasbourg	46.4	306	i 8 7 a	+ 1	i 14 39	+ 4	i 8 57	pP
Vladivostok	46.6	23	i 8 2	- 5	i 14 29	- 9	i 15 59	sS
Basle	46.7	304	e 8 9 a	+ 1	—	—	e 9 26	pP
Bergen	46.8	323	8 9	0	14 49	+ 8	18 22	SS
Neuchatel	47.2	304	e 8 13	+ 1	—	—	—	—
De Bilt	47.5	312	i 8 15 a	+ 1	i 14 59	+ 8	i 9 26	pP
Besançon	47.8	305	i 8 16	- 1	i 9 28	sP	i 8 52	pP
Paris	49.8	307	i 8 32	0	i 15 27	+ 4	i 9 22	pP
Clermont-Ferrand	50.1	303	i 8 35	+ 1	i 15 35	+ 8	i 9 47	PcP
Aberdeen	51.0	319	i 8 40	- 1	i 15 44	+ 5	i 10 24	PP
Kew	51.0	311	i 8 41 a	0	i 15 44	+ 5	i 9 43	sP
Durham	E. 51.1	316	i 8 43	+ 1	i 15 46	+ 5	i 9 55	PcP
Edinburgh	E. 51.8	317	8 45	- 2	16 12	+22	9 59	PcP
Barcelona	52.0	299	e 10 1	PcP	e 15 58	+ 5	e 17 25	ScS
Algiers Univ.	Z. 53.0	292	e 8 54	- 2	i 10 7	sP	e 9 46	pP
Tortosa	53.4	298	i 9 8	+ 9	17 43	ScS	—	—
Rathfarnham Castle	54.1	315	i 9 4	0	e 16 28	+ 7	i 9 45	pP
Alicante	55.0	296	9 12	+ 2	16 36	+ 3	10 10	PcP
Bandong	55.6	133	e 8 43	-31	e 16 9	-32	—	—
Scoresby Sund	56.7	337	i 9 12	-10	i 17 5	+ 9	20 30	SS
Toledo	57.0	298	i 9 25	+ 1	i 17 1	+ 1	i 10 14	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.	
Tamanrasset	z.	57.1	277	9 25 <sub>a</sub>	0	i 17 6	+ 5	i 10 17	pP	—
Granada		57.7	296	i 9 32 <sub>k</sub>	+ 3	i 17 9	0	11 29	PP	36.2
Malaga	z.	58.5	296	i 9 38 <sub>k</sub>	+ 3	i 18 54	S <sub>c</sub> S	12 58	PPP	32.8
Lisbon		61.1	299	i 9 51 <sub>a</sub>	- 2	17 57	+ 5	10 41	pP	—
Ivigtut		70.5	334	i 10 51	- 1	i 19 52	+ 6	21 17	sS	—
Pretoria	z.	73.8	220	i 11 10	- 2	—	—	i 12 3	pP	—
College		74.4	17	i 11 11	- 4	i 20 26	- 4	i 12 3	pP	e 30.5
Pietermaritzburg	z.	76.0	216	i 11 20	- 4	—	—	i 12 13	pP	—
Grahamstown		80.8	217	i 11 49	- 1	—	—	e 12 44	pP	—
Seven Falls	E.	89.6	335	e 12 33	0	e 23 5	+ 2	e 24 19	PS	—
Ottawa		92.8	337	i 12 47 <sub>a</sub>	- 1	(25 36?)	PS	i 13 43	pP	25.6
Harvard		93.9	333	i 12 52	- 1	—	—	e 13 46	pP	e 43.6
Weston		93.9	333	e 12 52	- 1	e 24 42	SP	—	—	—
Victoria		94.3	10	i 12 52	- 3	—	—	e 13 47	pP	—
Hungry Horse		95.2	4	i 12 57	- 2	e 23 50	- 1	i 13 51	pP	—
Seattle		95.2	9	e 12 58	- 1	e 23 19	[+ 7]	e 13 53	pP	—
Fordham		96.2	334	e 13 2	- 2	e 25 14	SP	e 17 6	PP	—
Philadelphia		97.4	334	e 17 5	PP	e 24 42	+32	—	—	e 43.2
Butte	N.	97.6	3	e 13 10	0	e 24 18	+ 6	e 13 50	pP	—
Pennsylvania	N.	97.6	337	—	—	i 23 21	[- 4]	i 27 13	PPS	—
Cleveland		98.1	340	e 13 11 <sub>a</sub>	- 1	e 24 43	+27	e 17 12	PP	—
Washington		99.0	335	e 17 19	PP	—	—	—	—	—
Chicago		99.4	345	—	—	e 25 13	?	e 27 32	PPS	e 40.9
Cincinnati		101.1	340	i 13 24	- 2	i 27 44	PPS	i 17 33	PP	—
Logan		101.9	2	e 13 28	- 1	e 24 56	+ 8	e 17 41	PP	—
Shasta Dam		102.1	11	e 13 28	- 2	—	—	e 17 30	PP	—
Riverview		102.8	123	i 19 0	?	e 23 46	[- 4]	i 32 3	SS	—
St. Louis		103.0	345	e 13 32	- 2	e 25 8	+11	i 26 38	sS	—
Berkeley		104.9	11	e 17 56	PP	e 25 14	+ 2	e 26 54	sS	—
Santa Clara	E.	105.4	11	—	—	(e 28 18)	SPP	—	—	e 28.3
Lick	z.	105.5	11	e 17 22 <sub>k</sub>	PKP	—	—	e 18 2	PP	—
Tinemaha	z.	106.2	8	e 18 6	PP	—	—	e 30 16	PKKP	—
Fresno	z.	106.3	9	e 17 57	[ 0]	—	—	e 18 18	PP	—
Overton	z.	107.0	4	e 17 46	[-12]	—	—	e 14 46	pP	—
Pierce Ferry		107.4	4	e 17 41	[-18]	e 28 47	PPS	e 13 54	P	—
Boulder City		107.5	5	e 13 55	P	e 24 14	[+ 3]	e 14 49	pP	—
Pasadena	z.	109.1	8	e 18 30	PP	—	—	i 30 4	PKKP	—
Riverside	z.	109.3	8	e 18 20	PP	—	—	e 30 5	PKKP	—
Palomar		110.0	7	e 18 30	PP	—	—	e 30 4	PKKP	—
Tucson		111.4	2	e 18 7	[ 0]	e 27 59	SP	e 18 36	PP	e 45.2
San Juan		111.6	316	e 18 52	PP	e 29 36	PS	e 34 45	PSS	e 44.7
New Plymouth	E.	121.4	117	—	—	e 35 36?	?	—	—	—
Christchurch		122.1	123	—	—	e 39 36?	?	—	—	—
Wellington		122.7	120	—	—	e 36 36?	SS	—	—	—
Tacubaya		123.4	349	e 19 46	PP	e 22 30	PKS	—	—	—
Bogota		127.2	314	e 18 41	[+ 3]	e 30 33	PS	e 21 4	PP	—
La Paz		138.3	288	i 19 0 <sub>a</sub>	[+ 1]	26 8	[+23]	i 22 42	PKS	—
Huancayo		140.7	300	e 19 24	[+21]	e 22 46	PKS	e 35 16	PPS	—

Additional readings:—

New Delhi P\*N=2m.35s., P<sub>g</sub>N=3m.33s.

Poona PPN=4m.11s., PPPN=4m.28s., sPN=4m.57s., SSN=7m.32s., iP<sub>c</sub>P=8m.28s.

Calcutta isSE=8m.36s.

Irkutsk sS=11m.26s.?

Moscow sS=11m.55s.

Helwan sPZ=7m.33s., eZ=8m.22s. and 8m.51s., sSZ=12m.48s.

Bucharest iE=7m.22s., iN=7m.31s., iE=7m.42s., iN=13m.18s.

Pulkovo eSS=13m.57s.

Sofia i=9m.20s.

Warsaw ePP=8m.9s., eP<sub>c</sub>P=8m.34s., e=9m.19s., esP<sub>c</sub>P=9m.33s., eEN=9m.41s.,

eN=11m.4s., epP<sub>c</sub>S=13m.12s., iEN=14m.1s., eZ=14m.23s., SS=15m.10s.,

eSSS=15m.47s., e=16m.39s., S<sub>c</sub>S=17m.22s.

Skalnate Pleso e=7m.23s., esPE=8m.12s., esPN=8m.16s., ePP=8m.41s., eP<sub>c</sub>P=

9m.10s., eE=9m.35s., esPP=9m.49s., esP<sub>c</sub>P=10m.28s., e=11m.26s., eP<sub>c</sub>SE=

13m.2s., eP<sub>c</sub>SN=13m.6s., esS=14m.1s., eSS?=15m.36s., e=16m.20s.

Budapest PPE=8m.23s., PPPE=8m.51s., PPPN=8m.58s., iE=9m.47s., eE=9m.51s.

and 13m.16s., eE=14m.36s.?, SSN=15m.51s., SSSE=16m.15s., eS<sub>c</sub>SN=16m.56s.,

S<sub>c</sub>SE=17m.3s

Continued on next page.

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Raciborzu ePPE = 8m 54s., eSSEN = 16m.30s.  
Ogyalla ePP = 9m.1s., esPP = 9m.52s., esS = 14m.24s., eSS = 16m.11s., esSS = 17m.9s., epScS = 18m.48s., e = 20m.6s.  
Nanking isPEZ = 8m.18s., PPZ = 8m.57s., iZ = 9m.51s., isS?EN = 14m.1s.  
Upsala sP?N = 8m.22s., esPE = 8m.26s., iPP = 8m.59s., iPPPE = 9m.47s., isPP?N = 9m.59s., ePcSN = 12m.52s., eSE = 13m.9s., sScPE = 14m.20s., eN = 15m.23s., e = 16m.3s., iSSN = 16m.24s., esScSE = 18m.36s.  
Vienna ePP? = 9m.13s., epPP = 9m.40s., sPP? = 10m.3s.?  
Prague isP = 8m.43s., ePP = 9m.3s., ePcP = 9m.19s., epPcP = 10m.22s., isPcP = 10m.47s., ePcS = 13m.14s., esS = 15m.4s., eSS = 16m.41s., eScS = 17m.3s., esScS = 18m.21s., and other unidentified e readings.  
Potsdam iN = 7m.42s., ipPE = 8m.51s., iPPZ = 9m.21s., ipPE = 9m.27s., iEZ = 10m.2s., iPPPEZ = 10m.29s., eN = 10m.36s., iSZ = 13m.52s., iSS = 17m.19s., iE = 18m.17s., iZ = 18m.22s. and 19m.27s., iE = 20m.0s.  
Collmberg esPE = 8m.49s., ePPE = 9m.24s., iPPZ = 9m.28s., ePPPE = 10m.20s., eN = 15m.11s., esSE = 15m.19s., eSSN = 17m.9s., eE = 17m.19s., esSSN = 18m.17s.?  
Triest iPcP = 8m.47s., iPP = 9m.23s. and 10m 5s., iPPP = 10m.29s., iSS = 15m.13s., iScS = 17m.43s.  
Copenhagen i = 8m.52s. and 10m.29s., SS = 17m.12s., 18m.36s., and 20m.21s.  
Messina e = 13m.3s.  
Cheb ePP = 9m.33s., ePPPN = 10m.16s., csPP = 10m.33s., cScPN = 12m.45s., esS = 15m.25s., eSSN = 17m.12s., and other unidentified e readings.  
Jena iE = 8m.57s., eE = 10m.0s., 10m.39s., and 12m.17s., eSS? = 17m.36s., eSS? = 17m.39s., eN = 18m.26s.  
Rome ePP = 9m.28s.  
Bologna e = 13m.25s.  
Florence Arc. i = 8m.45s., PP = 9m.32s.  
Stuttgart iZ = 8m.4s., eZ = 8m.19s., c = 8m.48s., eZ = 9m.19s., ePP = 9m.49s., epPP = 10m.26s., esPP = 11m.1s., e = 13m.19s., csS = 15m.41s., eSS = 17m.54s., esSS = 19m.6s.  
Zürich e = 10m.27s.  
Strasbourg i = 8m.21s. and 8m.44s., isP = 9m.19s., ePP = 10m.0s., epPP = 10m.41s., isPP = 11m.6s., ePPP = 11m.51s., i = 12m.17s., eScP = 12m.59s., ePcS = 13m.25s., isS = 15m.59s., eScS = 17m.21s., iSS = 18m.0s., esSS = 19m.3s.  
Vladivostok iPP = 9m.54s.  
Basle e = 10m.43s. and 15m.52s.  
Bergen eE = 9m.17s. and 11m.5s.  
De Bilt ipPPP = 11m.13s., e = 16m.9s., eSS = 18m.48s.  
Paris isP = 9m.43s., ePP = 10m.28s., ipPP = 11m.13s., iPPP = 11m.38s., c = 12m.2s. and 15m.11s., iS = 15m.33s., isS = 16m.49s., i = 17m.9s., iSS = 19m.25s., isSS = 20m.30s.  
Clermont-Ferrand iPPP = 11m.42s., iScS = 17m.15s., eSS = 19m.6s.  
Aberdeen iPPPEN = 11m.29s., iSSN = 20m.2s.  
Kew ePPP = 11m.34s., isSEN = 17m.5s., i = 17m.19s., eSS = 19m.33s.  
Durham iEN = 17m.9s.  
Edinburgh PSE = 16m.30s., SSE = 19m.59s.  
Algiers Univ. iPPZ = 11m.7s.  
Rathfarnham Castle ePcPZ = 9m.56s., isP = 10m.11s., cPPZ = 11m.12s., ePPP = 12m.20s., eScPEN = 13m.28s., eEN = 21m.36s.?  
Alicante PP = 11m.16s., PPP = 12m.24s., PPS = 17m.2s., ScS = 18m.40s., SS = 20m.22s., Q = 22m.32s.  
Scoresby Sund 10m.28s., 12m.34s., 18m.26s., and 22m.24s.  
Toledo iZ = 10m.38s. and 12m.44s., iE = 18m.31s.  
Tamanrasset isPZ = 10m.39s., ePPPZ = 12m.59s., iPcSZ = 14m.9s., eSSZ = 21m.15s., eSSSZ = 24m.6s., eZ = 29m.6s., ePKP,PKPZ = 39m.0s.  
Granada PcP = 10m.32s., PPP = 12m.46s., PcS = 14m.10s., PS = 18m.29s., SS = 21m.59s., SSS = 24m.38s.  
Malaga PcSZ = 14m.24s.  
Lisbon PcP?EZ = 11m.4s., sSEN = 19m.26s., SSE = 22m.10s.  
College i = 13m.21s., ePP = 14m.4s., epPP = 15m.15s., epPPP = 16m.47s., isS = 21m.57s., eSS = 25m.18s., eSSS = 28m.46s., eSKP,PKP? = 41m.51s.  
Seven Falls eE = 24m.45s.  
Ottawa e = 16m.30s., i = 17m.42s.  
Victoria e = 14m.20s.  
Hungry Horse eSKS = 23m.13s.  
Seattle e = 14m.51s., 25m.11s., 25m.57s., and 27m.39s.  
Fordham i = 17m.10s.  
Philadelphia epPPP = 20m.21s., i = 27m.15s.  
Butte esSSN = 32m.41s.  
Pennsylvania iN = 25m.3s., eN = 29m.13s.  
Cleveland eN = 18m.27s. and 25m.5s., ePS?E = 26m.22s., eEN = 27m.18s., eE = 29m.7s., eSSN = 31m.6s.  
Logan epPP = 18m.53s.  
Shasta Dam ePKKP? = 29m.29s., e = 30m.47s.  
Riverview PS?N = 26m.24s., iPSE = 27m.4s., iN = 27m.51s., iPPS = 27m.57s., iE = 32m.17s.  
St. Louis e = 25m.30s., ePS = 26m.54s., esSP = 28m.9s.  
Berkeley eZ = 18m.48s., eSKKSZ = 24m.29s., e = 28m.7s.  
Fresno esPPZ = 19m.26s.

*Continued on next page.*

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Overton iPPZ = 18m.5s.  
 Pierce Ferry ePKKP? = 29m.14s.  
 Boulder City ePP = 18m.29s., eS = 25m.49s.  
 Tucson epPP = 20m.5s., ePPS = 29m.58s.  
 Tacubaya e = 19m.53s. and 23m.49s.  
 Bogota eEN = 27m.11s.  
 La Paz iZ = 21m.49s. and 23m.50s., iPPS = 35m.30s.  
 Huancayo e = 26m.23s., cSS = 40m.51s., e = 50m.2s.

July 9d. 19h. 17m. 11s. Epicentre 35°·9S. 102°·4W. (as on 1950, April 14d.).

A = -·1743, B = -·7930, C = -·5838 ;  $\delta = +5$  ;  $h = 0$   
 D = -·977, E = +·215 ; G = +·125, H = +·570, K = -·812.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.	
	°	°	m. s.	s.	m. s.	s.	m. s.	m.	
Huancayo	34·1	53	i 6 52	+ 4	i 12 14	0	e 7 55	PP	—
La Paz	36·1	66	e 7 1	- 4	i 12 57	+12	i 8 35	PP	17·8
Bogota	48·3	39	i 8 49	+ 4	e 15 54	+ 9	e 10 49	PP	e 24·8
Tucson	68·2	353	e 11 3	- 1	—	—	—	—	—
Riverside	z. 70·9	347	i 11 20	- 1	—	—	i 11 34	P <sub>c</sub> P	—
Pasadena	z. 71·2	347	i 11 23	0	—	—	i 11 59	P <sub>c</sub> P	—
Boulder City	72·4	350	e 11 32	+ 2	—	—	e 11 44	P <sub>c</sub> P	—
Pierce Ferry	72·5	351	e 11 26	- 4	—	—	—	—	—
Overton	z. 72·9	350	i 11 33	0	—	—	e 14 33	PP	—
Fresno	z. 74·1	346	e 11 39k	- 1	—	—	—	—	—
Tinemaha	z. 74·1	348	i 11 28	-12	—	—	—	—	—
Lick	75·0	345	i 11 47k	+ 2	—	—	—	—	—
Berkeley	75·7	345	e 11 49a	0	e 26 39	SS	e 22 29	PPS	e 36·2
Shasta Dam	78·4	345	e 12 2	- 2	—	—	e 15 50	?	—
Cleveland	z. 79·4	16	i 12 10k	+ 1	—	—	—	—	—
Weston	82·9	23	e 12 23	- 5	—	—	—	—	—
Harvard	83·0	23	e 12 26	- 2	—	—	—	—	e 40·8
Ottawa	z. 84·4	18	e 12 36	0	—	—	—	—	—
Hungry Horse	84·5	353	i 12 35	- 1	—	—	—	—	—
Victoria	z. 86·1	347	e 13 44	+60	—	—	—	—	—
Tamanrasset	z. 117·1	81	e 18 50	[+ 3]	—	—	e 19 57	PP	—
Besançon	127·0	54	e 19 7	[+ 1]	—	—	—	—	—
Stuttgart	129·5	52	e 19 11	[0]	e 22 37	SKP	—	—	—
Rome	z. 130·0	62	e 22 41	PKS	—	—	—	—	—
Collmberg	z. 132·3	50	e 19 18	[+ 2]	—	—	—	—	—
Ksara	145·9	81	e 19 46	[+ 5]	—	—	—	—	—

Additional readings :—

La Paz iPZ = 7m.10s., iSS = 15m.24s.

Bogota eS<sub>c</sub>SEN = 18m.26s.,

Lick iZ = 11m.55s. and 12m.19s.

Berkeley eZ = 11m.55s., eE = 25m.23s., 32m.21s., and 34m.29s.

Long waves were also recorded at Christchurch, Wellington, Tacubaya, Philadelphia, Washington, Scoresby Sund, Granada, Kew, and Potsdam.

July 9d. Readings also at 1h. (Christchurch), 2h. (Boulder City, Overton, Tucson, and near Huancayo (2)), 4h. (Brisbane), 5h. (Harvard (2), College, Pierce Ferry, Tucson, Berkeley, Fresno, Lick, Collmberg (4), Stuttgart (3), and Granada (2)), 7h. (Besançon, Naryn, near Frunse, Almata, Przhhevsk, and Andijan), 8h. (Brisbane, Lick, Fresno, Hungry Horse, Shasta Dam, Pasadena, Riverside, Tinemaha, Overton, Boulder City, Pierce Ferry, Tucson, Seattle, near Victoria, near Bogota, and Chinchina), 9h. (San Juan (2)), 10h. (Huancayo, Boulder City, Overton, and Pierce Ferry), 11h. (near Alicante), 13h. (Timisoara), 14h. (Mount Wilson, Riverside, Palomar, Overton, Pierce Ferry, Tucson, Merida, near Puebla, Oaxaca, Tacubaya, and Vera Cruz), 16h. (Stuttgart, and near Kishinev), 17h. (College, Shasta Dam, Pierce Ferry, Kulyab, Murgab, Andijan, near Obi-garm, and Stalinabad), 18h. (La Plata), 22h. (near Andijan), 23h. (Huancayo, Tucson, Hungry Horse, Shasta Dam, and College).

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July 10d. 5h. 33m. 6s. Epicentre 18°·5S. 66°·5E. (as on August 8d.).

A = +·3784, B = +·8703, C = -·3154;  $\delta = +9$ ;  $h = +5$ ;  
D = +·917, E = -·399; G = -·126, H = -·289, K = -·949.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.	
		°	°	m. s.	s.	m. s.	s.	m. s.	m.	
Tananarive		18·0	266	e 4 4	- 9	7 8	-24	i 4 12	PP	e 8·2
Kodaikanal	E.	30·5	21	e 6 41	+24	—	—	—	—	—
Pretoria	Z.	36·1	252	e 7 4	- 1	—	—	—	—	—
Poona	N.	37·5	13	—	—	i 12 54	-13	—	—	—
Bombay		37·7	9	e 4 15	?	e 13 1	- 9	—	—	—
Grahamstown		38·6	240	e 7 0	-26	—	—	—	—	—
Djakarta		41·2	77	e 8 58	+70	e 15 47	?	—	—	—
Bandong		41·7	78	e 9 0	PP	e 15 54	?	—	—	—
New Delhi	N.	47·9	13	e 8 51	+ 9	i 15 25	-14	e 18 51	ScS	—
Mary		56·0	356	e 9 41	- 2	—	—	—	—	—
Kulyab		56·2	4	e 9 42	- 2	—	—	—	—	—
Stalinabad		56·8	3	e 9 46	- 2	e 17 32	- 9	—	—	—
Obi-garm		57·0	4	i 9 45	- 5	—	—	—	—	—
Samarkand		57·9	0	e 10 1	+ 5	—	—	—	—	—
Fergana		58·8	5	e 10 0	- 2	—	—	—	—	—
Helwan		58·8	324	e 10 0	- 2	18 4	- 3	e 12 21	PP	—
Andijan		59·2	6	e 9 59	- 6	—	—	—	—	—
Tashkent		59·6	3	e 10 0	- 8	—	—	—	—	—
Ksara		59·7	330	e 10 24	+15	e 19 24?	+65	—	—	—
Naryn		60·3	10	e 9 59	-14	—	—	—	—	—
Shenkla		61·1	345	e 10 20	+ 2	—	—	—	—	—
Almata		62·2	10	e 10 21	- 5	—	—	—	—	—
Tiflis		63·2	342	e 10 23	- 9	e 18 54?	- 9	—	—	—
Abastumanj		63·8	341	e 10 40	+ 4	—	—	—	—	—
Grozny		64·4	344	e 10 32	- 8	—	—	—	—	—
Istanbul		68·7	331	e 11 6	- 1	e 20 11	+ 1	—	—	—
Yalta		69·3	336	—	—	e 20 3	-14	—	—	—
Tamanrasset	Z.	72·3	302	e 11 22	- 7	—	—	e 13 55	PP	e 33·9
Sverdlovsk		75·2	357	11 43	- 3	21 15	-10	—	—	—
Moscow		77·9	345	12 0	- 1	21 48	- 6	—	—	—
Rome		78·1	322	e 12 10	+ 8	e 21 46	-10	e 15 20	PP	—
Bologna		80·4	324	e 12 27	+12	e 21 41	-40	—	—	—
Warsaw		80·8	334	e 12 11	- 6	e 22 20	- 5	e 15 21	PP	e 38·9
Algiers Univ.	Z.	81·2	313	e 12 19	0	—	—	—	—	—
Prague		82·3	329	e 12 34	+ 9	e 22 37	- 3	e 23 14	PS	—
Cheb		83·3	329	e 18 18	?	e 23 9	+19	—	—	—
Pulkovo		83·4	343	—	—	e 22 40	-11	—	—	—
Zürich		83·6	324	e 12 35	+ 4	—	—	—	—	—
Collnberg	Z.	83·7	329	e 12 31	- 1	—	—	—	—	—
Basle		84·3	324	e 12 43	+ 8	—	—	—	—	—
Alicante		84·4	314	e 14 2	?	e 22 50	-11	—	—	e 34·1
Potsdam		84·4	330	e 12 48	+12	e 21 54	?	—	—	e 46·9
Stuttgart		84·7	326	e 12 30	- 7	e 22 42	-22	e 23 10	SKS	e 36·9
Strasbourg		84·8	326	e 12 43	+ 6	e 22 58	- 7	—	—	e 34·9
Besançon		85·0	324	e 12 39	+ 1	—	—	—	—	—
Tortosa		85·0	316	e 15 30	PP	e 23 4	- 3	—	—	—
Clermont-Ferrand		85·9	321	e 13 2	?	e 23 29	+13	e 24 34	PS	39·9
Granada		86·1	311	e 12 54	+10	23 24	+ 6	29 14	SS	42·9
Malaga	Z.	86·5	311	e 12 45	- 1	e 23 21	- 1	—	—	40·2
Copenhagen		86·8	333	e 12 54	+ 7	e 23 20	- 5	—	—	38·9
Upsala		87·6	338	e 16 27	PP	e 23 18	[ 0]	—	—	e 44·9
Toledo		87·6	313	e 12 52	+ 1	e 23 48	+16	e 25 19	PPS	42·4
Paris		87·8	324	e 12 53	+ 1	e 23 29	- 4	e 18 0	PPP	e 34·9
De Bilt		88·1	327	e 13 18	+24	—	—	—	—	e 35·9
Kew		90·7	325	e 13 50	+44	e 23 57	- 4	e 28 43	?	e 33·9
Durham	E.	93·0	327	—	—	e 24 33	+12	—	—	—
Aberdeen		94·4	330	i 27 32	PPS	—	—	—	—	e 37·8
Rathfarnham C.	Z.	94·8	325	e 26 4	PS	—	—	—	—	e 42·6
La Paz		123·4	235	e 19 26	[ +26]	—	—	54 6	Q	57·1
College		128·3	18	e 22 46	PP	—	—	e 25 20	PPP	e 63·4

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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.
Huancayo	131.7	234	e 20 56	PP	e 39 9	SS	e 43 19	SSS e 51.1
Bermuda	134.2	297	e 23 19	PP	e 39 46	SS	—	e 57.4
Seven Falls	135.0	319	e 23 7	PKS	—	—	—	63.9
Sitka	138.2	18	—	—	e 28 18	{-52}	—	e 65.7
Cleveland	144.4	317	e 19 45	[+ 7]	—	—	e 27 42	P <sub>c</sub> PPKP 69.4
Chicago	148.0	323	e 20 33	[+ 49]	—	—	—	—
Victoria	z. 149.0	13	e 20 1	[+ 15]	—	—	e 23 12	PP e 63.3
Hungry Horse	150.2	0	e 19 49	[- 1]	—	—	—	—
Seattle	150.4	11	e 19 59	[+ 11]	—	—	e 20 20	PKP <sub>2</sub> e 93.9
Shasta Dam	156.6	18	e 20 18	PKP <sub>2</sub>	—	—	e 24 22	PP
Logan	156.8	356	e 20 29	PKP <sub>2</sub>	—	—	—	—
Berkeley	z. 159.2	20	e 20 50 <sub>a</sub>	PKP <sub>2</sub>	—	—	e 27 42	PPP
Lick	z. 159.9	20	e 20 55 <sub>a</sub>	PKP <sub>2</sub>	—	—	—	—
Fresno	z. 161.0	16	e 20 53	PKP <sub>2</sub>	—	—	—	—
Tinemaha	z. 161.1	11	e 20 13	[+ 11]	—	—	—	—
Overton	z. 162.0	3	e 20 15	[+ 12]	—	—	e 24 43	PP
Pierce Ferry	162.5	0	e 20 10	[+ 7]	—	—	e 24 18	PP
Boulder City	162.6	3	e 20 17	[+ 14]	—	—	e 24 47	PP
Mount Wilson	z. 163.8	14	e 19 58	[- 6]	—	—	—	—
Pasadena	z. 163.9	14	e 20 50	PKP <sub>2</sub>	—	—	—	—
Riverside	z. 164.2	14	e 20 9	[+ 4]	—	—	—	—
Tucson	166.1	350	e 20 11	[+ 4]	—	—	e 24 59	PP e 81.8

Additional readings :—

Tananarive eP = 4m.8s., ePPP = 4m.23s., iSSS? = 7m.33s., i = 7m.43s.  
 New Delhi eN = 12m.22s.  
 Helwan eZ = 10m.18s., pP?Z = 11m.27s., eZ = 13m.3s., 13m.39s., 18m.37s., and 19m.33s.  
 Tamanrasset eZ = 11m.42s. and 13m.47s., ePPPZ = 15m.33s.  
 Rome eSSE = 27m.8s., eSSSE = 30m.26s.  
 Bologna e = 13m.11s.  
 Warsaw eZ = 12m.52s., 13m.26s., 13m.55s., 16m.44s., and 21m.55s., eE = 24m.1s., eZ = 24m.25s., eE = 26m.28s., eSS = 27m.34s., e = 28m.45s.  
 Algiers Univ. eZ = 12m.35s. and 12m.40s.  
 Prague e = 12m.47s., 13m.32s., 14m.24s., 14m.50s., 15m.22s., and 17m.18s.  
 Collmberg eZ = 12m.37s.  
 Stuttgart e = 13m.33s., 24m.2s., and 25m.27s., eQ = 33.9m.  
 Strasbourg e = 12m.58s., i = 13m.24s., e = 26m.19s.  
 Besançon e = 12m.50s.  
 Granada SSS = 32m.29s.  
 Upsala eN = 21m.22s., eSKS?N = 23m.24s.  
 Toledo eZ = 13m.12s.  
 Paris i = 13m.14s., e = 13m.55s., 19m.41s., and 24m.51s.  
 Cleveland eE = 24m.19s.  
 Victoria eZ = 20m.47s.  
 Seattle e = 20m.33s. and 20m.52s.  
 Shasta Dam e = 20m.34s.  
 Berkeley eZ = 20m.56s. and 22m.46s., eN = 32m.38s. eZ = 36m.36s.  
 Lick iZ = 21m.5s.  
 Mount Wilson eZ = 20m.43s.  
 Tucson e = 21m.17s.  
 Long waves were recorded at Christchurch, Bozeman, Harvard, Weston, Washington, Philadelphia, Salt Lake City, San Juan, Scoresby Sund, and Bogota.

July 10d. 13h. 51m. 21s. Epicentre 20°·5S. 179°·0W. Depth of focus 0·080.  
 (as on 1950, June 15d.).

A = -·9373, B = -·0164, C = -·3481;  $\delta$  = -3; h = +5;  
 D = -·017, E = +1·000; G = +·348, H = +·006, K = -·937.

	$\Delta$	Az.	P.	O - C.	S.	O - C.	Supp.	L.
	$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Apia	9.6	47	e 2 15	0	e 3 59	- 3	—	—
Arapuni	18.1	195	e 3 33	- 6	e 6 33	- 3	—	—
Tuai	N. 18.6	190	e 3 57	+ 13	e 6 32	- 13	14 34	S <sub>c</sub> S
Wellington	21.4	193	4 6	- 4	7 18	- 13	14 16	S <sub>c</sub> S
Cobb River	E. 21.7	197	e 4 11	- 2	7 26	- 10	—	—

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.
Kaimata	N.E.	23.4	198	4 12	-16	7 52	-12	—	—
Brisbane		26.4	250	i 4 58 <sub>a</sub>	+ 3	i 8 54	+ 3	—	i 14.7
Riverview		29.6	237	i 5 23 <sub>k</sub>	0	i 9 39	- 2	i 14 59	ScS
Vladivostok		77.7	326	i 11 6	+ 4	i 20 19	+ 9	—	—
Berkeley	z.	78.8	43	i 11 8	0	—	—	—	—
Lick	z.	78.9	43	e 11 11 <sub>a</sub>	+ 3	—	—	e 13 15	pP
Pasadena		79.4	47	i 11 10	- 1	—	—	e 13 13	pP
Fresno	z.	79.7	45	e 11 13 <sub>a</sub>	0	—	—	e 13 17	pP
Palomar	z.	79.8	48	i 11 14	+ 1	—	—	—	—
Riverside	z.	79.8	47	i 11 13	0	—	—	i 13 18	pP
Shasta Dam		80.4	39	i 11 17	+ 1	—	—	e 13 20	pP
Haiwee	z.	80.6	46	i 11 18	+ 1	—	—	—	—
Boulder City		82.7	47	i 11 29	+ 1	—	—	e 13 32	pP
Overton	z.	83.2	47	i 11 32	+ 2	—	—	i 13 34	pP
Pierce Ferry		83.3	47	i 11 31	0	—	—	e 13 33	pP
Tucson		83.6	52	i 11 33	+ 1	—	—	e 13 47	pP
Logan		87.6	43	e 11 52	0	e 21 52	+ 5	e 13 56	pP
College		88.4	13	e 11 54	- 1	i 21 52	- 2	i 14 2	pP
Hungry Horse		89.7	37	e 12 1	0	—	—	e 13 58	pP
Pretoria	z.	127.0	211	i 18 2	[ 0 ]	—	—	—	—
Copenhagen		143.8	351	i 18 34	[ 0 ]	—	—	—	—
Warsaw	z.	144.7	340	e 18 39 <sub>a</sub>	[ + 3 ]	—	—	e 20 50	pPKP
Ksara		146.4	301	e 18 39	[ + 1 ]	—	—	20 53	pPKP
Potsdam	z.	146.8	347	i 18 44	[ + 5 ]	—	—	—	—
Collmberg	z.	147.8	347	i 18 45	[ + 5 ]	—	—	e 20 59	pPKP
Jena	N.	148.5	347	e 18 47	[ + 6 ]	—	—	—	—
Prague		148.6	343	e 18 48	[ + 7 ]	—	—	e 21 5	pPKP
Stuttgart	z.	151.0	350	e 18 46	[ + 1 ]	—	—	e 21 9	pPKP
Helwan	z.	151.1	295	e 18 47	[ + 2 ]	—	—	21 1	pPKP
Tamanrasset	z.	175.2	—	i 19 9 <sub>k</sub>	[ + 2 ]	—	—	e 21 26	pPKP

Additional readings :—

Brisbane eN = 11m.47s., iE = 11m.51s.

Riverview iE = 9m.49s., iN = 12m.42s. and 12m.48s., iE = 13m.2s.

Berkeley eZ = 11m.15s. and 11m.33s.

Lick eZ = 11m.17s.

Boulder City e = 11m.45s.

Tucson e = 11m.50s.

Warsaw eZ = 21m.41s., esPZ = 21m.59s., eZ = 22m.19s. and 22m.48s.

Collmberg eZ = 18m.50s.

Jena eN = 18m.59s.

Prague e = 18m.57s., ePKP<sub>2</sub> = 19m.10s., e = 20m.2s., 20m.27s., and 21m.46s., esPKP<sub>2</sub> = 22m.14s.

Stuttgart iPKPZ = 18m.53s., ePPZ = 22m.44s.

Helwan eZ = 18m.54s., PKP<sub>2</sub>Z = 19m.6s., pPKPZ = 21m.16s., PPZ = 22m.39s.

Tamanrasset iPKP<sub>2</sub>Z = 20m.52s., epPKP<sub>2</sub>Z = 22m.59s., ePPZ = 24m.42s., epPPZ = 26m.47s., esPPZ = 27m.51s., eZ = 28m.13s., ePPPZ = 28m.58s., epPPPZ = 30m.42s.

July 10d. Readings also at 0h. (Frunse, Samarkand, near Andijan, Kulyab, Murgab, Obi-garm, and Stalinabad), 1h. (Almata, Frunse, Mary, Przhevalsk, near Andijan, Fergana, Kulyab, Murgab, Obi-garm, Samarkand, and Stalinabad), 2h. (Lick), 4h. (near Huancayo), 11h. (Andijan, Frunse, Naryn, Almata, and near Przhevalsk), 12h. (Budapest, Kalossa, and near Timisoara), 14h. (Pierce Ferry and near Mizusawa), 16h. (Collmberg and Stuttgart), 19h. (Kaimata, Mount Wilson, Palomar, Riverside, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, and Shasta Dam), 21h. (La Paz, College, Fergana, near Andijan, Kulyab, Obi-garm, and Stalinabad).

July 11d. Readings at 0h. (near Vera Cruz), 3h. (College, near Ebingen, and Stuttgart), 5h. (Pierce Ferry), 7h. (Mount Wilson, Tucson, Hungry Horse, Boulder City, Overton, Pierce Ferry, Ksara, and Strasbourg), 8h. (Pierce Ferry, Hungry Horse, and near Ashkabad), 9h. (Mary, Przhevalsk, Samarkand, near Almata, Andijan, Fergana, Frunse, Kulyab, Naryn, Obi-garm, Stalinabad, Tashkent, near Ashkabad, near Neuchatel, Zürich, Granada, Shasta Dam, and near Overton), 10h. (Lick and near Istanbul), 11h. (Durham), 15h. (Naryn, near Andijan, and Murgab), 16h. (Haiwee, Palomar, Pasadena, Riverside, Tinemaha, Tucson, Boulder City, Pierce Ferry, Shasta Dam, Hungry Horse, College, Logan, Ottawa, Tacubaya, Huancayo, and near Sofia), 17h. (Shasta Dam, Hungry Horse, College, Tamanrasset, Bucharest, Timisoara, near Istanbul, and near Obi-garm), 19h. (Fergana, near Andijan (2), Murgab (2), Naryn, and Obi-garm), 21h. (near Obi-garm), 22h. (Cleveland).

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July 12d. 1h. 36m. 37s. Epicentre 1°·5N. 102°·0W.

A = -·2078, B = -·9778, C = +·0260 ;  $\delta = -5$  ; h = +7 ;  
D = -·978, E = +·208 ; G = -·005, H = -·025, K = -1·000.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Tacubaya	18·0	8	e 4 28	+15	e 7 51	+19	—	—
Vera Cruz	18·5	17	e 4 24	+ 5	e 7 53	+ 9	e 8 14	SS
Guadalajara	19·1	355	—	—	e 9 2	Q	—	i 9·3
Bogota	28·1	82	e 5 57	+ 2	e 10 21	-19	e 7 11	PP
Galerazamba	28·1	69	i 7 9	+74	—	—	—	—
Huancayo	29·7	117	e 6 14	+ 4	e 11 11	+ 5	e 9 35	PcP
Tucson	31·7	346	e 6 26	- 1	e 11 41	+ 4	e 7 36	PP
Palomar	z. 34·6	338	i 6 54	+ 1	—	—	—	e 13·8
Riverside	z. 35·4	337	i 6 58	- 2	—	—	—	—
Pasadena	35·8	337	i 7 2	- 1	—	—	—	e 17·4
Pierce Ferry	36·2	344	i 7 6	0	—	—	—	—
Boulder City	36·3	343	e 7 8	+ 1	—	—	—	—
Overton	z. 36·7	343	i 7 11	+ 1	—	—	—	—
Haiwee	z. 37·5	339	i 7 18	+ 1	—	—	—	—
La Paz	37·9	118	i 6 57	-23	i 13 19	+ 6	i 16 16	Q
Lick	z. 40·0	335	i 7 37k	- 1	—	—	—	—
Shasta Dam	43·2	338	e 8 2	- 2	—	—	—	—
Cleveland	43·9	22	i 8 7k	- 3	i 14 38	- 4	e 18 11	SS
Pennsylvania	44·8	25	—	—	e 14 56	+ 1	e 17 11	SS
Philadelphia	45·4	29	e 8 23	+ 1	e 15 7	+ 3	e 10 35	PP
Hungry Horse	47·8	349	e 8 39	- 2	—	—	—	—
Harvard	49·1	30	i 8 48	- 3	—	—	—	e 23·4
Weston	49·1	30	e 8 47	- 4	—	—	—	—
Ottawa	z. 49·5	24	i 8 51k	- 3	—	—	—	—
Victoria	50·3	342	8 56	- 4	16 15	+ 2	—	25·4

Additional readings :—

Tucson e = 6m.55s.

Palomar eZ = 7m.47s.

Shasta Dam e = 8m.57s.

Cleveland eSEN = 14m.42s.

Long waves were also recorded at Puebla, Honolulu, Berkeley, Seattle, Scoresby Sund, and Malaga.

July 12d. 11h. 9m. 10s. Epicentre 52°·5N. 167°·5W.

A = -·5968, B = -·1323, C = +·7914 ;  $\delta = -1$  ; h = -6 ;  
D = -·216, E = +·976 ; G = -·773, H = -·171, K = -·611.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
College	16·0	32	e 3 43	- 5	e 6 27	-19	—	e 8·1
Sitka	19·0	63	i 4 25	- 1	i 7 58	+ 3	i 5 0	PPP
Victoria	28·0	80	i 5 53k	- 2	10 40	+ 2	—	13·8
Seattle	29·0	81	e 6 6	+ 2	e 10 55	+ 1	e 7 42	PPP
Honolulu	32·0	162	e 7 37	PP	e 11 38	- 4	—	e 12·3
Shasta Dam	32·6	93	i 6 36	+ 1	e 11 52	+ 1	—	e 15·8
Ukiah	33·1	95	—	—	e 12 2	+ 3	—	e 14·0
Hungry Horse	33·7	75	i 6 43	- 2	e 12 1	- 7	i 9 24	PcP
Berkeley	34·5	97	i 6 49k	- 3	i 12 18	- 2	i 8 49	PPP
Santa Clara	35·0	97	e 7 22	+26	e 12 26	- 2	—	e 16·9
Lick	z. 35·2	97	i 6 57k	- 1	—	—	—	—
Butte	N. 35·7	77	e 7 2	0	e 12 29	-10	—	e 15·2
Saskatoon	36·2	66	—	—	e 12 46	- 1	—	17·3
Fresno	36·7	96	i 7 10k	0	e 12 54	0	—	e 17·4
Bozeman	36·8	77	e 7 29	+18	e 12 53	- 3	—	e 15·6
Tinemaha	37·4	94	i 7 19k	+ 3	—	—	—	—
Haiwee	38·2	95	i 7 24k	+ 1	—	—	—	—
Salt Lake City	39·0	84	i 7 28	- 2	i 13 28	- 1	e 8 52	PP
Pasadena	39·4	97	i 7 32k	- 1	i 13 33	- 2	—	e 16·3
Riverside	40·0	97	i 7 37k	- 1	—	—	—	e 16·4

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		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.	
		°	°	m. s.	s.	m. s.	s.	m. s.	m.	
Overton	Z.	40.1	92	i 7 40	+ 1	e 13 29	-17	i 9 10	PP	—
Boulder City		40.2	93	i 7 40	0	e 13 49	+ 1	e 9 25	PP	—
Pierce Ferry		40.6	92	i 7 44	+ 1	e 13 55	+ 1	—	—	—
Palomar		40.7	97	i 7 45 <sup>k</sup>	+ 1	e 13 56	+ 1	e 13 20	S <sub>c</sub> P	—
Vladivostok		40.7	282	i 7 46	+ 2	i 13 56	+ 1	—	—	—
Tucson		45.2	93	i 8 20	0	e 14 55	- 6	e 10 15	PP	e 18.2
Lincoln	E.	48.1	74	e 10 39	PP	e 15 35	- 7	e 18 33	SS	e 19.4
Irkutsk		50.5	308	e 9 1	- 1	e 16 17	+ 1	—	—	—
Chicago		52.7	68	e 9 17	- 1	e 16 37	- 9	e 19 1	S <sub>c</sub> S	—
St. Louis		53.3	72	e 9 21	- 2	i 16 48	- 6	i 17 16	SS	—
Scoresby Sund		54.8	15	i 9 33	- 1	e 17 9	- 5	19 21	S <sub>c</sub> S	26.8
Nanking	N.	55.7	280	i 7 47	?	i 17 29	+ 3	—	—	—
Cleveland		56.3	65	i 9 58 <sup>a</sup>	+13	e 17 28	- 6	—	—	—
Ivigut		56.8	32	e 9 46	- 2	e 17 40	- 1	19 44	S <sub>c</sub> S	27.8
Ottawa		56.8	58	9 46	- 2	17 36	- 5	—	—	23.8
Shawinigan Falls	N.	57.5	55	e 9 50	- 3	—	—	—	—	—
Pittsburgh		57.9	64	—	—	e 17 51	- 4	—	—	—
Seven Falls	E.	58.0	53	e 9 54	- 3	17 50	- 7	22 7	SS	26.8
Vermont		58.7	57	—	—	e 16 58	-68	e 21 14	SS	e 23.9
Pennsylvania		58.8	63	e 10 5	+ 3	i 18 1	- 6	i 19 46	S <sub>c</sub> S	e 22.6
Washington		60.6	63	e 10 15	0	—	—	—	—	e 32.5
Philadelphia		60.8	62	e 10 18	+ 2	i 18 31	- 2	—	—	e 18.9
Fordham		60.9	60	e 10 15	- 2	i 18 32	- 2	—	—	—
Harvard		60.9	58	i 19 15	- 2	e 18 28	- 6	e 31 50?	Q	e 35.3
Weston		61.1	58	i 10 16	- 2	i 28 33	?	—	—	—
Sverdlovsk		64.1	334	i 10 38	0	e 19 19	+ 5	—	—	—
Pulkovo		67.2	351	e 10 56	- 2	e 19 53	+ 1	—	—	—
Upsala		67.9	358	e 18 50?	?	e 24 50?	SS	e 28 50?	Q	e 31.8
Almata		69.6	317	e 11 12	- 1	—	—	—	—	—
Aberdeen	E.	70.0	10	i 15 38	PPP	i 20 25	- 1	i 21 52	PPS	e 31.0
Moscow		70.1	346	i 11 16	0	e 20 31	+ 4	—	—	—
Frunse		71.0	317	e 11 23	+ 1	—	—	—	—	—
Naryn		71.5	315	e 11 25	+ 1	e 20 49?	+ 6	—	—	—
Bermuda		72.1	60	e 11 32	+ 4	e 20 34	-16	e 21 28	PPS	e 29.4
Copenhagen		72.2	1	i 11 28	- 1	e 20 45	- 6	28 38	SSS	34.8
Durham		72.5	10	—	—	i 19 35	?	—	—	—
Rathfarnham C.	Z.	73.4	13	i 11 37	+ 1	e 21 9	+ 4	e 14 34	PP	e 31.0
Andijan		73.6	318	11 38	+ 1	—	—	—	—	—
Fergana		74.2	318	i 11 40	0	21 16	+ 2	—	—	—
Tashkent		74.4	320	i 11 41	- 1	e 21 17	+ 1	—	—	—
Murgab		75.0	315	e 11 47	+ 2	e 21 25	+ 2	—	—	—
Warsaw		75.4	355	e 11 47	0	e 21 29	+ 2	e 21 43	PS	e 34.8
Potsdam		75.5	1	i 11 48 <sup>k</sup>	0	e 22 8	PS	—	—	e 39.8
De Bilt		75.6	5	e 11 51	+ 3	e 21 42	+13	—	—	e 35.8
Kew		75.8	9	e 11 50	0	e 21 45	+14	e 14 43	PP	e 30.8
Obi-garm		76.5	318	i 11 56	+ 2	e 21 42	+ 3	—	—	—
Collmberg		76.6	0	e 11 54	0	—	—	—	—	e 43.8
Jena		76.9	1	e 11 55	- 1	e 22 6	PS	e 11 59	P	—
Stalinabad		77.0	319	i 11 58	+ 2	i 21 45	0	—	—	—
Kulyab		77.1	318	e 12 0	+ 3	—	—	—	—	—
Prague		77.8	359	e 12 2	+ 1	e 21 50	- 3	e 15 29	PP	—
Skalnate Pleso		78.5	356	e 12 14	+10	e 22 13	+12	e 22 58	PS	—
Paris		78.7	8	i 12 5	- 1	e 22 10?	+ 7	e 15 8	PP	e 37.8
Karlsruhe		78.8	4	e 12 7	+ 1	e 22 21	+17	—	—	—
Stuttgart		79.1	4	e 12 8 <sup>a</sup>	0	e 22 18	+11	e 31 20	SSS	e 38.8
Strasbourg		79.2	3	i 12 9	+ 1	i 22 9	+ 1	e 15 9	PP	e 37.7
Kishinev		79.9	350	e 12 12	0	—	—	—	—	—
Basle		80.2	4	e 12 14	0	e 21 41	-38	—	—	—
Budapest		80.2	356	e 12 15	+ 1	e 22 20	+ 1	—	—	e 50.8
Zürich		80.5	4	e 12 15 <sup>a</sup>	0	e 22 31	+ 9	—	—	—
Besançon		80.5	6	e 12 19	+ 4	—	—	—	—	—
Mary		80.5	323	i 12 17	+ 2	—	—	—	—	—
Kalossa		81.2	356	e 12 26	+ 7	—	—	e 14 36	PP	e 59.0
Ashkabad		81.5	326	e 12 17?	- 4	e 22 34?	+ 2	—	—	—
New Delhi	N.	81.6	307	e 12 21	0	22 27	- 6	22 40	PS	—

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	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Clermont-Ferrand	81.8	8	e 12 23	+ 1	e 22 42	+ 7	—	—
Tiflis	82.1	337	i 12 25	+ 1	e 22 41?	+ 3	—	—
Triest	82.2	0	e 12 25	+ 1	i 22 42	+ 3	e 23 11	PS
San Juan	82.3	71	e 12 30	+ 5	e 22 38	- 2	—	e 38.0
Bucharest	82.8	351	e 12 32	+ 5	e 22 49	+ 4	—	—
Galerazamba	82.9	82	—	—	e 22 45	- 1	e 26 25	SS
Prato	84.0	2	e 12 37	+ 4	e 23 2	+ 5	—	—
Florence Arc.	84.1	2	e 12 27 <sub>a</sub>	- 7	e 23 0	+ 2	—	—
Istanbul	85.7	348	12 43	+ 1	23 9	- 5	—	—
Rome	86.0	1	i 12 43 <sub>a</sub>	0	e 23 18	+ 1	e 16 26	PP
Tortosa	86.5	10	e 12 44	- 2	—	—	—	e 42.8
Lisbon	87.2	18	—	—	23 30	+ 2	23 14	SKS
Taranto	87.3	357	e 11 59?	- 51	e 23 30	+ 1	—	—
Fort de France	88.1	69	—	—	e 21 58	?	—	—
Bogota	88.5	84	e 13 21	+ 25	e 23 37	- 4	e 25 14	PPS
Alicante	88.8	11	13 2	+ 5	23 42	- 2	16 38	PP
Granada	89.6	14	e 13 11	+ 10	i 23 56	+ 5	29 34	SS
Malaga	z. 89.9	15	i 12 58 <sub>k</sub>	- 4	—	—	e 17 22	PP
Ksara	91.6	342	i 13 12	+ 2	e 24 22	+ 13	e 13 2	P
Bombay	E. 91.8	305	—	—	i 24 27	+ 16	—	e 47.6
Riverview	N. 93.2	215	—	—	e 23 55	[+ 4]	—	—
Helwan	96.3	345	e 13 32	0	24 8	[0]	17 29	PP
Tamanrasset	z. 104.8	7	17 38	?	—	—	—	—
La Paz	108.6	93	e 19 6	PP	i 25 14	[+ 8]	i 26 4	SKKS
Pretoria	z. 150.8	331	i 19 26	[- 23]	—	—	—	—
Pietermaritzburg	z. 153.6	324	e 20 3	[+ 10]	—	—	—	—
Grahamstown	158.3	328	i 20 6	[+ 7]	—	—	—	—

Additional readings :—

College iP = 3m.47s., i = 6m.46s.  
 Seattle e = 7m.30s., ePPP = 7m.54s., e = 8m.16s. and 8m.46s., eP<sub>c</sub>P = 9m.52s., e = 11m.10s., 11m.18s., and 11m.31s.  
 Shasta Dam e = 6m.50s.  
 Hungry Horse eS<sub>c</sub>S = 17m.4s.  
 Berkeley iE = 7m.12s., eZ = 11m.43s., iZ = 12m.26s.  
 Lick iZ = 7m.3s.  
 Fresno iZ = 7m.16s.  
 Pasadena iZ = 7m.38s., eZ = 7m.48s.  
 Overton iZ = 8m.3s. and 8m.45s.  
 Palomar iZ = 7m.51s. and 7m.57s., eN = 12m.54s., iEN = 14m.11s., eS<sub>c</sub>SN = 17m.50s., iN = 18m.5s.  
 Tucson i = 8m.36s., 8m.56s., and 9m.25s., ePPP? = 11m.0s.  
 St. Louis e = 19m.7s.  
 Scoresby Sund 22m.21s.  
 Ivigtut e = 15m.44s.  
 Seven Falls SSSE = 24m.14s.  
 Pennsylvania eSSN = 21m.25s.  
 Fordham iP = 10m.25s.  
 Upsala eN = 20m.56s., eE = 21m.23s.  
 Bermuda e = 12m.28s.  
 Copenhagen 21m.4s. and 28m.30s.  
 Rathfarnham Castle iPSZ = 21m.49s., eZ = 27m.36s.  
 Warsaw eZ = 11m.58s. and 12m.24s., eE = 20m.35s., ePSE = 21m.48s., ePPSE = 22m.14s., e = 22m.47s., eE = 23m.47s. and 24m.25s., ePKKPN = 30m.32s.  
 Kew ePSEN = 22m.6s.  
 Prague e = 12m.10s., 12m.19s., 12m.39s., 13m.2s., and 13m.9s., ePS? = 22m.21s.?  
 Skalnate Pleso e = 12m.24s. and 19m.22s., eN = 22m.4s., ePSE = 23m.3s., e = 25m.8s., eSS = 27m.38s., eSSS = 31m.8s.  
 Paris e = 12m.31s. and 16m.18s., iS<sub>c</sub>S? = 22m.28s., e = 26m.7s., eSSS = 30m.31s.  
 Stuttgart eZ = 12m.29s.  
 Strasbourg ePS = 22m.51s., eSS = 27m.16s., eSSS = 30m.33s.  
 Besançon e = 12m.34s.  
 New Delhi PPSN = 23m.0s., SSSN = 30m.5s.  
 Rome eSSE = 29m.2s.  
 Bogota eSKKSEN = 24m.32s.  
 Alicante S<sub>c</sub>S = 23m.54s., PS = 24m.46s., SS = 29m.42s., Q = 36m.58s.  
 Helwan eN = 24m.23s.  
 La Paz PS = 28m.20s., SS = 34m.10s.  
 Long waves were also recorded at Ferndale and Kodaikanal.

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July 12d. 11h. 44m. 0s. Epicentre 37°·3N. 141°·3E. Depth of focus 0·005.  
(as on 1947, October 12d.).

Intensity IV at Onahama, Hukushima, Mito ; II-III at Inawashiro, Sendai, Shirakawar, Ishinomaki, Tsukubasan. Epicentre as adopted. Macro seismic radius : 200-300km.  
Depth : 30-100km.

The Seismological Bulletin of the Central Meteorological Observatory, Japan, for the year 1950, Tokyo, 1952, p. 30-31. Macro seismic chart p, 30.

$$A = -.6223, B = +.4986, C = +.6034; \quad \delta = -5; \quad h = -1;$$

$$D = +.625, E = +.780; \quad G = -.471, H = +.377, K = -.797.$$

		$\Delta$	Az.	P.		O-C.	S.		O-C.
				m.	s.	s.	m.	s.	s.
Onahama		0·5	221	0	14	+ 1	0	24	+ 1
Hukushima		0·8	304	0	18 <sup>k</sup>	+ 1	0	29	0
Sendai		1·0	342	0	19 <sup>a</sup>	0	0	33	0
Mito		1·1	216	0	22	+ 2	0	37	+ 1
Tukubasan		1·4	222	0	26	+ 2	0	42	- 1
Utumomiya		1·4	237	0	24	0	0	40	- 3
Mizusawa	E.	1·8	356	0	32	+ 2	0	52	0
Kumagaya		1·9	233	0	38	+ 7	0	55	+ 1
Maebasi		2·0	243	0	35	+ 3	0	53	- 4
Tokyo		2·0	218	0	34	+ 2	0	58	+ 1
Yokohama		2·3	215	0	33	- 4	1	6	+ 2
Miyako		2·4	13	0	37	- 1	0	52	-15
Morioka		2·4	358	0	34	- 4	1	1	- 6
Akita		2·6	339	0	40	- 1	—	—	—
Mera		2·6	206	1	2	S	(1	2)	-10
Hunatu		2·7	229	0	54	+12	1	21	+ 7
Nagano		3·0	256	0	44	- 3	1	14	- 8
Osima		3·0	211	0	56	+ 9	—	—	—
Hatinohe		3·2	3	0	50	+ 1	1	25	- 2
Wazima		3·5	272	0	51	- 3	—	—	—
Aomori		3·6	353	1	6	+11	1	57	+20
Nagoya		4·1	240	1	26	+24	—	—	—
Nemuro		6·8	27	2	47	S	(2	47)	- 9

July 12d. 11h. 48m. 2s. Epicentre 20°·0S. 175°·0W. Depth of focus 0·005.  
(as on 1950, January 8d.).

Intensity III South of Tonga. Seismo. report Wellington, N.Z., 1950, p.4. Suggested depth 60km.

$$A = -.9368, B = -.0820, C = -.3400; \quad \delta = -8; \quad h = +5;$$

$$D = -.087, E = +.996; \quad G = +.339, H = +.030, K = -.940.$$

		$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.	
				m.	s.	s.	m.	s.	s.	m.	s.	m.	
Apia		6·9	27	e 1	34	- 7	e 2	41	-18	—	—	—	
Auckland	N.	19·0	206	3	58?	-21	—	—	—	—	—	—	
Arapuni		19·8	202	e 4	30	+ 2	e 8	12	+10	—	—	—	
Tuai	N.	19·9	199	e 4	34	+ 5	e 8	3	- 1	—	—	—	
New Plymouth	E.	21·2	204	e 4	46?	+ 4	e 8	46?	+17	e 16	52	S <sub>c</sub> S	—
Wellington		22·9	202	5	0	+ 1	9	2	+ 2	e 16	7	S <sub>c</sub> S	—
Cobb River	E.	23·5	205	e 5	12	+ 7	e 9	16	+ 6	—	—	—	—
Kaimata	N.E.	25·2	205	e 5	21	0	e 9	30	- 9	—	—	—	—
Christchurch		25·7	202	i 5	30	+ 4	9	56	+ 9	—	—	—	e 13·2
Brisbane	Z.	30·1	250	1	6	7 <sup>k</sup>	+ 1	—	—	—	—	—	—
Riverview		33·0	238	i 8	2	PP	e 14	33	Q	—	—	—	e 15·9
Berkeley		76·0	42	i 11	40 <sup>a</sup>	- 2	—	—	—	i 16	21	PPP	—
Lick	Z.	76·0	42	i 11	42 <sup>a</sup>	0	—	—	—	e 12	42	pP	—
Pasadena		76·3	46	i 11	42	- 2	—	—	—	—	—	—	—
Mount Wilson	Z.	76·4	46	i 11	43	- 1	—	—	—	i 12	9	pP	—
Palomar		76·7	47	i 11	46	0	—	—	—	i 12	8	pP	—
Riverside		76·8	46	i 11	46	0	—	—	—	i 12	7	pP	—
Fresno	Z.	76·8	43	e 11	46 <sup>a</sup>	0	—	—	—	e 12	4	pP	—
Haiwee		77·6	45	i 11	51	0	—	—	—	—	—	—	—
Shasta Dam		77·7	38	i 11	50	- 1	—	—	—	i 12	24	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.	
Tinemaha	78.0	44	i 11 54	+ 1	—	—	—	—	
Boulder City	79.6	46	i 12 2	0	—	—	i 15 0	PP	
Overton	z. 80.2	46	i 12 6	+ 1	—	—	i 12 44	pP	
Pierce Ferry	80.2	47	i 12 5	0	—	—	—	—	
Tucson	80.4	51	i 12 7	+ 1	e 21 21	-44	e 12 29	pP	36.5
Victoria	z. 82.3	33	e 12 15	- 1	—	—	—	—	
Hungry Horse	87.1	36	i 12 39	- 1	—	—	—	—	
College	87.1	11	e 12 39	- 1	e 23 12	0	e 23 39	sS	e 41.3
Warsaw	z. 145.5	344	e 19 36	[+ 5]	e 23 35	SKP	e 19 55	PKP <sub>2</sub>	—
Rathfarnham C.	z. 145.6	12	i 19 34	[+ 3]	i 26 56	[+25]	e 53 18	Q	—
Potsdam	z. 147.1	352	e 19 38	[+ 4]	—	—	—	—	—
Collmborg	z. 148.1	350	e 19 40	[+ 5]	—	—	e 20 4	pPKP	—
Jena	N. 148.7	352	e 19 43	[+ 7]	—	—	e 20 23	pPKP	—
Prague	149.1	348	e 19 49	[+12]	—	—	e 20 11	PKP <sub>2</sub>	—
Ksara	149.3	302	e 19 47	[+10]	—	—	—	—	—
Istanbul	150.7	321	e 19 48	[+ 9]	—	—	—	—	—
Stuttgart	z. 151.1	354	e 19 43	[+ 3]	—	—	—	—	—
Paris	151.2	4	e 19 45	[+ 5]	—	—	i 20 12	pPKP	e 71.0
Strasbourg	151.4	356	e 19 45	[+ 5]	—	—	i 20 6	pPKP	e 81.0
Basle	152.5	356	e 19 54	[+12]	—	—	e 20 53	PKP <sub>2</sub>	—
Zürich	152.5	356	e 19 49	[+ 7]	—	—	—	—	—
Besançon	152.8	357	e 19 54	[+12]	—	—	i 20 7	pPKP	—
Clermont-Ferrand	154.3	3	e 19 59	[+15]	—	—	i 20 21	pPKP	—
Tamanrasset	z. 177.2	—	e 20 4	[+ 1]	e 32 38	SKKS	i 20 28	pPKP	84.0

Additional readings :---

New Plymouth esS<sub>c</sub>SE = 17m.38s.  
 Wellington esS<sub>c</sub>S = 16m.45s.  
 Christchurch e = 8m.28s.  
 Riverview iZ = 8m.5s.  
 Berkeley iZ = 11m.48s., iEN = 13m.13s., eE = 15m.30s.  
 Lick iZ = 11m.57s.  
 Mount Wilson iZ = 11m.54s.  
 Palomar iZ = 11m.51s.  
 Riverside iZ = 12m.12s.  
 Shasta Dam ePP = 14m.44s., epPP = 15m.1s.  
 Overton iZ = 13m.11s. and 13m.51s.  
 Tucson i = 13m.3s.  
 Warsaw eE = 19m.40s., eZ = 19m.46s., eNZ = 20m.2s., eEZ = 20m.25s. and 20m.42s.,  
 eZ = 21m.21s., eEN = 21m.40s.  
 Rathfarnham Castle 19m.42s. and 20m.2s., e = 20m.20s. and 32m.51s.  
 Collmborg eZ = 19m.46s.  
 Jena ePKP?E = 19m.47s., eE = 21m.1s., eN = 21m.4s., eE = 21m.50s.  
 Prague epPKP = 20m.19s., esPKP = 20m.29s., esPKP<sub>2</sub> = 20m.39s., e = 21m.6s. and  
 21m.21s., i = 22m.10s., ePP? = 23m.21s., e = 24m.49s., 26m.4s., and 26m.16s.  
 Stuttgart eZ = 19m.51s.  
 Paris i = 19m.51s., iPKP<sub>2</sub> = 20m.7s., isPKP = 20m.21s., i = 20m.48s.  
 Strasbourg i = 19m.52s. and 21m.4s.  
 Besançon e = 21m.23s.  
 Tamanrasset iZ = 20m.9s. and 20m.16s., iPKP<sub>2</sub>Z = 21m.57s., eZ = 22m.11s., epPKP<sub>2</sub>Z =  
 22m.35s., ePPZ = 25m.46s., epPPZ = 26m.10s., eP<sub>c</sub>PKP?Z = 28m.50s., iZ =  
 29m.14s., ePPPZ = 30m.9s.

July 12d. 15h. 46m. 38s. Epicentre 56°·2N. 162°·8E. (as on 1948, November 1d.).

A = -·5339, B = +·1653, C = +·8292;  $\delta$  = -5;  $h$  = -7;  
 D = +·296, E = +·955; G = -·792, H = +·245, K = -·559.

	$\Delta$ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	Supp. m. s.	L. m.	
Vladivostok	23.7	249	e 5 43	+29	i 9 53	+26	—	—	
College	25.2	49	e 5 29	0	e 9 50	- 2	—	e 12.2	
Sitka	33.0	61	—	—	e 12 4	+ 7	—	e 14.2	
Irkutsk	33.5	289	e 6 43	0	e 11 29	-36	—	—	
Victoria	z. 43.7	67	e 8 8	0	—	—	—	—	
Seattle	44.8	68	e 8 26	+ 9	e 15 38	+43	e 18 32	SSS	—
Hungry Horse	48.5	62	i 8 46	0	—	—	—	—	—
Shasta Dam	49.5	75	i 8 53	- 1	—	—	—	—	—
Sverdlovsk	51.1	317	9 9	+ 3	16 29	+ 5	—	—	—
Berkeley	z. 51.6	77	e 9 8 <sub>a</sub>	- 2	—	—	—	—	e 29.4

Continued on next page.

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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.	
Lick	z.	52.3	77	i 9 14 <sub>a</sub>	- 1	—	—	i 9 44	pP	—
Almata		53.4	295	e 9 25	+ 1	—	—	—	—	—
Scoresby Sund		53.6	3	i 9 40	+15	e 17 8	+10	—	—	23.4
Fresno		53.7	76	e 9 24 <sub>k</sub>	- 2	—	—	—	—	—
Tinemaha	z.	54.3	75	i 9 30	0	—	—	—	—	—
Frunse		54.9	297	e 9 37	+ 2	—	—	—	—	—
Haiwee	z.	55.2	75	e 9 35	- 2	—	—	—	—	—
Pasadena	z.	56.5	77	i 9 45 <sub>k</sub>	- 1	—	—	i 9 57	pP	—
Overton	z.	56.8	73	i 9 48	0	—	—	i 10 51	P <sub>c</sub> P	—
Boulder City		57.0	74	e 9 48	- 2	—	—	—	—	—
Riverside	z.	57.1	77	e 9 48 <sub>k</sub>	- 2	—	—	i 9 59	pP	—
Pierce Ferry		57.3	73	i 9 52	0	—	—	—	—	—
Andijan		57.6	296	9 54	0	17 51	0	—	—	—
Palomar		57.8	77	i 9 54 <sub>k</sub>	- 1	—	—	i 10 7	pP	—
Fergana		58.2	296	e 9 58	0	—	—	—	—	—
Murgab		58.6	293	e 10 4	+ 3	—	—	—	—	—
Tashkent		58.7	299	e 10 1	- 1	e 18 3	- 3	—	—	—
Moscow		59.9	328	e 10 12	+ 2	e 18 25	+ 4	—	—	—
Obi-garm		60.5	296	i 10 13	- 1	—	—	—	—	—
Upsala	E.	61.0	341	—	—	e 18 22?	-13	—	—	e 36.4
Tucson		61.9	73	i 10 23	- 1	—	—	—	—	—
Copenhagen		65.9	343	—	—	e 19 44	+ 7	—	—	35.4
Ashkabad		66.6	304	e 10 54	0	—	—	—	—	—
Warsaw		67.4	336	e 10 55	- 4	e 20 0	+ 5	11 18	P <sub>c</sub> P	e 34.4
Ottawa	z.	67.5	41	e 10 57	- 3	—	—	—	—	—
Cleveland	z.	68.6	47	e 11 6 <sub>a</sub>	- 1	—	—	i 11 17	pP	—
Potsdam	z.	68.9	342	e 11 22	+13	—	—	—	—	e 40.4
Tiflis		69.3	316	e 11 15?	+ 4	—	—	—	—	—
Collmberg	z.	70.0	342	e 11 17	+ 2	—	—	—	—	—
Rathfarnham C.	z.	70.5	354	i 11 22?	+ 4	e 27 42	SSS	—	—	e 34.3
Jena		70.6	341	e 11 23	+ 4	—	—	—	—	—
Prague		70.9	340	e 11 40	+19	—	—	—	—	—
Harvard		71.5	39	i 11 28	+ 4	—	—	—	—	—
Weston		71.7	39	e 11 25	- 1	—	—	—	—	—
Stuttgart		73.1	342	e 11 35	+ 1	e 21 22	+21	e 11 47	P <sub>c</sub> P	e 39.4
Strasbourg		73.5	343	i 11 39	+ 3	e 21 9	+ 3	—	—	e 36.3
Paris		74.1	348	e 11 38	- 2	e 21 19	+ 7	e 24 45?	SS	e 34.4
Besançon		75.1	344	e 11 47	+ 1	—	—	—	—	—
Istanbul		75.5	325	11 49	+ 1	21 34	+ 6	—	—	—
Clermont-Ferrand		77.0	346	e 11 54	- 2	—	—	—	—	—
Rome		79.1	338	e 12 32	+24	e 22 7	0	e 15 27	PP	—
Ksara		79.6	318	e 12 34	+24	e 22 38	+26	—	—	—
Brisbane	z.	83.8	189	i 12 26	- 6	—	—	—	—	—
Alicante		84.7	348	e 12 54	+17	e 23 12	+ 8	24 4	PS	e 40.8
Granada		86.3	350	i 13 21 <sub>a</sub>	+36	—	—	—	—	—
Malaga	z.	86.8	350	e 12 49	+ 2	e 23 37	+12	e 16 17	PP	44.0
Tamanrasset	z.	99.0	338	e 13 51	+ 7	—	—	e 18 2	PP	62.4

Additional readings :—

College iP = 5m.35s.

Tinemaha eZ = 9m.38s.

Palomar iZ = 10m.11s.

Warsaw eS<sub>c</sub>SZ = 21m.51s., S<sub>c</sub>SE = 21m.59s., eE = 24m.4s., SS = 24m.59s.

Cleveland ePN = 11m.10s.

Collmberg eZ = 11m.28s., 11m.33s., and 11m.43s.

Rathfarnham Castle iZ = 11m.32s.

Jena eE = 11m.33s. and 12m.2s.

Prague e = 11m.43s., 12m.1s., 12m.34s., and 13m.21s.

Paris i = 11m.53s., e = 20m.18s.

Besançon e = 12m.1s., i = 12m.11s.

Alicante SSS = 30m.58s., Q = 35m.0s.

Malaga ePPPZ = 18m.19s.

Tamanrasset eZ = 17m.28s.

Long waves were also recorded at Nanking, Bombay, Kew, Tortosa, and Philadelphia.

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July 12d. 17h. 48m. 25s. Epicentre 37°·7N. 141°·8E. Depth of focus 0·015.  
(as on 1949, September 11d.).

Intensity V at Matusiro (Miyagi Pref.); IV at Watari and Koriyama (Hukusima Pref.); II-III at Isinomaki, Sendai, Hukusima, Onahama, Mito, and Miyako. Epicentre 37°·8N. 142°·0E. Depth 30-100km. Macro seismic radius 200-300km. Seismo. Bull. Cent. Met. Obs., Japan, for 1950. Tokyo, 1952, pp. 31, 32, with macro seismic chart.

$$A = -\cdot6234, B = +\cdot4905, C = +\cdot6090; \quad \delta = +10; \quad h = -1;$$

$$D = +\cdot618, E = +\cdot786; \quad G = -\cdot479, H = +\cdot377, K = -\cdot793.$$

	$\Delta$	Az.	P.	O-C.	S.	O-C.
	°	°	m. s.	s.	m. s.	s.
Sendai	0·9	309	0 15k	- 7	0 27	-12
Hukusima	1·1	273	0 21	- 3	0 36	- 7
Onahama	1·1	223	0 23k	- 1	0 40	- 3
Mito	1·7	219	0 32	+ 1	0 56	+ 2
Miyako	1·9	4	0 26	- 7	0 44	-14
Utunomiya	1·9	233	0 33	0	0 59	+ 1
Morioka	2·0	347	0 27	- 7	0 47	-13
Tukubasan	2·0	322	0 35	+ 1	1 1	+ 1
Kumagaya	2·5	231	0 47	+ 6	1 13	+ 1
Maebasi	2·6	239	0 43	+ 1	1 16	+ 2
Tokyo	2·6	219	0 43	+ 1	1 17	+ 3
Aikawa	2·8	276	0 41	- 4	1 13	- 6
Yokohama	2·8	217	1 9	?	—	—
Nagano	3·0	247	0 48	0	1 28	+ 4
Matusiro	3·1	248	1 23	S	(1 23)	- 3
Aomori	3·2	346	0 53	+ 3	—	—
Mera	3·2	210	1 32	S	(1 32)	+ 4
Hunatu	3·3	228	0 53 <sub>a</sub>	+ 1	1 38	+ 7
Osima	3·5	214	1 2	+ 8	—	—
Toyama	3·8	256	1 3	+ 5	—	—
Shizuoka	3·9	226	1 13	+14	1 48	+ 3
Wazima	3·9	267	0 59	0	1 41	- 4
Omaesaki	4·2	224	2 6	S	(2 6)	+14
Gihu	4·6	242	1 13	+ 4	2 3	+ 1
Nagoya	4·7	237	1 19	+ 9	—	—
Kameyama	5·2	238	1 56	+39	2 37	+21
Shasta Dam	70·5	53	e 11 4	+ 1	—	—
Hungry Horse	71·1	43	i 11 6	0	—	—
Overton	z. 77·9	53	i 11 48	+ 3	—	—
Pierce Ferry	78·5	53	i 11 51	+ 3	—	—

July 12d. 18h. 3m. 10s. Epicentre 17°·0N. 93°·9W. Depth of focus 0·030.  
(as on 1946, January 11d.).

$$A = -\cdot0651, B = -\cdot9547, C = +\cdot2906; \quad \delta = +14; \quad h = +5;$$

$$D = -\cdot998, E = +\cdot068; \quad G = -\cdot020, H = -\cdot290, K = -\cdot957.$$

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.
	°	°	m. s.	s.	m. s.	s.	m. s.
Oaxaca	2·7	270	0 56	+ 8	1 43	+18	—
Vera Cruz	3·1	316	0 52	0	—	—	—
Puebla	4·6	298	1 16	+ 5	2 20	+15	—
Merida	5·6	45	e 1 27	+ 4	i 2 40	+12	—
Tacubaya	5·6	296	i 1 28	+ 5	i 2 42	+14	—
Tucson	21·6	318	e 4 34	+ 1	—	—	e 4 52 pP
Pierce Ferry	26·1	321	e 5 15	0	—	—	i 5 35 pP
Palomar	z. 26·3	312	i 5 17	0	—	—	e 5 38 pP
Boulder City	26·5	319	e 5 19	0	—	—	e 5 44 pP
Overton	z. 26·6	321	e 5 20	0	—	—	i 5 40 pP
Cleveland	E. 26·6	21	e 5 34	+14	—	—	—
Riverside	Z. 27·0	313	e 5 21	- 2	—	—	e 5 45 pP
Mount Wilson	Z. 27·6	313	e 5 28	- 1	—	—	e 5 49 pP
Tinemaha	Z. 29·3	318	e 5 43	- 1	—	—	e 6 4 pP
Lick	Z. 31·7	316	i 6 4 <sub>a</sub>	- 1	—	—	i 6 26 pP

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.	s.
Shasta Dam	34.1	320	e 6 44	+19	—	—	—	—
Hungry Horse	35.3	337	e 6 34	-1	—	—	—	—
College	59.8	337	e 9 30	-14	—	—	—	—

Additional readings :—

Tucson i = 5m.27s.

Palomar eZ = 5m.50s.

Riverside eZ = 5m.56s.

Mount Wilson eZ = 6m.3s.

July 12d. 21h. 26m. 6s. Epicentre 45°·6N. 144°·4E. Depth of focus 0·040.

Intensity II-III at Hatinohe and Kusiro. Epicentre as adopted. Depth of focus 200km.

Macroseismic radius >300km.

Seismo. Bull. Cent. Met. Obs., Japan, for 1950, Tokyo, 1952. p. 32.

A = -·5708, B = +·4087, C = +·7121;  $\delta$  = -7; h = -4;

D = +·582, E = +·813; G = -·579, H = +·415, K = -·702.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	
	°	°	m. s.	s.	m. s.	s.	m. s.	s.
Nemuro	2.4	160	0 59	+10	1 42	+14	—	—
Sapporo	3.3	221	1 4 <sub>a</sub>	+6	1 50	+6	—	—
Aomori	5.4	210	1 27	+5	3 9	?	—	—
Hatinohe	5.5	204	1 27	+3	2 30	+1	—	—
Miyako	6.2	197	1 40	+8	2 51	+7	—	—
Morioka	6.4	203	1 36	+2	2 48	0	—	—
Mizusawa	6.9	202	1 46	+5	3 1	+1	—	—
Sendai	7.8	201	1 57	+5	3 20	0	—	—
Hokusima	8.4	202	2 2	+3	3 35	+2	—	—
Onahama	9.0	198	1 58	-9	3 47	+1	—	—
Vladivostok	9.3	269	i 2 7	-3	i 3 43	-10	—	—
Mito	9.7	199	2 18	+3	4 1	-1	—	—
Utunomiya	9.7	202	2 17	+2	4 1	-1	—	—
Maebasi	10.0	205	2 22	+3	4 15	+6	—	—
Kumagaya	10.2	203	2 26	+4	4 14	+1	—	—
Toyama	10.4	214	2 24	0	—	—	—	—
Tokyo	10.5	201	2 29	+4	4 18	-2	—	—
Yokohama	10.8	201	2 31	+2	—	—	—	—
Hunatu	10.9	205	2 34	+4	4 32	+3	—	—
Osima	11.5	201	2 39	+1	4 42	0	—	—
Gihu	11.7	212	2 41	+1	—	—	—	—
Nagoya	11.8	211	2 43	+2	—	—	—	—
Kameyama	12.3	212	2 48	0	—	—	—	—
Ooita	15.8	223	3 31	+2	—	—	—	—
Hukuoka	16.1	227	3 34	+2	—	—	—	—
College	40.8	37	i 7 14	-1	—	—	—	—
Victoria	z. 59.1	51	i 8 45 <sub>a</sub>	-47	—	—	—	—
Hungry Horse	64.1	47	i 10 5	-1	—	—	—	—
Shasta Dam	64.4	57	i 10 8	+1	—	—	e 11 50	pP
Tinemaha	z. 69.2	58	i 10 39 <sub>a</sub>	+2	—	—	i 12 22	pP
Haiwee	z. 70.0	58	i 10 43	+1	—	—	—	—
Pasadena	z. 71.2	60	i 10 49 <sub>a</sub>	-1	—	—	—	—
Riverside	z. 71.8	60	i 10 53	0	—	—	—	—
Overton	z. 71.8	57	i 10 55	+2	—	—	i 12 38	pP
Boulder City	71.9	57	i 11 1	+7	—	—	—	—
Pierce Ferry	72.3	57	i 10 58	+2	—	—	—	—
Palomar	z. 72.5	60	i 10 57	0	—	—	—	—
Collmberg	z. 74.8	331	e 11 4	-6	—	—	e 12 9	pP
Tucson	76.9	57	i 11 22	0	—	—	—	—
Stuttgart	z. 78.2	332	e 11 24	-5	—	—	e 12 20	pP
Strasbourg	78.8	332	i 11 28	-5	—	—	i 12 22	pP
Paris	80.3	336	e 11 32	-8	—	—	e 12 25	pP
Besançon	80.6	333	e 11 38	-4	—	—	e 12 24	pP
Harvard	86.6	26	i 12 10	-2	—	—	i 14 44	sP
Weston	86.8	26	i 12 11	-2	—	—	—	—

Additional readings :—

Riverside eZ = 11m.9s.

Harvard isP = 15m.45s. (?PP).

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July 12d. Readings also at 0h. (La Paz, La Plata, Pierce Ferry, and Ashkabad), 1h. (near Ashkabad), 3h. (College), 4h. (Tucson, Overton, Pierce Ferry, Hungry Horse, and Tamanrasset), 5h. (Ashkabad), 6h. (near Obi-garm), 7h. (Ashkabad), 11h. (Granada and Seattle), 12h. (Pierce Ferry), 14h. (Tananarive, Warsaw, Mary, and near Ashkabad), 15h. (Kulyab, Stalinabad, near Murgab, Obi-garm, near Athens, near Balboa Heights, Bogota, and Chinchina), 16h. (Ashkabad), 18h. (near Mizusawa), 20h. (near La Plata, and near Victoria), 21h. (Mount Wilson, Palomar, Riverside, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Shasta Dam, Hungry Horse, College, and Pretoria), 22h. (Lick).

July 13d. 4h. 3m. 59s. Epicentre 28°·0N. 139°·6E. Depth of focus 0·080.

Intensity IV at Onaka (Ibaraki Prefecture); II-III at Tokyo and Utunomiya. Epicentre as adopted. Macroseismic radius >300km. Depth >500km. Seismo. Bull. Cent. Met. Obs., Japan, 1950. Tokyo, 1952, p. 33.

$$A = -\cdot6734, B = +\cdot5731, C = +\cdot4670; \quad \delta = 0; \quad h = +2; \\ D = +\cdot648, E = +\cdot762; \quad G = -\cdot356, H = +\cdot303, K = -\cdot884.$$

	$\Delta$ °	Az. °	P.		O-C.	S.		O-C.		Supp.		L. m.
			m.	s.	s.	m.	s.	m.	s.			
Omaesaki	6·7	350	1	45	- 1	3	6	- 3	—	—	—	
Osima	6·7	358	1	43 <sub>a</sub>	- 3	3	6	- 3	—	—	—	
Owase	6·7	335	1	44 <sub>a</sub>	- 2	3	9	0	—	—	—	
Mera	6·9	1	1	44	- 3	3	7	- 6	—	—	—	
Muroto	7·0	319	1	48 <sub>k</sub>	0	3	16	+ 1	—	—	—	
Shizuoka	7·0	352	1	47	- 1	3	11	- 4	—	—	—	
Kameyama	7·3	339	1	52 <sub>k</sub>	+ 1	3	17	- 3	—	—	—	
Yokohama	7·4	0	1	53	+ 1	3	20	- 2	—	—	—	
Hunatu	7·5	355	1	51 <sub>a</sub>	- 2	3	20	- 4	—	—	—	
Nagoya	7·5	343	1	52 <sub>a</sub>	- 1	3	23	- 1	—	—	—	
Osaka	7·5	333	1	55 <sub>a</sub>	+ 2	3	24	0	—	—	—	
Simidu	7·5	311	1	51 <sub>k</sub>	- 2	3	20	- 4	—	—	—	
Sumoto	7·5	328	1	51 <sub>a</sub>	- 2	3	22	- 2	—	—	—	
Kōti	7·6	318	1	53 <sub>k</sub>	- 1	3	23	- 2	—	—	—	
Tokyo	7·6	1	1	54	0	3	20	- 5	—	—	—	
Gihu	7·7	342	1	53 <sub>a</sub>	- 2	3	21	- 6	—	—	—	
Kobe	7·7	331	1	55 <sub>a</sub>	0	3	27	0	—	—	—	
Kyoto	7·7	336	1	55	0	3	23	- 4	—	—	—	
Hikone	7·8	339	1	55	- 1	3	22	- 7	—	—	—	
Kumagaya	8·1	359	1	55	- 4	3	30	- 4	—	—	—	
Miyazaki	8·1	301	1	59 <sub>k</sub>	0	3	32	- 2	—	—	—	
Tukubasan	8·2	3	1	57	- 3	3	25	-11	—	—	—	
Matuyama	8·3	316	2	1	0	3	38	0	—	—	—	
Maebasi	8·4	357	1	59	- 3	3	35	- 5	—	—	—	
Mito	8·4	5	2	0 <sub>a</sub>	- 2	3	36	- 4	—	—	—	
Toyooka	8·5	333	2	3 <sub>k</sub>	0	3	42	0	—	—	—	
Utunomiya	8·5	1	1	59	- 4	3	37	- 5	—	—	—	
Kagosima	8·6	296	2	4 <sub>k</sub>	0	3	39	- 4	—	—	—	
Matusiro	8·6	352	2	1	- 3	3	40	- 3	—	—	—	
Ooita	8·6	309	2	1 <sub>k</sub>	- 3	3	48	+ 5	—	—	—	
Nagano	8·7	352	2	6	+ 1	3	45	0	—	—	—	
Hirosima	8·8	318	2	6 <sub>k</sub>	0	3	47	0	—	—	—	
Toyama	8·9	347	2	6 <sub>a</sub>	- 1	4	5	+16	—	—	—	
Onabama	9·0	7	2	6	- 2	3	47	- 4	—	—	—	
Kumamoto	9·1	304	2	8 <sub>k</sub>	- 1	4	3	+10	—	—	—	
Unzendake	9·3	302	2	6	- 5	3	51	- 5	—	—	—	
Hamada	9·4	319	2	12 <sub>k</sub>	0	3	50	- 8	—	—	—	
Wazima	9·6	347	2	15 <sub>a</sub>	0	4	1	- 1	—	—	—	
Hukuoka	9·7	307	2	15 <sub>k</sub>	- 1	4	5	+ 1	—	—	—	
Hokusima	9·7	4	2	13	- 3	4	0	- 4	—	—	—	
Sendai	10·3	6	2	19	- 3	4	14	- 1	—	—	—	
Tomie	10·4	299	2	23 <sub>k</sub>	0	4	18	+ 1	—	—	—	
Mizusawa	E. 11·2	6	2	33	+ 2	4	34	+ 2	—	—	—	
Akita	11·7	2	2	36 <sub>a</sub>	0	4	45	+ 4	—	—	—	
Miyako	11·8	9	2	35 <sub>a</sub>	- 2	4	44	+ 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.	
Morioka	11.8	6	2	36 <sub>a</sub>	- 1	4	44	+ 1	—	—	—
Hatinohe	12.6	7	2	45 <sub>a</sub>	0	5	0	+ 2	—	—	—
Aomori	12.8	4	2	48 <sub>a</sub>	+ 1	5	5	+ 3	—	—	—
Mori	14.1	3	2	52	- 8	5	28	+ 3	—	—	—
Sapporo	15.1	5	3	10 <sub>a</sub>	0	5	47	+ 3	—	—	—
Nemuro	16.0	16	3	21	+ 2	6	5	+ 5	—	—	—
Zi-ka-wei	16.1	286	i 3	17	- 3	6	3	+ 1	—	—	—
Vladivostok	16.3	339	i 3	23	+ 1	i 6	17	+ 12	—	—	—
Nanking	18.5	287	i 3	43	0	i 6	45	+ 2	i 4	29	pP
Irkutsk	35.7	323	6	15	+ 1	11	15	+ 1	e 7	51	pP
Bandong	46.4	226	—	—	—	i 13	49	+ 1	—	—	—
Djakarta	46.4	227	i 7	40	+ 1	i 13	47	- 1	—	—	—
Semipalatinsk	49.7	314	8	5	+ 1	14	33	0	—	—	—
Przhevalsk	51.0	304	i 8	15	+ 1	—	—	—	—	—	—
Almata	52.0	305	i 8	23	+ 2	i 15	8	+ 4	—	—	—
Naryn	52.9	302	i 8	28	+ 1	i 15	19	+ 3	—	—	—
Frunse	53.8	304	e 8	35	+ 1	15	31	+ 3	—	—	—
New Delhi	54.4	287	i 8	36	- 2	i 15	34	- 1	i 10	27	pP
Murgab	54.9	299	i 8	42	0	15	46	+ 4	—	—	—
Andijan	55.7	301	i 8	48	+ 1	i 15	55	+ 3	—	—	—
Fergana	56.2	301	i 8	51	+ 1	i 16	1	+ 2	—	—	—
Honolulu	56.7	81	i 8	54	0	e 16	9	+ 4	—	—	—
College	57.6	28	i 9	0	0	i 16	18	+ 1	e 11	14	PP
Tashkent	57.9	303	i 9	3	+ 1	i 16	24	+ 4	—	—	—
Obi-garm	58.1	300	i 9	5	+ 1	i 16	25	+ 2	—	—	—
Stalinabad	58.8	300	i 9	9	+ 1	—	—	—	—	—	—
Samarkand	59.9	302	i 9	15	- 1	16	47	+ 1	—	—	—
Kodaikanal	60.7	266	e 9	10	- 11	i 16	31	- 25	10	52	pP
Sverdlovsk	61.1	322	i 9	23	0	i 17	1	0	11	43	PP
Bombay	61.3	277	i 9	23	- 2	i 17	8	+ 5	11	8	pP
Riverview	62.5	168	i 12	11 <sub>k</sub>	PP	i 17	22	+ 4	i 14	33	sPP
Sitka	64.0	37	i 9	45	+ 3	e 17	23	- 13	e 12	14	PP
Mary	64.3	302	i 9	45	+ 1	17	45	+ 5	—	—	—
Ashkabad	66.9	302	i 10	1	+ 1	i 18	15	+ 5	—	—	—
Baku	72.2	307	e 10	36	+ 4	i 19	18	+ 7	—	—	—
Moscow	73.7	324	i 10	42	+ 2	i 19	28	+ 1	e 12	35?	pP
Victoria	73.9	43	10	43	+ 2	19	29	0	12	28	pP
Grozny	74.0	310	i 10	44	+ 2	i 19	32	+ 2	—	—	—
Seattle	74.9	43	i 10	51 <sub>a</sub>	+ 4	e 19	48	+ 8	e 12	51	pP
Pulkovo	75.2	331	i 10	50	+ 2	i 19	45	+ 2	i 23	3	sS
Tiflis	75.3	309	i 10	50	+ 1	i 19	48	+ 4	i 20	2	SKS
Piatigorsk	75.5	313	10	50	0	19	47	0	—	—	—
Erevan	76.1	308	10	59	+ 6	19	59	+ 6	—	—	—
Leninakan	76.3	309	e 10	57?	+ 3	19	59?	+ 4	—	—	—
Sotchi	77.8	313	i 11	3	0	i 20	11	0	—	—	—
Shasta Dam	77.9	50	i 11	5	+ 2	i 20	16	+ 4	i 12	51	pP
Ukiah	78.0	52	e 11	3	- 1	e 20	17	+ 4	e 29	57	SSS
Berkeley	79.3	53	i 11	11 <sub>a</sub>	+ 1	e 20	27	+ 1	e 13	1	pP
Hungry Horse	79.5	40	i 11	13	+ 1	i 20	32	+ 3	i 13	0	pP
Santa Clara	79.7	53	e 11	15	+ 2	e 20	35	+ 4	e 11	53	pP
Lick	79.9	53	i 11	16	+ 2	—	—	—	i 13	9	pP
Theodosia	79.9	316	e 11	16	+ 2	20	36	+ 3	—	—	—
Upsala	80.4	334	i 11	18	+ 2	i 20	35	- 3	i 13	9	pP
Scoresby Sund	80.9	354	i 11	21	+ 2	i 20	47	+ 4	i 13	11	pP
Fresno	81.5	53	e 11	24 <sub>a</sub>	+ 2	e 20	53	+ 4	e 13	13	pP
Saskatoon	81.5	35	11	24	+ 2	20	51	+ 2	—	—	—
Butte	81.6	42	i 11	25	+ 3	i 20	52	+ 2	e 13	17	pP
Tinemaha	82.5	52	i 11	28 <sub>a</sub>	+ 1	e 21	0	+ 1	i 13	17	pP
Bozeman	82.7	42	e 11	30	+ 2	e 21	1	+ 1	e 13	14	pP
Haiwee	83.1	52	i 11	33 <sub>a</sub>	+ 3	e 21	3	- 1	i 13	28	pP
Warsaw	83.8	327	e 11	35	+ 2	21	10	- 1	e 13	31	pP
Pasadena	83.9	54	i 11	36 <sub>a</sub>	+ 2	i 21	7	- 5	i 13	25	pP
Riverside	84.6	54	i 11	38	+ 1	—	—	—	i 13	35	pP
Salt Lake City	84.8	46	e 11	40	+ 2	i 21	15	- 6	e 13	29	pP
Ksara	85.2	305	i 11	41 <sub>k</sub>	+ 1	21	19	- 6	13	33	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.	
Copenhagen	85.3	333	i 11 40	- 1	i 21 24	- 1	i 13 34	pP	—
Palomar	85.3	54	i 11 43 <sub>a</sub>	+ 2	e 21 7	[- 5]	i 13 34	pP	—
Boulder City	85.4	51	e 11 44	+ 3	e 21 19	- 7	i 13 34	pP	—
Overton	85.4	50	i 11 43	+ 2	i 21 23	- 3	i 13 34	pP	—
Bucharest	85.8	319	e 11 46	+ 3	i 21 23	- 7	—	—	—
Pierce Ferry	85.9	50	i 11 46	+ 2	i 21 24	- 7	i 13 41	pP	—
Istanbul	85.9	315	11 45	+ 1	i 21 36	+ 5	—	—	—
Skalnate Pleso	86.1	325	e 11 46	+ 2	e 21 27	- 6	e 13 44	pP	—
Potsdam	87.3	331	i 11 53	+ 3	i 21 42	- 2	i 13 46	pP	e 47.0
Budapest	87.8	324	e 11 51	- 1	e 21 34	[+ 6]	e 15 1?	PP	—
Timisoara	E. 87.8	320	—	—	21 43	- 5	—	—	—
Ogyalla	88.0	325	e 13 32	pP	e 21 52	+ 2	e 16 31	PP	—
Collmberg	88.1	329	e 11 54	0	e 21 50	- 1	e 13 57	pP	e 47.0
Prague	88.3	328	e 11 57	+ 2	e 21 55	+ 2	e 13 50	pP	—
Sofia	88.4	318	e 11 56	+ 1	e 21 41	[+ 9]	—	—	—
Kalossa	N. 88.5	324	e 12 0	+ 4	e 21 38	[+ 5]	—	—	—
Jena	89.0	329	e 12 1	+ 3	i 21 59	0	e 13 56	pP	—
Aberdeen	89.2	340	i 17 8	PPP	i 21 59	- 2	e 28 11	SS	—
Cheb	89.3	329	e 15 43	PP	e 22 1	- 1	e 25 17	sS	—
Tucson	90.2	53	i 12 7	+ 3	e 22 17	+ 7	i 13 58	pP	e 45.3
Helwan	90.5	304	12 0	- 5	22 16	+ 3	14 0	pP	—
De Bilt	90.8	333	e 12 9	+ 3	e 22 16	+ 1	e 14 2	pP	e 46.0
Durham	91.1	338	—	—	i 22 18	0	i 25 44	sS	—
Stuttgart	91.7	329	e 12 11	+ 1	e 22 19	- 4	e 14 6	pP	e 49.0
Triest	91.7	325	e 12 13	+ 3	i 21 53	[+ 2]	e 16 0	PP	—
Karlsruhe	91.8	330	e 12 8?	- 3	e 22 24	0	—	—	e 52.0
Strasbourg	92.4	330	i 12 16	+ 2	i 22 38	+ 9	i 14 7	pP	—
Zürich	93.0	329	e 12 17 <sub>a</sub>	+ 1	e 22 34	0	e 14 13	pP	—
Basle	93.3	329	e 12 19	+ 1	e 22 37	0	e 14 15	pP	—
Taranto	93.4	319	e 15 25	PP	e 21 15	?	—	—	e 56.0
Kew	93.4	336	i 14 9	pP	i 22 37	- 1	e 22 5	SKS	e 32.0
Rathfarnham C.	z. 93.8	340	i 14 15	pP	22 8	SKKS	16 15	PP	—
Besançon	94.2	329	i 12 25	+ 3	e 24 0	SP	14 16	pP	—
Pavia	94.3	327	e 16 1?	PP	—	—	—	—	—
Prato	94.3	325	e 12 31	+ 9	e 24 9	SP	—	—	—
Paris	94.5	333	i 12 22	- 1	i 22 44	- 3	i 14 17?	pP	—
Rome	95.0	323	i 12 26	0	e 22 51	0	e 14 26	pP	—
Clermont-Ferrand	96.6	331	e 12 36	+ 3	i 23 8	+ 4	i 16 38	PP	—
Chicago	98.0	33	—	—	e 21 55	?	i 27 35	?	—
Ottawa	100.2	24	12 50	+ 1	22 36	[+ 1]	14 46	pP	—
Seven Falls	E. 100.3	20	17 2	PP	23 36	0	22 36	SKS	—
Cleveland	101.1	30	e 17 9	PP	e 23 45	+ 3	i 22 41	SKS	—
Tortosa	101.7	329	e 16 19	PP	i 23 48	+ 1	—	—	—
Pittsburgh	102.6	29	i 17 29	PP	i 22 51	[+ 4]	i 26 42	PS	—
Pennsylvania	103.2	28	e 17 26	PP	i 22 52	[+ 3]	i 23 34	SKKS	—
Algiers Univ.	103.7	325	17 28	PP	—	—	—	—	—
Alicante	104.2	328	13 47	P	24 11	+ 3	20 19	PPP	e 49.5
Harvard	104.2	22	e 13 5	P	e 22 53	[- 1]	e 17 30	PP	—
Weston	104.4	22	e 13 8	P	22 57	[+ 2]	i 17 35	PP	—
Philadelphia	105.0	27	e 19 28	pPP	i 23 2	[+ 5]	e 25 46	SP	e 44.0
Washington	105.1	28	e 17 32	PP	e 26 15	SP	e 19 20	pPP	—
Granada	106.5	329	18 1	PP	24 25	S	32 16	SS	50.0
Malaga	z. 107.3	330	e 17 43	PP	—	—	e 19 39	PPP	60.1
Tamanrasset	z. 112.8	314	e 17 28	[- 6]	e 23 39	[+ 9]	14 6	P	—
Bermuda	115.7	22	e 19 0	PP	e 23 50	[+ 9]	e 27 41	SP	—
Pretoria	z. 119.5	255	i 17 51	[+ 3]	—	—	i 19 18	pPKP	—
Grahamstown	123.0	247	i 17 59	[+ 4]	—	—	e 19 44	pPKP	—
San Juan	127.6	30	e 20 16	PP	e 25 51	SKKS	e 36 13	SS	e 54.4
Chinchina	132.8	51	i 18 19	[+ 5]	i 27 51	SKKS	i 20 15	PP	—
Fort de France	133.0	27	e 19 34	?	—	—	—	—	—
Bogota	134.1	50	e 18 31	[+ 15]	e 22 45	PKS	e 20 59	PP	—
Huancayo	143.7	71	i 18 42	[+ 8]	—	—	i 21 29	PP	—
La Paz	z. 152.0	71	e 18 37	[- 9]	i 28 46	SKKS	i 22 21	PP	—

For Notes see next page.

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NOTES TO JULY 13d. 4h. 3m. 59s.

Additional readings :—

Irkutsk ePP = 6m.30s., esS = 14m.4s., ISS = 14m.36s., S<sub>c</sub>S = 15m.32s.  
 New Delhi S<sub>c</sub>S?N = 17m.27s., sSN = 18m.26s., iSSN = 19m.26s., iSSSN = 20m.53s.  
 College i = 9m.14s. and 9m.32s., iP<sub>c</sub>P = 9m.53s., isP = 11m.40s., eS<sub>c</sub>P = 12m.51s., iS<sub>c</sub>S = 17m.56s., esS = 19m.6s., ePKP,PKP? = 38m.17s., e = 40m.38s.  
 Kodaikanal P<sub>c</sub>PE = 9m.28s., sPE = 11m.43s., iS<sub>c</sub>SE = 18m.13s., sSE = 19m.31s., QE = 27m.46s.  
 Sverdlovsk eSSS = 24m.35s.  
 Bombay sPEN = 11m.44s., S<sub>c</sub>SE = 18m.26s., sSN = 20m.11s.  
 Riverview iS<sub>c</sub>S?E = 18m.39s., iE = 18m.45s., iN = 20m.25s., isSE = 20m.30s., iSSN = 22m.9s.  
 Sitka iS = 17m.45s., eS<sub>c</sub>S = 18m.41s., esS = 20m.47s., eSS = 22m.21s., eSSS = 25m.21s.  
 Moscow esS = 22m.39s.  
 Victoria i = 13m.30s., PP = 13m.35s., i = 19m.33s.  
 Seattle iP<sub>c</sub>P = 11m.3s., i = 11m.34s. and 11m.57s., e = 13m.11s. and 13m.33s., ePP = 14m.14s., ePPP = 15m.16s., e = 19m.8s., 20m.14s., 20m.46s., 20m.55s., and 22m.59s.  
 Shasta Dam iPP = 14m.10s., eSKP,PKP = 40m.40s.  
 Berkeley isPZ = 14m.5s.  
 Hungry Horse ePKP,PKP = 37m.31s., eSKP,PKP = 40m.26s.  
 Santa Clara ePPEZ = 14m.46s., esSEZ = 21m.36s.  
 Upsala e = 13m.46s., ePP?E = 14m.19s., ePP?N = 14m.23s., iE = 20m.22s., iN = 22m.53s., esSN = 23m.43s., esS?E = 23m.53s., esPSE = 24m.28s.  
 Scoresby Sund 16m.55s., e = 19m.11s., 21m.25s., 24m.2s.  
 Fresno iZ = 13m.18s.  
 Saskatoon i = 21m.5s.  
 Butte esSN = 24m.8s.  
 Tinemaha iZ = 11m.44s., 13m.23s., and 14m.9s.  
 Bozeman ePP? = 14m.40s., esS = 24m.18s.  
 Warsaw esPE = 14m.47s., ePPZ = 14m.57s., epPPE = 16m.51s., epPPZ = 16m.57s., esPPE = 17m.56s., S<sub>c</sub>S = 21m.23s., eSPNZ = 21m.49s., eSPPNZ = 22m.25s., eSPPE = 22m.34s., i = 24m.33s., esS = 24m.39s., esSP = 25m.53s., sSS = 26m.51s., esSSS = 29m.31s.  
 Pasadena iEN = 11m.54s., iZ = 13m.32s., eZ = 13m.53s., eNZ = 24m.28s., eSKP,PKPZ = 40m.23s.  
 Salt Lake City ePP = 15m.3s., eSP = 22m.29s.  
 Copenhagen isS = 24m.46s., iSS = 27m.12s.  
 Palomar iZ = 13m.40s., 14m.57s., and 15m.8s., iSKP,PKPZ = 40m.24s.  
 Boulder City esP = 14m.27s., ePP = 15m.10s., eSKP,PKP = 40m.20s.  
 Overton isPZ = 14m.27s., iPPZ = 15m.8s., iZ = 15m.41s., ipPPPZ = 18m.37s., iSKP,PKPZ = 40m.21s.  
 Bucharest iN = 21m.33s.  
 Skalnaté Pleso ePPN = 15m.12s., ePPE = 15m.15s., epPP = 16m.56s., esSN = 24m.57s., eSS = 27m.28s., eSSS = 31m.30s., and other unidentified e readings.  
 Potsdam epPE = 13m.49s., epPN = 13m.55s., esPZ = 14m.35s., iPPZ = 15m.27s., ePPE = 15m.31s., iZ = 22m.50s., iE = 25m.14s., iN = 27m.52s., iZ = 28m.0s.?  
 Budapest eE = 21m.49s. and 25m.1s.?, iN = 25m.13s.  
 Ogyalla e = 14m.24s., 22m.41s., 23m.39s., and 26m.13s.  
 Collmberg eZ = 11m.57s. and 22m.53s., esSN = 25m.15s., eSSN = 27m.55s.  
 Prague epPZ = 13m.53s., esP = 14m.46s., ePP = 15m.34s., epPP = 16m.11s., esPP = 17m.6s., eSP = 22m.48s., ePS = 23m.51s., epS = 24m.6s., esS<sub>c</sub>S = 24m.19s., esS = 24m.56s., eSS = 27m.50s., esSS = 31m.12s., eSSS? = 39m.49s., and other e readings.  
 Sofia i = 22m.0s.  
 Kalossa eE = 12m.14s., 15m.3s., and 22m.1s.?, eN = 22m.4s., eE = 22m.23s., eN = 22m.34s., eE = 25m.1s.?  
 Jena eN = 12m.13s. and 15m.4s., ePP?E = 15m.21s., ePS?N = 23m.3s., iPS?EN = 23m.8s., esS?EN = 25m.11s., esS?E = 28m.6s.  
 Aberdeen eN = 18m.37s., iN = 21m.40s., iEN = 25m.25s.  
 Cheb e = 23m.11s., eSS = 28m.11s., e = 33m.13s., eN = 37m.25s.  
 Tucson esP = 14m.36s., ePP = 15m.47s., epPPP = 18m.57s., eSKS = 21m.36s., eSKKS = 21m.51s., eSP = 23m.23s., esS = 25m.19s.  
 Helwan sPZ = 14m.49s., PPZ = 15m.49s., PPPZ = 17m.55s., SKSEN = 21m.47s., sSN = 25m.19s., SSN = 28m.37s.  
 De Bilt ePS = 23m.29s., esS = 25m.27s., eSS = 28m.36s.  
 Stuttgart ePP?Z = 15m.9s., e = 15m.56s., iSKS = 22m.23s., ePS = 23m.35s., e = 25m.19s., 25m.49s., and 26m.51s., eSS = 28m.39s., e = 30m.29s., eSSS = 32m.31s., e = 34m.55s.  
 Trieste iSKKS = 22m.22s., eSP = 24m.12s., iPPS = 25m.29s.  
 Strasbourg isP = 15m.5s., ePP = 16m.10s., epPP = 17m.44s., esPP = 18m.44s., iSKS = 22m.12s., e = 22m.31s., isS? = 25m.23s., eSS = 28m.52s.  
 Basle ePP = 15m.51s.  
 Kew isP?EN = 22m.42s., esS?EN = 25m.58s., eSS?EN = 29m.13s.  
 Rathfarnham Castle eZ = 15m.4s., 23m.21s., and 26m.2s., eSSZ = 28m.51s.  
 Besançon i = 14m.27s., e = 16m.14s., iPP = 16m.22s.  
 Paris i = 13m.20s. and 14m.27s., isP = 15m.20s., iPP = 16m.17s. and 16m.21s., i = 16m.36s., e = 16m.46s., epPP = 17m.49s., eSKS = 22m.9s., isS = 25m.45s.  
 Rome iPPZ = 16m.23s.  
 Clermont-Ferrand eSS = 29m.56s.

Continued on next page.

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Ottawa PP = 17m.1s., SP = 25m.7s.  
 Seven Falls SPE = 25m.12s.  
 Cleveland ePPEN = 17m.13s., eSKKSN = 23m.19s., esKSN = 25m.22s., esSKSE = 25m.25s., esSE = 26m.17s., esSN = 26m.20s.  
 Pennsylvania eS?E = 24m.3s., eSP? = 25m.34s., eE = 26m.1s.  
 Alicante PS = 27m.13s., SSP = 32m.49s., Q = 43m.9s.  
 Philadelphia esPP = 20m.13s., eSKS = 23m.48s., eSPP = 26m.57s., eSS? = 32m.58s.  
 Tamanrasset eZ = 15m.8s. and 17m.54s., iPPZ = 18m.23s. and 18m.29s., epPKPZ = 19m.13s., ePPPZ = 21m.5s., eZ = 22m.52s., eSPZ = 27m.23s., ePSZ = 28m.3s., iSPPZ = 28m.39s.  
 San Juan eSKKS = 26m.16s.  
 La Paz iPKPZ = 18m.45s., iZ = 20m.53s., iSS = 41m.34s.

July 13d. Readings also at 2h. (Tucson, Mount Wilson, Tinemaha, Boulder City, Overton, Pierce Ferry, Shasta Dam, Hungry Horse, Vladivostok, and Irkutsk), 3h. (Boulder City, Stuttgart, Brisbane, Tashkent, near Andijan, Fergana, Murgab, Obi-garm, Samarkand, and Stalinabad), 4h. (Besançon, Paris, Rome, Strasbourg, Zürich, and near La Paz), 5h. (Shasta Dam and Hungry Horse), 7h. (near Victoria and Seattle (2)), 10h. (near Leninakan and near Istanbul), 12h. (College), 13h. (Tucson and Pierce Ferry), 14h. (near Istanbul), 15h. (College and Pierce Ferry), 16h. (Rathfarnham Castle and near Istanbul), 17h. (Clermont-Ferrand, near Alicante (3), near Andijan, Murgab, Obi-garm, near Oaxaca, Puebla, Tacubaya, and Vera Cruz), 18h. (near Taranto), 19h. (Lick, Tamanrasset, Almata, Mary, Naryn, near Andijan, Fergana, Frunse, Murgab, Obi-garm, Przhewalsk, Samarkand, Stalinabad, Tashkent, near Granada, and Malaga), 20h. (Lick, Huancayo, near La Paz, near Andijan, and Obi-garm), 21h. (near Andijan), 22h. (Collmberg and College), 23h. (near Taranto).

July 14d. 1h. Region of Samoa.

Apia iP = 33m.41s., eS = 34m.24s.  
 Pasadena iPZ = 43m.49s.  
 Riverside iPZ = 43m.50s.  
 Palomar iPZ = 43m.53s.  
 Shasta Dam iP = 43m.55s.  
 Tinemaha ePZ = 43m.58s.  
 Boulder City eP = 44m.9s.  
 Overton ePZ = 44m.12s.  
 Pierce Ferry iP = 44m.12s.  
 Tucson iP = 44m.15s.  
 College eP = 44m.40s.  
 Hungry Horse iP = 44m.41s.  
 Collmberg eZ = 51m.47s. and 52m.29s.  
 Prague e = 51m.52s., 52m.5s., 52m.15s., 52m.54s., 53m.10s., and 53m.44s.  
 Stuttgart ePKP?Z = 51m.55s., eZ = 52m.45s.  
 Paris iPKP = 51m.56s., i = 52m.27s., e = 52m.45s. and 53m.2s.  
 Strasbourg iPKP = 51m.59s.k, e = 52m.27s.  
 Ksara iP? = 52m., e = 62m.38s.  
 Besançon iPKP = 52m.2s.  
 Clermont-Ferrand PKP = 52m.6s.  
 Tamanrasset PKPZ = 52m.26s.k, iPKP,Z = 53m.51s., ePPZ = 57m.40s.

July 14d. 6h. 29m. 51s. Epicentre 45°·7N. 26°·8E. (as on 1950, January 16d.).

A = +·6255, B = +·3160, C = +·7133;  $\delta$  = -10; h = -4;  
 D = +·451, E = -·893; G = +·637, H = +·322, K = -·701.

	$\Delta$	Az.	P.	O - C.	S.	O - C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Bucharest	1·4	198	e 0 32	+ 5	i 0 53	+ 7	—	—
Kishinev	1·9	47	0 34	0	0 57	- 2	—	—
Sofia	3·9	221	e 1 3	+ 1	i 2 3	S*	—	—
Timisoara	3·9	273	e 1 39	P*	e 2 18	S*	—	—
Lwow	4·5	337	e 1 15	+ 4	i 2 9	+ 4	e 1 27	P*
Istanbul	4·9	160	i 1 17	0	i 2 9	- 6	—	—
Kalossa	N. 5·5	281	(e 1 21)	- 3	(e 2 36)	+ 6	—	—
Budapest	5·6	291	(e 1 21)	- 6	—	—	(e 1 42)	P* (e 2·6)
Theodosia	6·1	93	—	—	2 34?	- 11	—	—
Warsaw	7·5	332	(e 1 54)	+ 1	(e 3 33)	+ 13	(e 3 6)	P* (e 5·2)

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.
Stuttgart	12.4	291	e 3 13	PP	—	—	—	—
Pulkovo	14.3	7	i 3 27	+ 1	e 5 51	-15	—	—
Algiers Univ.	z. 19.9	251	i 4 35k	- 1	—	—	—	—
Sverdlovsk	23.7	50	5 9	- 5	—	—	—	—
Tamanrasset	z. 28.7	224	i 6 1a	- 0	e 12 33	SS	—	—
Hungry Horse	80.3	335	i 12 12	- 2	—	—	—	—

Additional readings :—

Bucharest iE = 44s.

Sofia e = 1m.34s., i = 2m.24s. and 2m.42s.

Timisoara iE = 1m.43s., iN = 1m.52s., eS = 2m.20s.

Lwow eP\* = 1m.24s.

Kalossa eE = (1m.26s.) and (2m.56s.); readings having been reduced by 2m.

Budapest readings have been reduced by 2m.

Warsaw ePE = (2m.1s.), e = (3m.55s.), and (4m.7s.); readings having been reduced by 1m.

Long waves were also recorded at Rome and Copenhagen.

July 14d. 12h. 7m. 4s. Epicentre 52°·5N. 167°·5W. (as on 1950, July 12d.).

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
College	16.0	32	e 3 48	0	e 6 55	+ 9	—	e 8.2
Sitka	19.0	63	i 4 28	+ 2	e 8 12	+17	—	e 10.3
Honolulu	32.0	162	—	—	e 9 34	P <sub>c</sub> P	—	e 13.5
Shasta Dam	32.6	93	e 6 36	+ 1	—	—	—	—
Hungry Horse	33.7	75	i 6 43	- 2	—	—	i 9 24	P <sub>c</sub> P
Berkeley	34.5	97	i 6 56a	+ 4	e 12 56	+36	e 8 20	PP
Lick	z. 35.2	97	e 7 0k	+ 2	—	—	—	—
Tinemaha	z. 37.4	94	i 7 18	+ 2	—	—	—	—
Haiwee	z. 38.2	95	e 7 22	- 1	—	—	—	—
Pasadena	39.4	97	e 7 32	- 1	—	—	—	e 17.2
Riverside	z. 40.0	97	e 7 36	- 2	—	—	—	—
Overton	z. 40.1	92	i 7 39	0	—	—	—	—
Boulder City	40.2	93	e 7 40	0	—	—	—	—
Pierce Ferry	40.6	92	i 7 43	0	—	—	—	—
Palomar	z. 40.7	97	i 7 44	0	—	—	—	—
Vladivostok	40.7	282	e 7 44	0	—	—	—	—
Tucson	45.2	93	i 8 20	0	—	—	—	—
Weston	61.1	58	e 10 16	- 2	—	—	—	—
Almata	69.6	317	e 11 38	+25	—	—	—	—
Alicante	88.8	11	e 12 37	-20	e 23 23	[- 2]	24 23	PS
Pretoria	z. 150.8	331	i 19 27	[-22]	—	—	—	—

Additional readings :—

Berkeley eZ = 7m.5s., 7m.18s., 7m.28s., and 7m.38s., eS<sub>c</sub>SZ = 16m.50s.

Tucson i = 8m.45s.

Alicante PPS = 25m.7s.

Long waves were also recorded at Victoria, Seattle, Harvard, Philadelphia, Scoresby Sund, Granada, Paris, and Strasbourg.

July 14d. Readings also at 0h. (Naryn, near Andijan, Fergana, Frunse, Murgab, Rome, near Messina, and Taranto), 2h. (Taranto), 3h. (Lick, Bandung, Djakarta, Rome, Triest, near Messina, and Taranto, and near Obi-garm), 5h. (Stuttgart and near Obi-garm), 6h. (near Kishinev), 7h. (Hungry Horse, Tamanrasset, Messina, near Taranto, and near Obi-garm), 9h. (Tucson (2), Overton (2), and Pierce Ferry (2)), 11h. (Helwan and near Seattle), 12h. (near Seattle), 13h. (near Obi-garm), 16h. (Helwan and Stuttgart), 19h. (Lick), 20h. (near Ashkabad), 22h. (near Prague).



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July 15d. 10h. Region of Samoa.

Apia eP = 30m.13s., e = 30m.23s., eS = 31m.6s.  
 Kaimata eNE = 34m.  
 Lick ePZ = 40m.27s., eZ = 40m.40s.  
 Pasadena iPZ = 40m.27s., eZ = 40m.40s.  
 Mount Wilson ePZ = 40m.28s., eZ = 40m.43s., iZ = 40m.47s.  
 Riverside ePZ = 40m.30s.  
 Palomar iPZ = 40m.32s., iZ = 40m.49s.  
 Haiwee ePZ = 40m.36s.  
 Shasta Dam iP = 40m.36s.  
 Boulder City eP = 40m.47s., epP = 41m.6s.  
 Overton iPZ = 40m.51s.  
 Pierce Ferry iP = 40m.51s.  
 Tucson iP = 40m.52s.  
 Hungry Horse iP = 41m.24s.  
 College iP = 41m.25s., epP = 41m.43s.  
 Prague ePKP = 47m.32s.  
 Potsdam eZ = 48m.25s.  
 Collmberg eZ = 48m.28s. and 48m.47s.  
 Stuttgart ePKPZ = 48m.30s., eZ = 48m.36s.  
 Besançon ePKP = 48m.35s., epPKP = 49m.2s.  
 Paris iPKP = 48m.36s., i = 48m.42s., eL = 92m.  
 Strasbourg iPKP = 48m.37s.  
 Tamanrasset ePKPZ = 48m.56s., ePKP<sub>2</sub>Z = 50m.36s., ipPKP<sub>2</sub>Z = 51m.8s., ePPZ = 54m.27s., ePPPZ = 59m.19s.

July 15d. 11h. 42m. 4s. Epicentre 11°·0S. 80°·0W.

Approximate.

A = +·1705, B = -·9670, C = -·1896;  $\delta$  = +11; h = +6;  
 D = -·985, E = -·174; G = -·033, H = +·187, K = -·982.

	$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.	
	°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.	
Huancayo	4·7	103	i 1	2	-12	i 1	57	-13	i 1	9	pP	—
La Paz	12·8	117	e 3	16	+10	5	49	+19	—	—	—	6·8
Chinchina	16·4	16	e 3	50	-3	—	—	—	—	—	—	e 8·8
Bogota	16·6	21	e 3	51	-5	e 6	49	-11	—	—	—	e 8·6
Palomar	z. 56·4	324	e 9	56	+11	—	—	—	i 11	0	P <sub>c</sub> P	—
Pierce Ferry	56·8	329	e 9	50	+2	—	—	—	—	—	—	—
Crest Line	z. 57·2	325	e 10	59	P <sub>c</sub> P	—	—	—	—	—	—	—
Overton	z. 57·3	328	e 9	45	-7	—	—	—	—	—	—	—
Mount Wilson	z. 57·7	324	e 9	57	+2	—	—	—	—	—	—	—
Hungry Horse	66·3	337	e 10	29	-23	—	—	—	—	—	—	—
Tamanrasset	z. 90·1	67	i 12	57 <sub>a</sub>	-6	—	—	—	—	—	—	—
College	90·7	337	e 13	4	-2	—	—	—	—	—	—	—

Additional readings :—

Bogota e = 6m.24s.

Tamanrasset iZ = 13m.8s.

July 15d. 13h. Samoa. Probably as above note for 10h.

Apia eP = 30m.45s., eS = 31m.38s.  
 Lick ePZ = 40m.59s., a.  
 Pasadena iPZ = 40m.59s., eL = 41m.15s.  
 Riverside ePZ = 41m.3s.  
 Palomar iPZ = 41m.4s., iZ = 41m.22s.  
 Shasta Dam eP = 41m.6s.  
 Haiwee eP = 41m.8s.  
 Boulder City eP = 41m.19s.  
 Pierce Ferry iP = 41m.23s.  
 Tucson iP = 41m.24s., e = 41m.42s.  
 Overton iPZ = 41m.24s.  
 Hungry Horse eP = 41m.56s.  
 College iP = 41m.57s.  
 Ottawa iZ = 47m.54s., i = 47m.57s., 48m.10s., and 48m.15s.  
 Paris e = 48m.50s., iPKP? = 49m.8s.  
 Collmberg eZ = 49m.0s.  
 Strasbourg ePKP = 49m.5s., epPKP = 49m.28s.  
 Stuttgart ePKPZ = 49m.8s., ePPZ = 52m.40s.

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July 15d. Readings also at 5h. (La Paz, La Plata, Mount Wilson, Palomar, Riverside, Tucson, and Pierce Ferry), 8h. (near Andijan, Murgab, Obi-garm, and Stalinabad), 9h. (near Andijan), 10h. (Tamanrasset), 15h. (Brisbane, College, and near Apia), 16h. (Palomar, Pasadena, Riverside, Tinemaha, Tucson, Pierce Ferry, College, Stuttgart, and Timisoara), 17h. (near Alicante), 23h. (Victoria).

July 16d. 3h. 19m. 31s. Epicentre  $36^{\circ}9N$ .  $2^{\circ}7W$ .

Intensity VI at San Javier and Pilar de la Horadada. Epicentre according to Malaga.

A. Duc Rojo, S.J.

Movimientos sismicos en España durante el año, 1950. Bull. de la Real Sociedad Española de Historia Natural, tome 49, 1951. Madrid, 1951, p. 213.

$$A = +.8007, B = -.0378, C = +.5978; \quad \delta = -9; \quad h = -1; \\ D = -.047, E = -.999; \quad G = +.597, H = -.028; \quad K = -.802.$$

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Granada	0.8	292	i 0 26k	+ 8	i 0 41	$S_g$	—	—
Malaga	z. 1.4	263	i 0 25a	- 2	i 0 41	- 5	i 0 46	$S_g$
Alicante	2.3	50	1 13	$S^*$	(1 13)	$S^*$	—	—
Toledo	z. 3.2	341	i 1 4	$P_g$	i 1 49	$S_g$	e 1 13	$P^*$ 2.2
Algiers Univ.	z. 4.6	90	e 1 7	- 5	—	—	e 1 47	$P_g$
Tortosa	4.7	31	—	—	i 2 19	+ 9	—	—
Tamanrasset	z. 15.8	151	e 3 27	-18	e 6 29	-13	—	— e 8.1

Additional readings :—

Granada S = 1m.5s.

Alicante  $P_g$  = 1m.17s., S = 1m.42s.,  $S_g$  = 1m.45s.

Toledo  $iS_gZ$  = 2m.4s.

July 16d. 12h. Undetermined shock. Off the coast of Ecuador.

Chinchina  $iP$  = 1m.14s., eSEN = 5m.15s.

Bogota ePZ = 2m.11s., eEN = 2m.21s., eSEN = 4m.43s., eLEN = 5m.54s.

Huancayo e = 2m.15s. and 5m.24s.

La Paz P = 4m.9s., S = 8m.12s., L = 11m.52s.

Tucson eP = 6m.43s.

Palomar  $iPZ$  = 7m.17s.

Riverside ePZ = 7m.22s.

Pasadena ePZ = 7m.26s.

Ottawa eZ = 7m.32s.

Pierce Ferry eP = 7m.50s.

Tinemaha ePZ = 7m.51s.

Lick ePZ = 7m.59s.k.

Hungry Horse eP = 8m.30s.

College eP = 11m.4s.

July 16d. Readings also at 2h. (near Ashkabad), 3h. (Boulder City, Overton, Pierce Ferry, Hungry Horse, College, Collmberg, and Stuttgart), 4h. (Pretoria, Przhevalsk, Seattle, and near Victoria), 5h. (College and La Paz), 8h. (College and near Alicante (3)), 9h. (College), 11h. (Paris, Stuttgart, and near Alicante (3)), 12h. (Mary and near Ashkabad), 14h. (Fergana, Obi-garm, Stalinabad, Tashkent, near Almata, Andijan, Frunse, Murgab, Naryn, and Przhevalsk), 17h. (Bucharest, Budapest, Kalossa, Ogyalla, Timisoara, Warsaw, Prague, Collmberg, Jena, Stuttgart, Zürich, Messina, Rome, Taranto, Tamanrasset, near Istanbul (2), and near Trieste), 22h. (Wellington), 23h. (near Bogota and near Chinchina).

July 17d. 20h. 17m. 46s. Epicentre  $22^{\circ}0S$ .  $171^{\circ}7E$ . (as on 1948, November 8d.).

Pasadena suggests depth 100km.

$$A = -.9184, B = +.1340, C = -.3724; \quad \delta = +10; \quad h = +4; \\ D = +.144, E = +.990; \quad G = +.368, H = -.054, K = -.928.$$

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Auckland	N. 15.1	170	i 3 37	+ 1	—	—	i 3 59	PP
Arapuni	16.4	169	e 3 57	+ 4	—	—	—	—
New Plymouth	E. 17.1	175	e 4 44	PPP	—	—	—	e 8.4
Tuai	N. 17.4	166	e 4 5	- 1	e 7 22	+ 3	—	—
Apia	N. 17.7	66	—	—	e 7 43	+17	e 7 58	SSS

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.	
Brisbane		17.8	248	i 3	15 <sub>a</sub>	-56	e 6	24	-64	i 6	43	SS	—
Cobb River	N.	19.0	178	e 4	27	+ 1	e 7	53	- 2	—	—	—	—
Wellington		19.4	174	e 4	24	- 6	e 8	1	- 3	—	—	—	e 9.6
Kaimata	N.E.	20.5	181	i 4	41	- 1	e 8	32	+ 5	—	—	—	—
Christchurch		21.5	179	i 4	51	- 1	e 8	43	- 4	e 6	6	PPP	—
Riverview		21.6	232	i 4	55 <sub>k</sub>	+ 1	i 8	49	0	i 5	18	pP	—
Bandong		63.4	273	e 10	30	- 4	—	—	—	—	—	—	—
Djakarta		64.4	273	e 10	38 <sub>a</sub>	- 2	i 19	12	- 6	—	—	—	—
Vladivostok		74.4	331	i 11	42	0	i 21	13	- 3	i 14	31	PP	—
Berkeley		86.0	47	e 12	44 <sub>a</sub>	+ 1	e 23	10	[+ 3]	e 29	32	SS	—
Lick	z.	86.1	47	i 12	45 <sub>a</sub>	+ 1	—	—	—	i 14	54	?	—
Pasadena		86.9	51	i 12	49 <sub>a</sub>	+ 1	e 23	22	- 4	e 13	17	pP	e 36.5
Riverside	z.	87.4	51	i 12	51 <sub>a</sub>	+ 1	—	—	—	i 13	19	pP	—
Shasta Dam		87.4	44	i 12	51	+ 1	—	—	—	—	—	—	—
Palomar		87.5	53	i 12	51 <sub>a</sub>	0	e 23	29	- 2	—	—	—	—
Haiwee	z.	88.0	50	i 12	53	0	—	—	—	—	—	—	—
Tinemaha		88.3	49	i 12	55 <sub>a</sub>	0	—	—	—	i 13	25	pP	—
Boulder City		90.2	51	i 13	5	+ 1	—	—	—	—	—	—	—
Overton	z.	90.7	51	i 13	8	+ 2	—	—	—	—	—	—	—
Sitka		90.7	26	—	—	—	e 23	54	- 7	e 29	52	SS	e 38.6
Pierce Ferry		90.9	51	i 13	8	+ 1	e 24	44	PS	—	—	—	—
Victoria		90.9	37	i 13	7 <sub>a</sub>	0	24	0	- 3	17	19	PP	—
Seattle		91.1	38	e 13	9 <sub>a</sub>	+ 1	e 23	54	-10	e 24	50	PS	—
Tucson		91.6	56	e 13	11	+ 1	—	—	—	—	—	—	—
College		92.0	15	i 13	11	- 1	e 24	10	- 2	e 16	44	PP	e 39.4
Irkutsk		94.3	325	e 13	20	- 3	24	25	- 7	23	47	SKS	—
Hungry Horse		96.3	40	e 13	30	- 2	—	—	—	e 17	24	PP	—
Frunse		109.7	309	i 19	2	PP	i 28	35	PS	—	—	—	—
La Paz		110.0	118	e 18	20	[-13]	—	—	—	—	—	—	—
Andijan		110.9	306	e 19	13	PP	e 28	44	PS	—	—	—	—
Fergana		111.3	306	e 18	39	[+ 3]	—	—	—	—	—	—	—
Obi-garm		112.5	304	e 19	18?	PP	—	—	—	—	—	—	—
Tashkent		113.3	306	e 18	41	[+ 1]	—	—	—	e 19	23	PP	—
Sverdlovsk		119.6	323	e 18	51	[- 1]	e 29	54	PS	i 20	15	PP	—
Pretoria	z.	120.8	219	i 18	54	[ 0]	—	—	—	—	—	—	—
Philadelphia		121.2	55	—	—	—	e 28	23	{+62}	e 37	24	SS	e 49.4
Harvard		124.0	52	—	—	—	e 31	52	PS	e 32	48	PPS	e 59.2
Weston		124.2	52	e 18	58	[- 3]	—	—	—	—	—	—	—
Baku		127.9	305	e 21	15?	PP	—	—	—	—	—	—	—
Bermuda		129.3	65	e 22	34	PKS	e 38	14	SS	—	—	—	e 54.4
Grozny		130.7	308	i 21	37	PP	—	—	—	—	—	—	—
Scoresby Sund		130.8	6	21	26	PP	22	38	PKS	38	50	SS	54.2
Tiflis		131.6	307	i 19	15	[ 0]	i 22	33	PKS	—	—	—	—
Moscow		132.2	326	e 19	16	[ 0]	e 22	43	PKS	—	—	—	—
Pulkovo		133.5	334	21	45	PP	—	—	—	—	—	—	—
Zugdidi		133.6	307	e 19	20	[+ 1]	e 22	40	PKS	—	—	—	—
Ksara		139.5	296	e 19	28?	[- 2]	—	—	—	22	28?	PP	—
Warsaw		142.3	329	e 19	31 <sub>a</sub>	[- 4]	e 23	18	PKS	e 19	41	PKP <sub>1</sub>	—
Copenhagen		143.0	340	e 19	32	[- 4]	—	—	—	—	—	—	—
Istanbul		143.3	310	i 19	38	[+ 2]	26	45	PPP	—	—	—	—
Helwan	z.	143.7	291	i 19	35 <sub>a</sub>	[- 2]	—	—	—	22	50	PP	—
Bucharest		144.0	316	e 19	36	[- 1]	—	—	—	—	—	—	—
Aberdeen	N.	144.6	353	e 23	6	PP	i 35	55	SS	e 50	1	SSS	—
Skalnate Pleso		144.7	327	e 19	37	[- 2]	e 29	20	{-28}	e 25	44	PPP	—
Raciborz		145.1	330	e 19	40	[+ 1]	—	—	—	—	—	—	—
Potsdam	z.	145.5	338	i 19	40 <sub>a</sub>	[ 0]	—	—	—	i 22	59	PP	e 70.2
Timisoara	N.	146.2	321	e 19	45?	[+ 4]	—	—	—	—	—	—	—
Collnberg	z.	146.4	336	e 19	43	[+ 1]	—	—	—	—	—	—	—
Sofia		146.5	315	e 19	47	[+ 5]	—	—	—	—	—	—	—
Ogyalla		146.6	327	e 19	39	[- 3]	e 26	31	[-18]	e 19	54	PKP <sub>1</sub>	—

Continued on next page.

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	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.	
	<sup>e</sup>	<sup>o</sup>	m. s.	s.	m. s.	s.	m. s.	m.	
Prague	146.8	333	e 19 44 <sub>a</sub>	[+ 2]	e 26 32	[-17]	e 22 39	PP	—
Jena	N. 147.2	335	e 19 44?	[+ 1]	—	—	e 23 17	PP	—
De Bilt	148.2	344	e 19 47	[+ 2]	e 23 50	PKS	e 23 19	PP	—
Kew	149.9	350	e 20 14?	[+27]	—	—	—	—	—
Stuttgart	149.9	336	e 19 45	[- 2]	e 27 14	[+20]	e 23 28	PP	—
Strasbourg	150.5	337	e 19 48	[ 0]	—	—	e 23 26	PP	—
Zürich	151.3	336	e 19 54 <sub>a</sub>	[+ 5]	—	—	e 20 37	PKP <sub>2</sub>	—
Basle	151.5	337	e 19 43	[- 7]	—	—	e 23 42	PP	—
Taranto	151.6	317	19 48	[- 2]	—	—	—	—	—
Paris	151.9	344	i 19 56 <sub>k</sub>	[+ 6]	—	—	i 20 6	PKP <sub>2</sub>	—
Besançon	152.3	338	e 19 58	[+ 7]	—	—	e 23 47	PP	—
Bologna	152.3	328	e 19 58 <sub>a</sub>	[+ 7]	—	—	e 24 6	PP	—
Pavia	152.8	333	e 20 14?	PKP <sub>2</sub>	—	—	—	—	—
Prato	152.9	328	e 19 55	[+ 3]	e 30 12	{-22}	—	—	—
Rome	153.4	323	e 19 51 <sub>a</sub>	[- 1]	e 34 7	PSKS	23 43	PP	e 72.9
Clermont-Ferrand	154.6	342	e 19 54	[ 0]	—	—	e 23 58	PP	—
Toledo	z. 161.8	350	e 20 46	PKP <sub>2</sub>	—	—	e 24 16	PP	—
Algiers Univ.	z. 162.3	328	e 20 2	[- 1]	i 20 50	PKP <sub>2</sub>	e 24 34	PP	—
Alicante	162.4	340	e 19 55	[- 8]	31 7	{-18}	20 37	PKP <sub>2</sub>	e 74.9
Granada	164.3	346	20 3 <sub>k</sub>	[- 2]	31 27	{- 7}	i 24 42	PP	82.3
Malaga	z. 164.9	347	i 24 53 <sub>a</sub>	PP	i 27 33	[+25]	—	—	84.1
Tamanrasset	z. 167.2	276	e 20 8	[ 0]	—	—	e 20 35	pPKP	—

Additional readings :—

Auckland iN = 4m.42s.  
 New Plymouth eE = 6m.2s.  
 Brisbane iE = 3m.27s., 3m.45s., and 6m.33s.  
 Wellington iZ = 4m.36s., eZ = 5m.21s., e = 9m.14s.  
 Riverview iEN = 5m.13s., iPPEZ = 5m.28s., iP<sub>c</sub>PN = 8m.53s., iEZ = 8m.56s., iN = 9m.14s., isSE = 9m.26s.  
 Berkeley eZ = 12m.53s. and 13m.16s., eSEN = 23m.54s., eSSSEZ = 46m.2s.  
 Pasadena iZ = 12m.58s., isPZ = 13m.25s., iZ = 14m.40s., eE = 23m.57s., eSPE = 25m.6s., eSSN = 29m.20s.  
 Riverside isPZ = 13m.29s.  
 Shasta Dam e = 13m.30s. and 14m.33s.  
 Palomar iZ = 13m.8s., eZ = 13m.22s., iZ = 14m.1s.  
 Tinemaha isPZ = 13m.35s.  
 Overton iZ = 13m.19s.  
 Victoria PS = 24m.49s., PPS = 25m.51s.  
 Seattle e = 13m.49s. and 26m.18s.  
 Tucson i = 13m.51s.  
 College ePPS = 25m.34s.  
 Irkutsk ePS = 25m.56s.  
 Hungry Horse ePKP = 30m.13s., ePKP,PKP = 38m.31s.  
 Harvard e = 33m.38s.  
 Warsaw ePPEZ = 22m.46s., eEZ = 23m.45s., eZ = 24m.35s., ePPPZ = 25m.52s., ePKKSE = 31m.20s., ePPSZ = 34m.41s., eE = 36m.10s.  
 Helwan eZ = 20m.1s. and 20m.36s.  
 Skalnate Pleso e = 19m.48s., eN = 19m.53s., e = 21m.39s., ePP = 22m.38s., e = 23m.41s., eE = 24m.39s., e = 26m.20s. and 30m.32s., eN = 41m.56s.  
 Collmberg eZ = 19m.52s. and 20m.25s.  
 Ogyalla ePKP<sub>2</sub>N = 20m.1s., e = 20m.36s., ePP = 22m.27s., eE = 22m.57s., eSKP? = 23m.31s., eN = 23m.57s., eE = 29m.20s.  
 Prague ePKP<sub>2</sub> = 19m.58s., e = 20m.40s., 20m.57s., and 21m.38s., eSKP = 23m.30s., e = 24m.3s., ePPP = 25m.56s., eSKKS = 29m.38s., eSS = 41m.32s., eSSS = 47m.14s.  
 Jena eN = 19m.48s., eE = 20m.0s., eN = 20m.18s. and 20m.26s., eE = 21m.0s., eN = 21m.7s., and 21m.57s.  
 De Bilt ePPP = 26m.35s.  
 Stuttgart ePKPZ = 19m.51s., e = 19m.58s., eZ = 20m.19s., e = 20m.32s., eZ = 21m.44s., e = 39m.14s.  
 Strasbourg i = 20m.2s., e = 23m.20s. and 24m.18s., ePPP = 26m.52s.  
 Basle e = 20m.36s.  
 Paris i = 20m.34s., iPP = 23m.43s., e = 24m.16s., iPPP = 27m.8s.  
 Besançon e = 20m.48s.  
 Rome iPKP = 20m.12s., eSS = 43m.21s.  
 Clermont-Ferrand e = 24m.32s.  
 Alicante PP = 24m.31s., PPS = 37m.35s., SSP = 45m.15s., Q = 66m.45s.  
 Granada SKSP = 35m.35s., SS = 45m.21s., SSS = 49m.30s.  
 Tamanrasset iPKP<sub>2</sub>Z = 21m.14s., iPPZ = 25m.2s.  
 Long waves were also recorded at Seven Falls,

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July 17d. 21h. 21m. 14s. Epicentre 29°·5S. 71°·5W. Depth of focus 0·005.  
(as on 1947, August 28d.).

Intensity IV between latitudes 29° and 30° South. Suggested Epicentre 29°·5S. 71°·0W.  
Depth 100km.

F. Greve.

Boletín del año 1950. Instituto sismológico, Santiago, 1951, p.7.

A = +·2766, B = -·8267, C = -·4899 ;  $\delta$  = -6 ; h = +2 ;  
D = -·948, E = -·317 ; G = -·155, H = +·465, K = -·871.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
La Plata	N.	12·7	119	2 58	- 2	4 52	-28	—	6·0
La Paz		13·3	14	3 8	0	—	—	—	—
Huancayo		17·8	347	e 4 10	+ 5	—	—	—	—
Harvard		71·7	1	e 11 16	- 1	—	—	—	—
Tucson		71·9	326	e 11 17	- 1	—	—	—	—
Palomar	z.	75·8	324	i 11 40	- 1	—	—	i 11 55	pP
Pierce Ferry		76·5	327	i 11 14	-31	—	—	—	—
Riverside	z.	76·6	322	i 11 45	0	—	—	i 12 2	pP
Pasadena	z.	77·2	323	i 11 49	0	—	—	e 12 6	pP
Tinemaha	z.	79·4	324	i 12 1	0	—	—	i 12 16	pP
Lick	z.	81·4	323	i 12 12 <sub>a</sub>	+ 1	—	—	i 12 29	pP
Shasta Dam		84·3	324	e 12 24	- 2	—	—	—	—
Pretoria	z.	85·4	118	e 12 30	- 2	—	—	—	—
Hungry Horse		86·4	333	i 12 35	- 1	—	—	e 12 50	pP
Tamanrasset	z.	90·5	64	e 12 55	- 1	—	—	—	—
Collmberg	z.	109·2	42	—	—	e 25 17	[+24]	—	—

Additional readings :—

La Plata N = 5m.5s.

Tamanrasset eZ = 13m.44s., iZ = 14m.0s.

July 17d. Readings also at 0h. (Christchurch, Wellington, Hungry Horse, Tamanrasset (2), Algiers Univ., Athens, Istanbul, Ksara, Bucharest, Timisoara, Ogyalla, Warsaw, Collmberg, Prague, Cheb, Copenhagen, Kew, Stuttgart, Zürich, Prato, Triest, Messina, Rome, Bologna, Florence, near Taranto, Mary, near Andijan, Fergana, Murgab, Obi-garm, Samarkand, and Stalinabad ; several shocks), 1h. (Scoresby Sund and near Obi-garm), 3h. (Athens, Bucharest, Sofia, Taranto, Rome, Messina, Collmberg, Prague (2), Stuttgart, and Tamanrasset), 4h. (Copenhagen, Warsaw, Timisoara, Prato, Hungry Horse (2), and near Obi-garm), 6h. (College and near Ashkabad), 7h. (near Huancayo), 8h. (Bogota, La Paz, and near Huancayo), 9h. (Chinchina, Mount Wilson, Riverside, Tinemaha, Tucson, Hungry Horse, College, and Tamanrasset), 10h. (College, Tamanrasset, and near Obi-garm), 11h. (Palomar, Pasadena, Tucson, Overton, Pierce Ferry, Shasta Dam, College, Scoresby Sund, and near Apia), 12h. (La Paz), 13h. and 14h. (near Andijan), 15h. (Brisbane, Copenhagen, Stuttgart, Salt Lake City, Mount Wilson, Tinemaha, Shasta Dam, Hungry Horse, near Pierce Ferry, and near Ashkabad), 16h. (Collmberg), 18h. (Ksara, Tamanrasset, and Pennsylvania), 21h. (Palomar, Pasadena, Riverside, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Lick, Shasta Dam, Hungry Horse, Victoria, Tamanrasset, Huancayo, near La Paz, and near Ashkabad), 22h. (near Algiers Univ.), 23h. (Ashkabad, Almata, Mary, Naryn, Przhewalsk, near Andijan, Fergana, Frunse, Murgab, Obi-garm (2), Samarkand, Stalinabad, and Tashkent.).

July 18d. 1h. 33m. 54s. Epicentre 39°·3N. 143°·7E.

Intensity IV at Miyako and Morioka. Epicentre as adopted. Macroseismic radius 200-300km.

Seismo. Bull. Cent. Met. Obs., Japan, 1950, Tokyo, 1952, p. 34, with macroseismic chart.

A = -·6254, B = +·4594, C = +·6308 ;  $\delta$  = +8 ; h = -1 ;  
D = +592, E = +·806 ; G = -·508, H = +·373, K = -·776.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Miyako		1·4	284	0 25 <sub>a</sub>	- 2	0 43	- 3	—	—
Morioka		2·0	282	0 35 <sub>a</sub>	0	1 1	- 1	—	—
Mizusawa		2·0	265	0 37	+ 2	e 1 11	S <sub>g</sub>	—	—
Hatinohe		2·1	307	0 36	- 1	1 3	- 1	—	—
Sendai		2·4	245	0 41 <sub>a</sub>	0	1 7	- 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.
Aomori	2.7	304	0 46	+ 1	1 29	+10	—	—
Akita	2.8	279	0 48	+ 1	1 19	- 3	—	—
Hukusima	3.0	239	0 48 <sub>a</sub>	- 2	1 28	+ 1	—	—
Onahama	3.2	223	0 48	- 4	1 58	S <sub>g</sub>	—	—
Mori	3.7	321	1 0	0	1 57	S <sub>g</sub> *	—	—
Mito	3.9	223	1 3	+ 1	2 4	S <sub>g</sub> *	—	—
Utunomiya	4.1	229	1 4	- 1	2 3	S <sub>g</sub> *	—	—
Sapporo	4.2	336	1 8	+ 1	2 2	+ 5	—	—
Tukubasan	4.2	224	1 6	- 1	2 16	S <sub>g</sub>	—	—
Kumagaya	4.6	229	1 15	+ 3	2 6	- 1	—	—
Maebasi	4.7	233	1 14	0	2 12	+ 2	—	—
Tokyo	4.8	222	1 15	0	2 17	+ 5	—	—
Matusiro	5.1	240	1 20 <sub>a</sub>	0	2 30	S <sub>g</sub> *	—	—
Nagano	5.1	241	1 22	+ 2	2 46	S <sub>g</sub>	—	—
Mera	5.3	217	1 37	P*	—	—	—	—
Hunatu	5.5	228	1 15	-10	2 41	+11	—	—
Osima	5.7	219	1 40	P*	—	—	—	—
Wazima	5.7	253	1 25	- 3	2 34	- 1	—	—
Toyama	5.8	245	1 28	- 1	3 1	S*	—	—
Shizuoka	6.1	226	1 44	P*	2 51	+ 6	—	—
Gihu	6.7	237	1 43	+ 1	3 16	S*	—	—
Nagoya	6.8	235	1 48	+ 4	3 10	+ 7	—	—
Hikone	7.2	238	1 51	+ 2	—	—	—	—
Kameyama	7.3	235	2 4	+14	3 22	+ 7	—	—
Kyoto	7.7	239	2 3	+ 7	—	—	—	—
Osaka	8.0	237	2 17	P*	4 26	S <sub>g</sub>	—	—
Owase	8.0	232	2 4	+ 4	3 54	+21	—	—
Sumoto	8.6	238	2 2	- 7	—	—	—	—
Vladivostok	9.7	297	i 2 20	- 2	14 24	+ 9	—	—
Irkutsk	30.0	310	e 6 9	- 3	16 41	S <sub>c</sub> S	e 7 12	PP
College	46.2	34	i 8 41	+13	e 15 13	- 2	—	e 21.2
Przhevsk	48.4	297	8 44	- 2	—	—	—	—
Almata	49.1	298	i 8 49	- 2	—	—	—	—
Naryn	50.4	296	e 9 8	+ 7	—	—	—	—
Frunse	50.9	298	i 9 2	- 3	e 16 22	+ 1	i 11 0	PP
Murgab	53.1	293	i 9 20	- 1	e 16 50	- 1	—	—
Andijan	53.2	296	i 9 19	- 3	16 53	+ 1	e 11 29	PP
Fergana	53.8	296	9 24	- 2	—	—	—	—
Sverdlovsk	54.7	319	i 9 32	- 1	—	—	11 39	PP
Tashkent	55.1	299	i 9 34	- 2	e 17 39	PS	—	—
Obi-garm	55.9	296	i 9 39	- 3	—	—	—	—
Stalinabad	56.6	296	e 9 44	- 3	17 36	- 2	—	—
Ashkabad	64.1	300	e 10 32	- 6	—	—	—	—
Moscow	66.5	324	e 10 51	- 3	e 19 41	- 3	13 12	PP
Shasta Dam	68.3	55	e 11 6	+ 1	—	—	—	—
Hungry Horse	68.9	45	e 11 9	0	—	—	—	—
Grozny	69.3	310	e 11 18	+ 7	—	—	—	—
Scoresby Sund	70.0	356	e 14 0	PP	20 28	+ 2	—	35.1
Tiflis	70.8	309	i 11 19	- 1	—	—	—	—
Zugdidi	72.1	311	e 11 28	0	—	—	—	—
Tinemaha	z. 73.0	56	e 11 39	+ 6	—	—	—	—
Pasadena	z. 74.8	58	e 11 44	0	—	—	—	—
Riverside	z. 75.5	58	e 11 48	0	—	—	—	—
Overton	z. 75.8	55	e 11 45	- 5	—	—	—	—
Boulder City	z. 75.9	55	e 11 56	+ 6	—	—	—	—
Palomar	z. 76.2	58	e 11 54	+ 2	—	—	—	—
Pierce Ferry	76.3	55	e 12 3	+11	—	—	—	—
Copenhagen	76.7	335	i 11 50	- 5	e 21 38	- 3	—	40.1
Skalnate Pleso	78.7	327	e 13 24	?	—	—	e 16 0	PP
Potsdam	z. 79.1	333	e 12 12	+ 4	—	—	—	e 47.1
Collmberg	80.0	331	e 12 10	- 3	—	—	—	e 46.1
Istanbul	80.3	316	—	—	e 22 6†	-14	—	—
Prague	80.5	330	e 11 58	-17	e 22 17	- 5	e 15 29	PP
Jena	N. 80.8	331	e 12 14	- 3	—	—	—	—
Tucson	80.8	56	e 12 25	+ 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.
Ksara	81.3	307	e 12 17	- 3	e 22 52?	+22	—	—
Stuttgart	83.5	332	e 11 54	-37	e 23 6	+14	—	e 45.1
Rathfarnham C. z.	84.2	343	e 12 32	- 2	e 29 22	SS	—	e 46.1
Strasbourg	84.2	333	i 12 42	+ 8	e 22 56	- 3	—	e 45.6
Kew	84.3	338	e 11 37	-58	e 22 57	- 3	—	e 44.1
Paris	85.8	336	i 12 42	0	e 22 37	-38	e 16 0	PP e 49.1
Besançon	85.9	332	e 12 42	- 1	e 19 9	?	—	—
Helwan z.	86.8	306	i 12 45	- 2	—	—	—	—
Rome E.	87.8	326	—	—	e 23 15	[- 4]	—	—
Clermont-Ferrand	88.2	334	e 12 55	+ 1	—	—	—	—
Granada	98.1	335	e 27 27	PPS	—	—	—	i 56.7
Tamanrasset z.	106.9	320	e 18 42	PP	—	—	—	—

Additional readings :—

Mizusawa SE = 1m.17s.

Andijan ePS = 17m.19s.

Shasta Dam e = 11m.14s.

Overton eZ = 11m.52s.

Copenhagen i = 12m.3s.

Collmberg eZ = 12m.19s. and 12m.31s.

Prague e = 12m.46s., 13m.19s., 13m.29s., 13m.59s., 14m.18s., 14m.41s., and 19m.14s., eSS? = 28m.24s.

Jena eEN = 12m.24s.

Stuttgart eZ = 12m.4s., 12m.29s., and 12m.39s.

Paris i = 12m.51s., 13m.0s., and 13m.14s.

Besançon e = 12m.52s.

Tamanrasset eZ = 18m.55s.

Long waves were also recorded at other European stations.

July 18d. 16h. 25m. 45s. Epicentre 9°·7N. 125°·7E. (as on 1948, July 18d.).

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.
Nanking	23.1	344	i 5 9 <sub>a</sub>	+ 1	i 9 22	+ 6	i 6 0	PPP
Bandong	24.4	229	—	—	e 9 43	+ 4	—	—
Djakarta	24.5	231	e 5 20	- 2	e 9 59	+19	—	—
Vladivostok	33.7	8	e 6 46	+ 1	i 12 14	+ 6	—	—
Brisbane z.	45.5	145	i 8 24 <sub>k</sub>	+ 1	—	—	—	—
Irkutsk	45.9	342	e 8 33	+ 7	—	—	—	—
Przhevalsk	52.6	317	i 9 17	- 1	—	—	—	—
Almata	53.9	318	e 9 30	+ 3	e 17 8	+ 6	—	—
Naryn	53.9	316	i 9 22	- 5	16 56	- 6	—	—
Murgab	54.3	311	e 9 35	+ 5	e 17 13	+ 6	—	—
Frunse	55.4	316	i 9 36	- 2	e 17 25?	+ 3	—	—
Andijan	56.2	313	9 42	- 2	17 32	- 1	—	—
Fergana	56.5	313	e 9 43	- 3	—	—	—	—
Obi-garm	57.6	311	i 9 50	- 4	i 17 46	- 5	—	—
Stalinabad	58.3	310	i 9 57	- 2	i 17 57	- 4	—	—
Tashkent	58.6	313	e 9 59	- 2	—	—	—	—
Mary	63.4	307	10 41	+ 7	—	—	—	—
Ashkabad	66.3	307	e 10 40?	-12	—	—	—	—
Sverdlovsk	68.4	328	i 11 7	+ 1	—	—	—	—
Baku	73.0	310	e 11 21?	-12	—	—	—	—
Grozny	76.1	313	e 11 51	0	—	—	—	—
Tiflis	76.8	311	i 11 54	- 1	—	—	—	—
Leninakan	77.6	310	e 12 14?	+14	—	—	—	—
Zugdidi	79.0	311	12 15?	+ 8	—	—	—	—
College	79.8	25	e 12 11	- 1	e 20 14	?	e 25 12	? e 37.1
Moscow	81.0	325	e 12 17	- 1	e 22 24	- 3	—	—
Ksara	84.5	303	i 12 37 <sub>k</sub>	+ 1	23 37	+35	—	—
Helsinki	87.0	331	—	—	e 23 37	+10	—	46.2
Istanbul	88.7	312	—	—	e 23 49	+ 6	—	—
Helwan z.	89.0	300	i 12 57	- 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.
Upsala	90.6	331	—	—	e 23 45	[+ 9]	—	e 48.2
Warsaw	91.2	324	e 12 57	-11	e 23 39	[- 1]	e 17 9	PP e 52.2
Potsdam	z. 95.8	325	e 13 34	+ 5	—	—	—	e 52.2
Prague	95.9	323	e 13 58	+28	—	—	e 17 22	PP —
Collmberg	z. 96.2	324	e 13 36?	+ 5	—	—	—	—
Scoresby Sund	97.0	350	17 45	PP	24 27	{- 6}	31 57	SSP —
Jena	N. 97.2	324	e 13 30?	- 6	—	—	—	—
Stuttgart	99.5	324	e 13 51?	+ 5	e 25 15	- 1	—	e 51.2
Shasta Dam	99.8	46	e 13 48	+ 1	—	—	e 17 42	PP —
Rome	100.3	316	e 18 2	PP	e 25 2	{+ 6}	—	e 53.0
Hungry Horse	101.9	36	e 14 0	+ 3	—	—	—	—
Kew	103.4	328	—	—	e 23 10	?	e 33 7	SS e 49.2
Paris	103.4	325	—	—	e 32 42	SS	—	e 54.2
Clermont-Ferrand	104.6	322	—	—	e 29 15	PKKP	e 41 43	? 55.2
Rathfarnham C. z.	105.2	333	—	—	e 32 1	SS	—	e 50.2
Mount Wilson	z. 105.5	51	e 18 16	[- 8]	—	—	e 19 14	PP —
Palomar	z. 106.8	51	e 18 48	PP	—	—	—	—
Overton	z. 107.2	48	e 19 22	PP	—	—	—	—
Pierce Ferry	107.7	48	e 18 0	[-28]	—	—	—	—
Alicante	110.7	317	e 15 36	P	—	—	—	e 54.9
Tucson	111.8	50	e 19 20	PP	—	—	—	—
Tamanrasset	z. 113.1	300	e 18 33	[- 6]	e 29 27	PS	e 19 34	PP —
Granada	113.4	318	(e 18 24)	[-16]	e 18 24	PKP	30 45	PPS 60.8
La Paz	164.9	118	e 20 17	[+11]	—	—	—	—

Additional readings :—

Warsaw eZ=13m.14s. and 13m.52s., ePPPZ=19m.37s., eE=23m.56s., eSKKSE=24m.17s., eEZ=25m.8s., PSE=26m.14s., eEZ=28m.8s., eE=29m.33s., SSEZ=31m.54s.

Prague e=14m.14s., 14m.21s., 14m.38s., 15m.26s., and 18m.6s.

Collmberg eZ=13m.45s.

Jena eE=13m.36s.? and 13m.59s., eN=14m.7s., eE=15m.9s.

Stuttgart eZ=14m.4s.

Shasta Dam e=16m.32s.

Kew e=35m.46s., eEN=45m.56s.

Granada ePKP?=9m.18s., PKP and PPS given as SKKS and SS respectively.

Long waves were also recorded at Aberdeen, Copenhagen, De Bilt, Strasbourg, and Malaga.

July 18d. Readings also at 0h. (Brisbane, Helwan, Ksara, Tamanrasset, and Copenhagen), 1h. (Tamanrasset, Huancayo, Shasta Dam, Hungry Horse, College, and near Seattle), 2h. (Hungry Horse), 3h. (Obi-garm, near Murgab, near Mizusawa, and near Trieste), 5h. (Palomar, Pasadena, Riverside, Tinemaha, Tucson, Overton, Shasta Dam, Hungry Horse, College, and near Obi-garm), 6h. (Bogota, Harvard, Weston, and Bermuda), 7h. (Hungry Horse and College), 8h. (Hungry Horse, College, and Prague), 9h. (Andijan and near Obi-garm), 12h. (Apia, Palomar, Pasadena, Riverside, Tinemaha, and Pierce Ferry), 15h. (Collmberg, Prague, and near Zürich), 16h. (near Istanbul), 17h. (Ashkabad), 18h. (Pierce Ferry, Paris, Tamanrasset, and near Obi-garm), 19h. (College), 22h. (Lick, Stuttgart, and near Prague), 23h. (Tamanrasset, Rome, Messina (2), Stuttgart, and near Taranto).

July 19d. 5h. 35m. 56s. Epicentre 64°·0N. 21°·0W.

Approximate position given by Strasbourg.

Intensity V-VI, and felt widely throughout south-west Iceland. Vedráttan, 1950.

Mánadaryfirlit samid á vedurstofunni, Júlí, p. 28.

$$A = +.4115, B = -.1580, C = +.8976; \quad \delta = -2; \quad h = -10;$$

$$D = -.358, E = -.934; \quad G = +.838, H = -.322, K = -.441.$$

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Reykjavik	0.4	289	i 0 7	- 6	i 0 14	- 7	—	0.4
Scoresby Sund	6.5	357	—	—	3 2	S*	—	—
Rathfarnham Castle	13.1	138	i 5 27	?	i 5 40	+ 2	e 9 7	? —
Paris	19.8	150	e 4 34	- 1	e 8 26	+13	e 9 13	Q e 10.1
Potsdam	z. 21.1	109	e 4 52	+ 4	—	—	—	e 13.1
Collmberg	z. 21.9	111	e 4 57	0	—	—	—	—
Strasbourg	21.9	121	e 5 17	PP	—	—	—	—
Stuttgart	22.3	119	e 5 3	+ 2	e 9 10	+ 8	—	e 12.1
Tamanrasset	z. 44.8	144	e 8 18	+ 1	—	—	—	—

Long waves were also recorded at Alicante, Granada, Tortosa, Clermont-Ferrand, Kew, and De Bilt.

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July 19d. 10h. 51m. 57s. Epicentre 51°·5N. 179°·5E.

A = -·6251, B = +·0055, C = +·7806;  $\delta = +12$ ;  $h = -6$ ;  
D = +·009, E = +1·000; G = -·781, H = +·007, K = -·625.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
College	21·5	39	e 4 53	+ 1	e 8 55	+ 8	—	c 10·2
Sitka	26·0	60	—	—	e 10 3	- 3	—	c 13·2
Vladivostok	32·8	274	i 6 35	- 2	i 11 54	0	—	—
Victoria	36·0	72	7 4	- 1	12 49	+ 5	9 29	P <sub>c</sub> P
Seattle	37·1	72	e 7 16	+ 2	e 13 5	+ 4	e 7 30	pP e 20·0
Shasta Dam	40·7	82	e 7 45	+ 1	e 13 53	- 2	—	—
Hungry Horse	41·6	67	i 7 51	0	e 13 31	-37	—	—
Berkeley	42·5	85	i 8 0k	+ 1	e 14 25	+ 3	e 17 47	SS c 20·4
Lick	z. 43·2	85	e 7 5k	-59	—	—	—	—
Saskatoon	43·8	59	—	—	e 18 6	SSS	—	23·4
Tinemaha	45·5	83	e 8 24	+ 1	—	—	—	—
Haiwee	z. 46·2	84	i 8 32	+ 4	—	—	—	—
Pasadena	47·4	86	i 8 37	- 1	—	—	e 8 50	pP c 22·0
Riverside	z. 48·0	86	e 8 42	- 1	—	—	e 8 55	pP
Overton	z. 48·2	81	i 8 54	+10	e 15 52	+ 9	i 10 17	P <sub>c</sub> P
Boulder City	48·3	82	e 8 45	0	—	—	—	—
Pierce Ferry	48·7	81	i 8 48	0	e 15 49	- 1	—	—
Tucson	53·2	83	e 9 21	- 1	—	—	—	—
Scoresby Sund	57·3	9	e 9 52	0	e 17 53	+ 6	—	26·0
Sverdlovsk	60·9	327	i 10 17	0	—	—	—	—
Ottawa	63·8	50	e 10 34	- 2	—	—	—	34·0
Almata	64·3	309	c 10 37	- 2	—	—	—	—
Harvard	67·9	49	e 11 1	- 1	—	—	—	e 36·0
Philadelphia	68·1	53	—	—	e 20 17	+14	—	e 32·4
Weston	68·2	49	e 11 2	- 2	—	—	—	e 36·6
Andijan	68·4	310	e 11 5	- 1	—	—	—	—
Fergana	69·0	310	e 11 8	- 1	—	—	—	—
Murgab	69·5	306	e 11 14	+ 2	—	—	—	—
Tashkent	69·5	312	i 11 12	0	e 20 22?	+ 2	—	—
Obi-garm	71·3	310	e 11 25	+ 2	e 11 31	?	—	—
Stalinabad	71·9	310	i 11 27	0	i 20 50	+ 2	—	—
Rathfarnham C.	z. 75·5	4	e 11 43	- 5	—	—	e 17 23	PPP
De Bilt	76·7	357	e 12 52	+57	—	—	—	e 48·0
Ashkabad	77·1	316	e 11 58	+ 1	—	—	—	—
Tiflis	79·1	328	i 12 9	+ 1	e 22 11	+ 4	—	—
Zugdidi	79·4	329	e 12 12	+ 3	—	—	—	—
Stuttgart	79·8	354	e 12 11	- 1	e 23 3	PS	e 30 33	SSS e 46·0
Paris	80·0	359	i 12 13	0	—	—	—	e 52·0
Strasbourg	80·0	355	e 12 13	0	—	—	—	—
Besançon	81·5	356	e 12 20	- 1	—	—	—	—
Clermont-Ferrand	83·1	358	e 12 29	0	—	—	—	53·0
Alicante	90·5	0	—	—	e 25 31	PPS	—	e 44·5
Granada	91·6	2	14 21 <sub>a</sub>	+71	—	—	—	51·7
Algiers Univ.	z. 92·1	357	8 27	?	—	—	—	—
Pretoria	z. 146·3	308	i 19 13	[-28]	—	—	—	—
Pietermaritzburg	z. 148·3	301	e 19 48	[+ 3]	—	—	—	—

Additional readings:—

College e = 5m.11s. and 9m.18s.

Seattle esP = 7m.40s., epS = 13m.19s., e = 13m.33s., eP<sub>c</sub>S = 14m.33s., e = 14m.53s. and 15m.8s., eS<sub>c</sub>S = 17m.11s., epS<sub>c</sub>S = 17m.31s., e = 17m.44s.

Shasta Dam e = 9m.1s. and 9m.12s.

Berkeley eZ = 8m.5s. and 10m.2s.

Lick iZ = 7m.26s., eZ = 8m.54s.

Overton iZ = 9m.6s.

Obi-garm readings are given as those of a local shock.

Strasbourg e? = 12m.25s.

Long waves were also recorded at Honolulu, Santa Clara, Washington, Kew, Potsdam, and Malaga.

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July 19d. 12h. 39m. 55s. Epicentre  $0^{\circ} \cdot 2N$ .  $125^{\circ} \cdot 2E$ . (as on 1949, June 26d.).

A =  $- \cdot 5764$ , B =  $+ \cdot 8171$ , C =  $+ \cdot 0035$ ;  $\delta = -10$ ;  $h = +7$ ;  
D =  $+ \cdot 817$ , E =  $+ \cdot 576$ ; G =  $- \cdot 002$ , H =  $+ \cdot 003$ , K =  $-1 \cdot 000$ .

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.
	$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.
Bandong	18.9	249	e 4 25	+ 1	e 7 59	+ 6	—
Djakarta	19.4	251	e 4 27	- 3	e 8 3	- 1	—
Vladivostok	43.2	7	e 8 7	+ 3	i 14 33	+ 1	—
Murgab	60.4	315	e 10 13	0	c 18 25	- 3	—
Almata	60.7	322	i 10 16	+ 1	—	—	—
Frunse	62.0	320	i 10 25	+ 1	18 49	+ 1	—
Andijan	62.5	317	e 10 29	+ 1	18 54	0	—
Fergana	62.8	317	e 10 28	- 2	—	—	—
Obi-garm	63.6	314	e 10 36	+ 1	—	—	—
Stalinabad	64.2	314	i 10 38	- 1	—	—	—
Tashkent	64.9	317	i 10 41	- 2	—	—	—
Sverdlovsk	76.3	330	i 11 51	- 1	—	—	—
Tiflis	82.7	312	i 12 27?	0	—	—	—
Moscow	88.5	326	e 12 55	- 1	e 23 36	- 5	—
College	88.5	26	e 16 18	PP	—	—	—
Copenhagen	102.5	328	e 10 34	?	—	—	—
Shasta Dam	106.7	47	e 18 54	PP	—	—	—
Mount Wilson	z. 111.8	53	e 18 40	[+ 3]	—	—	—
Overton	z. 113.9	50	e 19 6	[+ 25]	—	—	—
Pierce Ferry	114.4	50	e 18 47	[+ 5]	—	—	e 20 1 PP
Tamanrasset	z. 117.1	296	e 18 52	[+ 5]	29 15	PS	e 20 55 PP
Tucson	118.1	52	e 18 52	[+ 3]	—	—	e 20 21 PP

Additional readings:—

College e = 16m.47s.

Shasta Dam e = 19m.5s.

Mount Wilson eZ = 18m.47s.

July 19d. Readings also at 0h. (Potsdam), 3h. (Tucson, Overton, Pierce Ferry, Lick, Shasta Dam, College, Collmberg, and Stuttgart), 4h. (Bogota and Lick), 5h. (La Paz), 6h. (Shasta Dam, Taranto, and near Obi-garm), 10h. (Copenhagen), 11h. (College and near Stalinabad), 12h. (Galerazamba, near Bogota, and Chinchina), 13h. (Kew), 14h. (La Paz and College), 15h. (Ashkabad, Durham, Prague, Strasbourg, near Stuttgart, near Basle, Neuchatel, Zürich, and near Murgab), 19h. (Tamanrasset, Istanbul, Sofia, Warsaw, Prague, Timisoara, Potsdam, Stuttgart, Zürich, Rome, Triest, and near Taranto), 23h. (La Plata, Tamanrasset, Stuttgart, Andijan, Fergana, Stalinabad, near Murgab, and Obi-garm).

July 20d. 0h. Undetermined shock, probably deep.

Vladivostok iP = 27m.31s., iS = 28m.17s.

Mizusawa PEN = 28m.16s., SEN = 29m.36s.

Almata P = 33m.30s., S = 39m.5s.

Andijan P = 34m.2s., iS = 40m.4s.

Murgab P = 34m.5s.?, S = 40m.5s.?

Fergana iP = 34m.7s.

Obi-garm iP = 34m.23s., iS = 40m.41s.

Stalinabad P = 34m.28s., S = 40m.52s.

College iP = 34m.29s., ipP = 35m.58s.

Hungry Horse iP = 37m.9s.

Shasta Dam iP = 37m.13s.

Overton iPZ = 37m.54s.

Pierce Ferry eP = 37m.57s.

Tucson eP = 38m.20s.



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July 20d. 3h. 3m. 53s. Epicentre 26°·0S., 70°·2W. Depth of focus 0·015  
(as on 1946, October 28d.).

Intensity IV between 26° and 27°S. latitudes.  
Epicentre 25°·75S. 70°·25W. (Strasbourg). Depth 100km.

F. Greve.

Boletín del año 1950, Instituto sísmológico, Santiago, 1951, p.8.

A = +·3049, B = -·8468, C = -·4360 ;  $\delta = +13$ ,  $h = +3$  ;  
D = -·941, E = -·339 ; G = -·148, H = +·410, K = -·900.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.	
	°	°	m. s.	s.	m. s.	s.	m. s.	m.	
La Paz	9·6	12	2 13	- 3	i 3 59	- 3	i 4 19	SS	4·9
Huancayo	14·7	340	e 3 15	- 8	—	—	—	—	—
Tucson	69·7	324	i 10 58	0	—	—	i 11 17	pP	—
Ottawa	z. 71·2	356	i 11 4k	- 3	—	—	—	—	—
Palomar	z. 73·8	321	i 11 23k	+ 1	—	—	e 11 39	pP	—
Pierce Ferry	74·3	324	i 11 27	+ 2	—	—	—	—	—
Riverside	z. 74·6	321	i 11 29k	+ 2	—	—	i 11 49	pP	—
Boulder City	74·7	323	i 11 29	+ 2	—	—	e 11 58	pP	—
Overton	z. 74·9	324	i 11 31	+ 3	—	—	—	—	—
Pasadena	z. 75·2	321	i 11 32	+ 2	—	—	—	—	—
Tinemaha	z. 77·3	322	i 11 43k	+ 1	—	—	e 12 0	pP	—
Lick	z. 79·4	321	e 11 57	+ 4	—	—	e 12 25	pP	—
Berkeley	z. 80·1	321	—	—	i 28 52	?	—	—	—
Shasta Dam	82·2	323	i 12 8	0	—	—	—	—	—
Hungry Horse	83·8	333	i 12 17	+ 1	—	—	e 12 43	pP	—
Tamanrasset	z. 87·9	64	i 12 38a	+ 2	—	—	i 12 58	pP	—

Additional readings :—

Palomar eZ = 11m.33s.

Riverside eZ = 11m.39s.

Tinemaha eZ = 12m.4s.

Tamanrasset ePPZ = 16m.31s.

July 20d. 9h. 30m. 46s. Epicentre 16°·5S. 173°·0E.

Epicentre as given by U.S.C.G.S. and J.S.A.

A = -·9522, B = +·1169, C = -·2823 ;  $\delta = +4$  ;  $h = +5$  ;  
D = +·122, E = +·933 ; G = +·280, H = -·034, K = -·959.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.	
	°	°	m. s.	s.	m. s.	s.	m. s.	m.	
Apia	14·9	82	e 3 31	- 3	—	—	e 3 47	PP	e 6·5
Auckland	N. 20·3	175	e 4 33	- 7	e 8 44	SS	—	—	e 9·5
Brisbane	21·5	236	i 3 57	-55	i 7 54	-53	—	—	—
Arapuni	21·6	174	e 4 56	+ 2	e 8 27	-22	—	—	—
New Plymouth	E. 22·5	177	i 5 16	+14	e 9 19?	+14	e 8 14	?	—
Tual	N. 22·5	171	e 5 0	- 2	e 9 12	+ 7	—	—	—
Cobb River	E. 24·5	181	e 5 30	+ 8	e 9 44	+ 4	—	—	—
Wellington	24·7	177	i 5 23	- 1	e 9 44	0	i 5 59	PP	e 11·2
Kaimata	N.E. 26·0	182	e 5 36	0	—	—	—	—	—
Riverview	26·1	224	i 5 40a	+ 3	i 10 2	- 5	i 5 49	pP	e 12·0
Christchurch	26·9	180	5 40	- 5	i 10 24	+ 4	6 29	PP	e 12·8
Guam	40·8	315	12 14?	?	—	—	—	—	—
Honolulu	47·1	38	e 8 39	+ 4	e 15 12	-16	e 10 6	PP	e 19·6
Perth	53·8	243	—	—	i 17 16	PPS	i 19 29	S <sub>c</sub> S	—
Bandong	64·5	271	e 10 39	- 2	e 19 21	+ 2	—	—	—
Djakarta	65·4	271	e 10 51	+ 4	e 19 42	+12	—	—	—
Vladivostok	70·3	330	i 11 18	+ 1	i 20 35	+ 6	—	—	—
Ukiah	81·2	45	e 12 25	+ 6	e 22 35	+ 6	—	—	e 36·6
Berkeley	81·3	47	e 12 16	- 4	e 22 30	0	e 15 27	PP	e 34·0
Santa Clara	81·3	47	e 12 34	+14	e 22 34	+ 4	e 23 4	PS	e 37·3
Ferndale	E. 81·3	43	e 12 42	+22	—	—	—	—	e 35·6
Lick	z. 81·5	47	e 12 22a	+ 1	—	—	—	—	—
Fresno	82·5	48	e 12 26a	0	—	—	e 36 42	Q	e 38·9
Pasadena	82·5	51	e 12 25	- 1	i 22 45	+ 3	e 15 46	PP	e 33·3
Shasta Dam	82·6	44	i 12 26	0	e 22 45	+ 2	e 15 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.
Riverside	z.	83.1	51	e 12 28	- 1	—	—	—	—
Palomar		83.2	53	e 12 29	0	—	—	i 15 46	PP
Haiwee	z.	83.6	50	e 12 31	0	—	—	—	—
Tinemaha	z.	83.8	49	e 12 32	0	—	—	—	—
Sitka		84.9	26	e 12 38	0	e 23 10	+ 4	e 24 0	PS
Boulder City		85.8	51	e 12 41	- 1	c 23 9	[+ 3]	—	—
Victoria		85.8	37	12 45	+ 3	23 6	[ 0]	23 25	S
Seattle		86.0	38	i 12 47k	+ 4	e 23 28	+11	i 13 4	pP
Overton	z.	86.3	50	i 12 46	+ 1	—	—	—	—
College		86.4	16	e 12 43	- 2	c 23 14	{- 1}	e 24 19	SS
Pierce Ferry		86.5	51	i 12 45	- 1	—	—	—	—
Tucson		87.4	55	i 12 50	0	c 23 26	- 4	e 16 17	PP
Salt Lake City		89.8	47	e 13 0	- 2	e 23 40	{ 0}	e 16 16	PP
Irkutsk		90.5	325	13 5	0	e 23 43	{- 3}	16 45	PP
Butte	n.	91.3	42	e 13 51	+42	c 24 13	+ 7	e 29 55	SS
Hungry Horse		91.3	40	c 13 7	- 2	c 23 40	[ 0]	e 30 31	PKKP
Calcutta	E.	91.4	293	—	—	c 23 54	{+ 2}	—	—
Bozeman		92.2	43	e 13 10	- 3	e 23 43	{- 3}	e 24 19	S
Colombo	E.	94.9	276	—	—	c 23 14?	{-47}	—	—
Saskatoon		97.1	38	17 44	PP	24 14	[+ 2]	25 2	S
Lincoln	E.	100.9	50	e 18 0	PP	c 24 32	[+ 1]	e 26 59	PS
New Delhi	N.	102.7	297	e 17 14	?	24 42	[+ 2]	27 37	PS
Poona	N.	103.5	286	—	—	e 26 6	+16	—	—
Bombay	E.	104.4	286	18 44	PP	i 25 1	[+13]	21 12	PPP
Florissant		105.2	54	—	—	e 26 13	+ 9	—	—
St. Louis		105.3	54	e 18 30	PP	c 26 12	+ 7	e 28 52	PPS
Almata		105.5	311	e 14 8	- 5	—	—	—	—
Huancayo		106.7	108	e 18 56	PP	c 27 41	PS	e 34 6	SSP
Murgab		107.1	305	18 46	PP	28 21	PS	—	—
Chicago		107.7	50	e 18 35	[+ 6]	e 28 15	PS	e 18 51	PP
Andijan		108.6	308	e 14 25	P	c 25 3	{- 3}	e 18 54	PP
Fergana		109.0	308	e 14 28	P	e 28 44?	PS	—	—
Cincinnati		109.8	54	i 19 9	PP	i 29 47	PPS	—	e 52.4
Obi-garm		110.4	306	19 16	PP	i 26 14	{+ 6}	i 28 55	PS
Tashkent		110.9	309	e 14 45	P	i 25 25	[+ 9]	e 19 16	PP
Stalinabad		111.1	306	i 19 20	PP	i 28 59	PS	—	—
La Paz		111.4	115	e 18 50	[+14]	i 28 49	PS	e 14 34	P
Chinchina		111.9	91	—	—	e 28 56	PS	—	e 52.2
Columbia		112.1	59	—	—	e 28 48	PS	—	—
Cleveland		112.2	51	i 19 28	PP	c 27 14	S	e 28 57	PS
Bogota		113.3	92	—	—	c 24 49	{-36}	e 29 16	PS
Pennsylvania	N.	115.0	52	e 29 35	PS	i 27 42	S	e 39 22	SSS
Washington		115.6	54	e 20 50	PP	—	—	—	e 56.3
Sverdlovsk		115.9	326	e 18 50	[+ 5]	e 29 46?	PS	15 6	P
Mary		116.5	305	e 19 48	PP	—	—	—	—
Ottawa		116.5	47	e 18 50	[+ 4]	27 48	S	19 56	PP
Philadelphia		117.0	53	e 20 0	PP	e 27 17	{+23}	e 29 43	PS
Fordham		118.0	52	e 20 14	PP	e 36 21	SS	e 29 57	PS
Ashkabad		119.3	305	e 19 44	PP	—	—	—	—
Seven Falls	E.	119.7	44	i 20 17	PP	30 3	PS	36 56	SSP
Harvard		119.7	50	e 18 41	{-11}	e 30 11	PS	e 20 17	PP
Weston		119.8	50	e 18 56	[+ 4]	e 37 0	SSP	e 20 16	PP
San Juan		123.8	78	e 19 35	[+35]	e 30 35	PS	—	e 51.3
Halifax		125.1	46	—	?	(35 14?)	?	—	35.2
Scoresby Sund		125.3	6	19 2	{- 1}	30 54	PS	20 58	PP
Baku		125.6	309	e 19 28?	[+24]	—	—	—	—
Bermuda		125.8	62	e 21 4	PP	e 27 39	{-14}	e 30 59	PS
Ivigtut		126.6	23	—	—	34 2	?	38 32	SSP
Fort de France		127.9	84	e 21 15	PP	—	—	—	—
Grozny		128.1	313	e 19 4	{- 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.
Moscow	128.2	330	e 19 10	[+ 1]	28 17	{+ 9}	e 21 19 PP	—
Pulkovo	129.0	337	e 19 10	[ 0]	e 22 32	PKS	—	—
Tiflis	129.2	311	i 19 12?	[+ 2]	i 22 39	PKS	e 31 16 SKSP	—
Piatigorsk	129.8	314	—	—	i 22 42	PKS	—	—
Helsinki	130.6	341	—	—	e 22 39	PKS	e 25 37 ?	59.2
Zugdidi	131.0	312	e 19 23?	[+ 9]	i 22 47	PKS	—	—
Upsala	133.1	344	e 21 55	PP	e 22 45	PKS	e 39 14? SS	e 55.2
Bergen	N. 135.2	352	—	—	e 39 14?	SS	e 40 35 SSP	64.2
Ksara	137.9	302	19 29? a	[+ 2]	40 56	SSP	22 20? PP	—
Warsaw	138.0	335	e 19 29k	[+ 2]	e 26 36	[ 0]	e 22 36 PP	e 54.2
Copenhagen	138.2	344	e 19 28	[+ 1]	26 41	[+ 5]	40 56 SSP	59.2
Aberdeen	139.2	356	i 22 20	PP	e 40 52	SS	e 23 0 PKS	e 65.0
Istanbul	140.5	316	e 19 31	[ 0]	26 42	[+ 2]	—	—
Bucharest	140.6	322	e 20 2	[+30]	—	—	—	64.2
Skalnate Pleso	140.6	332	e 19 37	[+ 5]	e 26 38	[- 2]	e 22 28 PP	—
Potsdam	140.9	341	i 19 37 a	[+ 5]	—	—	e 22 38 PP	e 65.2
Durham	141.6	355	e 19 35	[+ 2]	—	—	e 20 28 ?	—
Collmberg	141.8	339	e 19 33?	[- 1]	e 46 44	SSS	e 19 41? PKP <sub>2</sub>	e 62.2
Prague	142.3	338	e 19 32	[- 3]	e 26 26	[-17]	e 22 20 PP	e 55.2
Helwan	z. 142.5	298	i 19 32 a	[- 3]	26 35	[- 8]	22 38 PP	—
Ogyalla	142.5	332	e 19 47	[+12]	e 29 48	{+12}	e 22 50 PP	—
Timisoara	142.5	327	19 14?	[-21]	—	—	—	77.2
Jena	142.6	340	e 19 34	[- 1]	e 23 7	PKS	e 25 14 PPP	e 62.2
Cheb	143.0	340	e 19 36	[ 0]	e 26 49	[+ 5]	e 22 30 PP	e 61.2
Kalossa	143.1	331	e 18 42	?	e 26 54	[+10]	e 22 57 PP	—
De Bilt	143.2	348	i 19 34	[- 2]	e 41 44	SS	i 22 50 PP	e 59.2
Sofia	143.2	322	e 19 38	[+ 2]	—	—	—	—
Rathfarnham Castle	143.3	0	e 19 39	[+ 3]	e 40 34	SS	e 22 44 PP	e 54.4
Kew	144.8	353	i 19 38k	[- 1]	e 29 58	{+ 9}	e 23 2 PP	e 56.2
Karlsruhe	145.2	343	i 19 45	[+ 5]	e 23 32	PKS	—	—
Stuttgart	145.2	341	i 19 39k	[- 1]	e 29 49	[- 2]	i 19 52 pPKP	70.2
Athens	145.6	314	i 19 38	[- 2]	—	—	—	—
Strasbourg	145.8	343	e 19 41k	[ 0]	e 26 43	[- 5]	e 23 19 PP	e 69.2
Triest	146.1	334	i 19 41	[ 0]	e 26 44	[- 4]	i 20 3 PKP <sub>2</sub>	e 66.8
Zürich	146.6	342	e 19 43k	[+ 1]	—	—	e 22 49 PP	—
Chur	146.8	339	e 19 44k	[+ 2]	—	—	e 19 49 PKP <sub>2</sub>	e 78.2
Basle	146.9	342	e 19 43	[+ 1]	—	—	e 22 39 PP	—
Paris	146.9	350	i 19 45	[+ 3]	e 42 54	SS	i 20 2 PKP <sub>2</sub>	e 64.2
Neuchatel	147.5	342	e 19 47	[+ 4]	—	—	—	—
Bologna	z. 148.1	336	e 19 48k	[+ 4]	—	—	e 20 19 pPKP	—
Taranto	148.2	324	e 19 14?	[-31]	23 34	PKS	40 34 ?	54.2
Pavia	z. 148.3	338	e 19 50	[+ 5]	—	—	—	—
Florence Xim	148.7	334	e 19 46	[+ 1]	—	—	e 23 26 PP	—
Prato	148.7	334	e 19 52	[+ 7]	—	—	i 20 17 PKP <sub>2</sub>	—
Clermont-Ferrand	149.6	347	i 19 52	[+ 5]	e 43 37	SSP	i 23 37 PP	70.2
Rome	149.7	331	i 19 46k	[- 1]	42 7	SS	i 20 58 pPKP	—
Messina	150.7	323	e 20 4	PKP <sub>2</sub>	—	—	e 22 57 PP	—
Tortosa	154.9	346	19 56	[+ 2]	(49 44)	SSS	—	49.7
Toledo	156.6	355	e 20 3	[+ 6]	26 53	[- 8]	e 20 32 PKP <sub>2</sub>	64.7
Alicante	157.7	348	20 3	[+ 5]	27 7	[+ 5]	20 38 PKP <sub>2</sub>	e 72.7
Lisbon	157.8	5	20 4 a	[+ 6]	50 14?	SSS	20 35 PKP <sub>2</sub>	65.5
Algiers Univ.	z. 157.9	339	e 19 54	[- 4]	—	—	e 20 35 PKP <sub>2</sub>	—
Granada	159.2	354	i 20 4 a	[+ 4]	i 31 31	{+23}	20 42 PKP <sub>2</sub>	i 77.3
Malaga	159.7	355	i 19 44k	[-16]	26 40	[-24]	i 20 46 PKP <sub>2</sub>	75.8
Tamanrasset	z. 166.7	300	20 7k	[ 0]	e 31 27	[-19]	e 21 14 PKP <sub>2</sub>	71.2

Additional readings :—

Auckland iN = 4m.43s. and 4m.51s.

Brisbane iZ = 4m.4s., iEN = 4m.54s. and 8m.28s., iE = 8m.58s.

Riverview iPPPE = 6m.28s., iEZ = 6m.36s., iE = 7m.12s. and 9m.16s., iZ = 9m.20s. and 9m.54s., isSEZ = 10m.19s., iE = 10m.50s. and 11m.13s.

Christchurch eZ = 7m.50s., eP<sub>c</sub>PZ = 8m.44s., eSE = 10m.0s., eSNZ = 10m.8s., eSS?Z = 11m.24s.

Honolulu eSS = 18m.18s.

Perth i = 17m.47s.

Berkeley ePZ = 12m.20s., i = 12m.24s., ePPPZ = 17m.23s., iPPSEN = 23m.23s., eZ = 25m.57s., eSSN = 27m.58s., eE = 28m.9s.

Continued on next page.

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Santa Clara eE = 23m.26s.  
 Lick iZ = 12m.41s.  
 Fresno eEN = 12m.29s., eZ = 12m.49s. and 13m.54s., eN = 15m.9s., eE = 18m.53s.  
 Pasadena i = 12m.30s., iPS = 23m.41s.  
 Shasta Dam e = 12m.57s.  
 Riverside iZ = 12m.34s., eZ = 16m.37s.  
 Palomar iZ = 12m.35s., 14m.21s., and 16m.38s.  
 Haiwee iZ = 12m.36s.  
 Sitka eSS = 28m.26s.  
 Victoria SS = 28m.42s.  
 Seattle ePP = 16m.4s., eSKS = 22m.56s., ePS = 23m.57s., ePPS = 24m.31s., eSS = 29m.33s., ePKKP = 30m.53s., and numerous unidentified readings.  
 College e = 15m.36s. and 16m.53s., eSS = 28m.58s.  
 Tucson i = 12m.55s., eS = 23m.40s., ePS = 24m.41s., eSS = 29m.31s.  
 Salt Lake City ePS = 24m.56s., eSS = 30m.3s.  
 Irkutsk eScS = 24m.8s., PS = 25m.22s.  
 Hungry Horse ePKP.PKP = 38m.8s.  
 Bozeman ePS = 25m.21s., eSS = 30m.21s., eSSS = 34m.3s.  
 Saskatoon PS = 26m.23s., SS = 31m.48s., SSS = 35m.22s.  
 Lincoln eSSE = 32m.41s., eSSSE = 36m.52s.  
 New Delhi eN = 17m.35s., SKKSN = 25m.27s., ScSN = 25m.57s., SSN = 33m.24s., SSSN = 37m.54s., iN = 40m.50s.  
 Bombay iSEN = 26m.14s., PPSEN = 28m.44s.  
 Huancayo e = 21m.53s., 28m.20s., and 40m.27s.  
 Chicago eSS = 33m.51s., eSSS = 37m.57s.  
 Andijan ePS = 28m.36s.  
 Cincinnati i = 19m.52s. and 23m.11s.  
 Tashkent iPS = 28m.44s.  
 La Paz iPPS = 29m.16s., iS = 33m.44s.  
 Cleveland eE = 30m.27s., eSSE = 35m.19s.  
 Sverdlovsk PP = 19m.56s.  
 Ottawa PS = 28m.57s., SSS = 36m.2s.  
 Philadelphia e = 27m.58s., ePPS = 31m.3s., eSS = 36m.10s., eSSS = 40m.39s.  
 Scoresby Sund 33m.20s., SS = 38m.25s., SSS = 42m.20s.?  
 Bermuda e = 21m.29s., ePPS = 32m.33s., ePPPS = 33m.39s., eSS = 37m.54s., eSSS = 42m.19s.  
 Moscow ePKS = 22m.31s.  
 Upsala e = 23m.46s., eSKKS?N = 28m.14s.?, eE = 35m.14s., eSSSE = 44m.14s.?  
 Warsaw eSKPZ = 22m.59s., eSKPEN = 23m.3s., ePPPEZ = 25m.45s., ePPPN = 25m.54s., eSKSN = 26m.48s., ePKKS = 30m.59s., ePS = 32m.47s., eSSSEN = 45m.59s., and other unidentified e readings.  
 Copenhagen e = 22m.24s., 23m.3s., SSS = 45m.56s.  
 Aberdeen iE = 31m.50s.  
 Bucharest eE = 20m.5s., iE = 24m.35s.  
 Skalnate Pleso eE = 22m.49s., SKP = 23m.14s., eN = 27m.35s., eE = 27m.45s., e = 28m.14s. and 32m.22s., ePPS? = 34m.56s., e = 39m.38s., eSS = 41m.32s., eSSS = 46m.20s.  
 Potsdam iPPZ = 22m.41s., e = 23m.14s.  
 Collmberg eE = 46m.56s.  
 Prague ePKPE = 19m.44s., eSKP = 22m.43s., ePPP = 26m.1s., eSKSP? = 32m.14s., ePS? = 33m.26s., eSS = 41m.20s., eSSS = 46m.8s.  
 Helwan eZ = 22m.14s., 23m.14s., and 27m.20s.  
 Ogyalla eSKP = 23m.34s., e = 25m.41s., ePPP = 26m.8s., eN = 28m.55s., ePPS = 35m.44s.  
 Jena ePKPE = 19m.37s., eEN = 20m.17s., eN = 22m.17s.  
 Cheb ePKPE = 19m.40s., eSKPN = 23m.14s., e = 25m.44s., eSKKSN = 29m.27s., ePPS = 35m.39s., eSS = 41m.38s., eSSS = 47m.10s.  
 Kalossa eE = 18m.50s., eN = 20m.1s., eE = 21m.28s., eN = 23m.36s., eE = 23m.42s.  
 Rathfarnham Castle iZ = 20m.19s.  
 Kew eSKSPEN = 23m.3s., eSSEN = 41m.6s., eSSSEN = 47m.6s.  
 Stuttgart iZ = 19m.47s., eZ = 19m.58s., e = 20m.17s. and 20m.59s., ePP = 23m.0s., eSKP = 23m.20s., e = 29m.23s. and 30m.33s., eSS = 42m.14s., eSSS = 47m.14s., eQ = 63.2m.  
 Strasbourg ePPP = 26m.20s., eSKKS = 30m.3s., ePSKS = 32m.46s., ePPS = 35m.37s., eSS = 42m.40s., eSSS = 47m.8s., eQ = 62.2m., and many unidentified readings.  
 Trieste iPP = 23m.25s., eSKKS = 29m.37s., ePPS = 36m.29s., eSS = 42m.23s.  
 Basle e = 21m.24s.  
 Paris i = 20m.9s., 20m.38s., and 23m.57s., eSS = 43m.9s., e = 51m.36s.  
 Bologna ePP = 23m.23s.  
 Clermont-Ferrand i = 21m.9s., eSSS = 48m.47s.  
 Rome ePP = 23m.25s., e = 28m.21s., 32m.18s., and 43m.58s., SSS = 47m.48s.  
 Messina e = 21m.24s.  
 Alicante PP = 24m.17s., SKKS = 31m.11s., PPS = 37m.37s., SS = 44m.19s., SSP = 45m.5s., SSS = 50m.31s., Q = 65m.15s.  
 Algiers Univ. eZ = 21m.58s., ePPZ = 24m.22s.  
 Granada iPP = 24m.14s., PPP = 27m.37s., SKSP = 35m.1s., PPS = 38m.40s., iSS = 45m.40s., SSS = 53m.10s., Q = 65.0m.  
 Malaga iPPZ = 24m.28s., PPPZ = 28m.42s., SKKSZ = 33m.36s., QZ = 68m.8s.  
 Tamarrasset iPPZ = 25m.6s., eZ = 26m.23s. and 32m.9s., eSKSPZ = 35m.15s., eSSZ = 45m.34s.  
 Long waves were also recorded at Barcelona and Budapest.

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July 20d. 13h. 14m. 25s. Epicentre 16°·5S. 173°·0E. (as at 9h.).

	$\Delta$	Az.	P.	O - C.	S.	O - C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Wellington	24·7	177	e 5 22	- 2	i 10 39	SS	—	e 11·6
Christchurch	26·9	180	e 5 45	0	e 10 25	+ 5	e 4 40	? e 13·1
Lick	z. 81·5	47	e 12 23	+ 2	—	—	—	—
Pasadena	z. 82·5	51	i 12 27	+ 1	—	—	—	—
Shasta Dam	82·6	44	e 12 27	+ 1	—	—	—	—
Riverside	z. 83·1	51	e 12 29	0	—	—	—	—
Palomar	z. 83·2	53	i 12 30	+ 1	—	—	—	—
Haiwee	z. 83·6	50	e 12 33	+ 2	—	—	—	—
Tinemaha	z. 83·8	49	e 12 32	0	—	—	—	—
Boulder City	85·8	51	e 12 43	+ 1	—	—	—	—
Overton	z. 86·3	50	e 12 46	+ 1	—	—	—	—
College	86·4	16	e 12 44	- 1	e 23 16	{ + 1 }	—	e 41·6
Pierce Ferry	86·5	51	i 12 47	+ 1	—	—	—	—
Tucson	87·4	55	e 12 52	+ 2	—	—	—	—
Hungry Horse	91·3	40	e 13 7	- 2	—	—	—	—
Collmberg	z. 141·8	339	e 19 36	[ + 2 ]	—	—	—	—
Stuttgart	z. 145·2	341	e 19 41	[ + 1 ]	—	—	e 23 23	PP
Strasbourg	145·8	343	i 19 43 <sub>a</sub>	[ + 2 ]	—	—	—	—
Paris	146·9	350	i 19 49	[ + 7 ]	—	—	—	—
Besançon	147·5	344	e 19 49	[ + 6 ]	—	—	—	—
Clermont-Ferrand	149·6	347	e 19 54	[ + 7 ]	—	—	—	—

Additional readings :—

Lick eZ = 12m.32s.

Tucson e = 13m.10s.

Stuttgart eZ = 20m.8s.

Strasbourg e = 19m.53s., i = 20m.18s.

Besançon e = 19m.57s.

July 20d. 16h. 50m. 57s. Epicentre 8°·7N. 126°·8E. (as on 1945, December 20d.).

Rough.

A = -·5922, B = +·7916, C = +·1503 ;  $\delta$  = -8 ; h = +7 ;

D = +·801, E = +·599 ; G = -·090, H = +·120, K = -·989.

	$\Delta$	Az.	P.	O - C.	S.	O - C.	Supp.
	°	°	m. s.	s.	m. s.	s.	m. s.
Bandong	24·6	232	e 5 24	+ 1	e 9 36	- 6	—
Djakarta	24·8	234	e 5 21	- 4	e 9 30	-16	—
Vladivostok	34·6	7	e 6 56	+ 3	i 12 33	+11	—
Almata	55·4	318	e 9 36	- 2	—	—	—
Murgab	55·8	311	e 9 40	- 1	—	—	—
Frunse	56·8	316	e 9 46	- 2	—	—	—
Andijan	57·7	313	e 9 40	-15	e 17 36	-17	—
Fergana	58·0	313	e 9 46	-11	—	—	—
Stalinabad	59·8	310	i 10 8	- 1	e 18 12	- 8	—
Tashkent	60·1	313	e 10 2	- 9	—	—	—
Ashkabad	67·7	308	e 10 47	-14	—	—	—
Sverdlovsk	69·8	328	e 11 5	- 9	—	—	—
College	80·2	26	e 12 14	0	—	—	—
Moscow	82·4	325	e 12 16	- 9	—	—	—
Ksara	86·0	303	i 12 47	+ 4	—	—	e 20 59 ?

Long waves were recorded at Calcutta, Copenhagen, De Bilt, Kew, Strasbourg, and Potsdam.

July 20d. Readings also at 0h. (near Messina), 1h. (Obi-garm, Andijan, near Stalinabad, Istanbul, Sofia, Trieste, Rome, and near Taranto), 2h. (Chinchina and near Bogota), 3h. (Shasta Dam and Pierce Ferry), 4h. (Tamanrasset, Stuttgart, Istanbul, Sofia, Trieste, Rome, and near Taranto (2)), 5h. (near Hungry Horse), 8h. and 9h. (Mary, near Ashkabad, and Kizyl-Arvat), 10h. (College, Hungry Horse, Shasta Dam, Boulder City, Pierce Ferry, Tucson, Tamanrasset, and Bogota), 11h. (Hungry Horse, Pierce Ferry, Zugdidi, Grozny, near Tiflis, near Granada, near Djakarta, and Bandong), 12h. (Christchurch, Wellington, Stuttgart, Obi-garm, near Stalinabad, Andijan, and Murgab), 14h. (Collmberg, Jena, and Stuttgart), 16h. (Stuttgart and Ashkabad), 18h. (near Ottawa), 19h. (Hungry Horse, Fergana, Tashkent, Samarkand, near Obi-garm, Stalinabad, Andijan, and Murgab), 20h. (Santa Clara and near Ashkabad), 22h. (Lick).



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July 21d. 4h. 46m. 56s. Epicentre 39°·9S. 174°·2E. Depth of focus 0·025.  
(as on 1949, February 9d.).

A = -·7653, B = +·0777, C = -·6389;  $\delta = -9$ ;  $h = -2$ ;  
D = +·101, E = +·995; G = +·636, H = -·065, K = -·769.

		$\Delta$	Az.	P.	O-C.	S.	O-C.
		°	°	m. s.	s.	m. s.	s.
New Plymouth	E.	0·8	353	i 0 30	+ 2	0 51	+ 1
Wellington		1·5	163	0 36	+ 3	i 1 3	+ 4
Cobb River	E.	1·6	223	i 0 37	+ 3	i 1 4	+ 3
Arapuni		2·1	32	i 0 38	- 1	e 1 7	- 3
Tuai	N.	2·5	70	i 0 44	0	1 15	- 3
Auckland	N.	3·1	9	i 0 48	- 3	i 1 26	- 4
Kaimata	N.E.	3·4	218	e 0 51	- 4	i 1 31	- 6
Christchurch		3·8	198	i 1 3	+ 3	i 1 47	+ 1

July 21d. 7h. 18m. 56s. Epicentre 29°·3S. 178°·2W. (as on 1949, November 22d.).

A = -·8730, B = -·0274, C = -·4869;  $\delta = -5$ ;  $h = +2$ ;  
D = -·031, E = +1·000; G = +·487, H = +·015, K = -·873.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Auckland	N.	9·6	216	e 2 14	- 7	e 4 18	+ 6	—	—
Arapuni		10·1	208	e 2 33	+ 5	e 4 5	-20	—	—
Tuai	N.	10·2	200	e 2 20	-11	e 3 53	-34	—	—
New Plymouth	E.	11·7	211	e 3 15?	+24	e 5 3?	- 1	—	—
Wellington		13·3	203	2 45	-28	5 1	-41	—	—
Cobb River	E.	13·9	210	—	—	e 5 20	-37	—	—
Kaimata	N.E.	15·6	210	e 3 36	- 7	e 6 2	-35	—	—
Christchurch		16·0	207	—	—	6 5	?	—	e 8·1
Brisbane		25·4	267	i 4 33k	-58	e 9 21	-35	—	—
Pasadena		84·8	47	e 12 37	0	e 23 24	+19	—	—
Berkeley		84·9	42	i 12 39k	+ 1	e 22 50	-16	e 39 15	Q e 45·5
Lick	Z.	84·9	42	e 12 42a	+ 4	—	—	—	—
Palomar	Z.	85·2	48	i 12 40	+ 1	—	—	—	—
Riverside	Z.	85·3	47	i 12 39	- 1	—	—	—	—
Fresno	Z.	85·6	43	e 12 41a	0	—	—	—	—
Haiwee	Z.	86·3	45	e 12 46	+ 1	—	—	—	—
Tinemaha	Z.	86·7	44	e 12 47	0	—	—	—	—
Shasta Dam		86·7	39	e 12 46	- 1	—	—	—	—
Boulder City		88·1	46	e 12 54	0	—	—	—	—
Tucson		88·5	51	i 12 56	0	—	—	—	e 36·2
Overton	Z.	88·7	46	i 12 57	0	—	—	—	—
Pierce Ferry		88·7	47	i 12 57	0	—	—	e 30 30	PKKP
Seattle		91·6	35	—	—	e 23 14	?	e 23 39	SKS
Hungry Horse		96·3	37	e 13 34	+ 2	—	—	—	—
College		96·8	13	e 13 34	0	e 23 54	{-17}	—	e 45·6
Ottawa	Z.	118·6	51	e 18 47	{- 3}	—	—	—	—
Ksara		150·7	287	i 19 51	{+ 3}	—	—	—	—
Copenhagen		152·6	347	i 19 59	{+ 8}	—	—	—	—
Warsaw		153·0	334	19 51	{- 1}	e 23 30	SKP	—	e 87·1
Istanbul		154·9	306	e 19 47	{-50}	—	—	e 20 28	PKP <sub>2</sub>
Potsdam	Z.	155·5	345	e 19 54	{- 1}	e 20 24	PKP <sub>2</sub>	e 24 1	PP e 80·1
Collmberg	Z.	156·5	342	e 19 55	{- 1}	—	—	—	—
Prague		157·2	338	e 20 38	PKP <sub>2</sub>	—	—	—	—
Kew		157·8	3	e 19 56	{- 2}	—	—	—	e 76·1
Stuttgart		159·7	346	e 19 58	{- 2}	e 31 4	{- 6}	e 20 41	PKP <sub>2</sub> e 85·1
Strasbourg		160·2	348	e 20 0?	{- 1}	—	—	e 20 46?	PKP <sub>2</sub>
Besançon		161·8	351	e 20 2	{- 1}	—	—	e 20 51	PKP <sub>2</sub>
Clermont-Ferrand		163·5	354	e 20 4	{ 0}	—	—	—	87·1
Malaga	Z.	170·9	34	i 20 10k	{ 0}	—	—	i 21 34	PKP <sub>2</sub> 85·5
Algiers Univ.	Z.	172·4	352	e 20 6	{- 5}	—	—	e 21 36	PKP <sub>2</sub>
Tamanrasset	Z.	172·7	208	i 20 8a	{- 3}	e 32 18	{+ 1}	i 21 30	PKP <sub>2</sub>

For Notes see next page.

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NOTES TO JULY 21d. 7h. 18m. 56s.

Additional readings :—

Pasadena iZ = 13m.5s.  
 Lick iZ = 13m.2s.  
 Palomar eZ = 12n.59s.  
 Fresno eN = 13m.4s.  
 Tucson e = 13m.52s.  
 Copenhagen i = 20m.16s.  
 Warsaw eZ = 20m.8s., 20m.21s., 22m.40s., and 24m.49s.  
 Prague e = 21m.8s.  
 Stuttgart ePPZ = 24m.19s.  
 Malaga iPPZ = 25m.22s., PPPZ = 29m.28s.  
 Tamanrasset ePPZ = 25m.11s., ePPPZ = 29m.14s.  
 Long waves were also recorded at Harvard, Scoresby Sund, Granada, and Paris.

July 21d. 8h. 16m. 32s. Epicentre 8°·2S. 71°·0W. Depth of focus 0·100 (as on 9d.).

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 40	- 2	i 3 1	- 3	—	—
La Paz	8·7	162	i 2 7k	- 1	i 3 48	- 2	4 2	SS 4·7
Fogota	13·1	346	i 2 51	+ 2	e 5 49	SS	i 5 14	pP
Chinchina	13·9	340	i 2 56	- 1	—	—	i 5 20	pP
San Juan	26·9	10	e 7 44	P <sub>c</sub> P	i 8 43	- 5	—	e 11·9
Tacubaya	39·0	316	i 6 47	+13	—	—	—	—
Bermuda	40·8	9	—	—	i 12 15	0	—	—
Weston	50·3	1	i 7 58	- 2	—	—	—	—
Harvard	50·5	1	i 7 50	-12	—	—	i 11 2	sP
Ottawa	z. 53·5	357	e 8 22	- 1	—	—	—	—
Tucson	55·3	320	i 8 35	- 1	—	—	e 10 37	pP
Pierce Ferry	59·8	321	i 9 6	0	—	—	e 11 8	pP
Palomar	60·0	317	i 9 7	0	—	—	e 11 17	pP
Boulder City	60·2	320	i 9 9	+ 1	—	—	—	—
Overton	z. 60·3	321	i 9 10	+ 1	—	—	i 11 17	pP
Riverside	z. 60·8	317	i 9 11	- 1	—	—	e 11 15	pP
Pasadena	61·4	317	i 9 16k	0	—	—	i 11 21	pP
Haiwee	z. 62·4	319	i 9 22	0	—	—	—	—
Tinemaha	z. 63·1	319	i 9 27k	0	—	—	e 11 32	pP
Fresno	63·9	318	e 10 32a	+60	—	—	e 11 27	pP
Lick	z. 65·5	318	i 9 46k	+ 4	—	—	—	—
Berkeley	z. 66·2	318	i 9 46k	0	—	—	—	—
Hungry Horse	67·8	331	i 9 56	0	e 18 6	+ 2	e 40 28	SKP.P'
Shasta Dam	67·8	320	i 10 4	+ 8	—	—	e 12 3	pP
Seattle	71·7	327	i 10 19k	0	—	—	—	—
Victoria	z. 72·8	327	i 10 25k	0	—	—	—	—
Tamanrasset	z. 80·9	65	i 11 9a	+ 1	e 20 31	+ 7	i 13 22	pP
College	91·8	335	i 11 59	- 1	—	—	i 14 15	pP

Additional readings :—

Huancayo i = 1m.45s., e = 2m.9s., i = 2m.51s.  
 La Paz SSS = 4m.12s.  
 Ottawa e = 9m.16s.  
 Tucson iP<sub>c</sub>P = 9m.26s., esP = 11m.43s.  
 Pierce Ferry isP = 12m.14s.  
 Palomar isP?Z = 12m.14s.  
 Overton isPZ = 12m.18s.  
 Riverside iP<sub>c</sub>P?Z = 9m.46s., eZ = 12m.7s.  
 Pasadena eP<sub>c</sub>P?Z = 9m.48s.  
 Tinemaha iZ = 9m.57s., esP?Z = 12m.37s.  
 Lick iZ = 9m.51s., 9m.59s., and 10m.54s.  
 Berkeley eZ = 10m.4s.  
 Tamanrasset ePPZ = 14m.27s., epPPZ = 15m.23s., eSPZ = 21m.19s.

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July 21d. 20h. 32m. 0s. Epicentre 16°18. 168°3E. (as on 1949, June 23d.).

A = -0.9413, B = +0.1949, C = -0.2756;  $\delta = -1$ ;  $h = +6$ ;  
D = +0.203, E = +0.979; G = +0.270, H = -0.056, K = -0.961.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Brisbane	18.1	229	i 3 18k	-56	e 6 50	-45	—	—
Apia	19.4	86	i 4 29	-1	e 8 12	+ 8	e 4 53	PP e 9.5
Auckland	N. 21.5	166	i 4 51	-1	e 8 47	0	—	—
Arapuni	22.8	165	5 6	+ 1	e 9 19	+ 8	e 14 12	S <sub>c</sub> S
New Plymouth	E. 23.4	168	5 15	+ 4	—	—	—	—
Riverview	23.5	217	i 5 15a	+ 3	i 9 25	+ 2	i 5 25	pP
Tuai	N. 23.9	163	e 5 15	-1	e 9 31	+ 1	e 10 8	SS
Cobb River	E. 25.2	172	5 30	+ 1	e 9 47	- 5	—	—
Wellington	25.7	170	i 5 30	- 3	e 9 54	- 7	6 5	PP
Kaimata	N.E. 26.5	175	e 5 40	- 1	e 10 42?	+28	—	11.0
Christchurch	27.6	173	e 5 41	-10	10 29	- 3	i 6 27	PP e 11.6
Guam	37.5	320	7 23	+ 6	16 2	SSS	—	—
Honolulu	49.9	43	e 8 55	- 2	e 15 38	-29	e 18 49	SS e 20.3
Perth	50.0	242	11 50	PPP	16 14	+ 5	—	24.6
Bandong	60.0	272	e 10 9	- 2	e 18 19	- 4	—	—
Djakarta	60.9	272	e 10 18	+ 1	i 18 35	+ 1	—	—
Nanking	67.4	316	i 11 1	+ 2	i 19 43	-12	i 11 52	pP
Vladivostok	67.7	333	i 11 3	+ 2	i 20 6	+ 8	—	—
Ukiah	84.2	47	12 39	+ 5	e 23 9	+10	e 29 9	SS e 38.4
Berkeley	84.3	49	e 12 32	- 3	i 23 6	+ 6	i 15 58	PP e 47.2
Santa Clara	84.3	49	i 12 41	+ 6	i 23 18	+18	—	—
Lick	Z. 84.6	49	i 12 38a	+ 2	—	—	e 15 47	PP
Shasta Dam	85.5	46	i 12 39	- 2	e 23 17	+ 5	e 23 40	PS
Fresno	85.7	50	e 12 40k	- 2	—	—	e 15 24	PP
Pasadena	85.9	53	i 12 41a	- 2	i 23 12	- 4	e 16 3	PP e 35.1
Riverside	86.4	53	i 12 44	- 1	—	—	e 38 53	P'P'
Sitka	86.5	27	e 12 42	- 4	i 23 22	0	e 16 10	PP e 36.3
Palomar	86.6	55	i 12 45	- 1	e 23 6	-17	e 38 54	P'P'
Haiwee	86.8	51	i 12 48	+ 1	—	—	—	—
Tinemaha	86.9	50	i 12 47	- 1	e 23 35	+ 9	—	—
Calcutta	E. 87.1	295	e 12 50	+ 1	i 23 20	- 8	e 16 21	PP
College	87.3	17	e 12 46	- 4	e 23 18	-11	e 16 18	PP e 35.9
Irkutsk	87.6	326	12 50	- 1	23 37	+ 5	e 16 30	PP
Victoria	88.2	39	12 52	- 2	23 14	-24	16 23	PP
Seattle	88.5	39	i 12 58k	+ 2	i 23 51	+10	e 16 34	PP
Boulder City	89.1	52	e 12 57	- 1	e 23 32	-14	e 17 13	PP
Overton	Z. 89.6	52	i 13 0	- 1	—	—	i 16 30	PP
Pierce Ferry	89.8	52	i 13 0	- 2	e 23 37	[+ 5]	e 16 50	PP
Colombo	E. 90.4	277	13 5	+ 1	23 37	[+ 2]	—	45.3
Tucson	91.0	57	e 13 7	0	e 23 40	[+ 1]	e 16 42	PP e 36.9
Salt Lake City	92.9	48	e 13 14	- 2	e 24 29	+ 9	e 17 18	PP e 39.8
Kodaikanal	K. 93.6	280	e 17 6	PP	25 51	PS	26 29	PPS
Hungry Horse	93.9	41	i 13 19	- 2	e 23 41	[-14]	e 16 39	PP
Butte	N. 94.1	43	e 13 21	- 1	e 24 35	+ 4	e 16 59	PP e 40.3
Hyderabad	94.5	287	17 10	PP	23 57	[- 1]	30 49	SS 43.4
Bozeman	95.0	44	e 13 28	+ 2	e 24 8	[+ 7]	—	—
New Delhi	E. 98.5	297	—	—	i 24 19	[- 1]	25 16	S e 40.4
Poona	99.1	286	i 13 22	-22	i 25 13	0	i 24 25	SKS 46.7
Bombay	E. 100.1	286	e 16 34	?	i 24 28	[+ 1]	—	—
Przhevalsk	100.6	311	e 13 51	0	i 24 35	[+ 5]	—	—
Almata	101.8	312	e 14 1	+ 5	e 24 34	[- 2]	e 18 19	PP
Naryn	102.2	310	e 14 0	+ 2	—	—	e 18 12	PP
Murgab	103.2	306	e 18 24	PP	i 24 46	[+ 4]	—	—
Frunse	103.5	311	e 14 6	+ 2	e 24 47	[+ 3]	e 18 21	PP
Andijan	104.8	308	e 14 11	+ 1	i 24 50	[ 0]	i 18 30	PP
Fergana	105.1	308	e 14 12	+ 1	27 51	PS	e 18 34	PP
Kulyab	106.3	306	e 18 51	PP	e 25 3	[+ 7]	—	—
Obi-garm	106.5	307	e 14 22	+ 5	i 25 5?	[+ 8]	i 18 37	PP
Tashkent	107.1	309	i 14 23	P	e 25 36	[- 9]	i 18 51	PP
Stalinabad	107.2	307	e 14 18	P	i 25 4	[+ 4]	e 18 48	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.
Milton	110.5	62	i 19 16	PP	—	—	—	—
Chicago	111.0	50	e 18 21	[-14]	e 26 28	{+16}	e 19 14	PP e 56.1
Huancayo	111.1	110	e 19 15	PP	—	—	i 19 19	PP
Swan Island	111.2	76	i 19 11	PP	—	—	—	—
La Plata	E. 112.9	140	19 25	PP	28 54	PS	35 17	SS 48.7
Sverdlovsk	113.0	325	e 14 52	P	25 38	{+14}	—	—
Cincinnati	113.2	53	e 14 45	P	i 27 25	S	i 19 30	PP
Cleveland	115.5	52	i 19 48 <sub>a</sub>	PP	e 26 53	{+9}	i 29 31	PS
La Paz	115.6	118	15 1	P	25 40	{+6}	i 18 50	PKP 54.0
Miami	115.8	67	i 19 51	PP	—	—	—	—
Chinchina	116.4	92	i 19 3	{+17}	i 25 38	{+1}	i 29 44	PS
Pittsburgh	116.7	52	i 21 14	?	i 29 55	PS	—	—
Bogota	117.8	93	e 20 11	PP	e 29 50	PS	—	—
Galerazamba	118.1	86	e 18 58	{+9}	e 29 59	PS	e 20 23	PP
Pennsylvania	E. 118.3	51	i 19 24	{+35}	i 27 16	{+14}	i 20 23	PP
Grahamstown	118.8	217	e 18 51	[0]	—	—	—	—
Ottawa	118.8	46	e 18 50	[-1]	25 56	{+10}	20 14	PP 53.5
Washington	119.0	53	i 20 11	PP	—	—	—	e 65.5
Guantanamo Bay	119.9	75	i 20 18	PP	—	—	—	—
Philadelphia	120.4	52	i 20 20	PP	e 25 58	{+7}	e 30 5	PS e 49.0
Fordham	121.3	51	e 18 58	{+3}	i 28 32	S	i 20 34	PP
Baku	121.8	308	e 19 1	{+5}	—	—	e 20 35	PP
Seven Falls	E. 122.6	43	19 4	{+6}	30 24	PS	20 36	PP 59.0
Harvard	122.9	49	e 20 33	PP	—	—	—	e 58.0
Weston	123.0	49	e 18 58	[0]	e 37 28	SS	i 20 34	PP
Pretoria	Z. 123.1	224	i 18 58	[-1]	i 28 51	PS	—	—
Grozny	124.5	312	19 4	{+3}	e 27 40	{-4}	—	—
Scoresby Sund	125.3	4	i 19 4	{+1}	37 53	SS	i 20 51	PP 62.0
Tiflis	125.5	310	i 19 5	{+2}	e 23 31	PPP	e 21 8	PP
Moscow	125.6	328	19 5	{+1}	26 11	{+3}	20 52	PP
Gori	125.9	311	e 19 18	{+14}	—	—	—	—
Pulkovo	126.8	335	e 19 8	{+2}	i 22 24	PKS	e 21 6	PP
Abastumanj	126.9	311	e 19 26	{+20}	—	—	—	—
Zugdidi	127.4	312	e 19 14	{+7}	—	—	—	—
Ivigtut	128.0	21	22 29	PKS	26 52	{+37}	—	70.0
Halifax	128.1	45	e 22 32	PKS	—	—	—	66.0
San Juan	128.1	78	e 19 6	[-2]	i 22 29	PKS	e 21 11	PP e 52.0
Helsinki	128.6	338	e 19 0	[-9]	e 28 7	{-4}	e 21 26	PP 61.0
Sotchi	128.7	313	e 19 24	{+15}	—	—	e 21 24	PP
Bermuda	129.4	60	e 19 15	{+4}	e 26 0	[-18]	e 21 25	PP e 52.0
Upsala	131.4	341	e 21 27	PP	e 22 36	PKS	e 24 22	PPP e 57.0
Fort de France	132.4	85	e 21 6	PP	—	—	—	—
Ksara	133.8	301	i 19 22 <sub>k</sub>	{+3}	i 22 57	PKS	i 22 5	PP
Bergen	134.1	348	e 22 20	PP	e 23 52?	?	—	—
Warsaw	135.6	331	e 19 26 <sub>a</sub>	{+4}	e 26 30	[-2]	22 57	PKS e 66.0
Lwow	135.7	327	e 19 29	{+6}	—	—	—	—
Copenhagen	136.4	341	i 19 27	{+3}	40 24	SS	23 3	PKS 58.0
Istanbul	137.0	314	i 19 34	{+9}	26 34	[0]	—	—
Bucharest	137.4	320	e 19 21	[-5]	i 23 6	PKS	i 22 15	PP
Skalmate Pleso	138.0	329	e 19 31	{+4}	e 26 24	[-12]	e 23 5	PKS
Helwan	138.3	297	i 19 29 <sub>a</sub>	{+2}	e 29 45	{+34}	22 20	PP
Aberdeen	138.4	352	e 19 35	{+7}	i 27 6	{+29}	i 22 48	PP e 78.8
Potsdam	138.8	337	e 19 18	[-10]	e 26 36	[-1]	e 23 6	PKS e 67.0
Timisoara	139.6	324	20 0?	{+30}	24 0?	PKS	—	—
Budapest	N. 139.7	327	e 22 36	PP	e 29 31	{+12}	e 41 40	SS e 70.5
Collnberg	139.7	335	e 19 35	{+5}	e 41 0	SS	e 22 31	PP e 69.0
Edinburgh	E. 139.7	352	e 19 36	{+6}	—	—	e 22 48	PP
Ogyalla	139.9	328	e 19 35	{+5}	e 29 0	{-20}	e 22 24	PP
Sofia	140.0	319	e 21 25	?	—	—	—	—
Prague	140.1	334	e 19 29	[-2]	e 26 36	[-3]	e 22 25	PP
Kalossa	N. 140.4	327	e 19 38	{+7}	e 25 30	PPP	e 22 21	PP
Jena	140.5	336	e 19 26?	[-5]	e 23 9	PKS	e 22 24	PP
Durham	140.6	350	e 18 16	?	—	—	e 23 12	PKS
Cheb	140.9	335	e 19 32	[0]	e 23 11	PKS	e 22 12	PP e 62.5
De Bilt	141.7	343	i 19 29	[-4]	e 23 15	PKS	e 22 19	PP e 69.0

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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	142.6	354	i 19 38	[+ 3]	e 41 17	SS	e 23 21	PP e 63.0
Stuttgart	143.2	337	e 19 32 <sub>a</sub>	[- 4]	e 23 14	PKS	e 22 59	PP 72.0
Karlsruhe	143.3	338	e 19 36	[0]	—	—	—	—
Kew	143.6	348	i 19 35 <sub>k</sub>	[- 2]	e 41 36	SS	e 20 8	PKP <sub>2</sub> e 61.0
Triest	143.6	330	i 19 35	[- 2]	i 29 16	{ -26}	i 20 31	PKP <sub>2</sub> —
Strasbourg	143.9	339	e 19 35 <sub>k</sub>	[- 2]	e 29 44	{ 0}	e 22 48	PP e 70.0
Chur	144.6	335	e 19 37	[- 1]	—	—	—	—
Zürich	144.6	336	e 19 28 <sub>a</sub>	[-10]	—	—	e 22 50	PP —
Basle	144.8	337	e 19 38	[- 1]	—	—	e 22 57	PP —
Taranto	145.1	320	19 28	[-11]	26 35	[-12]	29 45	SKKS —
Paris	145.4	334	e 19 39 <sub>k</sub>	[- 1]	i 26 32	[-16]	i 22 58	PP e 61.0
Neuchatel	145.5	337	e 19 41	[+ 1]	—	—	—	—
Bologna	145.6	330	i 19 45 <sub>k</sub>	[+ 5]	e 27 0	[+12]	e 42 0	SS —
Besançon	145.7	338	i 19 41	[+ 1]	—	—	e 22 56	PP —
Pavia	146.1	334	i 19 43	[+ 2]	—	—	e 20 25	PKP <sub>2</sub> —
Florence Arc.	146.2	329	i 19 40	[- 1]	e 26 53	[+ 4]	i 20 15	PKP <sub>2</sub> —
Rome	146.9	325	i 19 40	[- 2]	26 44	[- 6]	29 48	SKKS —
Messina	147.5	320	e 19 0 <sub>?</sub>	[-43]	—	—	—	—
Clermont-Ferrand	147.9	341	e 19 48	[+ 4]	e 23 18	PKS	e 23 28	PP 70.0
Barcelona	152.1	338	e 20 31	PKP <sub>2</sub>	—	—	—	e 95.0
Tortosa	153.2	339	19 50	[- 2]	—	—	—	e 70.0
Toledo	155.4	346	e 19 58	[+ 3]	26 55	[- 5]	e 24 0	PP 81.5
Algiers Univ.	z. 155.6	330	e 19 56	[+ 1]	—	—	e 20 35	PKP <sub>2</sub> —
Alicante	155.7	339	e 20 4	[+ 9]	26 44	[-16]	20 58	PKP <sub>2</sub> e 71.9
Lisbon	157.4	355	20 1 <sub>k</sub>	[+ 3]	37 11	PPS	20 33	PKP <sub>2</sub> 73.7
Granada	157.8	343	i 20 0 <sub>a</sub>	[+ 2]	31 24	{+23}	20 35	PKP <sub>2</sub> i 76.2
Malaga	z. 158.5	344	i 20 4 <sub>a</sub>	[+ 5]	—	—	i 20 38	PKP <sub>2</sub> 77.1
Tamanrasset	z. 162.5	296	e 20 4	[+ 1]	—	—	i 20 55	PKP <sub>2</sub> —

Additional readings :—

Riverview iZ = 5m.34s., iE = 6m.0s., 8m.54s., and 9m.32s., iNZ = 9m.36s.

Christchurch iP = 5m.48s., iNZ = 6m.12s., iPPP?Z = 6m.42s., eP<sub>c</sub>PNZ = 9m.0s., eE = 10m.5s.

Honolulu e = 9m.31s.

Nanking iZ = 11m.35s., iSPZ = 12m.13s., iZ = 12m.53s., iPP?Z = 13m.35s., iSS?EN = 21m.3s.

Berkeley e = 12m.48s., eE = 26m.50s., eQE = 35m.8s.

Lick iZ = 12m.43s. and 12m.52s.

Shasta Dam ePKP, PKP = 38m.53s.

Fresno iZ = 12m.53s., eN = 13m.30s. and 19m.50s.

Pasadena eEZ = 24m.17s., eSS?E = 28m.39s.

Sitka iP = 12m.45s., ePPP = 18m.22s., eSS = 28m.56s.

Palomar iZ = 39m.9s.

Calcutta SSE = 30m.15s.

College e = 13m.50s., ePS = 24m.8s., eSS = 28m.50s., ePKP, PKP = 38m.45s.

Irkutsk SKS = 23m.20s., PS = 24m.39s.?, SS = 29m.29s.

Victoria i = 12m.57s., e = 23m.43s., PS = 24m.50s.

Seattle i = 13m.8s. and 13m.18s., e = 14m.7s., 24m.7s., and 24m.27s., ePS = 24m.53s., ePPS = 25m.10s., e = 27m.10s., eSS = 29m.38s., ePKKP = 30m.36s., ePKKS = 34m.12s., e = 36m.0s. and 39m.50s.

Boulder City ePKKP = 30m.37s., ePKP, PKP = 38m.44s.

Overton iZ = 13m.28s., ePKKPZ = 30m.37s., ePKP, PKPZ = 38m.42s.

Pierce Ferry ePKKP = 30m.35s., ePKP, PKP = 38m.41s.

Tucson i = 13m.17s. and 14m.1s., eSP = 24m.34s., eSS = 30m.15s., eSSS = 33m.34s., ePKP, PKP = 38m.42s.

Salt Lake City eSKS = 23m.54s.

Kodaikanal SSPE = 31m.0s.

Hungry Horse ePKKP = 30m.13s., ePKP, PKP = 38m.26s.

New Delhi PSE = 26m.40s., PPSE = 27m.26s., SSE = 32m.0s., SSSE = 35m.38s.

Poona iN = 14m.16s.

Bombay iN = 24m.39s.

Obi-garm iPPP = 20m.56s., iPKS = 21m.53s.

Tashkent ePS = 27m.56s., iSS = 33m.41s.

Stalinabad PS = 28m.14s.

Chicago ePS = 28m.42s., eSS = 33m.56s., eSSS = 38m.38s.

La Plata E = 32m.48s.

Cincinnati iPS = 29m.17s.

Cleveland iSN = 27m.45s.

La Paz iZ = 19m.47s., iPPZ = 20m.4s., iPS = 29m.33s., iPPS = 30m.40s., iSS = 36m.7s., SSS = 40m.30s.

Pennsylvania iE = 20m.46s. and 22m.20s., iN = 28m.11s. and 29m.45s., iE = 29m.57s.

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Ottawa S = 27m.41s., e = 28m.14s., PS = 29m.50s., e = 32m.14s., SS = 36m.36s.  
Philadelphia IPS = 30m.12s., eSS = 36m.24s., i = 37m.0s.,  
Fordham IPS? = 30m.7s.  
Scoresby Sund 23m.6s., 32m.12s., i = 36m.5s., SSS = 40m.42s.  
Moscow SKKS = 27m.54s., ePS = 30m.56s., SS = 37m.59s., eSSS = 42m.36s.  
San Juan eSS = 38m.28s.  
Helsinki eSKP = 22m.31s., eN = 31m.27s., ePSKS = 32m.26s.  
Bermuda i = 22m.38s., ePPS = 33m.0s., eSS = 39m.0s.  
Upsala ePPE = 21m.35s., iPKS = 22m.40s., eN = 23m.13s. and 29m.16s., eE = 29m.30s.,  
eN = 34m.0s.?, eE = 34m.18s., eSSSN = 44m.0s.?.  
Warsaw eZ = 19m.47s., PPZ = 22m.6s., ePPPEN = 24m.56s., PPPZ = 25m.14s., iPPPP?Z =  
27m.16s., eSKKS = 28m.34s., e = 29m.38s. and 30m.18s., SKSP = 31m.53s., PS =  
32m.22s., iPPSZ = 33m.43s., iScSPKP?Z = 35m.0s., eSS = 39m.28s., eSSS = 44m.34s.  
Copenhagen 23m.13s., SSS = 45m.0s.  
Bucharest eE = 19m.29s., iS?E = 23m.9s., iE = 24m.45s.  
Skalnate Pleso e = 22m.25s., 25m.5s., 27m.53s., 28m.32s., 30m.21s., 31m.6s., and 32m.9s.,  
eSKSPN = 32m.51s., e = 34m.6s., ePPS?E = 34m.30s., eSS = 40m.24s., eSSS =  
45m.48s.  
Helwan eZ = 24m.12s., eN = 25m.2s.  
Aberdeen eEN = 19m.43s., iN = 23m.8s., iSSE = 40m.43s., eE = 64m.53s.  
Potsdam eZ = 19m.21s., iPKPZ = 19m.31s.k, iPPZ = 22m.25s., iPPPZ = 25m.33s.,  
eSKKSN = 29m.18s., iSSZ = 40m.36s.  
Budapest eN = 26m.0s.?, 32m.0s.?, and 36m.0s.?.  
Collmberg eZ = 19m.45s., eEN = 23m.0s., eZ = 31m.8s., eN = 32m.0s.  
Ogyalla e = 20m.31s., eSKP = 23m.14s., e = 23m.50s. and 32m.9s., eSS = 40m.24s.,  
e = 44m.24s.  
Prague ePKPE = 19m.42s., e = 19m.46s. and 21m.24s., eSKP = 23m.4s., ePPP = 25m.30s.,  
eSKKS? = 28m.48s., eSKSP = 32m.30s., ePS = 33m.24s., ePPS = 34m.36s., eSS =  
41m.0s., eSSS = 46m.12s.  
Kalossa eE = 20m.52s., 22m.25s., and 22m.50s.  
Jena eEN = 19m.44s. and 22m.15s., ePP?N = 22m.31s., eN = 25m.40s., 27m.3s. and  
30m.19s., eE = 31m.9s.?, eN = 31m.19s. and 34m.39s., eE = 37m.10s., and 38m.23s.  
Cheb ePPP = 25m.32s., eSKKS? = 28m.48s., ePPS = 34m.59s., e = 49m.30s.  
De Bilt eSS = 41m.12s.  
Stuttgart iPKP<sub>2</sub> = 19m.35s., e = 19m.42s. and 20m.10s., epPKP?Z = 20m.33s., e =  
21m.4s., 21m.56s., and 24m.36s., ePPP = 26m.0s., ePS = 34m.0s., eSS = 41m.12s.,  
e = 43m.6s., eQ = 70.0m.  
Kew ePPEN = 23m.18s., ePSEN = 43m.12s., eSSSEN = 47m.12s.  
Triest iSPKP? = 20m.49s., iPP = 22m.51s., iPP? = 23m.50s., iPSKS = 32m.56s., eSS =  
41m.43s.  
Strasbourg i = 20m.4s., e = 21m.22s., i = 22m.0s. and 22m.9s., e = 24m.33s., ePPP =  
26m.12s., e = 27m.23s., 29m.20s., and 41m.0s., eSS = 41m.40s. and 41m.47s., e =  
43m.6s., 43m.21s., 48m.17s., and 63m.0s.  
Basle e = 17m.21s.  
Taranto e = 21m.35s., 40m.5s., and 46m.15s.  
Paris i = 20m.4s., 20m.47s., 21m.10s., 22m.22s., iPKS = 23m.10s., iPPP? = 25m.40s.,  
iSKKS = 29m.45s., i = 30m.31s., iPcP,PKP = 31m.10s., e = 32m.7s., iPKKS =  
32m.22s., ePPS = 35m.32s., eSS = 41m.46s., eSSP = 42m.12s.  
Bologna e = 22m.30s. and 26m.17s.  
Besançon i = 19m.50s., e = 20m.18s.  
Rome i = 21m.46s., SS = 42m.2s., SSS = 47m.46s.  
Clermont-Ferrand i = 19m.52s. and 20m.1s.  
Toledo iPKP<sub>2</sub>Z = 20m.24s., SKSP?N = 34m.30s., eN = 51m.30s.  
Algiers Univ. iZ = 20m.4s., eZ = 20m.52s. and 21m.46s., ePPZ = 24m.4s., ePPPZ =  
27m.34s.  
Alicante PP = 24m.6s., SKSP = 34m.16s., SS = 49m.30s., SSS = 51m.34s., Q = 64m.14s.  
Lisbon PPNZ = 24m.12s.  
Granada iPP = 24m.12s., pPP = 24m.54s., PPP = 28m.0s., SKSP = 35m.32s., PPS =  
39m.21s., iSS = 44m.0s., SSS = 49m.39s.  
Malaga iPPZ = 24m.22s., PPPZ = 28m.12s., QZ = 67m.4s.  
Tamanrasset iPPZ = 24m.40s., ePPPZ = 28m.31s., ePPPZ( $\Delta > 180^\circ$ ) = 32m.12s.  
Long waves were also recorded at Tananarive.

July 21d. Readings also at 2h. (Collmberg and Granada (2)), 3h. (College), 5h. (near Andijan), 6h. (Mount Wilson, Palomar, Riverside, Tucson, Boulder City, Overton, Pierce Ferry, Berkeley, Lick, Shasta Dam, and near Obi-garm), 7h. (Hungry Horse and near Yalta), 8h. (Murgab, near Piatigorsk, near Obi-garm, and near Kulyab), 9h. (Almata, Kulyab, Mary, Przhevalsk, near Andijan, Fergana, Frunse, Murgab, Obi-garm, Stalinabad, and Tashkent), 12h. (near Yalta), 13h. (Pierce Ferry, Hungry Horse, and near College), 14h. (Pennsylvania, near Yalta and near Mizusawa), 15h. (Overton, Hungry Horse, and College), 16h. (College and Stuttgart), 17h. (Santa Clara and Victoria), 18h. (Santa Clara and near Ottawa (2)), 20h. (Kulyab, Samarkand, near Murgab, Stalinabad, and near Mizusawa), 21h. (Mount Wilson, Palomar, Riverside, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Berkeley, Lick (2), Shasta Dam, Hungry Horse, College, Besançon, Paris, and near Mizusawa).

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July 22d. 23h. 7m. 58s. Epicentre 13°·3S. 167°·0E. (as on 1948, November 21d.).

A = -·9486, B = +·2190, C = -·2285;  $\delta = +2$ ;  $h = +6$ ;  
D = +·225, E = +·974; G = +·223, H = -·051, K = -·974.

	$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.	
	°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.	
Brisbane	19·2	221	i 4	31k	+ 3	i 8	5	+ 6	i 4	58	PP	e 9·2
Apia	20·7	93	4	49	+ 5	e 8	43	+12	—	—	—	—
Auckland	24·5	166	e 5	41	+19	e 9	49	+ 9	—	—	—	—
Riverview	25·0	213	i 5	26a	- 1	i 9	47	- 2	i 6	2	PP	—
Wellington	28·7	168	e 6	52	+51	11	42	SS	—	—	—	e 14·0
Christchurch	30·5	171	—	—	—	e 11	20	+ 2	—	—	—	e 13·7
Bandong	58·7	271	e 9	55	- 7	e 17	56	-10	—	—	—	—
Djakarta	59·6	271	e 10	5	- 3	e 18	12	- 5	—	—	—	—
Nanking	64·5	316	i 10	40	- 1	i 19	16	- 3	i 11	49	pP	—
Vladivostok	64·7	333	i 10	42	0	i 19	20	- 2	—	—	—	—
Berkeley	83·4	49	e 12	32	+ 2	e 22	49	- 2	e 23	57	PS	e 38·1
Santa Clara	83·5	51	e 13	6	+35	e 23	32	PS	—	—	—	e 38·8
Lick	83·7	49	i 12	32k	0	—	—	—	e 15	48	PP	—
Shasta Dam	84·4	47	e 12	37	+ 1	—	—	—	e 16	7	PP	—
Irkutsk	84·6	327	12	36	0	e 22	56	- 7	—	—	—	—
Sitka	84·7	28	—	—	—	e 22	56	- 8	—	—	—	e 41·8
Fresno	84·9	50	e 12	38a	0	—	—	—	e 15	24	PP	—
College	85·0	18	i 12	37	- 1	e 22	44	[-17]	e 28	38	SS	e 35·8
Pasadena	85·2	54	e 12	39	0	e 24	25	PS	—	—	—	e 38·0
Riverside	85·8	54	i 12	45	+ 3	—	—	—	—	—	—	—
Palomar	86·0	56	e 12	44	+ 1	—	—	—	—	—	—	—
Tinemaha	86·1	51	i 12	47	+ 3	—	—	—	—	—	—	—
Victoria	86·8	40	e 12	45	- 2	—	—	—	—	—	—	41·0
Seattle	87·2	41	i 12	53	+ 4	e 23	34	+ 6	—	—	—	e 39·0
Boulder City	88·4	53	e 12	56	+ 1	—	—	—	—	—	—	—
Overton	88·8	53	e 12	56	- 1	—	—	—	—	—	—	—
Pierce Ferry	89·1	53	i 12	59	+ 1	—	—	—	—	—	—	—
Tucson	90·5	57	e 13	8	+ 3	e 24	5	+ 6	e 17	8	PP	e 41·0
Hungry Horse	92·6	41	e 13	15	0	e 30	6	PKKP	e 38	31	P'P'	—
Almata	99·0	313	e 13	42	- 2	—	—	—	—	—	—	—
Murgab	100·5	307	e 13	54	+ 3	e 25	22	- 3	18	4	PP	—
Frunse	100·7	311	e 17	58	PP	e 24	52	[- 7]	—	—	—	—
Andijan	102·0	310	e 13	56	- 1	24	33	[- 4]	18	10	PP	—
Fergana	102·4	310	18	7	PP	—	—	—	—	—	—	—
Kulyab	103·7	306	e 14	9	+ 4	e 24	45	[ 0]	e 18	21	PP	—
Obi-garm	103·8	307	e 18	22	PP	e 27	45	PS	e 32	38	SS	—
Stalinabad	104·5	307	e 14	10	+ 2	e 24	46	[- 2]	i 18	26	PP	—
Sverdlovsk	110·0	326	e 14	32	P	e 28	28	PS	e 19	7	PP	—
Chicago	110·2	49	e 28	30	PS	—	—	—	—	—	—	e 46·5
Cleveland	E. 114·7	50	e 19	43	PP	e 25	32	[+ 1]	e 29	46	PS	—
Ottawa	118·5	45	18	50	[ 0]	—	—	—	29	7	PKKP	—
Baku	119·1	310	e 20	12	PP	—	—	—	—	—	—	—
Philadelphia	119·7	51	e 30	17	PS	—	—	—	—	—	—	e 56·2
Shemakla	120·0	309	i 18	56	[+ 3]	—	—	—	i 20	33	PP	—
Grozny	121·7	313	e 20	26	PP	—	—	—	—	—	—	—
Weston	122·2	48	e 18	57	[ 0]	—	—	—	—	—	—	—
Moscow	122·6	328	e 18	56	[- 2]	—	—	—	20	32	PP	—
Scoresby Sund	122·6	3	20	26	PP	30	32	PS	36	14	SS	57·0
Tiflis	122·9	311	i 18	57	[- 1]	e 30	27	PS	e 20	37	PP	—
Gori	123·1	312	e 19	0	[+ 1]	—	—	—	—	—	—	—
Pretoria	z. 124·2	227	i 19	0	[- 1]	—	—	—	e 20	44	PP	—
Zugdidi	124·6	313	e 19	4	[+ 2]	—	—	—	—	—	—	—
Upsala	128·3	341	e 22	2?	?	e 22	25	PKS	e 38	2?	SS	e 69·0
Yalta	129·3	317	e 19	11	[ 0]	e 22	33	PKS	e 21	19	PP	—
Ksara	131·3	303	19	16	[+ 1]	22	36	PKS	i 21	36	PP	—
Warsaw	132·6	333	i 19	17	[ 0]	e 26	33	[+ 7]	e 21	40	PP	e 72·0
Copenhagen	133·3	341	e 19	17	[- 1]	i 22	52	PKS	21	46	PP	64·0
Istanbul	134·1	315	e 19	29	[+ 9]	—	—	—	—	—	—	70·0
Bucharest	134·5	321	e 20	32	?	i 22	52	PKS	e 21	56	PP	—
Potsdam	z. 135·8	338	i 19	23k	[ 0]	—	—	—	i 22	3	PP	e 70·0

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.	
Collmberg	136.6	337	e 19	16?	[- 8]	e 22	54	PKS	e 22	6	PP	e 79.0
Timisoara	136.6	325	e 22	2?	PP	—	—	—	—	—	—	—
Prague	137.0	334	e 19	15	[-10]	e 23	6	PKS	e 22	8	PP	—
Jena	E. 137.5	336	e 19	27	[+ 1]	—	—	—	e 22	9	PP	—
De Bilt	138.6	343	i 19	28	[ 0]	e 40	2?	SS	i 22	20	PP	e 68.0
Stuttgart	140.1	338	e 19	24	[- 7]	e 22	54	PKS	e 22	25	PP	73.0
Kew	140.6	348	e 22	22	PP	—	—	—	e 22	54	PKS	e 67.0
Triest	140.6	330	e 22	2?	PP	—	—	—	—	—	—	—
Strasbourg	140.9	338	e 19	28k	[- 4]	e 23	56	PKS	e 22	32	PP	e 70.0
Zürich	141.5	337	e 19	27	[- 6]	—	—	—	—	—	—	—
Taranto	142.1	322	22	39	PP	—	—	—	—	—	—	—
Paris	142.3	344	e 19	30k	[- 5]	e 23	2	PKS	i 22	43	PP	e 69.0
Besançon	142.6	339	e 19	31	[- 4]	—	—	—	e 22	43	PP	—
Bologna	142.6	331	e 19	48	[+13]	—	—	—	e 23	31	PKS	—
Florence Arc.	143.2	330	e 19	29	[- 7]	—	—	—	e 23	8	PKS	—
Prato	143.2	330	e 19	34	[- 2]	—	—	—	—	—	—	—
Messina	144.5	320	e 19	36	[- 2]	—	—	—	e 22	30	PP	—
Rome	144.9	326	i 19	32 <sub>a</sub>	[- 7]	40	59	SS	e 22	29	PP	—
Clermont-Ferrand	144.9	340	e 19	40	[+ 1]	—	—	—	e 23	2	PP	—
Tortosa	150.1	338	19	54	[+ 6]	—	—	—	—	—	—	e 79.0
Toledo	z. 152.4	345	e 19	52	[+ 1]	—	—	—	e 23	42	PP	—
Algiers Univ.	z. 152.6	331	e 19	53	[+ 2]	e 20	11	PKP <sub>2</sub>	e 23	41	PP	—
Alicante	152.7	338	e 20	3	[+12]	26	19	[-38]	23	47	PP	e 68.4
Granada	154.8	343	i 19	53 <sub>a</sub>	[- 1]	30	12	[-33]	20	30	PKP <sub>2</sub>	i 82.4
Malaga	z. 155.4	343	i 19	58k	[+ 3]	—	—	—	i 24	33	PP	77.4
Tamanrasset	z. 160.0	302	i 20	2 <sub>a</sub>	[+ 1]	i 20	42	PKP <sub>2</sub>	i 24	27	PP	92.4

Additional readings :—

Brisbane iEN = 4m.43s., iZ = 4m.46s.  
 Nanking i = 10m.54s., iPP?Z = 13m.14s.  
 Berkeley iZ = 12m.37s., eE = 24m.3s. and 26m.30s., eN = 29m.47s.  
 Lick iZ = 12m.50s.  
 Fresno eN = 12m.56s. and 13m.44s., eZ = 17m.34s. and 18m.48s.  
 College i = 13m.7s., eSS = 31m.52s.  
 Pasadena iZ = 13m.1s. and 13m.43s.  
 Palomar iZ = 12m.59s. and 13m.4s.  
 Victoria e = 14m.44s.  
 Seattle e = 13m.40s., 13m.58s., 24m.16s., 25m.0s., and 25m.59s.  
 Tucson i = 13m.39s., eSKS = 23m.45s., ePS = 25m.2s.  
 Murgab SKS = 24m.37s.  
 Andijan ePS = 27m.14s., SS = 32m.38s.  
 Stalinabad PS = 27m.41s.  
 Cleveland eE = 25m.53s., ePPSE = 31m.3s.  
 Yalta ePS = 31m.27s.  
 Warsaw eZ = 22m.16s., eSKPZ = 22m.43s., eSKPEN = 22m.48s., eEN = 23m.17s.,  
 ePPPZ = 24m.36s., eE = 25m.38s., eSKKSZ = 28m.21s.  
 Bucharest eE = 22m.31s.  
 Potsdam iZ = 22m.28s.  
 Collmberg eZ = 19m.22s. and 19m.27s.  
 Prague e = 19m.27s. and 20m.56s., ePPP = 24m.52s.  
 Stuttgart ePKPZ = 19m.30s., ePSKS = 32m.21s., e = 35m.50s., eQ = 71.0m.  
 Strasbourg ePKP = 19m.32s., e = 20m.37s., 22m.30s., and 24m.35s.  
 Paris i = 19m.42s., ePPP = 25m.58s., e = 37m.54s.  
 Messina e = 21m.4s.  
 Rome i = 21m.7s., iN = 23m.39s.  
 Toledo iZ = 19m.59s., 20m.9s., and 20m.28s.  
 Algiers Univ. iZ = 20m.0s., eZ = 24m.1s.  
 Alicante PKP<sub>2</sub> = 20m.27s.  
 Granada PP = 23m.56s., PPP = 27m.8s., SS = 42m.56s.  
 Malaga iPPPZ = 28m.35s.  
 Tamanrasset eZ = 24m.20s., ePPPZ = 28m.5s.  
 Long waves were also recorded at Aberdeen, Ivigtut, La Paz, Bermuda, and other American stations.

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July 22d. Readings also at 1h. (Mount Wilson, Riverside, Tinemaha, Overton, Pierce Ferry, Lick, Shasta Dam, College, Andijan, and near Murgab), 3h. (Huancayo), 6h. (Overton and near Shasta Dam), 7h. (College and Tamanrasset), 8h. (College and near Andijan (2)), 11h. (near Apia), 12h. (Haiwee, Palomar, Pasadena, Riverside, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Lick, Shasta Dam, Boulder City, Overton, Pierce Ferry, Lick, Shasta Dam, Hungry Horse, College, Tamanrasset, La Paz, Bermuda, and near San Juan), 13h. (near Andijan), 14h. (near La Paz), 17h. (Pierce Ferry, Shasta Dam, Hungry Horse, and College), 18h. (Tamanrasset), 19h. (Ottawa and Seattle), 21h. (near Seattle and near Mizusawa), 22h. (Ksara, Tamanrasset (2), and near Bogota), 23h. (Fergana, near Andijan, Kulyab, Obi-garm, Samarkand, and Stalinabad).

July 23d. 15h. 50m. 23s. Epicentre 13°·3S. 167°·0E. (as on 22d.).

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Brisbane		19·2	221	i 4 29k	+ 1	i 8 7	+ 8	—	—
Apia		20·7	93	e 4 47	+ 3	—	—	—	—
Auckland	N.	24·5	166	e 5 27	+ 5	—	—	—	—
Riverview		25·0	213	—	—	i 9 52	+ 3	—	e 11·6
Wellington		28·7	168	e 6 45	+44	e 11 43	+53	—	e 15·6
Christchurch		30·5	171	e 6 37?	+20	—	—	—	—
Bandong		58·7	271	e 10 3	+ 1	e 18 3	- 3	—	—
Djakarta		59·6	271	i 10 4	- 4	e 18 6	-11	—	—
Nanking		64·5	316	i 10 39a	- 2	—	—	—	—
Vladivostok		64·7	333	i 10 41	- 1	i 19 45	+23	—	—
Berkeley		83·4	49	i 12 32a	+ 2	e 22 28	-23	—	e 38·1
Lick	Z.	83·7	49	e 12 31k	- 1	—	—	—	—
Shasta Dam		84·4	47	e 12 35	- 1	—	—	—	—
Irkutsk		84·6	327	i 12 34	- 2	e 23 14	+11	—	—
Fresno	Z.	84·9	50	e 12 37k	- 1	—	—	—	—
College		85·0	18	i 12 35	- 3	e 22 54	[- 7]	e 28 32	SS e 36·2
Pasadena		85·2	54	e 12 39	0	—	—	i 12 56	pP e 38·9
Riverside	Z.	85·8	54	e 12 43	+ 1	—	—	i 13 0	pP
Palomar	Z.	86·0	56	i 12 44	+ 1	—	—	i 13 1	pP
Tinemaha	Z.	86·1	51	i 12 43	- 1	—	—	—	—
Boulder City		88·4	53	e 12 55	0	—	—	—	—
Overton	Z.	88·8	53	i 12 57	0	—	—	—	—
Pierce Ferry		89·1	53	i 12 58	0	—	—	—	—
Tucson		90·5	57	i 13 6	+ 1	—	—	—	—
Hungry Horse		92·6	41	i 13 13	- 2	i 30 10	PKKP	i 38 25	P'P'
Sverdlovsk		110·0	326	e 19 5	PP	e 28 27	PS	—	—
Ottawa		118·5	45	18 48	[- 2]	—	—	29 5	PKKP
Grahamstown		120·2	219	i 17 53	[- 60]	—	—	—	—
Moscow		122·6	328	e 20 18	PP	—	—	—	—
Tiflis		122·9	311	e 20 16	PP	—	—	—	—
Pretoria	Z.	124·2	227	i 18 59	[- 2]	—	—	—	—
Yalta		129·3	317	e 21 18	PP	e 22 32	PKS	—	—
Ksara		131·3	303	i 19 16	[+ 1]	—	—	21 36	PP
Warsaw		132·6	333	e 21 53	PP	e 22 47	PKS	—	e 75·6
Copenhagen		133·3	341	—	—	22 47	PKS	—	65·6
Istanbul		134·1	315	22 5	PP	—	—	—	—
Aberdeen		135·4	352	e 16 33	?	e 25 17	?	e 58 31	? i 61·9
Potedam	Z.	135·8	338	i 22 0	PP	—	—	—	e 72·6
Helwan	Z.	135·9	299	e 19 22	[- 1]	—	—	e 22 1	PP
Collmberg	Z.	136·6	337	e 19 17	[- 7]	—	—	—	—
Prague		137·0	334	e 18 59	[- 26]	—	—	e 21 52	PP
Jena	N.	137·5	336	e 22 10	PP	—	—	—	—
Stuttgart		140·1	338	e 19 24	[- 7]	e 23 3	SKP	e 22 17	PP
Strasbourg		140·9	338	e 19 29k	[- 3]	e 22 42	SKP	e 22 33	PP
Paris		142·3	344	e 19 30k	[- 5]	—	—	—	—
Besançon		142·6	339	e 19 37	[+ 2]	—	—	e 22 42	PP
Messina		144·5	320	e 19 36	[- 2]	—	—	—	—
Rome	Z.	144·9	326	i 19 31	[- 8]	—	—	—	—
Clermont-Ferrand		144·9	340	i 19 38	[- 1]	—	—	e 22 59	PP
Tortosa		150·1	338	i 19 45	[- 3]	—	—	—	—

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.
Toledo	z.	152.4	345	i 19 52	[+ 1]	—	—	—	—
Algiers Univ.	z.	152.6	331	e 19 51	[ 0]	i 19 57	PKP <sub>2</sub>	e 23 41	PP
Alicante		152.7	338	e 20 54	[+63]	(e 37 20)	PPS	—	e 37.3
Granada		154.8	343	20 22 <sub>a</sub>	PKP <sub>2</sub>	44 31	SSP	e 23 55	PP
Tamanrasset	z.	160.0	302	i 20 1 <sub>a</sub>	[ 0]	—	—	i 24 20	PP

Additional readings :—

Brisbane iZ = 4m.38s., iSE = 8m.10s.

Riverview iN = 10m.18s.

Berkeley iZ = 12m.49s. and 13m.25s.

Lick iZ = 12m.37s. and 12m.58s.

Fresno eEN = 13m.1s., eE = 14m.18s.

Riverside iZ = 13m.7s.

Palomar iZ = 13m.10s.

Overton iZ = 14m.27s.

Tucson i = 13m.36s.

Pretoria eZ = 19m.20s.

Collmberg eZ = 19m.23s.

Prague e = 21m.4s., 23m.9s., and 23m.46s., ePPP = 24m.55s.

Jena eEN = 22m.22s., eN = 22m.59s.

Stuttgart ePKP = 19m.29s., e = 20m.37s., ePSKS = 32m.7s.

Strasbourg e = 19m.34s.

Besançon e = 20m.47s.

Messina e = 19m.53s. and 21m.0s.

Toledo iZ = 19m.58s. and 20m.24s.

Granada PKP<sub>2</sub> = 21m.7s.

Tamanrasset eZ = 20m.15s., iZ = 20m.41s. and 21m.43s.

Long waves were also recorded at Scoresby Sund, Huancayo, Malaga, and other American stations.

July 23d. 23h. 32m. 8s. Epicentre 19°.1N. 61°.5W.

A = +.4512, B = -.8311, C = +.3252;  $\delta = +6$ ;  $h = +5$ ;  
D = -.879, E = -.477; G = +.155, H = -.286, K = -.946.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
San Juan		4.4	262	e 1 8	- 2	e 1 54	- 8	—	e 2.1
Bermuda		13.5	349	—	—	e 5 27	-20	—	—
Bogota		18.9	221	e 4 30	+ 6	e 8 15	+22	—	e 11.9
Chinchina		19.7	224	i 5 35	+61	e 9 11	+61	—	—
Philadelphia		23.9	335	i 5 16	0	e 9 36	+ 6	—	—
Washington		23.9	331	e 5 15	- 1	—	—	—	—
Weston		24.7	344	e 5 22	- 2	e 9 35	- 9	—	—
Harvard		24.8	344	i 5 25	0	e 9 50	+ 4	—	e 11.5
Ottawa		28.8	340	6 0	- 2	—	—	—	—
La Paz		36.0	190	e 8 2	+57	—	—	—	—
Tucson		46.0	297	e 8 27	0	—	—	—	—
Pierce Ferry		48.9	302	e 8 50	0	—	—	—	—
Overton	z.	49.3	303	i 8 53	0	—	—	—	—
Boulder City		49.6	302	e 8 55	0	—	—	—	—
Hungry Horse		51.2	318	e 9 6	- 1	—	—	i 10 25	P <sub>c</sub> P
Tinemaha	z.	52.4	303	i 9 19	+ 3	—	—	—	—
Lick	z.	55.1	304	e 9 37 <sub>a</sub>	+ 1	—	—	—	—
Bhasta Dam		55.9	307	e 9 41	- 1	—	—	—	—
Algiers Univ.	z.	58.7	58	e 9 59	- 3	—	—	—	—
Tamanrasset	z.	62.2	74	e 10 31	+ 5	—	—	—	—
Stuttgart	z.	63.2	45	e 10 33	+ 1	—	—	—	—
College		71.3	334	e 11 22	- 1	—	—	—	—

Additional readings :—

Hungry Horse e = 9m.15s.

Stuttgart eZ = 10m.42s.



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**July 23d.** Readings also at 0h. (Christchurch, Wellington, Ksara, near Kulyab, and near Andijan), 1h. (Wellington, Collmberg, Strasbourg, Stuttgart, Potsdam, Tucson, Hungry Horse, College, Frunse, near Fergana, Kulyab, Murgab, Obi-garm, Andijan, and Stalinabad), 3h. (Shasta Dam and Stuttgart), 5h. (near College), 6h. (Messina, Rome, and near Istanbul), 7h. (Triest), 8h. (Hungry Horse, College, and near Alicante), 9h. (Potsdam and near Huancayo), 11h. (near La Paz), 12h. (near Alicante), 14h. (Brisbane, Palomar, Pasadena, Riverside, Tinemaha, Overton, Pierce Ferry, Shasta Dam, Collmberg, Prague, Jena, Strasbourg, Stuttgart, Besançon, and Tamanrasset), 15h. (Overton, Pierce Ferry, and College), 16h. (Strasbourg, Stuttgart, Pretoria, Pierce Ferry, and Weston), 17h. (Riverside, Tinemaha, Boulder City, Overton, Pierce Ferry, Shasta Dam, Tamanrasset, Stuttgart, and Collmberg), 18h. (San Juan), 20h. (Wellington, Almata, Frunse, Przhivalsk, Stalinabad, near Andijan, Fergana, Kulyab, Murgab, Naryn, and Obi-garm), 21h. (Palomar, Riverside, Tinemaha, Tucson, Overton, and Pierce Ferry), 22h. (Pretoria), 23h. (La Paz).

**July 24d.** Readings at 0h. (Christchurch, Wellington, Mount Wilson, Riverside, Overton, Pierce Ferry, Shasta Dam, College, Algiers Univ., Tamanrasset, and near Alicante), 1h. (Pasadena, Harvard, and Granada), 2h. (Overton, Pierce Ferry, Harvard, Weston, and Bermuda), 3h. (La Paz, College, and near Obi-garm), 7h. (Hungry Horse, Tamanrasset, Frunse, Naryn, Obi-garm, Samarkand, near Andijan, Fergana, Kulyab, Murgab, and Stalinabad), 12h. (College), 13h. (Kew, and near Messina), 14h. (Collmberg), 17h. (near Prague), 18h. (Bermuda, Pierce Ferry, and Shasta Dam), 19h. (Kulyab, near Andijan, Fergana, Obi-garm, and Stalinabad), 20h. (Djakarta, near Bandung, and near Murgab), 21h. (near Istanbul), 22h. (Collmberg and Lick), 23h. (Collmberg).

**July 25d.** 18h. 15m. 0s. Epicentre 30°·5N. 41°·9W.

A = +·6424, B = -·5764, C = +·5050 ;  $\delta = -6$ ;  $h = +2$ ;  
D = -·668, E = -·744 ; G = +·376, H = -·337, K = -·863.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Bermuda	19·5	281	e 4 32	+ 1	e 8 5	- 1	—	e 9·0
Fort de France	23·7	231	e 5 10?	- 4	—	—	—	—
Weston	26·3	306	i 5 39	0	e 10 13	+ 2	—	—
Harvard	26·5	306	i 5 43	+ 2	e 10 6	- 8	—	e 12·5
Fordham	27·8	302	e 5 51	- 2	i 10 51	+16	—	13·1
City College, N.Y.	27·9	302	e 6 3	+ 9	e 10 41	+ 4	—	—
Philadelphia	28·6	298	e 6 1	+ 1	e 10 55	+ 7	e 7 0	PPP e 11·9
Ottawa	30·3	310	e 6 14	- 1	(11 18)	+ 3	—	(11·3)
Malaga z.	31·7	68	e 6 28k	+ 1	e 11 42	+ 5	—	14·8
Toledo z.	32·1	63	e 6 20	-11	e 11 20	-23	—	—
Granada	32·3	67	i 6 36 <sub>a</sub>	+ 3	11 44	- 2	7 59	PPP i 14·8
Cleveland	33·6	300	i 6 42 <sub>a</sub>	- 2	e 12 8	+ 2	e 7 50	PP —
Rathfarnham Castle	34·4	38	e 6 50	- 1	e 14 11	SS	e 7 52	PP e 17·0
Alicante	34·8	65	6 22	-32	i 11 34	-51	6 30	pP e 15·2
Tortosa	35·6	61	i 7 3	+ 2	12 40	+ 2	—	—
Kew	37·1	44	e 7 14	0	e 13 2	+ 1	e 15 48	SS e 18·0
Clermont-Ferrand	38·0	53	e 7 22	+ 1	e 13 22	+ 8	e 8 50	PP 18·0
Paris	38·1	48	e 7 22	0	e 13 16	0	e 16 8	SS e 17·0
Chicago	38·2	301	e 7 21	- 2	e 13 17	0	e 8 43	PP e 18·3
Bogota	39·8	237	e 7 57	+21	e 16 45	SSS	—	e 21·0
Besançon	40·2	52	e 7 38	- 2	—	—	—	—
Florissant	40·3	296	e 7 41	+ 1	e 13 51	+ 2	e 9 10	PP —
De Bilt	40·5	44	i 7 44	+ 2	e 13 50	- 2	e 9 20	PP e 19·0
Chinchina	40·6	239	i 7 42	- 1	—	—	—	—
Basle	41·3	51	e 8 17	+28	e 14 41	+37	—	—
Strasbourg	41·5	49	e 7 50	0	e 14 10	+ 3	e 9 36	PP e 20·0
Scoresby Sund	41·6	9	—	—	e 14 13	+ 5	—	20 0
Stuttgart	42·5	49	e 7 57	- 2	e 14 23	+ 1	e 17 30	SS e 21·2
Tamanrasset z.	42·8	88	i 8 1?k	0	—	—	e 10 5?	PPP —
Prato	43·6	57	e 8 8	0	—	—	—	—
Jena E.	44·3	47	e 8 10	- 3	—	—	e 9 40	PP —
Cheb	44·7	48	8 15	- 1	14 59	+ 5	—	—
Rome	44·7	60	e 8 15	- 1	14 53	- 1	—	—
Collmberg z.	45·2	47	e 8 18	- 2	—	—	—	—
Potsdam z.	45·4	45	e 8 20	- 2	e 15 10	+ 6	e 10 0	PP 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.
Triest	45.5	54	i 8 19	- 4	i 15 1	- 4	i 10 14	PP
Prague	46.0	48	i 8 26 <sub>a</sub>	- 1	e 15 15	+ 3	e 10 15	PP e 23.5
Warsaw	50.2	45	e 8 1	-59	e 16 17	+ 6	e 10 53	PP e 24.0
La Paz	53.1	212	i 9 23	+ 2	—	—	—	26.0
Hungry Horse	56.4	311	e 9 42	- 3	—	—	—	—
Istanbul	57.1	57	e 9 49	- 1	e 17 43	- 2	—	—
Tucson	57.9	292	e 9 56	0	e 18 5	+10	e 12 11	PP e 38.8
Pierce Ferry	59.3	297	e 10 5	- 1	—	—	—	—
Overton	z. 59.5	297	i 10 6	- 1	—	—	—	—
Moscow	59.7	40	e 10 6	- 3	e 18 23	+ 4	—	—
Boulder City	60.0	297	e 10 10	- 1	—	—	—	—
Helwan	z. 62.2	70	10 25	- 1	—	—	e 11 21	P <sub>c</sub> P
Tinemaha	z. 62.2	299	i 10 25	- 1	—	—	—	—
Haiwee	z. 62.3	298	e 10 26	0	—	—	—	—
Palomar	z. 62.4	295	i 10 26	- 1	—	—	—	—
Riverside	z. 62.6	296	e 10 27	- 1	—	—	—	—
Mount Wilson	z. 63.0	296	e 10 34	+ 3	—	—	—	—
Shasta Dam	64.1	304	e 10 36	- 2	—	—	—	—
Ksara	64.4	65	i 10 42	+ 2	—	—	—	—
Lick	z. 64.7	301	i 10 42 <sub>k</sub>	0	—	—	—	—
College	69.2	335	i 11 10	0	e 20 18	+ 2	—	e 32.2
Baku	72.2	53	e 11 21	- 8	—	—	—	—
Tashkent	84.4	45	e 12 35	- 1	e 23 9?	+ 8	—	—
Stalinabad	85.7	47	e 12 41	- 1	e 23 21	+ 7	—	—
Obi-garm	86.2	47	i 12 44	0	—	—	—	—
Fergana	86.5	44	e 12 47	+ 1	—	—	—	—
Andijan	86.6	44	e 12 46	0	—	—	—	—
Frunse	86.6	41	i 12 47	+ 1	—	—	—	—
Pretoria	z. 87.3	121	i 13 20	+30	—	—	—	—
Almata	87.7	40	e 12 51	- 1	—	—	—	—

Additional readings :-

Cleveland iPE = 6m.45s., ePZ = 6m.50s., eSSE = 14m.17s.

Rathfarnham Castle eEN = 11m.1s., eSEN = 11m.26s.

Alicante PP = 7m.22s., SS = 13m.10s.

Kew ePPEN = 8m.36s.

Clermont-Ferrand eSS = 16m.4s.

Paris ePP = 8m.49s., e = 10m.13s. and 11m.15s.

Bogota eSEN = 15m.33s., eSS = 17m.46s.

Strasbourg e = 8m.10s., eS = 14m.20s., eSS = 17m.14s., e = 17m.27s.

Stuttgart ePP = 9m.34s.

Tamanrasset iZ = 8m.15s.?, eZ = 8m.51s.?, ePPZ = 9m.42s.?

Jena eE = 8m.34s. and 9m.29s.

Collmberg eZ = 8m.24s.

Potsdam eZ = 14m.41s.

Triest epP? = 8m.44s., iPPP = 10m.56s., eSP = 15m.29s., eSS = 18m.15s.

Prague e = 8m.30s., 8m.36s., 8m.47s., and 9m.12s., ePPP? = 10m.38s., e = 11m.11s.

Warsaw eP<sub>c</sub>PZ = 9m.45s., eZ = 11m.24s., 13m.5s., and 14m.20s.

La Paz iZ = 9m.40s.

Tucson e = 10m.24s.

Ksara e? = 5m.34s.

Long waves were also recorded at Aberdeen, Seattle, Sitka, Washington, and Pasadena.

July 25d. Readings also at 1h. (Obi-garm, near Andijan, Fergana, Kulyab, and Stalinabad), 3h. (near Istanbul), 4h. (Tucson, Hungry Horse, and College), 5h. (College and Riverview), 7h. (near Yalta, near Istanbul, Bucharest, and Timisoara), 8h. (Palomar, Pasadena, Riverside, Tinemaha, and College), 9h. (Tamanrasset and near Ashkabad), 10h. (near Apia), 11h. (Mount Wilson, Tinemaha, Tucson, Overton, Pierce Ferry, Hungry Horse, College, and Strasbourg), 12h. (Lick), 14h. (near Istanbul), 15h. (near Granada), 16h. (Overton and Pierce Ferry), 18h. (Strasbourg and near Huancayo), 20h. (near Andijan), 22h. (College), 23h. (Berkeley, Lick, and Pierce Ferry).

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July 26d. 8h. Near San Juan.

San Juan eP = 31m.56s., iS = 32m.9s., iL = 32m.17s.  
 Fort de France e = 33m.32s.  
 Bermuda eP? = 34m.50s., eS = 37m.0s., eL = 40m.10s.  
 Chinchina eP = 35m.15s., eS = 38m.24s.  
 Bogota eP = 35m.18s., e = 36m.50s., eS = 38m.18s., eL = 40m.0s.  
 Washington eP = 36m.19s., eL = 45m.58s.  
 Philadelphia eP? = 36m.32s., eS = 40m.27s., eL = 41m.8s.  
 Pennsylvania iPN = 36m.45s.  
 Weston eP = 36m.55s., eS = 40m.56s.  
 Harvard eP = 36m.58s., eS = 40m.56s.  
 Cleveland iPZ = 36m.58s., eSN = 41m.38s.  
 Tucson eP = 39m.13s., e = 39m.32s.  
 Pierce Ferry iP = 39m.40s.  
 Overton ePZ = 39m.43s.  
 Palomar ePZ = 39m.56s.  
 Pasadena ePZ = 40m.3s.  
 Hungry Horse iP = 40m.5s.  
 Tinemaha ePZ = 40m.7s.  
 Lick eZ = 40m.38s.  
 Algiers Univ. ePZ = 41m.57s.  
 Tamanrasset iPZ = 42m.30s.  
 College eP = 42m.35s., eL = 64m.8s.  
 Long waves were also recorded at Seattle.

July 26d. 18h. 54m. 35s. Epicentre 44°·6N. 8°·8E.

A = +·7060, B = +·1093, C = +·6998;  $\delta$  = +10; h = -3;  
 D = +·153, E = -·988; G = +·692, H = +·107, K = -·714.

	$\Delta$	Az.	P.	O - C.	S.	O - C.	Supp.	L.	
	°	°	m. s.	s.	m. s.	s.	m. s.	m.	
Pavia	0·6	24	i 0 11k	- 4	e 0 19	- 7	0 13	P*	
Salo	1·6	50	e 0 27	- 3	e 0 43	- 8	—	—	
Chur	2·3	13	e 0 40k	0	e 1 4	- 5	e 0 41	P*	
Neuchatel	2·7	332	e 0 50	+ 5	e 1 22	+ 3	—	—	
Zürich	2·8	357	e 0 46	- 1	e 1 27	+ 5	e 0 55	P <sub>g</sub>	
Basle	3·1	344	e 1 13	P <sub>g</sub>	e 1 39	S <sub>g</sub>	—	—	
Ravensburg	3·2	10	e 1 20?	?	e 1 26	- 6	e 1 48	S <sub>g</sub>	
Besançon	3·3	324	e 0 57	+ 4	e 1 32	- 3	—	e 2·0	
Strasbourg	4·0	350	e 1 4	0	e 1 58	+ 6	e 1 38	P <sub>g</sub>	
Clermont-Ferrand	4·2	288	—	—	e 1 47	-10	e 2 20	S <sub>g</sub>	
Stuttgart	z.	4·2	4	e 1 17	P*	e 1 51	- 6	e 1 29	P <sub>g</sub>
Paris	6·0	316	—	—	e 2 25	-18	—	—	
Jena	6·6	16	e 2 7?	P <sub>g</sub>	e 3 28	S*	e 3 37	S <sub>g</sub>	
Prague	6·7	33	e 1 39	- 3	e 3 0	0	e 3 22	S*	

Additional readings:—

Basle e = 1m.47s.  
 Ravensburg e = 1m.41s.  
 Clermont-Ferrand eS\* = 2m.6s.  
 Stuttgart eP\*?Z = 1m.26s., eZ = 1m.39s., eS?Z = 1m.47s., eZ = 2m.4s., eS\*?Z = 2m.9s.,  
 eZ = 2m.12s., eS<sub>g</sub>?Z = 2m.15s., eZ = 2m.20s.  
 Jena eE = 2m.34s.?, and 2m.54s., eN = 2m.59s., eEN = 3m.15s., eN = 3m.40s.  
 Prague eS = 2m.45s., e = 2m.57s., eS\* = 3m.10s., e = 3m.15s.  
 Long waves were also recorded at Collmburg.

July 26d. Readings also at 1h. (Tamanrasset and near Istanbul), 2h. (La Paz), 4h. (Hungry Horse, College, and near Ashkabad), 5h. (near Huancayo), 6h. (College and near Port au Prince), 7h. (College and New Delhi), 8h. (Mount Wilson, Tinemaha, Tucson, Pierce Ferry, Hungry Horse, College, Besançon, Paris, Strasbourg, Stuttgart, and near Mizusawa), 9h. (Mary, Samarkand, near Andijan (2), Fergana (2), Kulyab (2), Murgab, Obi-garm (2), Stalinabad (2), and near Vladivostok), 10h. (Mount Wilson, Riverside, Tinemaha, and Tucson), 13h. (Durham, near Malaga, and near Tiflis), 15h. (Strasbourg), 16h. (Yalta (2)), 17h. (Rome and near Tacubaya), 21h. (near Mizusawa), 22h. (Lick, Djakarta, near Bandung, and near Grozny), 23h. (near Grozny).

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July 27d. 11h. 29m. 26s. Epicentre 33°·2N. 115°·7W. (as on 1946, Aug. 30d.).

A = -·3636, B = -·7555, C = +·5450,;  $\delta = +1$ ;  $h = +1$ ;  
D = -·901, E = +·434; G = -·230, H = -·491, K = -·838.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Palomar		1·0	279	i 0 20	- 1	i 0 36	0	i 0 23	?
La Jolla		1·4	256	i 0 25	- 2	i 0 43	- 3	i 0 29	P <sub>r</sub>
Perris	z.	1·4	295	i 0 26	- 1	—	—	i 0 29	P <sub>r</sub> *
Pasadena		2·3	295	e 0 39	- 1	i 1 15	S <sub>g</sub>	i 0 44	P <sub>r</sub> *
Boulder City		2·8	14	e 0 48	+ 1	i 1 31	S <sub>g</sub>	i 0 56	P <sub>r</sub>
Pierce Ferry		3·2	25	i 0 53	+ 1	—	—	i 1 4	P <sub>r</sub>
Overton	z.	3·5	18	i 0 57	0	—	—	—	—
Tucson		4·2	102	e 1 2	- 5	e 1 54	- 3	i 1 24	P <sub>r</sub>
Fresno		4·9	317	i 1 30 <sub>a</sub>	P*	i 2 40	S <sub>g</sub>	i 1 34	P <sub>r</sub>
Lick		6·4	312	e 1 38 <sub>k</sub>	0	e 3 26	S <sub>g</sub>	i 1 48	P*
Santa Clara	N.	6·6	311	i 1 49	+ 8	e 2 29	?	—	—
Berkeley	z.	7·1	313	e 2 6	P*	e 3 56	S <sub>r</sub>	e 2 21	P <sub>r</sub>
Reno		7·1	334	e 2 12 <sub>a</sub>	P*	—	—	e 2 56	?
Shasta Dam		9·2	326	—	—	e 2 52	P*	—	e 5·0
Hungry Horse		15·2	4	e 3 41	+ 3	e 6 40	+12	—	e 8·0
Cleveland		28·3	63	i 6 22 <sub>k</sub>	+25	—	—	—	e 14·7
Ottawa		32·9	56	e 11 4	?	—	—	—	17·3
College		37·2	338	e 7 35	+20	—	—	—	e 19·1

Additional readings :—

Pasadena iN = 51s.

Tucson i = 1m.18s.

Fresno iZ = 1m.48s. and 2m.26s., iEZ = 2m.46s., iN = 2m.59s., eE = 3m.20s., eEN = 5m.29s.

Lick iZ = 2m.2s. and 2m.38s.

Berkeley eE = 2m.17s., iEZ = 4m.18s. and 4m.34s.

Reno eE = 4m.12s.

Long waves were also recorded at numerous other North American stations and at Scoresby Sund.

July 27d. 17h. 30m. 26s. Epicentre 17°·8S. 178°·8W. Depth of focus 0·080.  
(as on 1948, March 6d.).

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.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Apia		7·9	60	e 1 57	0	e 3 17	-14	e 1 16	?
Kaimata	N.E.	26·0	197	e 4 34?	-17	—	—	—	—
Brisbane	z.	27·7	245	i 5 8 <sub>a</sub>	+ 2	—	—	—	—
Riverview		31·2	233	5 45	+ 9	i 10 7	+ 1	—	—
Berkeley	z.	76·7	44	e 10 55 <sub>a</sub>	- 2	—	—	—	—
Lick	z.	76·8	43	i 10 57 <sub>a</sub>	0	—	—	—	—
Pasadena		77·4	48	i 11 0 <sub>a</sub>	0	e 20 1	- 6	e 13 0	pP
Fresno		77·7	45	i 11 1 <sub>a</sub>	- 1	—	—	e 13 4	pP
Palomar	z.	77·9	50	i 11 4 <sub>a</sub>	+ 1	—	—	—	—
Riverside		77·9	48	i 11 9	+ 6	—	—	—	—
Shasta Dam		78·3	41	i 11 5	0	e 20 15	- 1	e 13 8	pP
Haiwee		78·6	46	i 11 7	0	—	—	—	—
Tinemaha		78·9	45	i 11 8 <sub>a</sub>	0	—	—	e 13 12	pP
Reno		79·2	43	i 11 10	0	e 20 24	- 1	e 13 20	pP
Boulder City		80·7	48	e 11 18	0	—	—	—	—
Overton	z.	81·3	47	i 11 21	0	—	—	e 14 37	PP
Pierce Ferry		81·4	48	i 11 22	+ 1	—	—	—	—
Tucson		81·9	52	i 11 25	+ 1	e 20 54	+ 1	e 13 26	pP
Victoria		82·4	35	i 11 26 <sub>k</sub>	0	i 20 46	-12	—	—
Salt Lake City		85·1	44	e 11 36	- 4	e 21 12	[+ 1]	—	—
College		85·7	12	e 11 41	- 2	i 21 11	[- 4]	e 25 8	sS
Butte	N.	87·2	40	—	—	e 21 18	[- 7]	—	—
Hungry Horse		87·4	37	i 11 49	- 2	e 21 22	[- 4]	e 15 17	PP
Potsdam	z.	144·2	349	i 18 36	[+ 1]	—	—	—	—
Ksara		145·1	303	i 18 39	[+ 3]	—	—	e 14 5	P

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.
Collmberg	z.	145.3	349	i 18 38	[+ 1]	—	—	—
Jena	N.	145.9	348	e 18 40	[+ 3]	—	—	—
Prague		146.1	345	i 18 41	[+ 3]	—	—	—
Istanbul		146.7	319	—	—	e 37 34?	?	e 39 34? P'P'
Stuttgart	z.	148.4	352	e 18 41	[ 0]	—	—	—
Strasbourg		148.8	352	e 18 43	[+ 1]	—	—	e 22 43 PP
Paris		149.0	358	e 18 43	[+ 1]	—	—	e 20 35 pPKP
Zürich		149.9	351	e 18 46	[+ 3]	—	—	—
Chur		150.2	349	e 18 44 <sup>a</sup>	[ 0]	—	—	—
Besançon		150.4	354	e 18 46	[+ 2]	—	—	—
Clermont-Ferrand		152.1	356	e 18 50	[+ 4]	—	—	—
Malaga	z.	160.5	13	i 19 0 <sup>k</sup>	[+ 3]	—	—	i 23 30 PP
Tamanrasset	z.	173.6	—	i 19 8	[+ 1]	i 30 35 SKKS	—	e 21 30 pPKP

Additional readings :—

Riverview iN = 11m.10s., iE = 13m.30s.  
 Lick iZ = 11m.0s.  
 Pasadena iZ = 14m.5s.  
 Tinemaha iZ = 11m.26s. and 11m.34s.  
 Overton iZ = 11m.33s.  
 Tucson i = 11m.33s.?  
 College e = 11m.59s., i = 21m.22s., eSP = 22m.20s.  
 Collmberg eZ = 18m.50s. and 19m.26s.  
 Jena eN = 19m.28s., eE = 19m.53s.  
 Prague e = 19m.44s. and 20m.47s.  
 Stuttgart iPKPZ = 18m.48s., eZ = 18m.52s.  
 Strasbourg i = 18m.47s., e = 19m.51s. and 20m.24s., i = 21m.12s.  
 Paris i = 18m.47s., iPKP<sub>2</sub>? = 19m.55s., e = 20m.29s., esPKP? = 21m.57s., ePP = 22m.29s.  
 Zürich e = 18m.51s.  
 Chur e = 18m.51s.  
 Besançon i = 18m.52s. and 19m.0s., e = 19m.11s.  
 Clermont-Ferrand i = 18m.57s.  
 Malaga iPKP<sub>2</sub>Z = 19m.46s., PPPZ = 27m.2s.  
 Tamanrasset iPKP<sub>2</sub>Z = 20m.43s., epPKP<sub>2</sub>Z = 22m.49s., iPPZ = 24m.37s.

July 27d. 22h. 50m. 49s. Epicentre 33°·2N. 115°·7W. (as at 11h.).

		$\Delta$	Az.	P.	O - C.	S.	O - C.	Supp.	L.
		$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Palomar		1.0	279	i 0 20	P <sub>g</sub>	—	—	—	—
La Jolla		1.4	256	i 0 25	- 2	i 0 43	- 3	—	—
Pasadena		2.3	295	e 0 44	P <sub>g</sub>	i 1 16	S <sub>g</sub>	—	—
Boulder City		2.8	14	e 0 49	+ 2	e 1 29	S <sub>g</sub> *	i 0 57	P <sub>g</sub>
Pierce Ferry		3.2	25	i 0 53	+ 1	—	—	—	—
Overton	z.	3.5	18	i 0 57	0	—	—	—	—
Tucson		4.2	102	e 1 2	- 5	e 1 53	- 4	i 1 19	P <sub>g</sub>
Fresno		4.9	317	e 1 30 <sup>k</sup>	P*	e 2 39	S <sub>g</sub>	e 1 35	P <sub>g</sub>
Lick	z.	6.4	312	e 1 47	P*	i 3 26	S <sub>g</sub>	—	—
Reno		7.1	334	e 2 17	P <sub>g</sub>	e 3 17	+ 7	e 3 57	S <sub>g</sub>

Additional readings :—

Tucson i = 1m.10s.  
 Fresno eE = 2m.47s., eN = 4m.39s., eE = 5m.28s.,  
 Reno eE = 4m.12s., eN = 4m.15s.  
 Long waves were also recorded at College, Seattle, Butte, Santa Clara, Shasta Dam, Salt Lake City, Philadelphia, and Cleveland.

July 27d. Readings also at 0h. (Stalinabad, Andijan, near Kulyab, and near Istanbul), 2h. (Prague (2) and Strasbourg), 4h. (Stuttgart), 5h. (La Paz), 6h. (Strasbourg, Jena, Collmberg, Samarkand, Almata, near Obi-garm, Stalinabad, Murgab, Kulyab (2), Fergana (2), and Andijan (2)), 7h. (near Istanbul), 9h. (Salt Lake City, Shasta Dam, near Palomar, La Jolla, Pasadena, Boulder City (2), Overton (2), Pierce Ferry (2), and Tucson), 10h. (Seattle, Lick, Chicago, and Philadelphia), 11h. (Pierce Ferry, near Boulder City (4), and Overton), 12h. (Christchurch, Kaimata, Chicago, Philadelphia, Salt Lake City, Seattle (2), near Boulder City (5), Overton (3), Pierce Ferry (5), and Tucson (2)), 13h. (College, Seattle (2), and near Boulder City (2)), 15h. (Strasbourg), 16h. (Hungry Horse, Boulder City, and near Pierce Ferry), 19h. (Boulder City), 20h. (Pasadena, Palomar, Riverside, Tinemaha, Boulder City, Overton, Pierce Ferry, Tucson, and Lincoln), 22h. (College, Hungry Horse, Tamanrasset, Andijan (2), near Kulyab, Obi-garm, Naryn, and near Boulder City).



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July 28d. 3h. 25m. 29s. (I)  
 17h. 26m. 50s. (II)  
 17h. 50m. 49s. (III)  
 17h. 58m. 10s. (IV) } Epicentre 33°·2N. 115°·7W.  
 (as on 27d.).

Shock III felt at intensity VI Brawley, Calipatria, Niland, Seeley, and Westmorland.  
 Epicentre 33°7'N. 115°34'W.

L. M. Murphy and F. P. Ulrich.  
 United States Earthquakes, 1950, serial No. 755, Washington, 1952, p.10.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
I	Palomar	1·0	279	i 0 21	0	—	—	—	—
II		1·0	279	i 0 18	- 3	—	—	—	—
III		1·0	279	i 0 19 <sub>a</sub>	- 2	—	—	—	—
I	La Jolla	1·4	256	i 0 26	- 1	i 0 45	- 1	—	—
II		1·4	256	i 0 23	- 4	i 0 43	- 3	—	—
III		1·4	256	i 0 24 <sub>a</sub>	- 3	—	—	—	—
IV		1·4	256	i 0 24	- 3	—	—	—	—
III	Riverside	1·5	300	e 0 29	+ 1	—	—	—	—
IV		1·5	300	i 0 30	+ 2	—	—	—	—
I	Pasadena	2·3	295	i 0 39	- 1	i 1 27	S <sub>g</sub>	—	—
II		2·3	295	i 0 41	+ 1	i 1 13	+ 4	—	—
III		2·3	295	e 0 37	- 3	i 1 13	+ 4	—	—
IV		2·3	295	i 0 40	0	—	—	—	—
I	Boulder City	2·8	14	e 0 49	+ 2	i 1 31	S <sub>g</sub>	—	—
II		2·8	14	i 0 54	P <sub>g</sub>	i 1 34	S <sub>g</sub>	—	—
III		2·8	14	i 0 46	- 1	—	—	—	—
IV		2·8	14	i 0 53	P*	i 1 33	S <sub>g</sub>	—	—
I	Pierce Ferry	3·2	25	i 0 53	+ 1	e 1 40	S <sub>g</sub> *	—	—
III		3·2	25	i 0 51	- 1	—	—	—	—
I	Overton	3·5	18	i 0 58	+ 1	—	—	—	—
III		3·5	18	i 0 55	- 2	—	—	—	—
I	Tucson	4·2	102	e 1 3	- 4	e 1 54	- 3	i 1 24	P <sub>g</sub>
II		4·2	102	i 1 2	- 5	i 1 49	- 8	e 1 17	P*
III		4·2	102	i 1 1	- 6	i 1 46	-11	—	—
IV		4·2	102	i 1 3	- 4	—	—	—	—
I	Fresno	4·9	317	e 1 31 <sub>k</sub>	P*	i 2 27	S*	i 2 47	S <sub>g</sub>
II		4·9	317	e 1 28	P*	e 2 35	S <sub>g</sub>	e 1 34	P <sub>g</sub>
III		4·9	317	e 1 15 <sub>a</sub>	- 2	e 2 26	S <sub>g</sub> *	i 2 41	S <sub>g</sub>
I	Lick	6·4	312	e 1 40	+ 2	i 3 37	S <sub>g</sub> *	—	—
II		6·4	312	i 1 35 <sub>a</sub>	- 3	i 3 21	S <sub>g</sub> *	i 3 39	S <sub>g</sub>
III		6·4	312	i 1 36 <sub>k</sub>	- 2	i 3 23	S <sub>g</sub> *	i 1 57	P <sub>g</sub>
IV		6·4	312	e 1 36	- 2	i 3 31	S <sub>g</sub>	i 1 58	P <sub>g</sub>
II	Santa Clara	6·6	311	e 2 50	S	(e 2 50)	- 8	i 3 47	S <sub>g</sub>
III		6·6	311	i 2 11	P <sub>g</sub>	i 3 27	S <sub>g</sub>	—	—
IV		6·6	311	—	—	i 3 50	S <sub>g</sub>	—	—
I	Berkeley	7·1	313	i 2 1 <sub>a</sub>	P*	e 3 55	S <sub>g</sub> *	e 2 29	P <sub>g</sub>
II		7·1	313	e 2 24	P <sub>g</sub>	e 3 47	S <sub>g</sub> *	e 4 2	S <sub>g</sub>
III		7·1	313	e 1 56	+ 8	i 3 27	S*	i 2 19	P <sub>g</sub>
I	Reno	7·1	334	e 2 11 <sub>k</sub>	P*	e 3 33	S*	i 2 26	P <sub>g</sub>
III		7·1	334	e 1 51 <sub>k</sub>	+ 3	i 3 10	0	i 2 19	P <sub>g</sub>
I	Salt Lake City	8·2	21	—	—	e 3 51	+13	—	—
II		8·2	21	—	—	e 4 2	S*	—	—
III		8·2	21	e 2 1	- 2	e 3 22	-16	—	—
I	Shasta Dam	9·2	326	e 2 36	P*	—	—	e 2 54	P <sub>g</sub>
II		9·2	326	e 2 50	P <sub>g</sub>	—	—	—	—
III		9·2	326	e 2 21	+ 5	—	—	—	—
IV		9·2	326	e 4 56	S <sub>g</sub>	—	—	—	—
III	Chihuahua	9·4	116	i 2 1	-17	—	—	—	—
III	Bozeman	13·0	15	e 3 12	+ 3	—	—	—	—
III	Butte	13·0	10	e 3 7	- 2	e 5 54	+19	—	—
I	Hungry Horse	15·2	4	e 3 38	0	—	—	—	—
II		15·2	4	e 3 43	+ 5	—	—	—	—
III		15·2	4	i 3 39	+ 1	e 6 44	+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.
III Seattle	15.3	343	e 4 2	+23	e 6 50	+20	e 8 39	P <sub>c</sub> P e 8.4
I Victoria	16.4	342	e 4 1	+ 8	—	—	—	10.1
III	16.4	342	e 3 57	+ 4	7 18	+22	—	8.9
III Guadalajara	16.6	135	—	—	e 7 15	+15	—	—
III Lincoln E.	17.0	57	e 4 11	+10	e 7 23	+13	—	e 8.6
III Saskatoon	20.0	16	e 4 56	+19	8 29	+12	—	10.8
III Tacubaya	20.2	128	e 5 19	+40	i 10 56	L	—	(i 10.9)
III Vera Cruz	22.4	123	e 5 14	+12	—	—	—	e 10.9
III Chicago	23.8	59	e 5 14	- 1	e 9 38	+10	—	e 11.8
III Sitka	27.4	337	—	—	e 10 33	+ 5	—	e 12.9
III Cleveland	28.3	63	e 6 2k	+ 5	e 10 58	+15	—	i 14.7
IV Pennsylvania E.	31.0	64	i 7 4	+43	—	—	—	—
III Ottawa	32.9	56	e 6 38	0	—	—	—	17.4
III Harvard	35.7	61	e 7 4	+ 2	—	—	—	e 18.5
III Weston	35.9	61	e 7 11	+ 7	—	—	—	e 18.2
III College	37.2	338	e 7 18	+ 3	—	—	—	—
III Bermuda	42.5	76	e 8 21	+22	—	—	—	e 20.6
III La Paz	67.1	129	e 10 58	+ 1	—	—	—	35.2
IV Kew	78.5	35	—	—	e 21 50	-11	—	31.8
III Paris	81.5	36	e 12 23	+ 2	—	—	—	e 42.2
III Jena N.	84.2	30	e 12 29	- 5	—	—	—	—
III Strasbourg	84.2	34	e 12 38	+ 4	—	—	—	e 44.2
III Besançon	84.3	36	e 12 36	+ 1	—	—	—	—
III Stuttgart	84.8	33	e 12 40	+ 3	—	—	—	e 47.2
III Malaga Z.	85.4	48	i 12 45 <sub>a</sub>	+ 5	e 23 11	0	i 16 11	PP 43.3
III Cheb	85.5	30	e 15 28	PP	e 24 35	PS	—	42.7

Additional readings :—

Pasadena III i = 43s.

Tucson i = 1m.19s., iS = 2m.0s., II eS = 1m.40s., III i = 1m.19s., eS = 1m.40s.

Fresno i iEN = 1m.37s., II eN = 2m.40s., III eZ = 1m.25s. and 1m.31s., iN = 1m.36s.

Lick i iZ = 1m.49s., II iZ = 1m.46s., III iZ = 1m.46s., iE = 3m.37s., iZ = 3m.40s.

Berkeley i eN = 3m.58s., eE = 5m.4s., eN = 5m.16s.; II eZ = 4m.52s.; III iZ = 3m.43s., eZ = 4m.35s.

Reno i eEN = 2m.31s., eE = 3m.57s. and 4m.16s.; III iZ = 2m.1s. and 2m.15s., iE = 3m.25s.

Hungry Horse III i = 3m.44s.

Seattle III e = 4m.9s., 7m.2s., 7m.19s., and 7m.50s.

Guadalajara III e = 7m.19s.

Cleveland III eE = 10m.45s., eN = 11m.12s.

Pennsylvania IV eN = 7m.34s., eE = 8m.18s., eEN = 8m.44s.

Jena III eE = 12m.41s.

Malaga III ePPPZ = 18m.19s.

Long waves to these shocks were also recorded at numerous American stations, less widely in Europe, and at Ksara and Scoresby Sund.

July 28d. 4h. 55m. 12s. Epicentre 13°-3S, 167°-0E. (as on July 23d.).

	$\Delta$	Az.	P.	O - C.	S.	O - C.	Supp.	L.
	$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Brisbane	19.2	221	i 4 30	+ 2	i 8 8	+ 9	—	—
Apia	20.7	93	e 4 39	- 5	e 8 32	+ 1	e 5 24	PPP e 10.8
Auckland	24.5	166	i 5 19	- 3	—	—	—	—
Riverview	25.0	213	i 5 34 <sub>a</sub>	+ 7	i 10 1	+12	i 6 11	PP e 12.2
Arapuni	25.9	167	e 5 35	0	—	—	—	—
Wellington	28.7	168	e 8 6	?	e 10 40	-10	e 9 14	P <sub>c</sub> P e 13.8
Christchurch	30.5	171	e 11 12	S	(e 11 12)	- 6	—	e 15.1
Honolulu	48.7	46	e 9 32	?	e 15 42	- 8	e 19 20	SS e 20.2
Perth	50.3	240	—	—	i 19 36	SS	—	i 26.5
Bandong	58.7	271	—	—	e 18 0	- 6	—	—
Djakarta	59.6	271	e 11 34	?	e 21 8	?	—	—
Vladivostok	64.7	333	i 10 45	+ 3	i 19 35	+13	—	—
Berkeley	83.4	49	i 12 30 <sub>k</sub>	0	e 22 54	+ 3	e 28 23	SS e 37.1
Santa Clara	83.5	51	e 12 45	+14	e 22 52	0	e 24 2	PPS e 38.4
Ljck Z.	83.7	49	i 12 31 <sub>k</sub>	- 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.	
Shasta Dam	84.4	47	e 12 35	- 1	e 23 3	+ 2	e 15 47	PP	—
Irkutsk	84.6	327	12 38	+ 2	e 23 5	+ 2	—	—	—
Sitka	84.7	28	e 12 37	0	e 23 14	+10	e 28 4	SS	e 36.6
Fresno	84.9	50	12 38 <sup>k</sup>	0	—	—	—	—	—
College	85.0	18	e 12 36	- 2	e 23 10	+ 3	—	—	e 35.6
Pasadena	85.2	54	e 12 37	- 2	e 23 11	+ 2	e 24 3	PS	e 36.0
Reno	85.8	48	e 12 41 <sup>a</sup>	- 1	e 23 17	+ 2	—	—	—
Palomar	86.0	56	i 12 43	0	—	—	—	—	—
Tinemaha	86.1	51	i 12 44	0	—	—	—	—	—
Victoria	86.8	40	i 12 47	0	i 23 31	+ 6	—	—	39.8
Seattle	87.2	41	e 12 54	+ 5	e 23 32	+ 4	e 24 38	PS	—
Boulder City	88.4	53	i 12 55	0	—	—	—	—	—
Overton	88.8	53	i 12 57	0	—	—	—	—	—
Pierce Ferry	89.1	53	i 12 58	0	—	—	e 16 36	PP	—
Tucson	90.5	57	e 13 4	- 1	e 24 1	+ 2	e 16 28	PP	e 40.5
Salt Lake City	92.0	50	e 13 8	- 4	e 24 0	{+ 4}	—	—	e 40.3
Hungry Horse	92.6	41	e 13 12	- 3	—	—	—	—	—
Butte	92.9	43	e 13 21	+ 5	e 24 17	- 3	—	—	e 45.6
Bozeman	93.9	44	e 13 26	+ 5	e 24 4	{+ 9}	e 25 43	PS	e 41.9
Andijan	102.0	310	e 18 11	PP	e 24 48	{+11}	e 25 57	S	—
Fergana	102.4	310	e 18 13	PP	—	—	—	—	—
Lincoln	103.3	50	—	—	e 25 59	+11	—	—	e 47.8
Obi-garm	103.8	307	e 18 26	PP	—	—	—	—	—
Stalinabad	104.5	307	e 18 44	PP	e 25 1	{+13}	e 33 33	SS	—
Sverdlovsk	110.0	326	e 19 19	PP	e 28 43	PS	—	—	—
Chicago	110.2	49	e 18 57	{+23}	e 26 57	{+51}	e 28 29	PS	e 51.0
Huancayo	113.3	110	—	—	e 29 32	PS	e 34 48	SS	e 53.1
Cleveland	114.7	50	e 19 43	PP	e 26 54	{+16}	e 29 17	PS	55.0
Pennsylvania	117.6	51	i 20 4	PP	i 26 45	{-13}	—	—	—
La Paz	118.0	117	—	—	33 18	?	—	—	58.5
Bogota	119.2	92	e 20 14	PP	—	—	—	—	—
Philadelphia	119.7	51	—	—	e 25 55	{+ 6}	e 29 55	PS	e 54.1
Harvard	122.0	48	e 20 28	PP	e 30 23	PS	e 37 30	SS	e 57.2
Moscow	122.6	328	e 20 36	PP	—	—	—	—	—
Scoresby Sund	122.6	3	20 36	PP	37 24	SS	41 36	SSS	61.8
Tiflis	122.9	311	e 20 32	PP	—	—	—	—	—
San Juan	128.8	77	e 22 28	PKS	—	—	—	—	e 60.5
Yalta	129.3	317	e 19 13	{+ 2}	e 22 33	PKS	e 21 23	PP	—
Ksara	131.3	303	e 19 19	{+ 4}	—	—	22 55?	PKS	—
Warsaw	132.6	333	e 19 19	{+ 2}	e 26 15	{-11}	e 22 54	PKS	e 61.8
Copenhagen	133.3	341	22 42	PKS	—	—	24 12	PPP	—
Istanbul	134.1	315	19 19	{- 1}	26 25	{- 4}	—	—	—
Helwan	135.9	299	e 19 27	{+ 4}	—	—	23 2	PKS	—
Collmberg	136.6	337	e 19 25	{+ 1}	—	—	e 22 11	PP	—
Jena	137.5	336	e 19 34	{+ 8}	e 26 20	{-15}	e 22 16	PP	—
Cheb	137.8	336	—	—	e 23 56	?	e 40 6	SS	—
De Bilt	138.6	343	e 19 32	{+ 4}	e 40 38	SS	e 22 11	PP	e 65.8
Stuttgart	140.1	338	e 19 31	{ 0}	e 26 39	{ 0}	e 22 28	PP	e 73.8
Kew	140.6	348	e 19 35	{+ 3}	e 29 8	{-17}	e 23 2	PP	e 56.8
Strasbourg	140.9	338	e 19 30	{- 2}	e 26 48	{+ 7}	e 22 36	PP	e 63.8
Paris	142.3	344	i 19 32	{- 3}	e 27 41	{+58}	e 22 45	PP	e 67.8
Besançon	142.6	339	e 19 37	{+ 2}	—	—	e 22 40	PP	—
Florence Arc.	143.2	330	e 19 50	{+14}	—	—	—	—	—
Prato	143.2	330	e 19 36	{ 0}	—	—	—	—	—
Rome	144.9	326	i 19 36 <sup>a</sup>	{- 3}	26 27	{-20}	22 15	PP	—
Clermont-Ferrand	144.9	340	e 19 41	{+ 2}	—	—	e 23 3	PP	e 69.8
Tortosa	150.1	338	i 19 58	{+10}	—	—	—	—	e 80.8
Toledo	152.4	345	e 19 54	{+ 3}	—	—	e 23 44	PP	—
Algiers Univ.	152.6	331	e 19 49	{- 2}	i 20 14	PKP <sub>2</sub>	e 23 45	PP	—
Alicante	152.7	338	20 6	{+15}	27 2	{+ 5}	23 44	PKS	e 78.0
Granada	154.8	343	20 23 <sup>k</sup>	{+29}	26 59	{ 0}	24 1	PP	79.8
Malaga	155.4	343	i 20 18 <sup>a</sup>	{+23}	i 20 26	PKP <sub>2</sub>	i 24 2	PP	84.6
Tamanrasset	160.0	302	i 20 4 <sup>k</sup>	{+ 3}	e 20 42	PKP <sub>2</sub>	e 24 24	PP	—

For Notes see next page.

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NOTES TO JULY 28d. 4h. 55m. 12s.

Additional readings :—

Riverview  $i=5m.55s.$ ,  $iPPPNZ=6m.24s.$ ,  $iZ=9m.12s.$ ,  $eN=9m.47s.$ ,  $iE=10m.9s.$ ,  
 $iZ=10m.17s.$ ,  $eQN=11m.0s.$   
 Berkeley  $iZ=12m.33s.$ ,  $eE=24m.13s.$  and  $28m.49s.$   
 Lick  $iZ=12m.35s.$ ,  $eZ=13m.22s.$   
 Fresno  $eZ=13m.54s.$   
 Reno  $eE=14m.30s.$   
 Tinemaha  $eZ=12m.57s.$   
 Victoria  $i=13m.8s.$   
 Seattle  $e=13m.20s.$ ,  $i=13m.53s.$ ,  $e=14m.9s.$ ,  $17m.8s.$ , and  $19m.9s.$ ,  $eS=23m.48s.$ ,  
 $eSS=29m.21s.$   
 Overton  $iZ=13m.14s.$   
 Tucson  $eSS=29m.24s.$   
 Chicago  $eSS=34m.35s.$   
 Huancayo  $e=30m.36s.$  and  $36m.0s.$   
 Cleveland  $eSE=27m.39s.$ ,  $ePPS?=30m.18s.$   
 Philadelphia  $eSS=36m.49s.$   
 Yalta  $ePS=31m.38s.$   
 Warsaw  $eZ=21m.10s.$  and  $22m.36s.$ ,  $eN=23m.42s.$ ,  $eZ=23m.53s.$ ,  $eEN=24m.8s.$ ,  
 $eEZ=25m.3s.$ ,  $eZ=30m.25s.$ ,  $ePKKS=31m.37s.$ ,  $ePPSN=33m.16s.$ ,  $e=38m.9s.$ ,  
 $eSSE=39m.57s.$ ,  $eEZ=41m.13s.$   
 Helwan  $eZ=20m.9s.$ ,  $PPP?Z=25m.48s.$   
 Collmberg  $eZ=19m.32s.$   
 De Bilt  $eSSS=45m.48s.?$   
 Stuttgart  $eZ=20m.51s.$ ,  $e=23m.49s.$  and  $24m.28s.$ ,  $ePPP=25m.48s.$ ,  $e=35m.42s.$ ,  
 $eSS=41m.7s.$ ,  $eQ=70.8m.$   
 Kew  $e=24m.6s.$   
 Strasbourg  $e=21m.48s.$ ,  $23m.18s.$ ,  $24m.0s.$ , and  $24m.30s.$ ,  $ePPP=26m.0s.$ ,  $e=28m.30s.$   
 and  $33m.48s.$   
 Paris  $e=20m.21s.$ ,  $20m.54s.$ , and  $22m.3s.$ ,  $i=23m.21s.$ ,  $e=30m.47s.$   
 Besançon  $e=19m.46s.$  and  $20m.14s.$ ,  $ePP=22m.46s.$   
 Rome  $SS=41m.24s.$   
 Alicante  $PP=24m.56s.$ ,  $SS=45m.30s.$   
 Granada  $PKP_2=21m.17s.$ ,  $iPP=25m.5s.$ ,  $SKKS=31m.56s.$ ,  $SS=44m.35s.$   
 Tamanrasset  $ePPPZ=28m.3s.$   
 Long waves were also recorded at Bombay, Aberdeen, Helsinki, Upsala, Bermuda, and other American stations.

July 28d. 5h. 23m. 20s. Epicentre  $13^{\circ}3S$ .  $167^{\circ}0E$ . (as at 4h.).

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Brisbane	z.	19.2	221	i 4 33k	+ 5	—	—	—	—
Auckland	N.	24.5	166	e 5 40?	+18	—	—	—	—
Wellington		28.7	168	—	—	e 10 40	-10	—	e 12.7
Berkeley		83.4	49	i 12 33a	+ 3	—	—	—	—
Lick	z.	83.7	49	e 12 32a	0	—	—	—	—
Shasta Dam		84.4	47	i 12 35	- 1	—	—	—	—
College		85.0	18	e 12 37	- 1	—	—	—	—
Pasadena	z.	85.2	54	i 12 34	- 5	—	—	—	—
Reno		85.8	48	e 12 42a	0	—	—	e 17 3	PP
Palomar		86.0	56	i 12 42a	- 1	—	—	—	—
Tinemaha	z.	86.1	51	e 12 43	- 1	—	—	—	—
Victoria	z.	86.8	40	e 12 50	+ 3	—	—	—	—
Seattle		87.2	41	e 12 50	+ 1	—	—	—	—
Boulder City		88.4	53	e 12 54	- 1	—	—	—	—
Overton	z.	88.8	53	i 12 57	0	—	—	—	—
Pierce Ferry		89.1	53	i 12 58	0	—	—	—	—
Tucson		90.5	57	e 13 6	+ 1	—	—	—	—
Hungry Horse		92.6	41	e 13 14	- 1	—	—	—	—
Besançon		142.6	339	e 22 49	PP	—	—	—	—
Clermont-Ferrand		144.9	340	e 19 43	[+ 4]	—	—	—	—
Rome		144.9	326	e 19 38	[- 1]	e 26 31	[-16]	e 39 35	P'P'
Tamanrasset	z.	160.0	302	e 20 5	[+ 4]	e 20 47	PKP <sub>2</sub>	e 24 27	PP

Additional readings :—

Berkeley  $iZ=12m.40s.$   
 Lick  $iZ=12m.40s.$   
 Shasta Dam  $i=12m.46s.$   
 Pasadena  $iZ=12m.46s.$   
 Tinemaha  $iZ=12m.54s.$   
 Tucson  $i=13m.21s.$

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July 28d. Readings also at 0h. (Palomar, Pasadena, Riverside, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Shasta Dam, Hungry Horse, Harvard, Weston, Huancayo, and near Mizusawa), 3h. (Santa Clara, near Boulder City (3), and near Kulyab), 4h. (near Boulder City), 5h. (Apia, Auckland, near Arapuni, Christchurch, Cobb River, Kaimata, New Plymouth, Tuai, Wellington, College, Overton, near Boulder City (2), and near Bogota), 6h. (Andijan and near Naryn), 8h. (Tamanrasset, Prato, near Florence Arc., Florence Xim, near Boulder City (2), and near Salt Lake City), 12h. (Harvard, San Juan, Huancayo, Philadelphia, Tucson, Lick, and Hungry Horse), 13h. (Bermuda, Pasadena, Seattle, College, Scoresby Sund, Granada, and Strasbourg), 15h. (near Andijan, Obi-garm, Samarkand, and Stalinabad), 16h. (Overton and Pierce Ferry), 17h. (Bogota, Huancayo, La Paz, Santa Clara, near Andijan (4), Frunse, Fergana (3), Obi-garm (3), Murgab (2), and Stalinabad (3)), 18h. (Overton, Pierce Ferry, Shasta Dam, College, and near Tucson), 19h. (Overton, near Boulder City, and Pierce Ferry), 20h. (Bandong), 21h. (Cleveland, Salt Lake City, Shasta Dam, near Santa Clara, near Boulder City (2), and near Fort de France), 22h. (near Andijan, Obi-garm, Stalinabad, and near Boulder City).

July 29d. 0h. 17m. 7s. Epicentre 33°·2N. 115°·7W. (as on July 28d.).

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
La Jolla		1.4	256	i 0 25	- 2	i 0 43	- 3	—	—
Riverside	N.	1.5	300	i 0 30	+ 2	—	—	—	—
Pasadena	Z.	2.3	295	e 0 41	+ 1	—	—	—	—
Boulder City		2.8	14	e 0 49	+ 2	i 1 36	S <sub>g</sub>	i 0 56	P <sub>g</sub>
Pierce Ferry		3.2	25	i 0 54	+ 2	—	—	—	—
Overton	Z.	3.5	18	i 0 57	0	—	—	—	—
Tucson		4.2	102	i 1 3	- 4	i 1 53	- 4	e 1 18	P*
Fresno		4.9	317	i 1 35 <sub>a</sub>	P <sub>g</sub>	i 2 35	S <sub>g</sub> *	—	—
Lick	Z.	6.4	312	e 1 47 <sub>k</sub>	+ 9	i 3 15	S <sub>g</sub> *	—	—
Santa Clara	E.	6.6	311	—	—	e 3 32	S <sub>g</sub>	—	e 4.1
Reno	Z.	7.1	334	e 2 19	P <sub>g</sub>	e 3 5	- 5	e 3 55	S <sub>g</sub>
Shasta Dam		9.2	326	e 4 49	S <sub>g</sub>	—	—	—	—
Hungry Horse		15.2	4	e 3 38	0	—	—	—	e 8.3

Reno gives also eEN = 4m.1s.

Long waves were also recorded at Salt Lake City, Seattle, Cleveland, and Philadelphia.

July 29d. 14h. 36m. 31s. Epicentre 33°·2N. 115°·7W. (as at 0h.).

Intensity VIII in district of Calipatria, where much damage was done and earth cracks opened; VII at Niland, Westmorland; VI at Brawley and Seeley; V at El Centro. Macro seismic area 50,000 sq. km. Epicentre 33°7'N. 115°34'W.

L. M. Murphy and F. P. Ulrich.

United States Earthquakes, 1950, Serial No. 755, Washington, 1952, pp. 10, 11, with macro seismic chart.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Palomar	Z.	1.0	279	i 0 20 <sub>a</sub>	- 1	—	—	—	—
La Jolla		1.4	256	i 0 25 <sub>a</sub>	- 2	i 0 43	- 3	—	—
Perris	Z.	1.4	295	i 0 27	0	—	—	—	—
Riverside		1.5	300	i 0 30	+ 2	i 0 57	+ 8	—	—
Mount Wilson	Z.	2.2	297	i 0 39	+ 1	—	—	—	—
Pasadena		2.3	295	i 0 39	- 1	i 1 16	+ 7	—	—
Boulder City		2.8	14	i 0 48	+ 1	—	—	—	—
Pierce Ferry		3.2	25	i 0 53	+ 1	—	—	—	—
Overton	Z.	3.5	18	i 0 57	0	—	—	—	—
Haiwee	Z.	3.5	328	i 0 57	0	—	—	—	—
Santa Barbara	Z.	3.6	291	e 0 58	0	—	—	—	—
Tucson		4.2	102	i 1 3	- 4	e 1 39	- 18	i 1 21	P <sub>g</sub>
Tinemaha	Z.	4.4	332	i 1 10	0	—	—	—	e 2.2
Fresno	Z.	4.9	317	e 1 17 <sub>k</sub>	0	i 2 29	+ 14	i 1 33	P <sub>g</sub>
Lick		6.4	312	i 1 37 <sub>a</sub>	- 1	i 3 22	S <sub>g</sub>	i 1 49	P*
Santa Clara		6.6	311	i 2 12	P <sub>g</sub>	i 3 20	S*	—	—
Berkeley		7.1	313	i 1 47 <sub>a</sub>	- 1	i 3 27	+ 17	i 1 58	P*
Reno		7.1	334	i 1 59 <sub>k</sub>	P*	i 3 15	+ 5	i 2 20	P <sub>g</sub>
Salt Lake City		8.2	21	e 2 8	+ 5	e 3 21	- 17	2 42	P <sub>g</sub>
Ukiah		8.5	316	—	—	e 3 35	- 10	—	e 4.5

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.
Shasta Dam	9.2	326	e 2 30	+14	—	—	—	e 4.8
Bozeman	13.0	15	e 3 14	+ 5	e 5 48	+13	—	e 6.7
Butte	13.0	10	e 3 10	+ 1	e 4 55	-40	—	e 6.0
Hungry Horse	15.2	4	i 3 41	+ 3	e 6 40	+12	—	e 7.9
Seattle	15.3	343	e 3 59	?	e 6 43	+13	e 7 41	P <sub>c</sub> P e 7.4
Victoria	16.4	342	e 3 59	+ 6	e 7 26	+30	—	9.2
Lincoln	17.0	57	e 4 5	+ 4	e 7 13	+ 3	—	e 8.2
Saskatoon	20.0	16	—	—	8 28	+11	—	10.4
Tacubaya	20.2	128	e 4 43	+ 4	—	—	e 8 53	SS
Florissant	21.2	68	e 4 49	0	i 8 47	+ 6	—	i 10.6
St. Louis	21.3	68	i 4 51	+ 1	i 8 51	+ 8	—	i 10.8
Vera Cruz	22.4	123	—	—	e 9 2	- 2	—	i 12.2
Chicago	23.8	59	e 5 14	- 1	e 9 37	+ 9	—	e 11.1
Cincinnati	25.8	67	5 44	+10	10 23	+21	—	i 13.4
Sitka	27.4	337	—	—	e 10 13	-15	—	e 12.7
Cleveland	28.3	63	i 6 6k	+ 9	e 11 0	+17	e 12 8	SS i 14.8
Washington	31.6	67	—	—	e 11 43	+ 8	—	i 16.4
Ottawa	32.9	56	e 6 39	+ 1	—	—	—	17.3
Philadelphia	33.0	66	—	—	e 11 59	+ 2	—	e 13.9
City College, N.Y.	33.9	64	—	—	e 12 32	+21	—	—
Vermont	34.6	58	e 6 36	-17	e 12 44	+22	—	e 15.1
Harvard	35.7	61	e 7 4	+ 2	e 12 59	+20	—	e 18.4
College	37.2	338	e 7 18	+ 3	e 13 16	+14	—	e 16.2
San Juan	46.6	95	e 8 59	+27	e 15 21	0	—	e 18.7
Scoresby Sund	60.3	22	e 10 22	+ 9	e 18 32	+ 6	22 17	SS 29.5
De Bilt	80.6	32	(e 12 29)	+13	e 12 29	P	—	e 38.5
Paris	81.5	36	e 12 24	+ 3	—	—	—	e 40.5
Strasbourg	84.2	34	e 12 38	+ 4	—	—	—	e 41.5
Besançon	84.3	36	i 12 39	+ 4	—	—	—	—
Stuttgart	84.8	33	e 12 42	+ 5	—	—	—	e 44.5
Malaga	z. 85.4	48	i 12 45 <sub>a</sub>	+ 5	e 23 33	+22	e 16 35	PP 42.5
Cheb	85.5	30	e 17 35	PPP	e 28 35	SS	—	—
Rome	91.4	36	—	—	e 24 34	+27	e 41 26?	Q e 46.4
Pretoria	z. 147.8	86	e 19 53?	[+ 9]	—	—	—	—

Additional readings :—

Pasadena iZ = 44s.

Fresno iZ = 1m.57s.

Berkeley iZ = 2m.14s.

Reno iN = 2m.39s.

Hungry Horse i = 3m.45s., e = 6m.10s., iS = 6m.50s.

Seattle e = 7m.17s.

Florissant i = 5m.2s.

St. Louis i = 5m.4s. and 6m.39s.

Cleveland eE = 10m.47s.

Strasbourg i = 12m.44s.

Besançon e = 12m.45s.

Malaga iPPPZ = 18m.25s., iPSZ = 24m.43s.

Long waves were also recorded at Honolulu, Puebla, Guadalajara, Ivigtut, Tamanrasset, Ksara, and many other American and European stations.

July 29d. 16h. 46m. 6s. Epicentre 2°·2N. 126°·9E. Depth of focus 0·010.

(as on 1949, November 7d.).

A = -·6000, B = +·7991, C = +·0382;  $\delta$  = +2; h = +7;

D = +·800, E = +·600; G = -·023, H = +·031, K = -·999.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Guam	20.9	57	4 55	+19	—	—	—	—
Djakarta	21.7	248	i 4 51 <sub>a</sub>	+ 7	i 8 52	+19	—	—
Nanking	30.6	346	i 6 7 <sub>a</sub>	0	i 10 56	- 4	i 6 32	pP
Hukuoka	z. 31.4	6	e 6 13	- 1	—	—	—	—
Matuyama	N. 31.9	9	i 6 17	- 1	e 11 20	- 1	7 1	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.
Hirosima	32.4	9	e 6	21	- 1	e 11	6	-23	—	—	—
Sumoto	32.8	13	i 6	24	- 2	11	32	- 3	—	—	—
Owase	32.9	15	e 6	22	- 5	—	—	—	e 7	49	PP
Osaka	33.3	14	e 6	29	- 1	—	—	—	—	—	—
Kyoto	33.7	14	e 6	30	- 4	—	—	—	—	—	—
Nagoya	34.1	15	6	36	- 1	11	52	- 3	—	—	—
Gihu	34.3	15	6	35	- 4	11	54	- 4	6	46	pP
Mera	34.7	19	6	52	+10	—	—	—	—	—	—
Hunato	34.9	17	i 6	41	- 3	e 12	0	- 7	—	—	—
Yokohama	35.1	18	e 6	52	+ 6	—	—	—	—	—	—
Tokyo	35.4	19	e 6	45	- 3	12	23	+ 8	8	12	PP
Perth	35.6	195	6	51	+ 1	12	24	+ 6	8	22	PPP
Kumagaya	35.7	17	e 6	47	- 4	—	—	—	e 8	35	PPP
Matusiro	35.7	15	6	48	- 3	12	14	- 6	9	25	P <sub>c</sub> P
Maebasi	35.8	17	e 6	51	- 1	e 11	58	-23	—	—	—
Nagano	35.8	15	e 6	49	- 3	12	20	- 1	8	2	PP
Mito	36.2	17	e 6	52	- 3	e 12	22	- 5	—	—	—
Hokusima	37.5	17	i 7	4	- 2	i 12	43	- 4	—	—	—
Sendai	38.1	19	e 7	8	- 3	i 12	51	- 5	—	—	e 17.5
Brisbane	E. 38.8	141	i 7	16	- 1	i 13	3	- 4	i 15	50	SS
Mizusawa	E. 39.0	19	7	17	- 1	13	10	0	—	—	—
Akita	39.2	17	e 7	22	+ 2	e 13	12	- 1	e 9	47	P <sub>c</sub> P
Hatinohe	40.4	18	7	32	+ 2	13	32	+ 1	—	—	—
Vladivostok	41.0	6	i 7	34	- 1	i 13	40	0	i 9	10	PP
Mori	41.6	15	e 7	40	0	e 13	48	0	e 9	38	PP
Riverview	42.5	149	i 7	48 <sup>a</sup>	+ 1	i 14	1	- 1	i 9	32	PP
Sapporo	42.7	16	i 7	48	- 1	e 14	4	- 1	8	35	pP
Colombo	E. 47.1	277	8	26	+ 2	15	9	+ 1	—	—	26.7
Hyderabad	E. 49.9	291	8	46	0	15	48	+ 1	19	35	SS
Irkutsk	53.3	343	i 9	12	+ 1	i 16	36	+ 2	e 11	11	PP
Dehra Dun	N. 54.0	307	e 15	24	?	—	—	—	—	—	—
New Delhi	54.1	305	e 9	16	- 1	i 16	41	- 3	12	21	PPP
Poona	E. 54.4	291	i 9	19	0	i 16	44	- 4	12	8	PPP
Bombay	55.4	291	e 9	29	+ 3	i 17	3	+ 1	20	54	SS
Auckland	N. 59.0	136	e 9	56	+ 4	—	—	—	—	—	—
Przhevalsk	59.0	321	i 9	53	+ 1	—	—	—	—	—	—
Cobb River	E. 59.9	141	e 9	55	- 3	e 19	39	?	e 12	56	PP
Kaimata	N.E. 59.9	143	e 9	58	0	—	—	—	—	—	—
Naryn	60.1	319	i 9	59	0	e 18	0	- 3	—	—	—
Arapuni	60.2	137	e 9	59	- 1	—	—	—	—	—	—
Murgab	60.2	314	9	56	- 4	18	2	- 2	—	—	—
Almata	60.3	321	e 9	29	-32	—	—	—	—	—	—
Christchurch	61.2	144	i 10	5	- 2	e 18	10	- 7	e 19	51	S <sub>c</sub> S
Wellington	61.3	141	i 10	4	- 4	i 18	9	- 9	e 21	57	SS
Tuai	N. 61.6	137	10	6	- 4	e 18	17	- 5	—	—	e 29.2
Frunse	61.6	318	i 10	10	0	i 18	28	+ 6	—	—	—
Semipalatinsk	62.1	329	—	—	—	e 18	25	- 3	—	—	—
Andijan	62.3	316	i 10	15	+ 1	i 18	34	+ 3	—	—	—
Fergana	62.5	316	10	17	+ 1	i 18	38	+ 4	—	—	—
Apia	62.8	106	10	15	- 3	e 18	38	+ 1	e 19	40	S <sub>c</sub> S
Kulyab	63.1	313	e 10	19	- 1	18	44	+ 3	—	—	—
Stalinabad	64.1	313	i 10	27	+ 1	i 18	53	0	—	—	—
Tashkent	64.4	315	i 10	30	+ 2	i 19	5	+ 8	—	—	—
Samarkand	65.7	313	10	36	0	19	12	- 1	—	—	—
Mary	69.0	311	10	58	+ 1	19	58	+ 5	—	—	—
Ashkabad	71.9	309	11	19	+ 5	—	—	—	—	—	—
Kizyl-Arvat	73.6	311	11	25?	+ 1	20	52?	+ 7	—	—	—
Sverdlovsk	75.3	329	i 11	34?	0	e 20	57?	- 7	i 11	48	P <sub>c</sub> P
Honolulu	75.5	69	i 11	32	- 3	i 21	6	0	e 12	17	pP
Baku	78.7	311	i 11	59?	+ 6	i 21	51?	+10	—	—	e 32.3

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.
Shemakla	79.7	311	i 11	54	- 5	i 21	50	- 2	—	—	—
Grozny	82.0	313	12	12	+ 1	22	20	+ 5	—	—	—
Tiflis	82.6	311	i 12	15	+ 1	i 22	26	+ 5	—	—	—
Erevan	82.8	310	e 12	25?	+10	e 22	30	+ 7	—	—	—
Leninakan	83.3	311	e 12	22?	+ 5	22	34?	+ 6	—	—	—
Borzhom	83.7	312	e 12	22	+ 3	e 22	34?	+ 2	—	—	—
Piatigorsk	84.0	314	12	19	- 2	22	34	- 1	—	—	—
Abastumanj	84.1	312	12	18?	- 3	e 22	30?	- 6	—	—	—
Zugdidi	84.8	313	i 12	30?	+ 5	e 22	46?	+ 3	—	—	—
College	86.0	25	i 12	28	- 3	i 22	39	[- 6]	i 15	48	PP e 36.2
Sotchi	86.5	314	e 12	32	- 1	e 22	49	[+ 2]	—	—	—
Moscow	87.8	326	e 12	41	+ 2	23	10	- 2	13	4	pP
Theodosia	89.5	315	e 12	49	+ 2	24	55	PS	—	—	—
Ksara	89.6	304	i 12	50	+ 2	i 23	49	+20	i 16	25	PP
Yalta	90.4	314	e 12	50	- 2	i 23	14?	[+ 2]	—	—	—
Pulkovo	91.4	330	i 12	56	0	i 23	44	- 1	e 16	40	PP
Sitka	92.4	33	i 13	0	- 1	i 24	0	+ 7	e 16	10	PP e 38.5
Helwan	93.7	300	i 13	8 <sub>a</sub>	+ 1	24	14	+ 9	16	54	PP
Kishinev	93.9	317	e 13	7	- 1	e 23	33	[+ 1]	—	—	—
Helsinki	94.0	331	—	—	—	e 23	32	[- 1]	e 24	29	S 46.9
Istanbul	94.5	313	e 13	6	- 4	—	—	—	e 16	21	PP
Bucharest	96.2	315	e 13	22	+ 4	i 24	49	+23	—	—	52.9
Lwow	96.6	321	e 13	27	+ 7	e 24	55	+26	e 16	36	PP
Pietermaritzburg z.	96.7	241	i 13	22	+ 2	—	—	—	—	—	—
Upsala	97.7	332	e 13	23	- 2	24	35	- 4	i 17	4	PP e 44.9
Warsaw	97.9	323	13	26	0	e 24	3	[+10]	17	16	PP e 51.9
Sofia	98.5	314	e 13	32	+ 3	i 23	59	[+ 2]	—	—	—
Pretoria z.	98.8	245	i 13	31?	+ 1	—	—	—	e 17	30?	PP
Skalnate Pleso	99.2	320	e 13	33	+ 1	e 24	3	[+ 3]	e 17	22	PP e 41.4
Timisoara	99.3	317	13	54?	+22	—	—	—	—	—	—
Grahamstown	99.8	237	i 13	37	+ 2	—	—	—	e 14	11	pP
Budapest	100.3	318	e 17	24	PP	i 24	9	[+ 4]	—	—	e 52.9
Ogyalla	100.8	319	e 19	10	?	e 24	11	[+ 3]	e 20	24	PPP
Victoria	101.3	40	i 13	41 <sub>k</sub>	0	24	13	[+ 3]	26	51	PS 45.9
Copenhagen	101.7	328	e 13	42	- 1	i 24	16	[+ 4]	i 24	48	SKKS
Seattle	102.2	40	i 13	47 <sub>a</sub>	+ 2	e 25	18	+ 2	e 18	2	PP e 43.9
Prague	102.5	323	e 13	44	- 3	e 24	17	[+ 1]	e 18	12	PP e 46.9
Potsdam	102.6	326	i 13	49	+ 2	e 24	18	[+ 2]	e 18	12	PP e 52.9
Collmberg	103.0	323	e 18	24	PP	e 24	24	[+ 6]	e 25	54	S e 52.9
Bergen E.	103.1	334	—	—	—	e 24	16	[- 2]	—	—	e 50.9
Taranto	103.4	312	e 14	27	+37	24	38	[+18]	19	8	PP e 57.6
Cheb	103.8	323	e 18	14	PP	e 24	22	[ 0]	e 27	8	PS
Jena	103.9	324	e 13	53	0	e 24	21	[- 1]	e 18	14	PKP
Ukiah	103.9	49	—	—	—	e 24	25	[+ 3]	e 31	3	SS e 40.1
Shasta Dam	104.1	46	i 13	53	0	e 24	18	[- 5]	e 18	9	PKP
Triest	104.4	318	e 13	59	+ 4	i 24	26	[+ 1]	e 18	3	PKP
Scoresby Sund	104.6	351	i 13	56	0	e 25	44	+ 8	i 24	29	SKS 53.9
Berkeley	105.0	50	e 13	56 <sub>a</sub>	P	e 24	30	[+ 2]	e 18	0	PP
Messina	105.3	311	e 14	5	P	e 24	30	[+ 1]	e 18	17	PP
Santa Clara	105.3	50	e 18	12	PP	e 24	46	[+17]	—	—	e 26.4
Lick z.	105.6	50	i 14	0 <sub>a</sub>	P	—	—	—	i 18	13	PP
Stuttgart	106.2	322	e 14	3	P	e 24	34	[+ 1]	e 18	25	PP e 51.9
Reno	106.3	47	e 14	4 <sub>a</sub>	P	e 24	18	[-15]	e 18	8	PP
Rocca di Papa	106.3	315	e 20	17	PPP	e 28	47	PS	—	—	—
Bologna	106.4	318	e 14	46	P	e 24	40	[+ 7]	e 18	37	PP
Rome	106.4	315	e 14	3 <sub>a</sub>	P	24	37	[+ 4]	18	25	PP
Florence Arc.	106.7	318	e 18	31	PP	e 24	32	[- 3]	—	—	—
Florence Xim.	106.7	318	e 14	3	P	—	—	—	e 18	30	PP
Chur	106.7	321	e 14	5 <sub>a</sub>	P	e 24	30	[- 5]	e 18	14	PP
De Bilt	107.1	327	e 14	7	P	i 24	41	[+ 5]	i 27	40	PS e 48.9
Strasbourg	107.1	323	e 14	6 <sub>k</sub>	P	e 24	39	[+ 3]	e 18	14	PKP e 52.9
Zürich	107.1	322	e 14	13	P	e 24	38	[+ 2]	e 18	4	PP
Fresno	107.2	49	e 14	6 <sub>a</sub>	P	—	—	—	e 18	30	PP
Hungry Horse	107.2	37	i 13	57	P	e 27	38	PS	i 29	48	PKKP
Pavia	107.6	319	e 13	54?	P	—	—	—	—	—	—

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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.
Basle	107.7	322	18 14	[ 0]	—	—	23 24	?
Aberdeen	108.1	333	i 18 43	PP	i 24 46	[+ 5]	i 27 51	PS
Tinemaha	N. 108.2	50	i 14 12	P	—	—	i 18 19	PKP
Neuchatel	108.3	322	i 18 1	[-15]	e 26 36	S	—	—
Haiwee	z. 108.7	50	e 14 15	P	—	—	i 18 20	PKP
Besançon	108.8	322	e 14 14	P	—	—	e 18 20	PKP
Butte	N. 109.1	39	e 18 14	[- 4]	e 26 22	S	—	e 45.1
Pasadena	109.1	53	i 14 16	P	i 24 51	[+ 6]	i 18 21	PP
Durham	109.2	331	i 19 21	PP	i 24 48	[+ 3]	i 28 7	PS
Edinburgh	E. 109.3	333	e 18 54	PP	—	—	—	—
Saskatoon	109.6	31	18 50	PP	24 53	[+ 6]	25 43	SKKS
Riverside	z. 109.8	53	e 14 18	P	—	—	i 18 21	PP
Bozeman	110.2	39	e 18 55	PP	e 24 53	[+ 3]	e 28 12	PS
Paris	110.2	325	e 14 22	P	i 24 57	[+ 7]	e 18 22	PKP
Kew	110.4	328	e 17 10	?	e 28 13	PS	e 29 16	PPS
Palomar	z. 110.4	54	e 14 21	P	i 18 46	PP	e 18 25	PKP
Boulder City	111.2	49	i 18 25	[+ 3]	—	—	i 19 57	PP
Overton	z. 111.3	48	i 14 27	P	—	—	i 18 25	PKP
Salt Lake City	111.6	43	e 18 51	PP	e 23 57	[-58]	e 26 29	S
Pierce Ferry	111.8	49	i 14 28	P	—	—	i 18 26	PKP
Clermont-Ferrand	111.9	321	e 14 28	P	e 25 4	[+8]	e 18 25	PKP
Rathfarnham Castle	112.3	332	i 18 26	[+ 11]	i 29 17	PS	i 19 5	PP
Algiers Univ.	z. 115.1	313	i 18 31 <sub>a</sub>	[+ 1]	i 29 7	PS	i 19 37	PP
Tortosa	115.2	317	i 19 20	PP	i 28 52	PS	—	—
Tucson	115.6	52	i 18 33	[+ 2]	e 26 33	S	e 19 31	PP
Ivigtut	116.7	357	19 36	PP	36 8	SS	—	—
Alicante	117.0	316	18 49	[+15]	25 55	[+39]	20 9	PP
Tamanrasset	z. 117.7	297	e 18 36	[+ 1]	e 25 14	[- 5]	i 19 58	PP
Toledo	z. 118.7	319	i 18 38	[+ 1]	e 29 42	PS	i 20 0	PP
Granada	119.7	316	18 30	[- 9]	25 27	[+ 1]	19 42	PP
Malaga	z. 120.5	316	i 18 40 <sub>k</sub>	[ 0]	22 22	PKS	e 29 40	PS
Chicago	126.1	32	e 20 7	PP	e 27 19	SKKS	e 28 25	SS
Florissant	126.7	36	i 18 52	[ 0]	i 32 17	PPS	e 20 45	PP
St. Louis	126.9	36	i 18 52	[- 1]	e 22 12	PKS	e 30 42	PS
Shawinigan Falls	N. 128.4	16	e 18 56	[ 0]	—	—	—	—
Seven Falls	E. 128.5	15	e 21 4	PP	—	—	—	—
Ottawa	128.5	20	e 18 42	[-14]	25 48	[- 4]	19 34	pPKP
Cleveland	129.4	27	e 18 58	[+ 1]	e 22 19	PKS	i 21 6	PP
Cincinnati	129.7	31	i 18 58	[ 0]	—	—	i 21 6	PP
Tacubaya	129.9	63	e 19 3	[+ 5]	e 22 19	PKS	—	—
Vermont	130.2	19	e 22 26	PKS	e 41 2	SS	—	—
Pittsburg	131.0	26	i 22 38	PKS	—	—	—	—
Halifax	132.4	9	e 22 33	PKS	—	—	—	—
Harvard	132.5	17	i 18 49	[-14]	i 22 10	PKS	e 21 13	PP
Weston	132.7	17	i 19 4	[ 0]	e 28 10	SKKS	i 21 28	PP
Vera Cruz	132.7	60	e 18 39	[-25]	e 29 29	?	—	—
City College, N.Y.	133.1	21	i 19 5	[+ 1]	—	—	i 21 36	PP
Fordham	133.1	21	e 19 4	[ 0]	i 22 24	PKS	—	—
Philadelphia	133.4	22	e 19 11	[+ 6]	i 22 35	PKS	e 21 22	PP
Washington	133.5	25	i 19 5	[ 0]	—	—	i 21 31	PP
Columbia	135.4	33	—	—	e 22 36	PKS	—	—
Miami	141.6	40	e 19 20	[ 0]	—	—	—	—
Bermuda	143.9	16	e 19 4	[-20]	e 26 44	[+22]	e 23 4	PKS
Swan Island	143.9	55	i 19 25	[+ 1]	—	—	—	—
La Plata	147.2	173	i 19 31	[+ 1]	—	—	—	—
Buenos Aires	147.4	173	e 19 35	[+ 5]	—	—	—	—
Guantanamo Bay	149.2	42	i 19 39	[+ 6]	—	—	—	—
Balboa Heights	151.4	66	e 19 38	[+ 2]	—	—	—	—
Galerzamba	154.5	58	i 17 7	?	—	—	—	—
San Juan	155.9	30	e 22 14	PP	i 25 54	[-43]	e 50 4	SSS
Huancayo	155.9	115	i 19 48	[+ 6]	e 30 39	SKKS	i 24 27	PP
Roosevelt Roads	156.2	28	i 19 45	[+ 2]	—	—	—	—
Chinchina	156.4	70	i 19 45	[+ 2]	e 30 30	SKKS	23 47	PKS
Bogota	158.0	70	e 19 47	[+ 2]	e 24 0	SKP	e 20 20	PKP <sub>1</sub>
La Paz	159.5	135	i 19 53 <sub>a</sub>	[+ 6]	i 31 12	SKKS	i 20 32	PKP <sub>2</sub>
Fort de France	161.4	25	e 19 48	[- 1]	e 24 20	PP	i 20 28	PKP <sub>3</sub>

For Notes see next page.

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NOTES TO JULY 29d. 16h. 46m. 6s.

Additional readings :—

Nanking iZ = 6m.16s., isP?Z = 6m.43s., iPPZ = 7m.3s.  
Hiroshima e = 8m.6s.  
Osaka e = 8m.20s.  
Kyoto e = 8m.36s.  
Gihu PP = 7m.30s., PPP = 7m.53s., SP = 12m.5s., i = 12m.43s., SS = 13m.16s.  
Tokyo PPP = 8m.34s., e = 9m.7s. and 9m.38s., Q = 14m.34s.  
Perth SS = 14m.36s.  
Matusiro i = 15m.26s.  
Nagano PPP = 8m.45s.  
Brisbane iP = 7m.56s., iE = 9m.5s., eE = 12m.49s., iE = 13m.58s.  
Mizusawa eSN = 13m.6s.  
Akita e = 7m.44s., 11m.0s., and 13m.45s.  
Riverview iZ = 8m.21s., iNZ = 9m.35s., iPPPEZ = 9m.52s., iN = 9m.54s., iZ = 10m.15s.,  
iN = 14m.12s., iSS?Z = 17m.13s., iN = 17m.16s., iE = 17m.27s., iSSSN = 17m.40s.  
Irkutsk epP = 9m.39s., SS = 20m.22s.  
New Delhi eN = 12m.53s., PPSN = 16m.59s., iN = 17m.36s., iScSN = 18m.55s., SSN =  
20m.12s., iN = 20m.56s. and 21m.16s., SSSN = 22m.5s.  
Poona PcSE = 13m.58s., ScSE = 18m.51s., iSSE = 20m.34s.,  
Bombay eE = 12m.54s.?  
Christchurch e = 14m.14s., eSSN = 22m.14s., eQEN = 25m.24s.  
Sverdlovsk epP = 11m.56s., iSKS = 21m.22s.  
Honolulu e = 22m.0s.  
College eSS = 28m.19s., ePKKP = 30m.24s., ePKP,PKP = 38m.18s.  
Moscow SKS = 22m.57s.  
Pulkovo eSKS = 23m.18s.  
Sitka iS = 18m.28s., iPS = 24m.38s., eSS = 30m.2s.  
Helwan eZ = 15m.6s. and 16m.22s., SKSE = 23m.36s., PSN = 25m.18s.  
Helsinki ePS = 26m.33s.  
Upsala ePPN = 17m.9s., ePPP?N = 19m.31s., eN = 23m.28s., eSKSN = 23m.46s., iSKSE =  
23m.50s., SKKSE = 24m.17s., S?E = 24m.39s., S?N = 24m.44s., ePS = 25m.54s.,  
eSN = 31m.12s., eSS?E = 31m.30s., eSSS = 34m.54s.  
Warsaw eZ = 13m.59s. and 18m.22s., PPPNZ = 19m.33s., eZ = 20m.30s. and 22m.27s.,  
eSKKSEN = 24m.26s., eSKKSZ = 24m.32s., eSEN = 24m.58s., eSZ = 25m.3s., ePS =  
26m.10s., ePPSEZ = 26m.58s., eN = 29m.27s., eSSEZ = 31m.22s., eSSN = 31m.28s.,  
eSSSEZ = 35m.19s.  
Pretoria iZ = 13m.55s.?, eZ = 16m.46s.?, ePKKPZ = 30m.26s.?.  
Skalnate Pleso eE = 13m.53s., e = 17m.5s., 17m.49s., and 18m.40s., ePPP = 20m.0s.,  
eSKKS = 24m.26s., eS? = 25m.5s., e = 25m.34s., ePS = 26m.0s., ePPS = 26m.39s.,  
eSS = 30m.54s.?, eSSS = 35m.36s.  
Budapest ePN = 18m.18s., eN = 24m.14s. and 25m.19s.  
Ogyalla e = 21m.4s. and 22m.19s., eSKKS?E = 24m.39s., eS? = 25m.33s., ePS = 26m.35s.,  
ePPS = 27m.22s., e = 30m.24s., eSS? = 31m.38s., eSSS = 37m.0s.  
Copenhagen 17m.54s., PS = 26m.39s., PPS = 28m.19s., SS = 32m.23s.  
Seattle e = 14m.21s. and 18m.30s., eSKS = 24m.24s., ePS = 27m.8s., ePPS = 27m.54s.,  
e = 29m.14s., eSS = 32m.24s., e = 36m.4s., eSKKS = 37m.29s., ePKP,PKP = 38m.14s.  
Prague ePPP = 20m.6s., eSKKS = 25m.3s., ePS = 27m.4s., ePPS = 27m.54s., eSS =  
32m.24s., eSSS = 36m.18s. and other e readings.  
Potsdam eZ = 13m.44s., ePPEN = 18m.15s., ePPP?Z = 20m.13s., eSKKSE = 25m.18s.,  
iSN = 25m.48s., iPS?Z = 26m.58s.?, iPPSZ = 28m.12s., eSS?E = 33m.18s., iSSSZ =  
37m.9s. and other unidentified e and i readings.  
Collmberg eN = 18m.30s., ePS?E = 26m.54s., eSS?N = 33m.42s., eSSS?N = 37m.30s.  
Taranto eS = 26m.39s., e = 32m.38s.  
Cheb e = 18m.25s., ePPS = 27m.57s., eSS = 33m.6s.  
Jena ePP?N = 18m.22s., eSKS?N = 24m.24s., eS?N = 25m.43s. and other unidentified  
e readings.  
Shasta Dam e = 17m.24s., ePKKP? = 31m.53s.  
Triest ePP = 18m.25s., ePPP = 20m.39s., iSKKS = 24m.54s., iS = 25m.49s., iPS =  
27m.24s., iPPS = 28m.20s., iSS = 33m.2s.  
Scoresby Sund 17m.54s. and 18m.21s., SKKS = 25m.13s., PS = 27m.24s., PPS = 28m.6s.,  
SS = 32m.1s., SSS = 36m.54s.?.  
Berkeley iZ = 14m.56s. and 18m.13s., iEZ = 18m.18s., Z = 18m.44s., eZ = 27m.19s.  
Messina e = 18m.51s. and 25m.41s., ePS? = 27m.33s.  
Lick iZ = 14m.5s. and 18m.40s.  
Stuttgart e = 14m.34s., eZ = 17m.12s., e = 19m.1s. and 25m.4s., eS = 26m.5s., ePS =  
27m.25s., ePPS = 28m.24s., eSS = 33m.18s., eSSS = 37m.24s.  
Reno eZ = 19m.18s. and 21m.26s., eN = 24m.38s., eZ = 26m.1s.  
Bologna e = 19m.13s. and 25m.1s.  
Rome eE = 19m.47s., eSN = 26m.12s., iPSE = 27m.27s., iE = 28m.35s., SS = 33m.20s.,  
SSS = 38m.31s.?.  
Chur e = 17m.21s.  
De Bilt eSS = 33m.54s.  
Strasbourg ePP = 18m.48s., ePPP = 21m.15s., eSKP? = 22m.5s., eS = 26m.13s., ePS =  
27m.55s. and 28m.16s., eSS = 33m.39s., eSSS? = 39m.4s., and many unidentified e  
readings.  
Zürich e = 19m.4s.  
Fresno eZ = 14m.37s., 17m.35s., and 21m.26s.

Continued on next page.



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Hungry Horse e = 17m.30s., i = 29m.31s.  
 Aberdeen iE = 19m.37s.  
 Tinemaha eZ = 18m.40s. and 18m.53s.  
 Haiwee iZ = 18m.43s.  
 Besançon e = 14m.28s. and 17m.48s., ePP = 18m.57s.  
 Pasadena iZ = 14m.35s. and 18m.47s., eEN = 25m.36s., iPS = 28m.2s., eSSEN = 34m.3s., eQ = 44.4m.  
 Durham iEN = 29m.8s.  
 Saskatoon PS = 28m.18s., SS = 33m.58s.  
 Riverside iZ = 18m.51s.  
 Bozeman eSS = 32m.58s., eSSS? = 37m.21s.  
 Paris iPP = 18m.57s., iPPP = 21m.15s., iS = 26m.38s., iPS = 28m.11s., iPPS = 29m.17s., eSS = 34m.39s., eSSS = 38m.17s., and other unidentified readings.  
 Kew eSSEN = 34m.14s.  
 Salt Lake City ePS? = 28m.25s.  
 Clermont-Ferrand e = 17m.57s., iPP = 19m.6s., i = 19m.40s., and 20m.40s., iPS = 28m.24s., ePPS = 29m.32s., eSS = 34m.42s.  
 Rathfarnham Castle eZ = 18m.38s. and 18m.58s., eEN = 20m.41s. and 28m.26s., eSSEN = 34m.24s.  
 Algiers Univ. ePPPZ = 21m.58s., eZ = 24m.31s. and 32m.9s.  
 Tucson eS = 27m.7s., iPS = 29m.4s., eSS = 35m.42s.  
 Alicante PKS = 22m.9s., PPP = 22m.39s., SKKS = 27m.1s., SS = 36m.1s., SSS = 40m.13s., Q = 48m.9s.  
 Tamanrasset eZ = 15m.14s. and 15m.21s., iZ = 21m.12s., iSKPZ = 22m.19s., iZ = 26m.25s., iPKKZ = 28m.59s., ePPSZ = 30m.43s., eZ = 31m.50s., SSZ = 36m.17s.  
 Toledo iZ = 28m.54s.  
 Granada SKKS = 26m.54s., PS = 29m.42s., PPS = 30m.39s., iSS = 36m.36s.  
 Malaga ePPSZ = 31m.10s., SSZ = 36m.8s.  
 Chicago eS? = 30m.55s.  
 St. Louis e = 18m.39s., i = 19m.30s., ePPS = 32m.31s.  
 Ottawa i = 18m.56s., PP = 21m.4s., sPP = 22m.18s., SKKS = 27m.49s., SKKP = 31m.54s.  
 Cleveland eN = 31m.3s., ePSE = 31m.16s., eSSE = 38m.17s.  
 Cincinnati i = 19m.17s. and 19m.51s.  
 Harvard iPKP = 19m.4s., e = 19m.24s. and 19m.38s., i = 21m.28s., i = 22m.22s., ePPP = 23m.41s., eSKSP = 30m.58s., ePS? = 32m.12s., e = 32m.41s., ePPS = 33m.19s.  
 Weston e = 18m.48s., iPKS? = 22m.33s.  
 Fordham e = 18m.51s.  
 Philadelphia e = 28m.16s., ePS = 31m.56s., eSS = 39m.10s.  
 Bermuda e = 29m.24s. and 34m.2s., eSS = 41m.39s., eSSS? = 46m.44s.  
 La Plata PE = 19m.34s., Z = 20m.0s., E = 20m.6s., N = 20m.12s.  
 San Juan e = 35m.6s.  
 Huancayo i = 20m.14s., ePS = 33m.24s., iSKSP = 34m.18s., eSS = 41m.9s., eSSS = 45m.44s.  
 Chinchina ePKP, EN = 19m.58s., ePPS?EN = 44m.18s.  
 Bogota ePSKSEN = 34m.42s.  
 La Paz iPPZ = 24m.8s., PKS = 25m.54s., iPPS = 37m.58s., SS = 44m.38s., SSS = 45m.36s.

July 29d. 18h. 42m. 44s. Epicentre 33°·2N. 115°·7W. (as at 14h.).

		$\Delta$	Az.	P.	O - C.	S.	O - C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m.	s.	m.
Palomar		1.0	279	i 0 20 <sub>a</sub>	- 1	—	—	—	—	—
La Jolla		1.4	256	i 0 25 <sub>a</sub>	- 2	i 0 44	- 2	—	—	—
Riverside		1.5	300	i 0 29 <sub>a</sub>	+ 1	—	—	—	—	—
Pasadena	z.	2.3	295	i 0 42	+ 2	—	—	—	—	—
Boulder City		2.8	14	e 0 49	+ 2	i 1 30	S <sub>r</sub>	—	—	—
Pierce Ferry		3.2	25	i 0 51	- 1	—	—	—	—	—
Overton	z.	3.5	18	i 0 58	+ 1	—	—	—	—	—
Tucson		4.2	102	e 1 2	- 5	i 1 51	- 6	i 1 22	P <sub>r</sub>	i 2.8
Fresno		4.9	317	e 1 24 <sub>a</sub>	+ 7	e 2 39	S <sub>r</sub>	e 1 42	P <sub>r</sub>	—
Lick		6.4	312	i 1 38 <sub>a</sub>	0	e 2 50	- 3	i 2 8	P <sub>r</sub>	e 3.4
Santa Clara	E.	6.6	311	—	—	i 3 40	S <sub>r</sub>	—	—	e 4.1
Berkeley		7.1	313	i 2 20 <sub>a</sub>	P <sub>r</sub>	i 3 55	S <sub>r</sub>	—	—	e 4.3
Reno		7.1	334	e 2 6	P <sub>r</sub> *	e 4 1	S <sub>r</sub>	e 2 24	P <sub>r</sub>	e 4.4
Shasta Dam		9.2	326	e 4 31	S*	—	—	—	—	—
Hungry Horse		15.2	4	e 3 45	+ 7	—	—	—	—	—

Additional readings :—

Boulder City iP = 54s.

Tucson e = 1m.15s.

Fresno eN = 1m.32s. and 8m.49s.

Long waves were also recorded at many other American stations.

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July 29d. 23h. 49m. 9s. Epicentre 6°·5S. 155°·0E. Depth of focus 0·010.  
(as on 1948, July 20d.).

Epicentre as suggested by Gutenberg. Depth 70km.

M. Ewing and F. Press.

Crustal structure and surface wave dispersion, Part II: Solomon Islands Earthquake of July 29, 1950. Bull. Seismo. Soc., Amer., vol. 42, No. 4, October, 1952, pp. 315-325 with 5 figs.

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

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.	
	°	°	m. s.	s.	m. s.	s.	m. s.	m.	
Brisbane	20·9	187	i 4 36	0	i 8 31	+12	i 4 58	PP	—
Guam	22·3	333	6 18	?	—	—	—	—	—
Riverview	27·4	188	i 5 40 <sub>a</sub>	+ 2	i 10 13	+ 3	i 6 22	PP	e 13·0
Apia	33·5	106	e 6 32	0	e 12 6	+20	e 8 1	PPP	e 14·0
Auckland	N. 35·2	153	i 6 52	+ 5	i 12 20	+ 8	—	—	i 17·1
Arapuni	36·6	153	6 57	- 1	e 12 38	+ 5	—	—	—
New Plymouth	36·7	154	e 7 1	+ 2	e 12 44	+ 9	—	—	—
Cobb River	E. 37·9	158	e 7 9	0	e 12 58	+ 5	—	—	—
Tuai	N. 37·9	152	7 9	0	e 12 55	+ 2	—	—	—
Kaimata	N.E. 38·7	161	e 7 17	+ 1	i 13 11	+ 6	—	—	—
Wellington	38·9	157	i 7 16	- 2	13 4	- 4	e 8 51	PP	16·3
Christchurch	40·0	161	i 7 26	- 1	13 18	- 7	i 7 51	pP	18·4
Yokohama	44·1	342	e 9 5	PP	—	—	—	—	—
Tokyo	44·3	342	7 56	- 6	14 28	0	9 32	PP	e 19·8
Perth	44·4	230	7 56	- 7	14 37	+ 8	17 59	SS	—
Hunatu	44·5	343	8 3	0	—	—	—	—	—
Kameyama	44·7	339	e 8 9	+ 4	—	—	—	—	—
Kōti	44·7	335	e 8 5	0	e 14 48	+14	e 10 9	PP	20·3
Osaka	44·9	337	e 8 44	+37	—	—	—	—	—
Sumoto	44·9	337	e 8 11	+ 4	—	—	—	—	e 19·3
Kumagaya	44·9	342	e 8 12	+ 5	—	—	e 10 24	PP	—
Utunomiya	45·1	344	e 8 6	- 2	—	—	—	—	—
Maebasi	45·2	342	e 8 14	+ 5	—	—	e 18 28	SS	—
Matusiro	45·6	342	e 8 13	+ 1	—	—	e 18 11	SS	—
Nagano	45·7	342	e 8 17	+ 4	—	—	e 9 59	PP	—
Hukushima	46·1	347	8 21	+ 5	e 13 25	-89	(e 18 17)	SS	e 18·3
Hukuoka	46·2	332	e 8 32	+15	e 15 11	+16	19 7	SS	25·2
Morioka	47·7	348	e 8 19	-10	—	—	—	—	—
Djakarta	47·9	268	i 8 30 <sub>a</sub>	0	i 15 22	+ 3	—	—	—
Mori	50·1	348	8 51	+ 4	e 16 0	+10	—	—	—
Sapporo	50·9	348	e 8 58	+ 5	e 16 16	+15	—	—	e 23·7
Nanking	51·6	321	i 8 59 <sub>a</sub>	+ 1	i 16 16	+ 6	10 54	PP	22·4
Vladivostok	53·7	339	i 9 13	- 1	i 16 42	+ 3	—	—	—
Honolulu	53·9	57	i 9 15	- 1	e 16 41	0	e 11 20	PP	21·6
Irkutsk	72·7	330	i 11 18	- 1	e 20 39	+ 4	13 54	PP	—
Colombo	E. 76·1	279	11 41	+ 2	21 21	+ 8	—	—	40·2
Dehra Dun	N. 82·1	303	e 18 48	?	—	—	—	—	—
New Delhi	82·5	300	e 12 13	0	i 22 22	+ 2	i 22 57	PS	34·0
College	82·6	20	e 12 13	- 1	i 22 23	+ 2	e 15 21	PP	e 34·1
Poona	83·7	290	12 16	- 3	i 22 33	+ 1	15 22	PP	37·8
Bombay	84·7	290	e 12 24	0	22 45	+ 3	28 27	SS	34·8
Sitka	84·8	31	i 12 25	0	i 22 47	+ 4	e 15 39	PP	e 34·8
Naryn	86·1	313	i 12 32	+ 1	—	—	—	—	—
Murgab	87·0	309	12 40	+ 4	23 10	+ 6	e 24 28	PS	—
Frunse	87·4	314	i 12 39	+ 2	e 23 15	+ 7	—	—	—
Ukiah	87·7	50	e 12 46	+ 7	e 23 3	- 8	e 15 53	PP	e 35·4
Berkeley	88·2	52	i 12 43 <sub>a</sub>	+ 2	e 23 39	[-20]	e 16 7	PP	e 39·4
Santa Clara	88·4	52	i 12 37	- 5	e 23 27	+ 9	e 16 14	PP	e 40·4
Shasta Dam	88·5	49	i 12 45	+ 2	e 23 7	[+ 6]	e 16 14	PP	e 41·5
Lick	88·6	52	i 12 45 <sub>a</sub>	+ 2	—	—	i 13 6	pP	e 43·1
Fergana	89·0	311	12 45	0	e 23 32	ScS	—	—	—
Victoria	89·3	41	i 12 47 <sub>a</sub>	+ 1	23 37	+11	22 51	SKS	40·2
Seattle	89·9	42	i 12 51 <sub>a</sub>	+ 2	e 23 39	+ 8	e 16 23	PP	e 41·8
Fresno	z. 90·0	53	i 12 52 <sub>a</sub>	+ 2	e 24 44	PS	e 16 19	PP	e 41·4
Kulyab	90·2	308	e 12 49	- 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.
Obi-garm	90.4	309	i 12 52	0	23 40	+ 4	—	—
Reno	90.4	50	i 12 55 <sup>k</sup>	+ 3	e 23 40	+ 4	e 16 28	PP e 44.1
Pasadena	91.0	56	i 12 57 <sup>a</sup>	+ 3	e 23 18	[+ 2]	i 16 31	PP e 36.6
Stalinabad	91.1	309	e 12 59	+ 4	i 23 51	+ 9	i 16 38	PP
Tinemaha	91.2	53	i 12 58 <sup>a</sup>	+ 3	i 38 27	P'P'	i 16 38	PP
Haiwee	91.4	54	i 12 59 <sup>a</sup>	+ 3	—	—	—	—
Riverside	91.6	56	i 12 58 <sup>a</sup>	+ 1	e 38 29	P'P'	i 16 7	PP
Palomar	92.0	57	i 13 3 <sup>a</sup>	+ 4	e 38 35	P'P'	i 16 37	PP
Samarkand	92.6	309	e 13 1	- 1	23 26	[+ 2]	—	—
Boulder City	93.9	54	i 13 11	+ 3	e 38 30	P'P'	e 30 16	PKKP
Overton	z. 94.3	53	i 13 12	+ 2	i 38 29	P'P'	i 17 1	PP e 44.8
Pierce Ferry	94.6	54	i 12 43	- 28	—	—	—	e 45.5
Hungry Horse	95.5	42	i 13 16	+ 1	e 24 13	- 7	e 17 14	PP e 45.2
Butte	n. 96.3	44	e 13 30	+ 11	e 23 55	[+ 10]	e 16 58	PP e 40.2
Tucson	96.9	58	e 13 25	+ 4	e 24 24	- 8	e 17 17	PP e 40.5
Bozeman	97.4	45	e 13 20	- 4	e 23 58	[+ 7]	e 17 11	PP e 39.2
Sverdlovsk	97.8	327	i 13 23	- 3	i 23 55	[+ 2]	i 17 31	PP
Ashkabad	99.2	307	e 17 22	PP	—	—	—	—
Saskatoon	100.2	38	13 37	+ 1	24 11	[+ 6]	17 42	PP 43.4
Tananarive	104.2	249	—	—	e 33 13	SS	e 37 10	SSS e 50.8
Baku	105.7	310	e 18 31?	PP	—	—	—	—
Shemakla	106.6	311	i 18 31	PP	—	—	—	—
Tacubaya	107.0	71	e 18 14	[ 0]	—	—	—	—
Lincoln	E. 108.1	48	e 18 32	PP	e 28 4	PS	e 21 4	PPP e 42.2
Grozny	108.4	313	e 18 41	PP	e 24 49	[+ 7]	e 28 8	PS
Tiflis	109.4	312	i 14 16	P	e 24 55	[+ 9]	i 18 54	PP
Vera Cruz	109.9	72	e 18 17	[- 3]	e 33 53	SS	—	—
Moscow	110.6	328	e 14 21	P	24 57	[+ 6]	18 57	PP
Pulkovo	112.5	333	e 19 11	PP	i 24 4	[- 55]	e 28 33	PS
Florissant	113.2	50	e 18 8	?	i 26 16	SKKS	i 19 14	PP e 52.8
St. Louis	113.3	50	e 18 28	[+ 1]	i 28 57	PS	i 19 18	PP e 53.8
Chicago	114.6	46	e 19 28	PP	e 27 10	S	e 29 8	PS e 52.7
Pietermaritzburg	z. 115.9	233	e 18 3	[- 29]	—	—	i 29 12	PKKP
Scoresby Sund	116.1	359	e 14 52	P	29 21	PS	e 18 36	PKP
Yalta	116.3	317	e 14 47	P	e 25 19	[+ 6]	e 18 31	PKP
Grahamstown	117.1	227	i 19 7	[+ 33]	—	—	i 29 34	PKKP
Cincinnati	117.6	48	14 57	P	i 29 32	PS	i 18 38	PKP 55.8
Ksara	117.7	304	i 18 38	[+ 3]	29 10	PS	19 42	PP
Upsala	117.8	338	e 17 26	?	e 25 20	[+ 1]	e 19 16	PP e 46.8
Helwan	z. 118.6	301	i 18 45 <sup>a</sup>	[+ 8]	e 30 12	PS	19 12	pPKP
Kishinev	118.9	322	e 18 38	[ 0]	—	—	—	—
Cleveland	119.1	46	i 18 39 <sup>k</sup>	[+ 1]	e 25 31	[+ 8]	i 19 59	PP
Pretoria	z. 119.2	236	i 18 39?	[+ 1]	—	—	e 28 53?	PKKP
Pittsburgh	120.5	45	i 20 13	PP	—	—	—	—
Warsaw	120.9	329	18 44	[+ 3]	e 25 38	[+ 9]	i 20 32	PP e 61.8
Istanbul	121.0	315	e 20 9	PP	—	—	—	—
Ottawa	121.5	39	i 18 43 <sup>a</sup>	[+ 1]	25 35	[+ 4]	20 8	PP 55.8
Swan Island	121.5	73	e 19 46	PP	—	—	—	—
Bergen	E. 121.6	343	—	—	e 29 48?	PS	—	—
Columbia	121.6	53	e 20 13	PP	e 25 41	[+ 9]	e 29 53	PS e 50.4
Bucharest	121.7	319	e 20 19	PP	e 30 17	PS	i 22 24	PPP 56.8
Pennsylvania	N. 121.9	45	i 20 19	PP	(e 25 43)	[+ 10]	i 22 24	PPP e 25.7
Copenhagen	122.7	336	i 18 48	[+ 3]	25 44	[+ 9]	20 18	PP
Ivigtut	122.7	12	i 18 47	[+ 2]	30 19	PS	i 20 26	PP 56.8
Skalnate Pleso	123.0	327	e 20 29	PP	e 25 38	[+ 2]	e 30 3	SKSP
Washington	123.2	46	e 19 6	[+ 20]	—	—	i 20 26	PP e 51.1
Vermont	123.6	40	e 20 30	PP	e 30 32	PS	e 37 5	SS e 50.4
Seven Falls	E. 123.7	35	18 51	[+ 4]	e 25 40	[+ 2]	e 20 31	PP 59.8
Miami	123.9	62	e 20 33	PP	—	—	—	—
Philadelphia	124.1	45	e 20 40	PP	e 25 56	[+ 16]	e 30 26	PS e 56.4
Timisoara	124.2	322	e 18 51?	[+ 4]	—	—	—	68.8

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.
Budapest	124.5	325	e 20 16	PP	e 38 31	?	e 31 51 <sup>†</sup>	PPS e 58.8
Potsdam	124.6	333	i 18 53 <sup>k</sup>	[+ 5]	e 30 31	PS	i 20 41	PP e 59.8
City College, N.Y.	124.7	44	e 18 50	[+ 2]	—	—	e 20 33	PP —
Fordham	124.7	44	i 18 50	[+ 2]	—	—	i 20 31	PP 60.8
Ogyalla	124.8	326	e 20 43	PP	e 26 3	[+ 21]	e 23 24	PPP —
Kalossa	N. 125.1	325	e 18 28	[- 21]	e 25 38	[- 5]	e 20 47	PP —
Collmborg	125.4	332	e 21 27	PKS	e 38 9	SSP	—	e 58.8
Prague	125.5	330	e 18 55	[+ 5]	e 26 13	[+ 29]	e 20 19	PP e 54.8
Harvard	125.5	41	i 18 51	[+ 1]	e 30 36	PS	i 20 38	PP e 56.0
Weston	125.7	41	i 18 52	[+ 2]	e 37 45	SS	e 20 40	PP —
Jena	N. 126.3	331	e 18 55	[+ 4]	—	—	e 21 23	PP —
Aberdeen	126.4	345	i 20 48	PP	30 51	PS	37 57	SS e 57.9
Cheb	126.5	331	e 19 13	[+ 21]	e 27 42	SKKS	e 20 51	PP e 56.4
Huancayo	126.7	110	i 18 57	[+ 5]	i 22 19	PKS	i 20 57	PP e 52.7
Edinburgh	E. 127.8	344	e 20 51	PP	—	—	—	—
De Bilt	128.2	337	i 18 58	[+ 3]	e 22 15	PKS	i 21 0	PP e 55.9
Durham	128.3	343	i 21 1	PP	i 27 54	SKKS	i 22 21	PKS 68.5
Triest	128.6	326	e 18 50	[- 6]	i 25 59	[+ 6]	i 21 2	PP e 54.8
Stuttgart	128.9	331	e 18 55	[- 2]	e 22 3	PKS	e 21 3	PP e 57.8
Halifax	129.3	35	e 22 23	PKS	e 31 17	PS	e 38 3	SS 57.6
Taranto	129.3	318	19 19	[+ 22]	22 19	PKS	e 29 9	SS —
Chinchina	129.6	87	i 19 0	[+ 2]	i 22 20	PKS	i 21 10	PP e 61.3
Guantanamo Bay	129.7	69	i 22 31	PKS	—	—	—	—
Strasbourg	129.7	332	e 18 59 <sup>k</sup>	[+ 1]	e 22 36	PKS	e 19 17	pPKP e 57.0
Chur	130.1	329	e 18 57 <sup>k</sup>	[- 2]	—	—	e 22 23	PKS —
Zürich	130.2	331	e 19 0 <sup>a</sup>	[+ 1]	e 22 10	PKS	e 21 12	PP —
Basle	130.5	331	e 19 11 <sup>a</sup>	[+ 11]	—	—	e 22 27	PKS —
Bologna	130.7	327	e 19 7	[+ 7]	—	—	e 22 53	PKS —
Kew	130.7	340	i 18 59	[- 1]	i 22 21	PKS	e 21 14	PP e 48.8
Rathfarnham Castle	130.9	345	i 19 4	[+ 4]	e 27 40	SKKS	i 19 31	pPKP e 53.4
Bogota	131.1	89	(i 19 5)	[+ 4]	e 30 41	PS	i 29 32	PKKP 63.8
Florence Arc.	131.1	325	e 22 23	PKS	—	—	—	—
Florence Xim.	131.1	325	e 19 1	[0]	—	—	i 21 19	PP —
Neuchatel	131.2	331	e 19 3	[+ 2]	—	—	—	—
Prato	131.2	325	e 18 39	[- 22]	—	—	i 22 27	PKS —
Besançon	131.5	331	e 18 59	[- 2]	e 22 24	PKS	e 21 22	PP —
La Paz	131.6	119	i 19 7 <sup>a</sup>	[+ 5]	26 19	[+ 18]	i 21 27	PP 64.4
Messina	131.6	317	e 19 16	[+ 14]	—	—	e 21 52	PP —
Rome	131.6	323	i 19 3	[+ 1]	i 22 24	PKS	21 19	PP —
Paris	131.8	336	e 19 5	[+ 3]	e 29 10	SKKS	i 19 24	pPKP e 57.8
Clermont-Ferrand	133.9	333	i 19 11	[+ 5]	i 22 36	PKS	e 21 41	PP 56.8
Bermuda	135.0	50	e 19 11	[+ 3]	e 26 1	[- 6]	e 21 45	PP e 52.2
Roosevelt Roads	138.7	68	i 19 10	[- 5]	—	—	—	—
Tortosa	138.9	330	i 19 18	[+ 3]	—	—	—	e 55.8
Algiers Univ.	z. 140.5	323	i 19 20 <sup>k</sup>	[+ 2]	e 22 49	PKS	e 19 43	pPKP —
Alicante	141.3	329	19 22	[+ 3]	26 32	[+ 14]	22 34	PKS e 67.2
Toledo	141.8	334	i 19 18	[- 2]	e 22 42	PKS	i 22 22	PP 62.6
Fort de France	143.6	74	e 19 19	[- 5]	e 31 29	?	e 23 15	PKS —
Granada	143.8	331	19 33	[+ 9]	25 59	[- 23]	23 6	PP i 79.9
Malaga	z. 144.5	331	i 19 25 <sup>k</sup>	[0]	29 49	SKKS	i 22 59	PP 71.0
Lisbon	144.9	338	19 27	[+ 1]	26 37	[+ 14]	29 25	SKKS —
Tamanrasset	z. 146.4	302	19 31 <sup>a</sup>	[+ 3]	e 33 26	PS	e 19 53	pPKP —

Additional readings :—

Brisbane ePE = 4m.42s.

Riverview iZ = 5m.57s., iPPPN = 6m.37s., iE = 10m.20s., iN = 10m.36s., iZ = 10m.39s., eQN = 11.0m.

Apia e = 6m.43s.

Christchurch PP = 9m.0s., eZ = 10m.49s., iSE = 13m.24s., QEN = 16m.16s., iScSZ = 16m.56s.

Tokyo eE = 8m.50s., PPPE = 10m.22s., iQ = 17m.50s.

Koti e = 13m.23s.

Hukuoka Q = 22m.21s.

Nanking iZ = 9m.19s. and 9m.50s., iScSE = 18m.52s., QN = 21.0m.

Honolulu e = 10m.4s., ePPP = 12m.26s., eSS = 19m.59s.

Irkutsk PS = 21m.6s.

Continued on next page.



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New Delhi SSN = 27m.31s.  
College e = 12m.32s. and 13m.48s., ePPP? = 17m.21s., ePS = 23m.29s., ePKKP = 30m.6s., eSSS? = 31m.29s., ePKP,PKP = 38m.29s.  
Poono S<sub>c</sub>SEN = 22m.49s.  
Sitka e = 23m.38s., eSS = 28m.14s.  
Ukiah ePS = 24m.59s., eSS? = 28m.37s.  
Berkeley eZ = 15m.9s., eE = 16m.11s.  
Shasta Dam ePKKP = 30m.26s., ePKP,PKP = 38m.34s.  
Lick iZ = 14m.36s.  
Victoria S = 24m.45s., PS = 29m.47s., PPS = 33m.1s., SS = 36m.21s.  
Seattle i = 13m.9s., ePPP = 18m.29s., eSKS = 23m.22s., ePS = 24m.45s., ePPS = 25m.21s., eSS = 29m.31s., ePKKP = 30m.9s., ePKKS = 31m.17s., eSKKS( $\Delta > 180^\circ$ ) = 37m.1s., ePPP( $\Delta > 180^\circ$ ) = 38m.57s., and many other unidentified e readings.  
Fresno eZ = 15m.33s.  
Reno iN = 13m.12s., eN = 16m.35s., eE = 16m.56s., ePPSZ = 25m.20s.  
Pasadena iZ = 13m.21s., ePSEN = 24m.52s., iPPSZ = 25m.22s., eSSEN = 29m.3s., ePKP,PKP?Z = 38m.36s.  
Riverside iZ = 13m.25s. and 15m.0s., ePKKPZ = 30m.19s.  
Palomar iZ = 13m.31s. and 17m.5s.  
Overton iPKKPZ = 30m.48s.  
Hungry Horse ePKKP = 30m.8s., ePKP,PKP = 38m.10s.  
Butte eN = 27m.20s.  
Tucson iPP = 17m.22s., ePPP = 19m.4s., eSPS = 23m.49s., eS? = 25m.8s., ePS = 26m.3s., ePKKP = 30m.7s., eSS = 31m.8s., eSSS = 34m.59s., ePKP,PKP = 38m.17s.  
Bozeman ePPP = 19m.34s., eS? = 24m.50s., ePS = 26m.0s., eSS = 31m.13s., eSSS? = 35m.13s.  
Sverdlovsk ePS = 26m.15s.  
Saskatoon PS = 26m.39s., SS = 32m.9s., SSS = 35m.58s.  
Lincoln eSSE = 33m.56s., eSSSE = 38m.4s.  
Tiflis ePS = 28m.14s.  
Moscow eSKKS = 25m.53s., PS = 28m.26s.  
Florissant iSP? = 28m.51s., eSS? = 34m.41s.  
St. Louis e = 17m.53s., ePPS = 30m.3s., iSS = 35m.2s.  
Chicago eSS = 35m.14s., eSSS = 39m.48s.  
Scoresby Sund 19m.41s. and 35m.21s.  
Yalta iPP = 19m.41s.  
Cincinnati iPP = 19m.49s., ipPP = 20m.5s.  
Upsala eE = 20m.7s., eN = 20m.12s., iSKSN = 25m.23s., ePSE = 28m.51s., eSSE = 34m.51s.?, eE = 36m.22s., eN = 36m.27s.  
Helwan PPZ = 20m.15s., eZ = 24m.1s., 31m.42s., and 32m.16s.  
Cleveland iZ = 28m.45s., ePSE = 29m.47s., eSSN = 36m.16s.  
Warsaw e = 21m.6s., eSKP?Z = 22m.30s., ePPPEZ = 23m.6s., eSKKS = 26m.53s., ePS = 30m.10s., ePPSEZ = 31m.22s., ePKKSEZ = 32m.31s., eSS?N = 37m.16s., eSSSNZ = 41m.7s.  
Istanbul e = 20m.41s.  
Ottawa PPP = 22m.41s., SKKS = 27m.11s., PS = 30m.1s., PPS = 31m.57s., SS = 36m.45s.  
Pennsylvania iN = 20m.52s., eN = 21m.25s.  
Copenhagen 30m.3s. and 36m.27s.  
Ivigtut SS = 36m.51s.  
Skalnate Pleso e = 21m.9s., 21m.29s., 27m.21s., and 28m.15s., eE = 29m.33s. and 32m.17s., eSSE = 37m.21s., eSSSN = 41m.51s.?, eE = 44m.15s.  
Vermont eSSS = 41m.20s.  
Seven Falls eE = 27m.24s., 31m.52s., and 37m.7s.  
Philadelphia e = 32m.12s., eSS = 36m.56s.  
Budapest eE = 20m.51s., eN = 35m.51s., eE = 36m.31s., EN = 40m.11s., eE = 40m.21s.  
Potsdam iZ = 21m.42s., iPPPZ = 23m.18s., iZ = 28m.36s., 32m.0s., 32m.27s., 35m.44s., and 35m.55s.?  
Ogyalla e = 21m.18s., 30m.36s., and 42m.15s.  
Kalossa eE = 18m.37s. and 20m.9s., eN = 22m.30s., eE = 22m.57s., 26m.46s., and 34m.48s., eN = 34m.55s.  
Collnberg eE = 38m.27s.  
Prague e = 19m.37s. and 21m.8s., eSKP? = 22m.16s., ePPP = 23m.27s. and 23m.56s., eSKKS = 27m.51s., ePS = 31m.3s., ePPS? = 32m.16s., e = 32m.58s. and 35m.46s., eSS = 37m.51s., eSSS = 42m.3s.  
Harvard e = 31m.36s., iPPS = 32m.15s., eSS = 38m.7s., eSSS? = 43m.5s.  
Aberdeen iEN = 23m.0s., eEN = 52m.46s.  
Cheb eSKP? = 22m.11s., ePPP = 24m.3s., e = 25m.26s. and 29m.15s., eSKSP? = 30m.45s., ePPS = 32m.21s., e = 35m.45s., eSS = 37m.51s., eSSS = 42m.39s.  
Huancayo ePSPS = 38m.15s.  
De Bilt eSS = 38m.33s.  
Triest iSKKS = 22m.19s., iS = 23m.53s.?  
Stuttgart iPKP = 18m.59s., e = 19m.10s., ePKS = 22m.15s., ePPP = 23m.51s., eZ = 27m.11s., eSS = 38m.21s., e = 53m.51s.  
Taranto e = 25m.9s., S = 30m.19s.  
Chinchina ePSEN = 31m.23s., eSSEN = 38m.56s.  
Strasbourg ePP = 21m.11s., ePPS? = 32m.24s., eSS = 38m.15s., eSSP? = 39m.16s., and other unidentified phases.  
Chur e = 19m.0s.

Continued on next page.



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Kew ePPS?Z = 35m.11s., eSS?EN = 41m.1s.  
Rathfarnham Castle e = 19m.23s., ePPZ = 21m.28s., epPP?Z = 21m.59s., eSKP = 22m.21s., ipPKS? = 22m.52s., eEN = 27m.0s., iEN = 30m.45s., ePSEN = 31m.40s., eEN = 31m.54s., e = 32m.51s., eEN = 33m.20s., eSSEN = 38m.47s., eSSSEN = 44m.21s., e = 45m.23s. and 49m.21s.  
Bogota eS?EN = 31m.58s.; PKP reading has been increased by 3m.  
Besançon e = 19m.3s., 19m.24s., and 21m.43s.  
La Paz iZ = 19m.23s., iPKSZ = 22m.24s. and 22m.39s., PS = 31m.38s., iSS = 40m.1s., Q = 61.8m.  
Rome PS? = 31m.20s., PPS = 33m.6s., SS = 38m.19s., SSS = 43m.51s.?, e = 56m.48s.  
Paris iPP = 21m.27s., iPKS = 22m.32s., ePPP? = 24m.31s., eSKKS?( $\Delta > 180^\circ$ ) = 35m.43s., and other unidentified readings.  
Clermont-Ferrand iPKS = 22m.45s., ePPS = 33m.19s., i = 35m.12s., eSS = 39m.29s. and 39m.35s., eSSS = 44m.19s.  
Bermuda i = 22m.39s., ePS = 32m.41s., eSS = 39m.21s.  
Algiers Univ. ePPZ = 22m.20s., eZ = 23m.27s., 27m.19s., and 30m.41s., iZ = 31m.23s., ePPSZ = 34m.22s.  
Alicante PKS = 23m.6s., PPP = 25m.36s., SS = 40m.36s., SSP = 41m.42s.?, Q = 58m.50s.  
Toledo iZ = 22m.55s.  
Granada eSKKS = 30m.29s., eSKSP = 34m.0s., Q = 70.4m.  
Malaga PPPZ = 26m.27s., QZ = 58m.39s.  
Lisbon PKPE = 19m.30s., EN = 21m.2s., SSE = 41m.3s.  
Tamanrasset ePP?Z = 22m.53s., ePPZ = 23m.13s., ePPPZ = 26m.12s., and other unidentified readings.  
Long waves were also recorded at Ferndale, Helsinki, and Barcelona.

July 29d. Readings also at 0h. (Pierce Ferry and Lick), 1h. (Lick), 2h. (near Obi-garm), 3h. (Almata, Frunse, Naryn, Przhevalsk, Samarkand, near Andijan, Fergana, Murgab, Obi-garm, Stalinabad, and near Boulder City), 4h. (near Mizusawa), 5h. (Shasta Dam, Chur, Besançon, Clermont-Ferrand, Paris, Jena, Strasbourg, Stuttgart, and Tamanrasset), 6h. (Yalta and near Obi-garm), 7h. (Djakarta, Overton, Pierce Ferry, Frunse (2), near Andijan (2), Fergana (2), Kulyab (2), Murgab, Obi-garm (2), Samarkand, and Stalinabad (2)), 9h. (near Mizusawa), 10h. (Fergana, Frunse, Naryn, Przhevalsk, near Andijan, Kulyab, Murgab, Obi-garm, Stalinabad, and near Boulder City), 11h. (near Mizusawa (2)), 13h. (Strasbourg (2), Kulyab, Stalinabad, near Andijan, and Obi-garm), 14h. (near Boulder City (2)), 15h. (Overton, Pierce Ferry, Shasta Dam, near Boulder City (5), near La Jolla, Palomar, Pasadena, Andijan, near Kulyab, Fergana, Obi-garm, Samarkand, and Stalinabad), 16h. (Boulder City and near Istanbul), 17h. (Prague, Stuttgart, Overton, Pierce Ferry, Shasta Dam, and near Boulder City), 18h. (near Seattle), 21h. (near Boulder City (2)), 22h. (Granada, near Bogota, and near Boulder City (2)).

July 30d. 14h. Indonesia.

Djakarta ePN = 24m.38s., eSN = 24m.54s.  
Brisbane iPZ = 32m.33s.k, iZ = 34m.55s.  
Andijan eP = 33m.49s., S = 41m.48s.  
Przhevalsk eP = 33m.49s.  
Shemakla eP = 35m.25s.  
Hungry Horse eP? = 43m.0s.  
Overton eP?Z = 43m.15s., iZ = 46m.55s. and 48m.34s.  
Harvard iP = 43m.34s., i = 43m.50s.  
Riverside ePZ = 46m.28s., eZ = 48m.21s.  
Pasadena iPZ = 46m.29s., iZ = 48m.31s.  
Tinemaha ePZ = 46m.36s., iZ = 48m.45s.  
Tucson eP? = 47m.50s.  
Boulder City eP? = 48m.30s.  
Lick iPZ = 48m.56s.k.

July 30d. Readings also at 0h. (College, Hungry Horse, Shasta Dam, Pasadena, Riverside, Palomar, Haiwee, Tinemaha, Boulder City, Overton, Pierce Ferry, Harvard, Weston, Ottawa, Copenhagen, De Bilt, Paris, Besançon, Strasbourg (2), Stuttgart (2), Tamanrasset, and Andijan: several shocks), 1h. (near Grozny), 2h. (Overton and near Apia), 3h. (Copenhagen, near Istanbul, and near La Paz), 4h. (College), 5h. (Galerazamba), 6h. (Stuttgart, Christchurch, Kaimata, and Wellington), 7h. (Stuttgart, Wellington, and near Istanbul), 8h. (near Collmberg, near Obi-garm, Stalinabad, Kulyab, Fergana, Samarkand, and Andijan), 9h. (College (2), Hungry Horse, Tamanrasset, and Ksara), 10h. (near Prague, near Algiers Univ., and near Alicante), 12h. (Pierce Ferry and near Alicante), 13h. (Tortosa, Pretoria, and near Kulyab), 14h. (College and Hungry Horse), 18h. (Tamanrasset, Sofia, Raciborzu, Warsaw, Timisoara, Bucharest, Strasbourg, Stuttgart, Collmberg, Potsdam, Triest, Ksara, near Yalta, and near Istanbul), 20h. (near Overton and Pierce Ferry), 21h. (Tamanrasset, Frunse, near Obi-garm, Stalinabad, Murgab, Fergana, Andijan, Samarkand, near Tiflis, Borzhomi, and near Istanbul), 22h. (Istanbul).

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July 31d. 18h. 28m. 29s. Epicentre 38°·0N. 21°·0E. (as on 1949, February 5d.).

Intensity VI at Ano Gherakari (Zante); V at Mouzaki; IV-V at Asprogerakas (Zante); IV at Katakalon, Agoulinitza (district of Elis), etc. Epicentre 37°·9N. 20°·9E. (Strasbourg).

A. Galanopoulos.

Seismological Institute Bulletin, 1950. Athens, 1951, p. 19.

A = +·7375, B = +·2831, C = +·6131;  $\delta = -6$ ;  $h = -1$ ;  
D = +·358, E = -·934; G = +·572, H = +·220, K = -·790.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Athens	2·1	91	e 0 39	+ 2	e 1 15	$S_g$	i 0 42	$P_g$
Taranto	3·8	312	e 0 58	- 3	e 2 7	$S_g$	e 1 9	$P_g$
Messina	4·3	274	i 1 37	$P_g$	i 2 9	$S_g^*$	—	—
Sofia	5·1	21	e 1 20	0	e 2 34	$S^*$	i 2 57	$S_g$
Istanbul	7·0	61	1 33	-13	3 40	$S^*$	—	—
Bucharest	7·4	30	—	—	e 3 43	$S^*$	—	—
Rome	7·6	304	e 2 43	$P_g$	e 3 38	$S^*$	i 3 59	$S_g$
Kalossa	n. 8·7	351	e 1 44	-26	—	—	—	—
Triest	9·4	327	e 3 56	S	(e 3 56)	-11	e 5 0	$S_g$
Florence Arc.	9·4	311	—	—	e 5 7	$S_g$	—	—
Florence Xim	9·4	311	e 2 45	$P^*$	i 4 56	$S^*$	—	—
Prato	9·5	311	i 2 46	$P^*$	e 5 23	$S_g$	—	—
Budapest	E. 9·6	352	—	—	e 5 26	$S_g$	—	—
Pavia	11·4	313	—	—	e 4 40	-16	—	—
Chur	12·2	320	e 2 55	- 3	e 4 59	-17	—	—
Ksara	12·8	105	e 3 28	PPP	—	—	—	—
Prague	13·0	341	e 3 17	PP	e 5 34	- 1	e 5 52	SS
Zürich	13·1	320	e 3 3	- 7	e 5 26	-12	—	—
Basle	13·7	319	e 3 18	0	e 5 36	-16	—	—
Stuttgart	13·7	326	e 3 8?	-10	e 6 4	SS	e 3 13	P
Warsaw	14·2	0	e 3 23	- 1	e 6 16	+12	e 5 49	?
Strasbourg	14·3	322	e 3 27	+ 1	e 6 5	- 1	—	—
Besançon	14·4	315	e 3 36	PP	—	—	—	—
Jena	14·5	336	e 3 33	+ 5	e 6 11	0	e 3 37	PP
Clermont-Ferrand	15·4	306	e 4 8	PPP	—	—	—	—
Potsdam	15·4	341	e 3 45	+ 5	—	—	—	—
Paris	17·2	315	e 4 3	0	—	—	e 4 59	?
Copenhagen	18·6	345	e 4 17	- 4	e 7 51	+ 5	—	—
Tamanrasset	z. 20·2	226	i 4 20k	-19	e 9 10	+49	—	—
Upsala	22·0	356	e 5 1	+ 3	e 8 46	-10	e 5 44	PPP
Pulkovo	22·6	13	4 56	- 7	9 12	+ 5	—	—
Hungry Horse	85·2	332	e 12 28	-11	—	—	—	—

Additional readings :—

Taranto e = 1m.36s.

Kalossa eE = 2m.41s. and 4m.6s., eN = 4m.12s., eS?N = 5m.17s., eS?E = 5m.31s.?, eN = 6m.31s.?

Triest iS<sub>g</sub>S<sub>g</sub> = 5m.56s., iS<sub>g</sub>S<sub>g</sub>S<sub>g</sub> = 6m.0s.

Florence Arc. e = 6m.28s.

Budapest eE = 5m.54s., eEN = 6m.31s.?, eE = 6m.46s., eN = 7m.31s.?

Prague e = 4m.25s., 4m.52s., and 5m.23s., eSS? = 6m.2s.

Strasbourg e = 5m.0s., 6m.42s., and 7m.56s.

Jena eE = 7m.42s.

Tamanrasset iZ = 5m.13s., eZ = 5m.27s. and 9m.28s.

Long waves were also recorded at Skalnaté Pleso, Collmberg, De Bilt, Kew, Alicante, and Ottawa.

July 31d. Readings also at 0h. (Andijan, near Obi-garm, Stalinabad, and Fergana), 1h. (near Obi-garm), 2h. (Overton and Tucson), 3h. (Fergana, Andijan, near Obi-garm, Stalinabad, and near Pierce Ferry), 6h. (College, Shasta Dam, Tucson, and near Andijan), 7h. (near Pierce Ferry), 8h. (Salt Lake City), 9h. (Boulder City and near Pierce Ferry), 12h. (Weston), 13h. (near Overton), 14h. (Collmberg, Naryn, Obi-garm, Frunse, and near Murgab), 15h. (Prague, near Obi-garm, and near Mizusawa), 16h. (near Ashkabad, Kizyl-Arvat, and Mary (2)), 17h. (Collmberg), 18h. (near Prague), 19h. (Tortosa, Fergana, near Obi-garm, and Stalinabad), 21h. (Przhevalsk, Frunse, Almata, near Murgab, Fergana, Andijan, Naryn, Obi-garm (3), Stalinabad, and Tashkent), 22h. (College), 23h. (La Paz).

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Aug. 1d. 0h. Undetermined shock.

Brisbane iPE = 17m.54s., iSE = 21m.33s., eSE = 21m.36s.  
 Riverview eZ = 19m.8s., eS?N = 22m.12s., eLZ = 25.3m.  
 College eP? = 25m.58s., eS? = 36m.16s., eL = 56m.20s.  
 Wellington e = 26.0m.  
 Tucson eP? = 26m.36s., eL = 56m.21s.  
 Istanbul eP = 32m.34s., eL = 35m.3s.  
 Paris ePKP? = 32m.55s., e = 35m.57s., eL = 92m.  
 Algiers Univ. Z = 33m.18s.  
 Tamanrasset eZ = 33m.23s. and 36m.11s.  
 Strasbourg e = 33m.26s.  
 Stuttgart eZ = 33m.30s.?  
 Ksara e = 34m.52s.  
 Kew eEN = 50m.0s.

Long waves were also recorded at Christchurch, Seattle, Santa Clara, Harvard and Potsdam.

Aug. 1d. 2h. 4m. 40s. Epicentre 42°·5N. 144°·4E. (as on July 5d. and foreshock of 9h.)

	$\Delta$ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	Supp. m. s.	L. m.
Mizusawa	4.2	218	1 16	P*	1 47	-10	—	—
Vladivostok	9.2	278	i 2 19	+ 3	e 4 30	+27	—	—
College	43.3	35	e 8 3	- 2	—	—	—	—
Sverdlovsk	52.7	317	9 17	- 1	—	—	—	—
Victoria	61.0	49	e 10 15	- 3	—	—	e 10 24	P
Shasta Dam	66.1	57	e 10 51	0	—	—	—	—
Hungry Horse	66.3	46	i 10 49	- 3	—	—	—	—
Lick	z. 68.5	59	i 11 14 <sub>a</sub>	+ 8	—	—	i 11 29	pP
Mount Wilson	z. 72.8	59	i 11 39	pP	—	—	—	—
Riverside	73.3	59	e 11 33	- 2	—	—	i 11 42	pP
Overton	z. 73.5	56	i 11 45	pP	—	—	—	—
Perris	z. 73.6	59	e 11 34	- 3	—	—	i 11 44	pP
Copenhagen	74.0	335	i 11 38	- 1	—	—	—	—
Pierce Ferry	74.1	56	i 11 37	- 3	—	—	i 11 48	pP
Stuttgart	z. 80.9	332	e 12 16	- 1	—	—	—	—
Paris	83.1	336	e 12 26	- 3	—	—	—	e 51.3
Harvard	89.4	26	e 13 8	+ 8	—	—	—	—
Weston	89.4	26	e 12 54	- 6	—	—	—	—
Tamanrasset	z. 104.8	321	e 18 30	PP	—	—	—	—
Huancayo	134.1	62	e 20 22	?	—	—	—	—

Aug. 1d. 8h. 37m. 20s. Epicentre 33°·2N. 115°·7W. (as on July 29d.).

Intensity VI at Calipatria; V at El Centro; IV at Campo, Seeley, Westmorland, etc.  
 Epicentre 33°07'N. 115°34'W.

L. M. Murphy and F. P. Ulrich.

United States Earthquakes 1950, Serial No. 755, Washington, 1952, p.11.

A = -0.3636, B = -0.7555, C = +0.5450;  $\delta = +1$ ;  $h = +1$ ;  
 D = -0.901, E = +0.434; G = -0.236, H = -0.491, K = -0.838.

	$\Delta$ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	Supp. m. s.	L. m.
La Jolla	1.4	256	i 0 25 <sub>a</sub>	- 2	i 0 42	- 4	—	—
Riverside	1.5	300	i 0 29 <sub>a</sub>	+ 1	—	—	—	—
Pasadena	2.3	295	i 0 38	- 2	i 1 15	S <sub>g</sub>	—	—
Peirce Ferry	z. 3.2	25	i 0 52	0	—	—	i 0 54	P*
Overton	z. 3.5	18	e 0 54	- 3	—	—	i 0 57	P*
Tucson	4.2	102	e 1 10	+ 3	e 1 53	- 4	e 1 19	P*
Fresno	4.9	317	e 1 18 <sub>k</sub>	+ 1	i 2 39	S <sub>g</sub>	e 1 38	P <sub>g</sub>
Lick	z. 6.4	312	e 1 36	- 2	i 3 4	S*	i 1 46	P*
Santa Clara	E. 6.6	311	e 2 14	P <sub>g</sub>	i 3 43	S <sub>g</sub>	—	—
Berkeley	7.1	313	i 2 0 <sub>a</sub>	P*	e 3 55	S <sub>g</sub>	i 2 19	P <sub>g</sub>

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	$\Delta$ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	Supp. m. s.	L. m.
Reno	7.1	334	e 1 54	+ 6	e 3 12	+ 2	e 2 20	—
Ukiah	8.5	316	—	—	e 3 50	+ 5	—	e 4.8
Shasta Dam	9.2	326	e 2 40	P*	—	—	—	e 5.0
Hungry Horse	15.2	4	e 3 39	+ 1	—	—	—	e 8.2
Seattle	15.3	343	e 8 46	P <sub>c</sub> P	—	—	—	e 8.5
Victoria	16.4	342	e 3 58	+ 5	—	—	—	9.7
Tacubaya	20.2	128	e 4 27	-12	—	—	—	e 11.4
Cleveland	28.3	63	i 6 14 <sub>a</sub>	+17	e 10 51	+ 8	e 13 33	e 14.8
College	37.2	338	e 7 19	+ 4	e 17 8	S <sub>c</sub> S	—	e 20.8

Additional readings :—

Tucson iS = 1m.46s.

Fresno eNZ = 1m.22s., iE = 2m.31s.

Berkeley iZ = 2m.59s., eEN = 3m.27s., iZ = 4m.6s.

Reno eE = 2m.12s., eN = 3m.52s., iN = 4m.39s.

Hungry Horse i = 3m.45s. and 3m.55s.

Tacubaya i = 6m.30s., e = 10m.54s. and 10m.58s.

Long waves were also recorded at many other North American stations and at Honolulu and Potsdam.

Aug. 1d. 9h. 11m. 39s. Epicentre 42°·5N. 144°·4E. (as at 2h. and on July 5d.).

A = -·6013, B = +·4305, C = +·6731;  $\delta$  = -4; h = -3;  
D = +·582, E = +·813; G = -·547, H = +·392, K = -·740.

	$\Delta$ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	Supp. m. s.	L. m.
Mizusawa	4.2	218	1 4	- 3	1 52	- 5	—	—
Vladivostok	9.2	278	i 2 21	+ 5	i 4 15	+12	—	—
Nanking	22.8	252	5 3	- 2	i 9 22	+11	5 45	PPP 11.2
Irkutsk	28.5	305	i 6 1	+ 2	—	—	—	—
College	43.3	35	e 8 5	0	e 14 29	- 4	—	e 17.8
Almata	48.2	296	i 8 47	+ 3	i 16 14	PPS	—	—
Naryn	49.6	294	i 8 55?	0	—	—	—	—
Frunse	49.9	296	i 8 59	+ 2	—	—	—	—
Sitka	50.6	44	e 9 5	+ 3	i 16 21	+ 4	e 18 53	S <sub>c</sub> S e 22.7
Honolulu	52.2	94	e 9 8	- 7	e 16 41	+ 2	e 19 4	S <sub>c</sub> S e 23.0
Andijan	52.3	295	9 16	+ 1	i 16 40	0	—	—
Murgab	52.4	291	i 9 17	+ 1	—	—	—	—
Sverdlovsk	52.7	317	i 9 19	+ 1	16 46	0	—	—
Fergana	52.9	294	i 9 20	0	e 16 48	0	—	—
Tashkent	54.1	297	i 9 30	+ 1	—	—	—	—
New Delhi	N. 55.1	280	e 9 35	- 1	i 17 32	PS	17 54	PPS 28.5
Obi-garm	55.1	294	i 9 36?	0	i 17 19?	+ 1	—	—
Kulyab	55.5	292	i 9 42?	+ 3	i 17 25?	+ 1	—	—
Stalinabad	55.8	294	i 9 40	- 1	i 17 26	- 2	—	—
Samarkand	56.5	296	e 9 47?	+ 1	—	—	—	—
Victoria	Z. 61.0	49	e 10 17	- 1	—	—	—	—
Seattle	62.1	50	e 10 26	+ 1	e 18 51	+ 2	e 20 27	S <sub>c</sub> S e 33.4
Ashkabad	63.1	298	10 37?	+ 5	—	—	—	—
Poona	E. 63.5	272	i 10 41	+ 7	19 15	+ 8	—	—
Bombay	64.0	273	e 10 41	+ 3	e 19 25	+12	e 24 3	SS
Moscow	64.3	323	i 10 39	0	e 19 14	- 3	—	—
Pulkovo	64.7	330	e 10 43	+ 1	e 19 20	- 2	—	—
Shasta Dam	66.1	57	i 10 50	- 1	—	—	—	—
Kodakanal	E. 66.2	263	—	—	e 20 1	+21	e 22 25	?
Helsinki	66.3	333	e 10 53	+ 1	e 19 39	- 3	e 19 55	PS 34.4
Hungry Horse	66.3	46	e 10 50	- 2	—	—	—	—
Baku	67.0	305	e 10 59	+ 2	—	—	—	—
Saskatoon	67.6	40	—	—	e 19 57	0	—	33.4
Grozny	67.7	309	e 11 3	+ 2	e 20 21	PS	—	—
Shemakla	67.7	306	10 53	- 8	i 20 6	+ 8	—	—

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	$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.	
	°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.	
Berkeley	67.8	59	i 11	1k	- 1	e 19	55	- 5	i 11	40	P <sub>c</sub> P	e 28.0
Reno	68.3	56	e 11	5k	0	e 20	5	- 1	—	—	—	—
Lick	68.5	59	e 11	5k	- 1	—	—	—	—	—	—	—
Upsala	69.0	335	i 11	8 <sub>a</sub>	- 1	i 20	12	- 2	e 15	10	PPP	e 34.4
Tiflis	69.3	308	i 11	14	+ 3	e 20	20	+ 3	—	—	—	—
Gori	69.5	309	e 11	15	+ 3	e 20	41	PS	—	—	—	—
Borzhom	70.0	309	11	18	+ 3	e 20	48	PS	—	—	—	—
Fresno	70.1	58	e 11	15k	- 1	—	—	—	—	—	—	—
Abastumanj	70.4	309	11	12	- 6	—	—	—	—	—	—	—
Zugdidi	70.4	310	11	23	+ 5	—	—	—	—	—	—	—
Tinemaha	70.8	58	i 11	30	+10	—	—	—	—	—	—	—
Haiwee	71.6	58	i 11	25	0	—	—	—	i 11	34	pP	—
Bergen	72.1	341	—	—	—	e 20	27?	-23	—	—	—	28.4
Pasadena	72.7	59	i 11	30	- 2	i 20	52	- 5	i 11	42	pP	—
Riverside	73.3	59	e 11	33	- 2	—	—	—	i 11	44	pP	—
Yalta	73.3	316	e 11	36	+ 1	21	4	0	e 14	22	PP	—
Overton	73.5	56	i 11	37	+ 1	e 21	8	+ 2	—	—	—	—
Boulder City	73.6	56	i 11	37	0	—	—	—	—	—	—	—
Warsaw	73.7	328	e 11	39k	+ 1	e 21	7	- 1	e 12	3	P <sub>c</sub> P	e 37.4
Copenhagen	74.0	335	i 11	40	+ 1	i 21	11	0	21	29	PS	38.4
Pierce Ferry	74.1	56	i 11	39	- 1	i 21	12	0	—	—	—	—
Kishinev	74.2	321	e 11	40	0	—	—	—	—	—	—	—
Lwow	74.3	325	e 11	41?	0	e 21	14?	- 1	—	—	—	—
Ivigtut	76.2	6	—	—	—	21	35	- 1	21	44	S <sub>c</sub> S	36.4
Riverview	76.2	174	i 12	5	P <sub>c</sub> P	—	—	—	—	—	—	e 38.6
Skalnate Pleso	76.4	326	11	54	+ 1	e 21	40	+ 2	e 12	9	P <sub>c</sub> P	—
Potsdam	76.6	332	i 11	53 <sub>a</sub>	- 1	e 21	39	- 1	i 12	12	P <sub>c</sub> P	e 40.4
Aberdeen	76.8	343	e 19	19	?	i 22	4	S <sub>c</sub> S	—	—	—	e 38.4
Bucharest	77.4	320	e 11	59	+ 1	21	50	+ 1	e 22	11	S <sub>c</sub> S	e 33.4
Collmberg	77.5	332	e 11	59	0	e 21	57	+ 7	e 22	15	S <sub>c</sub> S	e 41.4
Prague	78.0	330	12	3	+ 1	e 21	54	- 1	e 15	0	PP	e 33.4
Budapest	78.2	326	12	5	+ 2	e 21	59	+ 2	e 22	51	PPS	e 43.4
Jena	78.3	332	e 12	3	0	e 22	14	S <sub>c</sub> S	e 12	15	P <sub>c</sub> P	—
Ogyalla	78.3	327	e 12	7	+ 4	e 22	4	+ 5	e 22	37	PS	—
Istanbul	78.4	316	e 12	0	- 4	e 22	4	+ 4	—	—	—	—
Tucson	78.6	57	i 12	5	0	e 21	57	- 5	i 12	16	P <sub>c</sub> P	e 40.6
Cheb	78.7	332	e 12	6	0	e 22	0	- 3	e 22	22	S <sub>c</sub> S	—
Durham	78.8	341	—	—	—	e 21	48	-16	—	—	—	e 37.9
Kalossa	79.0	326	e 11	4	-63	e 21	22	-44	e 22	45	PS	e 45.4
De Bilt	79.4	336	i 12	11 <sub>a</sub>	+ 2	e 22	14	+ 4	—	—	—	e 38.4
Ksara	79.8	307	i 12	14	+ 2	22	25?	+11	—	—	—	—
Sofia	80.0	320	—	—	—	e 21	23	-54	—	—	—	—
Lincoln	80.4	42	—	—	—	e 22	14	- 7	—	—	—	e 40.5
Stuttgart	80.9	332	e 12	18	+ 1	e 22	24	- 2	e 15	24	PP	e 40.4
Karlsruhe	81.0	333	i 12	19	+ 1	e 22	46	S <sub>c</sub> S	—	—	—	—
Kew	81.5	339	e 12	22	+ 1	—	—	—	e 12	35	P <sub>c</sub> P	e 38.4
Strasbourg	81.6	333	i 12	21 <sub>a</sub>	0	e 22	31	- 2	i 12	36	P <sub>c</sub> P	e 38.8
Triest	81.9	328	—	—	—	e 22	32	- 4	e 22	50	S <sub>c</sub> S	—
Zürich	82.3	332	e 12	24 <sub>a</sub>	- 1	e 22	32	- 8	—	—	—	—
Chur	82.4	331	e 12	26	+ 1	e 22	39	- 2	—	—	—	—
Basle	82.5	332	e 12	26 <sub>a</sub>	0	e 22	44	+ 2	e 15	30	PP	—
Paris	83.1	336	e 12	30	+ 1	e 22	52?	+ 4	e 16	0	PP	e 42.4
Besançon	83.3	333	e 12	30	0	—	—	—	e 15	57	PP	—
Padova	83.5	328	e 12	29	- 2	e 22	41	-11	—	—	—	—
Bologna	83.8	329	e 12	13	-19	e 22	29	-26	e 22	56	S	—
Florence Xim	84.4	328	—	—	—	i 23	14	S <sub>c</sub> S	—	—	—	—
Florissant	85.0	40	e 12	38	0	e 23	0	[- 1]	—	—	—	—
St. Louis	85.2	40	i 12	39	0	e 23	1	[- 1]	i 12	49	P <sub>c</sub> P	—
Helwan	85.3	307	e 12	41 <sub>a</sub>	+ 1	23	3	[ 0]	16	6	PP	—
Ottawa	85.5	27	e 12	39	- 2	—	—	—	—	—	—	—
Rome	85.5	326	i 12	41 <sub>a</sub>	0	e 23	4	[ 0]	15	27	PP	e 36.4
Seven Falls	85.5	23	—	—	—	e 23	7	[ + 3]	—	—	—	—
Clermont-Ferrand	85.6	334	i 12	44	+ 3	e 23	15	+ 2	—	—	—	43.4
Cleveland	86.7	33	i 12	47k	0	i 23	20	{ + 2}	e 24	12	PS	—
Pittsburgh	88.2	32	—	—	—	i 25	35	PPS	—	—	—	—

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	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Harvard	89.4	26	i 13 0	0	e 23 53	+ 4	e 24 48	PS e 46.2
Weston	89.4	26	e 12 56	- 4	—	—	—	e 49.4
Fordham	90.1	29	e 13 3	0	e 23 51	- 4	—	45.4
Philadelphia	90.4	30	—	—	e 23 55	- 3	—	e 44.5
Washington	90.6	31	(e 13 4)	- 1	e 13 4	P	—	e 60.9
Tortosa	90.9	334	e 13 9	+ 2	23 39	{+ 1}	24 4	ScS e 42.4
Toledo	93.2	337	i 13 19	+ 2	—	—	e 17 0	PP 47.9
Alicante	93.4	333	13 23	+ 5	24 9	{+ 2}	17 7	PP e 44.3
Granada	95.5	336	13 25k	- 3	24 52	+10	i 17 22	PP i 48.4
Malaga	z. 96.2	336	i 13 30a	- 1	i 23 52	[-16]	i 17 10	PP 43.1
Tamanrasset	z. 104.8	321	e 14 10	0	e 26 0	0	i 18 30	PP —
Pretoria	z. 125.8	266	i 18 34	[-30]	—	—	—	—
La Paz	142.0	58	e 19 33	[-11]	—	—	—	—

Additional readings :—

Nanking i=5m.14s., Q=10m.20s.  
 Honolulu ePPP?=11m.46s., eSS?=20m.29s.  
 Seattle e=11m.21s., 12m.12s., and 25m.31s.  
 Bombay eE=10m.55s.  
 Hungry Horse ePcP?=11m.2s., ePKP,PKP?=39m.1s.  
 Berkeley iZ=11m.10s.  
 Reno eE=11m.26s.  
 Lick iZ=11m.17s., iPcPZ=12m.17s.  
 Upsala eE=11m.46s., eN=15m.42s., and 23m.45s., eQN=29.4m.  
 Fresno ePcPZ=12m.21s., eZ=13m.12s.  
 Yalta ePS=21m.36s.  
 Boulder City i=11m.49s.  
 Warsaw ePS=21m.27s., ePPSE=21m.35s.  
 Skalnaté Pleso e=21m.57s.  
 Potsdam eN=11m.57s., eZ=12m.31s., eScSNZ=21m.57s.  
 Bucharest eE=22m.7s.  
 Collmburg eSSN=27m.33s.  
 Prague e=12m.21s., 12m.41s., and 13m.47s., eSN=21m.58s., ePSN=22m.14s., ePS=22m.37s.  
 Jena ePP?N=14m.58s.  
 Ogyalla e=12m.40s.  
 Cheb eN=22m.45s.  
 Kalossa eE=11m.18s., eS?E=21m.25s.  
 Stuttgart eZ=12m.38s., eScS?=22m.37s.  
 Strasbourg ePP=15m.33s., ePS=23m.21s., eSS=27m.21s., e=32m.33s.  
 Paris e=12m.39s., 12m.48s., and 12m.58s.  
 Besançon e=12m.43s. and 13m.9s.  
 Helwan eZ=13m.15s. and 17m.48s., PPPZ=18m.3s., eN=23m.31s.  
 Cleveland eE=23m.47s.  
 Harvard e=44m.33s.  
 Tortosa SSP?E=25m.32s.  
 Toledo eE=18m.7s.  
 Alicante PPS=26m.3s., SSS=34m.3s., Q=38m.53s.  
 Tamanrasset eZ=15m.38s., PKPZ=18m.5s., iZ=19m.13s., eSKSZ=24m.43s.  
 Long waves were also recorded at Rathfarnham Castle, Christchurch and Wellington.

Aug. 1d. 10h. 42m. 48s. Epicentre 42°·5N., 144°·4E. (as at 9h.).

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Mizusawa	N. 4.2	218	e 1 7	0	e 1 47	-10	—	—
Vladivostok	9.2	278	i 2 20	+ 4	e 4 14	+11	—	—
Irkutsk	28.5	305	e 5 57	- 2	—	—	—	—
College	43.3	35	e 8 4	- 1	e 14 30	- 3	e 17 46	SS e 21.6
Andijan	52.3	295	e 9 15	0	—	—	—	—
Murgab	52.4	291	e 9 16	0	—	—	—	—
Sverdlovsk	52.7	317	9 18	0	e 16 38	- 8	—	—
Fergana	52.9	294	e 9 18	- 2	—	—	—	—
Obi-garm	55.1	294	9 36	0	—	—	—	—
Stalinabad	55.8	294	9 42	+ 1	—	—	—	—
Ashkabad	63.1	298	e 10 30	- 2	—	—	—	—
Moscow	64.3	323	e 10 38	- 1	e 19 9	- 8	—	—
Shasta Dam	66.1	57	e 10 52	+ 1	—	—	—	—
Hungry Horse	66.3	46	e 10 50	- 2	—	—	—	—
Tinemaha	z. 70.8	58	e 11 31	+11	—	—	—	—

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.
Haiwee	z.	71.6	58	i 11 35	+10	—	—	—	—
Mount Wilson	z.	72.8	59	e 11 30	- 2	—	—	e 11 41	PP
Riverside	z.	73.3	59	e 11 32	- 3	—	—	i 11 43	PP
Overton	z.	73.5	56	i 11 36	0	—	—	—	—
Boulder City		73.6	56	e 11 43	+ 6	—	—	—	—
Pierce Ferry		74.1	56	i 11 39	- 1	—	—	—	—
Tucson		78.6	57	e 12 4	- 1	—	—	—	—
Stuttgart		80.9	332	e 12 18	+ 1	—	—	—	e 44.2
Strasbourg		81.6	333	i 12 21k	0	—	—	—	—
Paris		83.1	336	i 12 30	+ 1	—	—	—	e 41.2
Besançon		83.3	333	e 12 29	- 1	—	—	—	—
Ottawa	z.	85.5	27	e 12 51	+10	—	—	—	—
Weston		89.4	26	e 13 12	+12	—	—	—	—
Bogota		121.6	46	e 29 54	PS	—	—	—	—

Additional readings :—

Overton  $iZ = 11m.47s.$

Pierce Ferry  $i = 11m.49s.$

Besançon  $e = 12m.50s.$

Long waves were also recorded at Potsdam, De Bilt, Clermont-Ferrand, and Granada.

Aug. 1d. Readings also at 0h. (near Ashkabad and near Obi-garm), 2h. (near Mizusawa), 3h. (College, Hungry Horse, Shasta Dam, Overton, Pierce Ferry, Lick, Pasadena, Riverside, Haiwee, Harvard, Stuttgart, Sofia, and Tamanrasset), 4h. (near Tacubaya and near Obi-garm), 6h. (Tucson), 7h. (Perris, Lick, Hungry Horse, Boulder City, Overton, Pierce Ferry, Tucson and near Tacubaya), 8h. (Ashkabad), 9h. (College), 10h. (College, Pasadena, Crest Line, Overton, Pierce Ferry and Tamanrasset), 11h. (Huancayo, Collmberg and Jena), 12h. (near Istanbul), 13h. (Seattle, Samarkand, Fergana, Tashkent, near Kulyab, Stalinabad, Obi-garm and Andijan), 14h. (Brisbane and Seattle), 15h. (Rome), 17h. (near Alicante), 19h. (Lick and Mizusawa), 20h. (Santa Clara, Overton, Pierce Ferry and near New Delhi), 22h. (Lick).

Aug. 2d. 10h. 50m. 6s. Epicentre  $11^{\circ}.7N. 143^{\circ}.3E.$  (as on 1941 Nov. 17d.).

$A = -.7853, B = +.5854, C = +.2015; \delta = -1; h = +6;$   
 $D = +.598, E = +.802; G = -.162, H = +.120, K = -.979.$

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Guam		2.3	39	0 51	$P_g$	—	—	—	—
Omaesaki		23.3	352	e 5 42	PP	—	—	—	12.3
Kōti		23.5	339	e 5 13	+ 1	e 9 17	- 6	e 5 42	PP
Shizuoka		23.6	352	e 5 7	- 6	e 11 39	L	—	19.5
Kameyama		23.9	348	5 17	+ 1	e 9 35	+ 5	e 6 0	PP
Osaka		23.9	345	e 5 15	- 1	—	—	e 6 29	PP
Hunatu		24.0	353	5 15	- 2	—	—	—	12.2
Kobe		24.0	345	e 5 18	+ 1	—	—	e 5 50	PP
Tokyo		24.1	353	5 19	+ 1	9 45	+11	6 19	PP
Kyoto		24.2	346	e 5 15	- 4	e 9 48	+13	—	—
Kumagaya		24.6	353	e 5 23	0	—	—	—	e 13.5
Mito		24.7	356	e 5 22	- 2	e 9 54	+10	—	—
Hukuoka		24.8	334	i 5 23	- 2	i 9 58	+12	i 5 42	PP
Maebasi		24.8	353	e 5 25	0	—	—	—	—
Matsuro		25.2	351	e 5 25	- 4	—	—	e 6 13	PP
Nagano		25.3	350	e 5 27	- 3	—	—	e 6 56	PPP
Toyama		25.5	350	e 5 21	-11	e 10 4	+ 7	6 20	PP
Hokusima		26.1	357	5 38	+ 1	10 16	+ 8	—	e 12.0
Sendai		26.5	358	e 5 43	+ 2	e 10 21	+ 7	—	—
Nanking		30.3	316	6 12	- 3	11 8	- 7	i 7 11	PP
Sapporo		31.3	358	e 6 22	- 2	—	—	—	—
Vladivostok		32.8	345	i 6 35	- 2	i 11 55	+ 1	—	—
Bandong		40.0	245	e 7 45	+ 7	e 13 59	+15	—	—
Brisbane		40.1	167	i 7 41k	+ 2	i 13 43	- 3	i 8 0	pP
Riverview		45.9	171	—	—	i 15 17	+ 6	i 18 26	$S_cS$

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.
Perth	50.7	211	i 9 59	+56	i 16 26	+ 8	i 21 4	SSS i 25.0
Irkutsk	51.2	331	9 5	- 2	—	—	—	—
Calcutta	E. 53.4	290	e 9 14	-10	e 16 37	-18	—	—
Auckland	N. 56.7	150	e 9 54	+ 6	—	—	—	—
Wellington	60.2	153	i 10 14	+ 2	e 23 4	SS	—	29.1
Christchurch	61.1	156	10 19	+ 1	e 18 42	+ 5	e 12 34	PP 29.6
Hyderabad	N. 62.8	284	—	—	18 58	0	—	—
New Delhi	N. 63.6	297	—	—	i 19 5	- 3	i 22 48	SS e 33.4
Kodaikanal	E. 64.5	277	e 9 8	?	—	—	—	—
Almata	64.9	313	i 10 43	0	i 19 26?	+ 2	—	—
Naryn	65.4	312	e 10 42	- 5	—	—	—	—
Frunse	66.5	313	i 10 52?	- 2	—	—	—	—
Murgab	66.6	307	i 10 56	+ 2	i 19 43?	- 2	—	—
Poona	N. 67.0	286	—	—	i 19 42	- 8	—	—
Bombay	E. 68.0	287	e 10 55	- 8	e 19 50	-12	e 13 29	PP 31.2
Andijan	68.0	309	i 11 2	- 1	20 1	- 1	—	—
Fergana	68.5	309	e 11 5	- 1	—	—	—	—
Kulyab	69.9	306	e 11 14	- 1	e 20 24	0	—	—
Obi-garm	70.0	307	i 11 13	- 2	i 20 23	- 3	—	—
Tashkent	70.4	310	i 11 18?	0	i 20 27?	- 3	—	—
College	70.6	25	i 11 16	- 3	—	—	—	—
Stalinabad	70.7	307	i 11 19	- 1	i 20 34	0	—	—
Samarkand	72.1	308	e 11 29	+ 1	—	—	—	—
Sitka	75.6	34	e 11 48	0	e 21 20	- 9	e 13 14	PP e 30.9
Mary	76.2	307	i 11 52?	0	—	—	—	—
Sverdlovsk	76.3	326	i 11 51	- 1	i 21 32	- 5	—	—
Ashkabad	79.0	307	e 12 11	+ 4	—	—	—	—
Victoria	83.5	43	i 12 31 <sub>a</sub>	0	i 22 53	+ 1	—	38.9
Seattle	84.4	44	i 12 37 <sub>a</sub>	+ 1	e 23 3	+ 2	i 13 24	pP
Shasta Dam	85.7	50	i 12 43	+ 1	e 23 12	- 2	—	—
Shemakla	86.0	311	e 12 50	+ 7	—	—	e 13 2	pP
Berkeley	86.4	53	i 12 46 <sub>a</sub>	+ 1	i 23 20	- 1	e 16 11	PP e 35.6
Mineral	z. 86.4	50	i 12 45	0	—	—	—	—
Santa Clara	86.7	53	e 12 50	+ 3	e 23 32	+ 8	—	e 58.2
Lick	z. 87.0	53	i 12 49 <sub>a</sub>	+ 1	—	—	—	—
Grozny	87.5	314	e 12 57	+ 6	e 23 35	+ 4	—	—
Fresno	88.6	53	e 12 56 <sub>a</sub>	0	e 23 42	0	e 26 8	PPS
Tifis	88.6	313	i 12 55	- 1	—	—	—	—
Moscow	89.0	328	e 12 57	- 1	e 23 40	- 5	e 23 23	SKS
Borzhomi	89.5	313	e 13 1	+ 1	—	—	—	—
Hungry Horse	89.6	41	e 13 55	+54	e 23 34	[+ 4]	—	—
Tinemaha	89.7	53	i 13 1	0	—	—	—	—
Haiwee	z. 90.1	53	i 13 4	+ 1	—	—	—	—
Pasadena	90.4	56	i 13 5 <sub>a</sub>	+ 1	i 23 56	- 2	—	e 40.9
Zugdidi	90.4	314	e 13 15?	+11	—	—	—	—
Riverside	91.0	56	i 13 8 <sub>a</sub>	+ 1	—	—	—	—
Pulkovo	91.1	332	e 13 6	- 2	e 23 36	[- 3]	—	—
Boulder City	92.6	52	e 13 16	+ 1	—	—	—	—
Overton	z. 92.8	52	i 13 17	+ 1	—	—	—	—
Saskatoon	92.8	35	—	—	e 23 52	[+ 3]	—	40.4
Logan	93.1	47	e 13 18	+ 1	e 23 54	[+ 3]	—	e 44.2
Pierce Ferry	93.2	52	i 13 19	+ 2	—	—	e 17 2	PP
Upsala	96.6	336	e 14 54?	?	e 24 42	-10	e 17 19	PP e 43.9
Tucson	96.9	55	e 13 35	+ 1	—	—	—	—
Warsaw	99.4	329	e 13 58	+12	e 24 24	[ 0]	e 17 52	PP e 50.9
Istanbul	99.9	316	e 13 44	- 4	e 24 25	[- 2]	—	—
Bucharest	100.4	320	e 21 12	?	e 27 46	PPS	—	49.9
Copenhagen	101.3	334	18 6	PP	i 24 33	[ 0]	25 32	S 47.9
Skalnate Pleso	101.4	326	e 18 14	PP	e 24 33	[- 1]	26 4	S
Budapest	N. 103.0	325	—	—	—	—	e 44 4	Q e 53.9
Ogyalla	103.3	326	—	—	e 24 36	[- 7]	e 27 24	PS
Prague	104.0	329	e 18 1	[-20]	e 26 2	+ 8	e 18 15	PP e 53.4
Cheb	105.0	330	e 18 9	[-14]	e 25 4	[+13]	e 18 35	PP
Aberdeen	105.7	341	—	—	i 25 0	[+ 6]	i 27 52	PS e 54.9
De Bilt	106.9	334	i 18 44 <sub>a</sub>	PP	e 28 0	PS	e 33 54?	SS e 50.9

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.
Durham	107.5	340	i 18 38	PP	i 24 58	[- 4]	—	—
Stuttgart	107.5	330	e 17 24?	PKP	e 28 5	PS	e 18 50	PP e 55.9
Strasbourg	108.3	331	e 14 27	P	e 25 7	[+ 2]	e 18 54	PP e 53.9
Florence Xim	109.6	325	e 14 33	P	e 25 29	[+19]	e 35 11	SS —
Kew	109.6	336	i 19 3a	PP	e 25 13	[+ 3]	e 29 45	PPS e 49.9
Besançon	110.1	331	19 54?	PP	—	—	—	—
Rome	110.1	323	e 14 34k	P	e 25 8	[- 5]	e 19 8	PP e 51.6
Rathfarnham Castle	110.2	341	i 18 4	[-30]	i 29 30	PPS	e 34 58	SSP 50.9
Paris	110.5	334	i 15 52	P	e 28 34	PS	e 19 9	PP e 55.9
Clermont-Ferrand	112.5	331	e 19 24	PP	e 28 57	PS	e 35 27	SSP 54.9
Cleveland	N. 112.9	35	e 18 15	[-24]	i 25 25	[+ 1]	e 29 2	PPS —
Seven Falls	K. 114.0	24	—	—	e 25 36	[+ 8]	—	— 48.9
Pennsylvania	115.4	33	—	—	e 27 30	S	i 29 24	PS —
Philadelphia	117.4	32	—	—	e 29 50	PS	e 40 6	SSS e 48.1
Tortosa	117.4	329	—	—	e 29 21	PS	—	— e 59.9
Alicante	119.8	328	18 55	[+ 3]	25 51	[+ 2]	29 53	PS e 58.1
Granada	122.3	329	20 29k	PP	e 26 7	[+ 9]	e 22 54	PKS 64.6
Tamanrasset	z. 126.3	310	i 19 7a	[+ 2]	e 22 29	SKP	e 21 4	PP 69.9
Bermuda	128.6	30	e 21 12	PP	e 32 55	PPS	e 39 26	SSP e 64.3
Chinchina	137.9	67	i 19 29	[+ 2]	e 26 26	[-10]	e 22 58	SKP —
Huancayo	142.2	94	e 20 10	[+36]	e 27 57	[+74]	e 39 24	SS e 66.7
Fort de France	144.3	43	e 19 10	[-28]	—	—	—	—
La Paz	149.2	103	e 19 52k	[+ 6]	30 26	(+12)	20 5	PKP, 73.9

Additional readings :—

Kobe iEN = 7m.10s.  
Tokyo e = 6m.58s., 11m.21s., and 11m.45s.  
Hukuoka eSS = 11m.29s.  
Nanking S?E = 9m.56s., iE = 10m.46s.  
Brisbane isSN = 14m.23s.  
Perth i = 11m.54s.  
Christchurch eSSEN = 22m.34s.  
New Delhi iN = 20m.26s.  
College e = 11m.47s.  
Seattle i = 12m.50s., 13m.8s., 13m.30s., 13m.39s., and 15m.33s., eS = 23m.35s., e = 23m.53s., 25m.10s., and 30m.24s.  
Lick iZ = 12m.56s. and 13m.13s.  
Fresno eZ = 13m.42s., eE = 14m.32s., eZ = 24m.42s.  
Pasadena iZ = 13m.15s., eZ = 14m.2s.  
Logan eSKS? = 23m.25s.  
Pierce Ferry i = 13m.50s.  
Upsala ePPP?E = 19m.7s., e = 21m.54s.?, eSKSE = 24m.1s., ePPSE = 26m.37s., eQN = 37.9m.  
Warsaw ePPPZ = 20m.3s., eZ = 23m.35s., ePSE = 26m.0s., ePSZ = 26m.3s., ePPSE = 26m.35s., eN = 27m.14s., eE = 27m.21s., eZ = 27m.31s., eSSSE = 34m.14s.  
Bucharest eN = 28m.36s.  
Copenhagen SS = 32m.48s.  
Skalnate Pleso ePPP = 21m.0s., ePS = 27m.6s., e = 28m.18s., eSS = 32m.36s., eSSS = 37m.18s.  
Prague e = 18m.25s. and 18m.59s., ePPPN = 20m.18s., eN = 22m.40s., e = 23m.23s., eSKS = 24m.36s., ePSE = 27m.17s., eSS = 33m.6s.  
Cheb ePPS = 28m.36s.  
Stuttgart ePPS = 29m.0s., ePKKP = 30m.12s., eSS = 34m.18s., e = 44m.24s.  
Strasbourg eS = 26m.27s., eSP = 28m.7s., ePS = 28m.18s., eSS = 34m.27s., e = 34m.37s. and 46m.39s.  
Kew eSSEN = 34m.49s.  
Rome ePS = 28m.34s., eSS = 35m.6s., e = 38m.19s.  
Rathfarnham Castle eEN = 20m.32s. and 43m.54s.  
Paris e = 20m.54s., ePPP = 21m.5s., ePPS? = 29m.57s., e = 32m.20s.  
Clermont-Ferrand eSPP = 29m.54s.  
Cleveland eE = 29m.5s.  
Granada S = 29m.30s.  
Tamanrasset iZ = 19m.37s., ePKSZ = 23m.8s., ePPPZ = 23m.47s., eZ = 25m.18s.  
Huancayo e = 25m.29s.  
La Paz iZ = 20m.37s., PKS = 23m.18s., iPPS = 36m.14s., SS = 42m.48s.  
Long waves were also recorded at Harvard, Ottawa, and other European stations.

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Aug. 2d. 13h. 49m. 55s. Epicentre 14°·5N. 39°·5E. (as on 1950, March 26d.).

A = +·7474, B = +·6161, C = +·2488;  $\delta$  = +9; h = +6;  
D = +·636, E = -·772; G = +·192, H = +·158, K = -·969.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Helwan	17·0	334	i 4 4k	+ 3	i 7 34	+24	—	—
Ksara	19·5	351	i 4 33k	+ 2	i 8 25	+19	—	—
Erevan	26·4	10	e 5 39	- 1	—	—	—	—
Athens	27·2	331	i 5 50k	+ 3	—	—	—	—
Shemakla	27·2	16	i 5 50	+ 3	—	—	i 16 29	ScS
Baku	27·3	17	e 5 49?	+ 1	—	—	—	—
Borzhom	27·4	7	5 51	+ 2	—	—	—	—
Tiflis	27·7	8	i 5 50	- 2	e 10 32	- 1	—	—
Istanbul	28·0	343	i 5 53	- 2	—	—	e 6 48	PP
Zugdidi	28·0	6	e 5 55?	0	—	—	—	—
Ashkabad	28·7	32	e 6 4?	+ 3	—	—	—	—
Sotchi	29·0	1	e 5 49	-15	—	—	—	—
Grozny	29·2	9	e 6 8	+ 3	—	—	—	—
Yalta	30·2	353	6 14	0	11 8	- 5	e 7 9	PP
Mary	30·4	36	i 6 14	- 2	—	—	—	—
Sofia	31·4	337	e 6 25	0	—	—	—	—
Messina	31·7	322	e 6 28	+ 1	—	—	—	e 15·9
Bucharest	31·9	342	e 6 31	+ 2	i 11 43	+ 3	—	—
Bombay	32·2	78	6 27	- 5	i 11 51	+ 6	i 7 39	PP
Taranto	32·4	327	e 7 27	+53	e 12 37	+49	—	—
Poona	33·1	79	6 38	- 2	i 12 1	+ 2	7 42	PP
Tamanrasset	z. 33·2	289	i 6 43k	+ 3	e 12 11	+11	i 8 0	PP
Kishinev	33·6	347	6 43	- 1	—	—	—	—
Tananarive	34·1	167	e 6 49	+ 1	—	—	—	e 17·0
Tunis	34·3	316	e 6 51	+ 1	e 12 23	+ 6	—	e 18·7
Timisoara	34·8	338	7 5?	+11	—	—	10 5?	?
Stalinabad	35·2	41	i 6 55	- 3	i 12 39	+ 8	i 8 16	PP
Kulyab	35·5	43	i 6 59	- 1	—	—	—	—
Obi-garm	35·9	41	i 7 1	- 3	i 12 48	+ 6	—	—
Rome	35·9	324	i 7 5k	+ 1	i 12 52	+10	i 8 31	PP
Kalossa	36·3	337	i 7 5?	- 2	e 12 23	-25	e 8 46	PP
Budapest	37·0	338	i 7 14	+ 1	13 5	+ 6	8 38	PP
Tashkent	37·2	39	i 7 14	- 1	i 13 7	+ 5	—	e 27·1
Kodaikanal	E. 37·3	92	(i 7 14a)	- 2	(i 13 2)	- 2	(i 8 42)	PP
Lwow	37·4	344	e 7 6?	-10	—	—	—	—
Hyderabad	E. 37·5	81	i 7 15	- 2	13 7	0	8 34	PP
New Delhi	N. 37·6	62	i 7 16k	- 2	i 13 14	+ 6	8 47	PP
Ogyalla	37·7	337	7 22	+ 3	e 13 17	+ 7	e 7 47	pP
Florence, Xim.	37·9	326	e 7 2	-18	—	—	8 47	PP
Triest	37·9	331	i 7 20	0	i 13 18	+ 5	i 7 32	pP
Skalnate Pleso	38·0	340	7 22	+ 1	e 13 19	+ 5	e 7 52	pP
Padova	38·0	328	i 7 30	+ 9	i 13 32	+18	9 2	PP
Prato	38·0	326	e 7 26	+ 5	i 13 38	+24	—	—
Fergana	38·2	41	i 7 22?	- 1	i 13 29?	+12	—	—
Bologna	38·3	327	e 7 19	- 5	—	—	e 8 49	PP
Murgab	38·6	46	i 7 28	+ 2	—	—	—	—
Andijan	38·7	42	i 7 27	0	e 13 33?	+ 8	i 8 16	PP
Vienna	38·7	336	e 7 28?	+ 1	—	—	e 9 4	PP
Algiers Univ.	z. 39·3	311	i 7 34	+ 2	e 13 39	+ 5	e 9 3	PP
Raciborzu	39·5	339	e 7 35	+ 1	e 13 35	- 2	e 9 5	PP
Pavia	39·9	327	e 7 38	+ 1	—	—	—	—
Colombo	E. 40·3	98	7 40	0	13 40	- 9	—	23·5
Warsaw	40·4	343	7 41a	0	e 13 37	-13	e 9 25	PP
Chur	40·8	329	e 7 45k	0	e 14 0	+ 4	e 9 23	PP
Prague	40·9	336	i 7 45	- 1	e 14 1	+ 3	e 9 23	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.
Moscow	40.9	359	i 7 49	+ 3	e 14 2	+ 4	—	—
Frunse	41.3	40	i 7 47	- 2	—	—	—	—
Naryn	41.5	41	i 7 49	- 1	—	—	—	—
Pretoria	z. 41.5	194	i 7 52	+ 2	—	—	—	e 20.7
Zürich	41.6	329	e 7 51k	0	e 14 7	- 1	e 9 27	PP
Cheb	41.8	335	e 7 52	- 1	e 14 7	- 4	e 8 20	pP
Barcelona	42.0	318	7 58	+ 4	e 14 20	+ 6	—	—
Neuchatel	42.2	328	e 7 57	+ 1	—	—	—	e 23.5
Basle	42.3	329	e 7 57	0	e 14 28	+ 9	e 9 42	PP
Stuttgart	42.3	330	i 7 57k	0	e 14 21	+ 2	i 9 40	PP
Collmberg	42.5	337	e 7 58	- 1	e 14 21	- 1	e 9 43	PP
Alicante	42.5	312	i 8 0	+ 1	i 14 32	+10	9 43	PP
Jena	42.8	335	e 8 0	- 1	e 13 45	-41	e 9 38	pP
Karlsruhe	42.8	331	i 8 1	0	—	—	i 8 49	pP
Tortosa	42.8	316	7 58	- 3	14 33	+ 7	9 43	PP
Besançon	42.9	327	e 8 3	+ 1	—	—	e 9 51	PP
Strasbourg	42.9	330	e 8 1	- 1	e 14 33	+ 6	e 9 47	PP
Almata	43.0	40	i 8 1	- 2	—	—	—	—
Potsdam	z. 43.3	337	i 8 5k	0	i 14 43	+10	i 9 42	PP
Clermont-Ferrand	43.7	323	i 8 11	+ 3	i 14 46	+ 7	i 9 56	PP
Granada	44.4	310	i 8 18a	+ 4	i 15 6	+17	i 10 18	PP
Pietermaritzburg	z. 44.7	190	i 8 21	+ 5	—	—	—	—
Malaga	z. 44.9	309	i 8 17a	- 1	i 15 3	+ 7	9 33	PcP
Sverdlovsk	45.2	17	i 8 19?	- 1	14 59?	- 2	—	—
Toledo	45.6	313	i 8 25	+ 1	i 15 19	+13	i 10 17	PP
Paris	45.7	327	i 8 24	0	i 15 11	+ 3	i 10 2	PcP
Pulkovo	45.7	354	i 8 24	0	e 15 1	- 7	i 10 16	PP
Copenhagen	46.1	340	i 8 27	- 1	i 15 23	+ 9	10 18	PP
De Bilt	46.4	332	i 8 30k	0	e 15 25	+ 7	e 10 7	PcP
Helsinki	46.8	350	i 8 32	- 1	e 15 31	+ 7	e 10 25	PP
Calcutta	E. 46.8	73	e 8 31	- 2	e 15 30	+ 6	19 10	SS
Upsala	48.1	345	i 8 41	- 2	e 15 32	-10	i 9 23	pP
Jersey	E. 48.5	325	e 8 45	- 1	—	—	e 11 20	PPP
Semipalatinsk	48.6	34	8 37	-10	—	—	—	—
Kew	48.7	328	i 8 51a	+ 3	e 15 55	+ 5	e 10 39	PP
Lisbon	49.0	309	i 8 53k	+ 3	16 3	+ 8	9 31	PcP
Durham	51.3	331	i 9 7	- 1	i 16 32	+ 6	—	—
Edinburgh	E. 52.7	332	9 15	- 3	16 44	- 2	—	—
Rathfarnham Castle	52.8	328	i 9 18	- 1	e 16 52	+ 5	e 10 24	PcP
Aberdeen	52.9	333	i 9 21	+ 1	i 16 53	+ 5	i 12 43	PPP
Irkutsk	63.3	38	e 10 31	- 2	e 19 8	+ 4	—	—
Nanking	73.5	61	i 11 33	- 3	21 6	0	i 14 16	PP
Ivigtut	76.3	330	11 50	- 2	e 21 42	+ 5	13 11	?
Vladivostok	82.0	48	i 12 21	- 2	i 22 37	0	—	—
Seven Falls	E. 92.8	320	e 13 16	0	—	—	—	—
Harvard	95.2	316	e 17 16	PP	—	—	—	—
College	100.7	3	e 16 18	?	—	—	i 17 54	PP
Sitka	108.1	357	e 18 57	PP	e 28 30	PS	i 29 26	PPS
La Paz	110.6	258	e 15 9	P	21 35	PKS	19 11	PP
Chinchina	112.8	282	e 19 54	PP	e 23 11	?	—	—
Hungry Horse	113.1	341	e 18 32	[- 7]	—	—	—	—
Seattle	116.0	346	—	—	e 28 34	?	e 29 55	PS
Shasta Dam	122.6	344	e 18 59	[+ 1]	—	—	—	—
Mineral	z. 122.7	343	e 18 58	[ 0]	—	—	—	—
Overton	z. 123.6	335	e 19 2	[+ 2]	—	—	i 20 41	PP
Pierce Ferry	123.8	333	i 19 3	[+ 3]	—	—	i 20 44	PP
Boulder City	124.2	335	e 19 4	[+ 3]	—	—	—	—
Tinemaha	z. 124.6	338	e 19 4	[+ 2]	—	—	—	—
Haiwee	z. 125.3	337	e 19 6	[+ 3]	—	—	—	—
Fresno	z. 125.4	339	e 19 5k	[+ 2]	—	—	—	—
Lick	z. 125.5	342	e 19 5k	[+ 2]	—	—	e 20 51	PP
Tucson	125.5	329	i 19 6	[+ 3]	—	—	i 20 55	PP
Riverside	z. 127.0	336	i 19 8	[+ 2]	—	—	—	—
Pasadena	127.2	336	i 19 8	[+ 1]	—	—	—	e 73.2

For Notes see next page.

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NOTES TO AUGUST 2d, 13h, 49m, 55s.

Additional readings and notes:—

Helwan  $iZ = 4m.43s.$ ,  $5m.5s.$ , and  $6m.33s.$   
Yalta  $iSSS = 12m.59s.$   
Bucharest  $iS?N = 11m.51s.$   
Poona  $PPPEN = 8m.7s.$ ,  $PcPEN = 8m.52s.$ ,  $PcSEN = 12m.40s.$ ,  $SSEN = 14m.15s.$ ,  
 $SSSEN = 14m.53s.$   
Tamanrasset  $iZ = 6m.49s.$ ,  $ePcPZ = 9m.25s.$ ,  $iZ = 12m.50s.$   
Tunis  $e = 7m.22s.$   
Kalossa  $eN = 8m.9s.$ ,  $eE = 9m.16s.$ ,  $eSE = 12m.26s.$   
Budapest  $eE = 8m.22s.$ ,  $iN = 8m.49s.$ ,  $PPPE = 9m.10s.$ ,  $PcSN = 9m.28s.$ ,  $ePcSE = 9m.32s.$ ,  $eSSN = 15m.5s.$ ,  $SSE = 15m.48s.$ ,  $eScSN = 17m.15s.$   
Kodaikanal  $PPPE = (9m.6s.)$ ,  $SSSE = (16m.5s.)$ , readings have been increased by 2m.  
Hyderabad  $SN = 13m.12s.$   
New Delhi  $PcPN = 9m.48s.$ ,  $PcSN = 13m.29s.$ ,  $SSN = 15m.47s.$ ,  $SSSN = 16m.17s.$   
Ogyalla  $e = 7m.30s.$ ,  $esP = 7m.56s.$ ,  $e = 8m.18s.$ ,  $ePP? = 8m.50s.$ ,  $ePcPN = 9m.21s.$ ,  
 $epPcP = 9m.46s.$ ,  $e = 10m.5s.$ ,  $eE = 11m.46s.$ ,  $eSE = 13m.21s.$ ,  $eSS = 16m.26s.$   
Florence  $i = 7m.35s.$  and  $14m.15s.$   
Triest  $iPP = 8m.50s.$ ,  $ipPP = 9m.8s.$ ,  $iSS = 15m.59s.$   
Skalnate Pleso  $ePP = 8m.50s.$ ,  $epPP = 9m.26s.$ ,  $epPcP = 10m.10s.$ ,  $e = 16m.5s.$ ,  $eSS = 16m.26s.$   
Bologna  $e = 7m.1s.$   
Vienna  $PcP = 9m.28s.?$   
Algiers Univ.  $iZ = 7m.39s.$ ,  $ePPPZ = 9m.17s.$ ,  $ePcPZ = 9m.41s.$   
Raciborzu  $eZ = 8m.9s.$ ,  $eE = 8m.18s.$ ,  $ePcPN = 9m.30s.$ ,  $ePcP?E = 9m.43s.?$ ,  $eSE = 13m.45s.$   
Warsaw  $PE = 7m.44s.$ ,  $eE = 8m.44s.$ ,  $ePPE = 9m.30s.$ ,  $ePPPZ = 9m.48s.$ ,  $eZ = 10m.5s.$ ,  
 $eE = 10m.28s.$ ,  $eZ = 12m.32s.$  and  $13m.14s.$ ,  $eSE = 13m.46s.$ ,  $eEN = 15m.3s.$ ,  $eSSE = 16m.23s.$ ,  $eSSSEZ = 17m.3s.$   
Prague  $e = 8m.41s.$  and  $8m.50s.$ ,  $ePPP = 9m.45s.$ ,  $e = 10m.32s.$ ,  $eN = 12m.55s.$ ,  $13m.16s.$ ,  
and  $13m.42s.$ ,  $eSS = 17m.5s.$ ,  $eSSS = 17m.53s.$   
Cheb  $e = 9m.1s.$ ,  $9m.21s.$ , and  $14m.28s.$ ,  $eSS = 17m.43s.$   
Stuttgart  $iZ = 8m.1s.$ ,  $eZ = 8m.16s.$ ,  $e = 10m.52s.$  and  $11m.27s.$ ,  $eSS = 17m.26s.$   
Collmberg  $eZ = 8m.4s.$ ,  $8m.15s.$ , and  $8m.47s.$ ,  $eN = 9m.34s.$ ,  $eE = 14m.32s.$ ,  $eSSE = 17m.17s.$ ,  $eN = 17m.48s.$   
Alicante  $PcP = 9m.48s.$ ,  $ScS = 13m.44s.$ ,  $PS = 14m.44s.$ ,  $SS = 17m.48s.$ ,  $ScS = 17m.56s.$ ,  
 $SS = 18m.24s.$   
Jena  $ePP?N = 9m.46s.$ ,  $eN = 11m.58s.$   
Tortosa  $PE = 8m.5s.$ ,  $PPPEN = 10m.12s.$ ,  $PcSE = 13m.33s.$ ,  $SSEN = 17m.28s.$ ,  
 $SSSN = 18m.37s.$   
Besançon  $e = 8m.50s.$   
Strasbourg  $i = 8m.56s.$ ,  $e = 10m.43s.$  and  $11m.2s.$ ,  $eSS = 17m.44s.$ ,  $e = 18m.8s.$ , and  
 $20m.34s.$   
Potsdam  $eSS?Z = 18m.5s.$   
Clermont-Ferrand  $eSS = 18m.8s.$   
Granada  $PPP = 11m.6s.$ ,  $PS = 16m.12s.$ ,  $ScS = 18m.5s.$ ,  $iSS = 18m.42s.$ ,  $SSS = 19m.18s.$   
Malaga  $PPZ = 10m.15s.$ ,  $ScPZ = 13m.31s.$   
Toledo  $PPPZ = 11m.5s.$ ,  $SS = 18m.43s.$   
Paris  $i = 8m.30s.$  and  $8m.43s.$ ,  $iPP = 10m.22s.$ ,  $iPS? = 16m.15s.$ ,  $eSS = 18m.27s.?$ ,  $i = 18m.45s.$ ,  $iQ = 18m.55s.$   
Copenhagen  $18m.35s.$   
Upsala  $esPE = 9m.48s.$ ,  $ePP?E = 10m.33s.$ ,  $ePPN = 10m.41s.$ ,  $ePPPE = 11m.54s.$ ,  $eN = 14m.46s.$ ,  
 $eS? = 15m.38s.$ ,  $esSE = 16m.38s.$ ,  $eScS?E = 18m.5s.?$ ,  $eN = 18m.35s.$  and  $22m.35s.$   
Jersey  $e?E = 7m.41s.$ ,  $eE = 14m.8s.$  and  $17m.10s.$   
Kew  $eSSEZ = 19m.58s.$   
Durham  $iEN = 18m.57s.$   
Rathfarnham Castle  $ePPEN = 11m.41s.$ ,  $eSSEN = 21m.45s.$   
Aberdeen  $iN = 19m.13s.$   
Nanking  $SSE = 26m.3s.$   
College  $e = 17m.19s.$   
La Paz  $PPS = 29m.11s.$ ,  $SS = 34m.25s.$   
Long waves were also recorded at Lome, Grahamstown, Bermuda, and Huancayo.

Aug. 2d. Readings also at 0h. (Overton, Pierce Ferry, Collmberg, and near Istanbul), 4h. (Hungry Horse), 6h. (Mount Wilson, Tinemaha, Tucson (2), Boulder City, Overton (2), Pierce Ferry (2), Fresno, Lick, College, Chicago, near Apia, and near Andijan), 8h. (Helwan), 9h. (Christchurch, Wellington, Tucson, College, and Upsala), 10h. (Algiers Univ., Upsala, near Obi-garm, and near Boulder City), 13h. (Shasta Dam, Boulder City, near Overton, Pierce Ferry, and near Zürich), 14h. (Almata, Kulyab, Samarkand, Tashkent, near Andijan, Fergana, Frunse, Obi-garm (2), and Stalina-bad), 16h. (Tamanrasset), 17h. (Lick (2) and near Ottawa), 18h. (Tananarive), 23h. (Pierce Ferry, Collmberg, near Yalta, near Almata, and near Tananarive).

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Aug. 3d. 6h. 14m. 55s. Epicentre 18°·1N. 99°·9W. Depth of focus 0·010.  
(as on 1941, February 23d.).

Felt strongly at Teloloapan, Guerrero, Mexico. Epicentre as adopted, suggested depth 100km.

Monthly Seismo. Bull., Tacubaya, for August, 1950, p.1.

A = -·1635, B = -·9370, C = +·3088;  $\delta = +6$ ;  $h = +5$ ;  
D = -·985, E = +·172; G = -·053, H = -·304, K = -·951.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.	
	°	°	m. s.	s.	m. s.	s.	m. s.	m.	
Tacubaya	1·5	27	i 0 25 <sub>a</sub>	- 2	—	—	—	i 0·7	
Puebla	1·9	60	i 0 29	- 3	0 53	- 2	—	—	
Oaxaca	3·1	110	0 48	0	—	—	—	1·5	
Vera Cruz	3·7	74	0 57	+ 1	1 48	+ 9	—	—	
Guadalajara	4·0	308	1 3	+ 3	—	—	—	2·0	
Manzanillo	4·3	284	1 5	0	—	—	—	2·1	
Merida	10·1	72	e 2 23	- 1	i 4 19	+ 3	—	—	
Chihuahua	11·9	333	i 2 50 <sub>k</sub>	+ 2	i 5 30	SS	—	e 6·3	
Tucson	17·2	327	e 3 52	- 3	i 7 5	+ 3	i 4 11	e 7·4	
Pierce Ferry	21·8	329	i 4 44	- 1	e 8 44	+ 9	i 6 21	i 11·1	
Boulder City	22·2	327	i 4 47	- 2	—	—	i 5 11	pP e 11·1	
Riverside	22·2	320	i 4 48 <sub>k</sub>	- 1	e 8 53	+11	i 6 6	PP	
Crest Line	z.	22·3	320	i 4 49 <sub>k</sub>	- 1	—	i 5 7	pP	
Overton	z.	22·4	329	i 4 50	- 1	i 8 57	+11	i 5 16	pP e 11·5
Lincoln	E.	22·8	6	e 4 58	+ 3	—	—	i 5 20	pP e 10·0
Pasadena	22·8	320	i 4 53 <sub>k</sub>	- 2	e 9 0	+ 7	i 5 14	pP e 10·7	
Haiwee	24·0	323	i 5 5	- 1	—	—	i 5 24	pP	
Tinemaha	24·8	324	i 5 12 <sub>k</sub>	- 2	—	—	i 8 49	P <sub>c</sub> P	
Logan	25·7	340	e 5 18	- 5	e 9 49	+ 7	e 6 19	PP e 13·4	
Fresno	25·8	322	e 5 19 <sub>k</sub>	- 5	e 10 41	+57	—	—	e 13·6
Lick	z.	27·0	320	e 5 32 <sub>k</sub>	- 3	—	—	i 5 58	pP e 14·5
Chinchina	27·1	114	i 5 51	+15	e 10 26	+21	—	—	—
Santa Clara	27·2	320	e 5 48	+12	e 10 13	+ 7	e 11 2	sS	e 14·7
Berkeley	27·8	320	e 5 38 <sub>a</sub>	- 4	e 10 20	+ 4	e 5 59	pP	e 15·4
Cleveland	28·1	29	i 5 43 <sub>k</sub>	- 2	e 10 21	0	e 11 16	sS	—
Bogota	28·6	114	e 5 54	+ 5	e 10 51	+22	e 6 7	pP	e 12·0
Washington	28·7	39	e 6 33	+43	e 10 18	-13	—	—	—
Bozeman	29·0	345	e 6 13	pP	e 10 22	-13	—	—	e 13·4
Mineral	z.	29·0	325	e 5 50	- 3	e 10 19	-16	—	—
Shasta Dam	29·7	325	i 5 54	- 5	e 12 44	S <sub>c</sub> P	e 6 56	PP	e 15·7
Butte	N.	29·8	343	e 7 22	PPP	e 11 14	+26	—	—
Philadelphia	30·5	40	e 7 3	PP	e 11 6	+ 7	—	—	e 12·1
Hungry Horse	32·3	343	i 6 19	- 3	e 11 47	+20	i 9 8	P <sub>c</sub> P	e 12·9
Ottawa	33·9	31	i 6 33 <sub>k</sub>	- 3	i 11 51	- 1	i 9 12	P <sub>c</sub> P	—
Harvard	34·2	39	i 6 37	- 1	—	—	—	—	—
Weston	34·3	39	i 6 38	- 1	—	—	i 7 17	pP	—
Seattle	34·7	334	i 6 41 <sub>a</sub>	- 1	—	—	i 6 58	pP	e 14·8
Victoria	35·9	334	i 6 49 <sub>k</sub>	- 3	—	—	e 15 38	SSS	19·9
Shawinigan Falls	N.	36·1	32	e 6 53	- 1	—	—	—	—
Seven Falls	E.	37·5	33	7 4	- 2	—	8 46	PP	—
La Paz	46·5	135	8 29	+10	e 22 58	Q	—	—	i 25·1
College	56·5	338	i 9 31	- 3	e 17 19	+ 3	i 10 30	P <sub>c</sub> P	—
Malaga	z.	83·6	53	i 12 23 <sub>a</sub>	+ 4	i 22 41	+10	i 12 45	pP
Granada	84·1	53	11 25	-56	21 47	-49	—	—	—
Paris	84·4	41	i 12 26	+ 3	—	—	i 12 47	pP	—
Clermont-Ferrand	85·9	44	i 12 33	+ 3	e 23 7	+13	i 12 53	pP	—
Copenhagen	87·2	32	—	—	i 23 18	+12	—	—	—
Besançon	87·2	41	i 12 37	+ 1	—	—	e 12 55	pP	—
Strasbourg	87·7	39	e 12 40	+ 1	e 23 24	+13	e 13 2	pP	—
Basle	88·1	40	e 12 42	+ 1	e 23 16	+ 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.	
Stuttgart	z.	88.5	39	e 12 45	+ 2	e 21 28	?	e 13 6	pP	—
Zürich		88.8	40	e 12 45k	+ 1	—	—	e 13 7	pP	—
Algiers Univ.	z.	89.3	52	i 12 49 <sub>a</sub>	+ 3	—	—	i 13 10	pP	—
Colimberg	z.	89.5	36	e 12 49	+ 2	e 21 19	?	e 13 10	pP	—
Prague		90.9	36	e 12 55	+ 1	e 23 35?	-5	—	—	—
Raciborzu	z.	93.0	34	e 13 6	+ 2	—	—	—	—	—
Tamanrasset	z.	96.6	63	i 13 23k	+ 3	—	—	i 13 46	pP	—

Additional readings :—

Puebla i = 45s.  
 Vera Cruz i = 1m.21s.  
 Tucson iPP? = 4m.44s., eP<sub>c</sub>P = 8m.38s.  
 Boulder City i = 5m.29s., e = 7m.17s.  
 Riverside iP<sub>c</sub>PZ = 8m.44s.  
 Crest Line iP<sub>c</sub>PZ = 8m.44s.  
 Overton iZ = 6m.47s., eP<sub>c</sub>PZ = 8m.42s.  
 Pasadena iZ = 5m.26s. and 5m.43s., iP<sub>c</sub>PZ = 8m.44s., iSN = 9m.11s., iS<sub>c</sub>S?E = 16m.17s.  
 Berkeley iP<sub>c</sub>PZ = 8m.57s., eZ = 11m.13s.  
 Cleveland iE = 6m.36s.  
 Bogota eP<sub>c</sub>PEN = 9m.56s.  
 Shasta Dam eP<sub>c</sub>P = 9m.0s.  
 Hungry Horse i = 6m.39s. and 6m.56s., eSS? = 12m.23s.  
 Ottawa iZ = 7m.52s., EN = 8m.14s.  
 Seattle i = 6m.47s. and 7m.21s., eP<sub>c</sub>P = 8m.34s.  
 Malaga ePPZ = 15m.35s., eSSZ = 31m.25s.  
 Paris isP = 12m.53s.  
 Besançon esP = 13m.7s., e = 13m.27s.  
 Strasbourg isP = 13m.11s., e = 13m.59s. and 14m.40s., eS = 23m.29s.  
 Tamanrasset eZ = 14m.17s. and 16m.50s., ePPZ = 17m.24s.  
 Long waves were also recorded at Saskatoon and Kew.

Aug. 3d. 9h. 27m. 59s. Epicentre 8°.4N. 72°.0W. (as on 1948, December 31d.).

A = +.3058, B = -.9410, C = +.1451;  $\delta$  = +5;  $h$  = +7;  
 D = -.951, E = -.309; G = +.045, H = -.138, K = -.989.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.	
		°	°	m. s.	s.	m. s.	s.	m. s.	m.	
Bogota		4.3	209	i 1 7	- 1	i 2 4	+ 4	i 1 20	P*	—
Chinchina		5.0	227	i 1 11	- 7	i 2 15	- 3	i 1 25	P*	—
Balboa Heights		7.5	274	i 1 55	+ 2	i 3 13	- 7	—	—	—
Huancayo		20.6	189	e 4 40	- 3	—	—	—	—	e 10.8
La Paz		25.0	171	i 5 29k	+ 2	i 9 54	+ 5	i 15 55	S <sub>c</sub> S	i 12.0
Weston		33.8	2	i 6 37	- 9	—	—	—	—	—
Harvard		34.0	2	e 6 29	-19	—	—	—	—	—
Tucson		43.1	309	e 8 5	+ 1	—	—	—	—	—
Pierce Ferry		47.1	312	i 8 37	+ 2	—	—	—	—	—
Overton	z.	47.6	313	i 8 31	- 8	—	—	—	—	—
Boulder City		47.7	312	e 8 42	+ 2	—	—	—	—	—
Riverside	z.	48.8	309	e 8 50	+ 1	—	—	—	—	—
Tinemaha	z.	50.6	312	i 9 4	+ 2	—	—	—	—	—
Hungry Horse		53.2	327	e 9 24	+ 2	—	—	e 11 49	PP	—
Lick	z.	53.3	312	i 9 24k	+ 1	—	—	—	—	—
Mineral	z.	54.3	315	e 9 30	0	—	—	—	—	—
Tamanrasset	z.	75.3	68	e 11 50	+ 3	—	—	e 14 39	PP	—
College		76.4	335	e 11 58	+ 5	—	—	—	—	—
Stuttgart	z.	77.9	42	e 12 8	+ 7	—	—	—	—	—

Additional readings :—

Bogota iS\* = 2m.41s.  
 Chinchina i = 2m.7s. and 2m.29s.  
 Lick iZ = 9m.31s.  
 Tamanrasset iZ = 11m.54s.

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Aug. 3d. 10h. 30m. 46s. Epicentre 47°·6N. 7°·6E. (as on 1942, July 18d.).

Intensity V at Basle and in neighbourhood; II-IV in the Jura region; also felt as far as Baden-Baden.

E. Wanner.

Jahresbericht des Erdbebendienstes der Schweiz im Jahr 1950. Zürich, 1951, p.2, with macroseismic chart. Epicentre as adopted.

A = +·6708, B = +·0895, C = +·7362;  $\delta = -3$ ;  $h = -4$ ;  
D = +·132, E = -·991; G = +·730, H = +·097, K = -·677.

	$\Delta$ °	Az. °	P.		O-C.	S.		O-C.	Supp.	
			m.	s.	s.	m.	s.	m.	s.	
Basle	0·0	—	i 0	8	+ 1	i 0	11	0	—	—
Zürich	0·7	289	i 0	14 <sub>a</sub>	- 3	i 0	21	- 7	—	—
Neuchatel	0·8	216	i 0	19	+ 1	i 0	30	- 1	—	—
Strasbourg	1·0	6	i 0	23 <sub>k</sub>	+ 2	e 0	34	- 2	—	—
Ebingen	1·1	58	e 0	22	0	e 0	36	- 3	—	—
Besançon	1·2	252	i 0	28	+ 4	i 0	46	+ 5	—	—
Ravensburg	1·4	82	e 0	27	0	e 0	43	- 3	e 0	46
Chur	1·5	120	e 0	27	- 1	i 0	47	- 2	—	—
Karlsruhe	1·5	21	e 0	47	S	i 0	55	?	—	—
Stuttgart	z. 1·6	42	e 0	27	- 3	e 0	46	- 5	e 0	34
Clermont-Ferrand	3·6	241	i 1	15	P <sub>g</sub>	i 2	8	S <sub>g</sub>	—	—
Jena	4·2	36	e 1	19	P*	i 2	19	S <sub>g</sub> *	e 1	25
Prague	5·1	59	i 1	39	P <sub>g</sub>	e 2	31	S*	e 2	44

Additional readings:—

Strasbourg iP<sub>g</sub> = 25s., i = 28s., iS<sub>g</sub> = 36s.

Ebingen e = 29s. and 43s., eZ = 54s.

Ravensburg e = 55s.

Stuttgart eP\*Z = 32s., eZ = 49s., eS\*Z = 52s., iS<sub>g</sub>Z = 54s., iZ = 58s. and 1m.1s.

Jena eP<sub>g</sub>N = 1m.31s., eN = 1m.38s., iEN = 2m.15s.

Prague iP<sub>g</sub> = 1m.47s., eS<sub>g</sub> = 3m.0s.

Aug. 3d. 15h. 26m. 48s. Epicentre 11°·7N. 143°·3E. (as on 2d.).

	$\Delta$ °	Az. °	P.		O-C.	S.		O-C.	Supp.		L.
			m.	s.	s.	m.	s.	m.	s.	m.	
Guam	2·3	39	(0	38)	- 2	—	—	—	—	—	—
Nanking	30·3	316	e 7	7	PP	11	30	+15	—	—	13·5
Vladivostok	32·8	345	i 6	36	- 1	e 14	0	SSS	e 7	41	PP
Brisbane	40·1	167	i 7	39 <sub>k</sub>	0	i 13	45	- 1	—	—	—
Irkutsk	51·2	331	9	5	- 2	e 16	19	- 6	—	—	—
Almata	64·9	313	i 10	42	- 1	—	—	—	—	—	—
Frunse	66·5	313	e 10	53	- 1	e 19	45	+ 1	—	—	—
Andijan	68·0	309	e 11	4	+ 1	e 20	1	- 1	—	—	—
Fergana	68·5	309	e 11	5	- 1	e 20	5	- 3	—	—	—
Kulyab	69·9	306	e 11	17	+ 2	—	—	—	—	—	—
Tashkent	70·4	310	i 11	16	- 2	i 20	28	- 2	—	—	—
College	70·6	25	e 11	15	- 4	—	—	—	—	—	—
Stalinabad	70·7	307	i 11	19	- 1	e 20	32	- 2	—	—	—
Samarkand	72·1	308	e 11	28	0	—	—	—	—	—	—
Sverdlovsk	76·3	326	i 11	51	- 1	21	33	- 4	—	—	—
Baku	85·1	310	—	—	—	e 23	12	+ 4	—	—	—
Shasta Dam	85·7	50	i 12	43	+ 1	—	—	—	—	—	—
Lick	z. 87·0	53	e 12	49 <sub>a</sub>	+ 1	—	—	—	—	—	—
Fresno	z. 88·6	53	e 12	56 <sub>a</sub>	0	—	—	—	—	—	—
Tiflis	88·6	313	e 12	57	+ 1	23	42	0	—	—	—
Moscow	89·0	328	e 12	58	0	e 23	26	[- 1]	—	—	—
Hungry Horse	89·6	41	e 13	1	0	—	—	—	—	—	—
Tinemaha	z. 89·7	53	e 13	9	+ 8	—	—	—	—	—	—
Haiwee	90·1	53	e 13	3	0	—	—	—	—	—	—
Pasadena	90·4	56	i 13	4	0	e 24	13	+15	—	—	e 47·2

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.
Riverside	z.	91.0	56	i 13 8	+ 1	—	—	—	—
Pulkovo		91.1	332	e 13 7	- 1	e 23 35	[- 4]	e 16 36?	PP
Boulder City		92.6	52	e 13 17	+ 2	—	—	—	—
Overton	z.	92.8	52	i 13 17	+ 1	—	—	—	—
Pierce Ferry		93.2	52	e 13 19	+ 2	—	—	—	—
Tucson		96.9	55	e 13 40	+ 6	—	—	e 17 31	PP
Ksara		97.6	307	e 13 38	0	—	—	e 27 20?	PPS
Warsaw		99.4	329	e 18 9	PP	e 24 13	[- 11]	e 33 12?	SSP
Istanbul		99.9	316	e 13 54	+ 6	—	—	e 17 54	PP
Bergen	N.	100.7	341	e 11 5	?	—	—	—	—
De Bilt		106.9	334	e 18 44	PP	e 28 1	PS	e 33 42	SS
Strasbourg		108.3	331	—	—	e 28 8	SP	e 37 12?	SSS
Kew	z.	109.6	336	e 19 4	PP	—	—	—	—
Paris		110.5	334	e 19 8	PP	e 28 35	PS	—	e 58.2
Jersey	E.	112.1	336	—	—	e 27 23	S	—	—
Tamanrasset	z.	126.3	310	e 19 9	[+ 4]	e 25 19	[- 51]	e 21 2	PP

Additional readings and note :-

Guam reading has been reduced by 8m.

Vladivostok iPPP = 7m.53s.

Brisbane iZ = 7m.46s.

Lick iZ = 13m.20s.

Boulder City i = 13m.47s.

Warsaw eZ = 18m.47s., 22m.9s., and 23m.11s.

Strasbourg ePS = 28m.18s.

Tamanrasset ePPPZ = 23m.41s.

Long waves were also recorded at Rome.

Aug. 3d. 15h. 44m. 59s. Epicentre 39°·9N. 142°·4E. Depth of focus 0·010.  
(as on 1949, September 16d.).

Intensity V Sawauchi (Iwate prefecture), Odate Hanawa (Akita prefecture); IV at Miyako, Hatinohe, Morioka; II-III at Aomori and Akita. Epicentre 39°·9N. 142°·5E. Depth 30km. Macroseismic radius 220-300km.

Seismo. Bull. Cent. Met. Obs., Japan, 1950. Tokyo, 1952, p.35, with macroseismic chart.

A = -·6095, B = +·4694, C = +·6389;  $\delta = +2$ ;  $h = -2$ ;  
D = +·610, E = +·792; G = -·506, H = +·390, K = -·769.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Miyako		0.4	230	0 8k	- 7	0 18	- 9	—	—
Hatinohe		0.9	314	0 12k	- 7	0 24	- 10	—	—
Morioka		1.0	258	0 15k	- 5	0 30	- 6	—	—
Mizusawa	E.	1.2	232	0 21	- 2	0 39	- 1	—	—
Aomori		1.5	307	0 23	- 4	0 46	- 1	—	—
Akita		1.8	264	0 29k	- 1	0 55	+ 2	—	—
Sendai		2.0	215	0 34k	+ 1	1 2	+ 5	—	—
Mori		2.6	328	0 36	- 5	1 10	- 2	—	—
Onahama		3.2	202	0 46	- 4	1 36	+ 9	—	—
Sapporo		3.2	346	0 43	- 7	1 18	- 9	—	—
Mito		3.8	204	0 51	- 7	1 55	+ 13	—	—
Nemuro		4.2	34	0 52k	- 11	1 33	- 18	—	—
Kumagaya		4.4	213	1 9	+ 3	2 5	+ 9	—	—
Maebasi		4.4	218	1 8	+ 2	2 3	+ 7	—	—
Nagano		4.6	227	1 10	+ 1	2 27	SS	—	—
Matusiro		4.7	226	1 11	+ 1	2 28	SS	—	—
Tokyo		4.7	207	1 9	- 1	2 11	+ 7	—	—
Wazima		5.0	241	1 16	+ 2	2 28	+ 17	—	—
Yokohama		5.0	207	1 16	+ 2	2 33	SS	—	—
Toyama		5.2	233	1 17	0	2 55	SSS	—	—
Hunatu		5.3	214	1 19	+ 1	2 26	+ 8	—	—
Shizuoka		5.9	214	1 26	0	2 46	+ 13	—	—
Omaesaki		6.2	213	1 48	+ 18	3 8	SSS	—	—
Gihu		6.3	227	1 33	+ 1	3 1	+ 18	—	—
Nagoya		6.4	224	1 36	+ 3	3 8	+ 22	—	—

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.
Hikone	6.7	228	1 41	+ 4	—	—	—	—
Kameyama	6.9	225	1 51	+11	3 39	SS	—	—
Osaka	7.6	228	1 59	+ 9	—	—	—	—
Owase	7.6	222	1 55	+ 5	—	—	—	—
Vladivostok	8.5	296	i 2 2	0	i 3 46	+ 9	—	—
College	46.3	34	e 8 15	- 3	—	—	—	—
Sverdlovsk	53.5	318	9 12	- 1	16 44	SP	—	—
Obi-garm	54.8	294	i 9 22?	0	—	—	—	—
Samarkand	56.2	296	e 9 34	+ 2	—	—	—	—
Moscow	65.4	324	e 10 33	- 1	e 19 38	PS	10 48	pP
Pulkovo	66.1	330	e 10 38	- 1	—	—	e 10 52	pP
Shasta Dam	68.8	54	e 10 56	0	—	—	e 11 7	pP
Hungry Horse	69.2	44	e 10 58	0	—	—	—	—
Tiflis	69.7	308	i 11 1?	0	—	—	—	—
Borzhomi	70.5	308	11 4	- 2	—	—	—	—
Zugdidi	71.0	309	e 11 16	+ 7	—	—	—	—
Lick	z. 71.2	57	e 11 10k	0	—	—	—	—
Warsaw	z. 75.1	328	e 11 36	+ 3	e 21 18	+16	i 14 40	PP
Pasadena	z. 75.4	58	e 11 33	- 2	—	—	—	e 38.0
Copenhagen	75.7	334	i 11 36	0	e 21 31	PS	14 34	PP
Overton	z. 76.3	53	i 11 40	0	—	—	—	—
Boulder City	76.4	54	e 11 41	+ 1	—	—	—	—
Pierce Ferry	76.8	54	i 11 43	0	—	—	—	—
Potsdam	z. 78.1	332	i 11 50	0	—	—	—	e 35.0
Collmberg	79.0	331	e 11 55	0	—	—	e 12 8	pP
Tucson	81.3	55	e 12 8	+ 1	—	—	—	—
Stuttgart	82.5	331	e 12 13	0	e 12 27	P <sub>c</sub> P	e 17 11	PPP
Strasbourg	83.2	332	i 12 19	+ 2	—	—	—	—
Rathfarnham Castle	83.3	342	e 11 11	-66	—	—	—	e 34.0
Kew	83.4	338	11 8	-70	—	—	—	e 40.0
Besançon	84.9	332	e 12 25	0	—	—	—	—
Tamanrasset	105.8	319	18 18	PP	—	—	—	—

Additional readings :—

Mizusawa SN = 42s.

Warsaw eS?E = 21m.21s., cPPSZ = 22m.16s.

Long waves were also recorded at Clermont-Ferrand and Granada.

Aug. 3d. 22h. 18m. 17s. Epicentre 9°·7N. 69°·8W.

Destructive at Tocuyo. Strongly felt at Guanare and San Cristobal. Epicentre 10°N. 69°·5W. (U.S.C.G.S.).

Bull. Seismo. Soc., America, Vol. 40, No. 4, Oct., 1950, p.315.

A = +.3404, B = -.9253, C = +.1674;  $\delta$  = +8; h = +7;  
D = -.938, E = -.345; G = +.058, H = -.157, K = -.986.

	$\Delta$ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	Supp. m. s.	L. m.
Galerazamba	5.5	282	i 1 29	+ 4	i 2 39	+ 9	i 1 43	P*
Bogota	6.6	220	i 1 54	P*	i 3 13	+15	i 2 15	P <sub>g</sub>
Chinchina	7.4	231	i 1 51	- 1	i 3 17	- 1	i 4 11	S <sub>g</sub>
Port au Prince	9.1	345	i 2 17	+ 3	i 3 55	- 5	—	i 4.2
San Juan	9.3	22	i 2 17	0	i 4 0	- 5	—	e 4.6
Roosevelt Roads	9.4	25	i 2 16	- 2	i 4 10	+ 3	—	—
Balboa Heights	9.7	266	i 2 25	+ 3	i 4 9	- 6	—	—
Fort de France	9.8	59	e 2 22	- 2	e 4 12	- 5	e 3 17	P <sub>g</sub>
Miami	19.0	332	i 4 27	+ 1	e 8 3	+ 8	—	—
Merida	22.1	303	i 4 55 <sub>a</sub>	- 4	i 8 56	- 2	—	—
Huancayo	22.3	194	i 5 2	+ 1	i 9 22	+20	—	i 10.0
Bermuda	23.0	11	i 5 9	+ 2	i 9 24	+10	i 5 41	PP
Cherry Point	25.0	347	e 5 36	+ 9	—	—	—	—
La Paz	26.1	175	i 5 38 <sub>a</sub>	+ 1	i 10 19	+12	i 6 12	PP
Milton	26.2	325	i 5 25?	-13	—	—	—	13.3

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.
Columbia		26.3	339	e 5 38	- 1	e 10 22	+11	—	e 11.7
Vera Cruz		27.2	294	e 4 49	-58	i 10 28	+ 3	—	—
Puebla		29.0	293	e 4 57	-67	i 10 51	- 3	—	—
Tacubaya		30.0	293	i 6 13	+ 1	e 10 45	-25	i 7 2	PP
Philadelphia		30.5	352	i 6 18	+ 1	i 11 23	+ 5	e 7 44	PP i 13.0
City College, N.Y.		31.2	355	i 6 23	0	i 11 29	0	—	—
Fordham		31.2	355	i 6 23	0	i 11 31	+ 2	—	14.9
Pennsylvania		31.8	349	i 6 29	+ 1	i 11 47	+ 9	i 7 23	PP
Cincinnati		32.1	339	i 6 33	+ 2	—	—	—	—
Weston		32.6	359	i 6 35	0	i 11 50	- 1	i 7 46	PP i 14.6
Harvard		32.7	359	i 6 35	- 1	i 11 54	+ 2	i 7 51	PP e 14.5
Cleveland		33.3	344	i 6 42 <sub>k</sub>	+ 1	i 12 3	+ 1	i 7 39	PP
Guadalajara		34.1	293	e 8 11	PP	e 12 11	- 3	—	—
St. Louis		34.2	331	i 6 47	- 2	i 12 13	- 3	i 8 8	PP
Florissant		34.3	331	i 6 51	+ 1	i 12 16	- 1	e 7 52	PP
Vermont		34.8	356	i 6 57	+ 3	e 12 5	-20	i 8 8	PP e 15.9
Halifax		35.2	8	7 3	+ 5	12 36	+ 5	8 19	PP
Chicago		35.6	337	i 6 58	- 3	i 12 31	- 7	e 8 3	PP e 14.4
Ottawa		35.9	353	e 7 12	+ 8	12 45	+ 3	8 15	PP
Shawinigan Falls N.		36.8	357	7 11	0	—	—	8 31	PP
Seven Falls	E.	37.3	359	7 17	+ 1	13 5	+ 1	8 52	PP
Lincoln	E.	39.1	327	i 7 30	- 1	i 13 26	- 5	e 9 3	PP e 15.3
Santiago		42.9	181	i 8 16	+14	e 14 39	+12	10 0	PP
Tucson		44.0	307	i 9 54	PP	i 14 39	- 4	(e 18 17)	S <sub>c</sub> S e 18.3
Buenos Aires		45.3	166	i 8 25	+ 4	e 15 4	+ 2	—	—
La Plata	E.	45.8	166	e 8 22	- 3	15 13	+ 4	18 37	S <sub>c</sub> S 24.2
	N.	45.8	166	e 8 22	- 3	15 7	- 2	10 16	PP 23.9
Pierce Ferry		47.9	311	i 8 42	0	i 15 45	+ 6	i 10 24	PP e 29.4
Overton		48.4	311	i 8 46	0	e 15 51	+ 5	—	—
Boulder City	Z.	48.5	310	e 8 47	+ 1	e 14 10	?	i 12 6	PPP e 25.5
Logan		48.8	318	e 8 48	- 1	i 15 53	+ 1	i 10 59	PP e 19.9
Riverside		49.8	307	i 8 56	0	—	—	—	—
Bozeman		50.3	323	i 9 0	0	i 16 12	- 1	e 11 1	PP e 22.1
Pasadena		50.5	307	i 9 2 <sub>a</sub>	0	i 16 16	0	i 10 38	P <sub>c</sub> P e 21.7
Haiwee	Z.	50.9	309	i 9 5	0	—	—	—	—
Butte	N.	51.4	323	e 9 7	- 2	e 16 26	- 2	e 11 6	PP e 22.3
Tinemaha		51.4	310	i 9 8 <sub>a</sub>	- 1	i 16 33	+ 5	—	—
Saskatoon		51.8	332	i 9 14	+ 2	i 16 33	0	10 31	P <sub>c</sub> P
Fresno		52.5	310	i 9 16 <sub>k</sub>	- 1	e 16 45	+ 2	i 9 56	P <sub>c</sub> P
Hungry Horse		53.4	325	e 9 22	- 2	e 17 18	+23	e 11 23	PP e 32.7
Ivigut		53.8	13	e 9 33	+ 7	e 17 10	+ 9	20 42	SS 25.7
Lick		54.1	310	i 9 28 <sub>a</sub>	- 1	e 17 8	+ 3	i 12 50	PPP e 31.9
Santa Clara		54.3	310	i 9 32	+ 2	i 17 14	+ 7	—	—
Berkeley		54.7	310	i 9 32 <sub>a</sub>	- 1	e 17 17	+ 4	—	e 31.2
Mineral	Z.	55.0	313	i 9 34	- 1	—	—	e 11 43	PP
Shasta Dam		55.7	313	e 9 37	- 3	e 17 16	-10	e 13 22	PPP
Ferndale		57.0	313	e 9 56	+ 6	e 17 43	0	—	—
Seattle		58.1	321	i 9 58 <sub>k</sub>	0	i 17 59	+ 1	i 10 53	P <sub>c</sub> P i 24.6
Victoria		59.1	322	i 10 3 <sub>a</sub>	- 1	18 8	- 3	—	e 25.3
Lisbon		61.2	51	i 10 19 <sub>a</sub>	0	18 40	+ 2	12 23	PP 28.7
Malaga	Z.	64.6	53	i 10 45 <sub>k</sub>	+ 4	i 19 27	+ 6	i 11 5	pP 30.8
Granada		65.3	53	i 10 46 <sub>a</sub>	0	i 19 37	+ 8	11 31	P <sub>c</sub> P 35.3
Toledo		65.3	50	i 10 44	- 2	i 19 29	0	e 13 12	PP 27.3
Rathfarnham Castle		66.6	35	i 10 54	0	e 19 39	- 6	e 13 52	PP e 25.7
Scoresby Sund		67.7	15	i 11 0	- 1	—	—	—	—
Alicante		67.8	52	i 10 57	- 5	i 19 57	- 3	11 11	P <sub>c</sub> P e 32.0
Jersey	E.	68.2	40	e 11 4	0	e 22 46	?	—	30.7
Tortosa		68.8	50	i 11 4	- 4	i 19 51	-20	11 34	P <sub>c</sub> P c 33.7
Edinburgh	E.	69.0	33	e 11 1	- 8	19 59	-15	20 32	PS
Durham		69.6	35	i 11 15	+ 2	i 20 22	+ 1	—	—
Kew		69.7	38	i 11 11 <sub>a</sub>	- 3	i 20 21	- 1	e 15 24	PPP e 24.7
Aberdeen		69.9	32	i 11 11	- 4	i 20 21	- 3	e 25 4	SS e 32.5
Barcelona		70.1	49	—	—	(e 28 20)	SSS	e 15 57	PPP e 28.3
Algiers Univ.	Z.	70.5	54	e 11 12	- 6	—	—	—	—
Paris		71.1	41	i 11 20	- 2	i 20 36	- 2	i 11 48	P <sub>c</sub> P 30.7

Continued on next page.

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	△	Az.	P.		O-C.	S.		O-C.	Supp.		L.	
			m.	s.		m.	s.		m.	s.		
Clermont-Ferrand	71.2	45	e 11	21	- 2	e 20	48	+ 8	i 11	29	P <sub>c</sub> P	32.7
Tamanrasset z.	72.8	68	i 11	33 <sub>a</sub>	+ 1	e 21	10	+12	e 11	52	P <sub>c</sub> P	33.7
De Bilt	73.2	38	i 11	34 <sub>a</sub>	- 1	i 21	2	0	e 14	13	PP	e 30.7
Besançon	73.3	43	e 11	34	- 1	—	—	—	e 11	53	P <sub>c</sub> P	—
Neuchatel	73.9	43	e 11	37	- 2	—	—	—	—	—	—	—
Bergen	74.3	29	11	41	0	21	18	+ 3	—	—	—	31.7
Basle	74.4	43	e 11	40	- 2	e 21	17	+ 1	—	—	—	—
Strasbourg	74.6	42	e 11	41 <sub>a</sub>	- 2	i 21	19	+ 1	i 12	3	P <sub>c</sub> P	e 31.7
Karlsruhe	75.0	41	i 11	45	0	e 21	23	0	—	—	—	—
Zürich	75.1	43	e 11	43 <sub>k</sub>	- 3	e 21	20	- 4	e 12	7	pP	—
Stuttgart	75.5	42	i 11	47 <sub>a</sub>	- 1	e 21	28	0	e 12	11	P <sub>c</sub> P	e 31.7
Chur	75.7	44	e 11	47	- 2	e 21	11	-19	—	—	—	—
College	76.2	335	e 11	49	- 3	e 21	33	- 3	—	—	—	—
Florence, Xim.	76.9	47	e 11	50	- 6	e 21	45	+ 2	—	—	—	—
Jena E.	77.1	39	e 11	56	- 1	e 21	46	0	e 12	24	P <sub>c</sub> P	—
Cheb	77.6	40	11	58	- 2	e 21	52	+ 1	e 15	6	PP	—
Copenhagen	77.7	35	i 11	59	- 1	i 21	54	+ 2	15	9	PP	35.7
Rome	77.9	49	i 11	54 <sub>a</sub>	- 7	i 21	52	- 2	26	52	SS	37.4
Collnberg	78.0	39	e 12	0	- 2	e 21	55	0	e 27	1	SS	e 32.7
Potsdam	78.0	38	e 12	2	0	i 21	54	- 1	e 12	9	P <sub>c</sub> P	e 30.7
Rocca di Papa	78.1	49	e 12	14	+12	—	—	—	—	—	—	—
Prague	78.9	40	12	7 <sub>k</sub>	0	22	7	+ 2	e 15	17	PP	e 34.2
Upsala	80.4	31	e 12	13 <sub>a</sub>	- 2	i 22	19	- 2	e 12	21	P <sub>c</sub> P	e 32.7
Raciborz	81.4	40	e 12	22	+ 2	e 22	43	+12	—	—	—	—
Ogyalla	81.6	43	12	24	+ 3	e 22	32	- 1	e 15	30	PP	—
Skalnate Pleso	82.8	41	e 12	27	0	e 22	43	- 2	e 15	45	PP	—
Warsaw	82.9	38	12	29 <sub>k</sub>	+ 1	22	47	+ 1	16	41	PP	e 36.7
Timisoara	83.9	45	12	43 <sub>?</sub>	+10	23	43 <sub>?</sub>	PS	—	—	—	47.7
Lwow	85.1	40	e 12	41	+ 2	e 23	11	+ 3	—	—	—	—
Pulkovo	86.8	30	12	49	+ 2	e 23	9	[- 4]	i 12	55	P <sub>c</sub> P	—
Athens	86.9	52	e 12	49 <sub>k</sub>	+ 1	—	—	—	—	—	—	—
Bucharest	87.5	45	e 12	54	+ 3	23	16	[- 1]	—	—	—	—
Kishinev	88.8	42	13	1	+ 4	—	—	—	—	—	—	—
Istanbul	90.3	48	e 13	3	- 1	e 23	32	[- 3]	—	—	—	—
Moscow	91.7	33	e 13	10	0	e 23	40	[- 3]	e 16	48	PP	—
Yalta	93.1	44	13	17	0	24	25	+ 3	e 23	47	SKS	—
Helwan	94.7	59	i 13	27 <sub>k</sub>	+ 3	24	37	+ 1	17	13	PP	—
Ksara	97.4	54	i 13	39	+ 2	26	27	PS	17	31	PP	—
Zugdidi	99.0	44	14	7 <sub>?</sub>	+23	—	—	—	—	—	—	—
Borzhom	100.3	44	13	54	+ 4	—	—	—	—	—	—	—
Tiflis	101.3	43	i 13	54	0	e 24	34	[+ 1]	i 18	4	PP	—
Sverdlovsk	102.2	25	13	59	+ 1	25	45	+ 6	—	—	—	—
Shemakla	104.4	44	i 18	33	PP	—	—	—	—	—	—	—
Baku	105.4	44	e 18	37	PP	e 25	39	{+ 6}	—	—	—	—
Mary	114.8	41	e 19	5	PP	—	—	—	—	—	—	—
Tashkent	116.8	34	e 19	40	PP	e 25	3	[- 36]	29	12	SKSP	—
Irkutsk	118.1	4	20	3	PP	29	55	PS	—	—	—	—
Frunse	118.4	29	e 20	9	PP	e 27	17	{+ 14}	e 29	40	SKSP	—
Stalinabad	118.4	36	i 20	3	PP	e 29	58	PS	—	—	—	—
Fergana	118.8	33	e 20	7	PP	—	—	—	—	—	—	—
Andijan	118.9	32	e 18	53	[+ 2]	e 27	23	{+ 17}	e 20	6	PP	—
Tananarive	118.9	106	—	—	—	—	—	—	e 54	13	Q	e 64.0
Almata	119.2	27	e 20	2	PP	—	—	—	—	—	—	—
Vladivostok	123.8	342	e 19	0	[ 0]	e 22	40	PKS	i 20	43	PP	—
New Delhi	130.4	39	e 21	30	PP	i 22	39	PKS	e 24	59	PPP	—
Bombay	133.5	53	e 13	50	?	—	—	—	i 22	54	PKS	—
Poona N.	134.5	52	e 21	53	PP	31	13	PS	29	1	SSP	—
Nanking	137.7	10	e 22	5	PP	—	—	—	—	—	—	e 67.1
Kodaikanal	E. 141.9	59	e 18	11	?	—	—	—	—	—	—	—
Colombo	E. 145.6	62	19	44	[+ 4]	—	—	—	—	—	—	—
Bandong	176.3	—	e 21	3	PKP <sub>2</sub>	—	—	—	—	—	—	—

For Notes see next page.

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NOTES TO AUGUST 3d. 22h. 18m. 17s.

Additional readings :—

Bogota  $iS^*EN = 3m.45s.$   
Port au Prince  $i = 2m.21s., 3m.15s. \text{ and } 4m.5s.$   
Fort de France  $eP^* = 2m.50s., S^* = 4m.48s., S_g = 5m.21s.$   
La Paz  $iZ = 5m.56s., iP_cP = 9m.7s., i = 10m.33s., iSS = 11m.28s., iS_cS = 16m.28s.$   
Philadelphia  $e = 11m.48s.$   
Cleveland  $iPPN = 7m.43s., ePPPE = 7m.56s., eSSE = 13m.46s.$   
St. Louis  $i = 6m.56s., 7m.3s., 12m.41s., 12m.58s., \text{ and } 13m.40s., iSS = 14m.11s.$   
Florissant  $iPPP = 8m.10s., i = 8m.27s. \text{ and } 13m.11s., iSS = 14m.13s.$   
Halifax  $SS = 15m.6s.$   
Ottawa  $P_cP = 9m.31s., eZ = 11m.21s., SS = 15m.5s.$   
Seven Falls  $SSE = 16m.31s.$   
Lincoln  $eE = 14m.27s.$   
La Plata  $e = 8m.25s., N = 8m.55s., PPPE = 11m.1s., N = 13m.25s., P_cPN = 13m.55s., E = 15m.55s., S_cSN = 18m.25s., N = 19m.37s. \text{ and } 21m.37s., E = 23m.7s.$   
Overton  $iZ = 12m.55s.$   
Boulder City  $i = 9m.2s.$   
Logan  $e = 9m.55s., i = 11m.21s.$   
Riverside  $iZ = 9m.21s.$   
Bozeman  $eSS = 20m.0s.$   
Pasadena  $i = 9m.26s., ePPiZ = 10m.51s., iS_cP?Z = 14m.21s.$   
Butte  $iSN = 16m.29s., eSS?N = 20m.16s.$   
Tinemaha  $iZ = 9m.14s. \text{ and } 9m.27s.$   
Saskatoon  $PP = 11m.11s., PPP = 12m.17s., PS = 16m.56s., S_cS = 19m.0s., SS = 20m.8s., SSS = 22m.1s.$   
Fresno  $iZ = 9m.32s., ePPPZ = 12m.37s., eE = 14m.47s.$   
Ivigut  $19m.18s., SSS = 22m.13s.$   
Lick  $iS_cPZ = 15m.5s.$   
Seattle  $iPP = 12m.7s., iPPP = 13m.7s., iP_cS = 15m.3s., eS_cS = 20m.13s., iSS = 22m.6s., \text{ and many other unidentified } i \text{ and } e \text{ readings.}$   
Lisbon  $Z = 10m.58s., PSE = 18m.56s., N = 22m.6s., SS?EN = 23m.13s., QN = 25m.7s.$   
Malaga  $PPZ = 13m.17s., PPPZ = 14m.47s., iSSZ = 20m.5s., SSZ = 23m.51s.$   
Granada  $PP = 13m.1s., PPP = 13m.59s., i = 17m.13s., PS = 20m.1s., SS = 22m.31s., SSS = 24m.37s.$   
Rathfarnham Castle  $i = 11m.29s. \text{ and } 11m.49s., e = 11m.57s., i = 12m.42s., eEN = 15m.26s., ePSEN = 20m.15s.$   
Alicante  $PP = 13m.33s., PPP = 15m.5s., P_cS = 15m.23s., PS = 20m.23s., PPS = 20m.31s., S_cS = 20m.49s., SS = 24m.19s.$   
Tortosa  $PP?N = 13m.55s., PPPN = 15m.9s., PSN = 20m.9s., S_cS?N = 21m.8s., SS?N = 24m.53s.$   
Edinburgh  $PPSE = 20m.44s.$   
Kew  $iPSEN = 21m.14s., eSKS?EZ = 22m.17s.$   
Paris  $iPP = 14m.1s., ePS = 21m.11s., iSKS? = 21m.25s., eSS = 25m.15s., e = 26m.9s., Q = 28.7m. \text{ and other } i \text{ readings without phase.}$   
Clermont-Ferrand  $iPP = 14m.1s., ePS = 21m.12s., eSS = 25m.38s., eSSS = 28m.39s.$   
Tamanrasset  $iPPZ = 14m.14s., ePPPZ = 15m.52s., eSSZ = 25m.37s., QZ = 30m.12s., ePKP, PKPZ = 39m.9s.$   
Besançon  $i = 12m.33s.$   
Strasbourg  $ePP = 14m.28s., ePPP = 16m.16s., ePS = 21m.48s., ePPS = 22m.11s., eSS = 26m.9s., \text{ and other unidentified phases.}$   
Stuttgart  $ePZ = 12m.37s., eZ = 12m.53s., e = 13m.7s., ePP = 14m.26s., eS_cS = PS = 21m.57s., e = 25m.25s., eSS = 26m.3s., eSSS = 28m.43s. \text{ and } 29m.13s.$   
Jena  $ePP?N = 15m.2s., eE = 16m.10s., \text{ and } 22m.18s.$   
Cheb  $e = 12m.57s., eN = 14m.13s., eE = 25m.9s.$   
Copenhagen  $22m.32s., 23m.16s., \text{ and } 24m.49s.$   
Rome  $eN = 32m.52s.$   
Collnberg  $eZ = 12m.7s., 12m.18s., 12m.55s., \text{ and } 13m.32s., eEN = 22m.23s., eN = 25m.49s.$   
Potsdam  $iZ = 12m.58s., eN = 13m.8s., ePPZ = 15m.3s., ePPN = 15m.9s.$   
Prague  $e = 12m.23s., 12m.31s., \text{ and } 12m.41s., eZ = 12m.46s., e = 13m.11s., 14m.4s., 22m.31s., \text{ and } 23m.10s., eSS = 27m.25s., e = 29m.49s.$   
Upsala  $iN = 14m.5s., PPE = 15m.14s., ePPPE = 17m.14s., eSE = 22m.6s., eN = 24m.8s. \text{ and } 25m.27s., eE = 25m.33s.$   
Ogyalla  $e = 13m.6s. \text{ and } 14m.7s., ePPP = 18m.1s., eSN = 22m.36s., ePSN = 23m.13s., eSS = 28m.1s.$   
Skalnate Pleso  $e = 12m.59s., 23m.11s., \text{ and } 23m.59s.$   
Warsaw  $ePE = 12m.32s., ePN = 12m.35s., SN = 22m.51s., eS_cSEN = 23m.9s., ePPSEN = 24m.11s., ePPSZ = 24m.24s., eSSN = 28m.17s., eSSZ = 28m.24s., eSSSN = 32m.4s., eSSSZ = 32m.7s., \text{ and other unidentified phases.}$   
Pulkovo  $ePP = 16m.4s., SKKS = 23m.19s.$   
Moscow  $eSKKS = 23m.50s., eS = 24m.13s., PS = 25m.22s.$   
Helwan  $PPPZ = 20m.19s.$   
Tashkent  $iSS = 36m.0s.$   
Frunse  $e = 31m.10s.$   
Andijan  $eSKSP = 30m.1s.$   
Vladivostok  $ePPP = 23m.18s.$   
Poona  $PPSN = 32m.45s.$   
Long waves were also recorded at Christchurch and Wellington.



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Aug. 3d. Readings also at 0h. (Obi-garm, Samarkand, Stalinabad, Tashkent, Kulyab, near Almata, Andijan, Fergana, Frunse, Murgab, Naryn, and Przhevalsk), 1h. 1h. (near Borzhomi and Yalta), 2h. (Strasbourg and Tamanrasset), 3h. (Pierce Ferry (2)), 7h. (Overton and Pierce Ferry), 8h. (Copenhagen), 9h. (Yalta, near Granada, and near Ottawa), 10h. (Mizusawa, Paris, near Basle (2), Zürich (3), and near Seven Falls), 11h. (near Irkutsk), 15h. (Istanbul, Tamanrasset, and Victoria), 18h. (Tucson, Overton, Pierce Ferry, Hungry Horse, and Ashkabad), 19h. (New Delhi, Andijan, Fergana, Mary, Murgab, Tashkent, near Kulyab, Samarkand, and Stalinabad), 22h. (Granada, Malaga, and Bogota (2)).

Aug. 4d. 3h. 50m. 35s. Epicentre  $44^{\circ}2N$ .  $11^{\circ}8E$ .

Felt at Modigliana. Approximate epicentre as adopted (Strasbourg).  
Rome Monthly Bulletin. National Institute of Geophysics, August, 1950, p.4

$$A = +.7041, B = +.1471, C = +.6947; \quad \delta = 0; \quad h = -3;$$

$$D = +.204, E = -.979; \quad G = +.680, H = +.142, K = -.719.$$

	$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.
	$^{\circ}$	$^{\circ}$	m.	s.	s.	m.	s.	s.	m.	s.	m.
Padova	0.3	12	e 0	30	?	0	48	?	—	—	—
Bologna	0.4	312	i 0	18	+ 5	e 0	26	+ 5	—	—	—
Florence, Xim.	0.6	222	-i 0	2?	?	i 0	7?	?	—	—	—
Prato	0.6	238	i 0	15	0	i 0	25	- 1	—	—	—
Zürich	3.9	326	e 1	2	0	e 1	50	- 0	—	—	—
Basle	4.5	320	e 1	39	P <sub>g</sub>	e 2	1	- 4	—	—	e 2.6
Stuttgart	z. 4.9	340	e 1	41	P <sub>g</sub>	e 2	15	0	e 2	55	S <sub>g</sub>
Besançon	5.1	309	2	1?	P <sub>g</sub>	—	—	—	—	—	—
Strasbourg	5.2	329	e 1	29	P*	e 2	11	-11	e 2	50	S <sub>g</sub>
Prague	6.1	16	e 2	1	P <sub>g</sub>	e 2	40	- 5	e 3	22	S <sub>g</sub>
Collmburg	z. 7.1	6	e 1	49?	+ 1	e 4	8	S <sub>g</sub>	—	—	e 4.4
Paris	7.9	309	e 2	24	P*	e 4	24	S <sub>g</sub>	—	—	e 4.9

Additional readings :—

Bologna i = 29s.  
Stuttgart eZ = 2m.34s.  
Strasbourg e = 1m.55s., eS\*? = 2m.36s.  
Prague e = 2m.32s., eS\* = 2m.56s., e = 3m.6s.  
Long waves were also recorded at Jena.

Aug. 4d. Readings also at 0h. (Chinchina, Huancayo, La Paz (2), Tucson, Pierce Ferry, Lick, Tortosa, and Tamanrasset), 1h. (Overton and near Pierce Ferry), 2h. (Seattle), 3h. (Lick, Tamanrasset, Bombay, Calcutta, Andijan, and near Borzhomi), 4h. (near Bogota, near Boulder City, Overton and Pierce Ferry), 6h. (Ksara, Tamanrasset, Ottawa and near Seven Falls), 7h. (Stuttgart, Ksara, Tamanrasset, near Istanbul and near Prague), 8h. (Tamanrasset and near Istanbul), 10h. (Balboa Heights, Huancayo and Overton), 12h. (Ashkabad), 14h. (near Ottawa, Seven Falls and Shawinigan Falls), 15h. (Durham, Tucson, Seattle, Hungry Horse, Pierce Ferry, near Oaxaca, Puebla, Tacubaya, Vera Cruz, and near Bogota), 16h. (La Paz and near Ashkabad), 18h. (La Paz), 19h. (Zürich), 22h. (Washington and near Tananarive), 23h. (Bandong).

Aug. 5d. 9h. 17m. 2s. Epicentre  $48^{\circ}2S$ .  $164^{\circ}2E$ . (as on 1950 Feb. 6d.).

Intensity IV near the Straits of Foveau.  
Seismological Report July - Sept. 1950, Wellington, N.Z., p.9.

$$A = -.6438, B = +.1822, C = -.7432; \quad \delta = +2; \quad h = -5;$$

$$D = +.272, E = +.962; \quad G = +.715, H = -.202, K = -.669.$$

	$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.
	$^{\circ}$	$^{\circ}$	m.	s.	s.	m.	s.	s.	m.	s.	m.
Christchurch	7.5	55	i 1	53	0	e 3	28	+ 8	—	—	—
Kaimata	N.E. 7.6	44	1	56	+ 1	3	29	+ 6	—	—	—
Cobb River	E. 9.3	44	2	19	+ 2	e 4	5	0	—	—	—
Wellington	10.2	51	i 2	30	- 1	i 4	5	-22	—	—	—
New Plymouth	E. 11.6	42	e 2	51	+ 1	—	—	—	—	—	—
Arapuni	13.1	44	e 3	11	+ 1	e 5	37	- 1	—	—	—
Tuaj	N. 13.3	50	3	12	- 1	e 6	4	+22	—	—	—
Auckland	N. 13.8	38	i 3	15	- 4	—	—	—	—	—	—
Riverview	17.4	331	i 4	8 <sub>a</sub>	+ 2	i 7	17	- 2	i 4	20	PP
Brisbane	22.4	334	i 5	3 <sub>a</sub>	+ 1	e 9	20	+16	i 5	43	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.
Apia		39.7	40	7 33	- 3	e 13 29	-11	—	e 18.0
Perth		39.7	277	7 31	- 5	13 28	-12	16 33	SSS
Bandong		62.9	293	e 10 20	-10	e 18 57	- 3	—	—
Guam		63.8	338	11 31	+55	—	—	—	—
La Plata	E.	89.1	147	12 58	0	24 4	+18	29 10	SS
	N.	89.1	147	12 40	-18	23 22	[- 5]	24 28	PS
Nanking		89.6	322	i 12 55	- 6	i 23 50	- 1	i 16 29	PP
Grahamstown		90.4	215	i 12 50	-14	—	—	—	—
Colombo	E.	91.3	279	13 2	- 7	23 32	[- 8]	—	—
Pietermaritzburg	Z.	92.2	220	e 12 59	-14	—	—	—	—
Vladivostok		95.3	336	i 13 21	- 6	i 24 48	+ 7	i 17 16	PP
Kodaikanal	E.	95.4	279	19 35	PPP	i 24 38	- 4	25 57	PS
Pretoria	Z.	96.5	220	e 13 23	- 9	—	—	e 17 5	PP
Hyderabad	N.	100.0	284	—	—	26 37	PS	—	—
Huancayo		100.2	121	e 13 14	-35	e 25 24	+ 2	e 17 4	PP
La Paz		100.5	129	i 13 40	-11	i 24 18	[- 7]	i 13 46	P <sub>c</sub> P
Poona	N.	103.8	282	i 18 17	PP	i 25 40	-12	24 28	SKS
Bombay		104.8	281	e 13 57	-13	i 25 50	-10	18 18	PP
Pasadena		107.2	58	e 18 40	PP	i 28 7	PS	e 21 19	PPP
Mount Wilson	Z.	107.4	58	e 18 40	PP	—	—	e 29 47	PKKP
Santa Clara		107.5	52	e 18 46	PP	e 28 20	PS	e 29 17	PKKP
Riverside	Z.	107.6	58	18 46	PP	—	—	—	—
Berkeley		107.7	52	e 18 46 <sub>a</sub>	PP	i 28 20	PS	i 29 22	PKKP
Lick	Z.	107.7	52	e 18 45 <sub>k</sub>	PP	—	—	—	—
Crest Line	Z.	107.8	58	e 18 46	PP	—	—	e 29 44	PKKP
Fresno	Z.	108.2	55	e 18 47 <sub>a</sub>	PP	—	—	e 28 53	PS
Tacubaya		108.5	82	e 18 39	PP	e 28 5	PS	—	—
New Delhi		108.8	291	—	—	26 26	- 9	—	—
Tinemaha	Z.	109.3	56	e 18 58	PP	—	—	—	—
Shasta Dam		109.7	51	e 17 58	[- 34]	e 28 20	PS	i 19 1	PP
Mineral	Z.	109.9	52	e 18 26	[- 7]	e 29 22	PPS	—	—
Tucson		110.2	64	e 14 28	P	e 28 44	PS	e 18 27	PKP
Boulder City		110.4	58	e 18 26	[- 8]	—	—	e 19 4	PP
Pierce Ferry		111.0	59	e 14 32	P	e 29 3	PKKP	i 19 9	PP
Overton	Z.	111.1	58	e 14 33	P	e 29 9	PKKP	i 19 9	PP
Irkutsk		112.3	324	e 14 30	P	e 25 16	[- 5]	e 17 58	PKP
Chinchina		113.5	110	e 19 22	PP	e 27 15	?	e 29 6	PS
Bogota		114.2	111	e 15 32	P	22 26	PKS	e 19 23	PP
Seattle		114.8	46	e 18 36 <sub>k</sub>	[- 7]	e 25 30	[- 1]	e 18 46	pPKP
Victoria		114.9	45	18 24	[- 19]	25 26	[- 6]	19 35	PP
Logan		116.1	55	e 18 35	[- 10]	e 29 27	PS	e 19 46	PP
Sitka		116.6	32	e 19 50	PP	i 29 44	PS	e 36 16	SS
Przhevsk		117.6	303	e 18 39	[- 9]	—	—	e 31 11	PPS
Naryn		118.3	300	e 18 39	[- 10]	—	—	e 20 5	PP
Butte	N.	118.6	51	e 20 1	PP	e 26 36	{ - 28 }	e 29 56	PS
College		118.7	20	e 18 40	[- 10]	—	—	e 20 4	PP
Almata		119.0	304	e 18 42	[- 9]	e 29 56	PS	e 20 1	PP
Bozeman		119.2	53	e 18 40	[- 11]	e 25 47	{ 0 }	e 20 6	PP
Hungry Horse		119.3	48	i 18 43	[- 8]	e 28 51	PKKP	e 20 12	PP
Kulyab		119.7	295	e 18 43	[- 9]	—	—	—	—
Andijan		120.0	298	e 18 45	[- 8]	e 31 24	PPS	e 20 15	PP
Frunse		120.0	302	e 18 43	[- 10]	i 36 51	SS	i 20 10	PP
Fergana		120.1	298	e 18 42	[- 11]	e 22 44	PKS	e 20 9	PP
Obi-garm		120.3	295	i 18 42	[- 11]	i 27 10	{ - 6 }	i 20 12	PP
Stalinabad		120.7	295	i 18 45	[- 9]	i 27 18	{ 0 }	—	—
Tashkent		122.1	297	i 18 46	[- 11]	i 30 19	PS	i 20 18	PP
Samarkand		122.5	294	e 18 45	[- 13]	—	—	—	—
Mary		124.4	289	i 18 51	[- 10]	—	—	e 20 50?	PP
Lincoln	E.	124.4	65	e 20 42	PP	e 37 41	SS	e 46 8	Q
Saskatoon		125.4	49	20 49	PP	25 59	[- 8]	30 45	PS
Ashkabad		126.8	288	e 17 58	[- 68]	—	—	—	—

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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.	
St. Louis	127.1	70	e 18	54	[-12]	e 25	53	[-19]	e 29	12	PKKP	—
San Juan	129.7	107	e 19	20	[+ 9]	e 32	2	PS	e 22	21	PKS	e 51.1
Fort de France	130.0	117	e 19	5	[- 7]	e 22	15	PKS	—	—	—	—
Columbia	130.3	81	e 21	16	PP	e 31	18	SKSP	e 22	26	PKS	e 46.4
Chicago	130.5	68	e 19	0	[-13]	e 31	20	SKSP	e 21	14	PP	e 50.1
Cincinnati	131.0	73	i 19	3	[-11]	i 22	28	PKS	i 21	21	PP	—
Baku	133.6	286	e 19	12	[- 7]	e 22	46	PKS	e 21	48	PP	—
Cleveland	134.2	72	i 19	10	[-10]	e 22	40	PKS	i 21	44	PP	—
Shemakla	134.6	286	i 19	12	[- 9]	i 23	24	PKS	—	—	—	—
Pittsburgh	134.7	74	i 21	49	PP	—	—	—	i 24	32	PPP	—
Sverdlovsk	135.0	310	e 16	21	P	i 26	51	[+20]	e 19	3	PKP	—
Washington	135.7	78	i 19	13	[-10]	e 22	45	PKS	e 21	54	PP	—
Pennsylvania	136.2	74	e 19	17	[- 7]	i 23	34	PKS	e 21	55	PP	—
Philadelphia	137.5	78	e 19	15	[-11]	e 26	2	[-33]	e 22	9	PP	e 55.2
Tiflis	137.6	284	e 19	7	[-19]	e 40	15	SS	i 22	1	PP	—
Grozny	137.8	287	e 19	15	[-12]	e 22	45	PKS	—	—	—	—
Gori	138.2	284	e 19	19	[- 8]	e 22	53	PKS	—	—	—	—
Fordham	138.8	77	i 19	20	[- 8]	i 22	53	PKS	i 22	13	PP	56.6
Abastumanj	138.9	283	e 19	18	[-11]	e 22	56	PKS	—	—	—	—
Ksara	139.2	268	e 19	11	[-18]	—	—	—	i 22	19	PP	—
Helwan	139.8	260	i 19	19 <sub>a</sub>	[-11]	22	57	PKS	22	18	PP	—
Ottawa	139.8	69	i 19	12	[-18]	28	58 <sub>?</sub>	{-22}	22	18	PP	—
Bermuda	140.2	94	e 19	14	[-17]	i 22	58	PKS	e 22	21	PP	e 56.6
Harvard	141.2	76	i 19	18	[-15]	e 32	29	SKSP	e 22	9	PP	e 66.9
Weston	141.2	76	i 19	14	[-19]	e 31	12	?	i 22	27	PP	—
Seven Falls	E. 143.6	69	19	22	[-15]	29	42	{ 0}	22	42	PP	—
Theodosia	145.2	285	e 19	32	[- 8]	—	—	—	—	—	—	—
Moscow	147.0	303	e 19	33	[-10]	—	—	—	e 23	2	PP	—
Halifax	147.3	78	e 19	37	[- 6]	42	25	SS	23	4	PP	—
Istanbul	147.7	275	i 19	31	[-13]	—	—	—	e 28	26	PKKP	—
Tamanrasset	Z. 149.5	221	i 19	36 <sub>a</sub>	[-11]	e 26	18	[-35]	i 23	11	PP	68.5
Kishinev	150.2	287	e 19	36	[-12]	—	—	—	—	—	—	—
Bucharest	151.1	279	e 19	37	[-12]	e 33	34	PS	—	—	—	—
Pulkovo	151.1	311	i 19	38	[-11]	e 23	14	PKS	e 19	49	PKP <sub>2</sub>	—
Sofia	152.2	273	e 19	43	[- 8]	—	—	—	—	—	—	—
Helsinki	153.8	313	e 20	6 <sub>?</sub>	[+13]	e 30	30	{- 9}	e 23	55	PP	70.0
Lwow	154.0	288	e 20	6	[+13]	—	—	—	—	—	—	—
Timisoara	154.8	278	19	58 <sub>?</sub>	[+ 4]	—	—	—	—	—	—	—
Skalnate Pleso	156.3	286	19	48	[- 8]	e 26	58	[- 3]	e 20	13	PKP <sub>2</sub>	—
Warsaw	156.3	294	19	44 <sub>k</sub>	[-12]	e 26	47	[-14]	20	21	PKP <sub>2</sub>	e 69.0
Kalossa	156.5	281	20	13	PKP <sub>2</sub>	e 33	59	PS	e 24	0	PP	—
Budapest	156.7	282	20	17	PKP <sub>2</sub>	e 30	46	{- 9}	e 24	11	PP	e 83.0
Ogyalla	157.4	283	e 19	48	[-10]	e 31	4	{+ 5}	20	33	PKP <sub>2</sub>	—
Upsala	E. 157.4	313	e 19	45	[-13]	e 23	16	PKS	i 23	55	PP	e 68.0
	N. 157.4	313	e 19	34	[-24]	e 23	20	PKS	e 27	39	PPP	—
Scoresby Sund	157.4	6	i 19	47	[-11]	e 23	31	PKS	e 20	26	PKP <sub>2</sub>	—
Ivigut	157.5	42	i 19	47	[-11]	24	10	PKS	i 20	23	PKP <sub>2</sub>	85.0
Raciborzu	157.8	289	e 19	46	[-12]	—	—	—	—	—	—	—
Rome	159.1	264	i 19	48 <sub>a</sub>	[-12]	30	45	{-22}	20	21	PKP <sub>2</sub>	—
Triest	159.7	274	i 20	5	[+ 5]	e 30	58	[-12]	e 21	4	PKP <sub>2</sub>	—
Prague	160.2	287	e 19	49 <sub>a</sub>	[-12]	e 31	3	{-10}	e 20	41	PKP <sub>2</sub>	e 64.5
Padova	160.6	270	e 19	58	[- 3]	—	—	—	24	23	PP	—
Florence Xim	160.7	267	e 19	49	[-12]	—	—	—	i 28	58	PPP	i 62.0
Bologna	160.9	270	e 20	3	[+ 1]	e 27	55	[+50]	e 24	45	PP	—
Prato	160.9	267	e 19	10	[-52]	e 33	38	PS	—	—	—	—
Copenhagen	161.1	304	i 19	50	[-12]	44	34	SS	i 24	24	PP	75.0
Collmberg	161.2	291	e 24	16 <sub>?</sub>	PP	e 27	40	[+34]	34	40	SKSP	e 71.0
Potsdam	161.2	294	i 19	49	[-13]	—	—	—	i 20	38	PKP <sub>2</sub>	e 78.0
Cheb	161.5	286	e 19	54	[- 8]	e 31	3	{-17}	e 20	39	PKP <sub>2</sub>	—
Jena	162.1	289	e 19	50	[-13]	e 44	53	SS	20	40	PKP <sub>2</sub>	—
Algiers Univ.	Z. 162.1	237	e 19	51	[-12]	—	—	—	i 20	37	PKP <sub>2</sub>	—
Pavia	162.6	271	e 20	38	PKP <sub>2</sub>	—	—	—	—	—	—	—
Bergen	E. 162.7	323	e 30	30	?	e 45	30	SS	—	—	—	—
Chur	162.9	275	e 19	58	[- 6]	—	—	—	e 20	42	PKP <sub>2</sub>	—
Stuttgart	163.4	282	i 19	52 <sub>a</sub>	[-12]	e 34	58	PSKS	i 20	46	PKP <sub>2</sub>	93.0

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	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Zürich	163.6	276	e 19 50 <sub>a</sub>	[-14]	—	—	e 20 44	PKP <sub>2</sub> —
Karlsruhe	164.0	284	e 19 54	[-11]	—	—	e 24 24	PP e 95.0
Basle	164.3	276	e 19 50	[-15]	—	—	e 24 33	PP —
Strasbourg	164.3	281	e 19 52 <sub>k</sub>	[-13]	e 32 3	{+28}	e 20 49	PKP <sub>2</sub> e 90.0
Alicante	165.2	234	20 46	PKP <sub>2</sub>	27 28	[+19]	25 37	PP e 79.3
Besançon	165.3	275	e 19 48	[-18]	—	—	e 20 48	PKP <sub>2</sub> —
Barcelona	165.6	250	e 22 58	PKS	—	—	—	— e 83.1
Granada	165.8	224	i 19 54 <sub>a</sub>	[-13]	27 7	[-2]	20 8	pPKP i 84.6
Malaga	z. 165.8	220	i 19 59 <sub>k</sub>	[-8]	27 7	[-2]	i 21 3	PKP <sub>2</sub> 78.2
De Bilt	166.0	294	i 19 56 <sub>a</sub>	[-11]	e 45 28	SS	i 21 0	PKP <sub>2</sub> e 78.0
Tortosa	166.3	245	20 3	[-4]	27 17	[+8]	21 21	PKP <sub>2</sub> 86.6
Clermont-Ferrand	166.9	266	i 19 57	[-10]	e 31 39	[-8]	i 21 6	PKP <sub>2</sub> 79.0
Aberdeen	167.8	322	e 24 26	?	i 32 57	{+65}	i 25 2	PP e 87.0
Paris	167.8	280	e 19 57	[-11]	e 31 46	[-6]	i 21 6	PKP <sub>2</sub> e 78.0
Toledo	168.2	229	e 19 56	[-12]	38 34	PPS	e 20 58	PKP <sub>2</sub> 68.6
Durham	169.0	310	i 21 15	PKP <sub>2</sub>	i 46 11	SS	i 25 8	PP —
Edinburgh	E. 169.0	318	21 7	PKP <sub>2</sub>	45 52	SS	24 58	PP —
Lisbon	169.4	212	19 59	[-10]	31 46	[-14]	25 6	PP 84.0
Kew	169.5	294	i 19 57 <sub>a</sub>	[-12]	e 30 47	[-73]	i 21 13	PKP <sub>2</sub> e 71.0
Jersey	E. 170.9	283	e 21 25	PKP <sub>2</sub>	e 39 23	PPS	e 29 8	PPP 91.0
Rathfarnham Castle	172.1	314	i 21 28	PKP <sub>2</sub>	e 31 40	[-33]	i 25 22	PP e 75.0

Additional readings :—

Riverview iPPPE = 4m.30s., iSSE = 7m.37s., iZ = 7m.44s., iN = 7m.47s.  
 Perth i = 8m.18s. and 14m.56s.  
 La Plata N = 13m.10s. and 14m.40s., E = 14m.58s. and 22m.40s., SKSE = 23m.4s., SSE = 36m.10s.  
 Nanking iE = 14m.7s., S = 24m.54s., PKKP = 29m.53s.  
 Vladivostok iSKS = 23m.58s., iPS = 26m.38s., iSS = 31m.23s.  
 Kodaikanal iSKSE = 23m.53s., PPSE = 26m.36s., SSE = 31m.7s., SSPE = 31m.13s., SSSE = 34m.53s., QE = 41m.21s.  
 Huancayo eSKS = 24m.17s., i = 26m.50s., iSS = 32m.4s., i = 37m.36s.  
 La Paz iPPZ = 17m.41s., eS = 24m.58s., iPS = 26m.53s., iPPS = 27m.19s., SS = 31m.59s., Q = 42m.22s.  
 Poona iPSN = 27m.17s., iPPSN = 28m.17s., SSN = 33m.5s., SSPN = 33m.25s., SSSN = 36m.58s.  
 Bombay PPPE = 20m.34s., eSKSN = 24m.38s., iPSN = 27m.31s., iPPSEN = 28m.29s., iSSE = 33m.16s.  
 Pasadena iEN = 28m.39s., iPPSEN = 29m.10s., eSSEN = 33m.46s.  
 Berkeley eZ = 20m.9s., 20m.55s., and 27m.29s., eE = 45m.10s. and 48m.52s.  
 Fresno eZ = 19m.38s. and 22m.2s.  
 New Delhi iEN = 26m.20s.  
 Shasta Dam ePPS = 29m.25s.  
 Tucson ePP = 19m.3s.  
 Pierce Ferry ePKP = 17m.41s.  
 Overton iPKP?Z = 17m.58s.  
 Irkutsk PP = 19m.16s., PS = 28m.56s., eSSS = 38m.58s.  
 Bogota ePSEN = 29m.11s.  
 Seattle ePP = 19m.36s., epPP = 19m.45s., ePPP = 21m.28s., ePKS = 22m.18s., ePS = 29m.33s., ePPS = 30m.13s., eSS = 35m.28s., eSKKS = 37m.18s., ePKKKS = 40m.28s. and other e readings.  
 Victoria e = 20m.51s., PPP = 22m.54s., PS = 29m.23s., PPS = 31m.9s.  
 Logan ePPP = 22m.14s., eSS = 34m.42s.  
 Butte ePPSN = 31m.11s., eSSN = 36m.28s.  
 College c = 19m.36s.  
 Bozeman e = 21m.5s., ePS = 30m.11s., ePPS = 31m.16s., eSS = 36m.2s.  
 Andijan ePPP = 22m.48s. e = 28m.5s.  
 Obi-garm iSKPS = 29m.58s.  
 Tashkent iPPP = 23m.0s.  
 Mary e = 20m.27s. and 21m.48s.  
 St. Louis iPS = 31m.8s.  
 San Juan eSS = 38m.9s., eSSS = 43m.19s.  
 Columbia e = 34m.15s., ePSPS? = 39m.38s.  
 Chicago iPKS? = 22m.22s., eSS = 37m.38s.  
 Cleveland iN = 19m.24s., iEN = 21m.54s. and 22m.48s., eN = 35m.17s., 35m.47s., 36m.7s., and 36m.14s., eSS?N = 38m.38s.  
 Shemakla i = 20m.48s.  
 Pittsburg i = 25m.19s.  
 Sverdlovsk iPP = 21m.51s., iPKS = 22m.45s., iPPP = 24m.51s., ePS = 32m.17s., SS = 39m.43s., SSS = 44m.46s.  
 Washington e = 29m.24s.  
 Pennsylvania iN = 19m.37s., eN = 22m.3s., iEN = 22m.48s., eN = 23m.21s.

Continued on next page.



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Philadelphia ePKS = 24m.2s., eSKS? = 25m.57s., eSKSP = 32m.15s., ePPS = 34m.35s., eSS = 40m.3s., eSSS = 45m.48s.  
Fordham eSS = 40m.31s.  
Ksara i = 19m.22s.  
Helwan eZ = 20m.43s., PPPNZ = 25m.23s.  
Ottawa PKS = 26m.2s., iPS = 31m.58s.?, PPS = 34m.58s.?, SS = 40m.58s.?.  
Bermuda eSKSP? = 32m.39s., e = 40m.58s., ePSPS = 41m.14s., eSSS? = 46m.12s.  
Harvard e = 27m.51s. and 33m.27s., eScSPKP = 34m.25s., ePPS? = 34m.46s., e = 50m.7s.  
Seven Falls PSE = 32m.53s., PPSE = 36m.46s., SSE = 42m.2s.  
Halifax i = 33m.12s., e = 44m.4s.  
Tamanrasset iPKP<sub>2</sub>Z = 19m.45s., eZ = 21m.15s., iZ = 21m.46s. and 25m.31s., eSKSP?Z = 33m.21s., eSSZ = 41m.44s., eSSS?Z = 46m.11s.  
Bucharest eEN = 19m.40s., eE = 19m.47s., eN = 19m.55s.  
Pulkovo ePP = 23m.24s., ePPP = 26m.58s.  
Helsinki ePP = 24m.41s., eSS = 43m.23s.  
Skalnate Pleso eE = 20m.8s., eSKP = 23m.25s., ePP = 23m.58s., eSKKS = 31m.4s., e = 33m.7s., eSKSP?N = 34m.16s., eSS? = 43m.7s., eSSS = 50m.16s.  
Warsaw PKP?E = 19m.56s., PKP<sub>2</sub>?E = 20m.24s., PKP<sub>2</sub>?Z = 20m.43s., SKPEN = 22m.51s., SKPZ = 22m.58s., PPZ = 23m.58s., eE = 25m.2s., eNZ = 25m.20s., eEN = 25m.52s., SKSZ = 26m.28s., iPPPZ = 27m.37s., SKKSZ = 30m.51s., SKKSE = 30m.56s., PPP?EZ( $\Delta > 180^\circ$ ) = 32m.23s., SKSPEN = 34m.25s., eZ = 35m.42s., PPSZ = 36m.53s., eEN = 38m.28s., eEZ = 40m.7s., eSSNZ = 43m.50s., eSSE = 44m.5s.  
Kalossa eN = 20m.18s., eE = 20m.39s., 21m.11s., and 24m.12s.  
Budapest eE = 20m.38s., eN = 21m.16s., 32m.16s., 34m.24s., and 41m.58s.  
Ogyalla e = 20m.20s., ePP = 24m.15s., e = 26m.25s., eSKSPE = 34m.28s., e = 37m.16s., eSS = 44m.22s., eSSS = 50m.58s.  
Upsala eN = 19m.58s., iPKP<sub>2</sub> = 20m.22s., ePPN = 23m.58s., eE = 27m.9s., eP<sub>c</sub>P, PKPN = 29m.48s., eP<sub>c</sub>P, PKPE = 29m.58s.?, ePPSE = 37m.22s., eN = 38m.40s., eE = 39m.10s., eSS = 43m.58s.?, eN = 47m.58s.? and 53m.58s.?.  
Scoresby Sund PP = 24m.5s.  
Ivigtut 31m.32s.  
Rome pPKP? = 20m.29s., PP = 24m.9s., PSKS = 34m.25s., PPS? = 37m.21s., SS = 44m.5s.  
Triest eSKP = 24m.13s., iPP = 24m.48s., iPPP = 28m.42s., iPSKS = 34m.31s., eSS = 45m.44s.  
Prague e = 20m.33s., eN = 21m.28s., eE = 22m.15s., eSKP = 23m.23s., ePP = 24m.16s., eE = 25m.21s., e = 26m.15s., eN = 27m.36s., ePPP = 27m.58s., eZ = 28m.51s., eN = 29m.38s., eSKSP = 34m.34s., eSS = 44m.22s., eSSS = 50m.16s.  
Padova e = 20m.22s.  
Copenhagen i = 20m.40s., 24m.32s., and 30m.31s.  
Collnberg eN = 34m.10s., eE = 36m.34s., ePS?N = 38m.10s., eSS?N = 44m.40s., eSSS?N = 50m.34s.  
Potsdam ePKP<sub>2</sub>N = 20m.42s., iPPZ = 24m.21s., iPPPZ = 28m.10s.  
Cheb eSKP = 23m.30s., ePP = 24m.4s., ePPP = 28m.10s., eE = 32m.3s. and 34m.1s., eSKSP = 34m.46s., eSS = 44m.40s., eSSSE = 51m.6s.  
Jena eN = 21m.9s., ePP?N = 24m.22s., ePP?E = 24m.26s., eN = 26m.10s.  
Algiers Univ. iPPZ = 24m.9s.  
Chur ePP = 24m.26s.  
Stuttgart ePPZ = 24m.19s., ePP = 24m.29s., ePPP = 28m.26s., eSS = 44m.57s., e = 46m.4s., eSSS = 51m.16s., eQ = 81.0m.  
Zürich ePP = 24m.26s.  
Strasbourg ePP = 24m.34s., iPP = 24m.37s., ePP( $\Delta > 180^\circ$ ) = 27m.2s. and 27m.23s., ePPP = 28m.31s., eSKKS?( $\Delta > 180^\circ$ ) = 33m.7s., ePSKS = 35m.9s., ePPS = 38m.20s., eSS = 44m.50s. and 45m.9s., eSSP? = 46m.25s., eSSS = 51m.25s. and other unidentified e readings.  
Alicante PKP<sub>2</sub> = 21m.44s., PPP = 29m.20s., PPS = 39m.16s., SS = 46m.12s., SSS = 52m.58s.  
Besançon ePP = 24m.33s.  
Granada PKP<sub>2</sub> = 20m.58s., iPP = 24m.20s., PPP = 28m.16s., iSKKS = 31m.25s., SKSP = 34m.58s., PPS = 38m.52s., iSS = 45m.22s., SSS = 51m.34s., Q = 74.6m.  
Malaga iPPZ = 24m.47s., PPPZ = 32m.1s., QZ = 72m.3s.  
De Bilt iPP = 24m.48s., iPPP = 28m.42s., ePPS = 38m.34s., eSSS = 51m.58s.?.  
Tortosa PPEN = 25m.13s., SKKSN = 33m.17s., SKSPN = 35m.38s. and 37m.2s., SSEN = 46m.31s., SSSE = 55m.59s.  
Clermont-Ferrand ePP = 24m.50s., ePPP = 28m.43s., ePPS = 38m.43s., eSSP = 46m.36s., eSSS = 52m.9s.  
Aberdeen iPPPEN = 29m.9s., iE = 37m.16s., iN = 38m.1s., eEN = 68m.28s.  
Paris ePP = 24m.53s., ePPP = 28m.46s., ePPS = 38m.28s., eSS = 45m.40s., eSSP = 46m.54s., eSSS = 52m.4s. and other unidentified readings.  
Toledo ePPZ = 24m.54s., eE = 28m.34s., iE = 30m.38s., SSE = 45m.40s., SSS = 52m.34s.  
Durham iEN = 35m.35s.  
Lisbon EZ = 24m.52s., SSN = 45m.46s.  
Kew iPKSZ = 22m.12s., ePP = 25m.7s., ePPP = 29m.31s., eSKSP = 35m.37s., eSSEN = 46m.1s.  
Jersey eE = 33m.18s.  
Rathfarnham Castle e = 22m.29s., i = 28m.14s., eEN = 30m.24s., i = 33m.47s., iZ = 35m.5s., iEN = 35m.19s., eSKSP = 36m.10s., ePPPS? = 41m.59s., eSSEN = 47m.4s., eEN = 61m.24s.



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Aug. 5d. 10h. 45m. 10s. Epicentre 9°·7N. 69°·8W. (as on 3d.).

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.	
	°	°	m. s.	s.	m. s.	s.	m. s.	m.	
Bogota	6·6	220	i 1 40	- 1	e 3 1	+ 3	e 3 32	S <sub>g</sub>	—
Chinchina	7·4	231	e 1 51	- 1	e 3 15	- 3	—	—	—
Fort de France	9·8	59	e 2 23	- 1	e 4 7	-10	—	—	—
Huancayo	22·3	194	e 5 3	+ 2	—	—	e 6 18	PPP	e 11·1
La Paz	26·1	175	i 11 10	S	(i 11 10)	+63	—	—	(i 14·5)
Tucson	44·0	307	e 8 12	+ 1	—	—	—	—	—
Pierce Ferry	47·9	311	e 8 43	+ 1	—	—	—	—	—
Boulder City	48·5	310	e 8 42	- 4	—	—	—	—	—
Hungry Horse	53·4	325	e 9 23	- 1	—	—	—	—	—
Shasta Dam	55·7	313	e 9 41	+ 1	—	—	—	—	—
Victoria	z. 59·1	322	e 10 7	+ 3	—	—	—	—	—
Tamanrasset	z. 72·8	68	e 11 30	- 2	—	—	—	—	—
College	76·2	335	e 11 53	+ 1	—	—	—	—	—

La Paz gives S as P and L as S.  
Tamanrasset gives also eZ = 11m.38s.

Aug. 5d. Readings also at 1h. (Raciborzu), 2h. (Piatigorsk, Shemakla, near Borzhomi, Grozny, and Gori), 3h. (Brisbane), 4h. (near Fergana, Kulyab, and Obi-garm), 5h. (Strasbourg, Ksara, Overton, Shasta Dam, Hungry Horse (2), College, near Andijan, Murgab, Samarkand, Stalinabad, and near La Paz), 6h. (Granada), 8h. (near Alicante), 9h. (near Istanbul), 11h. (Clermont-Ferrand, Paris, Strasbourg, Stuttgart, Nanking, Zi-ka-wei, College, Hungry Horse, Lick, and Shasta Dam), 12h. (Potsdam), 13h. (Overton, Pierce Ferry, Hungry Horse, College, and Seven Falls), 14h. (Harvard, Weston, near Basle, Zürich, and Stuttgart), 17h. (Hungry Horse), 18h. (College), 21h. (near Naryn), 23h. (Shawinigan Falls, and near Ottawa).

Aug. 6d. Readings at 0h. (Seven Falls), 2h. (Prague), 3h. (Lick), 6h. (Tucson, Pierce Ferry, Shasta Dam, Hungry Horse, and College), 7h. (Christchurch, Kaimata, and Wellington), 8h. and 10h. (near Alicante), 12h. (Pasadena, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Shasta Dam, Lick, Hungry Horse, College, Collmberg, Prague, Stuttgart, Padova, near Trieste, and near Apia), 13h. (Bandong, Collmberg, Clermont-Ferrand, Paris, Strasbourg, Stuttgart, and College), 15h. (College, Pierce Ferry, near Apia, and near Shemakla), 17h. (Bandong and La Paz), 18h. (La Paz, Mount Wilson, Tinemaha, Tucson, Overton, Pierce Ferry, Shasta Dam, Hungry Horse, and Tamanrasset), 19h. (College), 20h. (Huancayo, La Paz, Bogota, Chinchina, Washington, Tucson, Overton, Hungry Horse, College, Jena, and near Collmberg), 23h. (Pasadena, Tinemaha, Pierce Ferry, Lick, Shasta Dam, Hungry Horse, College, and Vladivostok).

Aug. 7d. 2h. 45m. 1s. Epicentre 6°·2N. 125°·6E. Depth of focus 0·015.  
(as on 1949, April 30d.).

A = -·5788, B = +·8084, C = +·1073;  $\delta = +3$ ;  $h = +7$ ;  
D = +·813, E = +·582; G = -·062, H = +·087, K = -·994.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Guam	20·2	67	4 24	- 3	—	—	—	—
Bandong	22·1	235	e 5 5	pP	i 9 51	SSS	—	—
Djakarta	22·4	237	i 4 46 <sub>a</sub>	- 2	e 9 40	SSS	—	—
Zi-ka-wei	N. 25·2	352	e 5 35	pP	i 10 3	sS	6 11	PPP
Miyazaki	26·2	10	5 22	- 2	e 9 44	- 1	—	—
Tomie	26·4	11	e 5 45	pP	i 10 19	sS	i 16 25	ScS
Nanking	26·5	347	i 5 26 <sub>a</sub>	- 1	9 54	+ 4	5 55	pP
Nagasaki	26·7	8	5 32	+ 3	9 55	+ 2	—	—
Kumamoto	26·9	10	e 5 33	+ 2	10 1	+ 5	—	—
Simidu	27·3	14	e 6 35	+60	11 4	+61	—	—
Ooita	27·5	11	e 5 41	+ 5	e 10 3	- 3	—	—
Hukuoka	27·6	9	i 5 35 <sub>a</sub>	- 2	i 10 7	- 1	e 5 58	pP
Koti	28·2	14	e 5 42	- 1	i 10 19	+ 2	e 6 40	PP
Matuyama	28·3	13	e 5 44	0	i 10 19	0	6 32	PP
Hirosima	28·7	12	e 5 49	+ 2	e 10 26	+ 1	e 7 57	?

Continued on next page.

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	△	Az.	P.		O-C.	S.		O-C.	Supp.		L. m.
			m.	s.		m.	s.		m.	s.	
Owase	29.4	18	i 5	54 <sup>a</sup>	+ 1	i 10	37	+ 1	6 51	PP	—
Kobe	29.7	16	e 5	57	+ 1	e 10	43	+ 2	i 6 49	PP	e 12.6
Osaka	29.8	17	e 5	49	- 8	e 10	39	- 4	e 6 41	PP	e 11.7
Kameyama	30.2	18	i 6	1	+ 1	i 10	50	+ 1	—	—	—
Hikone	30.5	17	e 6	4	+ 1	e 10	55	+ 1	—	—	—
Omaesaki	30.6	21	5	6	-58	i 10	57	+ 2	—	—	—
Nagoya	30.7	19	6	5	0	10	57	0	—	—	—
Gihu	30.8	19	6	16	+10	10	55	- 3	6 23	pP	15.2
Shizuoka	31.0	21	6	8	0	11	0	- 2	—	—	15.1
Hunatu	31.6	21	i 6	12 <sup>k</sup>	- 1	i 11	10	- 1	—	—	14.2
Tokyo	32.1	22	5	23	-54	e 11	12	- 7	7 35	PP	13.6
Toyama	32.1	18	e 6	11	- 6	11	19	0	7 55	PPP	—
Kumagaya	32.4	21	6	17	- 3	—	—	—	e 7 37	PP	—
Maebasi	32.5	19	e 6	23	+ 2	e 11	18	- 7	e 7 38	PP	—
Nagano	32.5	19	e 6	19	- 2	e 11	22	- 3	8 11	PPP	—
Tukubasan	32.7	23	6	20	- 2	11	24	- 4	7 49	PPP	19.0
Wazima	32.7	17	e 6	23	+ 1	11	28	0	—	—	—
Mito	33.0	23	e 6	25	0	11	26	- 7	i 8 2	PPP	—
Onahama	33.6	23	e 5	36	-54	i 11	42	0	e 11 39	S	—
Hukusima	34.2	22	6	35	0	i 11	52	+ 1	—	—	e 15.1
Sendai	34.8	22	6	40	0	i 12	1	+ 1	—	—	—
Mizusawa	35.7	21	6	49	+ 1	12	14	0	—	—	—
Akita	35.8	20	6	49	0	12	17	+ 1	e 7 17	pP	e 21.3
Morioka	36.2	21	e 6	53	+ 1	e 12	23	+ 1	—	—	—
Miyako	36.4	22	6	54	0	e 12	22	- 3	—	—	—
Aomori	37.0	20	7	1	+ 2	12	38	+ 4	—	—	—
Hatinohe	37.0	20	7	0	+ 1	12	31	- 3	—	—	—
Vladivostok	37.2	8	i 7	0	0	i 12	40	+ 3	—	—	—
Perth	39.1	193	7	19	+ 3	13	4	- 2	8 57	PPP	—
Sapporo	39.3	18	i 7	19	+ 1	i 13	10	+ 1	—	—	—
Calcutta	39.4	298	i 7	26	+ 7	i 13	18	+ 8	i 8 10	pP	—
Brisbane	42.7	143	e 7	43 <sup>a</sup>	- 3	i 13	54	- 5	i 8 11	pP	—
Colombo	45.4	273	8	3	- 4	14	39	+ 1	—	—	25.6
Riverview	46.6	151	i 8	20 <sup>a</sup>	+ 3	i 14	58	+ 3	i 8 54	pP	—
Hyderabad	47.4	288	i 8	23	0	i 15	5	- 1	18 25	SS	22.2
Kodaikanal	47.8	279	i 8	28 <sup>a</sup>	+ 2	i 15	6	- 6	10 20	PP	21.3
Irkutsk	49.2	343	i 8	36	- 1	15	28	- 3	i 9 5	pP	—
New Delhi	50.8	302	i 8	50	+ 1	i 15	52	- 2	10 46	PP	23.1
Poona	51.8	288	9	1	+ 4	16	2	- 5	9 33	pP	—
Bombay	52.9	289	9	6	+ 1	i 16	23	+ 1	i 11 10	PP	24.2
Przhevalsk	55.1	319	i 9	20	- 1	—	—	—	—	—	—
Naryn	56.3	317	e 9	28	- 2	—	—	—	—	—	—
Almata	56.4	320	i 9	29	- 1	—	—	—	—	—	—
Murgab	56.6	313	i 9	31	- 1	i 17	9	- 3	—	—	—
Frunse	57.8	318	e 9	38	- 2	e 17	28	+ 1	—	—	—
Andijan	58.5	315	9	48	+ 3	i 17	39	+ 3	10 18	pP	—
Fergana	58.8	314	e 9	45	- 2	—	—	—	—	—	—
Kulyab	59.5	311	i 9	49	- 3	—	—	—	—	—	—
Obi-garm	59.8	312	i 9	55	+ 1	i 17	55	+ 2	—	—	—
Stalinabad	60.5	312	i 9	57	- 2	i 17	59	- 3	—	—	—
Tashkent	60.9	315	i 9	59	- 2	—	—	—	—	—	—
Samarkand	62.1	312	i 10	10	+ 1	i 18	24	+ 1	—	—	—
Cobb River	63.2	141	e 10	19	+ 2	—	—	—	—	—	—
Kaimata	63.9	144	e 10	23	+ 2	—	—	—	—	—	—
Arapuni	64.0	138	10	24	+ 2	—	—	—	—	—	—
Apia	65.2	108	e 10	32	+ 2	i 19	7	+ 6	—	—	—
Christchurch	65.2	144	i 10	31	+ 1	i 19	3	+ 2	i 11 0	pP	—
Wellington	65.2	141	e 10	28	- 2	e 18	49	-12	i 19 49	PPS	—
Mary	65.5	309	e 10	30	- 2	—	—	—	—	—	—
Ashkabad	68.3	309	e 10	50	+ 1	19	40?	+ 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.
Kizyl-Arvat	70.1	310	i 10	58	- 2	—	—	—	—	—	—
Sverdlovsk	71.3	329	i 11	4	- 3	i 20	11	- 2	—	—	—
Baku	75.1	310	i 11	32	+ 2	—	—	—	—	—	—
Honolulu	75.3	70	i 11	32	+ 1	e 20	56	- 2	e 14	39	PP e 33.3
Shemakla	76.1	311	i 11	38	+ 3	—	—	—	—	—	—
Grozny	78.4	313	i 11	48	0	e 21	29	- 3	e 12	7	P <sub>c</sub> P —
Tiflis	79.0	312	i 11	52	+ 1	i 21	36	- 2	—	—	—
Leninakan	79.7	311	e 11	57	+ 2	—	—	—	—	—	—
Borzhom	80.1	312	e 11	58	+ 1	21	50	+ 1	—	—	—
Piatigorsk	80.4	314	e 11	57?	- 2	e 21	50?	- 3	—	—	—
Abastumanj	80.5	312	11	59	0	e 21	51	- 3	—	—	—
Tananarive	80.8	250	e 12	0	- 1	e 21	57	0	27	17	SS 36.7
Zugdidi	81.2	313	12	6?	+ 3	—	—	—	—	—	—
Sotchi	82.8	313	e 12	13	+ 2	22	15	- 2	—	—	—
College	83.0	26	i 12	10	- 2	e 22	15	- 4	e 15	9	PP —
Moscow	83.8	326	e 12	13	- 3	e 22	22	- 5	e 14	48	pP —
Theodosia	85.8	315	e 12	26?	0	—	—	—	—	—	—
Ksara	86.4	303	i 12	30	+ 1	i 23	2	+10	i 24	0	PS —
Yalta	86.7	314	i 12	30	0	22	55	0	e 18	5	PPP —
Pulkovo	87.3	330	i 12	34	+ 1	i 22	46	[ 0]	i 13	5	pP —
Sitka	89.7	33	i 12	47	+ 2	e 23	2	[+ 1]	e 13	19	pP —
Helsinki	89.9	331	e 12	45	- 1	i 23	20	- 5	e 24	34	SP —
Kishinev	90.1	318	12	45	- 2	—	—	—	—	—	—
Helwan	90.6	300	i 12	50 <sub>a</sub>	+ 1	23	30	- 1	i 23	5	SKS —
Istanbul	90.9	311	e 12	49	- 1	e 23	20	SKKS	—	—	—
Bucharest	92.5	315	i 12	58	0	i 23	16	[- 1]	i 16	23	PP 42.0
Upsala	93.6	331	e 13	0?	- 3	e 23	16	[- 8]	13	45	pP e 37.0
Warsaw	94.0	323	e 13	4	- 1	23	27	[+ 1]	13	41	sP e 44.0
Sofia	94.8	314	e 12	8	-60	—	—	—	—	—	—
Skalnate Pleso	95.3	320	e 20	5	pPPP	e 24	10	- 2	e 26	13	PPS —
Timisoara	95.5	316	e 13	59?	+48	—	—	—	—	—	—
Raciborzu	96.3	322	e 13	19?	+ 4	—	—	—	—	—	—
Budapest	96.5	319	13	15	- 1	23	42	[+ 3]	e 26	3	PS e 48.0
Kalossa	96.8	319	e 13	31	+14	e 23	30	[-11]	e 25	43	SP —
Ogyalla	96.9	320	e 13	20	+ 2	e 23	38	[- 3]	e 13	55	pP e 43.5
Copenhagen	97.6	328	i 13	21	0	i 23	45	[ 0]	i 17	23	PP —
Vienna	98.0	320	e 13	22	- 1	—	—	—	e 17	55	pPP —
Potsdam	98.6	325	e 13	23	- 2	i 27	1	PPS	e 17	47	PP e 47.0
Prague	98.6	323	e 13	25	0	e 23	50	[ 0]	e 14	4	sP e 44.5
Bergen	99.0	335	17	38	PP	24	43	0	—	—	37.4
Collnberg	99.0	324	e 13	27	0	e 24	47	+ 4	e 17	41	PP e 48.0
Victoria	99.0	39	i 13	28 <sub>a</sub>	+ 1	24	45	+ 2	23	56	SKS —
Pretoria	z. 99.3	245	e 13	33?	+ 4	—	—	—	e 17	32?	PP —
Cheb	99.8	323	e 13	30	- 1	e 23	52	[- 4]	e 17	39	PP e 49.0
Taranto	99.8	313	17	43	PP	e 23	54	[- 2]	27	44	PPS —
Jena	100.0	323	e 13	29	- 3	e 24	49	- 2	e 17	43	PP —
Seattle	100.0	40	e 13	35 <sub>a</sub>	+ 3	e 24	4	[+ 7]	e 14	13	pP e 41.5
Scoresby Sund	100.4	350	i 13	36	+ 2	—	—	—	e 14	5	pP —
Triest	100.5	318	e 13	4	-30	i 23	53	[- 6]	e 14	10	pP —
Padova	102.2	318	e 13	41	- 1	e 25	12	+ 2	e 17	57	PP —
Stuttgart	102.2	322	e 13	41 <sub>a</sub>	- 1	e 24	5	[- 3]	e 14	12	pP e 50.0
Shasta Dam	102.3	46	i 13	42	0	e 24	10	[+ 2]	i 14	21	pP —
Bologna	102.6	317	e 14	51	?	e 24	31	[+21]	e 17	55	PP —
Karlsruhe	102.6	323	e 13	58	+15	e 24	12	[+ 2]	e 18	2	PP e 54.0
Rome	102.7	315	13	26? <sub>a</sub>	-18	26	1?	+47	17	41?	PP —
Chur	102.8	321	e 13	44	0	—	—	—	—	—	e 55.5
Florence, Xim.	102.9	317	e 13	39	- 6	i 24	10	[- 1]	i 17	55	PP —
Prato	102.9	317	e 13	43	- 2	i 28	55	?	—	—	—
Mineral	z. 103.0	46	e 13	46	+ 1	e 26	51	SP	e 17	59	PP —
De Bilt	103.1	327	i 13	46 <sub>a</sub>	0	i 24	11	[- 1]	e 14	19	pP e 48.0

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.	
Strasbourg	103.2	323	e 13	45 <sub>a</sub>	- 1	i 24	1	[- 11]	e 14	21	pP	e 47.5
Zürich	103.2	322	e 13	44 <sub>a</sub>	- 2	e 24	11	[- 11]	e 18	6	PP	—
Berkeley	103.4	49	i 13	49 <sub>k</sub>	+ 2	i 24	16	[+ 31]	i 18	4	PP	—
Basle	103.7	322	e 18	0	PP	e 25	17	- 5	e 20	23	PPP	—
Pavia	103.7	320	e 15	54	?	—	—	—	—	—	—	—
Santa Clara	103.8	49	e 17	47	PP	i 24	22	[+ 7]	e 32	46	SS	e 51.4
Aberdeen	104.0	334	e 18	9	PP	i 24	17	[+ 1]	i 27	40	SPP	e 50.0
Lick	z. 104.0	49	i 13	51 <sub>a</sub>	+ 1	e 27	3	SP	i 18	7	PP	—
Neuchatel	104.4	322	e 18	11	PP	e 26	13	?	—	—	—	—
Hungry Horse	104.8	36	e 13	53	0	e 24	14	[- 6]	i 14	31	pP	—
Durham	105.1	331	e 18	18	PP	i 24	21	[ 0]	—	—	—	—
Edinburgh	E. 105.2	333	e 18	23	PP	24	37	[+ 16]	28	34	PPS	—
Fresno	z. 105.6	49	e 13	57 <sub>a</sub>	P	e 24	27	[+ 4]	e 18	9	PP	—
Paris	106.2	324	i 14	1	P	i 24	26	[ 0]	e 14	36	pP	e 45.0
Kew	106.3	328	e 13	59	P	e 24	26	[ 0]	e 14	32	pP	e 42.0
Tinemaha	106.6	49	e 14	4	P	e 24	34	[+ 6]	i 18	14	PP	—
Butte	N. 106.8	37	e 14	1	P	e 24	27	[- 11]	e 27	33	SP	e 51.7
Saskatoon	106.9	30	—	—	—	24	35	[+ 6]	33	27	SS	—
Clermont-Ferrand	107.3	322	e 14	5	P	e 24	29	[- 2]	e 14	38	pP	53.5
Pasadena	107.7	51	e 14	7	P	e 24	29	[- 3]	i 18	15	PP	e 43.8
Bozeman	107.9	37	e 18	35	PP	e 24	35	[+ 2]	e 25	24	SKKS	e 44.5
Rathfarnham Castle	108.2	332	e 18	18	PP	e 25	23	[+ 49]	e 28	45	SPP	e 43.0
Riverside	z. 108.4	51	e 14	11	P	—	—	—	i 18	16	PP	—
Jersey	E. 108.5	327	e 17	29	?	e 25	29	[+ 53]	e 28	27	PS	56.0
Logan	109.2	41	e 14	15	P	i 24	41	[+ 2]	e 29	8	PPS	e 45.0
Boulder City	109.6	48	e 14	16	P	e 24	51	[+ 11]	e 18	19	PKP	—
Overton	z. 109.6	47	i 14	17	P	i 28	3	SP	i 18	49	PP	—
Barcelona	110.0	318	e 18	27	[+ 11]	—	—	—	—	—	—	e 59.2
Pierce Ferry	110.1	48	i 14	18	P	i 24	49	[+ 7]	i 18	52	PP	—
Algiers Univ.	z. 111.4	313	e 18	21	[+ 2]	e 22	3	PKS	e 19	5	PP	—
Tortosa	111.4	318	19	3	PP	28	56	PS	19	44	pPKP	e 58.0
Alicante	113.2	316	19	6	PP	25	50	[+ 55]	22	6	PKS	e 53.5
Tucson	114.1	50	e 18	27	[+ 3]	e 26	18	SKKS	e 14	38	P	e 56.3
Tamanrasset	z. 114.7	300	18	29	[+ 4]	i 29	15	PS	14	53	P	45.0
Toledo	114.8	319	e 18	28	[+ 3]	29	2	PS	e 19	26	PP	54.6
Granada	115.9	317	i 19	26 <sub>a</sub>	PP	i 26	32	SKKS	19	48	pPP	i 61.2
Malaga	z. 116.7	317	i 18	31 <sub>k</sub>	[+ 2]	25	33	[+ 25]	i 22	41	PPP	64.2
Lisbon	118.7	321	18	34	[+ 1]	—	—	—	19	56	PP	57.5
Chicago	123.4	29	e 18	44	[+ 2]	e 25	23	[- 7]	e 20	26	PP	e 50.2
St. Louis	124.4	33	e 18	44	[ 0]	e 25	35	[+ 2]	i 19	17	pPKP	—
Seven Falls	E. 125.0	13	18	46	[+ 1]	e 37	8	SS	e 20	33	PP	—
Shawinigan Falls	N. 125.0	14	e 18	48	[+ 3]	—	—	—	—	—	—	—
Ottawa	125.2	18	18	46	[+ 1]	25	24	[- 12]	20	27	PP	—
Cleveland	126.4	25	i 18	48 <sub>k</sub>	[ 0]	i 27	27	SKKS	i 20	43	PP	—
Cincinnati	127.0	29	i 18	52	[+ 3]	—	—	—	i 20	48	PP	—
Pittsburgh	128.0	24	e 19	8	[+ 17]	i 36	48	?	—	—	—	—
Pennsylvania	128.5	22	i 18	55	[+ 3]	i 27	43	SKKS	i 20	46	PP	—
Halifax	128.8	8	21	58	pPP	31	14	PS	38	6	SS	—
Tacubaya	129.1	59	e 19	3	[+ 10]	—	—	—	i 21	7	PP	—
Harvard	129.1	15	i 18	56	[+ 3]	i 22	3	SKP	i 19	29	pPKP	e 54.0
Weston	129.2	15	i 18	55	[+ 2]	i 22	14	PKS	i 21	4	PP	—
Fordham	129.9	18	i 18	57	[+ 2]	i 38	26	SS	i 21	9	PP	—
Philadelphia	130.2	20	e 19	0	[+ 5]	e 27	49	SKKS	e 21	5	PP	e 50.3
Vera Cruz	131.8	57	e 17	52	[- 66]	—	—	—	e 21	10	PP	—
Merida	136.1	51	e 20	29	?	—	—	—	i 21	32	PP	—
Bermuda	140.4	13	e 19	13	[- 1]	e 29	37	SKKS	i 22	12	PP	e 55.8
Balboa Heights	150.8	58	e 19	45	[+ 13]	—	—	—	—	—	—	—
La Plata	N. 151.3	175	19	28	[- 4]	—	—	—	23	11	PP	—
San Juan	153.0	24	e 19	28	[- 7]	e 28	58	SKKS	e 43	3	SS	e 80.3
Chinchina	156.1	60	i 19	40	[+ 1]	i 30	24	SKKS	i 20	10	PKP <sub>2</sub>	—
Bogota	157.6	60	i 19	43	[+ 2]	i 23	56	PKS	i 20	18	PKP <sub>2</sub>	—
Fort de France	158.2	16	i 19	43	[+ 2]	e 30	59	SKKS	e 27	37	PPP	—
Huancayo	158.5	108	i 19	31	[- 11]	i 30	40	SKKS	i 24	8	PP	e 64.8
La Paz	163.1	129	i 19	51 <sub>a</sub>	[+ 4]	i 26	52	[+ 15]	i 20	47	PKP <sub>2</sub>	78.0

For Notes see next page.



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NOTES TO AUGUST 7d. 2h. 45m. 1s.

Additional readings and notes :—

Zi-ka-wei iN = 10m.47s.  
Miyazaki eN = 5m.26s., iS = 9m.49s.  
Nanking iZ = 8m.30s. and 9m.11s.  
Hukuoka e = 6m.26s., iSS = 10m.54s., Q = 12m.41s.  
Kōti eSS = 11m.14s.  
Matuyama iEN = 7m.14s., eSS = 11m.15s.  
Owase SS = 11m.23s.  
Osaka eE = 6m.47s.  
Gihu i = 6m.30s., PP = 7m.1s., PPP = 8m.11s.  
Tokyo PP = 5m.49s., e = 8m.28s. and 9m.37s., Q = 13m.23s.  
Toyama PP? = 6m.48s.  
Akita e = 8m.31s.  
Perth i = 14m.29s., 15m.9s., and 16m.24s.  
Calcutta ePPE = 9m.1s., iSE = 14m.36s., eSSE = 16m.3s., iSSSE = 16m.44s.  
Brisbane iPPEN = 9m.27s., iZ = 13m.48s.  
Riverview iN = 8m.34s., iZ = 9m.3s., iPP = 10m.9s., iSN = 15m.58s., iSSE = 18m.27s., iE = 18m.32s., iZ = 18m.36s., iE = 18m.49s. and 19m.28s.  
Hyderabad iN = 16m.8s.  
Kodaikanal PPPE = 11m.2s., PcSE = 14m.2s., SSE = 18m.22s., SSSE = 19m.26s.  
New Delhi PPPN = 11m.35s., iEN = 16m.50s., SSEN = 19m.24s., SSSN = 20m.33s.  
Poona sPN = 9m.49s., PcPN = 10m.22s., PPN = 10m.36s., PPPN = 11m.57s., PcSN = 14m.14s., sSN = 16m.52s., SSN = 19m.21s., SSS = 20m.51s.  
Bombay PPN = 11m.39s., iSSE = 20m.15s., iSSN = 20m.31s.  
Christchurch iPcPZ = 11m.13s., PPZ = 12m.54s., eS?EZ = 18m.53s., sSN = 19m.52s., eSSZ = 23m.9s., eSSEN = 23m.39s., eSSS?NZ = 26m.9s.  
Wellington i = 21m.10s., eSS = 22m.12s.  
Honolulu iS = 21m.0s., iScS = 21m.35s., eSS = 25m.45s., eSSS? = 29m.47s.  
Tananarive PP = 15m.44s., i = 23m.40s., Q = 33m.39s.  
College ePPP? = 17m.11s., ePKKP? = 30m.32s., ePKP,PKP = 38m.35s., eSKP,PKP? = 41m.43s.  
Moscow eSS = 23m.36s. ; pP as given.  
Pulkovo iS = 23m.8s.  
Sitka i = 14m.4s., ePPP? = 17m.59s., iSKS = 23m.5s., iS = 23m.29s., ePS = 24m.29s., iPS = 24m.36s., eSS = 29m.11s.  
Helsinki ePP = 16m.52s., ePPP = 19m.31s., iSKKS = 23m.39s., eN = 24m.8s. and 24m.22s.  
Helwan iZ = 13m.30s., eEZ = 16m.14s., iE = 24m.26s., PSEN = 24m.59s., iN = 26m.11s. and 30m.29s.  
Bucharest iE = 15m.5s., iEN = 16m.27s., iPPPE = 18m.17s., iSKKS?E = 23m.27s., iSKKSN = 23m.38s., iPSE = 24m.34s., iPSN = 24m.41s., iSSN = 29m.16s., iSSE = 29m.28s.  
Upsala eN = 14m.25s., eE = 16m.21s., ePPN = 16m.42s., eE = 16m.51s., ipPPN = 17m.15s., sPPN = 17m.40s., epPPPN = 19m.11s., epPPP?E = 19m.18s., iN = 23m.52s., esS? = 24m.38s., eN = 28m.34s.  
Warsaw ePE = 13m.8s., PPZ = 17m.1s., isPPZ = 17m.24s., ePPPN = 18m.48s., ePPPZ = 18m.53s., SKSZ = 23m.22s., SKKSZ = 23m.52s., SKKSE = 24m.2s., SKKSN = 24m.5s., SPE = 24m.53s., SPZ = 25m.4s., PSZ = 25m.24s., PSN = 25m.28s., PPSEZ = 26m.2s., SSEN = 30m.27s., SSSN = 34m.1s., SSSE = 34m.12s., SSSZ = 34m.20s., and many unidentified e readings.  
Skalnate Pleso e = 21m.35s., eN = 23m.47s., eS? = 25m.24s., ePPS = 27m.5s., eSSS = 35m.59s.  
Budapest e = 17m.49s., PP = 18m.5s., PKS = 21m.24s., e = 31m.27s., SS = 31m.57s., SSS = 36m.17s.  
Kalossa eN = 17m.56s., eE = 18m.37s., eN = 21m.50s., eE = 21m.59s.? and 26m.1s., eN = 31m.50s.  
Ogyalla ePP = 17m.34s., ePPP = 19m.49s., ePS = 26m.30s., ePPS = 27m.29s., eSS = 31m.11s. and other unidentified e readings.  
Copenhagen i = 17m.53s., 19m.45s., 25m.44s., 32m.19s.  
Potsdam eN = 18m.29s., ePPPEN = 19m.59s., eE = 22m.41s., iN = 25m.51s., eSS?N = 32m.33s., eE = 32m.47s.  
Prague ePP = 18m.3s. and 18m.22s., epPPZ = 18m.44s., esPP = 19m.2s., ePS = 26m.14s., ePPS?E = 27m.9s., eSS = 31m.9s. and many other unidentified e readings.  
Bergen eN = 21m.48s., eEN = 23m.55s., eN = 27m.48s. and 36m.13s.?  
Collmberg ePPZ = 18m.4s., ePPPEZ = 20m.1s., eSN = 25m.11s., ePSE = 27m.5s., eSSE = 32m.17s., eSSSE = 36m.29s., and other unidentified e readings.  
Victoria PP = 17m.3s., e = 21m.1s., PS = 26m.14s., SS = 31m.35s.  
Pretoria eZ = 16m.40s.? and 18m.4s.?, iZ = 30m.23s.?  
Cheb eN = 16m.45s., epPPE = 18m.3s., e = 20m.16s., 22m.15s., and 23m.37s., eSPN = 26m.14s., ePS?N = 26m.45s., ePPS = 27m.37s., e = 32m.59s., eSSS = 35m.35s., e = 37m.30s.  
Taranto e = 20m.14s.  
Jena ePN = 13m.33s., ePKPN = 17m.48s., ePP?E = 18m.12s., ePP?Z = 18m.23s., ePP?N = 18m.26s., eSSE = 33m.7s., and other unidentified e readings.  
Seattle e = 13m.55s., esP = 14m.27s., e = 18m.16s., i = 18m.44s., e = 20m.17s., ePKS = 21m.44s., iSKS = 23m.44s., ePS = 26m.31s., ePPS = 27m.18s., e = 30m.55s., eSS = 32m.24s., eSKKS = 36m.51s., e = 40m.19s.  
Scoresby Sund 17m.39s., PPP = 20m.10s.

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Triest iPKP = 17m.43s., iPP = 18m.12s., iSKKS = 24m.48s., iPS = 27m.18s., iPPS = 28m.11s., iSS = 32m.59s.  
Padova e = 18m.33s.  
Stuttgart eZ = 14m.22s., ePP = 17m.57s. and 18m.32s., ePPP = 20m.5s., e = 22m.59s. and 26m.17s., ePS = 27m.23s., eSS = 33m.17s., eSSS = 38m.5s.  
Shasta Dam ePP = 17m.54s., ePPP? = 19m.59s., eSKKS = 24m.14s., eS = 25m.17s., iSP = 26m.47s.  
Bologna e = 19m.9s.  
Rome SS = 33m.31s.?  
Florence, Xim. iPPS = 27m.38s., iSS = 33m.20s.  
Mineral-eZ = 17m.42s.  
De Bilt iPP = 18m.2s., ePP = 18m.36s., eZ = 22m.33s., ePPS = 27m.39s., eSS = 32m.49s.  
Strasbourg ePP? = 17m.59s., eSKKS = 25m.7s., eS? = 26m.13s., ePS = 27m.29s., ePPS = 28m.54s., eSS = 33m.29s., eSSS = 38m.19s., eQ = 42m.21s., and numerous unidentified readings  
Zürich ePKP = 17m.37s.  
Berkeley ePSZ = 26m.51s.  
Santa Clara iZ = 26m.53s.  
Aberdeen iEN = 18m.42s. and 33m.47s.  
Hungry Horse ePP? = 17m.17s., eS = 25m.52s., ePKKP = 29m.35s., eS<sub>c</sub>S, S<sub>c</sub>S = 37m.36s.  
Durham iEN = 18m.52s. and 29m.20s., iE = 34m.22s.  
Fresno eZ = 17m.17s., eEN = 17m.27s., ePPSN = 28m.7s.  
Paris iSP = 14m.56s., iPP = 18m.12s., iSP? = 27m.50s., iPS = 28m.15s., iSS = 33m.49s. and other unidentified readings.  
Kew ePP = 18m.6s., ePPPEZ = 21m.0s., ePKKPEN = 29m.25s.  
Tinemaha eZ = 17m.43s.  
Butte ePPN = 17m.57s., eSKKSN = 25m.18s., eSSN = 33m.26s.  
Saskatoon S = 25m.54s., PS = 27m.30s., PPS = 28m.24s., SSS = 38m.43s.  
Clermont-Ferrand ePKP = 17m.55s., ePP = 18m.35s., ePP = 19m.9s., ePPP = 21m.0s., e = 21m.23s. and 23m.12s., eSKKS = 25m.29s., ePS? = 28m.21s., ePPS? = 29m.30s., eSS = 34m.20s., eSSS = 38m.25s.  
Pasadena ePPZ = 18m.1s., iSKS = 24m.37s., iSEN = 25m.25s., iPS = 27m.43s., iPPSEN = 28m.35s., iPKKPZ = 29m.35s., eSSZ = 33m.17s.  
Bozeman ePPP? = 20m.16s., eSP = 27m.37s., iSP = 27m.42s., eSS = 33m.14s.  
Rathfarnham Castle ePPZ = 18m.33s., e = 18m.58s., eEN = 20m.53s., ePPPEN = 21m.41s., iEN = 24m.33s., ePPS?EN = 29m.29s., e = 30m.0s., eSSEN = 34m.37s.  
Jersey eE = 23m.11s.  
Logan ePKP = 17m.40s., ePP = 19m.18s., iSKKS = 25m.40s., iPPS = 29m.10s., eSS = 33m.48s.  
Boulder City eSKKS = 25m.43s.  
Overton eZ = 36m.51s.  
Pierce Ferry e = 17m.39s., ePS = 28m.29s.  
Algiers Univ. eZ = 19m.23s., 19m.53s., and 20m.52s., iPPP?Z = 21m.44s., eZ = 29m.27s. and 37m.5s.  
Tortosa PPE = 23m.48s., SKKSEN = 30m.14s., SSE = 38m.2s.  
Alicante PP = 19m.52s., PS = 29m.26s., PPS = 30m.42s., SS = 35m.46s., SSP = 36m.10s., SSS = 39m.48s., Q = 46m.46s.  
Tucson ePKP = 18m.9s., ePP = 19m.1s., iPP = 19m.28s., eS = 27m.12s., ePS = 28m.46s., e = 29m.36s., and 30m.42s., i = 33m.9s., eSS = 35m.16s.  
Tamanrasset ePPZ = 19m.30s., ePPPZ = 21m.54s., iPKKP?Z = 29m.11s., iPPS?Z = 30m.29s., eSSZ = 36m.7s., and other unidentified readings.  
Toledo iZ = 20m.7s., ePPPN = 21m.51s., eN = 29m.36s., SSN = 35m.12s., eE = 36m.51s.  
Granada iPP = 20m.9s., pPP = 21m.30s., sPP = 21m.57s., PS = 29m.32s., pPS = 29m.48s., PPS = 30m.24s., pPPS = 31m.33s., SS = 34m.21s., SSS = 39m.50s.  
Malaga SKKSZ = 26m.21s., PSZ = 28m.59s.  
Chicago e = 27m.6s., ePS = 30m.14s., eSS = 36m.49s., eSSS = 41m.49s.  
St. Louis iSKS = 25m.39s.  
Ottawa e = 21m.5s., PS = 30m.9s., SS = 36m.43s.  
Cleveland iSKPZ = 21m.52s., ePPSN = 32m.0s., eSSN = 37m.47s., and other unidentified readings.  
Cincinnati i = 21m.28s.  
Pennsylvania eE = 21m.3s., iEN = 22m.15s., iN = 22m.53s., iE = 23m.29s., 24m.38s., 25m.1s., and 28m.5s., eE = 28m.21s.  
Harvard iPP = 21m.4s., ipPP = 21m.32s., iPKS = 22m.9s., epPKS = 22m.37s., esPKS = 23m.1s., ePPP = 23m.43s., eSKSP = 30m.51s., epPS = 31m.46s., eSPP = 32m.30s., e = 33m.19s., 34m.32s., and 35m.39s., eSS = 38m.18s., isSS = 39m.15s., eSSS = 42m.48s., e = 43m.36s.  
Weston eSS = 38m.23s.  
Fordham iPS = 30m.56s.  
Philadelphia i = 22m.23s., iPKS = 22m.56s., iSKKS = 27m.54s., eSKSP = 31m.7s., ePPS = 33m.0s., iSS = 38m.27s., iSSS = 43m.26s.  
Bermuda iPKS = 23m.29s., i = 39m.28s., iSS = 40m.30s., iSPS = 41m.3s., eSSS = 45m.46s., i = 46m.36s.  
La Plata PE = 19m.37s., iPZ = 19m.43s., Z = 19m.51s., N = 20m.35s. and 24m.17s.  
San Juan iPKP = 19m.38s. and 20m.20s., e = 21m.24s., iPP? = 24m.24s., e = 27m.43s., 30m.50s., and 32m.19s., eSKSP? = 34m.17s., ePPS = 37m.10s., eSSS = 63m.26s.  
Chinchina eEN = 31m.13s., eSSEN = 44m.6s.  
Huancayo i = 20m.23s., e = 31m.35s., eSKSP = 34m.23s., ePPS = 38m.11s., eSS = 44m.29s.  
La Paz iPPZ = 24m.26s., iZ = 25m.0s., iSKKS = 31m.9s., iPPS = 38m.25s., iSS = 44m.49s., iSSP = 45m.46s., iSSS = 51m.9s.

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Aug. 7d. 4h. Kurile Islands region.

Mizusawa PE = 54m.20s., SE = 55m.40s.  
 Vladivostok eP = 55m.0s., eS = 57m.49s.  
 College iP = 59m.1s.  
 Shasta Dam eP = 61m.53s.  
 Hungry Horse iP = 61m.54s.  
 Tinemaha ePZ = 62m.26s.  
 Riverside ePZ = 62m.40s.  
 Crest Line ePZ = 62m.41s., eZ = 62m.50s.  
 Boulder City eP = 62m.43s.  
 Overton iPZ = 62m.43s.  
 Pierce Ferry iP = 62m.45s.  
 Tucson eP = 63m.13s.  
 Collmberg eZ = 63m.34s.  
 Stuttgart ePZ = 63m.53s.  
 Strasbourg eP = 63m.57s.  
 Paris iP = 64m.14s.  
 Clermont-Ferrand eP = 64m.16s.  
 Weston eP = 64m.17s.

Aug. 7d. 10h. 56m. 24s. Epicentre 41°·6N. 45°·3E.

Epicentre as given by U.S.S.R., with a depth of 70km.

A = +·5275, B = +·5331, C = +·6614;  $\delta = -10$ ;  $h = -2$ ;  
 D = +·711, E = -·703; G = +·465, H = +·470, K = -·750.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Tiflis	0·4	287	i 0 20	+ 7	i 0 28	+ 7	—	—
Gori	1·0	294	i 0 29	+ 8	0 46	+10	—	—
Leninakan	1·4	233	i 0 30?	P <sub>g</sub>	0 50	S <sub>g</sub>	—	—
Borzhomi	1·5	279	i 0 34	P <sub>g</sub>	i 0 57	S <sub>g</sub>	—	—
Erevan	1·5	204	i 0 36	P <sub>g</sub>	0 58	S <sub>g</sub>	—	—
Grozny	1·7	11	e 0 40	P <sub>g</sub>	i 1 3	S <sub>g</sub>	—	—
Abastumanj	1·8	275	0 39	+ 7	—	—	—	—
Shemakla	2·7	108	e 0 32?	-13	i 1 16?	- 3	—	—
Piatigorsk	2·9	326	e 1 8?	+20	1 49?	+25	—	—
Baku	3·7	108	e 0 59	- 1	—	—	—	—
Sotchi	4·6	298	e 1 43	P <sub>g</sub>	—	—	—	—
Ashkabad	10·7	106	2 34	- 4	4 26	-13	—	—
Ksara	10·8	227	i 3 1	+22	5 33	L	—	(5·6)
Istanbul	12·2	273	—	—	e 5 20	+ 4	—	—
Mary	13·4	102	e 3 9	- 5	5 29	-16	—	—
Moscow	15·0	343	e 3 40	+ 5	e 6 31	+ 8	—	—
Sverdlovsk	18·2	27	i 4 13	- 3	e 7 23	-14	—	—
Kulyab	19·2	92	e 4 20	- 8	—	—	—	—
Andijan	20·4	83	e 4 40?	- 1	—	—	—	—
Pulkevo	20·4	338	e 4 46	+ 5	e 8 31	+ 6	—	—
Frunse	21·7	75	e 4 53	- 2	—	—	—	—
Prague	23·0	303	e 4 27	-40	—	—	e 5 48	PPP
Copenhagen	25·6	315	i 5 38	+ 6	—	—	—	—
Chur	26·0	295	e 5 37	+ 1	—	—	—	—
Stuttgart	z. 26·3	299	e 5 41	+ 2	—	—	—	—
Zürich	26·7	296	e 5 42	- 1	—	—	—	—
Strasbourg	27·2	299	e 6 27	PP	—	—	—	—
Tamanrasset	z. 38·1	253	e 7 26	+ 4	—	—	i 7 39	pP
Pretoria	z. 68·9	196	e 11 8?	- 1	—	—	—	—
College	73·4	6	i 11 35	- 1	—	—	—	—
Hungry Horse	88·6	346	i 12 57	+ 1	—	—	i 13 9	P <sub>c</sub> P
Shasta Dam	97·3	351	e 13 37	+ 1	—	—	—	—
Overton	z. 100·1	343	i 18 50	?	—	—	—	—
Lick	z. 100·5	351	i 17 41 <sub>a</sub>	PP	—	—	i 17 48	?

Prague gives also e = 4m.53s.

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Aug. 7d. 15h. 47m. 23s. Epicentre 1°·1N., 126°·4E. (as on 1950 June 15d.).

A = -·5933, B = +·8047, C = +·0190;  $\delta$  = -9; h = +7;  
D = +·805, E = +·593; G = -·011, H = +·015, K = -1·000.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Bandong	E.	20·4	248	i 5 1	PP	—	—	—	—
Djakarta		20·8	250	e 4 44	- 1	e 8 44	+11	—	—
Guam		21·9	54	4 55	- 2	—	—	5 18	PP
Nanking		31·6	347	6 27	+ 1	11 38	+ 3	—	—
Brisbane		38·3	140	i 7 22 <sub>a</sub>	- 2	i 13 11	- 8	i 8 51	PP
Riverview		41·8	148	i 7 54 <sub>a</sub>	+ 1	i 14 10	- 1	i 9 34	PP
Vladivostok		42·1	6	i 7 57	+ 2	e 14 12	- 4	—	—
Calcutta	E.	42·7	303	e 8 2	+ 2	e 14 22	- 2	—	—
Colombo	E.	46·8	278	9 9	+36	15 17	- 7	—	—
Kodaikanal	E.	49·5	283	e 9 13	+19	—	—	—	—
Irkutsk		54·3	343	9 30	0	e 17 3	- 4	—	—
New Delhi		54·3	305	e 9 29	- 1	i 16 58	- 9	19 15	S <sub>e</sub> S
Poona		54·4	292	12 44	PPP	17 10	+ 1	19 8	S <sub>e</sub> S
Bombay		55·4	292	e 9 25	-13	e 17 6	-16	—	—
New Plymouth	E.	59·2	138	e 11 37?	?	—	—	—	—
Kaimata	N.E.	59·4	143	e 10 8	+ 2	—	—	—	—
Przhevalsk		59·5	321	i 10 7	0	—	—	—	—
Naryn		60·5	318	e 10 13?	- 1	—	—	—	—
Murgab		60·6	314	i 10 16	+ 1	i 18 28	- 2	—	—
Almata		60·8	321	i 10 16	0	e 18 24?	- 9	—	—
Wellington		60·8	140	e 10 14	- 2	—	—	—	e 27·4
Frunse		62·1	318	e 10 24	- 1	e 18 46	- 3	—	—
Andijan		62·7	315	e 10 29	0	18 54	- 3	—	—
Fergana		63·0	315	e 10 30	- 1	e 18 56	- 5	—	—
Obi-garm		63·8	313	i 10 35	- 1	i 19 7	- 4	—	—
Stalinabad		64·4	313	i 10 41	+ 1	—	—	—	—
Tashkent		65·1	315	i 10 43	- 2	i 19 23	- 4	—	—
Samarkand		66·1	313	e 10 51	0	e 19 36	- 3	—	—
Ashkabad		72·1	310	11 35	+ 7	—	—	—	—
Sverdlovsk		76·0	329	i 11 50	- 1	i 21 26	- 8	—	—
Baku		79·0	311	e 12 9	+ 2	e 22 7	+ 1	—	—
Grozny		82·4	313	e 12 29	+ 4	22 37	- 4	—	—
Tiflis		83·0	312	i 12 30	+ 2	e 22 44	- 3	—	—
Erevan		83·1	310	e 12 35	+ 6	—	—	—	—
Leninakan		83·7	310	e 12 15?	-17	e 22 53?	- 1	—	—
Borzhomi		84·1	312	i 12 37	+ 3	e 22 55	- 3	—	—
Piatigorsk		84·4	314	12 47?	+11	—	—	—	—
Abastumanj		84·5	312	12 37	+ 1	e 22 57	- 5	—	—
Zugdidi		85·2	312	12 44	+ 5	e 23 11	+ 2	—	—
Sotchi		86·8	313	e 12 49	+ 2	—	—	—	—
College		87·2	25	i 12 49	0	e 23 13	[- 2]	e 15 48	PP
Moscow		88·4	326	e 12 55	0	e 23 35	- 5	—	—
Ksara		89·8	303	i 13 6	+ 4	24 2	+ 9	—	—
Pulkovo		92·1	330	e 13 12	0	e 23 42	[- 3]	e 24 11?	S
Sitka		93·5	32	e 13 20	+ 1	e 23 51	[- 2]	e 24 30	S
Helwan		93·9	300	i 13 22 <sub>a</sub>	+ 1	23 55	[ 0]	25 47	PS
Istanbul		94·8	311	e 13 24	- 1	e 24 31	- 5	—	—
Pietermaritzburg	z.	95·8	240	e 13 31	+ 2	—	—	—	—
Bucharest		96·6	315	e 13 31	- 2	e 24 9	[- 1]	—	—
Pretoria	z.	97·9	245	e 17 35?	PP	—	—	—	—
Upsala		98·4	331	e 23 37?	?	i 24 13	[- 6]	e 24 59	S
Warsaw		98·5	323	e 13 37?	- 5	e 24 16	[- 4]	e 25 13	S
Grahamstown		98·8	237	i 13 45	+ 2	—	—	—	—
Victoria	z.	102·4	40	i 14 0 <sub>a</sub>	+ 1	—	—	—	—
Copenhagen		102·4	328	—	—	i 24 38	[+ 1]	—	—
Prague		103·1	322	e 13 58	- 4	e 25 47	+ 1	e 24 40	SKS
Bergen	N.	103·9	334	—	—	e 34 37?	?	—	—
Cheb		104·3	323	e 18 43	PP	e 24 45	[- 2]	—	—
Jena	E.	104·5	323	e 14 9	+ 1	—	—	—	—
Shasta Dam		105·2	47	i 14 14	+ 2	—	—	i 18 33	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.
Scoresby Sund	105.6	350	14 1	P	24 55	[+ 2]	18 39 PP	53.6
Padova	106.5	318	—	—	e 24 44	[-13]	—	—
Lick	z. 106.6	50	e 18 30	[+ 4]	—	—	i 14 21k P	—
Stuttgart	106.7	322	e 18 30	[+ 4]	e 24 56	[- 2]	e 14 19 P	59.6
Rome	106.9	315	e 18 15	[-12]	e 24 58	[- 1]	e 14 19 P	—
De Bilt	107.7	327	e 18 37	PP	25 15	[+13]	e 28 7 PS	e 59.6
Strasbourg	107.7	323	e 18 4	[-24]	e 25 0	[- 2]	e 18 52 PP	e 37.6
Fresno	z. 108.2	50	e 14 28	P	—	—	e 18 4 ?	—
Hungry Horse	108.4	37	e 18 21	[- 9]	—	—	i 14 29 P	—
Tinemaha	z. 109.3	50	i 14 32	P	—	—	i 19 2 PP	—
Pasadena	110.2	53	i 18 37	[+ 3]	—	—	e 29 48 PKKP	e 53.2
Mount Wilson	z. 110.3	53	i 14 36	P	—	—	—	—
Paris	110.8	324	e 18 35	[ 0]	e 26 46	S	e 19 13 PP	—
Crest Line	z. 110.9	53	i 18 38	[+ 3]	—	—	e 14 34 P	—
Kew	111.0	328	e 28 38	PS	—	—	—	e 47.6
Clermont-Ferrand	111.8	321	e 18 47	[+10]	e 25 28	[+ 8]	e 19 28 PP	48.1
Boulder City	112.3	50	e 18 42	[+ 4]	—	—	e 19 19 PP	—
Overton	z. 112.4	50	i 18 43	[+ 5]	—	—	e 14 41 P	—
Pierce Ferry	112.9	50	i 18 43	[+ 4]	—	—	e 14 49 P	—
Tucson	116.6	53	e 18 50	[+ 4]	—	—	e 19 55 PP	—
Alicante	117.4	315	—	—	26 11	[+30]	48 47 Q	e 56.4
Tamanrasset	z. 117.8	297	i 18 52 <sub>a</sub>	[+ 4]	e 29 50	PS	e 20 0 PP	52.6
Granada	120.1	315	18 43	[-10]	25 28	[-22]	20 43 PP	62.6
Shawinigan Falls N.	129.6	17	e 21 45	PP	—	—	—	—
Ottawa	129.7	20	i 19 14 <sub>k</sub>	[+ 3]	e 22 47	PKS	e 21 18 PP	—
Seven Falls	E. 129.7	15	e 22 35	PKS	—	—	—	—
Cleveland	z. 130.6	27	i 19 16 <sub>k</sub>	[+ 3]	i 22 34	SKP	i 21 35 PP	—
Tacubaya	130.9	63	i 19 15	[+ 1]	—	—	e 18 32 ?	—
Pennsylvania	E. 132.8	25	e 22 15	PP	i 23 1	PKS	—	—
Harvard	133.7	18	i 19 21	[+ 2]	—	—	e 21 51 PP	e 73.6
Weston	133.9	18	i 19 21	[+ 2]	e 39 43	SS	—	—
Philadelphia	134.6	23	e 22 37	PP	e 28 51	{+ 2}	e 39 42 SS	e 58.9
Washington	134.7	25	i 19 24	[+ 3]	e 23 1	PKS	i 19 42 ?	—
Bermuda	145.1	17	e 19 42	[+ 3]	e 35 45	PPS	e 23 9 PP	e 82.0
Huancayo	155.8	117	e 20 4	[+ 9]	—	—	—	—
Chinchina	157.2	72	e 19 55	[- 3]	e 30 53	{- 5}	e 20 29 PKP <sub>2</sub>	—
Bogota	158.8	73	e 20 4	[+ 5]	e 31 4	{- 2}	e 20 40 PKP <sub>2</sub>	e 76.6
La Paz	159.0	138	i 20 6 <sub>a</sub>	[+ 6]	i 44 29	SS	i 20 44 PKP <sub>1</sub>	81.3

Additional readings and notes.

Nanking iZ = 6m.48s. and 6m.59s.

Brisbane iZ = 7m.27s.

Riverview iPPPZ = 10m.0s., eSSN = 17m.15s., iN = 17m.26s., iE = 17m.31s., iN = 17m.59s.

Poona iSEN = 16m.55s., PSEN = 17m.2s.

College eS<sub>c</sub>S = 23m.27s., ePKKP = 30m.42s., ePKP,PKP = 38m.49s.

Pulkovo eS<sub>c</sub>S = 24m.15s.

Helwan iZ = 13m.41s., eZ = 15m.54s.

Upsala ePSE = 26m.24s., eN = 30m.17s.

Warsaw ePZ = 13m.43s., ePPEZ = 18m.33s., ePPPE = 20m.0s., ePPPZ = 20m.10s.,

eE = 20m.52s., eEZ = 22m.41s., eSKKSEN = 25m.4s., eEZ = 25m.55s., ePS =

26m.33s., ePPS = 27m.36s., eSSE = 31m.55s., eSSSZ = 35m.41s.

Prague e = 14m.24s., 14m.50s., and 17m.6s., ePP = 17m.55s., e = 18m.44s., eN = 21m.21s.,

eSKKS = 25m.5s., e = 27m.37s., 28m.37s., and 33m.37s.

Shasta Dam ePKKP = 30m.10s.

Scoresby Sund PS = 27m.37s.

Lick iPKKPZ = 30m.5s.<sub>a</sub>; given as P of another shock.

Stuttgart ePP = 18m.47s., eSKKS = 25m.37s., eS = 26m.16s., ePS = 27m.55s., eSS =

33m.43s., eQ = 55.6m.

Rome SKKS = 25m.45s., iS = 26m.15s., e = 27m.59s.

Strasbourg e = 19m.7s., 19m.56s., and 23m.17s., eS = 26m.27s., e = 27m.8s., 33m.14s.,

and 34m.59s.

Hungry Horse iPKKP = 30m.15s.

Tinemaha iZ = 14m.45s., iPKKPZ = 29m.54s.

Paris e = 19m.41s.

Crest Line eZ = 14m.44s., iZ = 19m.12s., iPKKPZ = 29m.46s.

Clermont-Ferrand ePS = 29m.46s.

Boulder City ePKKP = 29m.41s.

Overton iPPZ = 19m.51s., iPKKPZ = 30m.12s., iZ = 33m.7s.

Continued on next page.

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Pierce Ferry iPP = 29m.35s., iPKKP = 29m.38s.  
 Tucson iPKKP = 29m.21s.  
 Tamanrasset eZ = 19m.14s., iZ = 19m.49s., iPKKPZ = 29m.15s.  
 Cleveland iZ = 19m.34s., eSKPE = 22m.37s., eE = 22m.55s., and 23m.0s.  
 Pennsylvania iEN = 22m.49s.  
 Philadelphia e = 41m.44s.  
 Bogota eSKSEN = 25m.6s.  
 La Paz iPPZ = 24m.21s.  
 Long waves were also recorded at Christchurch, Collmberg, and Aberdeen.

Aug. 7d. Readings also at 0h. (near Istanbul), 2h. (Collmberg), 3h. (Istanbul and Pietermaritzburg), 8h. (Fergana, near Obi-garm, Kulyab, Stalinabad, and Andijan), 11h. (College, Shasta Dam, Overton, Pierce Ferry (2), Tucson, and near La Paz), 14h. (near Ashkabad), 15h. (near Athens), 17h. (near Huancayo), 18h. (Tamanrasset), 20h. (Fergana, Andijan, near Kulyab, Obi-garm, Murgab, Stalinabad, and near Ashkabad), 22h. (Collmberg, Stalinabad, Murgab, Samarkand, near Kulyab, and Obi-garm, near Djakarta, and Bandung, near Basle, and Zürich).

Aug. 8d. 2h. 59m. 18s. Epicentre 18°·5S, 178°·0W. Depth of focus 0·070.  
 (as on 1950, May 27d.).

A = -·9484, B = -·0331, C = -·3154;  $\delta = +4$ ;  $h = +5$ ;  
 D = -·035, E = +·999; G = +·315, H = +·011, K = -·949.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	s.
Apia		7·6	53	e 1 54	+ 1	e 3 19	- 3	—	—
Vladivostok		76·7	325	e 11 2	0	e 20 6	- 3	—	—
Lick	z.	76·8	42	i 10 4 <sub>a</sub>	-59	—	—	—	—
Pasadena	z.	77·3	47	i 11 5 <sub>a</sub>	- 1	—	—	e 12 56	pP
Fresno	z.	77·7	44	e 11 7 <sub>a</sub>	- 1	—	—	e 13 0	pP
Riverside	z.	77·8	47	i 11 7 <sub>a</sub>	- 1	—	—	e 12 57	pP
Shasta Dam		78·3	40	e 11 10	- 1	—	—	e 13 2	pP
Mineral	z.	78·6	41	e 11 11	- 1	—	—	—	—
Tinemaha	z.	78·9	45	i 11 12 <sub>a</sub>	- 2	—	—	—	—
Boulder City		80·6	47	e 11 23	0	—	—	—	—
Overton	z.	81·2	47	i 11 26	0	—	—	i 13 17	pP
Pierce Ferry		81·3	47	i 11 27	0	—	—	e 12 26	pP
Tucson		81·7	52	i 11 30	+ 1	—	—	e 13 20	pP
College		86·3	12	i 11 48	- 3	e 21 38	- 7	e 13 42	pP
Hungry Horse		87·5	37	i 11 56	- 1	—	—	e 13 52	pP
Rathfarnham C.	z.	144·7	8	i 18 38	[- 4]	—	—	—	—
Collmberg	z.	146·1	347	e 18 45 <sub>k</sub>	[+ 1]	—	—	e 20 51	pPKP
Ksara		146·2	303	e 20 47	PKP <sub>2</sub>	—	—	e 31 22	?
Jena	n.	146·8	347	e 18 47	[+ 2]	—	—	—	—
Prague		147·0	345	e 18 51	[+ 5]	—	—	e 20 24	pPKP
Istanbul		147·7	320	e 20 51	pPKP	—	—	e 21 28	?
Stuttgart	z.	149·2	350	e 18 49	[+ 0]	—	—	e 20 52	pPKP
Strasbourg		149·6	352	e 18 55 <sub>k</sub>	[+ 6]	—	—	e 20 58	pPKP
Paris		149·8	359	i 18 55	[+ 5]	—	—	—	—
Basle		150·7	352	e 18 53	[+ 2]	—	—	—	—
Zürich		150·7	351	e 18 55	[+ 4]	—	—	—	—
Clermont-Ferrand		152·8	358	e 19 1	[+ 7]	—	—	—	—
Tamanrasset	z.	174·6	323	i 19 15 <sub>a</sub>	[+ 2]	e 22 49	PKS	e 20 53	PKP <sub>2</sub>

Additional readings:—

Lick iZ = 10m.28s.  
 Tinemaha iZ = 11m.25s.  
 College eSKS = 21m.24s.  
 Collmberg eZ = 19m.1s. and 21m.43s.  
 Jena eN = 19m.25s.  
 Stuttgart ePKPZ = 18m.54s.  
 Strasbourg e = 19m.2s.  
 Paris i = 20m.2s.  
 Basle e = 19m.5s.



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Aug. 8d. 5h. 11m. 55s. Epicentre 54°·5N. 136°·0W. (as on 1949, August 26d.).

A = -·4196, B = -·4052, C = +·8123;  $\delta = +8$ ;  $h = -7$ ;  
D = -·695, E = +·719; G = -·584, H = -·564, K = -·583.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.	
		°	°	m. s.	s.	m. s.	s.	m. s.	m.	
Sitka		3·1	7	i 0 43	- 8	e 1 11	-18	e 0 48	P	i 1·3
Seattle		11·0	123	i 2 45	+ 3	—	—	—	—	e 5·1
College		11·9	335	i 3 1	+ 7	—	—	—	—	e 6·4
Hungry Horse		15·0	105	e 3 28	- 7	e 6 5	-18	e 4 52	?	e 7·9
Shasta Dam		16·5	141	i 3 57	+ 3	—	—	—	—	—
Butte	N.	17·2	107	e 3 56	- 7	e 7 17	+ 3	—	—	e 8·4
Berkeley		19·0	145	e 4 27k	+ 1	e 8 13	+18	—	—	e 11·5
Santa Clara		19·7	145	e 4 38	+ 4	e 8 32	+22	—	—	—
Lick	Z.	19·8	145	e 4 37k	+ 2	—	—	—	—	—
Logan		20·4	118	e 4 38	- 3	e 8 39	+14	—	—	e 10·7
Fresno		21·0	140	e 4 47k	0	e 8 46	+ 9	—	—	—
Tinemaha	Z.	21·3	138	e 4 52	+ 2	—	—	—	—	—
Overton	Z.	23·3	132	e 5 12	+ 2	—	—	—	—	—
Boulder City		23·6	133	e 5 14	+ 1	—	—	—	—	—
Pierce Ferry		23·8	131	i 5 17	+ 2	—	—	—	—	—
Pasadena		23·9	141	i 5 18	+ 2	—	—	—	—	e 16·2
Crest Line	Z.	24·1	140	e 5 20	+ 2	—	—	—	—	—
Riverside	Z.	24·3	141	e 5 20	0	—	—	—	—	—
Tucson		28·5	130	e 5 59	0	—	—	—	—	—
Cleveland	E.	37·7	86	e 8 28	PP	e 13 29	+19	—	—	e 19·4
Ottawa		38·7	78	e 7 23	- 4	—	—	—	—	19·6
Weston		43·1	78	e 8 7	+ 3	—	—	—	—	e 21·7
Paris		71·3	28	i 11 23	0	—	—	—	—	e 39·1
Alicante		79·9	34	15 31	PP	27 19	SS	—	—	e 38·0
La Paz		91·1	117	13 45	+37	—	—	—	—	—
Ksara		91·8	8	21 44	?	25 24	PS	—	—	—

Additional readings :—

Seattle e = 3m.10s.

Berkeley eN = 9m.33s.

Lick eEN = 4m.42s.

Fresno eN = 6m.56s.

Pasadena iZ = 5m.30s.

Long waves were also recorded at Rathfarnham Castle, Scoresby Sund, and other American and European stations.

Aug. 8d. 5h. 29m. 14s. Epicentre 38°·4N. 58°·4E. (as on 1950, May 9d.).

A = +·4117, B = +·6692, C = +·6186;  $\delta = -1$ ;  $h = -1$ ;  
D = +·852, E = -·524; G = +·324, H = +·527, K = -·786.

		$\Delta$	Az.	P.	O-C.	S.	O-C.
		°	°	m. s.	s.	m. s.	s.
Ashkabad		0·4	185	0 12	- 1	—	—
Kizyl-Arvat		1·8	291	i 0 34	+ 2	—	—
Mary		2·8	106	i 0 50	+ 3	e 1 25	+ 3
Samarkand		6·8	77	e 1 43	- 1	e 3 1	- 2
Shemakla		7·9	290	e 1 59	0	—	—
Stalinabad		8·1	86	i 2 2	0	i 3 37	+ 2
Obi-garm		8·8	84	i 2 12	+ 1	—	—
Tashkent		8·9	67	e 2 14?	+ 2	—	—
Kulyab		9·0	90	e 2 23	+10	—	—
Fergana		10·6	75	e 2 33?	- 3	e 4 33?	- 4
Grozny		10·8	301	e 2 42	+ 3	—	—
Andijan		11·0	73	e 2 42	0	e 4 45?	- 2
Borzhomi		12·0	291	e 2 52	- 3	—	—
Murgab		12·2	85	e 2 56	- 2	—	—
Abastumanj		12·4	291	e 2 54	- 7	—	—
Frunse		13·1	65	e 3 6	- 4	5 30?	- 8
Zugdidi		13·2	293	e 3 17?	+ 6	—	—
Naryn		13·9	72	—	—	e 5 49	- 8
Almata		14·8	65	e 3 33	+ 1	e 6 18?	0
Przhevalsk		15·8	69	e 3 46	+ 1	—	—

Continued on next page.

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	$\Delta$	Az.	P.	O-C.	S.	O-C.
	°	°	m. s.	s.	m. s.	s.
Sverdlovsk	18.5	5	e 4 20	+ 1	e 7 42	- 2
Ksara	18.7	263	4 25	+ 3	8 5	SS
Yalta	19.1	297	4 26	- 1	—	—
Moscow	22.2	329	e 5 5	+ 5	e 9 9	+ 9
Istanbul	22.7	287	e 5 6	+ 2	—	—
Collmberg	z. 34.1	308	e 6 54	+ 6	—	—
Stuttgart	z. 36.5	304	e 7 9	0	—	—
Clermont-Ferrand	41.0	300	e 7 51	+ 5	—	—
Tamanrasset	z. 47.5	268	e 8 38	0	—	—

Additional readings :—  
 Stuttgart eZ = 7m.14s.  
 Tamanrasset iZ = 8m.46s.

Aug. 8d. 9h. 36m. 57s. Epicentre 38°·6N. 70°·5E. (as on 1941, April 26d.).

A = +·2615, B = +·7386, C = +·6213 ;  $\delta$  = -7 ; h = -1 ;  
 D = +·943, E = -·334 ; G = +·207, H = +·586, K = -·784.

	$\Delta$	Az.	P.	O-C.	S.	O-C.
	°	°	m. s.	s.	m. s.	s.
Obi-garm	0.6	279	e 0 11	- 4	e 0 21	- 5
Kulyab	0.9	219	i 0 16	- 4	i 0 28	- 6
Stalinabad	1.4	268	i 0 25	- 2	i 0 45	- 1
Fergana	2.0	29	i 0 37	+ 2	1 5	+ 3
Andijan	2.6	34	0 47	+ 3	1 23	S*
Murgab	2.7	95	e 0 49	+ 4	1 26	S <sub>g</sub>
Samarkand	2.9	291	i 0 54	P*	—	—
Tashkent	2.9	341	i 0 48	0	—	—
Naryn	5.1	54	i 1 37	P <sub>g</sub>	—	—
Frunse	5.3	35	e 1 21	- 1	—	—
Mary	6.9	264	—	—	2 55	-10
Przhevalsk	7.2	55	e 1 48	- 1	—	—
Ashkabad	9.6	270	e 2 24	+ 3	—	—
Kizyl-Arvat	11.1	276	e 2 41	- 2	—	—
Sverdlovsk	19.4	344	e 4 37	+ 7	e 8 6	+ 2
Tamanrasset	z. 57.0	275	e 9 47	- 3	—	—
College	72.6	17	e 11 26	- 5	—	—

Aug. 8d. Readings also at 0h. (Prague), 1h. (Lick), 2h. (Huancayo), 4h. (La Paz), 6h. (Overton, Hungry Horse, Seattle, and College), 7h. (Scoresby Sund (2), Lick, near Ashkabad), 9h. (College, Hungry Horse, and Rathfarnham Castle), 10h. (College and near Théodosia), 11h. (Lick), 13h. (Tortosa, Andijan (2), near Almata, Frunse, Naryn, Przhevalsk ; near Obigarm, Kulyab, and Stalinabad), 18h. (near La Paz), 19h. (Andijan, near Fergana, Obi-garm, and Stalinabad), 20h. (Victoria), 21h. (Hungry Horse, Victoria, College, and La Paz), 23h. (Hungry Horse, Tamanrasset, Fergana, near Andijan, Kulyab, Obi-garm, Samarkand, Stalinabad, and Tashkent).

Aug. 9d. 7h. 52m. 56s. Epicentre 47°·6N. 7°·6E. (as on 3d.).

Intensity IV at Basle and in its vicinity ; III at Rheinfelden and Laufenburg. Epicentre as given.

E. Wanner.

Jahresbericht des Erdbebendienstes der Schweiz im Jahre 1950, Zürich, 1951, p.2, with macroseismic chart, Fig. 3.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.
	°	°	m. s.	s.	m. s.	s.	m. s.
Basle	0.0	—	e 0 8	+ 1	i 0 11	0	—
Zürich	0.7	289	e 0 14	- 3	i 0 22	- 6	—
Neuchatel	0.8	216	i 0 19	+ 1	i 0 30	- 1	—
Strasbourg	1.0	6	—	—	e 0 37	+ 1	i 0 42
Besançon	1.2	252	e 0 30	+ 6	e 0 40	- 1	i 0 42
Ravensburg	z. 1.4	82	e 0 27?	0	e 0 44	- 2	—
Chur	1.5	120	e 0 32	+ 4	e 0 48	- 1	—
Stuttgart	z. 1.6	42	e 0 32	+ 2	e 0 52	+ 1	—
Collmberg	z. 5.1	42	—	—	e 2 44	SS <sub>g</sub>	—

Stuttgart gives also eP<sub>g</sub>?Z = 38s., eS<sub>g</sub>? = 54s., eZ = 57s.

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Aug. 9d. Readings also at 1h. (Collmberg, Stuttgart, Tamanrasset, Hungry Horse (2), and College (2)), 2h. (Tamanrasset, Rome, Ksara, Sofia, Timisoara, near Istanbul (2), Bucharest, and near Obi-garm), 3h. (Messina and Nanking), 6h. (near Yalta), 7h. (Hungry Horse, College, and Pierce Ferry), 8h. (near Yalta), 11h. (Scoresby Sund, Fergana, Obi-garm, near Andijan, and Murgab), 13h. (near Obi-garm), 14h. (Brisbane, Overton, Pierce Ferry, College, and Tamanrasset), 15h. (near Sotchi), 17h. (College (2), Hungry Horse, and near Vladivostok), 18h. (Brisbane, Mount Wilson, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Lick, Shasta Dam, Hungry Horse, and College), 19h. (Lick), 22h. (Tamanrasset), 23h. (Hungry Horse).

Aug. 10d. 19h. 19m. 31s. Epicentre 7°·2S, 155°·3E. (as on 1948, October 21d.).

A = -·9014, B = +·4146, C = -·1245;  $\delta$  = -8;  $h$  = +7;  
D = +·418, E = +·909; G = +·113, H = -·052, K = -·992.

	$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.	
	°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.	
Brisbane	20·3	185	i 4	41k	+ 1	i 8	32	+ 9	i 4	53	pP	—
Riverview	26·8	187	e 6	5	+21	i 10	36	+17	i 6	49	PP	e 13·0
Cobb River	E. 37·2	158	e 7	14	- 1	—	—	—	—	—	—	—
Kaimata	N.E. 38·0	160	e 6	29?	-52	—	—	—	—	—	—	—
Wellington	38·1	155	—	—	—	e 16	4	Q	—	—	—	e 18·7
Christchurch	39·2	159	i 7	31	0	e 13	33	+ 1	e 16	54	SS	e 19·6
Nanking	52·3	320	e 9	15	0	—	—	—	e 10	38	PP	—
Vladivostok	54·4	339	i 9	30	- 1	e 16	59	-10	—	—	—	—
College	83·2	20	e 12	23	- 6	—	—	—	i 12	39	pP	—
Naryn	86·8	312	i 12	47	0	e 23	23	- 2	e 13	0	pP	—
Murgab	87·7	309	e 12	51	- 1	—	—	—	—	—	—	—
Frunse	88·1	313	e 12	53	- 1	23	35	- 2	e 13	8	pP	—
Lick	z. 88·8	52	e 12	50k	- 7	—	—	—	—	—	—	—
Shasta Dam	88·8	49	e 12	54	- 3	—	—	—	e 16	36	PP	—
Andijan	89·3	311	e 13	0	+ 1	e 23	48	0	—	—	—	—
Fergana	89·7	311	i 13	1	0	—	—	—	—	—	—	—
Seattle	90·2	42	—	—	—	e 24	9	+13	e 25	39	PPS	e 42·5
Kulyab	90·9	308	e 13	6	- 1	—	—	—	—	—	—	—
Pasadena	91·1	56	i 13	4	- 4	—	—	—	i 13	17	pP	e 41·6
Tinemaha	z. 91·4	53	e 13	1	- 8	—	—	—	e 13	16	pP	—
Stalinabad	91·6	309	13	11?	+ 1	24	6?	- 3	e 13	24?	pP	—
Tashkent	91·7	311	e 13	10	0	—	—	—	e 13	24	pP	—
Riverside	z. 91·8	56	i 13	7	- 4	—	—	—	i 13	21	pP	—
Samarkand	93·2	309	e 13	17	0	—	—	—	—	—	—	—
Boulder City	94·1	54	e 13	5	-17	—	—	—	e 13	33	pP	—
Overton	z. 94·4	53	i 13	20	- 3	e 17	13	PP	i 13	35	pP	—
Pierce Ferry	94·8	54	e 13	37	+12	—	—	—	—	—	—	—
Hungry Horse	95·8	42	e 13	24	- 5	—	—	—	e 30	19	PKKP	—
Tucson	97·1	58	e 17	39	PP	—	—	—	—	—	—	—
Sverdlovsk	98·5	326	e 13	39	- 3	—	—	—	—	—	—	—
Moscow	111·3	327	e 19	15	PP	—	—	—	—	—	—	—
Grahamstown	116·9	227	e 18	48	[+ 1]	—	—	—	—	—	—	—
Ksara	118·3	304	e 19	40	PP	31	48	SKKP	—	—	—	—
Pretoria	z. 119·1	236	i 18	52	[+ 1]	—	—	—	—	—	—	—
Istanbul	121·7	314	e 19	29?	?	—	—	—	—	—	—	—
Philadelphia	124·4	45	—	—	—	—	—	—	(e 35	9)	i	e 35·2
Prague	125·7	331	e 19	0	[- 4]	—	—	—	e 21	47	PP	—
Collmberg	z. 126·1	333	e 19	4	[ 0]	—	—	—	—	—	—	—
Jena	127·0	332	e 19	5	[- 1]	—	—	—	—	—	—	—
Triest	129·3	327	i 22	46	PKS	—	—	—	—	—	—	—
Stuttgart	z. 129·7	332	e 19	10	[- 1]	—	—	—	e 21	56	PP	—
Strasbourg	130·1	333	i 19	28k	[+16]	e 22	58	PKS	—	—	—	—
Padova	131·1	326	e 20	13	[+59]	e 22	39	PKS	—	—	—	—
Bologna	131·4	326	e 23	0	PKS	—	—	—	—	—	—	—
Rome	132·3	322	e 19	28	[+12]	e 31	23	PS	e 22	37	SKP	—
Besançon	132·3	322	e 19	16	[ 0]	—	—	—	e 22	38	SKP	—
Paris	132·6	336	i 19	18	[+ 1]	—	—	—	—	—	—	e 68·5
Algiers Univ.	z. 141·2	329	e 19	25	[- 8]	—	—	—	—	—	—	—
Alicante	142·0	328	e 19	35	[+ 1]	26	57	[+15]	22	59	PP	e 67·2
Granada	144·5	331	19	8k	[-30]	e 29	35	[-12]	i 23	11	PP	i 84·8

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.	
Malaga	z. 145.3	331	i 19 39k	[- 1]	i 19 53	PKP <sub>2</sub>	i 23 13	PP	—
Tamanrasset	z. 147.1	302	e 19 42	[- 1]	i 20 0	PKP <sub>2</sub>	e 23 23	PP	—

Additional readings :—

Brisbane iZ = 5m.15s., isSN = 9m.1s.  
 Riverview iEN = 10m.46s., iSSN = 11m.51s.  
 Cobb River eE = 7m.28s.  
 Christchurch i = 7m.45s., eSNZ = 13m.49s., QEN = 16m.49s.  
 Prague e = 19m.22s. and 20m.8s.  
 Collmberg eZ = 19m.19s.  
 Jena eN = 19m.20s.  
 Stuttgart eZ = 19m.25s. and 19m.40s.  
 Strasbourg e = 20m.2s.  
 Besançon i = 19m.31s.  
 Paris i = 19m.34s.  
 Algiers Univ. eZ = 19m.49s.  
 Alicante SSS = 46m 35s, Q = 59m.29s.  
 Tamanrasset iZ = 19m.52s. and 21m.35s.  
 Long waves were also recorded at Harvard, Weston, Seven Falls, De Bilt, and Kew.

Aug. 10d. Readings also at 0h. (Granada, Overton, and Pierce Ferry), 4h. (Frunse, Mary, near Andijan, Fergana, Kulyab, Obi-garm, Samarkand, Stalinabad, Tashkent, near Ashkabad, and near Kizyl-Arvat), 5h. (Tamanrasset, near Andijan, and near Messina), 6h. (near Seven Falls), 8h. (Seattle), 9h. (College (2), near Yalta, near Obi-garm, near Boulder City, Overton, and Pierce Ferry), 11h. (Hungry Horse and near College), 12h. (Tamanrasset, near Obi-garm, and near Logan), 13h. (Seven Falls, near Alicante, near Overton, and near Yalta (2)), 14h. (Collmberg, Stuttgart, near Prague, and near Alicante), 15h. (College (2), near Obi-garm), 17h. (Collmberg and Brisbane), 18h. (Riverview, Mount Wilson, Riverside, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Shasta Dam, College, Collmberg, Prague, Jena, Paris, Strasbourg, Besançon, Stuttgart, Tamanrasset, Frunse, Tashkent, near Andijan, Fergana, Kulyab, Samarkand, Stalinabad, and near La Paz), 19h. (Pierce Ferry), 20h. (Tamanrasset), 21h. (La Paz, near Bogota, and Chinchina).

Aug. 11d. 3h. 1m. 26s. Epicentre 50°-8N. 154°-2E. Depth of focus 0.015.  
 (as on 1948 April 29d.).

Identification very doubtful.

A = -0.5713, B = +0.2762, C = +0.7728;  $\delta = -11$ ;  $h = -6$ ;  
 D = +0.435, E = +0.900; G = -0.696, H = +0.336, K = -0.635.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.
	$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.
Vladivostok	17.0	252	e 3 35	-16	e 6 17	-37	—
College	32.6	42	i 6 27	+ 6	—	—	i 6 58 pP
Sverdlovsk	51.4	315	e 8 54	0	—	—	—
Seattle	51.8	59	e 8 34?	-23	—	—	—
Hungry Horse	55.8	53	e 9 28	+ 2	—	—	—
Shasta Dam	56.1	65	i 9 29	+ 1	—	—	e 10 3 pP
Tinemaha	z. 60.9	66	i 10 2	+ 1	—	—	e 10 36 pP
Pasadena	z. 63.0	68	i 10 14	- 2	—	—	—
Overton	z. 63.5	64	i 10 20	+ 1	—	—	—
Riverside	z. 63.6	68	e 10 18	- 1	—	—	—
Boulder City	63.7	64	i 10 20	0	—	—	—
Pierce Ferry	64.1	64	i 10 23	0	—	—	—
Tucson	68.7	65	e 10 51	- 1	—	—	—
Collmberg	z. 73.8	337	e 11 17	- 5	—	—	—
Prague	73.8	334	e 12 2	pP	—	—	—
Stuttgart	z. 76.4	337	e 11 37	0	—	—	—
Strasbourg	76.9	338	e 11 40	0	—	—	e 12 13 pP
Paris	77.8	341	i 11 47	+ 3	—	—	—
Zürich	77.8	337	e 11 45 <sub>a</sub>	+ 1	—	—	—
Basle	77.9	337	e 11 44	- 1	—	—	—
Besançon	78.6	339	i 11 49	0	—	—	—
Tamanrasset	z. 101.7	331	e 13 39	0	—	—	—

Additional readings :—

Tinemaha iZ = 10m.50s.  
 Boulder City i = 10m.27s. and 11m.7s.  
 Paris i = 12m.54

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Aug. 11d. Readings also at 0h. (Samarkand, near Andijan, Kulyab (2), and Stalinabad), 1h. (near Istanbul), 2h. (Strasbourg), 3h. (near Huancayo), 4h. (near Andijan), 5h. (Tucson, Hungry Horse, and College), 6h. (Samarkand, near Andijan, Kulyab, Obi-garm, and Stalinabad), 8h. (near Athens), 9h. (College and Tucson), 10h. (Brisbane, Mount Wilson, Riverside, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Shasta Dam, Besançon, Strasbourg, and Stuttgart), 11h. (Brisbane, Christchurch, Wellington, and Tamanrasset), 12h. (Tacubaya, Harvard, Weston, and Prague), 13h. (Stalinabad (2) and near Obi-garm (2)), 14h. (College, Stalinabad, near Obi-garm, and near Mizusawa), 16h. (Granada), 17h. (near Obi-garm), 18h. (Lick, Shasta Dam, and College), 20h. (Apia, Brisbane, Christchurch, Wellington, Mount Wilson, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Lick, Shasta Dam, Hungry Horse, College, Ksara, Collmberg, Jena, Prague, and Tamanrasset), 21h. (Harvard, Weston, Philadelphia, Seven Falls, Alicante, Malaga, De Bilt, and Granada), 23h. (Ashkabad, Hungry Horse, and College).

Aug. 12d. 3h. 59m. 6s. Epicentre  $32^{\circ}6'N$ .  $75^{\circ}9'E$ . (as on 1947, July 10d.).

Felt at Gulmarg and Srinagar.

Seismo. Bull. Government of India, Aug., 1950, p.6. Epicentre  $33^{\circ}5'N$ .  $76^{\circ}E$ .

A = +.2056, B = +.8187, C = +.5362;  $\delta = +5$ ;  $h = +1$ ;  
D = +.970, E = -.244; G = +.131, H = +.520, K = -.844.

	$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.	
	$^{\circ}$	$^{\circ}$	m.	s.	s.	m.	s.	s.	m.	s.	m.	
New Delhi	4.1	164	e 1	17	$P_{\Sigma}$	i 2	3	S*	1	24	PP	1.8
Murgab	6.0	345	i 1	34	+ 2	e 2	39	- 4	—	—	—	—
Kulyab	7.3	318	e 1	52	+ 2	e 3	13	- 2	—	—	—	—
Obi-garm	7.9	322	e 1	59	0	i 3	25	- 5	—	—	—	—
Stalinabad	8.3	318	i 2	6	+ 2	i 3	38	- 2	—	—	—	—
Fergana	8.4	338	e 2	5	- 1	3	39	- 4	—	—	—	—
Andijan	8.6	342	2	8	- 1	e 3	42	- 6	—	—	—	—
Naryn	8.8	1	i 2	10	- 1	i 3	49	- 4	—	—	—	—
Przhevalsk	10.1	11	2	28	- 1	—	—	—	—	—	—	—
Samarkand	10.1	317	e 2	29	0	e 4	23	- 2	—	—	—	—
Tashkent	10.2	331	e 2	27	- 4	e 4	19?	- 8	—	—	—	—
Frunse	10.3	355	i 2	31	- 1	e 4	27	- 3	—	—	—	—
Almata	10.7	4	e 2	36	- 2	—	—	—	—	—	—	—
Mary	12.5	297	—	—	—	e 5	15	- 8	—	—	—	—
Bombay	E. 13.9	192	—	—	—	e 5	52	- 5	—	—	—	e 6.9
Poona	E. 14.1	188	e 3	43	+20	6	20	+18	6	34	SS	6.1
Ashkabad	15.3	295	e 3	42	+ 3	—	—	—	—	—	—	—
Kizyl-Arvat	17.2	297	e 4	3	0	i 7	21	+ 7	—	—	—	—
Colombo	E. 25.8	172	—	—	—	e 9	52	-10	—	—	—	—
Ksara	33.4	283	e 9	37	$P_{cP}$	—	—	—	—	—	—	e 16.3
Collmberg	Z. 48.8	313	e 8	49	0	—	—	—	—	—	—	—
Stuttgart	Z. 51.5	310	e 9	10	+ 1	—	—	—	—	—	—	—
Tamanrasset	Z. 62.1	281	i 10	26	+ 1	—	—	—	e 11	1	$P_{cP}$	—
College	77.0	18	i 11	56	0	—	—	—	e 14	35	PP	—
Hungry Horse	98.9	7	e 17	8	PP	—	—	—	—	—	—	—

Additional readings :—

New Delhi PPPEN = 1m.31s., SSEN = 2m.14s.

Poona SSSE = 6m.48s.

Collmberg eZ = 8m.59s.

Tamanrasset eZ = 12m.18s.

Long waves were also recorded at Hyderabad,



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Aug. 12d. 10h. 44m. 10s. Epicentre 33°·5S. 179°·0W. (as on 1950, July 8d.).

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

		$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.
		°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.
Auckland	N.	6·1	235	e 1	36	+ 2	i 3	15	S <sub>g</sub>	—	—	—
Tuai	N.	6·2	209	1	33	- 2	e 2	36	-12	—	—	—
Arapuni		6·3	222	1	39	+ 3	e 2	51	+ 1	—	—	—
New Plymouth	E.	7·9	223	e 2	10	+11	e 3	35	+ 5	—	—	—
Wellington		9·2	211	e 2	13	- 3	e 3	44	-19	—	—	—
Cobb River	E.	10·0	218	e 3	17	P <sub>g</sub>	e 4	8	-14	—	—	—
Kaimata	N.E.	11·8	217	e 2	57	+ 4	e 4	45	-21	—	—	—
Christchurch		12·0	211	e 2	54	- 1	e 4	50	-21	—	—	—
Brisbane	Z.	24·8	277	i 5	24 <sub>k</sub>	- 1	—	—	—	—	—	—
Riverview		24·8	261	5	47	+22	i 10	19	+33	—	—	e 12·1
Pasadena	Z.	88·2	46	i 12	56	+ 2	—	—	—	—	—	—
Lick	Z.	88·4	42	i 12	58	+ 3	—	—	—	e 13	21	P <sub>c</sub> P
Riverside	Z.	88·6	46	i 12	57	+ 1	—	—	—	—	—	—
Fresno	Z.	89·1	43	i 13	1 <sub>k</sub>	+ 3	—	—	—	—	—	—
Haiwee	Z.	89·7	45	i 13	3	+ 2	—	—	—	—	—	—
Tinemaha	Z.	90·2	44	e 13	5	+ 1	—	—	—	—	—	—
Shasta Dam		90·4	39	e 13	7	+ 3	—	—	—	—	—	—
Reno		91·0	41	e 13	1	- 6	—	—	—	—	—	—
Boulder City		91·5	46	e 13	13	+ 3	—	—	—	—	—	—
Tucson		91·6	51	e 13	13	+ 3	—	—	—	—	—	—
Overton	Z.	92·1	46	i 13	15	+ 3	—	—	—	—	—	—
Pierce Ferry		92·1	47	i 13	16	+ 4	—	—	—	—	—	—
College		101·0	12	e 17	27	PP	—	—	—	—	—	—
Ksara		151·0	281	e 19	55 <sub>?</sub>	[+ 6]	e 36	3	PPS	—	—	—
Tamanrasset	Z.	168·6	200	i 20	11 <sub>a</sub>	[+ 3]	e 24	42	PKS	e 21	21	PKP <sub>2</sub>

Additional readings :—

Reno eN = 13m.26s.

Tamanrasset iZ = 20m.23s., ePPZ = 25m.6s.

Long waves were also recorded at Prague.

Aug. 12d. Readings also at 0h. (near Andijan), 1h. (Frunse, near Andijan, and Naryn), 2h. (near Boulder City, Overton, and Pierce Ferry), 4h. (Poona), 6h. (Mount Wilson, Riverside, Tinemaha, Tucson, Overton, Shasta Dam, Hungry Horse, Stuttgart, and near La Paz), 8h. and 10h. (near Obi-garm), 12h. (Calcutta, New Delhi, Jena, Besançon, Strasbourg, Stuttgart, Tamanrasset, and College), 15h. (Brisbane and College), 16h. (Brisbane, Christchurch, Wellington, Mount Wilson, Tinemaha, Boulder City, Overton, Pierce Ferry, Shasta Dam, College, and Stuttgart), 17h. (Granada), 18h. (Pierce Ferry, Victoria, and near Obi-garm), 19h. (Brisbane, Haiwee, Mount Wilson, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Shasta Dam, College, Besançon, Paris, Strasbourg, Stuttgart, and Tamanrasset), 21h. (Pretoria), 22h. (Tamanrasset), 23h. (Istanbul).

Aug. 13d. 5h. 59m. 7s. Epicentre 33°·5N. 80°·0E.

Given by stations of U.S.S.R.

A = +·1451, B = +·8229, C = +·5493;  $\delta=-5$ ;  $h=+1$ ;  
D = +·985, E = -·174; G = +·095, H = +·541, K = -·836.

		$\Delta$	Az.	P.		O-C.	S.		O-C.
		°	°	m.	s.	s.	m.	s.	s.
Murgab		6·9	317	e 1	50	+ 5	i 3	12	+ 7
Naryn		8·5	339	i 2	3	- 4	i 3	41	- 4
Przhevalsk		9·1	353	2	8	- 6	—	—	—
Kulyab		9·4	301	e 2	21	+ 3	e 4	10	+ 3
Andijan		9·5	322	e 2	21	+ 1	—	—	—
Fergana		9·5	319	e 2	21	+ 1	—	—	—
Obi-garm		9·8	305	e 2	24	0	i 4	18	+ 1
Frunse		10·3	337	e 2	29	- 3	—	—	—
Stalinabad		10·4	302	e 2	36	+ 2	e 4	35	+ 3
Stuttgart	Z.	53·6	309	e 9	23	- 2	—	—	—
College		75·1	20	e 11	37	- 9	—	—	—
Hungry Horse		97·6	10	i 17	6	PP	—	—	—

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Aug. 13d. 16h. 43m. 20s. Epicentre 19°·4N. 70°·4W. (as on 1949, February 18d.).

A = +·3166, B = -·8892, C = +·3302;  $\delta = -6$ ;  $h = +5$ ;  
D = -·942, E = -·335; G = +·111, H = -·311, K = -·944.

	$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.	
	°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.	
Port au Prince	2·0	245	i 0	49	+14	i 1	14	+ 2	i 1	6	S <sub>g</sub>	i 1·7
San Juan	4·2	103	i 1	3	- 4	i 1	41	-16	i 1	21	P <sub>g</sub>	i 1·8
Guantanamo Bay	4·4	277	i 1	12	+ 2	—	—	—	—	—	—	—
Galerazamba	9·8	209	e 3	2	+38	e 5	15	S <sub>g</sub>	e 10	40	?	e 5·7
Miami	11·2	307	e 3	5	PP	i 5	23	SS	—	—	—	—
Swan Island	13·0	263	i 3	11	+ 2	—	—	—	—	—	—	—
Bermuda	13·9	21	e 3	12	- 9	e 5	40	-17	—	—	—	i 6·4
Bogota	15·1	194	i 3	41	+ 5	e 6	32	+ 7	i 3	48	PP	—
Chinchina	15·2	200	i 3	40	+ 2	e 6	36	+ 8	e 7	4	SS	—
Merida	18·1	278	e 4	11	- 3	e 7	26	- 9	—	—	—	—
Washington	20·3	347	e 4	36	- 4	i 8	8	-15	—	—	—	e 15·9
Philadelphia	20·9	351	e 4	42	- 4	e 8	38	+ 3	—	—	—	e 9·8
City College, N.Y.	21·6	353	e 4	51	- 3	e 8	47	- 2	—	—	—	—
Pennsylvania	22·3	345	i 5	2	+ 1	i 9	10	+ 8	i 5	37	PPP	—
Pittsburgh	22·5	342	—	—	—	i 8	59	- 6	—	—	—	—
Weston	22·9	359	i 5	5	- 1	i 9	4	- 9	—	—	—	—
Cincinnati	23·1	333	i 5	13	+ 5	i 9	27	+11	i 5	35	PP	—
Harvard	23·1	359	i 5	4	- 4	i 9	4	-12	e 5	15	P	e 11·4
Cleveland	24·0	339	i 5	17	0	i 9	40	+ 8	e 5	41	PP	—
St. Louis	25·8	322	e 5	33	- 1	e 10	3	+ 1	i 6	20	PPP	e 12·6
Florissant	25·9	322	e 5	29	- 6	i 10	9	+ 5	i 10	19	?	i 12·7
Ottawa	26·3	352	5	38	- 1	10	6	- 5	—	—	—	14·0
Chicago	26·7	331	e 5	47	+ 4	e 10	1	-16	(e 10	10)	S	e 10·2
Shawinigan Falls N.	27·2	358	e 5	44	- 3	—	—	—	—	—	—	—
Seven Falls E.	27·7	0	6	39	PP	e 11	8	+35	—	—	—	—
Huancayo	31·6	189	i 6	27	+ 1	i 11	45	+10	e 13	18	SS	e 14·8
La Paz	35·8	175	7	5	+ 2	i 12	44	+ 3	8	26	PP	17·7
Tucson	38·4	298	e 7	27	+ 2	—	—	—	i 7	56	pP	e 16·4
Logan	41·5	312	e 7	50	0	(e 17	6)	SS	e 9	54	P <sub>c</sub> P	e 17·1
Pierce Ferry	41·6	303	i 7	54	+ 3	—	—	—	—	—	—	—
Overton	z. 42·1	304	i 7	57	+ 2	—	—	—	—	—	—	—
Boulder City	42·3	303	e 7	58	+ 1	—	—	—	e 9	55	P <sub>c</sub> P	—
Bozeman	42·5	318	—	—	—	e 14	22	0	—	—	—	e 21·5
Saskatoon	43·2	328	—	—	—	e 17	23	S <sub>c</sub> S	—	—	—	22·2
Pasadena	z. 44·7	300	i 8	18	+ 2	—	—	—	—	—	—	—
Haiwee	z. 44·8	302	i 8	22	+ 5	—	—	—	—	—	—	—
Tinemaha	z. 45·2	303	i 8	22	+ 2	—	—	—	—	—	—	—
Hungry Horse	45·4	320	i 8	21	- 1	e 15	4	0	i 8	26	P	—
Fresno	z. 46·3	303	e 8	29 <sub>a</sub>	0	—	—	—	—	—	—	—
Reno	46·8	308	e 7	53	-40	—	—	—	e 8	19	pP	—
Lick	z. 47·9	304	i 8	43 <sub>k</sub>	+ 1	—	—	—	i 8	59	pP	—
Santa Clara	E. 48·1	304	e 5	11	?	e 15	25	-17	—	—	—	e 29·0
Shasta Dam	49·0	308	e 8	49	- 1	—	—	—	—	—	—	—
Seattle	50·4	317	e 10	27	P <sub>c</sub> P	e 15	53	-21	e 20	38	Q	e 24·7
Scoresby Sund	58·6	17	—	—	—	18	10	+ 6	—	—	—	28·7
Malaga	z. 59·7	58	i 10	6 <sub>a</sub>	- 3	e 18	12	- 7	i 12	18	PP	27·9
Toledo	59·9	54	e 10	7	- 3	—	—	—	13	30	PPP	—
Granada	60·3	58	i 10	10 <sub>k</sub>	- 3	i 18	11	-15	—	—	—	i 29·2
Sitka	60·5	326	—	—	—	e 18	27	- 2	e 20	4	S <sub>c</sub> S	e 32·2
Alicante	62·7	56	10	8	-21	i 17	52	-65	24	40	Q	e 28·2
Paris	64·5	45	i 10	45	+ 4	e 19	14	- 5	e 10	26	?	e 28·7
Clermont-Ferrand	64·9	48	e 10	44	+ 1	e 19	23	- 1	e 19	38	PS	29·7
De Bilt	66·1	40	e 10	40	-11	e 19	34	- 5	—	—	—	e 31·7
Besançon	66·9	46	e 10	51	- 5	—	—	—	e 11	32	P <sub>c</sub> P	—
College	67·3	334	e 10	55	- 4	e 14	24	sP	e 13	29	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.
Strasbourg		67.9	44	e 10 58	- 4	e 19 57	- 4	e 24 20 SS	30.7
Stuttgart		68.9	44	e 11 3	- 6	e 20 6	- 7	e 20 58 PPS	32.7
Jena	E.	70.2	42	e 11 15	- 2	—	—	e 11 1?	—
Tamanrasset	Z.	70.2	72	i 11 14	- 3	(24 40?)	SS	e 13 47 PP	24.7
Cheb		70.8	42	e 18 23	?	e 20 33	- 2	e 21 23 PPS	—
Collmberg	Z.	71.0	41	e 11 17	- 5	—	—	e 11 21 P	—
Prague		72.1	42	e 11 28	0	e 20 46?	- 4	e 21 25 PS	—
Rome		72.1	52	e 11 25	- 3	e 20 42	- 8	21 21 PS	38.4
Triest		72.4	47	e 19 46	?	e 20 27	-26	—	—
Warsaw		75.8	40	e 19 26	?	e 21 35	+ 4	—	e 39.7
Ksara		92.1	54	e 13 19?	+ 7	25 33	PS	—	—

Additional readings :—

Bogota eP<sub>c</sub>P?EN = 7m.57s.  
 Chinchina eP<sub>c</sub>P?EN = 9m.6s.  
 Pennsylvania iN = 6m.13s.  
 Cleveland iPZ = 5m.21s., iE = 5m.24s., 9m.46s., and 10m.14s.  
 St. Louis iPP = 5m.55s., i = 6m.44s., 7m.20s., and 10m.15s.  
 Huancayo e = 6m.52s.  
 La Paz iSS = 15m.10s.  
 Tucson ePP = 8m.58s., eS = 9m.21s., e = 9m.54s.  
 Malaga ePPPZ = 13m.40s.  
 Alicante P<sub>c</sub>P = 10m.40s.  
 Paris eS<sub>c</sub>S? = 20m.20s.  
 Clermont-Ferrand eS<sub>c</sub>S = 20m.35s., eSS = 23m.30s.  
 Besançon i = 10m.55s.  
 Strasbourg i = 11m.3s., e = 11m.13s. and 29m.40s.  
 Stuttgart eP = 11m.7s., eQ = 29.7m.  
 Jena eE = 11m.52s. and 12m.7s.  
 Tamanrasset iP<sub>c</sub>PZ = 12m.30s., ePPPZ = 15m.34s., ePKP,PKPZ = 39m.22s.  
 Prague eN = 11m.47s., e = 12m.15s., 12m.24s., and 13m.33s., ePP = 14m.34s., e = 15m.46s.,  
 eN = 18m.58s., e = 22m.58s. and 26m.58s., eSSS = 29m.4s.  
 Rome eSS?N = 25m.7s.  
 Long waves were also recorded at Fort de France, Victoria, Aberdeen, Kew, and Tortosa.

Aug. 13d. 18h. 39m. 10s. Epicentre 52°·1N. 177°·5W. (as on 1950, April 5d.).

A = -·6162, B = -·0269, C = +·7871;  $\delta$  = -5;  $h$  = -6;  
 D = -·044, E = +·999; G = -·786, H = -·034, K = -·617.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.
		$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.
College		19.9	37	e 4 38	+ 2	e 8 26	+11	e 12 43 S <sub>c</sub> P
Victoria		34.1	74	e 6 48	0	—	—	e 6 59 pP
Seattle		35.1	74	e 7 2	+ 5	—	—	e 7 32 pP
Shasta Dam		38.8	84	i 7 28	0	—	—	—
Mineral	Z.	39.5	84	e 8 34	+60	—	—	—
Hungry Horse		39.6	69	i 7 35	0	e 17 49	SSS	i 9 42 P <sub>c</sub> P
Reno	Z.	41.1	84	e 7 46k	- 1	—	—	e 7 58 pP
Tinemaha	Z.	43.6	86	i 8 8	0	—	—	i 9 55 P <sub>c</sub> P
Haiwee	Z.	44.3	86	i 8 12	- 1	—	—	—
Pasadena	Z.	45.5	88	e 8 21	- 2	—	—	i 8 33 pP
Overton	Z.	46.2	83	i 8 29	+ 1	—	—	—
Boulder City		46.4	84	i 8 29	- 1	—	—	i 8 42 pP
Pierce Ferry		46.8	83	i 8 33	0	—	—	—
Tucson		51.3	85	i 9 7	- 1	—	—	—
Harvard		66.1	51	e 10 53	+ 2	—	—	e 11 15 pP
Weston		66.3	51	e 10 50	- 2	—	—	—
Pretoria	Z.	147.3	313	i 19 49	[+ 6]	—	—	—
Pietermaritzburg	Z.	149.5	307	i 19 55	[+ 8]	—	—	—

Additional readings :—

Seattle e = 7m.57s.  
 Hungry Horse iSP = 9m.54s.  
 Harvard eSP = 11m.27s.  
 Long waves were recorded at Collmberg.

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Aug. 13d. Readings also at 0h. (Stalinabad, near Andijan, Murgab, and Naryn), 1h. (Prague and near Chinchina), 2h. (near Bogota), 5h. (La Paz and near Mizusawa), 6h. (near Ashkabad, Borzhomi, Grozny, Leninakan, and Tiflis), 7h. (Seattle), 8h. (near Obi-garm), 9h. (Brisbane, College, and Hungry Horse), 11h. (Collmberg), 12h. (Seattle, Prague, and near Malaga), 13h. (College (3), Hungry Horse, Tortosa, Triest, Collmberg, and near Stuttgart), 14h. (College, Christchurch, and Wellington), 19h. (Tucson, Overton, and Pierce Ferry).

Aug. 14d. 0h. 35m. 30s. Epicentre 48°·0N. 7°·1E.

Local shock in the neighbourhood of Munster (Haut-Rhin). Intensity IV at Eschbach; III at Griesbach, Munster, etc. Epicentre 48°03'N. 7°08'E.

J. P. Rothé and N. Dechevoy.

La Séismicité de la France de 1940 à 1950, Annales de l'Institut de Physique du Globe de Strasbourg, 3 ème partie, Géophysique, Nouvelle Série, Tome VII, Le Puy, 1954, p. 60.

A = +·6664, B = +·0830, C = +·7409;  $\delta = -9$ ;  $h = -5$ ;  
D = +·124, E = -·992; G = +·735, H = +·092, K = -·672.

	$\Delta$	Az.	P.	O-C.	S.	O-C.
	°	°	m. s.	s.	m. s.	s.
Basle	0·6	148	e 0 15	0	e 0 24	- 2
Strasbourg	0·7	37	e 0 15	- 2	i 0 24	- 4
Neuchatel	1·0	187	e 0 23	+ 2	i 0 38	+ 2
Zürich	1·2	122	e 0 27	+ 3	e 0 40	- 1
Stuttgart	z.	1·6	e 0 30?	0	e 0 53	+ 2
Collmberg	z.	5·1	47	—	e 2 42	S*

Stuttgart gives also  $eS_gZ = 48m.$  and  $50s.$ ,  $eZ = 52s.$   
Long waves were recorded at Besançon.

Aug. 14d. 6h. 31m. 35s. Epicentre 17°·4S. 71°·0W. (as on 1948, Dec. 8d.).

Intensity III-IV at Calana (Tacna). Epicentre near 18°S. 71°W. (Strasbourg).

E. Silgado.

Datos Sismológicos del Perú, 1949-1950, Bol. No. 4, Lima, Peru, 1942, p. 23.

A = +·3109, B = -·9028, C = -·2972;  $\delta = +3$ ;  $h = +5$ ;  
D = -·946, E = -·326; G = -·097, H = +·281, K = -·955.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.	
	°	°	m. s.	s.	m. s.	s.	m. s.	m.	
La Paz	2·9	72	i 0 53k	+ 5	i 1 30	+ 6	i 1 2	P <sub>g</sub>	1·8
Harvard	59·6	0	e 10 30	+22	—	—	—	—	—
Pierce Ferry	67·0	323	i 10 56	- 1	—	—	—	—	—
Boulder City	67·4	322	e 10 59	0	—	—	—	—	—
Overton	z.	67·5	i 11 1	+ 1	—	—	i 11 22	P <sub>c</sub> P	—
Riverside	z.	67·5	e 11 10	+10	—	—	—	—	—
Pasadena	z.	68·1	i 11 4	0	—	—	—	—	—
Tinemaha	z.	70·1	e 11 16	0	—	—	—	—	—
Shasta Dam	74·9	322	e 11 41	- 3	—	—	—	—	—
Hungry Horse	75·9	332	e 11 48	- 2	—	—	—	—	—
Tamanrasset	z.	84·8	e 12 19	-18	—	—	—	—	—

La Paz gives also  $iS_g = 1m.43s.$

Aug. 14d. 22h. 51m. 24s. Epicentre 28°·0S. 63°·5W. Depth of focus 0·090.  
(as on 1949, June 12d.).

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. s.	s.	m. s.	s.	m. s.	m.	
Antofagasta	7·6	303	i 1 59	+ 3	i 3 55	+26	i 13 35	ScS	—
Buenos Aires	7·8	148	i 2 1	+ 3	i 3 15	-17	i 2 10	?	i 3·6
La Plata	8·4	147	i 2 4	0	i 3 44?	+ 2	—	—	4·4
La Paz	12·2	338	i 2 42k	+ 1	i 4 49	- 1	i 2 52	?	6·0
Huancayo	19·4	324	i 3 51	+ 2	i 6 54	0	e 6 18	?	—

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.	
Bogota	34.0	342	i 5	54	- 2	i 10	39	- 3	i 7	34	pP	—
Chinchina	34.7	340	i 6	1	- 1	i 10	48	- 4	i 7	41	pP	—
Balboa Heights	39.9	336	i 7	2	+17	e 12	25	+16	e 15	59	sS	—
Fort de France	42.5	5	i 9	54	?	e 17	22	SSS	—	—	—	—
San Juan	46.2	358	i 7	28	- 6	i 13	21	-16	e 9	20	pP	e 18.8
Port au Prince	47.1	349	i 7	43	+ 2	i 13	46	- 4	9	35	PP	—
Guantanamo Bay	48.9	348	i 7	54	0	—	—	—	—	—	—	—
Swan Island	49.3	336	e 7	55	- 2	—	—	—	—	—	—	—
Merida	54.8	331	i 8	38	+ 2	i 15	29	- 4	—	—	—	—
Oaxaca	55.1	322	e 8	41	+ 3	—	—	—	—	—	—	—
Miami	56.0	342	e 8	42	- 2	—	—	—	—	—	—	—
Vera Cruz	56.6	323	i 8	51 <sub>a</sub>	+ 2	i 15	57	+ 1	—	—	—	—
Puebla	57.6	321	i 8	56	+ 1	i 16	5	- 3	—	—	—	—
Tacubaya	58.4	321	i 9	4	+ 3	i 16	22	+ 3	10	1	P <sub>c</sub> P	—
Bermuda	60.1	359	i 9	13	+ 1	i 16	24	-16	e 11	6	pP	—
Manzanillo	61.2	316	i 9	22 <sub>a</sub>	+ 3	e 16	56	+ 2	—	—	—	—
Guadalajara	61.8	318	i 9	32 <sub>a</sub>	+ 9	i 17	9	+ 8	—	—	—	—
Columbia	63.9	345	e 9	33	- 3	i 17	20	- 6	e 11	36	pP	e 25.1
Washington	67.8	350	i 9	58	- 2	i 18	8	- 4	i 12	1	pP	—
Philadelphia	68.5	351	i 10	4	- 1	i 18	17	- 3	i 12	8	pP	e 27.9
Chihuahua	69.5	322	i 10	14 <sub>a</sub>	+ 3	i 18	24	- 8	—	—	—	—
Cincinnati	69.6	344	i 10	8	- 3	i 18	25	- 8	i 12	11	pP	—
Pennsylvania	69.7	349	i 10	11	- 1	i 18	33	- 1	i 12	16	pP	—
Weston	70.4	355	i 10	14	- 2	i 18	37	- 5	i 12	10	pP	—
Harvard	70.5	355	i 10	15	- 1	i 18	38	- 5	i 12	21	pP	—
St. Louis	70.8	339	i 10	15	- 3	i 18	39	- 7	i 12	19	pP	—
Florissant	71.0	339	i 10	17	- 2	i 18	42	- 6	i 12	21	pP	—
Lome	71.0	71	i 10	21	+ 2	i 18	40	- 8	i 12	32	pP	—
Cleveland	71.1	346	i 10	18	- 2	i 18	44	- 6	i 12	22	pP	—
Buffalo	72.0	349	i 10	29	+ 4	i 19	0	0	e 12	35	pP	—
Halifax	72.3	1	10	22	- 5	18	54	- 9	19	18	SP	—
Chicago	72.9	342	i 10	20	-10	i 18	54	-15	e 12	26	pP	e 29.4
Ottawa	73.9	352	i 10	34 <sub>a</sub>	- 2	i 19	14	- 6	(10 40)	—	pP	—
Shawinigan Falls N.	74.7	354	10	38	- 2	19	25	- 4	(11 1)	—	pP	—
Tucson	74.9	320	i 10	42	0	e 19	31	0	i 12	59	pP	e 33.1
Seven Falls	E. 75.1	356	10	41	- 2	19	29	- 4	12	8	pP	—
Grahamstown	75.3	120	i 10	42	- 2	e 20	32	+58	e 12	49	pP	e 35.6
Pierce Ferry	79.6	321	i 11	8	+ 1	i 20	22	+ 2	i 13	29	pP	—
Pretoria	Z. 79.7	113	i 11	6	- 1	e 20	19	- 2	e 13	8	pP	—
Pietermaritzburg	Z. 79.8	118	i 11	7	- 1	—	—	—	e 13	15	pP	—
Perris	79.8	318	i 11	9 <sub>a</sub>	+ 1	—	—	—	—	—	—	—
Boulder City	79.9	320	i 11	4	- 4	i 20	26	+ 3	i 13	19	pP	—
Riverside	80.0	317	i 11	9	0	i 20	26	+ 2	i 13	24	pP	—
Overton	Z. 80.1	321	i 11	11	+ 2	i 20	30	+ 5	e 37	52	P'P'	—
Pasadena	80.6	317	i 11	13 <sub>a</sub>	+ 1	i 20	31	+ 1	i 13	22	pP	—
Haiwee	81.8	319	i 11	19 <sub>a</sub>	+ 1	i 20	43	+ 1	i 13	29	pP	—
Logan	82.5	327	i 11	21	0	i 20	40	- 9	i 13	54	pP	e 30.0
Tinemaha	82.7	319	i 11	23 <sub>a</sub>	+ 1	i 20	46	- 5	i 13	34	pP	—
Fresno	83.3	318	i 11	25 <sub>a</sub>	0	e 20	54	- 3	i 13	46	pP	—
Tamanrasset	Z. 83.5	60	i 11	24 <sub>k</sub>	- 2	e 20	48	-11	i 13	34	pP	34.4
Lisbon	83.6	40	i 11	23 <sub>k</sub>	- 4	20	48	-12	13	30	pP	—
Malaga	Z. 85.0	44	i 11	33 <sub>a</sub>	- 1	i 21	5	[+ 5]	i 13	33	pP	33.6
Santa Clara	85.0	317	i 11	37	+ 3	i 21	1	[+ 1]	(i 12 11)	—	pP	—
Bozeman	85.1	329	i 11	35	+ 1	i 20	58	[- 2]	e 13	46	pP	—
Berkeley	85.6	317	i 11	38 <sub>a</sub>	+ 1	i 21	4	[ 0]	i 13	48	pP	—
Granada	85.8	45	i 11	35	- 3	21	18	- 2	25	6	sS	39.0
Butte	N. 86.0	329	i 11	42	+ 3	i 21	24	+ 2	e 13	51	pP	—
Mineral	Z. 86.8	320	i 11	42	0	e 21	10	[- 1]	i 14	4	pP	—
Toledo	87.3	42	i 11	42	- 3	21	12	[- 3]	13	57	pP	—
Shasta Dam	87.5	320	i 11	45	- 1	e 21	28	- 8	i 14	2	pP	—
Saskatoon	88.3	335	11	48	- 1	21	18	[- 3]	14	6	pP	—
Alicante	88.5	45	i 11	48	- 2	i 21	15	[- 7]	14	5	pP	e 41.5
Ferndale	88.5	319	e 11	55	+ 5	e 21	26	[+ 4]	—	—	—	—
Iviglut	89.7	8	e 11	54	- 2	i 21	54	- 2	i 14	7	pP	—
Algiers Univ.	Z. 89.8	48	i 11	53 <sub>k</sub>	- 3	i 21	24	[- 6]	i 14	6	pP	—

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		$\Delta$ °	Az. °	P.		O - C. s.	S.		O - C. s.	Supp.		L. m.	
				m.	s.		m.	s.		m.	s.		
Tortosa		90.5	44	i 11	57	- 3	i 21	29	[- 5]	12	6	PcP	c 34.6
Barcelona		91.8	43	i 12	3	- 3	i 21	37	[- 4]				e 34.8
Seattle		92.0	325	i 12	6 <sub>a</sub>	0	i 21	43	[+ 1]	i 14	27	pP	
Christchurch		92.2	217	i 12	11	+ 4	i 21	45	[+ 2]	14	19	pP	
Wellington		92.5	220	i 12	13	+ 4	i 21	47	[+ 2]	i 14	24	pP	
Victoria		93.1	325	i 12	11 <sub>a</sub>	0	21	50	[+ 2]	14	23	pP	
Kaimata	N.E.	93.5	217	e 12	20	+ 7	21	49	[- 1]	e 14	33	pP	
Cobb River	E.	93.8	219	12	18	+ 3	e 21	47	[- 5]	14	32	pP	
Jersey	E.	94.3	35	e 13	14	?	i 21	51	[- 3]	e 16	9	PP	
New Plymouth	E.	94.4	221	e 16	29	PP	e 21	48	[- 7]	e 25	59	PPS	
Tunis		94.5	52	e 12	16	- 2	i 22	34	- 3	e 14	47	pP	
Rathfarnham Castle		94.9	30	i 12	16	- 4	i 21	52	[- 6]	i 14	42	pP	
Clermont-Ferrand		95.0	41	i 12	19	- 1	i 21	58	[0]	i 14	28	pP	
Auckland	N.	95.4	223	i 14	42	pP	i 22	0	[0]	i 16	46	PP	
Paris		96.5	38	i 12	24 <sub>a</sub>	- 3	21	59	[- 7]	i 14	35	pP	
Kew		96.6	35	i 12	23 <sub>k</sub>	- 4	i 22	1	[- 5]	i 14	34	pP	e 34.6
Besançon		97.5	39	i 12	28	- 3				i 16	22	PP	
Reykjavik		97.5	16	i 12	30	- 1	i 22	12	[+ 1]	i 23	1	S	
Neuchatel		97.9	41	e 12	30	- 3	e 22	10	[- 3]				
Durham		98.0	31	i 12	32	- 2	i 22	12	[- 2]	i 16	38	PP	
Edinburgh	E.	98.0	30	12	36	+ 2	22	5	[- 9]	14	54	pP	
Pavia	Z.	98.3	43	i 12	32 <sub>k</sub>	- 3							
Basle		98.6	41	e 12	33 <sub>k</sub>	- 3	e 22	13	[- 4]	e 14	54	pP	
Tananarive		98.6	117	16	44	PP	22	16	[- 1]	27	23	sS	
Rome		98.7	47	i 12	35 <sub>k</sub>	- 2	i 22	12	[- 5]	14	51 <sub>?</sub>	pP	
Florence Xim		98.8	45	i 12	17	-20	i 21	54	[-24]	i 15	46	?	
Prato		98.8	45	i 12	34	- 3	i 22	12	[- 6]				
Rocca di Papa		98.8	47	e 12	40	+ 3	i 22	16	[- 2]	e 16	43	PP	
Messina		98.9	51	e 12	50	+12	i 22	9	[- 9]				
Apia		99.1	249	e 11	41	-57	22	23	[+ 4]	e 16	48	PP	
Zürich		99.1	42	e 12	35 <sub>k</sub>	- 3	e 22	14	[- 5]	e 14	46	pP	
Bologna		99.2	43	e 12	37	- 2	e 22	15	[- 4]	e 16	52	PP	
Strasbourg		99.2	40	i 12	36 <sub>k</sub>	- 3	i 22	14	[- 5]	e 14	48	pP	e 37.6
Aberdeen		99.3	30	i 12	36	- 3	i 22	14	[- 6]	i 14	48	pP	e 43.6
Chur		99.4	43	e 12	37 <sub>k</sub>	- 3	e 22	15	[- 5]	e 14	58	pP	
Padova		99.6	44	12	40	- 1	i 22	18	[- 3]	16	41	pP	
De Bilt		99.7	36	i 12	38 <sub>k</sub>	- 3	i 22	18	[- 4]	i 14	52	pP	
Karlsruhe		99.8	39	e 12	36 <sub>?</sub>	- 6	e 22	8	[-14]				e 38.6
Stuttgart		100.1	41	i 12	40 <sub>k</sub>	- 3	i 22	20	[- 4]	e 14	51	pP	
Triest		101.3	45	i 12	45 <sub>k</sub>	- 3	i 22	27	[- 3]	i 15	39	sP	
Cheb		102.6	40	12	49	P	i 22	35	[- 1]	e 15	5	pP	
Jena		102.6	39	e 12	51	P	e 22	34	[- 2]	e 15	1	pP	
Scoresby Sund		102.6	13	i 12	52	P	i 22	35	[- 1]	15	7	pP	
Prague		103.8	41	12	57 <sub>k</sub>	P	i 22	39	[- 2]	e 15	19	pP	
Sitka		103.9	329	e 13	6	P	i 22	41	[0]	e 15	19	pP	
Potsdam		104.1	38	i 12	59	P	i 22	42	[0]	i 23	48	S	e 35.6
Vienna		104.1	43	e 12	59	P	i 22	39	[- 3]	i 17	19	PP	
Athens		104.6	55	e 13	2	P	i 22	42	[- 3]				
Kalossa	E.	105.0	45	e 13	5	P	i 22	43	[- 3]	e 23	45	S	e 38.8
	N.	105.0	45	e 13	2	P	i 22	44	[- 2]	i 17	25	PP	e 39.1
Ogyalla		105.0	43	e 13	6	P	e 22	42	[- 4]	e 15	20	pP	
Copenhagen		105.3	35	i 13	4	P	i 22	46	[- 2]	e 15	14	pP	
Budapest	E.	105.4	44	13	7	P	i 22	44	[- 4]	i 17	32	PP	e 39.6
	N.	105.4	44	13	7	P	i 22	45	[- 3]	i 17	46	PP	e 39.1
Raciborz		106.0	41	e 13	7	P	e 22	50	[- 1]	e 16	21	sP	
Timisoara		106.1	46	e 13	7	P	i 22	49	[- 2]	i 17	35	PP	
Sofia		106.2	50	e 13	9	P	i 22	50	[- 2]	i 17	15	?	
Skalnate Pleso	N.	106.8	43	e 13	13	P	e 22	54	[0]	e 16	54	sP	
Helwan		107.2	66	13	12	P	22	51	[- 5]	15	26	pP	
Warsaw		108.4	40	e 13	22	P	i 23	2	[+ 1]	e 15	34	pP	e 40.6
Bucharest		108.7	49	e 13	16	P	i 23	1	[- 1]	i 17	55	PP	38.6
Lwow		109.3	43	e 16	45	?							
Upsala		109.5	32	e 17	18	[- 4]	i 22	58	[- 7]	i 17	58	PP	e 33.6
Istanbul		109.6	54	e 13	22	P	e 19	56	?				
Riverview		110.3	211	i 18	15	PP	i 23	11	[- 2]	i 25	0	S	

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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.
Kishinev	111.4	45	e	13 35	P	—	—	—	—	—	—
Ksara	112.3	63	i	13 37	P	27	15	sS	15	51	pP
College	112.6	333	e	13 38	P	e 23	15	[ - 3]	e 15	42	pP
Helsinki	113.1	32	i	18 20	PP	i 23	14	[ - 6]	e 25	6	S
Yalta	114.2	52	e	17 28	[ - 3]	i 23	18	[ - 6]	e 13	40	P
Brisbane	z. 114.6	216	i	18 43	PP	—	—	—	—	—	—
Theodosia	115.2	50	e	17 33	[ + 0]	23	25	[ - 3]	—	—	—
Pulkovo	115.6	34	e	17 36	[ + 2]	i 23	27	[ - 2]	e 13	51	P
Sotchi	117.9	52	e	17 47	[ + 8]	e 23	41	[ + 4]	e 19	7	PP
Moscow	118.8	40	i	17 42	[ + 1]	i 23	39	[ - 1]	e 14	5	P
Zugdidi	119.2	54	—	17 45	[ + 4]	—	—	—	e 19	7	PP
Borzhomi	120.1	55	e	17 45?	[ + 2]	—	—	—	—	—	—
Leninakan	120.3	58	e	17 45	[ + 1]	—	—	—	e 19	15	PP
Piatigorsk	120.4	52	e	17 46	[ + 2]	e 23	45	[ 0]	e 20	12?	pPKP
Erevan	120.6	57	e	17 46	[ + 2]	—	—	—	e 19	23	PP
Gori	120.7	55	e	17 45	[ + 1]	—	—	—	i 19	17	PP
Tiflis	121.2	57	i	17 45	[ 0]	i 19	53	SKP	i 19	18	PP
Grozny	122.1	55	e	17 48	[ + 1]	—	—	—	i 19	28	PP
Adak	125.6	317	i	16 54	?	i 24	2	[ 0]	—	—	—
Ashkabad	130.5	63	i	18 8	[ + 5]	—	—	—	e 20	27	pPKP
Sverdlovsk	131.5	37	i	20 35?	pPKP	e 37	6	SS	i 22	39	pPP
Mary	133.7	63	e	18 2	[ - 7]	—	—	—	—	—	—
Samarkand	137.3	62	e	18 8	[ - 8]	i 24	21	[ - 8]	i 26	56	SKKS
Bombay	139.1	94	e	18 12	[ - 7]	21	58	PKS	i 20	58	PP
Stalinabad	139.1	62	—	18 12	[ - 7]	—	—	—	i 20	58	PP
Kodaikanal	E. 139.3	117	e	21 8	PP	31	17	SP	38	53	SS
Tashkent	139.4	59	e	18 21	[ + 1]	e 27	5	SKKS	i 20	59	PP
Colombo	E. 139.5	115	—	18 23	[ + 3]	—	—	—	27	16	PKKP
Obi-garm	139.9	61	i	18 10	[ - 11]	—	—	—	—	—	—
Poona	N. 139.9	96	—	18 23	[ + 2]	21	40	PKS	21	11	PP
Fergana	141.4	60	—	18 16	[ - 8]	—	—	—	—	—	—
Andijan	141.8	60	—	18 18	[ - 7]	—	—	—	e 21	4	PP
Frunse	143.2	55	e	18 21	[ - 6]	—	—	—	e 21	9	PP
Murgab	143.2	63	i	18 24	[ - 3]	—	—	—	—	—	—
Hyderabad	143.5	98	—	18 23	[ - 5]	45	27	SSS	27	31	PKKP
Bandong	N. 144.3	167	i	18 33	[ + 4]	e 19	24	?	—	—	—
Naryn	144.4	56	i	18 28	[ - 1]	—	—	—	—	—	—
Almata	144.8	53	i	18 30	[ 0]	—	—	—	—	—	—
Djakarta	144.8	164	i	18 30	[ 0]	i 19	21	?	—	—	—
New Delhi	145.5	80	i	18 31 <sub>a</sub>	[ 0]	41	33	SS	18	41	PKP <sub>2</sub>
Przhevalsk	146.0	54	i	18 32	[ + 1]	—	—	—	—	—	—
Guam	150.0	247	—	18 46	[ + 9]	—	—	—	—	—	—
Nemuro	152.0	313	c	18 43	[ + 3]	—	—	—	—	—	—
Calcutta	E. 154.0	96	—	18 50	[ + 7]	29	23	SKKS	19	21	PKP <sub>2</sub>
Irkutsk	154.1	18	—	18 52	[ + 9]	22	25	PKS	i 21	8	pPKP
Sapporo	154.8	316	e	18 44	[ 0]	e 25	14	[ + 21]	e 28	40	SKKS
Aomori	156.3	311	—	18 51	[ + 5]	i 28	51	SKKS	—	—	?
Mizusawa	156.8	306	—	18 52	[ + 5]	27	5	PS	—	—	—
Sendai	157.2	304	e	18 52	[ + 5]	e 26	3	SP	e 19	27	PKP <sub>2</sub>
Onahama	157.6	302	c	18 49	[ + 1]	e 28	50	SKKS	i 19	53	?
Hokusima	157.7	301	—	18 41	[ - 7]	—	—	—	—	—	—
Tokyo	158.8	299	e	18 59	[ + 10]	i 29	6	SKKS	i 19	38	PKP <sub>2</sub>
Kumagaya	159.0	301	e	18 51	[ + 2]	e 29	5	SKKS	e 23	16	PP
Mera	159.0	297	e	19 34	PKP <sub>2</sub>	—	—	—	—	—	—
Maebasi	159.2	302	e	18 55	[ + 6]	e 29	4	SKKS	—	—	—
Aikawa	159.3	308	e	18 40	[ - 9]	—	—	—	—	—	—
Hunatu	159.7	299	—	18 53	[ + 3]	e 29	9	SKKS	e 23	6	PP
Matusiro	159.8	304	—	18 51	[ + 1]	i 29	13	SKKS	i 21	18	pPKP
Nagano	159.8	304	e	18 56	[ + 6]	e 29	9	SKKS	e 20	16	PKP <sub>2</sub>
Shizuoka	160.1	300	e	19 15	[ + 25]	e 29	10	SKKS	e 33	26	?
Omaesaki	160.3	298	e	18 34	[ - 16]	—	—	—	—	—	—
Vladivostok	160.4	326	i	18 52	[ + 2]	—	—	—	—	—	—
Toyama	160.5	305	e	18 55	[ + 4]	e 29	14	SKKS	e 20	2	PKP <sub>2</sub>
Nagoya	161.2	298	c	18 54	[ + 3]	e 29	17	SKKS	—	—	—
Gihu	161.3	298	—	18 57	[ + 6]	e 29	13	SKKS	—	—	—

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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.	
Kameyama	161.7	298	e 18 56	[+ 4]	e 29 21	SKKS	i 23 58	PP	—
Owase	z. 162.1	294	18 55	[+ 3]	—	—	e 23 34	PP	—
Osaka	162.5	299	e 18 58	[+ 5]	e 29 23	SKKS	i 23 34	PP	—
Koti	164.4	296	e 18 58	[+ 4]	i 29 32	SKKS	e 23 39	PP	—
Matuyama	164.9	297	e 18 59	[+ 4]	e 29 36	SKKS	e 23 48	PP	—
Ooita	166.0	300	e 19 6	[+ 10]	—	—	e 18 1	?	—
Hukuoka	166.8	301	e 19 0	[+ 3]	e 29 45	SKKS	e 23 49	PP	—
Nanking	175.5	—	i 19 2 <sub>a</sub>	[+ 1]	i 22 56	PKS	i 21 23	pPKP	—

Additional readings and notes :—

Antofagasta e = 5m.25s.  
 La Plata iPEN = 2m.7s., Z = 2m.14s., iSZ = 3m.49s., iSN = 3m.52s.  
 Bogota iS<sub>c</sub>P? = 10m.54s., i = 14m.43s.  
 Chinchina i = 6m.16s., iS?EN = 13m.56s., iS<sub>c</sub>PZ = 15m.20s.  
 Fort de France i = 11m.40s. and 14m.12s.  
 Port au Prince PP? = 9m.1s., SS? = 16m.34s.  
 San Juan i = 7m.50s., eP<sub>c</sub>P = 8m.53s., e = 9m.45s., iS<sub>c</sub>P = 10m.24s., eS<sub>c</sub>P = 11m.44s.,  
 esPP = 12m.13s., eP<sub>c</sub>S = 12m.44s., e = 15m.54s., iS<sub>c</sub>S = 16m.13s., esS? = 16m.40s.,  
 eSS = 17m.5s., iSKKP = 29m.29s.  
 Bermuda iS<sub>c</sub>P = 12m.12s., epPP = 13m.9s., iS<sub>c</sub>S = 18m.1s., i = 18m.56s., iSS = 21m.13s.  
 Columbia eS<sub>c</sub>S = 18m.21s., esS = 20m.42s.  
 Washington iPP = 12m.34s., ipPP = 14m.15s., iPPP = 14m.26s., e = 20m.2s., i = 38m.17s.  
 Philadelphia iP<sub>c</sub>P? = 10m.48s., ePP? = 13m.5s., iPPP? = 14m.32s., eS = 18m.10s.,  
 iS<sub>c</sub>S = 19m.1s., iS = 21m.54s., iSS = 22m.53s.  
 Cincinnati i = 19m.11s.  
 Pennsylvania eN = 13m.21s., iE = 15m.0s., iN = 22m.11s.  
 Weston iSS = 23m.24s.  
 Harvard i = 11m.2s., iPP = 11m.58s., iS<sub>c</sub>P = 13m.55s., ipPP or PPI? = 14m.52s., i =  
 17m.6s., iS = 22m.20s., ePKP,PKP = 37m.50s.  
 St. Louis e = 13m.30s., i = 14m.47s., 19m.12s., and 19m.17s., iS = 22m.17s., iSS =  
 23m.18s.  
 Florissant i = 19m.21s., iS = 22m.16s., i = 22m.20s., iSS = 23m.26s.  
 Lome iP<sub>c</sub>P = 10m.42s., i = 11m.7s., iS<sub>c</sub>P? = 13m.50s., iPPP = 15m.7s., i = 19m.22s.,  
 e = 20m.10s. and 22m.31s., eSS? = 23m.16s., e = 24m.2s.  
 Cleveland ipPE = 12m.28s., iN = 19m.22s., iSSE = 22m.24s.  
 Buffalo i = 13m.40s.  
 Halifax PPS = 19m.30s., S<sub>c</sub>S = 20m.2s., SS = 22m.58s.  
 Chicago epPP? = 15m.10s., iS<sub>c</sub>S = 19m.24s., iSP = 19m.31s., e = 21m.54s., eSS = 22m.26s.,  
 esPS = 23m.18s., esSS? = 26m.12s.  
 Ottawa sPZ = 12m.21s., PP = 13m.22s., PPP = 14m.54s., S<sub>c</sub>S = 19m.41s., sS = 21m.14s.,  
 i = 22m.54s., SS = 23m.41s., PKP,PKPZ = 37m.32s.; pP as given.  
 Shawinigan Falls PPN = 12m.1s.; pP as given.  
 Tucson iP<sub>c</sub>P = 10m.56s., ePP? = 13m.41s., iS<sub>c</sub>S? = 20m.0s., i = 21m.48s., eSS = 23m.45s.,  
 i = 25m.4s., ePKKP = 29m.0s., ePKP,PKP = 37m.41s., iSKP,PKP = 40m.20s.,  
 ePKP,PKP,PKP? = 57m.7s.  
 Seven Falls eE = 11m.11s., sPE = 13m.6s., SPE = 20m.20s., sSE = 21m.57s., iE = 23m.5s.,  
 SSE = 24m.25s.; pP as given.  
 Pierce Ferry iPP = 14m.16s., iPKKP? = 27m.48s., cPKP,PKP = 37m.39s., iSKP,PKP? =  
 40m.10s., e = 47m.37s. and 57m.14s.  
 Pretoria eZ = 30m.11s., 37m.42s., 40m.8s., and 53m.11s.  
 Pietermaritzburg eZ = 16m.8s.  
 Boulder City iPP = 14m.29s., ipPP = 15m.36s., e = 29m.45s., i = 31m.41s., ePKP,PKP? =  
 38m.1s.  
 Overton eSKP,PKP?Z = 39m.6s., eZ = 57m.41s.  
 Pasadena iZ = 12m.52s., iSPZ = 14m.30s., eZ = 15m.59s., iZ = 16m.16s., ePKKPZ =  
 29m.36s., ePKP,PKPZ = 37m.43s., ipPKP,PKP?Z = 40m.10s.  
 Haiwee iSPZ = 14m.33s., ePKKPZ = 29m.45s., ePKP,PKPZ = 37m.49s., ipPKP,  
 PKP?Z = 39m.39s.  
 Tinemaha iPKKPZ = 29m.43s., iPKP,PKPZ = 37m.44s., ipPKP,PKP?Z = 40m.5s.  
 Fresno iP<sub>c</sub>PZ = 11m.47s., iZ = 12m.37s. and 14m.25s., iSPZ = 14m.54s., epPP?E =  
 16m.39s., eN = 17m.32s. and 23m.39s.  
 Tamarrasset iP<sub>c</sub>PZ = 11m.28s., ipP<sub>c</sub>PZ = 13m.40s., ePPZ = 14m.51s., ipPPZ = 16m.31s.,  
 ePPPZ = 16m.46s., eZ = 17m.46s., eSPZ = 21m.46s., eZ = 25m.36s. and 25m.54s.,  
 eSSZ = 26m.41s., ePKP,PKPZ = 37m.32s., iZ = 37m.51s., 40m.12s., and 40m.18s.  
 Lisbon PPZ = 14m.40s., iPPZ = 14m.45s., sSEN = 24m.44s.  
 Malaga iPPPZ = 15m.5s., PSZ = 21m.45s., SSZ = 26m.1s.  
 Santa Clara iSN = 21m.18s.; pP as given.  
 Bozeman ePP = 15m.1s., i = 21m.16s., iSP = 21m.57s., i = 22m.51s., iS = 25m.1s., eSS =  
 27m.14s., esSS = 30m.16s.  
 Berkeley ePPZ = 15m.5s., eZ = 16m.59s., eSZ = 20m.59s.  
 Granada P<sub>c</sub>P = 11m.44s., iPP = 15m.0s., PPP = 16m.54s., iS = 21m.31s., iSS = 26m.36s.,  
 sSS = 30m.33s., sSSS = 34m.16s.  
 Butte ePP?N = 15m.3s., iSKSN = 21m.8s., esSN = 25m.11s., eSSN = 27m.33s., eSSS?N =  
 30m.54s.  
 Mineral esPZ = 14m.37s., eZ = 18m.21s., 22m.21s., and 22m.27s.

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Toledo PPZ = 15m.15s., PPPE = 17m.24s., iSE = 21m.29s., sSE = 25m.21s., SSE = 27m.24s.  
 Shasta Dam ePP = 15m.32s., eSKS = 21m.9s., e = 28m.20s., iPKKP = 29m.32s., ePKP, PKP = 37m.16s.  
 Saskatoon e = 21m.37s., 25m.33s., and 30m.48s.  
 Alicante P<sub>c</sub>P = 11m.50s., PP = 15m.29s., PS = 24m.19s., PPS = 25m.5s., sS = 25m.31s., SS = 27m.59s., SSS = 31m.29s., Q = 35m.39s.  
 Ivigtut i = 15m.10s., iSKS = 21m.24s., i = 25m.40s., 26m.2s., and 31m.9s.  
 Algiers Univ. ePPZ = 15m.32s., iZ = 16m.18s., epPPZ = 17m.8s., ePPPZ = 17m.29s., eZ = 20m.10s., iSZ = 21m.40s., eSPZ = 22m.44s., iZ = 24m.43s., eZ = 40m.12s.  
 Tortosa PPE = 15m.39s., PPP?E = 17m.40s., iSEN = 21m.58s., PPS?N = 24m.3s., sSN = 26m.2s., SSN = 28m.32s., SSSN = 31m.53s.  
 Barcelona iPS? = 22m.10s., SS = 26m.13s.  
 Seattle i = 12m.11s. and 12m.23s., e = 14m.17s., i = 14m.43s., 15m.39s., and 16m.53s., e = 21m.57s., 22m.4s., and 22m.20s., i = 22m.27s., 23m.41s., and 26m.17s.  
 Christchurch eS?EN = 15m.8s., eS?Z = 15m.20s., iP<sub>c</sub>P?NZ = 16m.5s., iZ = 23m.44s. and 37m.29s.; readings wrongly identified.  
 Wellington iPP = 16m.2s.  
 Victoria PP = 15m.58s., S = 22m.16s., sS = 26m.19s., SS = 29m.16s., sSS = 32m.0s.  
 Cobb River PPE = 16m.15s., SE = 22m.35s.  
 Jersey eSS?E = 29m.36s.  
 Tunis iPP = 16m.23s., iPPP = 18m.36s., iSKS = 21m.49s., iSP? = 23m.30s., eSP? = 23m.43s., esS = 26m.35s., and other unidentified readings.  
 Rathfarnham Castle iZ = 12m.48s., e = 13m.20s., i = 14m.57s., iPP = 16m.12s., eEN = 17m.33s., i = 18m.2s., iSEN = 22m.36s., eSPEN = 23m.44s., esSP?EN = 27m.46s., eSSN = 33m.26s., eSKPPK?EN = 40m.1s.  
 Clermont-Ferrand esP = 15m.34s., iPP = 16m.15s., iPPP = 18m.30s., i = 19m.15s., iS = 22m.38s., isSKS = 25m.27s., isS? = 26m.12s., isPS = 27m.54s., eSS = 29m.18s., eSSS = 32m.26s.  
 Paris isP = 15m.31s., iPP = 16m.29s., iPPP = 18m.16s., PPP = 18m.29s.?, isPP = 19m.25s., iS = 22m.43s., iSP = 24m.27s., isPP? = 25m.22s., isSKS? = 26m.11s., isS = 26m.43s., eSS = 29m.17s., esSS = 32m.44s., isSS = 32m.59s., eL? = 39m.36s.?, and other unidentified readings.  
 Kew iZ = 12m.30s., esP = 15m.41s., ePP = 16m.21s., iPPP = 19m.24s., iSKS?N = 22m.46s., isSEN = 26m.12s., eSSN = 28m.8s., esSSN = 30m.0s., eSSSEN = 33m.4s.  
 Besançon i = 12m.39s. and 15m.0s., ipPP = 17m.11s.  
 Reykjavik iE = 15m.28s., iN = 25m.55s., iEN = 26m.30s. and 29m.59s.  
 Durham iPSN = 22m.58s., iE = 25m.48s., iEN = 26m.0s., 26m.27s., and 26m.37s., iSSN = 27m.12s., iEN = 28m.24s.  
 Edinburgh PPE = 16m.36s., PPSE = 26m.5s., sSE = 27m.12s., iE = 28m.31s., SSE = 29m.44s.  
 Basle ePP = 16m.43s.  
 Tananarive e = 16m.54s., S = 23m.23s., PS = 26m.21s., SS = 30m.6s.  
 Rome iPPPZ = 16m.43s., iZ = 18m.30s., S = 22m.48s., isS = 27m.13s., SS = 30m.7s.  
 Messina e = 15m.11s., i = 24m.44s.  
 Apia e = 13m.57s., eE = 19m.3s.  
 Zürich e = 15m.45s., ePP = 16m.35s.  
 Bologna e = 23m.57s.  
 Strasbourg i = 12m.58s. and 13m.38s., esP = 15m.49s., iPP = 16m.41s., i = 16m.52s. and 17m.26s., epPP = 18m.37s., ePPP = 19m.3s., esPP = 19m.47s., esS = 22m.50s., iS = 23m.15s., i = 25m.56s. and 26m.32s., isSKS = 26m.36s., esS = 27m.18s., isPS = 28m.40s., e = 29m.2s., eSS = 30m.18s., isSS = 33m.43s.  
 Aberdeen esPE = 15m.54s., iPPN = 16m.41s., isPPEN = 19m.47s., iEN = 26m.28s. and 28m.31s., isSSN = 33m.36s.  
 Padova i = 17m.28s., iSKKS? = 22m.51s.  
 De Bilt iPP = 16m.46s., ipPP = 18m.43s., iZ = 19m.49s., iS = 23m.14s., esSKS = 26m.0s., esS = 27m.14s., eSS = 30m.11s., esSS = 33m.36s.  
 Stuttgart iPZ = 12m.44s. and 12m.48s., eZ = 13m.6s., ePP = 15m.36s., epPP? = 16m.49s., ePPP = 18m.44s., e = 19m.7s., epPPP = 19m.52s., eS = 23m.14s., e = 26m.16s. and 27m.11s., eSS = 28m.42s., eZ = 28m.59s. and 31m.42s., eSSS = 33m.54s.  
 Trieste iZ = 13m.11s., iPKP = 16m.59s., isSKS = 26m.39s., i = 28m.57s.  
 Cheb esP = 16m.21s., iPP = 17m.5s., e = 18m.11s., epPP = 19m.4s., iPPP = 19m.19s., e = 21m.1s. and 23m.13s., eS = 23m.44s., i = 24m.1s., e = 24m.50s., eSP = 25m.21s., esSKS = 26m.44s., esSP = 29m.10s., eSSS = 35m.0s.  
 Jena esPN = 16m.2s., esPE = 16m.12s., iPP = 17m.8s., epPP?E = 19m.16s., eSN = 23m.12s., eN = 26m.28s., eE = 26m.36s., eN = 26m.46s. and 27m.41s., eEN = 29m.16s., eSS?N = 30m.52s., eL?N = 34m.26s. and 34m.36s., eL?E = 45m.0s.  
 Scoresby Sund 16m.12s., iPP = 17m.11s. and 20m.13s., S? = 23m.40s., PS = 26m.19s.  
 Prague esP = 16m.22s., iPP = 17m.17s., epPPE = 19m.17s., ePPP? = 19m.37s., eSKKS = 23m.0s., iS = 23m.52s., epSKS = 25m.55s., eSPPE = 26m.46s., esSKS = 27m.13s., ePS = 27m.15s., esSE = 29m.26s., eSS = 31m.14s., eSSS = 36m.7s., and other unidentified readings.  
 Sitka ePP = 17m.16s., epPP = 19m.11s., e = 19m.28s., iS = 23m.56s., esS = 27m.53s., eSS = 30m.54s., esSS = 34m.56s.  
 Potsdam ePN = 13m.2s., iE = 16m.2s., iPPEN = 17m.19s., iSKS<sub>2</sub>N = 22m.59s., iE = 24m.34s., iPSE = 26m.58s., ePPS?N = 27m.42s., iE = 29m.36s., eSS?E = 31m.36s., isS?N = 32m.0s.

Continued on next page.



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Kalossa eE = 16m.50s., PPPE = 17m.29s., iPPPN = 17m.51s., iE = 17m.55s., PPSN = 23m.22s., PSE = 23m.25s., SSE = 27m.1s., eSSSE = 29m.45s., eSSSN = 31m.40s.  
 Ogyalla esP?E = 16m.12s., ePPN = 17m.26s., epPPN = 19m.20s., esPP = 20m.26s., eSKKSE = 23m.1s., eS? = 24m.1s., epSKS = 25m.54s., esSKSN = 26m.52s., ePSN = 27m.7s., esSN = 28m.11s., eSS = 31m.30s., eSSS = 35m.54s., and other unidentified e readings.  
 Copenhagen i = 17m.28s. and 20m.32s., SKKS = 23m.2s., iS = 23m.33s., i = 24m.3s., 27m.0s., and 29m.43s.  
 Budapest iE = 17m.3s., iN = 17m.30s., eE = 18m.15s., PSE = 23m.21s., PPSN = 23m.27s., e = 24m.16s., 24m.48s., and 26m.22s., eSSEN = 27m.3s., eSSSE = 29m.44s., eSSSN = 31m.33s.  
 Raciborzu esP?N = 16m.29s., ePPN = 17m.34s., eN = 19m.28s., eE = 20m.38s., eN = 20m.43s., 25m.30s., and 25m.54s., eE = 27m.18s.  
 Timisoara ePE = 13m.10s.?, SKKSN = 23m.24s.  
 Skalnaté Pleso ePPN = 17m.36s., esPPN = 20m.55s., epPPP = 22m.3s., eSN = 24m.15s., ePSN = 27m.36s., esSN = 28m.29s., esPS = 30m.18s., eSS = 31m.55s., eSSS = 36m.30s., and other unidentified e readings.  
 Helwan PPZ = 17m.42s., iZ = 20m.0s., iE = 23m.42s., SN = 24m.12s., PSEN = 27m.12s., sSN = 28m.18s.  
 Warsaw esP = 16m.27s., ePPE = 17m.48s., ePPN = 17m.51s., eE = 19m.50s., ePPPE = 20m.4s., ePPPN = 20m.13s., esPPE = 20m.54s., esPPN = 20m.59s., SKKS = 23m.52s., e = 24m.18s., SeSEN = 24m.34s., eEN = 25m.38s., eSN = 26m.15s., eSPE = 26m.19s., eSPP = 27m.8s., PSE = 28m.32s., sSP = 30m.1s., eE = 31m.22s., SSEN = 31m.59s., sSSN = 35m.19s., SSSN = 36m.9s.  
 Bucharest ePZ = 13m.19s., iPSE = 23m.33s., iSSE = 27m.34s.  
 Upsala eN = 17m.22s., epPPN = 20m.18s., i = 23m.57s., iSN = 24m.35s., eN = 26m.1s., 26m.56s., and 30m.19s.  
 Riverview iSP?E = 26m.47s., iSP?NZ = 26m.50s., iPS?E = 27m.59s., iSSE = 33m.1s., and other unidentified i readings.  
 College iPKP = 17m.29s., eSKKS? = 24m.21s., e = 55m.38s. and 58m.0s.  
 Helsinki eSKKS = 24m.21s., iSP = 27m.9s., epS = 28m.4s., esS = 29m.8s., esSP = 31m.0s., eSS = 33m.9s.  
 Yalta iPP = 18m.28s., epPP = 20m.33s.?, iSKKS = 24m.26s.  
 Brisbane iZ = 18m.51s.  
 Pulkovo epP = 16m.6s., PP = 18m.40s., pPP = 20m.40s., iSKKS = 24m.40s., SKSP = 27m.25s., SS = 34m.6s.  
 Moscow epP = 16m.17s., iPP = 19m.6s., epPP = 21m.6s., ePPP = 21m.43s., iSKKS = 24m.59s., S = 25m.58s., iSKSP = 27m.50s., SP = 28m.54s.  
 Piatigorsk ePP = 19m.11s., ePPP = 22m.0s., eSKKS = 25m.12s.  
 Ashkabad P = 17m.43s.  
 Sverdlovsk eSSS = 40m.54s.  
 Samarkand iPP = 18m.28s.  
 Bombay iPKKPE = 27m.7s., PSE = 31m.23s., SKKS<sub>2</sub>E = 34m.37s., SSSE = 44m.16s.  
 Kodaikanal PKKPE = 27m.10s., SSSE = 44m.0s.  
 Poona PKS<sub>2</sub>N = 21m.54s., PPPN = 24m.13s., SKS<sub>2</sub>N = 25m.15s., PSN = 31m.51s., PPSN = 33m.15s., SSPN = 39m.53s., SSS?N = 44m.36s.?  
 Bandung and Djakarta readings given as for local shock.  
 New Delhi PKKPN = 27m.48s., PKKSEN = 31m.33s., SSPEN = 42m.18s., SSEN = 47m.56s.  
 Calcutta PKKPE = 28m.36s.  
 Irkutsk iPKP<sub>2</sub> = 19m.9s., iPP = 22m.44s., PPP = 26m.1s., SS = 41m.24s.  
 Mizusawa SN = 27m.10s.  
 Sendai eE = 28m.26s.  
 Tokyo eN = 20m.49s. and 23m.18s., iN = 27m.41s., eN = 33m.31s.  
 Matusiro e = 19m.36s., 21m.47s., and 23m.19s.  
 Toyama e = 19m.38s., 26m.2s., and 32m.44s.  
 Nagoya e = 19m.45s.  
 Gihu e = 19m.49s. and 22m.9s.  
 Owase iZ = 19m.48s.  
 Koti e = 19m.57s., 30m.30s., 31m.53s., 33m.32s., 35m.49s., and 44m.26s.  
 Matuyama i = 20m.0s., e = 22m.20s.  
 Oita e = 23m.3s., eL = 28m.37s.  
 Hukuoka e = 20m.9s.  
 Nanking eZ = 19m.41s., iPKP<sub>2</sub> = 20m.43s., iPP = 24m.34s., i = 26m.49s.  
 Long waves were also recorded at Bergen.

Aug. 14d. Readings also at 0h. (Prague), 1h. (Overton and Tucson), 2h. (Frunse, near Naryn, Przhevalsk, Andijan, and near Obi-garm), 3h. (Huancayo), 4h. (Obi-garm, Fergana, Andijan, Naryn, Frunse, near Murgab, and New Delhi), 7h. (Port au Prince and Hungry Horse), 8h. (Hungry Horse (2), Pierce Ferry, Harvard, and Nanking), 9h. (near Yalta), 10h. (Tamanrasset), 11h. (near Istanbul), 13h. (Brisbane, Galerazamba, College, Hungry Horse, Overton, Shasta Dam, Pasadena, Mount Wilson, Tinemaha, Tamanrasset, Istanbul (2), Tiflis, Leninakan, near Borzhomi, Gori, near Djakarta, and Bandung; several shocks), 14h. (near Yalta), 15h. (Tamanrasset), 16h. (near Obi-garm), 17h. (Granada, near Bogota, and near Obi-garm), 18h. (Fergana, Andijan, near Stalinabad, Obi-garm, Samarkand, and near Istanbul), 19h. (Tucson), 22h. (Sofia and near Istanbul), 23h. (Stuttgart and Helwan).



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Aug. 15d. 14h. 9m. 30s. Epicentre 28°·7N. 96°·6E.

Intensity scale X at Sadya, Passighat, Dum Duma, Dibrugarh, North Lakhimpur, and Sibsagar; IX at Digboi and Golaghat; VIII at Tezpur, Gauhati, and Shillong; VI at Dacca, Calcutta, Dhubri, Darjeeling, and Imphal. Macroseismic area 1,794,000 sq. km., of which 49,700 sq. km. suffered great damage.

This great earthquake, destructive in Assam and Tibet, has a calculated magnitude of 8·6, and Strasbourg regards it as the most important since the introduction of seismological observing stations. Alterations of relief were brought about by many rock falls in the Mishmi Hills and destruction of forest areas. In the Abor Hills 70 villages were destroyed with 156 casualties due to landslides. Dykes blocked the tributaries of the Brahmaputra; that in the Dibang valley broke without causing damage, but that at Subansiri opened after an interval of 8 days and the wave, 7 metres high, submerged several villages and killed 532 persons.

Anders Kyale.

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On Dispersion Curves of surface waves from the great Assam earthquake of Aug. 15d., 1950. Bull. Earth Research Institute, Tokyo Univ., Vol. 30, pt. 3, Sept., 1952, pp. 237-257, with 15 figures.

"Anonymous."

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M. B. Ramachandra Rao.

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A compilation of papers on the Assam earthquake of Aug. 15d., 1950. Central Board of Geophysics publication No. 1, Calcutta, 1953, Vol. 1, 112 pages with maps and figures.

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S. L. Malurkar.

The Great Earthquake on the Assam border of Aug. 15d., 1950. Journal of Science and Industrial Research, India, 1951, Vol. X, No. 1, p.p. 21-25 with figures.

$$A = -.1010, B = +.8727, C = +.4777; \quad \delta = 0; \quad h = +2;$$

$$D = +.993, E = +.115; \quad G = -.055, H = +.475, K = -.879.$$

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Calcutta	E.	9·7	232	i 2 20	- 2	—	—	—	—
Dehra Dun	N.	16·2	280	e 6 36	?	e 9 18	?	—	—
New Delhi		17·0	274	i 3 57 <sub>a</sub>	- 4	i 6 57	-13	—	—
Nanking		19·4	75	i 4 28 <sub>a</sub>	- 2	i 8 10	+ 6	—	—
Hyderabad	N.	20·1	239	i 4 35	- 3	—	—	—	—
Przhevalsk		20·2	317	i 4 48	+ 9	—	—	—	—
Naryn		21·1	313	i 4 50	+ 2	—	—	—	—
Almata		21·5	319	i 4 55	+ 3	—	—	—	—
Zi-ka-wei		21·6	77	5 0	+ 6	8 58	+ 9	—	—
Frunse		22·7	314	i 5 8	+ 4	—	—	—	—

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	$\Delta$ °	Az. °	P.		O - C. s.	S.		O - C. s.	Supp.		L. m.	
			m.	s.		m.	s.		m.	s.		
Poona	23.1	249	i 5	6 <sub>a</sub>	- 2	i 9	18	+ 2	—	—	—	
Andijan	23.2	307	i 5	13	+ 4	—	—	—	—	—	—	
Fergana	23.5	307	i 5	14	+ 2	—	—	—	—	—	—	
Bombay	23.8	251	i 5	15	0	—	—	—	—	—	—	
Garm	24.0	303	5	19	+ 2	—	—	—	—	—	—	
Irkutsk	24.2	11	i 5	24	+ 5	i 9	47	+12	—	—	—	
Semipalatinsk	25.0	336	i 5	31	+ 4	i 9	56	+ 7	—	—	—	
Stalinabad	25.1	301	i 5	30 <sub>?</sub>	+ 2	i 9	45 <sub>?</sub>	- 6	—	—	—	
Tashkent	25.5	307	i 5	34	+ 2	i 10	4	+ 7	—	—	—	
Kodaikanal	E. 25.7	229	i 5	33	0	i 10	3	+ 2	—	—	—	
Samarkand	26.7	302	i 5	47	+ 4	—	—	—	—	—	—	
Colombo	E. 26.8	219	i 5	42	- 2	10	0	-19	—	—	—	
Nagasaki	28.8	73	i 5	57 <sub>k</sub>	- 5	i 10	56	+ 5	e 7	3	PP	14.2
Unzendake	29.1	73	5	56	- 8	e 11	2	+ 6	—	—	—	—
Hukuoka	29.3	72	i 6	6	0	11	10	+11	12	33	SS	15.3
Kumamoto	29.5	73	i 6	7 <sub>a</sub>	- 1	11	2	0	—	—	—	15.6
Yakusima	29.5	79	6	4	- 4	11	34	+32	7	0	PP	15.8
Miyazaki	30.2	76	i 6	13	- 1	11	25	+12	i 7	6	PP	13.7
Ooita	30.3	72	i 6	17	+ 2	e 11	28	+13	e 7	13	PP	e 14.9
Mary	30.3	297	e 6	16	+ 1	—	—	—	—	—	—	—
Hirosima	31.0	71	e 6	20	- 1	e 11	52	+26	—	—	—	e 17.4
Matuyama	31.2	72	e 6	22	- 1	e 11	58	+29	i 9	0	P <sub>c</sub> P	15.8
Simidu	31.4	73	6	26	+ 1	12	16	+44	7	26	PP	15.9
Vladivostok	31.7	54	i 6	27	0	—	—	—	—	—	—	—
Koti	31.9	72	i 6	18	-11	e 11	29	-11	i 7	12	PP	13.4
Sumoto	33.0	70	i 6	39	0	i 13	0	+63	i 7	34	PP	e 16.6
Ashkabad	33.1	297	i 6	40	0	—	—	—	—	—	—	—
Kobe	33.2	70	6	41	+ 1	e 13	2	+62	i 7	40	PP	21.7
Osaka	33.5	70	i 6	44	+ 1	e 13	38	SS	e 8	12	PP	e 17.3
Hikone	34.1	68	e 5	50	-58	e 11	25	-49	e 6	48	PP	e 15.9
Owase	34.1	70	i 6	48 <sub>k</sub>	0	i 13	16	+62	7	50	PP	17.4
Kameyama	34.3	69	i 6	49	- 1	e 12	14	- 3	9	9	PPP	21.1
Gihu	34.5	69	i 6	52	0	—	—	—	e 8	26	PP	e 14.8
Nagoya	34.7	69	i 6	54	0	12	31	+ 7	e 7	49	PP	e 20.7
Wazima	34.7	64	6	53	- 1	e 14	24	SS	—	—	—	e 19.9
Kizyl-Arvat	34.8	299	i 6	57	+ 3	—	—	—	—	—	—	—
Matusiro	35.7	66	7	2	0	i 12	44	+ 5	8	59	PPP	20.4
Nagano	35.7	66	i 7	3	+ 1	e 12	33	- 6	e 8	1	PP	e 20.1
Aikawa	35.8	63	i 7	0	- 3	e 13	6	+25	—	—	—	—
Shizuoka	35.9	69	i 7	3	- 1	e 13	27	+45	8	5	PP	18.8
Djakarta	36.0	162	i 7	1	- 4	e 12	44	0	—	—	—	—
Hunatu	36.2	68	i 7	6	0	13	8	+21	—	—	—	18.1
Maebasi	36.4	67	i 7	7	- 1	e 13	39	+49	e 8	39	PP	i 21.6
Kumagaya	36.6	67	7	8	- 2	e 14	0	+67	e 9	24	P <sub>c</sub> P	18.1
Osima	36.7	70	i 7	11	+ 1	14	8	+64	e 7	34	pP	i 24.6
Yokohama	36.9	68	i 7	12	0	—	—	—	e 7	54	pP	16.4
Bandong	37.0	160	e 7	7	- 6	e 13	42	+43	—	—	—	—
Mera	37.0	70	7	12	- 1	—	—	—	—	—	—	—
Tokyo	37.0	68	7	11	- 2	13	21	+22	8	44	PP	18.1
Utunomiya	37.0	66	i 7	11	- 2	e 14	10	+71	8	44	PP	—
Tukubasan	37.2	67	i 7	14	- 1	13	36	+34	9	35	P <sub>c</sub> P	18.2
Akita	37.3	62	i 7	13 <sub>a</sub>	- 3	—	—	—	e 15	53	PS	—
Hokusima	37.5	65	i 7	16 <sub>a</sub>	- 1	—	—	—	e 8	23	PP	34.8
Mito	37.5	67	i 7	16	- 1	13	2	- 5	9	5	PPP	17.4
Onahama	E. 37.8	66	7	19	- 1	13	31	+20	—	—	—	18.7
Aomori	37.9	59	7	21	+ 1	i 16	13	SSS	i 8	57	PP	e 21.4
Mori	37.9	56	7	20	0	13	35	+22	—	—	—	—
Sendai	37.9	63	i 7	19	- 1	13	27	+14	8	58	PP	17.5
Mizusawa	38.1	62	7	22	0	13	20	+ 4	—	—	—	16.1
Morioka	38.1	61	e 7	24	+ 2	—	—	—	e 16	9	SS	e 19.5
Hatinohe	38.4	58	7	23	- 2	13	44	+24	8	47	PP	19.9

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.	
Sapporo	38.5	55	i 7	24	- 2	e 13	31	+ 9	e 9	38	PPP	19.5
Miyako	38.7	61	7	26	- 1	e 13	25	0	18	36	Q	22.6
Baku	39.8	300	i 7	39	+ 3	—	—	—	—	—	—	—
Nemuro	41.6	56	7	50	- 1	14	0	- 8	—	—	—	—
Grozny	43.0	304	8	6	+ 3	—	—	—	—	—	—	—
Tiflis	43.7	302	i 8	10	+ 2	i 14	39?	0	—	—	—	—
Erevan	43.9	299	e 8	21	+11	—	—	—	—	—	—	—
Leninakan	44.4	301	e 8	17	+ 3	—	—	—	—	—	—	—
Borzhomi	44.7	302	i 8	19	+ 3	e 15	1	+ 7	—	—	—	—
Piatigorsk	45.0	305	e 8	19?	0	i 14	58?	0	e 9	50	PP	—
Abastumanj	45.1	302	e 8	17	- 3	—	—	—	—	—	—	—
Zugdidi	45.8	303	8	30?	+ 5	—	—	—	—	—	—	—
Guam	47.1	99	10	4	PP	—	—	—	—	—	—	—
Sotchi	47.4	305	8	36	- 2	15	32	0	—	—	—	—
Moscow	49.4	321	i 8	56	+ 3	i 16	2	+ 2	—	—	—	—
Theodosia	50.4	307	e 9	3	+ 2	e 16	20	+ 6	i 10	4	P <sub>c</sub> P	—
Simferopol	51.4	307	9	10?	+ 1	16	26?	- 2	—	—	—	—
Yalta	51.4	306	9	8	- 1	16	31	+ 3	—	—	—	—
Ksara	51.5	292	i 9	9	0	16	31?	+ 2	—	—	—	—
Pulkovo	53.8	326	i 9	28	+ 2	i 17	4	+ 3	—	—	—	—
Kishinev	54.8	309	9	32	- 2	17	14	0	—	—	—	—
Istanbul	55.5	302	i 9	39	0	i 17	25	+ 1	—	—	—	—
Helwan	z. 56.2	289	i 9	43 <sub>a</sub>	- 1	—	—	—	—	—	—	—
Helsinki	56.5	326	i 9	46	0	i 17	39	+ 2	i 14	18	P <sub>c</sub> S	27.0
Cernauti	56.6	311	e 9	48	+ 1	i 17	43	+ 5	—	—	—	—
Bucharest	57.1	307	i 9	51 <sub>a</sub>	+ 1	i 17	48	+ 3	—	—	—	—
Lwow	57.7	313	9	54	- 1	i 17	52	- 1	10	41	P <sub>c</sub> P	—
Warsaw	59.2	317	e 10	8	+ 3	i 18	13	+ 1	i 12	14	PP	e 26.5
Sofia	59.4	305	i 10	7	+ 1	i 18	14	- 1	i 11	12	P <sub>c</sub> P	—
Athens	60.2	300	i 10	12 <sub>a</sub>	0	i 18	22?	- 3	i 13	57	PPP	i 33.8
Skalnate Pleso	60.2	313	i 10	12	0	i 18	30	+ 5	i 10	30	P <sub>c</sub> P	—
Timisoara	E. 60.2	309	i 10	13	+ 1	—	—	—	—	—	—	—
Upsala	N. 60.2	326	i 10	10 <sub>a</sub>	- 2	i 18	24	- 1	i 12	12	PP	e 27.0
Budapest	E. 61.3	311	i 10	21	+ 1	e 18	48	+ 9	11	1	P <sub>c</sub> P	—
	N. 61.3	311	i 10	22	+ 2	18	39	0	12	24	PP	—
Raciborzu	E. 61.4	315	i 10	21	+ 1	—	—	—	e 11	3	P <sub>c</sub> P	—
Kalossa	61.6	311	10	23	+ 1	18	43	0	10	54	P <sub>c</sub> P	—
Ogyalla	61.8	312	e 10	25	+ 2	18	49	+ 3	e 12	53	PP	—
Vienna	62.9	313	i 10	31	+ 1	e 19	17	+17	e 11	7	P <sub>c</sub> P	—
Perth	63.0	161	10	32	+ 1	19	40	+39	13	10	PP	—
Copenhagen	63.6	322	i 10	35	0	i 19	13	+ 5	—	—	—	—
Prague	63.7	315	10	36 <sub>a</sub>	0	i 19	11	+ 1	i 10	52	P <sub>c</sub> P	e 31.5
Potsdam	64.0	318	i 10	40	+ 2	e 19	16	+ 3	i 12	56	PP	33.0
Collmberg	z. 64.3	317	e 10	38	- 1	i 19	18	+ 1	e 13	4	PP	i 27.6
Taranto	64.4	304	10	42	+ 2	19	21	+ 3	14	16	PPP	—
Cheb	65.0	316	10	44	0	i 19	30	+ 4	e 13	50	PP	—
Jena	65.3	316	e 10	45	- 1	i 19	30	+ 1	i 13	26	PP	i 31.5
Triest	65.3	310	i 10	47	+ 1	i 19	29	0	20	0	PPS	—
Adak	66.1	42	i 9	48	-63	e 20	19	PPS	—	—	—	—
Bergen	66.1	328	i 10	51	0	i 19	22	-17	13	28	PP	30.2
Messina	66.3	302	i 10	52 <sub>a</sub>	0	i 19	34	- 8	i 13	21	PP	—
Padova	66.9	309	i 10	56 <sub>a</sub>	0	i 19	49	0	24	30	SS	i 35.9
Tananarive	67.0	231	e 10	54	- 3	e 19	49	- 1	15	5	PPP	29.8
Rocca di Papa	67.2	306	e 10	55	- 3	i 19	48	- 4	e 24	17	SS	—
Bologna	67.3	310	i 11	2 <sub>a</sub>	+ 3	i 19	57	+ 3	e 24	19	SS	e 36.1
Rome	67.4	306	i 10	56 <sub>a</sub>	- 3	i 19	54	- 1	i 13	31	PP	—
Stuttgart	67.4	315	e 10	59	0	i 19	59	+ 4	i 13	39	PP	37.5
Florence Xim	67.6	309	i 10	46	-15	i 19	37	-20	i 20	7	PPS	—
Prato	67.7	309	i 10	1	-60	i 19	54	- 4	—	—	—	—
Chur	67.8	312	e 11	1	- 1	e 20	0	0	—	—	—	—

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		$\Delta$	Az.	P.		O - C.	S.		O - C.	Supp.		L.
		°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.
Karlsruhe		67.8	316	i 11	4	+ 2	i 20	2	+ 2	—	—	e 28.5
Zürich		68.2	314	e 11	4 <sub>a</sub>	0	e 20	5	+ 1	—	—	—
Strasbourg		68.3	315	i 11	6 <sub>a</sub>	+ 1	i 20	7	+ 1	i 11	23	P <sub>c</sub> P i 32.0
Pavia		68.6	311	i 11	8 <sub>a</sub>	+ 1	i 20	10	+ 1	i 28	29	Q i 37.0
De Bilt		68.7	319	i 11	9 <sub>a</sub>	+ 2	i 20	4	- 6	—	—	e 43.5
Basle		68.8	314	e 11	8	0	e 20	13	+ 2	—	—	—
Neuchatel		69.4	314	e 11	11	- 1	e 20	12	- 6	—	—	—
Besançon		69.9	314	i 11	15	0	—	—	—	—	—	—
Tunis		70.8	302	e 11	18	- 2	i 20	28	- 7	e 11	43	P <sub>c</sub> P i 36.2
Aberdeen		70.8	326	i 11	20	0	i 20	39	+ 4	i 14	14	PP 36.5
Durham		71.5	323	i 11	26	+ 2	i 20	46	+ 3	—	—	—
Paris		71.5	316	e 11	24	0	i 20	43	0	i 11	41	P <sub>c</sub> P e 40.5
Edinburgh	E.	71.9	325	i 11	25	- 2	e 20	45	- 3	11	43	P <sub>c</sub> P —
Scoresby Sund		72.0	343	i 11	28	0	—	—	—	—	—	—
Kew		72.2	320	i 11	30 <sub>a</sub>	+ 1	i 20	52	+ 1	i 15	4	PP e 31.5
Clermont-Ferrand		72.3	313	e 11	30	+ 1	i 20	56	+ 4	i 11	48	P <sub>c</sub> P 32.5
Jersey	E.	74.1	318	i 11	41	+ 1	i 21	11	- 1	—	—	32.5
College		74.3	24	e 11	40	- 1	e 21	9	- 6	i 22	0	S <sub>c</sub> S —
Barcelona		74.7	310	i 11	44	+ 1	i 21	18	- 1	—	—	38.0
Rathfarnham Castle		74.7	323	i 11	43	0	i 21	16	- 3	i 21	28	PS 33.5
Reykjavik		75.8	338	e 11	54	+ 4	e 21	42	+11	i 22	19	PS e 38.3
Algiers Univ.	z.	76.1	305	e 11	50	- 1	—	—	—	e 14	39	PP —
Tortosa		76.1	309	i 11	50	- 1	i 21	35	0	12	7	P <sub>c</sub> P 35.5
Brisbane		77.7	130	i 11	56	- 4	i 21	34	-18	—	—	—
Alicante		77.9	307	i 12	3	+ 2	—	—	—	15	11	PP —
Toledo		79.6	310	i 12	11	+ 1	i 22	15	+ 3	15	14	PP —
Granada		80.6	307	i 12	13 <sub>k</sub>	- 3	i 22	27	+ 4	12	25	P <sub>c</sub> P i 38.2
Tamanrasset	z.	80.6	291	12	15 <sub>a</sub>	- 1	—	—	—	—	—	—
Riverview		80.8	136	i 12	17 <sub>k</sub>	0	i 22	25	0	i 12	22	P <sub>c</sub> P e 37.5
Malaga	N.	81.4	307	i 12	23	+ 3	i 22	31	0	i 15	29	PP 39.4
Lisbon		83.6	311	12	32 <sub>a</sub>	+ 1	22	45	- 8	23	35	PS 36.1
Sitka		83.9	26	i 12	35	+ 2	i 22	58	+ 2	e 16	0	PP i 45.8
Pretoria	z.	85.1	238	i 12	37	- 2	e 23	42	+34	e 18	23	PPP e 35.5
Johannesburg	z.	85.5	237	i 12	46	+ 5	i 23	4	[ 0]	—	—	e 37.2
Pietermaritzburg	z.	85.8	233	i 12	42	0	—	—	—	e 30	32	PKKP e 40.5
Iviglut		86.0	344	i 12	42	- 1	i 23	4	[- 3]	i 24	15	PS —
Grahamstown		90.6	232	i 13	5	0	e 21	30?	?	—	—	e 38.5
Lome		91.8	278	e 13	25	+14	e 23	44	[+ 1]	i 17	17	PP 41.6
Honolulu		92.7	64	e 12	53	-22	i 23	49	[+ 1]	i 17	1	PP e 39.2
Victoria		95.2	25	e 13	37 <sub>a</sub>	+10	i 24	5	[+ 3]	17	12	PP —
Seattle		96.3	25	i 13	33 <sub>a</sub>	+ 1	e 27	9	PPS	e 18	12	PP e 41.5
Saskatoon		97.0	14	13	36	+ 1	e 24	8	[- 4]	17	43	PP —
Apia		97.9	101	e 13	40 <sub>a</sub>	+ 1	e 25	13	+10	e 17	45	PP e 47.5
Auckland	N.	98.1	128	e 14	2	+22	e 25	7	+ 3	i 18	40	PKP 45.6
Kaimata	N.E.	98.7	134	e 13	44	+ 2	e 24	27	[+ 6]	e 24	58	S —
New Plymouth	E.	98.7	129	e 14	33	+51	24	52	{+ 7}	e 17	27	PKP —
Cobb River	E.	98.8	132	e 14	55	+72	e 24	50	{+ 4}	e 17	25	PKP —
Arapuni		99.3	128	e 16	16	?	e 24	48	{- 1}	e 18	16	PP —
Christchurch		100.0	134	i 13	56	+ 8	24	20	[- 7]	e 27	15	PS —
Wellington		100.3	131	i 13	54	+ 4	24	20	[- 8]	e 17	35	PKP —
Butte	N.	101.1	20	e 13	56	+ 3	i 24	33	[+ 1]	i 18	6	PP i 49.0
Ferndale		101.3	30	e 14	10	+16	—	—	—	18	2	PKP e 56.5
Bozeman		101.8	19	e 13	53	- 3	i 24	38	[+ 2]	i 18	6	PP e 46.6
Shasta Dam		102.1	29	e 13	58	0	e 25	33	- 5	e 18	7	PP —
Mineral	z.	102.7	28	e 14	1	+ 1	e 18	21	PP	e 17	51	PKP e 49.0
Seven Falls	E.	103.7	352	e 14	10	+ 5	24	38	[- 7]	i 18	24	PP —
Berkeley		104.4	30	e 14	9	+ 1	i 24	54	[+ 6]	e 18	13	PKP e 52.7
Shawinigan Falls	N.	104.5	353	14	14	+ 6	25	52	- 6	i 18	39	PP —
Halifax		104.8	345	14	8	- 2	25	58	- 2	18	36	PP —
Santa Clara		105.0	30	e 14	13	+ 2	i 27	33	PS	i 18	17	PP e 56.0

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	$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.	
	°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.	
Logan	105.1	21	e 14	13	+ 2	e 24	21	[-30]	i 18	30	PP	i 50.0
Ottawa	105.9	355	e 14	14 <sub>a</sub>	- 1	e 24	58	[+ 3]	i 18	39	PP	—
Fresno	106.5	29	e 14	18 <sub>a</sub>	+ 1	e 25	28	[+31]	e 17	59	PKP	e 53.7
Tinemaha	z. 106.8	28	e 18	26	[- 1]	i 30	40	PKKP	e 18	53	PP	—
Harvard	108.3	349	i 14	27	P	—	—	—	i 17	59	PKP	—
Weston	108.4	349	i 14	28	P	i 28	22	PS	i 19	0	PP	—
Buffalo	108.6	357	i 14	28	P	i 25	4	[- 2]	i 18	30	PKP	—
Overton	z. 108.9	26	e 14	30	P	—	—	—	e 19	6	PP	—
Boulder City	109.2	26	e 14	32	P	e 24	54	[-15]	i 18	29	PKP	—
Mount Wilson	z. 109.3	29	e 14	37	P	i 29	57	PKKP	e 38	20	P'P'	—
Pasadena	109.4	29	i 14	31 <sub>a</sub>	P	i 25	13	[+ 3]	i 19	3	PP	e 45.5
Pierce Ferry	109.4	25	e 14	32	P	—	—	—	i 19	16	PP	—
Ann Arbor	109.4	0	e 14	31	P	—	—	—	—	—	—	—
Crest Line	z. 109.7	28	e 14	31	P	—	—	—	—	—	—	—
Chicago	109.8	3	e 14	26	P	e 25	6	[- 5]	e 19	16	PP	e 43.4
Cleveland	110.1	358	i 14	33	P	e 28	48	PS	i 18	17	PKP	—
Pennsylvania	110.7	355	e 14	40	P	—	—	—	i 19	18	PP	e 54.5
Philadelphia	111.3	352	e 14	40	P	e 24	51	[-26]	e 18	35	PKP	i 44.0
Cincinnati	112.5	1	i 14	44	P	—	—	—	i 18	11	PKP	—
Washington	112.5	353	e 14	44	P	i 27	1	{+38}	i 18	19	PKP	e 47.0
Florissant	112.5	5	e 14	44	P	—	—	—	i 19	26	PP	—
St. Louis	112.7	5	e 14	59	P	i 29	13	PS	i 19	28	PP	—
Tucson	114.0	25	e 14	53	P	e 25	35	[+ 7]	e 18	53	PKP	e 54.5
Bermuda	116.7	341	e 14	56	P	e 25	28	[-10]	e 19	42	PP	i 58.5
Columbia	117.6	357	e 15	10	P	i 25	34	[- 8]	e 19	18	PKP	e 48.6
Milton	120.9	3	i 15	42	P	—	—	—	—	—	—	—
Tacubaya	129.8	18	e 19	28	[+16]	i 29	51	PKKP	—	—	—	—
Roosevelt Roads	130.3	336	e 16	22	?	—	—	—	—	—	—	—
San Juan	130.3	337	e 19	17	[+ 4]	i 26	23	[+ 2]	e 21	37	PP	e 50.2
Fort de France	131.8	330	e 16	28	?	e 29	55	PKKP	e 19	58	PKP	—
Port au Prince	131.8	345	e 19	48	[+32]	22	53	PKS	e 22	8	PP	61.5
Swan Island	134.2	359	e 18	43	?	—	—	—	—	—	—	—
Guatemala City	136.4	8	e 22	5	PKS	—	—	—	—	—	—	e 68.8
Balboa Heights	142.4	352	e 19	56	[+21]	e 35	43	PPS	—	—	—	e 72.5
Bogota	145.7	343	i 19	43	[+ 3]	e 23	42	SKP	i 19	57	PKP <sub>2</sub>	e 69.5
Chinchina	145.7	345	i 19	42	[+ 2]	—	—	—	i 19	56	PKP <sub>2</sub>	e 67.5
La Plata	E. 157.5	248	20	7	PKP <sub>2</sub>	26	30	[-32]	24	16	PP	77.8
	N. 157.5	248	20	8	PKP <sub>2</sub>	38	18	PPS	28	42	PPP	75.8
	z. 157.5	248	20	16	PKP <sub>2</sub>	38	48	PPS	24	24	PP	77.7
Buenos Aires	158.0	249	20	10	[+11]	30	56	{- 6}	20	50	PKP <sub>2</sub>	76.9
La Paz	161.4	308	i 20	6 <sub>a</sub>	[+ 4]	i 26	55	[-11]	i 20	51	PKP <sub>2</sub>	71.5
Huancayo	161.8	334	i 20	7	[+ 4]	—	—	—	—	—	—	—
Antofagasta	167.3	290	i 20	14	[+ 6]	i 27	8	[- 2]	i 24	30	PKS	81.4
Santiago	168.1	243	e 20	31	[+23]	—	—	—	—	—	—	—

Additional readings :—

Nagasaki PPP = 7m.30s., eP<sub>c</sub>P = 8m.1s., SS = 12m.21s.  
Hukuoka e = 14m.28s.  
Ooita eSS = 12m.58s.  
Matuyama iE = 11m.8s., iN = 11m.38s.  
Koti iPPP = 7m.43s.  
Sumoto iPPZ = 8m.44s.; PP given as pP.  
Kobe eEZ = 7m.54s., iEZ = 8m.1s., eE = 8m.29s., Q = 16m.50s.  
Osaka e = 10m.20s., iZ = 15m.38s.  
Hikone ePPP = 17m.25s., e = 9m.6s., eSS = 13m.25s.  
Owase eZ = 9m.30s.  
Kameyama e = 15m.18s., Q = 18m.33s.  
Gihu e = 9m.38s.  
Nagoya eE = 10m.9s. and 11m.15s., eQ? = 13m.25s.  
Matsuro e = 18m.16s., i = 11m.0s., S? = 13m.14s., i = 14m.25s., e = 15m.13s., SS? = 16m.25s., Q = 17m.54s.  
Nagano e = 9m.4s.  
Shizuoka PP = 8m.45s., sS = 14m.7s.; PP given as pP.  
Maebasi iPPPEN = 9m.41s., SS?Z = 17m.14s.  
Kumagaya e = 10m.24s. and 16m.24s.  
Osima ePP? = 9m.8s., esPP = 9m.39s., ePPP? = 10m.11s., e = 14m.34s., eS<sub>c</sub>S? = 16m.34s., esSS = 18m.10s., eSSS? = 19m.43s., iQ = 21m.51s.

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Tokyo  $iEN = 7m.54s.$ ,  $iZ = 9m.20s.$ ,  $PPPZ = 9m.45s.$ ,  $i = 12m.51s.$  and  $14m.19s.$ ,  $QEN = 15m.54s.$ ,  $SS = 16m.50s.$ ,  $S_cS^?E = 17m.3s.$   
 Utunomiya  $e = 8m.7s.$ ,  $PPP = 9m.40s.$ ,  $e = 13m.17s.$   
 Tukubasan  $PPP = 10m.31s.$ ,  $Q = 16m.49s.$   
 Hukusima  $e = 10m.32s.$ ,  $16m.48s.$ , and  $21m.46s.$ ,  $Q = 31m.57s.$   
 Mito  $PPPEN = 9m.27s.$   
 Sendai  $P_cP = 12m.38s.$ ,  $Q = 15m.49s.$   
 Mizusawa  $PN = 7m.26s.$   
 Hatinohe  $PPP = 9m.26s.$ ,  $SS = 16m.46s.$   
 Sapporo  $iQ = 16m.34s.$   
 Theodosia  $iPP = 11m.8s.$   
 Helsinki  $iScS = 19m.19s.$ ,  $iSS = 21m.21s.$   
 Bucharest  $iSE = 17m.52s.$   
 Lwow  $ePP = 12m.2s.$   
 Warsaw  $e = 10m.24s.$  and  $10m.40s.$ ,  $i = 11m.19s.$ ,  $iPPP = 13m.47s.$ ,  $i = 16m.5s.$ ,  $19m.25s.$  and  $19m.49s.$ ,  $iSS = 22m.13s.$   
 Sofia  $i = 10m.26s.$ ,  $11m.48s.$ ,  $19m.32s.$ , and  $22m.16s.$   
 Athens  $e = 11m.2s.$  and  $12m.38s.$ ,  $ePPS = 18m.51s.$ ,  $iSS = 22m.20s.?$ ,  $e = 25m.35s.$ ,  $i = 29m.11s.$   
 Skalnate Pleso  $i = 10m.25s.$ ,  $iE = 11m.16s.$ ,  $e = 12m.40s.$ ,  $ePP = 12m.51s.$ ,  $ePPP = 13m.56s.$ ,  $eE = 14m.30s.$ ,  $eN = 14m.53s.$ ,  $c = 15m.36s.$ ,  $eN = 17m.1s.$ ,  $eE = 17m.30s.$ ,  $iN = 17m.42s.$ ,  $eSS = 22m.42s.$   
 Upsala  $iN = 11m.9s.$ ,  $12m.41s.$ ,  $18m.4s.$ , and  $21m.11s.$ ,  $iSSS^?N = 24m.14s.$ ,  $eQN = 25m.24s.$   
 Budapest  $P_cPN = 10m.53s.$ ,  $PPE = 12m.21s.$ ,  $iE = 12m.57s.$ ,  $PPPN = 13m.57s.$ ,  $PPPE = 14m.1s.$ ,  $P_cSE = 15m.2s.$ ,  $P_cSN = 15m.5s.$ ,  $PSE = 19m.3s.$   
 Raciborzu  $ePN = 10m.24s.$   
 Kalossa  $P_cPE = 11m.8s.$ ,  $PPE = 12m.18s.$ ,  $PPN = 12m.21s.$ ,  $PPPN = 13m.53s.$ ,  $PPPE = 14m.0s.$ ,  $P_cSN = 15m.0s.$ ,  $PSN = 18m.59s.$ ,  $PSE = 19m.4s.$  and other unidentified readings.  
 Ogyalla  $ePPP = 14m.5s.$ ,  $ePS = 19m.16s.$ ,  $eSS = 23m.30s.$  and other unidentified phases.  
 Vienna  $PP = 12m.54s.?$ ,  $eSS = 23m.42s.$   
 Perth  $PPP = 14m.28s.$   
 Prague  $PPZ = 13m.18s.$ ,  $PPPZ = 14m.43s.$ ,  $ePS = 19m.30s.?$ ,  $SS = 23m.40s.$ ,  $SSS = 26m.26s.$ , and other unidentified  $e$  and  $i$  readings.  
 Potsdam  $iPPP^?E = 14m.54s.$ ,  $iPPP^?N = 14m.59s.$ ,  $iP_cSE = 15m.26s.$ ,  $iE = 18m.15s.$ ,  $iSE = 19m.20s.$ ,  $iPPSE = 19m.53s.$ ,  $iPPSN = 19m.59s.$ ,  $E = 22m.24s.$ ,  $iSSN = 23m.29s.?$   
 Collmberg  $ePPPE = 14m.49s.$ ,  $eSSN = 24m.6s.$ ,  $eSSSN = 26m.48s.$  and other unidentified phases.  
 Taranto  $i = 11m.12s.$   
 Cheb  $eN = 10m.51s.$ ,  $ePPPN = 15m.3s.$   
 Jena  $iPN = 10m.54s.$ ,  $iP = 11m.2s.$ ,  $iPPN = 13m.30s.$  and  $13m.35s.?$ ,  $iPPPE = 14m.46s.$ ,  $iPPPN = 15m.6s.$ ,  $iSZ = 19m.50s.$ ,  $iSSN = 23m.45s.$  and  $24m.26s.$ ,  $iSSSEN = 27m.30s.$ ,  $iSSSN^?Z = 27m.40s.$   
 Trieste  $i = 11m.20s.$ ,  $eSS = 24m.22s.?$   
 Bergen  $PPPE = 15m.22s.$ ,  $eEN = 16m.14s.$ ,  $SN = 19m.27s.$ ,  $PSN = 19m.36s.$ ,  $SSN = 24m.30s.?$   
 Messina  $i = 11m.11s.$  and  $15m.1s.$ ,  $iPS = 20m.3s.$ ,  $i = 23m.32s.$   
 Padova  $i = 11m.4s.$   
 Tananarive  $iP = 11m.3s.$ ,  $e = 19m.40s.$ ,  $ePPS = 20m.29s.$   
 Rocca di Papa  $i = 12m.13s.$ ,  $SSS = 25m.45s.$   
 Bologna  $iZ = 11m.8s.$ ,  $i = 20m.52s.$ ,  $e = 21m.10s.$ ,  $eSSS = 26m.38s.$ ,  $e = 27m.24s.$   
 Rome  $i = 11m.24s.$ ,  $PPP^? = 14m.51s.$ ,  $iPS = 20m.24s.$ ,  $SS = 24m.27s.$ ,  $SSS = 25m.56s.$   
 Stuttgart  $iPPP = 15m.50s.$ ,  $iSS = 24m.30s.$ ,  $iSSS = 26m.54s.$ ,  $iQ = 28.5m.$   
 Florence  $Xim i = 11m.23s.$   
 Strasbourg  $iPP = 13m.42s.$ ,  $iPPP = 15m.16s.$ ,  $iPS = 20m.38s.$ ,  $iScS = 20m.56s.$ ,  $iSS = 24m.32s.$ ,  $iSSS = 27m.23s.$  and other unidentified  $i$  readings.  
 Tunis  $iPP = 13m.55s.$  and  $14m.4s.$ ,  $iPPP = 15m.34s.$ ,  $iS = 20m.38s.$ ,  $iPS = 20m.59s.$ ,  $iScS = 21m.40s.$  and other unidentified  $i$  readings.  
 Aberdeen  $iPPPN = 15m.12s.$ ,  $iSSN = 25m.46s.$ ,  $iSSSN = 28m.37s.$   
 Paris  $i = 11m.33s.$ ,  $12m.1s.$  and  $13m.49s.$ ,  $iPP = 14m.16s.$ ,  $i = 21m.59s.$ ,  $iSS = 24m.53s.$ ,  $ePKP, PKP = 39m.21s.$   
 Edinburgh  $PPE = 14m.8s.$ ,  $PPPE = 15m.51s.$ ,  $SKSE = 21m.23s.$ ,  $SSE = 25m.26s.$   
 Kew  $i = 12m.34s.$ ,  $ePPP = 16m.52s.$ ,  $iEN = 20m.26s.$ ,  $iPSZ = 21m.10s.$ ,  $eZ = 23m.8s.$ ,  $eSSSZ = 27m.34s.$ ,  $ePKKP^?Z = 30m.32s.$   
 Clermont-Ferrand  $iPP = 14m.18s.$   
 Jersey  $iE = 17m.26s.$   
 College  $iPKKP = 29m.36s.$ ,  $iPKP, PKP = 38m.44s.$   
 Rathfarnham Castle  $iPP = 15m.24s.$ ,  $ePPP = 17m.13s.$ ,  $iZ = 19m.37s.$   
 Reykjavik  $iEN = 12m.12s.$ ,  $12m.50s.$  and  $13m.11s.$ ,  $eEN = 17m.45s.$ ,  $eE = 18m.35s.$ ,  $eSE = 21m.48s.$ ,  $iPS^?N = 22m.52s.$ ,  $iE = 23m.9s.$ ,  $eEN = 30m.54s.$ ,  $eE = 33m.54s.$   
 Algiers Univ.  $ePPPZ = 16m.27s.$   
 Tortosa  $PPN = 14m.44s.$ ,  $PPPN = 16m.35s.$ ,  $ScSE = 21m.58s.$ ,  $PPSN = 22m.36s.$ ,  $SSE = 26m.42s.$ ,  $SSSE = 29m.53s.$   
 Toledo  $PPPZ = 17m.2s.$ ,  $PSZ = 22m.59s.$ ,  $SSZ = 27m.24s.$ ,  $SSSZ = 32m.42s.$   
 Granada  $iPP = 15m.11s.$ ,  $PPP = 16m.34s.$ ,  $PS = 22m.44s.$ ,  $PPS = 23m.34s.$ ,  $iSS = 27m.59s.$ ,  $SSS = 30m.31s.$ ,  $Q = 32.5m.$

*Continued on next page.*

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Riverview iE = 12m.50s., iN = 13m.11s., iE = 13m.15s., 13m.31s., 14m.2s., and 14m.10s.,  
iN = 14m.19s., iEN = 22m.35s., iSSN = 22m.47s., iE = 23m.11s., iN = 24m.4s., iE =  
24m.17s., iN = 24m.24s. and 24m.39s.  
Malaga iPPN = 17m.28s.  
Lisbon P = 12m.52s., iSN = 22m.57s., PSEN = 23m.35s., QE = 35m.26s.  
Sitka ePPS = 24m.0s.  
Pretoria iZ = 30m.46s.  
Pietermaritzburg iZ = 30m.51s.  
Ivigtut i = 14m.37s., 22m.11s., and 22m.46s.  
Grahamstown e = 13m.28s.  
Lome i = 14m.47s. and 17m.46s., ePPP = 19m.2s., i = 19m.46s., iSKKS = 23m.55s., iS =  
24m.11s., iPS = 25m.33s., ePPS? = 26m.27s., ePKKS? = 27m.47s., eSS = 30m.20s.,  
e = 30m.30s., iSSS = 33m.21s., iSSS? = 36m.16s., eQ = 38.0m.  
Honolulu ePP = 16m.54s., eSKS = 23m.23s., iPS = 25m.8s., iPPS? = 25m.24s., eSS =  
30m.30s.  
Victoria i = 14m.21s. and 22m.52s., PKKP = 30m.23s., SS = 39m.48s.  
Seattle e = 16m.52s., 17m.7s., 18m.46s., and 19m.35s., ePPP = 20m.35s., ePPS = 28m.0s.  
Apia eP = 13m.44s., eN = 14m.41s., e = 18m.42s., eE = 20m.6s., eEN = 31m.46s., eE =  
41m.15s.  
Auckland ePN = 14m.20s., eSN = 26m.53s., ePKKPN = 30m.50s.  
New Plymouth eE = 21m.13s. and 22m.19s., eSKKS?E = 25m.51s.  
Cobb River ePPE = 18m.21s.  
Arapuni e = 19m.11s. and 31m.48s.  
Christchurch i = 14m.41s. and 15m.34s., iEN = 18m.54s., e = 23m.15s., eSSZ = 32m.30s.  
Wellington e = 14m.15s., ePP = 18m.12s., SKKS = 24m.56s.  
Butte eSN = 24m.3s., iPPS?N = 28m.18s., iN = 30m.44s. and 33m.53s., ePKP,PKP?N =  
39m.1s.  
Ferndale eE = 21m.42s., eN = 29m.20s., eE = 34m.44s.  
Bozeman ePPP = 21m.13s., eS = 26m.11s., i = 27m.31s., ePSPS = 33m.45s.  
Shasta Dam eSKS = 24m.24s., ePKKP? = 30m.8s., ePKP,PKP = 38m.27s., ePKP,  
PKP,PKP? = 59m.58s.  
Mineral eZ = 14m.16s., iZ = 14m.54s., eZ = 19m.38s.  
Seven Falls iE = 19m.11s., PPPE = 20m.54s., eE = 23m.45s., SKSE = 24m.58s., SKKSE =  
26m.1s., PSE = 27m.0s., PPSE = 28m.36s., SSE = 34m.12s.  
Berkeley iEN = 15m.9s., eE = 35m.8s., and 45m.5s.  
Shawinigan Falls PPPN = 20m.44s., SKSN = 24m.45s., PSN = 27m.39s., SSN = 33m.36s.  
Halifax SKS = 24m.48s., PS = 27m.56s., PPS = 28m.48s.  
Santa Clara eN = 51m.4s.  
Logan i = 15m.8s. and 17m.25s., e = 24m.11s., iPS = 27m.7s., iSS = 33m.12s.  
Ottawa SKKS = 25m.45s., PS = 27m.48s., PPS = 28m.42s., PKKP = 30m.6s.  
Fresno eZ = 15m.14s. and 16m.22s., eE = 18m.36s., iPPNZ = 18m.44s., eE = 20m.8s.,  
iZ = 29m.14s., eZ = 43m.0s., eE = 53m.42s.  
Boulder City iPP = 19m.7s., iScS = 21m.43s., eSKKS = 26m.9s., ePS? = 28m.50s., i =  
31m.4s., ePKP,PKP = 39m.0s.  
Mount Wilson iZ = 30m.38s.  
Pasadena ePKPZ = 18m.13s., ePPPZ = 21m.30s., eSKS = 24m.54s., ePSN = 28m.12s.,  
ePKKPZ = 29m.48s., iZ = 30m.42s. and 31m.3s., eSSN = 34m.54s., iPKP,PKPZ =  
38m.28s.  
Pierce Ferry i = 15m.33s.  
Chicago ePPP = 21m.36s., eS = 26m.56s., iS = 27m.6s., eSS = 34m.6s., e = 35m.16s. and  
37m.36s., eSSS? = 38m.2s.  
Cleveland ePE = 14m.46s., iPP = 18m.55s., iN = 19m.20s., eE = 19m.33s.  
Pennsylvania eE = 15m.1s.  
Philadelphia ePP = 19m.13s., iPPP = 21m.29s., i = 22m.23s., iS = 26m.53s., i = 27m.52s.,  
iPS = 29m.3s., iPPS = 30m.18s., iSS = 35m.42s., iPSPS = 39m.27s.  
Cincinnati iPP = 19m.12s., i = 19m.29s.  
Washington iPP = 19m.36s., iPPP? = 22m.3s., i = 24m.35s., iPS = 28m.56s., iPSPS =  
35m.49s.  
Florissant i = 23m.55s., and 24m.15s.  
St. Louis i = 19m.53s., 20m.22s., 20m.53s., 22m.45s., 23m.41s. and 27m.49s., iPPS = 30m.6s.  
Tucson ePP = 19m.26s., iPP = 19m.41s., i = 19m.52s., iPS? = 22m.30s., e = 30m.18s.,  
i = 42m.36s.  
Bermuda iPP = 20m.11s., iSKKS = 26m.46s., iS = 27m.51s.  
Columbia ePP = 20m.0s., ePPP = 22m.0s., e = 26m.20s., eS = 27m.34s., e = 28m.35s.,  
ePS? = 29m.28s., iPS = 29m.55s., ePPS = 31m.14s., eSS = 35m.56s., eSSS = 40m.20s.  
Milton e = 17m.18s.  
San Juan i = 22m.35s., eSKS? = 25m.55s., ePS = 32m.8s., eSS = 38m.17s., eSSS =  
43m.24s.  
Fort de France i = 20m.30s.  
Port au Prince i = 20m.53s., PPP = 25m.8s.  
La Plata e. PKP? = 20m.12s., ePKP = 20m.38s.?, SKKS = 31m.54s., SKSP = 34m.42s.,  
PPS = 37m.48s., SS = 43m.54s., PSS = 45m.42s., SSS = 50m.48s., Q = 60m.6s.  
La Plata n. PKP = 20m.19s., SS = 44m.2s., PSS = 45m.11s., SSS = 50m.30s., Q = 65.3m.  
La Plata z. PSS = 45m.54s. Other phases are recorded at La Plata without phase.  
Buenos Aires PP = 24m.28s., PPP = 28m.14s., PPS = 37m.50s., SSS = 51m.4s.  
La Paz iPPZ = 24m.41s., iSKKS = 31m.30s., iPPS = 36m.48s., iSS = 44m.55s., iSSP =  
45m.54s., iSSS = 51m.8s.  
Antofagasta ePeP.PKS? = 32m.27s., eSKSP? = 33m.38s., ePPS? = 36m.56s., iPPPS? =  
39m.31s., iPSPS = 45m.16s., eSSS = 53m.20s., Q = 71.6m. with several other unidenti-  
fied phases.

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Aug. 15d. 15h. 57m. 39s. Epicentre 28°·7N. 96°·6E. (as at 14h.).

	$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.	
	°	°	m.	s.	s.	m.	s.	s.	m.	s.
Andijan	23·2	307	e 4	52	-17	—	—	—	—	—
Fergana	23·5	307	e 5	7?	- 5	—	—	—	—	—
Grozny	43·0	304	e 8	5	+ 2	—	—	—	—	—
Simferopol	51·4	307	e 9	7	- 2	e 16	15	-13	—	—
Copenhagen	63·6	322	i 10	35	0	—	—	—	—	—
Prague	63·7	315	10	36	0	e 19	3	- 7	e 12	52
Collmberg	z. 64·3	317	e 10	38	- 1	—	—	—	—	PP
Jena	E. 65·3	316	e 10	47	+ 1	—	—	—	—	—
Stuttgart	67·4	315	10	59	0	—	—	—	—	—
Strasbourg	68·3	315	i 11	6	+ 1	—	—	—	—	—
Besançon	69·9	314	i 11	16	+ 1	—	—	—	—	—
Paris	71·5	316	i 11	26	+ 2	—	—	—	—	—
Kew	z. 72·2	320	e 11	31	+ 2	—	—	—	—	—
Clermont-Ferrand	72·3	313	i 11	32	+ 3	—	—	—	—	—
College	74·3	24	e 11	49	+ 8	—	—	—	—	—
Algiers Univ.	z. 76·1	305	e 11	51	0	—	—	—	—	—
Hungry Horse	98·5	20	e 13	49	+ 7	—	—	—	—	—

Prague gives also, eN = 11m.0s., ePPPE = 14m.22s., eN = 14m.53s. and 19m.48s.

Aug. 15d. 16h. 29m. 28s. Epicentre 28°·7N. 96°·6E. (as at 15h.).

	$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.	
	°	°	m.	s.	s.	m.	s.	s.	m.	s.
Andijan	23·2	307	e 5	20	+11	e 9	38	+20	—	—
Fergana	23·5	307	e 5	20	+ 8	e 9	41	+18	—	—
Semipalatinsk	25·0	336	e 5	32	+ 5	—	—	—	—	—
Grozny	43·0	304	e 8	9	+ 6	—	—	—	—	—
Tifis	43·7	302	e 8	11	+ 3	—	—	—	—	—
Erevan	43·9	299	e 8	23?	+13	—	—	—	—	—
Leninakan	44·4	301	e 8	17?	+ 3	—	—	—	—	—
Piatigorsk	45·0	305	e 8	18	- 1	—	—	—	—	—
Simferopol	51·4	307	e 9	8	- 1	e 16	34	+ 6	—	—
Warsaw	z. 59·2	317	e 10	10	+ 5	—	—	—	—	—
Copenhagen	63·6	322	i 10	36	+ 1	—	—	—	—	—
Prague	63·7	315	10	36	0	e 19	19	+ 9	e 13	19
Collmberg	z. 64·3	317	i 10	39	0	—	—	—	—	PP
Taranto	64·4	304	11	48	+68	—	—	—	—	—
Jena	65·3	316	e10	46	0	—	—	—	—	—
Triest	z. 65·3	310	i 10	45	- 1	—	—	—	—	—
Stuttgart	67·4	315	10	58	- 1	—	—	—	—	—
Prato	67·7	309	i 11	0	- 1	e 21	16	ScS	—	—
Zürich	68·2	314	e 11	3	- 1	—	—	—	—	—
Strasbourg	68·3	315	i 11	5a	0	—	—	—	—	—
Pavia	68·6	311	e 11	2?	- 5	—	—	—	—	—
Besançon	69·9	314	i 11	14	- 1	—	—	—	—	—
Paris	71·5	316	i 11	25	+ 1	—	—	—	i 11	41
Kew	z. 72·2	320	e 11	28	- 1	—	—	—	—	PcP
Clermont-Ferrand	72·3	313	e 11	30	+ 1	—	—	—	—	—
College	74·3	24	e 11	40	- 1	—	—	—	—	—
Rathfarnham Cas.	z. 74·7	323	e 11	50	+ 7	—	—	—	i 29	7
Algiers Univ.	z. 76·1	305	e 11	49	- 2	—	—	—	e 14	41
Tortosa	N. 76·1	309	13	0	?	—	—	—	—	PP
Granada	80·6	307	i 11	48k	-28	—	—	—	i 15	21
Tamanrasset	z. 80·6	291	i 12	13a	- 3	—	—	—	e 12	22
Pretoria	z. 85·1	238	i 12	29	-10	—	—	—	—	PcP
Pietermaritzburg	z. 85·8	233	i 12	34	- 8	—	—	—	—	—
Hungry Horse	98·5	20	i 13	40	- 2	—	—	—	—	—
Tinemaha	z. 106·8	28	e 18	21	[- 6]	—	—	—	—	—

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		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	
		$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	
Overton	z.	108.9	26	e 18 24	[- 7]	—	—	—	—
Boulder City		109.2	26	e 18 29	[- 2]	—	—	—	—
Pierce Ferry		109.4	25	e 18 20	[- 12]	—	—	e 19 4	PP
Bogota		145.7	343	i 19 37	[- 3]	—	—	—	—

Additional readings :—

Prague eN = 12m.12s., eE = 12m.56s., e = 13m.45s., 14m.10s. and 17m.51s.

Tamanrasset iZ = 14m.3s., iPPZ = 15m.14s.

Aug. 15d. 16h. 49m. 56s. Epicentre 28°·7N. 96°·6E. (as at 16h.29m.).

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	
		$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	
Andijan		23.2	307	e 5 1	- 8	e 9 18	0	—	—
Fergana		23.5	307	e 5 7	- 5	e 9 26	+ 3	—	—
Semipalatinsk		25.0	336	e 5 26	- 1	—	—	—	—
Tiflis		43.7	302	e 8 22	+ 14	—	—	—	—
Leninakan		44.4	301	e 8 15	+ 1	—	—	—	—
Warsaw	z.	59.2	317	e 10 9	+ 4	—	—	—	—
Copenhagen		63.6	322	i 10 36	+ 1	—	—	—	—
Prague		63.7	315	e 10 36	0	—	—	e 12 35	PP
Collnberg	z.	64.3	317	e 10 38	- 1	—	—	—	—
Jena	E.	65.3	316	e 10 46	0	—	—	—	—
Triest	z.	65.3	310	i 10 46	0	—	—	—	—
Stuttgart		67.4	315	10 58	- 1	—	—	—	—
Chur		67.8	312	e 11 0 <sub>a</sub>	- 2	—	—	—	—
Zürich		68.2	314	e 11 2	- 2	—	—	—	—
Strasbourg		68.3	315	i 11 6	+ 1	—	—	i 11 13	P <sub>c</sub> P
Besançon		69.9	314	i 11 14	- 1	—	—	—	—
Paris		71.5	316	i 11 25	+ 1	—	—	i 11 33	P <sub>c</sub> P
Kew	z.	72.2	320	i 11 30	+ 1	—	—	—	—
Clermont-Ferrand		72.3	313	e 11 31	+ 2	—	—	—	—
Algiers Univ.	z.	76.1	305	e 11 49	- 2	—	—	i 11 58	P <sub>c</sub> P
Tortosa		76.1	309	9 29	?	—	—	—	—
Toledo	z.	79.6	310	i 12 13	+ 3	—	—	—	—
Granada		80.6	307	i 12 26 <sub>a</sub>	+ 10	—	—	15 17	PP
Tamanrasset	z.	80.6	291	i 12 16 <sub>k</sub>	0	—	—	i 12 25	P <sub>c</sub> P
Malaga	z.	81.4	307	i 12 27	+ 7	—	—	—	—
Pretoria	z.	85.1	238	e 12 42	+ 3	—	—	—	—
Hungry Horse		98.5	20	e 13 51	+ 9	e 23 4	?	e 17 52	PP
Overton	z.	108.9	26	e 18 21	[- 10]	e 25 53	{ - 4 }	e 19 10	PP
Pierce Ferry		109.4	25	e 18 45	[ + 13 ]	—	—	i 19 18	PP

Additional readings :—

Prague eN = 18m.44s.

Jena eE = 16m.1s.

Tamanrasset iZ = 14m.7s., ePPZ = 15m.16s.

Overton iPPZ = 19m.15s., iZ = 24m.23s.

Aug. 15d. 17h. 16m. 51s. Epicentre 28°·7N. 96°·6E. (as at 16h.).

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.		L.
		$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.		m.
New Delhi	E.	17.0	274	e 3 45	- 16	i 6 24	- 46	—	—	i 9.4
Andijan		23.2	307	e 5 4	- 5	e 9 9	- 9	—	—	—
Fergana		23.5	307	e 5 3	- 9	—	—	—	—	—
Semipalatinsk		25.0	336	e 5 25	- 2	e 9 44	- 5	—	—	—
Stalinabad		25.1	301	i 5 21	- 7	i 9 34	- 17	—	—	—
Grozny		43.0	304	e 8 2	- 1	—	—	—	—	—
Tiflis		43.7	302	e 8 14	+ 6	—	—	—	—	—
Gori		44.2	302	e 8 27	+ 15	—	—	—	—	—
Borzhomí		44.7	302	e 8 21	+ 5	—	—	—	—	—
Simferopol		51.4	307	e 9 5	- 4	—	—	—	—	—

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.
Warsaw	z.	59.2	317	e 10 6	+ 1	—	—	—	—
Copenhagen		63.6	322	i 10 32	- 3	—	—	—	—
Prague		63.7	315	e 10 34	- 2	e 19 54	PPS	—	—
Collimberg	z.	64.3	317	e 10 37	- 2	—	—	—	—
Jena		65.3	316	e 10 45	- 1	—	—	—	—
Stuttgart		67.4	315	10 58	- 1	—	—	—	—
Chur		67.8	312	e 11 0	- 2	—	—	—	—
Zürich		68.2	314	e 11 1	- 3	—	—	—	—
Strasbourg		68.3	315	i 11 4 <sub>a</sub>	- 1	i 11 12	P <sub>c</sub> P	i 13 30	PP
Pavia		68.6	311	e 11 39	P <sub>c</sub> P	—	—	—	—
Besançon		69.9	314	i 11 13	- 2	—	—	i 11 22	P <sub>c</sub> P
Paris		71.5	316	i 11 24	0	—	—	i 11 32	P <sub>c</sub> P
Kew	z.	72.2	320	e 11 29	0	—	—	—	—
Clermont-Ferrand		72.3	313	e 11 29	0	—	—	—	—
College		74.3	24	i 11 52	P <sub>c</sub> P	—	—	—	—
Rathfarnham C.	z.	74.7	323	i 11 31	- 12	—	—	—	—
Algiers Univ.	z.	76.1	305	i 11 49 <sub>a</sub>	- 2	e 12 2	P <sub>c</sub> P	e 14 42	PP
Tortosa		76.1	309	i 11 58	+ 7	i 21 37	+ 2	—	—
Granada		80.6	307	i 12 16 <sub>a</sub>	0	—	—	15 19	PP
Tamanrasset	z.	80.6	291	i 12 14 <sub>a</sub>	- 2	i 12 23	P <sub>c</sub> P	i 15 19	PP
Pietermaritzburg	z.	85.8	233	e 12 45	+ 3	—	—	—	—
Hungry Horse		98.5	20	e 13 50	+ 8	—	—	e 17 49	PP
Tinemaha	z.	106.8	28	e 18 52	PP	—	—	—	—
Overton	z.	108.9	26	i 18 29	[- 2]	—	—	i 19 12	PP
Boulder City		109.2	26	e 18 43	[+ 11]	—	—	—	—
Mount Wilson	z.	109.3	29	e 18 38	[+ 6]	—	—	e 19 12	PP
Pierce Ferry		109.4	25	e 18 1	[- 31]	e 41 37	SSS	i 19 16	PP
Bogota	z.	145.7	343	i 20 48	[+ 68]	—	—	i 20 58	PKP <sub>2</sub>

Additional readings :—

Prague e = 10m.46s., eZ = 10m.53s., e = 20m.18s.

Algiers Univ. iZ = 11m.53s., eZ = 11m.57s.

Aug. 15d. 18h. 38m. 40s. Epicentre 28°·7N. 96°·6E. (as at 17h.).

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
New Delhi		17.0	274	e 3 44	- 17	i 6 38	- 32	7 0	SSS
Nanking		19.4	75	i 4 41 <sub>a</sub>	+ 11	8 27	+ 23	—	—
Hyderabad	N.	20.1	239	i 4 34	- 4	i 8 4	- 15	—	—
Przhevsk		20.2	317	i 4 38	- 1	—	—	—	—
Naryn		21.1	313	e 4 48	0	8 38	- 1	—	—
Almata		21.5	319	i 4 51	- 1	i 8 47	0	—	—
Poona	N.	23.1	249	5 5	- 3	i 9 5	- 11	5 24	PP
Andijan		23.2	307	e 5 11?	+ 2	—	—	—	—
Fergana		23.5	307	e 5 11?	- 1	e 9 24?	+ 1	—	—
Bombay	N.	23.8	251	i 5 14	- 1	i 9 21	- 7	—	—
Irkutsk		24.2	11	i 5 26	+ 7	—	—	—	—
Obi-garm		24.4	302	i 5 21	0	—	—	—	—
Stalinabad		25.1	301	i 5 27	- 1	—	—	—	—
Tashkent		25.5	307	i 5 32	0	i 10 2	+ 5	—	—
Kodaikanal	E.	25.7	229	i 5 34 <sub>a</sub>	+ 1	i 10 2	+ 1	—	—
Samarkand		26.7	302	e 5 41	- 2	—	—	—	—
Colombo	E.	26.8	219	5 44	0	10 15	- 4	—	16.7
Vladivostok		31.7	54	i 6 36	+ 9	—	—	—	—
Kizyl-Arvat		34.8	299	i 5 53	- 61	—	—	—	—
Sverdlovsk		37.8	328	i 7 23	+ 3	i 13 6	- 5	—	—
Baku		39.8	300	e 7 33	- 3	—	—	—	—
Grozny		43.0	304	e 8 3	0	e 14 36?	+ 7	—	—
Tiflis		43.7	302	e 8 11	+ 3	—	—	—	—
Erevan		43.9	299	e 9 59	PP	—	—	—	—
Leninakan		44.4	301	e 8 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.	
Platigorsk		45.0	305	e 8 17	- 2	—	—	i 9 52	P <sub>c</sub> P	—
Moscow		49.4	321	e 8 54	+ 1	e 15 59	- 1	—	—	—
Theodosia		50.4	307	e 9 3	+ 2	e 16 15	+ 1	—	—	—
Simferopol		51.4	307	e 9 8	- 1	16 20	- 8	—	—	—
Yalta		51.4	306	e 9 6	- 3	e 16 25	- 3	—	—	—
Pulkovo		53.8	326	i 9 27	+ 1	i 17 1	0	—	—	—
Kishinev		54.8	309	e 9 33?	- 1	e 17 6?	- 8	—	—	—
Istanbul		55.5	302	e 9 35	- 4	—	—	—	—	—
Helwan		56.2	289	i 9 43 <sub>a</sub>	- 1	i 17 26	- 7	e 10 20	P <sub>c</sub> P	—
Helsinki		56.5	326	e 9 46	0	i 17 37	0	i 17 46	PS	—
Bucharest		57.1	307	i 9 52 <sub>a</sub>	+ 2	i 17 45	0	—	—	—
Warsaw		59.2	317	e 10 9	+ 4	e 18 11	- 1	e 11 3	P <sub>c</sub> P	e 32.3
Timisoara		60.2	309	e 10 39	+27	e 18 23	- 2	—	—	—
Skalnate Pleso		60.2	313	—	—	e 18 28	+ 3	e 19 0	PPS	—
Upsala	N.	60.2	326	e 10 8	- 4	e 18 22?	- 3	e 20 1	S <sub>c</sub> S	e 27.3
Raciborz		61.4	315	e 10 23	+ 3	—	—	—	—	—
Ogyalla		61.8	312	e 10 32	+ 9	e 18 45	- 1	e 13 0	PP	e 34.8
Copenhagen		63.6	322	i 10 36	+ 1	—	—	—	—	—
Prague		63.7	315	e 10 35	- 1	19 10	0	e 13 27	PP	e 35.3
Collnberg	Z.	64.3	317	e 10 37	- 2	—	—	—	—	—
Taranto		64.4	304	—	—	e 19 6	-12	—	—	—
Cheb		65.0	316	e 10 45	+ 1	e 19 28	+ 2	e 23 32	SS	—
Jena		65.3	316	e 10 45	- 1	—	—	e 10 48	P	—
Triest		65.3	310	i 10 44	- 2	i 19 26	- 3	—	—	—
Messina		66.3	302	e 10 55	+ 3	e 19 37	- 5	—	—	—
Padova		66.9	309	e 10 57	+ 1	19 45	- 4	—	—	—
Bologna		67.3	310	e 11 23	+24	e 20 51	+57	—	—	—
Rome		67.4	306	10 59	0	19 49	- 6	—	—	—
Stuttgart		67.4	315	10 57	- 2	—	—	—	—	—
Florence Xim		67.6	309	e 11 1	0	—	—	—	—	—
Prato		67.7	309	e 11 1	0	i 19 52	- 6	—	—	—
Chur		67.8	312	e 10 54	- 8	e 19 50	-10	—	—	—
Zürich		68.2	314	i 10 59	- 5	—	—	—	—	—
Strasbourg		68.3	315	e 11 5	0	e 20 3	- 3	e 11 26	P <sub>c</sub> P	—
Pavia		68.6	311	e 10 50	-17	—	—	—	—	—
De Bilt		68.7	319	i 11 11	+ 4	i 20 16	+ 6	—	—	—
Besançon		69.9	314	e 11 14	- 1	—	—	e 11 31	P <sub>c</sub> P	—
Paris		71.5	316	i 11 24	0	—	—	—	—	—
Kew	Z.	72.2	320	e 11 28	- 1	—	—	—	—	—
Clermont-Ferrand		72.3	313	e 11 30	+ 1	—	—	—	—	—
Collego		74.3	24	i 11 45	+ 4	e 21 35	+20	e 38 42	P'P'	e 44.9
Algiers Univ.	Z.	76.1	305	e 11 48	- 3	—	—	i 12 1	P <sub>c</sub> P	—
Tortosa		76.1	309	11 52	+ 1	21 33	- 2	22 5	PS	—
Brisbane	Z.	77.7	130	i 12 5	+ 5	—	—	—	—	—
Alicante		77.9	307	i 12 7	+ 6	21 53	- 1	15 5	PP	e 36.6
Toledo	Z.	79.6	310	i 12 11	+ 1	—	—	—	—	—
Granada		80.6	307	i 12 19 <sub>a</sub>	+ 3	i 22 18	- 5	12 54	P <sub>c</sub> P	—
Tamanrasset	Z.	80.6	291	i 12 14 <sub>k</sub>	- 2	—	—	e 12 23	P <sub>c</sub> P	—
Riverview		80.8	136	i 12 24 <sub>a</sub>	+ 7	i 22 34	+ 9	—	—	—
Malaga	Z.	81.4	307	i 12 33	+13	—	—	—	—	—
Pretoria	Z.	85.1	238	i 12 38	- 1	—	—	—	—	—
Pietermaritzburg	Z.	85.8	233	i 12 42	0	—	—	—	—	—
Shasta Dam		102.1	29	e 17 53	PP	—	—	—	—	—
Tinemaha	Z.	106.8	28	e 18 45	PP	—	—	—	—	—
Harvard		108.3	349	i 18 55	PP	—	—	—	—	—
Overton	Z.	108.9	26	e 17 20	?	—	—	i 19 6	PP	—
Boulder City		109.2	26	e 19 3	PP	—	—	—	—	—
Pierce Ferry		109.4	25	e 18 33	[+ 1]	—	—	i 19 9	PP	—
Tucson		114.0	25	e 18 49	[+ 8]	—	—	—	—	—
Bogota	Z.	145.7	343	i 18 34	[-66]	—	—	—	—	—
Chinchina		145.7	345	i 19 46	[+ 6]	—	—	—	—	—
Huancayo		161.8	334	e 20 10	[+ 7]	—	—	e 21 50	PKP <sub>s</sub>	—

For Notes see next page.

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NOTES TO AUGUST 15d. 18h. 38m. 40s.

Additional readings and notes :—

New Delhi iE = 6m.48s. and 7m.6s.  
 Poona PPPN = 5m.50s., SSN = 9m.53s., SSSN = 10m.5s.  
 Piatigorsk ePPP = 10m.47s.  
 Warsaw ePPZ = 12m.16s., ePPE = 12m.19s., ePPPZ = 13m.41s., ePPPE = 13m.53s.,  
 eSE = 18m.15s., eSZ = 18m.23s., S<sub>c</sub>SE = 19m.59s., SSE = 21m.57s., SSSE = 24m.34s.  
 Timisoara eN = 18m.26s.  
 Upsala eN = 11m.59s., 17m.43s., 18m.39s., 19m.45s., 21m.52s., and 22m.38s., eQN = 24m.44s.  
 Ogyalla ePPP = 14m.13s., e = 14m.38s. and 20m.0s.  
 Prague ePPPE = 14m.33s., ePSE = 19m.29s., eSS = 23m.38s., eSSS = 25m.58s. and several other e readings.  
 Strasbourg e = 12m.9s.  
 Besançon i = 12m.15s., e = 13m.28s.  
 Paris i = 11m.33s. and 11m.45s.?  
 Algiers Univ. ePPZ = 14m.42s., ePPPZ = 16m.28s.  
 Alicante PS = 22m.17s., PPS = 22m.49s.  
 Granada iPP = 15m.9s., PPP = 17m.9s., PS = 23m.9s., SS = 27m.47s.  
 Tamanrasset iZ = 13m.10s., ePPZ = 15m.16s., ePPPZ = 17m.1s.  
 Long waves were also recorded at Dehra Dun, Edinburgh, Ivigtut, and Seattle.

Aug. 15d. 19h. 58m. 45s. Epicentre 28°·7N. 96°·6E. (as at 18h.).

		Δ	Az.	P.	O - C.	S.	O - C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m.	s.
Przhevsk		20·2	317	e 4 43	+ 4	—	—	—	—
Almata		21·5	319	e 4 48	- 4	8 41	- 6	—	—
Frunse		22·7	314	e 5 8	+ 4	—	—	—	—
Andijan		23·2	307	e 5 19	+10	—	—	—	—
Fergana		23·5	307	e 5 27	-10	e 9 14?	- 9	—	—
Irkutsk		24·2	11	e 5 24	+ 5	—	—	—	—
Obi-garm		24·4	302	5 18	- 3	9 29	-10	—	—
Stalinabad		25·1	301	i 5 24	- 4	i 9 47	- 4	—	—
Tashkent		25·5	307	e 5 28	- 4	e 9 57	0	—	—
Samarkand		26·7	302	e 5 48	+ 5	—	—	—	—
Sverdlovsk		37·8	328	i 7 19	- 1	—	—	—	—
Borzhomi		44·7	302	e 8 14	- 2	—	—	—	—
Moscow		49·4	321	e 8 52	- 1	e 15 57	- 3	—	—
Prague	E.	63·7	315	e 10 33	- 3	—	—	e 12 20	PP
Collmberg	Z.	64·3	317	e 10 45	+ 6	—	—	—	—
Jena	E.	65·3	316	e 10 46	0	—	—	—	—
Stuttgart		67·4	315	10 57	- 2	—	—	—	—
Strasbourg		68·3	315	e 11 3	- 2	—	—	e 11 12	P <sub>c</sub> P
Besançon		69·9	314	e 11 12	- 3	—	—	i 11 20	P <sub>c</sub> P
Paris		71·5	316	i 11 23	- 1	—	—	i 12 31	P <sub>c</sub> P
College		74·3	24	e 11 45	+ 4	—	—	—	—
Algiers Univ.	Z.	76·1	305	e 11 46	- 5	i 11 56	P <sub>c</sub> P	e 14 30	PP
Brisbane	Z.	77·7	130	i 12 0	0	—	—	—	—
Tamanrasset	Z.	80·6	291	i 12 13	- 3	e 22 12	-11	e 12 22	P <sub>c</sub> P
Pretoria	Z.	85·1	238	i 12 40	+ 1	—	—	—	—
Pietermaritzburg	Z.	85·8	233	e 12 44	+ 2	—	—	—	—
Hungry Horse		98·5	20	e 13 45	+ 3	—	—	—	—
Pierce Ferry		109·4	25	e 18 58	[+26]	—	—	—	—

Additional readings :—

Jena eN = 10m.51s.?  
 College e = 11m.54s.  
 Tamanrasset eZ = 13m.5s., ePPZ = 15m.11s., ePPPZ = 17m.4s.

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Aug. 15d. 21h. 1m. 34s. Epicentre 28°·7N. 96°·6E. (as at 19h.).

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
New Delhi		17·0	274	e 3 55	- 6	i 7 2	- 2	—	7·0
Nanking		19·4	75	i 4 29	- 1	8 13	+ 9	—	i 10·8
Hyderabad	N.	20·1	239	i 4 24	-14	i 8 4	-15	—	—
Przhevsk		20·2	317	e 4 46	+ 7	—	—	—	—
Naryn		21·1	313	e 4 52	+ 4	e 8 57	+18	—	—
Almata		21·5	319	i 4 58	+ 6	i 9 9	+22	—	—
Frunse		22·7	314	i 5 10	+ 6	i 9 34	+25	—	—
Poona	N.	23·1	249	e 5 0	- 8	e 9 11	- 5	—	10·0
Andijan		23·2	307	e 5 16	+ 7	e 9 41	+23	—	—
Fergana		23·5	307	e 5 15	+ 3	e 9 39	+16	—	—
Bombay	N.	23·8	251	e 5 13	- 2	e 9 31	+ 3	—	—
Irkutsk		24·2	11	5 29?	+10	e 9 53?	+18	—	—
Obi-garm		24·4	302	i 5 23?	+ 2	i 9 55?	+16	—	—
Stalinabad		25·1	301	i 5 30	+ 2	i 10 0	+ 9	—	—
Tashkent		25·5	307	i 5 34	+ 2	i 10 15	+18	—	—
Kodaikanal	E.	25·7	229	i 5 25k	- 8	i 9 55	- 6	—	—
Samarkand		26·7	302	e 5 47	+ 4	—	—	—	—
Vladivostok		31·7	54	i 6 29	+ 2	—	—	—	—
Kizyl-Arvat		34·8	299	e 6 53	- 1	—	—	—	—
Sverdlovsk		37·8	328	i 7 26	+ 6	13 29	+18	—	—
Grozny		43·0	304	e 8 5	+ 2	—	—	—	—
Tiflis		43·7	302	8 9	+ 1	—	—	—	—
Borzhomi		44·7	302	8 19	+ 3	—	—	—	—
Moscow		49·4	321	e 8 57	+ 4	e 16 12	+12	—	—
Simferopol		51·4	307	e 9 9	0	e 16 34	+ 6	—	—
Yalta		51·4	306	e 9 9	0	e 16 30?	+ 2	—	—
Ksara		51·5	292	i 9 9	0	16 31	+ 2	—	—
Pulkovo		53·8	326	e 9 29	+ 3	e 17 12	+11	—	—
Istanbul		55·5	302	e 9 39	0	—	—	—	—
Helwan	z.	56·2	289	e 9 39	- 5	—	—	10 38	P <sub>c</sub> P
Warsaw		59·2	317	e 10 9	+ 4	e 18 29	+17	—	e 33·4
Upsala	N.	60·2	326	e 11 46	?	e 18 37	+12	e 20 18	S <sub>c</sub> S e 32·4
Copenhagen		63·6	322	i 10 37	+ 2	—	—	—	—
Prague		63·7	315	e 10 37	+ 1	e 19 7	- 3	e 23 15	SS
Collnberg	z.	64·3	317	e 10 40	+ 1	—	—	—	—
Taranto		64·4	304	—	—	e 19 13	- 5	—	—
Triest	z.	65·3	310	i 10 46	0	—	—	—	—
Stuttgart		67·4	315	10 59	0	—	—	—	—
Rome		67·4	306	e 10 55	- 4	e 19 42	-13	—	—
Florence Xim		67·6	309	e 10 47	-14	—	—	—	—
Chur		67·8	312	e 11 0	- 2	—	—	—	—
Zürich		68·2	314	e 11 3	- 1	—	—	—	—
Strasbourg		68·3	315	i 11 6k	+ 1	—	—	—	—
Besançon		69·9	314	i 11 16	+ 1	—	—	—	—
Paris		71·5	316	i 11 25	+ 1	—	—	—	—
Kew	z.	72·2	320	e 11 29	0	—	—	—	e 43·6
Algiers Univ.	z.	76·1	305	i 11 48	- 3	—	—	—	—
Tortosa	N.	76·1	309	10 44	-67	i 12 52	?	—	—
Granada		80·6	307	13 3 <sub>a</sub>	+47	—	—	e 15 24	PP
Tamanrasset		80·6	291	i 12 14 <sub>a</sub>	- 2	—	—	e 12 22	P <sub>c</sub> P
Pretoria	z.	85·1	238	i 12 31	- 8	—	—	—	—
Pietermaritzburg	z.	85·8	233	e 12 34	- 8	—	—	—	—
Hungry Horse		98·5	20	e 13 42	0	—	—	—	—
Pierce Ferry		109·4	25	e 18 26	PP	—	—	—	—

Additional readings :—

Upsala eN = 26m.45s., 28m.3s., and 30m.56s.

Prague eN = 11m.2s., 11m.29s., and 11m.58s., ePP? = 13m.30s., eN = 15m.29s. and 17m.7s., eE = 18m.33s.

Strasbourg e = 11m.33s.

Granada PPP = 17m.22s.

Tamanrasset ePPZ = 15m.16s.

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Aug. 15d. 21h. 42m. 14s. Epicentre 25°·0N. 93°·0E.

Intensity VI at Bagdogra, Berhampur, Dhanbad, Tezpur, Darjeeling, Gaubati, and Malda; V at Pandu. Epicentre 25°·5N. 93°·0E.  
Seismo. Bull. Indian Government, August, 1950, p. 12.

A second shock is recorded at some stations approximately 12secs. later.

A = -·0475, B = +·9062, C = +·4203;  $\delta = +11$ ;  $h = +3$ ;  
D = +·999, E = +·052; G = -·022, H = +·420, K = -·907.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Dehra Dun	N.	14·2	295	e 0 10	?	e 2 28	?	—	e 9·7
New Delhi		14·6	288	e 3 27	- 3	i 5 59	-14	6 15	5·9
Hyderabad	N.	15·5	244	i 3 54	+12	i 6 20	-15	—	—
Poona	N.	18·9	254	3 39	-45	i 7 36	-17	8 19	7·9
Bombay	N.	19·7	256	i 4 17	-17	i 8 15	+ 5	—	—
Kodaikanal	E.	20·8	230	i 4 50k	+ 5	i 8 41	+ 8	—	9·8
Przhevalsk		21·2	330	i 4 52	+ 3	8 41	0	—	—
Naryn		21·6	325	e 4 55	+ 1	e 8 43	- 6	—	—
Almata		22·5	328	i 5 5	+ 3	i 9 7	+ 2	—	—
Andijan		23·3	317	e 5 14	+ 4	e 9 24	+ 4	—	—
Frunse		23·4	323	i 5 13	+ 2	i 9 24	+ 3	—	—
Fergana		23·5	316	e 5 13	+ 1	e 9 21	- 2	—	—
Nanking		23·7	66	(e 5 15)	+ 1	i 9 30	+ 3	—	—
Obi-garm		24·0	311	e 5 7?	-10	i 9 33?	+ 1	—	—
Stalinabad		24·6	310	i 5 24	+ 1	i 9 39	- 3	—	—
Tashkent		25·6	315	5 31	- 1	—	—	—	—
Samarkand		26·3	310	i 5 41	+ 2	—	—	—	—
Semipalatinsk		27·2	342	e 5 39	- 8	—	—	—	—
Irkutsk		28·6	13	6 16?	+16	10 40	- 8	—	—
Mary		29·3	303	e 6 4	- 2	—	—	—	—
Kizyl-Arvat		33·9	304	i 6 46	- 1	—	—	—	—
Sverdlovsk		39·4	332	i 7 35	+ 2	i 13 31	- 4	—	—
Grozny		42·5	308	e 7 53	- 6	—	—	i 9 20	PP
Erevan		43·0	303	e 8 11	+ 8	—	—	—	—
Tiflis		43·0	305	i 8 5?	+ 2	i 14 33?	+ 4	—	—
Leninakan		43·6	304	e 8 10	+ 2	—	—	—	—
Borzhomi		44·1	305	8 13	+ 1	—	—	—	—
Piatigorsk		44·6	308	e 8 14	- 2	—	—	—	—
Theodosia		50·1	309	e 8 57?	- 2	e 16 4?	- 6	—	—
Moscow		50·3	323	i 9 1	+ 1	i 16 6	- 7	—	—
Ksara		50·9	293	i 8 59	- 6	16 27?	+ 6	—	—
Simferopol		51·0	309	9 6	0	e 16 18	- 4	—	—
Yalta		51·0	308	i 9 5	- 1	16 18	- 4	—	—
Helwan		54·4	290	i 9 30 <sub>a</sub>	- 1	e 17 16	+ 7	e 10 35	PcP
Istanbul		54·8	304	e 9 33	- 1	—	—	e 9 50	?
Kishinev		54·8	312	9 32?	- 2	—	—	—	—
Pulkovo		55·0	327	i 9 36	+ 1	i 17 11	- 6	—	—
Bucharest		56·8	308	i 9 48 <sub>a</sub>	0	e 17 38	- 3	—	—
Helsinki		57·8	327	e 9 50	- 5	i 17 45	- 9	e 18 5	PS
Athens		59·3	300	e 10 3 <sub>a</sub>	- 3	—	—	e 10 17	?
Warsaw		59·7	318	e 10 10k	+ 1	e 18 18	- 1	e 12 24	PP
Timisoara	E.	60·1	310	i 10 12	+ 1	—	—	—	e 33·8
Skalnate Pleso		60·4	314	e 10 16	+ 3	e 18 26	- 2	e 12 59	PP
Budapest		61·4	312	i 10 20	0	e 18 35	- 5	10 46	PcP
Upsala	N.	61·4	326	e 10 8	-12	e 18 11	-29	e 19 46	ScS
Kalossa		61·5	312	e 10 21	0	e 18 38	- 4	e 10 47	PcP
Ogyalla		61·9	313	e 10 25	+ 1	e 19 3	+16	e 12 58	PP
Taranto		63·8	305	10 33	- 3	19 14	+ 3	—	—
Prague		64·1	316	10 38	0	19 11	- 3	e 13 14	PP
Copenhagen		64·5	322	i 10 40	- 1	i 19 15	- 4	—	e 38·6
Collnberg		64·8	317	i 10 41 <sub>a</sub>	- 2	e 19 22	- 1	e 13 6	PP
Triest		65·3	311	i 9 44	-62	i 18 24	-65	—	—
Cheb		65·4	316	i 11 7	+20	19 29	- 1	e 26 52	SSS
Messina		65·5	303	e 10 50	+ 3	e 19 46	+14	—	—
Jena		65·7	316	e 10 48	0	e 19 30	- 4	e 13 15	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.
Padova	66.8	310	e 10	18	-38	e 19	42	- 6	—	—	—
Rome	67.0	307	e 10	54	- 3	19	56	+ 6	—	—	e 39.7
Bologna	67.2	311	e 10	56	- 2	e 19	48?	- 4	—	—	—
Florence Xim	67.4	309	i 11	10	+11	—	—	—	—	—	—
Prato	67.5	309	i 11	10	+10	i 20	4	+ 8	—	—	—
Stuttgart	67.7	315	e 10	56	- 5	e 19	55	- 3	e 13	27	PP e 34.8
Chur	67.9	313	e 10	56	- 6	—	—	—	—	—	—
Karlsruhe	68.1	316	i 11	2	- 2	e 20	2	- 1	—	—	e 42.8
Zürich	68.4	314	e 11	4 <sub>a</sub>	- 2	—	—	—	—	—	—
Pavia	68.5	312	e 11	9	+ 3	—	—	—	—	—	—
Strasbourg	68.6	315	i 11	7 <sub>a</sub>	0	i 20	6	- 3	i 11	25	P <sub>c</sub> P e 33.8
Basle	69.0	314	e 11	9	0	e 20	27	+13	—	—	—
De Bilt	69.4	319	i 11	10	- 2	e 20	16	- 2	i 13	46	PP e 34.8
Neuchatel	69.6	314	e 11	12	- 1	e 20	15	- 6	—	—	—
Besançon	70.1	314	i 11	16	0	—	—	—	e 13	29	PP
Paris	71.9	316	i 11	28	+ 1	i 20	43	- 5	i 11	44	P <sub>c</sub> P e 39.8
Aberdeen	72.0	325	i 11	45	+17	i 20	44	- 5	i 21	53	PPS
Clermont-Ferrand	72.5	313	i 11	31	+ 1	e 21	7	+13	e 14	13	PP
Kew	72.8	319	e 11	33	+ 1	e 20	54	- 4	e 21	10	PS e 33.8
Algiers Univ. z.	75.5	304	i 11	46 <sub>a</sub>	- 2	—	—	—	e 14	41	PP
Rathfarnham Castle	75.6	323	e 11	35	-13	e 21	34	+ 5	i 12	7	P <sub>c</sub> P
Tortosa	75.9	309	i 11	51	+ 1	i 21	38	+ 6	12	8	P <sub>c</sub> P
Alicante	77.5	306	i 12	3	+ 4	22	3	+13	15	1	PP e 38.1
Brisbane z.	77.9	127	i 12	5	+ 4	—	—	—	—	—	—
Tamanrasset z.	78.5	290	i 12	6 <sub>a</sub>	+ 2	—	—	—	i 12	15	P <sub>c</sub> P
College	79.0	22	i 12	7	0	e 22	2	- 4	e 15	8	PP e 39.0
Toledo z.	79.5	309	i 12	12	+ 2	—	—	—	—	—	—
Granada	80.2	306	i 12	11 <sub>k</sub>	- 3	i 22	20	+ 1	12	38	P <sub>c</sub> P 45.6
Pretoria z.	80.4	236	i 12	18	+ 3	—	—	—	—	—	—
Malaga z.	81.0	306	i 12	17	- 1	—	—	—	—	—	—
Pietermaritzburg z.	81.0	231	e 12	23	+ 5	—	—	—	—	—	—
Grahamstown	85.7	230	i 12	47	+ 5	—	—	—	e 13	3	P <sub>c</sub> P
Sitka	88.4	24	i 13	0	+ 5	i 23	24	[+ 1]	e 16	20	PP e 47.8
Victoria z.	99.9	23	e 13	53	+ 5	—	—	—	—	—	—
Shasta Dam	106.8	27	e 14	27	P	—	—	—	e 18	16	PP
Berkeley z.	109.2	28	e 19	17	PP	—	—	—	—	—	—
Logan	109.7	19	e 19	7	PP	e 26	41	S	—	—	e 63.1
Lick z.	109.9	28	e 18	38	[+ 5]	—	—	—	e 19	23	PP
Fresno z.	111.2	27	e 18	22	[-14]	—	—	—	e 19	31	PP
Harvard	111.3	347	e 19	21	PP	—	—	—	—	—	e 55.2
Weston	111.4	347	e 19	3	PP	—	—	—	—	—	e 59.4
Overton z.	113.6	24	e 14	15	P	e 29	37	PKKP	i 18	57	PKP
Boulder City	113.9	24	e 18	45	[+ 4]	—	—	—	—	—	—
Pierce Ferry	114.1	24	e 18	18	[-23]	—	—	—	i 19	27	PP
Pasadena z.	114.2	27	e 18	40	[- 1]	—	—	—	—	—	—
Philadelphia	114.4	350	e 22	23	PKS	e 29	17	PS	—	—	e 51.9
Washington	115.8	352	e 19	48	PP	e 22	23	PKS	—	—	e 67.0
Tucson	118.7	23	e 18	54	[+ 4]	—	—	—	e 20	41	PP
Bogota z.	148.1	336	i 19	50	[+ 6]	—	—	—	i 20	2	PKP <sub>2</sub>
Chinchina	148.2	338	i 19	48	[+ 3]	i 23	16	PKS	—	—	—
Huancayo	163.0	319	e 20	10	[+ 6]	—	—	—	e 20	59	PKP <sub>2</sub>

Additional readings :—

Hyderabad ePN = 2m.36s.

Poona SSSN = 8m.39s.

Nanking e = 1m.40s. ; true P is given as S.

Helwan eZ = 12m.8s.

Warsaw ePN = 10m.14s., eZ = 10m.27s., eE = 10m.31s., eZ = 11m.33s., ePPN = 12m.29s.,

ePPPZ = 13m.47s., eSZ = 18m.53s., eZ = 18m.24s., ePS?N = 18m.34s., eZ = 18m.50s.,

eE = 19m.8s., eSSE = 21m.56s., eSSZ = 22m.0s., eSSSZ = 24m.34s.

Skalnate Pleso ePS = 18m.46s., eSSS = 24m.52s.

Budapest eSE = 18m.49s.

Upsala eSSSN = 24m.16s.

Kalossa eN = 10m.24s., eSE = 18m.51s.

Ogyalla ePPP = 14m.3s., ePS = 19m.25s., eSS = 23m.10s.

Prague i = 10m.51s., iNZ = 10m.55s., e = 11m.5s. and 14m.5s., ePPPE = 14m.32s.,

e = 15m.14s., ePS = 19m.30s., e = 20m.5s., eSS = 25m.58s.

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Collmberg iZ = 10m.53s.  
 Jena eE = 11m.1s. and 15m.4s., ePS?EN = 19m.49s.  
 Stuttgart iP = 11m.1s., e = 11m.13s., i = 11m.18s., ePS = 20m.12s.  
 Chur iP = 11m.2s.  
 Strasbourg eSS = 24m.28s., eSSS = 27m.46s.?  
 Paris iPP = 14m.8s., e = 38m.9s., ePKP,PKP = 39m.30s.  
 Aberdeen iE = 18m.45s., eEN = 28m.55s.  
 Clermont-Ferrand i = 11m.49s., ePPP = 16m.7s.  
 Kew eZ = 11m.45s.  
 Algiers Univ. iZ = 12m.13s.  
 Tortosa PPE? = 14m.51s.  
 Alicante PPP = 16m.49s., SS = 26m.43s.  
 Tamanrasset iPPZ = 15m.20s., ePPPZ = 17m.8s.  
 College i = 12m.20s., eScS = 22m.27s.  
 Granada iPP = 15m.17s., ePPP = 16m.35s., PS = 22m.53s., SS = 27m.35s.  
 Sitka ePS = 23m.42s., iPPS = 24m.4s., eSS = 29m.16s., e = 33m.56s.  
 Pierce Ferry i = 19m.42s.  
 Long waves were also recorded at Edinburgh, Bermuda, Seven Falls, and Seattle.

Aug. 15d. 22h. 30m. 47s. Epicentre 28°·7N. 96°·6E. (as at 21h. 1m.),

	$\Delta$ °	Az. °	P. m. s.	O - C. s.	S. m. s.	O - C. s.	Supp. m. s.	
Naryn	21·1	313	e 4 44	- 4	e 8 32	- 7	—	—
Almata	21·5	319	i 4 50	- 2	e 8 45	- 2	—	—
Frunse	22·7	314	e 5 3	- 1	e 9 5	- 4	—	—
Fergana	23·5	307	e 5 10	- 2	e 9 16	- 7	—	—
Irkutsk	24·2	11	e 5 27	+ 8	e 9 43	+ 8	—	—
Stalinabad	25·1	301	e 5 42	+14	—	—	—	—
Tashkent	25·5	307	e 5 27?	- 5	—	—	—	—
Sverdlovsk	37·8	328	e 7 22	+ 2	—	—	—	—
Moscow	49·4	321	e 8 54	+ 1	—	—	—	—
Collmberg	z. 64·3	317	e 10 47	+ 8	—	—	—	—
Stuttgart	67·4	315	11 0	+ 1	—	—	—	—
Chur	67·8	312	e 10 58	- 4	—	—	—	—
College	74·3	24	e 11 47	+ 6	—	—	—	—
Tamanrasset	z. 80·6	291	i 12 17	+ 1	e 16 14	PP	e 12 25	P <sub>c</sub> P

Aug. 15d. 23h. 44m. 33s. Epicentre 28°·7N. 96°·6E. (as at 22h.).

Felt at Tezpur. Seismological Bull., Gov. of India, Aug., 1950., p.13.

	$\Delta$ °	Az. °	P. m. s.	O - C. s.	S. m. s.	O - C. s.	Supp. m. s.	L. m.
New Delhi	17·0	274	e 4 7	+ 6	i 6 30	-40	—	—
Nanking	19·4	75	i 4 52	+22	e 8 53	+49	—	10·0
Hyderabad	N. 20·1	239	e 4 33	- 5	8 9	-10	—	—
Naryn	21·1	313	i 4 44	- 4	e 8 30	- 9	—	—
Almata	21·5	319	i 4 52	0	i 8 46	- 1	—	—
Frunse	22·7	314	i 5 3?	- 1	e 9 8?	- 1	—	—
Poona	N. 23·1	249	5 3	- 5	i 9 6	-10	—	—
Andijan	23·2	307	e 5 11	+ 2	e 9 12	- 6	—	—
Fergana	23·5	307	e 5 9	- 3	e 9 11	-12	—	—
Bombay	N. 23·8	251	e 5 7	- 8	i 9 14	-14	—	—
Irkutsk	24·2	11	i 5 32	+13	e 9 55	+20	—	—
Obi-garm	24·4	302	i 5 17	- 4	i 9 33	- 6	—	—
Semipalatinsk	25·0	336	e 5 14?	-13	e 9 37?	-12	—	—
Stalinabad	25·1	301	i 5 24?	- 4	i 9 36?	-15	—	—
Tashkent	25·5	307	i 5 28	- 4	—	—	—	—
Kodaikanal	E. 25·7	229	e 5 33	0	e 10 6	+ 5	—	—
Mary	30·3	297	e 5 43?	-32	—	—	—	—
Vladivostok	31·7	54	e 6 44	+17	e 12 3	+26	—	—
Grozny	43·0	304	e 8 3	0	—	—	—	—
Tiflis	43·7	302	8 8	0	—	—	—	—
Leninakan	44·4	301	e 8 13	- 1	—	—	—	—
Borzhome	44·7	302	8 16	0	—	—	—	—
Moscow	49·4	321	e 8 55	+ 2	e 15 56	- 4	—	—
Simferpol	51·4	307	e 9 7	- 2	e 16 19	- 9,	—	—
Yalta	51·4	306	9 6	- 3	16 16	-12	e 10 12	P <sub>c</sub> P

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	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Ksara	51.5	292	i 9 9	0	16 30	+ 1	—	—
Pulkovo	53.8	326	i 9 29	+ 3	16 57	- 4	—	—
Helwan	56.2	289	i 9 40 <sub>a</sub>	- 4	17 21	-12	e 10 44	P <sub>c</sub> P
Bucharest	57.1	307	i 9 50 <sub>a</sub>	0	e 17 39	- 6	—	—
Warsaw	59.2	317	e 10 8	+ 3	e 18 14	+ 2	e 12 15	PP
Timisoara	60.2	309	10 27?	+15	—	—	—	—
Copenhagen	63.6	322	i 10 37	+ 2	—	—	—	26.4
Prague	63.7	315	e 10 35	- 1	e 19 9	- 1	e 13 28	PP
Collnberg	z. 64.3	317	e 10 39	0	—	—	—	—
Taranto	64.4	304	e 10 45	+ 5	—	—	—	—
Jena	65.3	316	e 10 46	0	—	—	—	—
Triest	65.3	310	e 10 46	0	e 19 24	- 5	—	—
Padova	66.9	309	e 10 56	0	—	—	—	—
Bologna	67.3	310	e 11 21	+22	—	—	—	—
Stuttgart	67.4	315	e 11 0 <sub>a</sub>	+ 1	e 19 50	- 5	—	e 37.4
Rome	67.4	306	e 10 57	- 2	—	—	—	e 36.1
Florence, Xim.	67.6	309	i 11 1	0	—	—	—	—
Prato	67.7	309	i 11 0	- 1	e 19 58	0	—	—
Chur	67.8	312	e 11 1 <sub>a</sub>	- 1	—	—	—	—
Zürich	68.2	314	e 11 4 <sub>a</sub>	0	—	—	—	—
Strasbourg	68.3	315	i 11 6	+ 1	—	—	—	—
De Bilt	68.7	319	i 11 9	+ 2	—	—	—	e 37.4
Basle	68.8	314	e 11 8	0	—	—	—	—
Besançon	69.9	314	e 11 14	- 1	—	—	e 12 25	P <sub>c</sub> P
Paris	71.5	316	i 11 27	+ 3	—	—	—	e 39.4
Kew	z. 72.2	320	e 11 30	+ 1	—	—	—	—
Clermont-Ferrand	72.3	313	e 11 30	+ 1	—	—	—	—
College	74.3	24	i 11 51	+10	—	—	—	—
Rathfarnham C.	z. 74.7	323	i 11 45	+ 2	—	—	i 13 26	?
Algiers Univ.	z. 76.1	305	i 11 50 <sub>a</sub>	- 1	—	—	—	—
Tortosa	76.1	309	11 54	+ 3	e 21 36	+ 1	12 6	P <sub>c</sub> P
Toledo	z. 79.6	310	i 12 12	+ 2	—	—	—	—
Tamanrasset	z. 80.6	291	12 15 <sub>a</sub>	- 1	—	—	e 12 24	P <sub>c</sub> P
Granada	80.6	307	i 12 18 <sub>k</sub>	+ 2	22 22	- 1	12 49	P <sub>c</sub> P
Malaga	z. 81.4	307	i 12 21	+ 1	—	—	—	45.2
Pretoria	z. 85.1	238	i 12 41	+ 2	—	—	i 12 45	P <sub>c</sub> P
Hungry Horse	98.5	20	i 13 52	+10	—	—	—	—
Bogota	z. 145.7	343	i 19 48	[+ 8]	—	—	—	—
Chinchina	145.7	345	i 20 49	[+69]	—	—	—	—

Additional readings :—

Nanking e = 7m.58s.

Yalta eSS = 20m.33s.

Helwan eZ = 17m.36s.

Warsaw ePPE = 12m.20s., ePPPZ = 13m.44s.

Prague eN = 10m.45s., e = 12m.18s., eN = 15m.27s., e = 17m.34s., eSS?N = 23m.11s.,

eSSS? = 25m.30s.

Strasbourg i = 11m.53s.

Algiers Univ. eZ = 11m.57s.

Tortosa PPN = 14m.43s. PSE = 22m.14s.

Tamanrasset ePPZ = 15m.16s.

Granada iPP = 15m.20s., SS = 27m.36s.

Long waves were also recorded at Dehra Dun and Upsala.

Aug. 15d. Many other shocks from the Assam district have been recorded on short-period instruments at stations in Europe, India, Ksara, Tamanrasset, Brisbane, South Africa, Algiers, and Western United States of America. There are also a few other shock records from stations in Central Asia but these are scanty. Most of the shocks recorded at a distance have not been noticed by nearby stations.

Aug. 15d. Readings also at 0h. (Helwan), 3h. (near Balboa Heights), 4h. (Copenhagen, Prague, Paris, Strasbourg, Stuttgart, Pasadena, Riverside, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Shasta Dam, and College), 5h. (Christchurch, Wellington, Mount Wilson, Riverside, Tinemaha, Pierce Ferry, Rome, and Ksara), 6h. (Paris), 7h. (Kew Sofia, and near Athens), 8h. (Overton and Pierce Ferry), 9h. (College (2) and near Apia), 10h. (Overton, Pierce Ferry, and near Mizusawa), 11h. (near Prague), 13h. (College, near Ashkabad, and near Mizusawa), 16h. (Galera-zamba), 17h. (Bogota), 18h. (near Kulyab), 21h. (near Mizusawa), 22h. (near Istanbul).

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Aug. 16d. 5h. 33m. 6s. Epicentre 28°·7N. 96°·6E. (as on 15d.).

	△	Az.	P.		O - C.	S.		O - C.	Supp.		L. m.	
			m.	s.		m.	s.		m.	s.		
New Delhi	17·0	274	e 3	52	- 9	i 6	54	-16	7	9	SS	—
Nanking	19·4	75	i 4	31	+ 1	8	1	- 3	—	—	—	e 9·3
Hyderabad	20·1	239	i 4	38	0	8	27	+ 8	—	—	—	—
Przhevalsk	20·2	317	e 4	40	+ 1	—	—	—	—	—	—	—
Naryn	21·1	313	i 4	49	+ 1	e 8	38	- 1	—	—	—	—
Murgab	21·2	303	e 4	49	0	i 8	39	- 2	—	—	—	—
Almata	21·5	319	i 4	55	+ 3	i 8	55	+ 8	—	—	—	—
Frunse	22·7	314	e 5	6	+ 2	i 9	16	+ 7	—	—	—	—
Poona	23·1	249	5	9	+ 1	i 9	17	+ 1	10	17	SS	9·4
Andijan	23·2	307	i 5	12	+ 3	i 9	22	+ 4	—	—	—	—
Fergana	23·5	307	i 5	12	0	9	23	0	—	—	—	—
Bombay	23·8	251	i 5	17	+ 2	i 9	31	+ 3	—	—	—	—
Kulyab	24·2	300	i 5	21	+ 2	i 9	40	+ 5	—	—	—	—
Obi-garm	24·4	302	i 5	11?	-10	i 9	18?	-21	—	—	—	—
Stalinabad	25·1	301	i 5	29	+ 1	i 9	49	- 2	—	—	—	—
Tashkent	25·5	307	e 5	33	+ 1	i 9	58	+ 1	—	—	—	—
Kodaikanal	25·7	229	i 5	34	+ 1	i 10	2	+ 1	—	—	—	—
Samarkand	26·7	302	e 5	45	+ 2	—	—	—	—	—	—	—
Colombo	26·8	219	e 5	54	+10	10	22	+ 3	—	—	—	14·2
Vladivostok	31·7	54	i 6	27	0	i 11	35	- 2	—	—	—	—
Djakarta	36·0	162	e 6	58	- 7	e 12	25	-19	—	—	—	—
Sverdlovsk	37·8	328	i 7	22	+ 2	i 13	12	+ 1	—	—	—	—
Baku	39·8	300	—	—	—	e 13	46	+ 4	—	—	—	—
Grozny	43·0	304	e 8	7	+ 4	—	—	—	—	—	—	—
Tiflis	43·7	302	—	—	—	i 14	41	+ 2	—	—	—	—
Borzhomj	44·7	302	8	19	+ 3	—	—	—	—	—	—	—
Moscow	49·4	321	e 8	55	+ 2	e 16	1	+ 1	—	—	—	—
Yalta	51·4	306	e 9	8	- 1	i 16	25	- 3	—	—	—	—
Ksara	51·5	292	i 9	19	+10	i 16	39	+10	—	—	—	—
Pulkovo	53·8	326	i 9	29	+ 3	i 17	3	+ 2	—	—	—	—
Istanbul	55·5	302	e 9	38	- 1	—	—	—	—	—	—	—
Helwan	56·2	289	e 9	45	+ 1	i 17	30	- 3	—	—	—	—
Helsinki	56·5	326	—	—	—	e 21	23	SS	—	—	—	—
Warsaw	59·2	317	e 18	12	S	(e 18	12)	0	e 18	38	PS	e 33·9
Skalnate Pleso	60·2	313	—	—	—	e 18	30	+ 5	—	—	—	—
Timisoara	60·2	309	13	54?	PPP	18	54?	?	—	—	—	—
Upsala	60·2	326	e 10	26	+14	e 18	21	- 4	e 18	35	PS	e 27·9
Ogyalla	61·8	312	e 14	42	PPP	e 19	2	PS	e 20	16	?	—
Copenhagen	63·6	322	i 10	35	0	i 19	4	- 4	i 20	31	PS	33·9
Prague	63·7	315	e 10	35	- 1	e 19	12	+ 2	e 14	23	PPP	—
Collmberg	64·3	317	e 10	39	0	e 12	22	?	—	—	—	e 37·9
Cheb	65·0	316	e 10	47	+ 3	e 19	25	- 1	—	—	—	—
Jena	65·3	316	e 10	46	0	—	—	—	—	—	—	—
Messina	66·3	302	e 11	1	+ 9	e 19	39	- 3	—	—	—	—
Padova	66·9	309	e 11	4	+ 8	e 19	46	- 3	—	—	—	—
Rome	67·4	306	e 10	58	- 1	i 19	50	- 5	—	—	—	—
Stuttgart	67·4	315	e 10	59	0	e 19	56	+ 1	e 15	29	PPP	e 36·9
Florence Xim	67·6	309	e 10	56	- 5	—	—	—	—	—	—	—
Prato	67·7	309	e 10	54	- 7	e 19	54	- 4	—	—	—	—
Strasbourg	68·3	315	i 11	6	+ 1	e 20	8	+ 2	e 11	15	P <sub>c</sub> P	e 35·9
Pavia	68·6	311	e 11	24	+17	—	—	—	—	—	—	—
De Bilt	68·7	319	i 11	9	+ 2	e 20	13	+ 3	i 13	42	PP	e 37·9
Basle	68·8	314	e 12	9	+61	—	—	—	—	—	—	—
Besançon	69·9	314	e 11	15	0	—	—	—	—	—	—	—
Aberdeen	70·8	326	—	—	—	i 20	35	0	i 29	0	Q	e 38·7
Paris	71·5	316	i 11	25	+ 1	e 20	46	+ 3	i 11	34	pP	e 38·9
Scoresby Sund	72·0	343	i 11	30	+ 2	i 20	51	+ 2	14	19	PP	39·9
Kew	72·2	320	i 11	29	0	e 20	50	- 1	e 21	8	PS	e 36·9
Clermont-Ferrand	72·3	313	i 11	30	+ 1	e 20	56	+ 4	—	—	—	—
College	74·3	24	e 11	41	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.
Rathfarnham Castle	74.7	323	i 11 43	0	e 21 16	- 3	—	43.9
Algiers Univ.	z. 76.1	305	i 11 50 <sup>k</sup>	- 1	e 12 2	P <sub>c</sub> P	e 14 47?	PP
Tortosa	N. 76.1	309	i 12 6	+15	21 35	-11	—	—
Brisbane	z. 77.7	130	i 12 8	+ 8	—	—	—	—
Alicante	77.9	307	12 18	+17	i 21 58	+ 4	22 12	S <sub>c</sub> S e 37.3
Granada	80.6	307	13 1 <sup>a</sup>	+45	22 38	+15	15 41	PP 42.9
Tamanrasset	z. 80.6	291	i 12 16 <sup>a</sup>	0	e 12 24	P <sub>c</sub> P	e 15 16	PP
Malaga	z. 81.4	307	i 12 22	+ 2	—	—	—	—
Sitka	83.9	26	e 12 36	+ 3	e 22 51	- 5	i 22 58	S <sub>c</sub> S e 46.9
Pretoria	z. 85.1	238	i 12 40	+ 1	—	—	—	—
Pietermaritzburg	z. 85.8	233	e 12 43	+ 1	—	—	—	—
Victoria	z. 95.2	25	e 13 27	0	—	—	—	—
Hungry Horse	98.5	20	e 17 40	PP	—	—	—	—
Lick	z. 105.1	30	e 18 33 <sup>a</sup>	[+10]	—	—	—	—
Fresno	z. 106.5	29	e 18 42	[+16]	—	—	—	—
Tinemaha	z. 106.8	28	e 18 44	PP	—	—	—	—
Harvard	108.3	349	—	—	e 28 17	PS	—	e 57.9
Overton	z. 108.9	26	i 18 27	[- 4]	—	—	i 18 59	PP
Boulder City	109.2	26	e 18 47	[+16]	—	—	—	—
Pierce Ferry	109.4	25	e 18 32	[ 0]	—	—	e 19 13	PP
Pasadena	109.4	29	e 18 55	PP	—	—	—	e 58.0
Chicago	109.8	3	—	—	e 25 0	[-11]	—	e 61.6
Cleveland	z. 110.1	358	e 19 15	PP	—	—	—	—
Philadelphia	111.3	352	—	—	e 25 16	[- 2]	e 29 45	PPS e 58.0
Tucson	114.0	25	e 18 42	[+ 1]	—	—	—	—
Huancayo	161.8	334	e 20 12	[+ 9]	—	—	—	—

Additional readings:—

Poona P<sub>c</sub>SN = 12m.11s.

Helwan iN = 17m.42s.

Warsaw ePZ = 18m.15s., eN = 19m.57s., eE = 20m.0s., eN = 24m.45s., eE = 24m.53s., eSE = 26m.3s.; phases wrongly identified.

Upsala eN = 20m.13s. and 20m.36s., eQN = 25m.6s.

Prague eE = 10m.49s. and 11m.1s., ePS = 19m.23s., eN = 20m.18s., 21m.6s., and 22m.15s., eSS = 23m.24s., eSSS = 26m.0s.

Jena eE = 10m.58s.

Stuttgart eS<sub>c</sub>S? = 20m.57s., eSS = 24m.12s.

Strasbourg e = 14m.21s., ePS = 20m.23s., e = 22m.34s., eSS = 24m.36s., eSSS = 27m.59s.

Kew iZ = 11m.42s., eSKSEN = 21m.56s.

Algiers Univ. iZ = 13m.4s. and 13m.34s.

Tortosa iN = 13m.8s.

Granada PPP = 17m.43s., PS = 23m.35s., SS = 27m.16s., SSS = 32m.1s.

Tamanrasset iZ = 14m.2s.

Sitka iPS? = 23m.9s.

Long waves were also recorded at Ivigtut and other American stations.

Aug. 16d. 6h. 41m. 57s. Epicentre 28°·7N. 96°·6E. (as at 5h.).

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Dehra Dun	N. 16.2	280	—	—	e 6 53	+ 2	—	e 11.5
New Delhi	17.0	274	i 3 47 <sup>a</sup>	-14	i 6 42	-28	4 0	PP 6.6
Nanking	19.4	75	4 39	+ 9	i 8 29	SS	i 4 55	PP i 10.3
Hyderabad	20.1	239	i 4 28	-10	i 8 10	- 9	—	—
Przhevalsk	20.2	317	i 4 36	- 3	i 8 23	+ 2	—	—
Naryn	21.1	313	i 4 48	0	e 8 44	+ 5	—	—
Murgab	21.2	303	i 4 45	- 4	—	—	—	—
Almata	21.5	319	i 4 52	0	i 8 56	+ 9	—	—
Frunse	22.7	314	i 5 3	- 1	i 9 16	+ 7	—	—
Poona	N. 23.1	249	5 2	- 6	i 9 3	-13	—	—
Andijan	23.2	307	i 5 8	- 1	i 9 24	+ 6	—	—
Fergana	23.5	307	i 5 8	- 4	i 9 23	0	—	—
Bombay	23.8	251	i 5 10	- 5	i 9 19	- 9	—	—
Kulyab	24.2	300	i 5 17?	- 2	i 9 32?	- 3	—	—
Irkutsk	24.2	11	i 5 26	+ 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.	
Semipalatinsk		25.0	336	e 5 22	- 5	—	—	—	—	
Stalinabad		25.1	301	i 5 25	- 3	i 9 50	- 1	—	—	
Tashkent		25.5	307	i 5 31	- 1	i 10 6?	+ 9	—	—	
Kodaikanal	E.	25.7	229	i 5 34	+ 1	i 9 59	- 2	—	—	
Samarkand		26.7	302	e 5 42	- 1	—	—	—	—	
Colombo	E.	26.8	219	5 43	- 1	10 18	- 1	—	—	
Kizyl-Arvat		34.8	299	i 7 43	+49	—	—	—	—	
Djakarta	Z.	36.0	162	e 6 52	-13	—	—	—	—	
Sverdlovsk		37.8	328	i 7 20	0	i 13 12	+ 1	—	—	
Baku		39.8	300	e 7 39?	+ 3	—	—	—	—	
Grozny		43.0	304	8 4	+ 1	—	—	—	—	
Tiflis		43.7	302	i 8 8	0	e 14 34?	- 5	—	—	
Borzhomi		44.7	302	i 8 8	- 8	—	—	—	—	
Piatigorsk		45.0	305	e 8 16	- 3	—	—	e 9 54	PP	
Sotchi		47.4	305	e 8 11?	-27	—	—	—	—	
Moscow		49.4	321	e 8 54	+ 1	e 16 0	0	—	—	
Theodosia		50.4	307	e 9 0	- 1	e 16 13?	- 1	—	—	
Yalta		51.4	306	9 5	- 4	e 16 26?	- 2	—	—	
Ksara		51.5	292	i 9 6	- 3	16 28	- 1	—	—	
Pulkovo		53.8	326	i 9 27	+ 1	i 17 1	0	—	—	
Kishinev		54.8	309	e 9 32	- 2	—	—	—	—	
Istanbul		55.5	302	e 9 36	- 3	—	—	e 10 37	PP	
Helwan		56.2	289	i 9 39 <sub>a</sub>	- 5	17 25	- 8	11 45	PP	
Helsinki		56.5	326	e 9 47	+ 1	e 17 37	0	—	29.0	
Bucharest		57.1	307	i 9 50 <sub>k</sub>	0	e 17 45	0	—	33.0	
Warsaw		59.2	317	e 10 8	+ 3	e 18 5	- 7	e 10 53	P <sub>c</sub> P e 32.0	
Athens		60.2	300	e 10 11 <sub>k</sub>	- 1	—	—	—	—	
Skalnate Pleso		60.2	313	e 10 13	+ 1	e 18 24	- 1	e 12 47	PP	
Timisoara		60.2	309	e 11 3?	P <sub>c</sub> P	—	—	—	33.0	
Upsala		60.2	326	e 10 14	+ 2	e 18 29	+ 4	e 12 52	PP	
Budapest		61.3	311	10 20	0	—	—	e 12 21	PP	
Kalossa	N.	61.6	311	e 10 25	+ 3	—	—	—	—	
Ogyalla		61.8	312	e 10 25	+ 2	e 18 50	+ 4	—	—	
Copenhagen		63.6	322	i 10 35	0	i 19 13	+ 5	i 20 30	S <sub>e</sub> S 31.0	
Prague		63.7	315	e 10 36	0	e 19 9	- 1	e 14 21	PPP	
Collmberg		64.3	317	e 10 37	- 2	e 19 21	+ 4	e 13 0	PP e 33.6	
Cheb		65.0	316	10 44	0	e 19 21	- 5	e 14 33	PPP	
Jena	E.	65.3	316	e 10 45	- 1	e 19 28	- 1	e 13 43	PP	
Messina		66.3	302	e 10 54	+ 2	e 19 38	- 4	—	—	
Padova		66.9	309	e 10 58	+ 2	19 47	- 2	—	—	
Bologna		67.3	310	e 11 1	+ 2	e 19 47	- 7	e 13 53	PP	
Rome		67.4	306	10 57	- 2	19 51	- 4	13 27	PP	
Stuttgart		67.4	315	e 10 58	- 1	e 19 57	+ 2	e 13 26	PP e 35.0	
Florence Xim		67.6	309	e 11 1	0	19 47	-10	—	—	
Prato		67.7	309	e 11 1	0	e 19 51	- 7	—	—	
Chur		67.8	312	e 10 59 <sub>a</sub>	- 3	—	—	—	—	
Karlsruhe		67.8	316	e 11 3?	+ 1	e 19 57	- 3	—	—	
Zürich		68.2	314	e 11 3 <sub>a</sub>	- 1	—	—	—	—	
Strasbourg		68.3	315	i 11 4 <sub>a</sub>	- 1	e 20 0	- 6	e 13 35	PP e 34.0	
Pavia		68.6	311	e 11 9	+ 2	—	—	—	—	
De Bilt		68.7	319	i 11 7	0	e 20 7	- 3	e 13 33	PP e 35.0	
Basle		68.8	314	e 11 8	0	e 20 14	+ 3	—	—	
Besançon		69.9	314	e 11 13	- 2	i 11 40	P <sub>c</sub> P	e 13 39	PP	
Aberdeen		70.8	326	11 21	+ 1	i 20 32	- 3	e 28 22	SSS e 34.2	
Paris		71.5	316	i 11 24	0	e 20 46	+ 3	i 14 6	PP	
Scoresby Sund		72.0	343	e 11 30	+ 2	i 20 54	+ 5	15 45	PPP 41.0	
Kew		72.2	320	i 11 29	0	e 20 53	+ 2	i 11 51	P <sub>c</sub> P e 34.0	
Clermont-Ferrand		72.3	313	i 11 30	+ 1	e 20 55	+ 3	e 14 7	PP	
College		74.3	24	e 11 46	+ 5	—	—	—	—	
Rathfarnham Castle		74.7	323	i 11 44	+ 1	e 21 23	+ 4	i 14 31	PP e 35.0	

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.	
Algiers Univ.	z.	76.1	305	e 11 48	- 3	e 12 0	P <sub>c</sub> P	e 14 40	PP	—
Tortosa		76.1	309	11 52	+ 1	21 36	+ 1	12 8	P <sub>c</sub> P	e 42.0
Brisbane	z.	77.7	130	i 12 7 <sub>k</sub>	+ 7	—	—	—	—	—
Alicante		77.9	307	i 12 1	0	22 1	+ 7	14 59	PP	e 36.3
Toledo		79.6	310	i 12 11	+ 1	i 22 10	- 2	i 15 13	PP	44.7
Granada		80.6	307	i 12 10 <sub>a</sub>	- 6	i 22 19	- 4	12 37	P <sub>c</sub> P	42.4
Tamanrasset	z.	80.6	291	i 12 13 <sub>a</sub>	- 3	—	—	i 15 16	PP	—
Malaga	z.	81.4	307	i 12 19	- 1	—	—	—	—	—
Lisbon		83.6	311	i 12 34 <sub>k</sub>	+ 3	23 0	+ 7	31 51	SSS	39.4
Sitka		83.9	26	i 12 40	+ 7	e 23 3	+ 7	e 28 21	SS	e 46.0
Pretoria	z.	85.1	238	i 12 38	- 1	—	—	—	—	—
Pietermaritzburg	z.	85.8	233	i 12 42	0	—	—	—	—	—
Grahamstown		90.6	232	i 13 5	0	—	—	—	—	—
Victoria	z.	95.2	25	e 13 33	+ 6	—	—	—	—	—
Hungry Horse		98.5	20	e 13 48	+ 6	—	—	i 17 49	PP	—
Butte	N.	101.1	20	e 18 11	PP	e 25 40	+10	—	—	e 59.3
Shasta Dam		102.1	29	e 14 4	+ 6	—	—	e 17 47	PP	—
Mineral	z.	102.7	28	e 18 17	[- 2]	—	—	—	—	—
Logan		105.1	21	e 18 6	[-17]	—	—	—	—	—
Lick	z.	105.1	30	e 18 36 <sub>a</sub>	[+13]	—	—	—	—	—
Fresno	z.	106.5	29	e 18 32 <sub>a</sub>	[+ 6]	—	—	e 21 7	PPP	—
Tinemaha	z.	106.8	28	e 18 33	[+ 6]	—	—	e 29 48	PKKP	—
Harvard		108.3	349	e 18 48	PP	e 28 21	PS	e 21 7	PPP	e 57.0
Weston		108.4	349	e 18 33	[+ 3]	—	—	—	—	—
Overton	z.	108.9	26	e 14 36	P	—	—	i 18 23	PKP	—
Boulder City		109.2	26	e 17 26	[-66]	—	—	—	—	—
Pierce Ferry		109.4	25	i 18 39	[+ 7]	—	—	i 19 11	PP	—
Pasadena		109.4	29	e 18 36	[+ 4]	i 29 41	PKKP	e 19 5	PP	e 59.2
Chicago		109.8	3	—	—	e 25 5	[- 6]	e 28 31	PS	e 53.2
Cleveland		110.1	358	e 18 37	[+ 4]	e 28 34	PS	i 29 49	PPS	55.0
Philadelphia		111.3	352	e 20 24	?	e 25 26	[+ 8]	e 28 44	PS	e 53.1
Washington		112.5	353	e 19 23	PP	—	—	—	—	e 67.2
Tucson		114.0	25	e 18 48	[+ 7]	—	—	—	—	—
Bogota	z.	145.7	343	i 19 46	[+ 6]	i 24 23	?	—	—	—
Chinchina		145.7	345	i 20 43	PKP <sub>2</sub>	—	—	—	—	—
La Paz		161.4	308	i 20 9	[+ 7]	31 25	{+ 5}	24 42	PP	—
Huancayo		161.8	334	e 20 9	[+ 7]	—	—	i 20 56	PKP <sub>2</sub>	—

Additional readings :—

New Delhi SSN = 6m.59s., SSSN = 7m.10s.  
 Nanking i = 4m.43s., iP<sub>c</sub>P = 9m.16s.  
 Hyderabad SE = 8m.15s.  
 Piatigorsk eP<sub>c</sub>P = 11m.37s.  
 Helwan iZ = 12m.41s.  
 Warsaw ePN = 10m.19s., ePPZ = 12m.19s., ePPPEZ = 13m.41s., eSN = 18m.16s., eSZ = 18m.21s., eZ = 18m.34s., eS<sub>c</sub>SE = 19m.45s., eS<sub>c</sub>SZ = 19m.51s., eS<sub>c</sub>SN = 20m.2s., eSSE = 22m.5s., eZ = 22m.58s., eSSSNZ = 24m.46s., eSSSE = 24m.53s.  
 Skalnaté Pleso ePPP = 13m.44s.  
 Upsala eN = 11m.35s., ePPPN = 13m.51s., eN = 16m.48s., 18m.16s., 21m.45s., and 24m.3s.?  
 Kalossa eE = 9m.22s.  
 Prague e = 10m.54s., eZ = 11m.5s., e = 11m.21s., 11m.46s., and 12m.47s., ePS?N = 19m.23s., eSS?E = 23m.45s.  
 Collmberg eZ = 11m.16s. and 24m.35s.  
 Cheb e = 13m.11s., eSS = 23m.30s., eSSS = 26m.21s.  
 Jena eE = 13m.8s.  
 Rome SS = 24m.13s.  
 Stuttgart ePPP = 15m.13s., eSS = 24m.3s.  
 Strasbourg ePPP = 15m.13s., e = 16m.32s. and 20m.8s., eSS = 24m.21s., e = 24m.36s., eSSS = 27m.39s., e = 28m.4s.  
 Besançon ePPP = 15m.10s.  
 Aberdeen iE = 19m.51s.  
 Paris i = 13m.18s., iPPP = 15m.45s., e = 22m.36s.  
 Kew eSKSEN = 21m.41s., e = 29m.6s.  
 Clermont-Ferrand ePPP = 15m.54s.  
 Rathfarnham Castle e = 22m.1s.  
 Algiers Univ. iZ = 11m.51s., 13m.48s., and 15m.5s., iPPPZ = 16m.31s.  
 Tortosa S<sub>c</sub>S?E = 22m.10s., PS?N = 22m.18s.

Continued on next page.

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Alicante PPP = 16m.53s., PS = 22m.35s.  
 Granada iPP = 14m.52s., PS = 23m.7s., SS = 27m.40s.  
 Tamanrasset eZ = 12m.23s.  
 Sitka iS = 23m.8s.  
 Tinemaha eZ = 18m.49s.  
 Overton iPPZ = 19m.7s.  
 Pierce Ferry ePKP = 17m.47s.  
 Philadelphia eSPSP? = 35m.59s., eSSS? = 38m.13s.  
 Long waves were also recorded at Edinburgh, Bergen, Ivigtut, Bermuda, and Seat.

Aug. 16d. 11h. 28m. 20s. Epicentre 27°·5N. 96°·4E. (as on 1946, March 7d.)

A = -·0990, B = +·8828, C = +·4593;  $\delta$  = +9; h = +3;  
 D = +·994, E = +·111; G = -·051, H = +·456, K = -·888.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	l.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
New Delhi		17·0	278	e 3 56	- 5	e 6 49	-21	—	6·7
Hyderabad	N.	19·3	242	—	—	8 12	+10	—	—
Nanking		20·0	71	4 49 <sup>a</sup>	+12	8 32	+15	—	—
Przhevsk		20·9	320	4 43	- 3	e 8 28	- 7	—	—
Murgab		21·7	305	e 5 52	+57	—	—	—	—
Naryn		21·7	315	i 4 51	- 4	—	—	—	—
Almata		22·3	320	i 4 57	- 4	i 8 56	- 6	—	—
Poona	N.	22·5	252	e 8 10	P <sub>c</sub> P	i 12 10	L	—	(i 12·2)
Bombay		23·3	253	e 5 17	+ 7	e 9 33	+13	—	—
Frunse		23·4	316	i 5 10	- 1	i 9 21	0	—	—
Andijan		23·8	309	5 14	- 1	9 28	0	—	—
Fergana		24·0	309	e 5 15	- 2	e 9 30	- 2	—	—
Kulyab		24·6	302	e 5 22	- 1	e 9 44	+ 2	—	—
Kodaikanal	E.	24·8	230	—	—	e 10 3	SS	—	—
Obi-garm		24·9	303	i 5 20	- 6	—	—	—	—
Irkutsk		25·5	10	e 5 32?	0	e 9 43?	-14	—	—
Stalinabad		25·6	303	i 5 31	- 1	i 10 3	+ 4	—	—
Tashkent		26·1	309	i 5 36	- 1	e 10 6	- 1	—	—
Samarkand		27·2	304	e 5 47	0	—	—	—	—
Vladivostok		32·6	52	e 6 43?	+ 8	—	—	—	—
Ashkabad		33·5	298	e 6 41	- 2	—	—	—	—
Sverdlovsk		38·7	329	i 7 27	0	e 13 18	- 7	—	—
Grozny		43·5	305	e 8 9	+ 2	—	—	—	—
Moscow		50·3	321	e 9 0	0	e 16 8	- 5	—	—
Ksara		51·8	293	e 9 14	+ 2	—	—	11 15	PP
Upsala		61·1	326	e 4 1	?	e 12 21	?	—	e 26·7
Prague		64·5	315	e 10 41	0	e 19 10	- 9	e 13 0	PP
Collnberg	Z.	65·1	316	e 10 45	0	—	—	—	—
Jena		66·0	316	e 10 51	+ 1	—	—	e 10 56?	P
Stuttgart		68·1	315	11 4	0	—	—	—	—
Strasbourg		69·1	315	e 11 11	+ 1	—	—	—	—
De Bilt		69·5	319	—	—	e 17 40?	?	—	e 36·7
Besançon		70·6	314	e 11 20	+ 1	—	—	—	—
Paris		72·3	316	i 11 31	+ 2	—	—	—	e 43·7
College		75·5	23	e 11 51	+ 3	—	—	—	—
Algiers Univ.	Z.	76·6	304	e 11 55	+ 1	—	—	—	—
Tamanrasset	Z.	80·5	291	e 12 21	+ 6	—	—	e 12 30	P <sub>c</sub> P
Pretoria	Z.	84·3	237	i 11 43?	-52	—	—	—	—
Pietermaritzburg	Z.	84·9	233	e 13 19	+41	—	—	—	—
Hungry Horse		99·7	20	e 13 55	+ 8	—	—	e 17 55	PP
Overton	Z.	110·0	26	e 19 12	PP	—	—	—	—
Pierce Ferry		110·5	25	e 18 56	[+22]	—	—	—	—

Additional readings and note :—

Poona QN = 12m.25s., SSN = 13m.10s.  
 Upsala ePP?E = 6m.30s., ePPP?N = 7m.21s., eSS?N = 16m.4s. ; timing wrong.  
 Prague eE = 11m.21s.  
 Tamanrasset eZ = 14m.7s., iPPZ = 15m.22s.  
 Long waves were also recorded at Warsaw, Copenhagen, and Kew.

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Aug. 16d. 12h. 38m. 27s. Epicentre 27°·9N. 91°·9E. (as on 1948, October 7d.).

Intensity V at Gauhati and Tezpur. Epicentre about 29°N. 91°·5E.  
Seismo. Bull., Government of India, August, 1950, p.15.

A = -·0293, B = +·8846, C = +·4654;  $\delta = -3$ ;  $h = +3$ ;  
D = +·999, E = +·033; G = -·015, H = +·465, K = -·885.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
New Delhi	13·0	277	e 3 7	- 2	i 5 36	+ 1	5 56 SS	5·5
Przhevalsk	18·2	328	4 19	+ 3	—	—	—	—
Murgab	18·3	310	e 4 17	0	e 8 3	SS	—	—
Naryn	18·8	321	i 4 24?	+ 1	—	—	—	—
Almata	19·5	327	i 4 32	+ 1	i 8 27	SS	—	—
Bombay	N. 19·6	247	e 4 36	+ 4	e 8 22	+14	—	—
Andijan	20·5	314	e 4 45	+ 3	8 45	+18	—	—
Fergana	20·7	314	e 4 44	0	—	—	—	—
Kulyab	21·0	305	e 4 48	+ 1	e 8 47	+10	—	—
Obi-garm	21·4	308	i 4 50	- 1	e 8 55	+10	—	—
Stalinabad	22·0	306	i 4 59	+ 1	i 9 19	SS	—	—
Kodaikanal	E. 22·2	222	—	—	e 9 5	+ 5	—	—
Tashkent	22·8	312	i 5 8?	+ 3	i 9 22?	+11	—	—
Samarkand	23·7	306	5 14	0	—	—	—	—
Nanking	23·7	72	—	—	e 9 14	-13	—	12·5
Irkutsk	26·1	17	e 5 33	+ 6	—	—	—	—
Mary	27·0	300	e 5 45	0	—	—	—	—
Sverdlovsk	36·4	332	i 7 7	- 1	e 13 2	+12	—	—
Tiflis	40·6	304	e 7 54	+11	—	—	—	—
Borzhom	41·6	304	e 7 54	+ 3	—	—	—	—
Ksara	48·0	291	8 43	0	—	—	10 44 PP	—
Collmberg	z. 62·0	316	e 10 20	- 4	—	—	—	—
Stuttgart	65·0	314	10 40	- 4	—	—	—	—
Strasbourg	65·9	314	e 10 47	- 3	—	—	—	—
Besançon	67·4	313	e 10 56	- 3	—	—	—	—
Paris	69·2	316	i 11 7	- 3	—	—	—	e 44·6
Tamanrasset	z. 76·7	290	e 11 53	- 2	e 12 3	P <sub>c</sub> P	e 14 52 PP	—

Additional readings :—

Bombay eE = 4m.41s.

Tamanrasset eZ = 14m.30s.

Long waves were also recorded at Warsaw and Clermont-Ferrand.

Aug. 16d. 15h. 29m. 25s. Epicentre 29°·2N. 95°·1E.

Seismo. Bull. Government of India, 1950, Aug., p.16. Felt at Tezpur.

A = -·0777, B = +·8709, C = -·4853;  $\delta = +2$ ;  $h = +2$ ;  
D = +·996, E = +·089; G = -·043, H = +·483, K = -·874.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
New Delhi	15·7	272	e 3 35	- 9	i 6 21	-18	—	6·3
Przhevalsk	18·9	320	4 26	+ 2	7 59	+ 6	—	—
Hyderabad	19·2	236	i 4 28	0	i 8 1	+ 2	—	9·9
Murgab	19·8	304	e 4 32	- 3	i 8 7	- 6	—	—
Almata	20·2	320	i 4 40	+ 1	e 8 24	+ 3	—	—
Nanking	20·6	75	4 42	- 1	8 35	+ 6	—	10·0
Frunse	21·4	315	i 4 52	+ 1	i 8 47	+ 2	—	—
Andijan	21·8	308	e 4 57	+ 1	8 53	+ 1	—	—
Fergana	22·1	308	4 58	- 1	e 8 56	- 2	—	—
Poona	N. 22·1	246	e 4 55	- 4	8 55	- 3	—	9·2
Bombay	22·8	249	i 5 5	0	i 9 9	- 2	—	—
Kulyab	22·8	299	e 5 5	0	i 9 9	- 2	—	—
Obi-garm	23·0	301	e 5 6	- 1	i 9 16	+ 2	—	—
Stalinabad	23·6	301	i 5 14	+ 1	i 9 24	- 1	—	—
Irkutsk	24·0	13	i 5 20	+ 3	e 9 43	+11	—	—

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.
Tashkent	24.2	307	e 5 20	+ 1	—	—	—	—
Kodaikanal	E. 25.1	226	i 5 23	- 5	e 9 49	- 2	—	—
Samarkand	25.3	302	i 5 31?	+ 1	e 9 47?	- 7	—	—
Colombo	E. 26.4	216	—	—	10 20	+ 8	—	e 15.2
Mary	28.9	297	—	—	e 10 54	+ 1	—	—
Ashkabad	31.7	297	e 6 27	0	—	—	—	—
Vladivostok	32.5	55	i 6 34	0	e 11 50	+ 1	—	—
Kizyl-Arvat	33.4	299	e 6 43	+ 1	—	—	—	—
Sverdlovsk	36.7	329	i 7 10	0	i 12 53	- 1	—	—
Tiflis	42.3	302	e 8 2	+ 5	—	—	—	—
Moscow	48.2	321	e 8 44	0	e 15 41	- 2	—	—
Ksara	50.1	291	e 9 6	+ 7	e 16 32	+22	—	—
Pulkovo	52.6	325	i 9 19	+ 1	16 43	- 1	—	—
Istanbul	54.1	302	e 9 16	-13	e 16 56	- 9	—	—
Helwan	54.8	288	e 9 39	+ 5	i 17 7	- 7	—	—
Helsinki	55.3	326	—	—	e 17 18	- 3	—	29.6
Warsaw	58.0	317	e 9 58	+ 1	e 17 58	+ 1	e 12 18	PP e 26.6
Skalnate Pleso	58.9	313	—	—	e 19 47	S <sub>c</sub> S	—	—
Upsala	59.0	325	e 10 2	- 2	i 18 7	- 3	e 12 8	PP e 28.6
Copenhagen	62.4	321	—	—	e 18 49	- 4	e 20 19	S <sub>c</sub> S 31.6
Prague	62.5	315	e 10 26	- 2	e 18 50	- 4	e 12 59	PP e 32.1
Potsdam	N. 62.8	318	—	—	i 18 57	- 1	—	e 35.6
Collmburg	Z. 63.1	316	e 10 30	- 2	—	—	—	—
Jena	E. 64.0	316	e 10 36	- 2	—	—	—	—
Triest	Z. 64.0	310	i 10 35k	- 3	—	—	—	—
Rome	66.0	306	e 10 37	-13	19 33	- 5	23 53	SS
Stuttgart	66.1	314	10 49	- 2	19 37	- 2	—	—
Chur	66.5	312	e 10 52	- 2	—	—	—	—
Zürich	66.9	313	e 11 15	P <sub>c</sub> P	—	—	—	—
Strasbourg	67.1	315	i 10 56	- 1	—	—	—	e 35.6
De Bilt	67.5	319	e 11 11	+11	e 19 53	- 3	—	e 36.6
Besançon	68.9	314	e 11 5	- 4	—	—	e 11 45	P <sub>c</sub> P
Paris	70.3	316	i 11 16	- 1	i 20 26	- 3	i 11 24	pP e 37.6
Kew	70.9	319	e 17 58	?	—	—	—	e 36.6
Scoresby Sund	71.1	342	—	—	20 38	0	—	30.6
College	74.4	23	e 11 40	- 2	—	—	—	—
Algiers Univ.	Z. 74.7	304	e 11 41	- 2	—	—	—	—
Tortosa	N. 74.8	309	—	—	21 16	- 4	—	43.6
Tamanrasset	Z. 78.9	290	i 12 6	- 1	i 12 13	P <sub>c</sub> P	e 15 13	PP
Brisbane	Z. 79.1	129	i 12 15	+ 7	—	—	—	—
Sitka	83.8	25	—	—	e 22 58	+ 3	—	e 51.6
Pretoria	Z. 84.3	236	e 12 35?	0	—	—	—	—
Pietermaritzburg	Z. 85.0	232	e 12 41	+ 3	—	—	—	—
Hungry Horse	98.5	19	e 13 42	0	—	—	e 18 24	PP
Shasta Dam	102.3	28	e 18 1	PKP	—	—	—	—
Tinemaha	Z. 107.1	27	e 18 46	PP	—	—	—	—
Overton	Z. 109.0	24	i 19 3	PP	—	—	—	—
Boulder City	109.3	24	e 18 47	[+15]	—	—	e 19 1	PP
Pierce Ferry	109.5	24	e 18 33	[+ 1]	e 25 50	{-11}	i 19 6	PP
Pasadena	Z. 109.6	28	e 19 4	PP	—	—	—	—
Philadelphia	110.6	351	e 18 38	[+ 4]	—	—	—	e 64.8
Tucson	114.1	24	19 3	[+22]	—	—	—	—
Bogota	144.8	341	i 19 41	[+ 2]	—	—	—	—

Additional readings :—

New Delhi iEN = 3m.46s.

Warsaw ePE = 9m.40s., ePN = 10m.7s., ePPPE = 13m.32s., eE = 15m.31s., SSEZ = 22m.34s., SSSZ = 24m.24s.

Upsala ePN = 10m.5s., eE = 17m.0s., eSN = 18m.18s., eS<sub>c</sub>SN = 20m.0s., eS<sub>c</sub>S<sub>i</sub>E = 20m.4s., eN = 22m.58s.

Copenhagen 25m.53s.

Prague eE = 10m.56s., eN = 12m.19s., e = 14m.17s., ePSN = 19m.8s.

Besançon e = 11m.13s.

Paris iP<sub>c</sub>P = 11m.32s.

Tamanrasset eZ = 15m.3s.

Sitka e = 23m.17s.

Long waves were also recorded at Dehra Dun, Aberdeen, Clermont-Ferrand, Bergen, Harvard and Weston,

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Aug. 16d. 16h. 36m. 0s. Epicentre 29°·2N. 95°·1E. (as at 15h.).

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
New Delhi		15·7	272	e 3 36	- 8	e 6 17	-22	—	6·2
Hyderabad		19·2	236	—	—	7 45	-14	—	9·8
Murgab		19·8	304	e 4 32	- 3	i 8 22	+ 9	—	—
Naryn		19·8	315	e 4 35	0	—	—	—	—
Almata		20·2	320	i 4 42	+ 3	e 8 39	+18	—	—
Nanking		20·6	75	4 42k	- 1	8 35	+ 6	—	e 10·4
Frunse		21·4	315	i 4 54	+ 3	e 9 0	+15	—	—
Andijan		21·8	308	e 4 58	+ 2	e 9 4	+12	—	—
Fergana		22·1	308	e 5 2	+ 3	e 9 9	+11	—	—
Poona		22·1	246	4 54	- 5	8 48	-10	—	—
Bombay	E.	22·8	249	5 2	- 3	9 0	-11	—	—
Kulyab		22·8	299	e 5 6	+ 1	e 9 15?	+ 4	—	—
Obi-garm		23·0	301	i 5 6	- 1	i 9 20	+ 6	—	—
Irkutsk		24·0	13	e 5 26	+ 9	—	—	—	—
Tashkent		24·2	307	e 5 21	+ 2	e 9 45	+10	—	—
Kodaikanal	E.	25·1	226	e 5 31	+ 3	e 9 51	0	—	—
Samarkand		25·3	302	e 5 30	0	—	—	—	—
Mary		28·9	297	e 6 18	+15	—	—	—	—
Ashkabad		31·7	297	e 6 25	- 2	—	—	—	—
Sverdlovsk		36·7	329	i 7 14	+ 4	13 2	+ 8	—	—
Leninakan		43·0	300	e 8 7	+ 4	—	—	—	—
Moscow		48·2	321	e 8 46	+ 2	e 15 48	+ 5	—	—
Istanbul		54·1	302	e 9 26	- 3	—	—	—	—
Helwan	N.	54·8	288	—	—	e 17 12	- 2	—	—
Upsala		59·0	325	e 10 10	+ 6	e 18 13	+ 3	e 12 17	PP e 32·0
Prague		62·5	315	e 10 27	- 1	e 18 25	-29	e 12 46	PP
Collnberg	Z.	63·1	316	e 10 30	- 2	—	—	—	—
Triest	Z.	64·0	310	i 10 35	- 3	—	—	—	—
Stuttgart		66·1	314	10 49	- 2	—	—	—	—
Zürich		66·9	313	e 10 51	- 5	—	—	—	—
Strasbourg		67·1	315	i 10 56	- 1	—	—	—	—
Besançon		68·9	314	e 11 4	- 5	—	—	e 11 43	P <sub>c</sub> P
Kew	Z.	70·9	319	e 11 24	+ 3	—	—	—	—
College		74·4	23	e 11 44	+ 2	—	—	—	—
Algiers Univ.	Z.	74·7	304	e 11 40	- 3	—	—	e 12 10	P <sub>c</sub> P
Tamanrasset	Z.	78·9	290	e 12 6	- 1	e 12 13	P <sub>c</sub> P	e 15 5	PP
Victoria	Z.	95·3	24	e 14 12	P <sub>c</sub> P	—	—	—	—
Lick	Z.	105·4	28	e 13 53	P	—	—	i 14 0	P
Tinemaha	Z.	107·1	27	e 13 41	P	—	—	—	—
Overton	Z.	109·0	24	e 13 29	P	—	—	e 19 2	PP
Pierce Ferry		109·5	24	i 13 26	P	—	—	e 19 3	PP

Additional readings :—

Upsala e = 10m.26s., ePPP?E = 13m.21s., eP<sub>c</sub>S = 14m.41s., e = 18m.29s., eE = 20m.26s.

Prague e = 11m.5s. and 14m.41s., eN = 18m.16s.

Tinemaha iZ = 13m.47s.

Long waves were also recorded at Copenhagen and Warsaw.

Aug. 16d. 17h. 51m. 37s. Epicentre 27°·9N. 91°·9E. (as at 12h.).

Intensity VI at Gauhati and Silcher; VI at Dhubri and Jespur. Suggested epicentre 28°·3N. 92°·0E. Seismo. Bull. of Indian Government, August, 1950, p. 17.

A = -·0293, B = +·8846, C = +·4654;  $\delta$  = -3; h = +3;

D = +·999, E = +·033; G = -·015, H = +·465, K = -·885.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
New Delhi		13·0	277	i 3 11k	+ 2	i 5 34	- 1	—	—
Hyderabad		16·2	233	3 49	- 1	7 9	+18	—	—
Przhevalsk		18·2	328	4 21	+ 5	—	—	—	—
Murgab		18·3	310	i 4 13	- 4	i 7 43	+ 4	—	—
Naryn		18·8	321	i 4 25	+ 2	e 8 11	SS	—	—

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.	
Poona	N.	19.0	245	e 4	16	-10	7	48	-7	8	23	Q	9.4
Almata		19.5	327	i 4	35	+4	i 8	23	+17	—	—	—	—
Bombay		19.6	247	e 4	23	-9	e 8	24	+16	—	—	—	—
Andijan		20.5	314	4	46	+4	8	46	+19	—	—	—	—
Frunse		20.5	322	i 4	44	+2	8	41	+14	—	—	—	—
Fergana		20.7	314	e 4	47	+3	e 8	45	+14	—	—	—	—
Kulyab		21.0	305	i 4	51	+4	e 8	51	+14	—	—	—	—
Obi-garm		21.4	308	i 4	53	+2	i 8	53	+8	—	—	—	—
Stalinabad		22.0	306	i 4	59	+1	i 9	6	+10	—	—	—	—
Kodaikanal	E.	22.2	222	e 4	55	-5	e 9	5	+5	—	—	—	—
Tashkent		22.8	312	i 5	9	+4	9	20	+9	—	—	—	—
Samarkand		23.7	306	—	—	—	e 9	42	+15	—	—	—	—
Nanking		23.7	72	5	1 <sub>a</sub>	-13	i 9	10	-17	i 5	41	PP	i 10.0
Colombo	E.	23.8	211	5	13	-2	9	38	+10	—	—	—	16.4
Irkutsk		26.1	17	e 5	31	-6	e 9	50?	-17	—	—	—	—
Ashkabad		29.8	300	e 6	11	0	e 11	14	+7	—	—	—	—
Kizyl-Arvat		31.5	302	e 6	28	+2	—	—	—	—	—	—	—
Vladivostok		35.6	54	e 6	58	-3	—	—	—	—	—	—	—
Sverdlovsk		36.4	332	i 7	7	-1	12	52	+2	—	—	—	—
Baku		36.6	302	e 7	23?	+13	—	—	—	—	—	—	—
Grozny		40.0	306	e 7	44	+6	—	—	—	—	—	—	—
Tiflis		40.6	304	e 7	46	+3	e 14	2	+8	—	—	—	—
Gori		41.1	304	e 8	17?	+30	—	—	—	—	—	—	—
Leninakan		41.2	302	e 7	53	+5	—	—	—	—	—	—	—
Borzhome		41.6	304	e 7	54	+3	—	—	—	—	—	—	—
Sotchi		44.4	306	e 8	21?	+7	—	—	—	—	—	—	—
Moscow		47.5	322	e 8	37	-1	e 15	33	-1	—	—	—	—
Theodosia		47.6	308	e 8	44	+5	—	—	—	—	—	—	—
Ksara		48.0	291	i 8	44	+1	i 16	0	PS	—	—	—	—
Yalta		48.5	307	e 8	40?	-6	15	51?	+3	—	—	—	—
Kishinev		52.1	311	9	13	-1	—	—	—	—	—	—	—
Pulkovo		52.1	327	i 9	13	-1	i 16	38	0	—	—	—	—
Istanbul		52.4	303	e 9	16	0	e 16	47	+5	—	—	—	—
Helwan		52.5	288	9	15	-2	16	47	+4	—	—	—	—
Bucharest		54.2	307	e 9	39	+10	e 17	10	+4	—	—	—	—
Warsaw		56.9	317	e 9	42	-7	e 17	45	+3	e 10	51	P <sub>c</sub> P	e 29.4
Timisoara		57.5	309	10	23?	+30	—	—	—	—	—	—	—
Skalnate Pleso		57.7	314	e 9	56	+1	e 17	59	+6	e 12	3	PP	—
Upsala		58.5	326	e 11	56	PP	e 19	47	S <sub>c</sub> S	e 22	6	SS	e 26.0
Ogyalla		59.2	313	e 10	4	-1	—	—	—	—	—	—	—
Prague		61.3	315	e 10	19	-1	e 18	42	+3	e 12	45	PP	e 33.4
Taranto		61.3	304	e 11	18	+58	—	—	—	—	—	—	—
Copenhagen		61.6	322	—	—	—	e 18	46	+3	20	11	S <sub>c</sub> S	—
Potsdam		61.8	318	i 10	30	+7	—	—	—	—	—	—	e 34.4
Collmberg	Z.	62.0	316	e 10	23?	-1	—	—	—	—	—	—	—
Cheb		62.6	315	e 10	32	+4	e 18	55	-1	e 23	8	SS	—
Triest		62.7	310	e 10	26	-3	i 18	58	+1	—	—	—	—
Jena		63.0	316	e 10	28	-3	e 19	1	0	e 12	56	PP	—
Messina		63.2	302	e 10	41	+9	e 19	13	+10	—	—	—	—
Padova		64.2	310	e 10	43	+4	e 19	15	-1	—	—	—	—
Rome		64.5	306	10	37	-4	19	19	0	13	12	PP	—
Florence Xim		64.8	309	e 10	36	-7	i 19	11	-12	—	—	—	—
Stuttgart		65.0	314	e 10	41	-3	e 19	26	0	—	—	—	—
Chur		65.2	312	e 10	42 <sub>a</sub>	-3	—	—	—	—	—	—	—
Zürich		65.7	313	e 10	46 <sub>a</sub>	-2	—	—	—	—	—	—	—
Strasbourg		65.9	314	i 10	48	-2	e 19	39	+2	e 13	11	PP	e 31.4
Basle		66.3	313	e 10	50	-2	e 19	43	+1	—	—	—	—
De Bilt		66.6	319	e 10	48	-6	e 19	48	+3	—	—	—	e 36.4
Besançon		67.4	313	i 10	58	-1	—	—	—	—	—	—	—
Aberdeen	N.	69.1	325	i 13	2	PP	—	—	—	—	—	—	e 34.5

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.
Paris	69.2	316	i 11 9	- 1	—	—	—	e 35.4
Clermont-Ferrand	69.8	312	i 11 13	- 1	e 20 19	- 4	e 25 8 PS	40.4
Kew	70.0	320	e 11 14	- 1	e 20 27	+ 1	e 21 21 SKS	e 33.4
Scoresby Sund	71.5	342	—	—	20 44	+ 1	—	e 38.4
Rathfarnham Castle	72.7	322	e 11 29	- 3	e 21 47	PPS	e 13 59 PP	e 34.4
Algiers Univ. z.	73.0	303	i 11 31 <sub>a</sub>	- 2	—	—	—	—
Tortosa	73.3	308	—	—	i 21 1	- 3	—	e 42.4
Alicante	75.0	307	e 11 48	+ 3	i 21 22	- 1	14 32 PP	e 36.6
College	76.7	23	e 11 48	- 7	—	—	—	—
Tamanrasset z.	76.7	290	e 11 53	- 2	—	—	e 12 3 P <sub>c</sub> P	—
Granada	77.7	306	i 11 59 <sub>k</sub>	- 1	i 21 56	+ 4	i 15 20 PP	41.6
Brisbane z.	80.4	128	i 12 6 <sub>a</sub>	- 9	—	—	—	—
Pretoria z.	81.2	236	i 12 16	- 3	—	—	—	—
Pietermaritzburg z.	82.0	231	e 12 20	- 3	—	—	—	—
Grahamstown	86.8	230	e 12 46	- 1	—	—	—	—
Hungry Horse	100.6	17	e 13 46	- 5	—	—	e 17 44 PP	—
Shasta Dam	104.7	26	e 18 13	[- 9]	—	—	e 18 32 PP	—
Fresno z.	109.1	26	e 18 55	[+ 24]	—	—	—	—
Overton z.	111.3	22	e 18 24	[- 12]	—	—	—	—
Boulder City	111.7	23	e 19 10	PP	—	—	—	—
Pierce Ferry	111.8	22	e 18 39	[+ 2]	—	—	e 19 18 PP	—
Tucson	116.4	21	e 18 43	[- 3]	—	—	—	—
Bogota	145.0	336	i 18 38	[- 61]	—	—	—	e 68.4
Chinchina	145.2	337	i 19 3	[- 37]	—	—	e 19 35 PKP	—

Additional readings :—

Helwan eZ = 9m.23s.

Warsaw ePZ = 9m.49s., ePP = 11m.59s., ePPPEZ = 13m.23s., eE = 18m.11s., eS<sub>c</sub>SE = 19m.40s., eSSE = 21m.23s., eE = 22m.8s., eZ = 22m.18s., eSSS = 24m.13s.

Skalnate Pleso ePPP = 13m.29s.

Upsala ePP?E = 12m.0s., eN = 18m.50s. and 23m.52s., eSSS?E = 24m.2s.

Prague eZ = 10m.23s., e = 10m.26s. and 12m.36s., ePPP = 13m.51s., ePS = 19m.1s., eSS = 22m.59s., eSSS = 24m.49s.

Copenhagen 22m.53s.

Jena ePN = 10m.31s., eE = 10m.38s., ePP?N = 13m.3s., ePS?E = 19m.30s.

Rome i = 10m.47s. and 20m.35s., SS = 23m.43s.

Stuttgart e = 10m.49s.

Strasbourg eSS = 24m.1s.

Besançon i = 11m.3s.

Paris i = 11m.15s.

Clermont-Ferrand i = 11m.22s., eSSS = 28m.28s.

Rathfarnham Castle i = 12m.23s., eEN = 18m.12s. and 28m.23s.?

Alicante S<sub>c</sub>S = 21m.46s., SS = 26m.12s., Q = 31m.26s.

Tamanrasset eZ = 12m.14s., ePPZ = 14m.49s., eZ = 15m.7s.

Granada PS = 22m.47s., iSS = 26m.29s.

Boulder City e = 19m.17s.

Long waves were also recorded at Dehra Dun, Bergen, Edinburgh, Harvard, Weston, and Philadelphia.

Aug. 16d. 19h. 25m. 40s. Epicentre 29°·2N. 95°·1E. (as at 16h.).

	$\Delta$	Az.	P.	O - C.	S.	O - C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
New Delhi	15.7	272	e 3 42	- 2	i 6 30	- 9	—	—
Przhevalsk	18.9	320	i 4 26	+ 2	—	—	—	—
Hyderabad	19.2	236	4 30	+ 2	8 0	+ 1	—	—
Murgab	19.8	304	e 4 34	- 1	i 8 26	+ 13	—	—
Naryn	19.8	315	i 4 35	0	e 8 25	+ 12	—	—
Almata	20.2	320	i 4 43	+ 4	—	—	—	—
Nanking	20.6	75	4 36 <sub>a</sub>	- 7	8 10	- 19	—	e 9.7
Frunse	21.4	315	i 4 54?	+ 3	i 9 6?	+ 21	—	—
Andijan	21.8	308	4 59	+ 3	9 11	+ 19	—	—
Fergana	22.1	308	5 0	+ 1	e 9 10	+ 12	—	—
Poona E.	22.1	246	5 0	+ 1	9 7	+ 9	—	—
Bombay	22.8	249	e 5 5	0	e 9 16	+ 5	—	—
Kulyab	22.8	299	i 5 8	+ 3	e 9 22	+ 11	—	—
Obi-garm	23.0	301	i 5 11?	+ 4	i 9 47?	+ 33	—	—
Stalinabad	23.6	301	e 5 19	+ 6	i 9 41	+ 16	—	—

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	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Irkutsk	24.0	13	5 15 <sup>f</sup>	- 2	e 9 25 <sup>f</sup>	- 7	—	—
Tashkent	24.2	307	e 5 23	+ 4	—	—	—	—
Kodaikanal	E. 25.1	226	—	—	e 9 58	+ 7	—	—
Samarkand	25.3	302	e 5 33	+ 3	—	—	—	—
Mary	28.9	297	e 6 27	+24	—	—	—	—
Ashkabad	31.7	297	e 6 28	+ 1	—	—	—	—
Sverdlovsk	36.7	329	i 7 11	+ 1	e 13 4	+10	—	—
Grozny	41.6	304	e 7 54	+ 3	—	—	—	—
Tiflis	42.3	302	e 7 58	+ 1	—	—	—	—
Gori	42.8	302	e 8 10 <sup>f</sup>	+ 9	—	—	—	—
Borzhomi	43.4	302	e 8 7	+ 1	—	—	—	—
Moscow	48.2	321	e 8 45	+ 1	e 15 55	+12	—	—
Ksara	50.1	291	i 9 1	+ 2	16 21	PS	—	—
Pulkovo	52.6	325	i 9 19	+ 1	e 16 58	PS	—	—
Istanbul	54.1	302	e 9 28	- 1	—	—	—	—
Upsala	59.0	325	e 10 2	- 2	e 16 33	PS	e 11 55	PP e 28.3
Prague	62.5	315	e 10 26	- 2	e 18 57	+ 3	e 12 50	PP
Collmberg	Z. 63.1	316	e 10 30	- 2	—	—	—	—
Jena	E. 64.0	316	e 10 36	- 2	—	—	—	—
Triest	Z. 64.0	310	i 10 35 <sup>k</sup>	- 3	—	—	—	—
Stuttgart	66.1	314	10 49	- 2	—	—	—	—
Chur	66.5	312	e 10 51 <sup>a</sup>	- 3	—	—	—	—
Zürich	66.9	313	e 10 54	- 2	—	—	—	—
Strasbourg	67.1	315	i 10 56 <sup>a</sup>	- 1	i 11 5	P <sub>c</sub> P	e 13 25	PP
Basle	67.5	313	e 11 10	+10	—	—	e 15 20	PPP
De Bilt	67.5	319	e 10 56	- 4	—	—	—	e 37.3
Besançon	68.9	314	e 11 4	- 5	—	—	—	—
Paris	70.3	316	e 11 16	- 1	—	—	i 12 37	PP e 42.3
Kew	70.9	319	e 11 20	- 1	—	—	—	e 34.3
Clermont-Ferrand	71.0	312	e 11 13	- 9	—	—	—	—
Rathfarnham Castle	73.5	323	e 11 48	+12	—	—	—	e 37.3
College	74.4	23	i 11 35	- 7	—	—	i 11 46	P <sub>c</sub> P
Algiers Univ.	Z. 74.7	304	e 11 39	- 4	—	—	e 14 27	PP
Tamanrasset	Z. 78.9	290	i 12 6 <sup>a</sup>	- 1	i 12 15	P <sub>c</sub> P	e 15 7	PP
Pretoria	Z. 84.3	236	e 12 32	- 3	—	—	—	—
Pietermaritzburg	Z. 85.0	232	e 12 36	- 2	—	—	—	—
Hungry Horse	98.5	19	i 13 37	- 5	—	—	e 17 16	PP
Shasta Dam	102.3	28	e 28 8	PS	—	—	—	—
Tinemaha	Z. 107.1	27	e 19 0	PP	—	—	—	—
Overton	Z. 109.0	24	e 18 32	[+ 1]	—	—	i 19 6	PP
Boulder City	109.3	24	e 18 51	[+19]	—	—	e 19 9	PP
Pierce Ferry	109.5	24	e 18 50	[+18]	—	—	i 19 21	PP
Tucson	114.1	24	e 18 42	[+ 1]	—	—	e 19 14	PP

Additional readings :—

Upsala eE = 11m.6s., e = 22m.59s.

Prague e = 10m.46s. and 13m.43s.

Besançon e = 11m.12s.

Paris i = 11m.26s.

Overton eZ = 18m.55s.

Pierce Ferry i = 19m.0s.

Long waves were also recorded at Warsaw, Rome, Potsdam, Granada, and Harvard.

Aug. 16d. 20h. 1m. 17s. (I) } Epicentre 25°·9N. 96°·8E.  
20h. 11m. 11s. (II) } (as on 1949, November 17d.).

A = -·1066, B = +·8944, C = +·4344;  $\delta$  = +2;  $h$  = +3;  
D = +·993, E = +·118; G = -·051, H = +·431, K = -·901.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
II New Delhi	E. 17.6	283	e 4 9	+ 1	i 7 12	-11	—	—
II Hyderabad	19.0	246	i 4 38	+12	8 22	+27	—	—
II Nanking	20.3	67	e 4 27	-13	i 8 18	- 5	9 17	Q e 9.8
II Poona	N. 22.4	225	8 4	S	(8 4)	-60	—	(12.3)
I Przhewalsk	22.4	322	i 4 59	- 3	—	—	—	—
II	22.4	322	e 5 0	- 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.
I Murgab		22.9	308	e 5	5	- 1	—	—	—	—	—	—
II		22.9	308	e 5	2	- 4	i 9	5	- 8	—	—	—
II Naryn		23.1	317	e 5	6	- 2	—	—	—	—	—	—
II Bombay	E.	23.2	256	i 5	20	+11	i 9	41	+23	—	—	—
I Almata		23.7	322	i 5	11	- 3	e 9	9	-18	—	—	—
II		23.7	322	i 5	13	- 1	e 9	28	+ 1	—	—	—
II Kodaikanal	E.	24.0	233	e 4	50	?	—	—	—	—	—	—
I Frunse		24.8	317	e 5	24?	- 1	e 9	36?	-10	—	—	—
II		24.8	317	e 5	24	- 1	9	46	0	—	—	—
I Andijan		25.1	310	e 5	13?	-15	—	—	—	—	—	—
II		25.1	310	e 5	27	- 1	e 9	48	- 3	—	—	—
I Fergana		25.3	310	e 5	29	- 1	—	—	—	—	—	—
II		25.3	310	e 5	27	- 3	e 9	49	- 5	—	—	—
I Kulyab		25.8	304	e 5	37	+ 3	—	—	—	—	—	—
II		25.8	304	e 5	37	+ 3	e 10	1	- 1	—	—	—
I Obi-garm		26.1	306	i 5	39	+ 2	e 9	58	- 9	—	—	—
II		26.1	306	i 5	35?	- 2	e 10	9?	+ 2	—	—	—
I Stalinabad		26.8	306	e 5	52	+ 8	—	—	—	—	—	—
II		26.8	306	e 5	53	+ 9	e 10	20	+ 1	—	—	—
II Irkutsk		26.9	10	e 5	40	- 5	e 10	20?	0	—	—	—
I Tashkent		27.4	310	e 5	36?	-13	—	—	—	—	—	—
II		27.4	310	e 5	44?	- 5	—	—	—	—	—	—
I Samarkand		28.4	304	e 6	2	+ 4	—	—	—	—	—	—
II		28.4	304	e 5	57	- 1	—	—	—	—	—	—
II Vladivostok		33.3	50	e 6	38	- 3	e 11	54	- 8	—	—	—
I Sverdlovsk		40.3	330	7	41	+ 1	—	—	—	—	—	—
II		40.3	330	7	37	- 3	—	—	—	—	—	—
II Tiflis		45.3	303	e 8	20	- 1	—	—	—	—	—	—
II Gori		45.8	304	e 8	30?	+ 5	—	—	—	—	—	—
II Leninakan		46.0	302	e 8	34?	+ 7	—	—	—	—	—	—
II Borzhomi		46.4	304	e 8	30	0	—	—	—	—	—	—
II Moscow		51.8	321	e 9	11	- 1	e 16	27	- 6	—	—	—
II Ksara		52.8	293	e 9	23	+ 4	e 16	56	+ 9	—	—	—
II Pulkovo		56.2	325	e 9	43	- 1	e 17	29	- 4	—	—	—
II Istanbul		57.2	303	e 9	50	- 1	e 14	11	PcS	—	—	—
II Upsala	N.	62.6	326	e 25	16	?	e 33	23	?	—	—	e 39.8
II Prague		65.8	315	e 10	53	+ 4	19	13	-22	e 13	14	PP
II Collmberg	Z.	66.5	316	e 10	52	- 2	—	—	—	—	—	—
II Triest	Z.	67.3	310	i 11	4k	+ 5	—	—	—	—	—	—
II Jena	N.	67.4	316	e 10	57	- 2	—	—	—	—	—	—
I Stuttgart		69.5	315	11	18	+ 6	—	—	—	—	—	—
II		69.5	315	11	10	- 2	—	—	—	—	—	—
I Chur		69.8	313	e 11	21k	+ 7	—	—	—	—	—	—
II		69.8	313	e 11	13k	- 1	—	—	—	—	—	—
II Strasbourg		70.3	315	e 11	19	+ 2	—	—	—	e 11	52	PcP
II De Bilt		71.0	319	e 10	49?	-33	—	—	—	—	—	e 36.8
II Besançon		72.0	314	e 11	26	- 2	—	—	—	—	—	—
II Paris		73.7	316	i 11	38	0	—	—	—	—	—	—
II Kew		74.4	320	e 11	41	- 1	—	—	—	—	—	e 38.8
II Brisbane	Z.	75.8	130	i 10	3k	?	—	—	—	—	—	—
I College		76.8	23	e 12	5	+10	e 21	45	+ 3	e 15	3	PP
II		76.8	23	e 11	51	- 4	—	—	—	e 13	11	?
II Rathfarnham C.		77.0	323	e 11	53	- 3	—	—	—	—	—	e 40.8
II Algiers Univ.	Z.	77.8	305	e 12	1	0	—	—	—	e 12	16	PcP
I Tamanrasset	Z.	81.4	291	e 12	35k	+15	e 12	44	PcP	e 15	40	PP
II	Z.	81.4	291	e 12	23a	+ 3	i 12	31	PcP	e 15	27	PP
II Pretoria	Z.	83.8	237	—	—	—	i 24	17	PPS	—	—	—
II Grahamstown		89.0	232	—	—	—	i 23	54	+ 9	—	—	—
I Hungry Horse		101.1	20	e 14	6	+13	—	—	—	e 17	51	PP
II		101.1	20	e 13	50	- 3	—	—	—	—	—	—
I Shasta Dam		104.4	29	i 25	1	SKS	(i 25	1)	[+13]	—	—	—
II		104.4	29	—	—	—	i 24	56	[+ 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.
II Tinemaha	z.	109.2	29	i 24 34	?	e 26 43	S	—	—
I Overton	z.	111.3	27	e 19 24	PP	—	—	—	—
II	z.	111.3	27	e 20 3	PP	—	—	—	—
I Pierce Ferry		111.8	26	e 19 24	PP	—	—	—	—
II		111.8	26	e 18 42	[+ 5]	e 26 27	(+ 9)	—	—

Additional readings and note :—

Nanking II iP = 4m.35s., iZ = 6m.11s.

Poona II gives S as P and L as S.

Bombay II eN = 2m.56s. (?L for shock I), eN = 5m.34s.

Upsala readings are not accountable to these shocks.

Prague II e = 12m.8s. and 15m.17s.

Besançon II e = 11m.33s.

Paris II e = 11m.44s.

College I i = 12m.13s.

Long waves to shock II were recorded at Rome and Granada.

Aug. 16d. 21h. 44m. 19s. Epicentre 29°·2N. 95°·1E. (as at 19h.).

Intensity VII at Gauhati. Seismo. Bull., Indian Government, August, 1950, p. 18.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
New Delhi		15.7	272	e 3 40	- 4	e 6 28	-11	—	—
Murgab		19.8	304	e 4 37	+ 2	e 8 15	+ 2	—	—
Almata		20.2	320	i 4 42	+ 3	e 8 34	+13	—	—
Nanking		20.6	75	4 39	- 4	8 37	+ 8	—	e 9.8
Frunse		21.4	315	e 4 53?	+ 2	e 8 52?	+ 7	—	—
Andijan		21.8	308	e 4 59	+ 3	e 8 56	+ 4	—	—
Fergana		22.1	308	e 5 30	+31	e 9 0	+ 2	—	—
Bombay		22.8	249	e 5 11	+ 6	e 9 11	0	—	—
Kulyab		22.8	299	e 5 6	+ 1	e 9 14	+ 3	—	—
Obi-garm		23.0	301	i 5 14	+ 7	i 9 19	+ 5	—	—
Stalinabad		23.6	301	e 5 22	+ 9	e 9 30	+ 5	—	—
Irkutsk		24.0	13	e 5 20?	+ 3	e 9 47?	+15	—	—
Tashkent		24.2	307	e 5 21?	+ 2	e 9 40?	+ 5	—	—
Kodaikanal	E.	25.1	226	—	—	9 37	-14	—	—
Vladivostok		32.5	55	e 6 32	- 2	—	—	—	—
Sverdlovsk		36.7	329	7 11	+ 1	12 56	+ 2	—	—
Moscow		48.2	321	e 8 44	0	e 15 42	- 1	—	—
Ksara		50.1	291	8 41?	-18	—	—	—	—
Pulkovo		52.6	325	e 9 21	+ 3	—	—	—	—
Upsala	N.	59.0	325	e 3 16	?	—	—	(e 12 41?)	PP e 12.7
Prague		62.5	315	e 10 27	- 1	e 18 59	+ 5	e 12 53	PP
Collimberg	z.	63.1	316	e 10 30	- 2	—	—	—	—
Jena	E.	64.0	316	e 10 36	- 2	—	—	—	—
Triest	z.	64.0	310	e 11 37	+59	—	—	—	—
Stuttgart		66.1	314	10 49	- 2	—	—	—	—
Chur		66.5	312	e 10 52 <sub>a</sub>	- 2	—	—	—	—
Zürich		66.9	313	e 10 54	- 2	—	—	—	—
Strasbourg		67.1	315	e 10 57	0	—	—	—	—
Besançon		68.9	314	e 11 11	+ 2	—	—	e 11 27	P <sub>c</sub> P
Paris		70.3	316	i 11 17	0	—	—	i 11 31	P <sub>c</sub> P
College		74.4	23	e 11 40	- 2	e 22 28	PPS	e 14 27	PP
Algiers Univ.	z.	74.7	304	11 44	+ 1	—	—	—	—
Tamanrasset	z.	78.9	290	e 12 6	- 1	e 12 12	P <sub>c</sub> P	e 15 9	PP
Pretoria	z.	84.3	236	e 12 39	+ 4	—	—	—	—
Hungry Horse		98.5	19	i 13 41	- 1	—	—	e 17 36	PP
Overton	z.	109.0	24	e 19 10	PP	—	—	—	—
Boulder City		109.3	24	e 18 55	PP	—	—	—	—
Pierce Ferry		109.5	24	i 18 39	[+ 7]	—	—	e 19 4	PP

Additional readings :—

Strasbourg e = 11m.2s.

Paris i = 11m.23s. and 11m.54s.

College e = 12m.11s.

Algiers Univ. eZ = 11m.47s.

Long waves also recorded at Warsaw.



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Aug. 16d. 22h. 28m. 53s. Epicentre 28°·7N. 96°·6E. (as at 6h.).

	$\Delta$	Az.	P.		O - C.	S.		O - C.
	°	°	m.	s.	s.	m.	s.	s.
Przhevalsk	20·2	317	e 4	39	0	—	—	—
Murgab	21·2	303	e 4	45	- 4	e 8	34	- 7
Almata	21·5	319	e 4	52	0	—	—	—
Frunse	22·7	314	e 5	4	0	e 9	9	0
Andijan	23·2	307	5	9	0	e 9	15	- 3
Fergana	23·5	307	e 5	7	- 5	—	—	—
Obi-garm	24·4	302	i 5	21	0	e 9	40	+ 1
Stalinabad	25·1	301	e 5	30	+ 2	e 9	49	- 2
Samarkand	26·7	302	e 5	42	- 1	—	—	—
Sverdlovsk	37·8	328	e 7	21	+ 1	—	—	—
Stuttgart	67·4	315	10	59	0	—	—	—
College	74·3	24	i 11	46	+ 5	—	—	—
Tamanrasset	z. 80·6	291	e 12	8	- 8	—	—	—

Aug. 16d. 23h. 21m. 18s. Epicentre 25°·9N. 96°·8E. (as at 20h.).

	$\Delta$	Az.	P.		O - C.	S.		O - C.	Supp.		L.	
	°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.	
New Delhi	17·6	283	e 4	2	- 6	e 7	11	- 12	—	—	—	
Hyderabad	19·0	246	4	41	+ 15	8	31	SS	—	—	—	
Nanking	20·3	67	4	36 <sub>a</sub>	- 4	i 8	18	- 5	i 5	2	PP	e 9·8
Poona	22·4	225	e 5	12	PP	9	19	+ 15	—	—	—	
Przhevalsk	22·4	322	i 4	59	- 3	—	—	—	—	—	—	
Murgab	22·9	308	e 5	1	- 5	e 9	5	- 8	—	—	—	
Naryn	23·1	317	i 5	6?	- 2	—	—	—	—	—	—	
Bombay	23·2	256	e 5	17	+ 8	e 9	31	+ 13	—	—	—	
Almata	23·7	322	i 5	13	- 1	i 9	26	- 1	—	—	—	
Kodaikanal	E. 24·0	233	—	—	—	e 10	3	SS	—	—	—	
Frunse	24·8	317	i 5	25	0	i 9	45	- 1	—	—	—	
Andijan	25·1	310	5	28	0	9	48	- 3	—	—	—	
Fergana	25·3	310	e 5	29	- 1	—	—	—	—	—	—	
Kulyab	25·8	304	e 5	35	+ 1	—	—	—	—	—	—	
Obi-garm	26·1	306	i 5	37	0	i 10	8	+ 1	—	—	—	
Irkutsk	26·9	10	e 5	42	- 3	e 10	21	- 1	—	—	—	
Samarkand	28·4	304	e 5	57	- 1	—	—	—	—	—	—	
Vladivostok	33·3	50	e 6	37	- 4	i 11	52	- 10	—	—	—	
Ashkabad	34·5	300	6	56	+ 4	—	—	—	—	—	—	
Kizyl-Arvat	36·3	302	e 7	10	+ 3	—	—	—	—	—	—	
Sverdlovsk	40·3	330	i 7	38	- 2	i 13	44	- 5	—	—	—	
Grozny	44·7	306	8	19	+ 3	14	54	0	—	—	—	
Tiflis	45·3	303	e 8	23	+ 2	—	—	—	—	—	—	
Leninakan	46·0	302	e 8	30	+ 3	—	—	—	—	—	—	
Borzhomi	46·4	304	e 8	32	+ 2	—	—	—	—	—	—	
Moscow	51·8	321	e 9	9	- 3	e 16	23	- 10	—	—	—	
Ksara	52·8	293	i 9	23	+ 4	16	53	+ 6	—	—	—	
Yalta	53·2	307	e 9	22	0	e 16	46	- 6	—	—	—	
Pulkovo	56·2	325	i 9	43	- 1	e 17	28	- 5	—	—	—	
Istanbul	57·2	303	e 9	51	0	e 17	42?	- 4	—	—	—	
Helwan	z. 57·3	289	9	53	+ 1	—	—	—	—	—	—	
Warsaw	61·4	318	(e 10	21)	+ 1	(e 25	20)	Q	(e 16	18)	? e 31·7	
Prague	E. 65·8	315	e 10	48	- 1	—	—	—	e 13	9	PP	
Copenhagen	65·9	322	i 10	48	- 2	20	54	PPS	—	—	34·7	
Collmberg	z. 66·5	316	e 10	53	- 1	—	—	—	—	—	—	
Jena	67·4	316	e 10	59	0	—	—	—	e 11	3	P	
Stuttgart	69·5	315	11	12	0	—	—	—	—	—	—	
Chur	69·8	313	e 11	13 <sub>a</sub>	- 1	—	—	—	—	—	—	
Strasbourg	70·3	315	i 11	18 <sub>a</sub>	+ 1	e 11	36	P <sub>c</sub> P	e 13	33	PP	
Zürich	70·3	314	e 11	16 <sub>a</sub>	- 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.
Besançon		72.0	314	i 11 27	- 1	—	—	—	—
Paris		73.7	316	i 11 38	0	—	—	—	e 43.7
Kew		74.4	320	e 11 42	0	—	—	—	e 39.7
College		76.8	23	i 11 52	- 3	—	—	—	—
Rathfarnham Castle		77.0	323	i 11 56	0	—	—	—	e 41.7
Algiers Univ.	z.	77.8	305	e 12 0	- 1	—	—	14 49	PP
Tamanrasset	z.	81.4	291	i 12 24 <sub>a</sub>	+ 4	e 12 33	P <sub>c</sub> P	i 15 28	PP
Pretoria	z.	83.8	237	i 12 41	+ 9	—	—	—	—
Hungry Horse		101.1	20	e 13 53	0	—	—	e 17 38	PP
Overton	z.	111.3	27	e 18 18	[- 18]	—	—	—	—
Boulder City		111.6	27	e 19 22	PP	—	—	—	—
Pierce Ferry		111.8	26	e 18 41	[+ 4]	—	—	e 19 18	PP
Bogota		148.4	342	i 19 54	[+ 9]	—	—	—	—

Additional readings :—

Nanking  $i = 5m.38s.$ ,  $eE = 8m.5s.$ ,  $iP_cP?N = 9m.13s.$

Warsaw readings except L have been increased by 30m.

Prague  $eE = 10m.55s.$ ,  $11m.26s.$ , and  $11m.52s.$

Besançon  $e = 11m.37s.$

Paris  $i = 11m.42s.$  and  $12m.49s.$

Long waves were also recorded at Granada, Rome, Potsdam, and Upsala.

Aug. 16d. Readings also at 0h. (Collmberg (2), Chur, Paris (2), Strasbourg (2), Stuttgart (4), Tamanrasset (4), Pretoria, Overton, Pierce Ferry (2), Hungry Horse, College, New Delhi, Przhevalsk and near Fergana), 1h. (Collmberg, Stuttgart (5), Tamanrasset, and near Florence Xim), 2h. (Almata (2), Andijan (2), Fergana, Frunse (2), Tashkent, Samarkand, Stalinabad, Borzhomi, Sverdlovsk (2), Bombay, Ksara, Jena, Stuttgart, Tamanrasset, Huancayo, and Lick), 3h. (Almata, Andijan, Fergana, Frunse, Samarkand, Stalinabad, Tashkent, Irkutsk, Sverdlovsk, Bombay, Kodaikanal, Pulkovo, Ksara, Moscow, Collmberg (3), Besançon (2), Paris (3), Strasbourg (4), Stuttgart (5), Algiers Univ., Tamanrasset (3), and Overton), 4h. (Almata (2), Andijan (4), Fergana, Frunse (3), Murgab, Obi-garm, Stalinabad (3), Tashkent (2), Nanking, Sverdlovsk (2), Bombay (3), Kodaikanal, New Delhi, Moscow, Collmberg (2), Besançon, Paris, Strasbourg (2), Stuttgart (6), Algiers Univ., Tamanrasset (4), Pretoria, and near Huancayo), 5h. (Tamanrasset), 6h. (Collmberg, Stuttgart, Tamanrasset, Bogota, Overton, Pierce Ferry, and near Ashkabad), 7h. (Almata, Andijan, Frunse, Kulyab, Murgab, Przhevalsk, Stalinabad, Tashkent, Irkutsk, Sverdlovsk, Pulkovo, Bombay, New Delhi, Moscow, Prague, Jena, Chur, Collmberg, Stuttgart (3), Tamanrasset, Overton, Pierce Ferry, Lick, Hungry Horse, College, and near Yalta), 8h. (New Delhi, Collmberg, Stuttgart (2), Tamanrasset, Overton, Pierce Ferry, and Hungry Horse), 9h. (Andijan, Frunse, Przhevalsk, Stuttgart (2), Grahamstown, Tamanrasset, Mount Wilson, Riverside, Tinemaha, Boulder City, Overton, Pierce Ferry, Mineral, Shasta Dam, Hungry Horse, Victoria, College, and near Guam), 10h. (De Bilt and Kew), 11h. (Prague, Stuttgart, Tamanrasset (2), Kodaikanal, Nanking, Sverdlovsk, Tashkent, Andijan, Samarkand, near Fergana, Kulyab, Murgab, Obi-garm, and Stalinabad), 12h. (Andijan, Bombay, Collmberg, Stuttgart (2), Tamanrasset, La Paz, and College), 13h. (Andijan (2), Frunse, Murgab, Stalinabad, Sverdlovsk, Bombay, New Delhi, Collmberg, and Stuttgart (3)), 14h. (Almata, Andijan, Fergana, Frunse, Kulyab, Murgab, Przhevalsk, Samarkand, Stalinabad, Irkutsk, Bombay (2), Sverlovsk, Moscow, Collmberg, Upsala, Stuttgart (4), and Tamanrasset (2)), 15h. (Almata (2), Andijan (2), Frunse (2), Kulyab, Murgab (2), Obi-garm, Przhevalsk (2), Samarkand (2), Stalinabad (2), Tashkent (2), Irkutsk, Nanking, Bombay (2), Sverdlovsk (2), Moscow (2), Collmberg (2), Jena, Besançon, Stuttgart (3), Chur, Strasbourg, Algiers Univ., Tamanrasset, Pretoria (2), Overton, and Victoria), 16h. (Christchurch, Kaimata, Wellington, Riverview, Besançon, Kew, and Tamanrasset (2)), 17h. (Andijan, Frunse, Samarkand, Stalinabad (2), Stuttgart (2), and Tamanrasset), 18h. (Stuttgart and Overton), 19h. (Stuttgart (2) and Tamanrasset), 20h. (La Paz, Tamanrasset, Overton, Pierce Ferry (2), and College), 21h. (Stuttgart), 22h. (De Bilt, Stuttgart (2), Tamanrasset, and College (2)), 23h. (Stuttgart and Tamanrasset (2)).

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Aug. 17d. 1h. 54m. 14s. Epicentre 29°·2N. 95°·1E. (as on 16d.).

Intensity V at Gauhati and Tezpur; IV at Pandu. Epicentre 29°N. 94°E.  
Seismological Bulletin, Government of India, August, 1950, p. 19.

A = -·0777, B = +·8709, C = +·4853;  $\delta = +2$ ;  $h = +2$ ;  
D = +·996, E = +·089; G = -·043, H = +·483, K = -·874.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Dehra Dun	N.	14·9	279	e 8 32	PcP	—	—	—	e 7·3
New Delbi		15·7	272	e 3 37	- 7	e 6 25	-14	3 48 PP	—
Przhevalsk		18·9	320	i 4 29	+ 5	—	—	—	—
Hyderabad	N.	19·2	236	i 4 17?	-11	i 7 47	-12	—	9·8
Murgab		19·8	304	i 4 32?	- 3	—	—	—	—
Naryn		19·8	315	i 4 36	+ 1	—	—	—	—
Almata		20·2	320	i 4 43	+ 4	i 8 38	+17	—	—
Nanking		20·6	75	i 4 43 <sub>a</sub>	0	i 8 32	+ 3	i 5 25 PPP	e 9·9
Frunse		21·4	315	i 4 55?	+ 4	i 8 59?	+14	—	—
Andijan		21·8	308	e 4 58	+ 2	9 1	+ 9	—	—
Fergana		22·1	308	e 5 0	+ 1	—	—	—	—
Poona	N.	22·1	246	4 56	- 3	8 50	- 8	—	9·1
Bombay		22·8	249	e 5 2	- 3	i 9 2	- 9	9 31 SS	10·5
Kulyab		22·8	299	e 5 6	+ 1	e 9 15	+ 4	—	—
Obi-garm		23·0	301	i 5 9	+ 2	i 9 15	+ 1	—	—
Stalinabad		23·6	301	i 5 15	+ 2	i 9 29	+ 4	—	—
Irkutsk		24·0	13	i 5 25	+ 8	e 10 4	+32	—	—
Tashkent		24·2	307	i 5 21	+ 2	e 9 41	+ 6	—	—
Kodaikanal	E.	25·1	226	i 5 17	-11	i 9 43	- 8	—	—
Samarkand		25·3	302	e 5 30	0	—	—	—	—
Colombo	E.	26·4	216	5 37	- 3	10 7	- 5	—	13·9
Ashkabad		31·7	297	e 6 27	0	—	—	—	—
Kizyl-Arvat		33·4	299	e 6 43	+ 1	i 12 4	+ 1	—	—
Sverdlovsk		36·7	329	i 7 15	+ 5	i 13 2	+ 8	—	—
Djakarta		37·0	159	e 7 7	- 6	e 12 49	-10	—	—
Baku		38·4	300	e 7 46	+21	—	—	—	—
Tiflis		42·3	302	e 7 58	+ 1	—	—	—	—
Moscow		48·2	321	i 8 46	+ 2	i 15 47	+ 4	—	—
Yalta		50·0	305	8 56	- 2	i 16 8	- 1	—	—
Ksara		50·1	291	i 8 57	- 2	16 19	+ 9	—	—
Pulkovo		52·6	325	i 9 21	+ 3	i 16 51	+ 7	—	—
Kishinev		53·5	310	9 3	-21	—	—	—	—
Istanbul		54·1	302	e 9 27	- 2	e 17 1	- 4	—	—
Helwan		54·8	288	i 9 31 <sub>a</sub>	- 3	17 10	- 4	—	—
Helsinki		55·3	326	e 9 39	+ 1	e 17 25	+ 4	e 21 2 SS	28·8
Bucharest		55·7	306	e 9 42	+ 2	e 17 27	+ 1	—	—
Warsaw		58·0	317	e 9 59	+ 2	18 3	+ 6	e 12 1 PP	e 29·8
Skalnate Pleso		58·9	313	e 10 4	+ 1	e 18 10	+ 2	e 18 32 PPS	—
Timisoara		58·9	309	9 46?	-17	—	—	—	—
Upsala		59·0	325	i 10 4	0	i 18 11	+ 1	e 12 15 PP	e 27·8
Ogyalla		60·5	312	e 10 16	+ 2	e 18 31	+ 2	e 13 4 PP	—
Copenhagen		62·4	321	i 10 28	+ 1	i 18 57	+ 4	22 46 SS	32·8
Prague		62·5	315	e 10 27	- 1	e 18 57	+ 3	e 12 53 PP	e 30·8
Potsdam		62·8	318	i 10 35	+ 5	e 18 58	0	—	e 32·8
Taranto		63·0	303	—	—	i 18 48	-13	—	—
Collnberg		63·1	316	e 10 31	- 1	e 19 4	+ 2	—	—
Cheb		63·7	315	e 10 33	- 3	e 19 12	+ 2	e 12 55 PP	—
Jena		64·0	316	e 10 37	- 1	e 19 11	- 2	19 15 S	—
Triest		64·0	310	i 10 36 <sub>a</sub>	- 2	i 19 15	+ 2	—	—
Messina		64·9	302	e 10 43	0	e 19 24	0	—	—
Padova		65·6	309	e 10 48	0	19 32	- 1	13 18 PP	—
Bologna		66·0	310	e 11 13	+23	—	—	—	—
Rome		66·0	306	i 10 48	- 2	i 19 36	- 2	13 15 PP	e 34·0
Stuttgart		66·1	314	i 10 50 <sub>a</sub>	- 1	e 19 42	+ 3	—	—
Florence Xim		66·3	308	e 10 56	+ 4	i 19 42	0	—	—
Prato		66·3	308	e 10 50	- 2	e 20 5	PS	—	—
Chur		66·5	312	e 10 52 <sub>a</sub>	- 2	—	—	—	—
Zürich		66·9	313	e 10 54 <sub>a</sub>	- 2	—	—	—	—
Strasbourg		67·1	315	i 10 57 <sub>a</sub>	0	e 19 54	+ 3	e 24 15 SS	e 32·8
Basle		67·5	313	e 10 59	- 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.
De Bilt		67.5	319	i 11 0	0	e 20 2	+ 6	—	e 33.8
Besançon		68.9	314	i 11 6	- 3	—	—	—	—
Aberdeen		69.7	325	—	—	i 20 27	+ 5	e 27 41	SSS e 35.8
Durham		70.3	323	e 11 28	+11	i 20 36	+ 7	—	—
Paris		70.3	316	i 11 12	- 5	i 20 31	+ 2	i 11 18	P e 36.8
Kew		70.9	319	e 11 22	+ 1	e 20 40	+ 4	—	e 35.8
Clermont-Ferrand		71.0	312	e 11 21	- 1	e 20 39	+ 2	e 13 58	PP —
Scoresby Sund		71.1	342	—	—	20 48	+10	—	36.8
Rathfarnham Castle		73.5	323	e 11 34	- 2	e 21 0	- 6	—	e 37.8
College		74.4	23	i 11 43	+ 1	—	—	—	—
Algiers Univ.	z.	74.7	304	e 11 40	- 3	—	—	—	—
Tortosa		74.8	309	11 43	- 1	21 25	+ 5	21 55	ScS e 41.8
Alicante		76.5	307	11 53	- 1	21 39	0	14 45	PP e 36.8
Tamanrasset	z.	78.9	290	i 12 5 <sub>a</sub>	- 2	—	—	i 12 13	PcP —
Granada		79.2	307	i 12 8 <sub>a</sub>	0	i 22 8	0	i 15 14	PP 41.6
Sitka		84.1	25	e 12 37	+ 3	e 23 4?	+ 6	—	—
Pretoria	z.	84.3	236	i 12 29	- 6	—	—	—	—
Pietermaritzburg	z.	85.0	232	i 12 33	- 5	—	—	—	—
Grahamstown		89.8	231	e 12 56	- 6	—	—	—	—
Hungry Horse		98.5	19	e 13 43	+ 1	—	—	e 17 36	PP —
Shasta Dam		102.3	28	e 18 7	PP	—	—	—	—
Tinemaha	z.	107.1	27	e 18 51	PP	—	—	—	—
Harvard		107.6	349	—	—	e 28 20	PS	—	e 57.3
Overton	z.	109.0	24	e 18 18	[-13]	—	—	i 19 5	PP —
Boulder City		109.3	24	e 19 1	PP	—	—	—	—
Pierce Ferry		109.5	24	e 18 34	[+ 2]	—	—	i 19 6	PP —
Mount Wilson	z.	109.5	28	e 19 6	PP	—	—	—	—
Philadelphia		110.6	351	e 28 49	PS	—	—	—	e 55.0
Tucson		114.1	24	e 18 43	[+ 2]	—	—	—	—
Bogota		144.8	341	i 19 42	[+ 3]	—	—	—	—
Chinchina		144.9	343	i 19 39	[ 0]	—	—	—	—
Huancayo		160.7	330	e 20 5	[+ 3]	—	—	—	—

Additional readings:—

New Delhi SSEN = 6m.40s.

Nanking PPP? = 5m.41s., iZ = 6m.34s., PcP?N = 9m.40s.

Warsaw ePPPEZ = 13m.39s., PSE = 18m.26s., ScSE = 19m.53s., SSE = 21m.45s., eZ = 22m.59s., SSSZ = 24m.2s.

Upsala eQN = 24.8m.

Ogyalla ePPP = 14m.7s., eSSS = 24m.52s.

Copenhagen 20m.22s.

Prague e = 10m.32s., 11m.11s., 11m.41s., 12m.18s., 15m.10s., and 21m.36s., eSS = 24m.10s., eSSS = 25m.8s.

Cheb e = 22m.55s., eSSS = 26m.40s.

Rome i = 20m.47s., SS = 23m.55s.

Strasbourg eSSS = 27m.10s.

Clermont-Ferrand ePPP = 15m.45s., eSS = 25m.21s., eSSS = 28m.36s.

Tortosa PSN = 22m.13s., SSN = 26m.39s.

Alicante PPP = 16m.33s., PS = 22m.25s., SS = 26m.53s., SSS = 30m.13s.

Tamanrasset eZ = 14m.55s., iPPZ = 15m.11s., ePPPZ = 17m.2s.

Granada PcP = 12m.22s., PS = 22m.44s., iSS = 27m.14s.

Long waves were also recorded at Bergen, Edinburgh, Weston, and Seattle.

Aug. 17d. 3h. 26m. 15s. Epicentre 33°·5N. 80°·0E. (as on 13d.).

A = +·1451, B = +·8229, C = +·5493;  $\delta$  = -5; h = +1;

D = +·985, E = -·174; G = +·095, H = +·541, K = -·836.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.
	°	°	m. s.	s.	m. s.	s.	m. s.
New Delhi	5.5	207	e 1 35	P*	e 2 52	S*	—
Murgab	6.9	317	e 1 45	0	i 3 4	- 1	—
Naryn	8.5	339	e 2 4	- 3	e 3 39	- 6	—
Przhevalsk	9.1	353	i 2 9	- 5	—	—	—
Kulyab	9.4	301	e 2 23	+ 5	e 4 14	+ 7	—

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.
Andijan	9.5	322	e 2 18	- 2	—	—	—
Fergana	9.5	319	e 2 20	0	—	—	—
Obi-garm	9.8	305	e 2 31	+ 7	—	—	—
Almata	10.0	347	i 2 23	- 4	—	—	—
Frunse	10.3	337	e 2 30	- 2	—	—	—
Stalinabad	10.4	302	e 2 44	+10	—	—	—
Tashkent	11.6	316	e 2 47?	- 3	e 4 35?	-26	—
Samarkand	12.1	304	e 3 0	+ 3	—	—	—
Ashkabad	18.1	290	e 4 20	+ 6	—	—	—
Sverdlovsk	26.8	336	5 39	- 5	—	—	—
Moscow	36.7	320	e 7 8	- 2	e 12 51	- 3	—
Pulkovo	41.6	325	e 7 53	+ 2	—	—	—
Prague	50.0	311	e 8 55	- 3	—	—	e 10 56
Collmberg	z. 50.8	311	e 9 5	+ 1	—	—	—
Stuttgart	53.6	309	9 23	- 2	—	—	—
Tamanrasset	z. 65.3	282	e 10 46	0	—	—	—
College	75.1	20	i 11 37	- 9	—	—	—

Long waves were recorded at Bombay, Kodaikanal, and other European stations.

Aug. 17d. 3h. 44m. 14s. Epicentre 29°·2N. 95°·1E. (as at 1h.).

	$\Delta$ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	Supp. m. s.
Przhevalsk	18.9	320	i 4 29	+ 5	—	—	—
Murgab	19.8	304	e 4 34	- 1	e 8 18	+ 5	—
Almata	20.2	320	e 4 40	+ 1	e 8 34	+13	—
Frunse	21.4	315	e 4 54	+ 3	e 8 56	+11	—
Andijan	21.8	308	e 4 52	- 4	—	—	—
Stalinabad	23.6	301	e 5 13	0	—	—	—
Tashkent	24.2	307	e 5 21	+ 2	—	—	—
Sverdlovsk	36.7	329	7 12	+ 2	—	—	—
Collmberg	z. 63.1	316	e 10 31	- 1	—	—	—
Stuttgart	66.1	314	10 48	- 3	—	—	—
Kew	70.9	319	e 10 46?	-35	—	—	—
Rathfarnham C.	z. 73.5	323	i 11 24	-12	—	—	e 14 48
College	74.4	23	e 11 41	- 1	—	—	—
Tamanrasset	z. 78.9	290	e 12 3	- 4	—	—	—

Long waves were recorded at Bombay.

Aug. 17d. 5h. 29m. 10s. Epicentre 29°·2N. 95°·1E. (as at 3h.).

	$\Delta$ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	Supp. m. s.	L. m.
Dehra Dun	N. 14.9	279	e 5 20	?	—	—	—	e 7.3
New Delhi	15.7	272	e 3 41	- 3	e 6 30	- 9	3 53	PP
Hyderabad	E. 19.2	236	4 31	+ 3	8 13	+14	—	10.2
Murgab	19.8	304	4 33	- 2	8 7	- 6	—	—
Naryn	19.8	315	e 4 33	- 2	e 8 8	- 5	—	—
Almata	20.2	320	i 4 38	- 1	—	—	—	—
Nanking	20.6	75	i 4 50 <sub>a</sub>	+ 7	i 8 42	+13	—	19.2
Frunse	21.4	315	e 4 49?	- 2	i 8 49?	+ 4	—	—
Andijan	21.8	308	e 4 55	- 1	i 8 52	0	—	—
Fergana	22.1	308	e 4 57	- 2	e 8 54	- 4	—	—
Poona	E. 22.1	246	5 6	+ 7	9 8	+10	—	—
Bombay	22.8	249	5 9	+ 4	9 16	+ 5	—	10.8
Kulyab	22.8	299	e 5 3	- 2	e 9 7	- 4	—	—
Obi-garm	23.0	301	i 5 5	- 2	i 9 15	+ 1	—	—
Stalinabad	23.6	301	i 5 15?	+ 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.
Irkutsk	24.0	13	i 5 19	+ 2	—	—	—	—
Tashkent	24.2	307	i 5 20	+ 1	i 9 37	+ 2	—	—
Kodaikanal	25.1	226	e 6 8	+40	—	—	—	—
Samarkand	25.3	302	e 5 31	+ 1	—	—	—	—
Ashkabad	31.7	297	e 6 26	- 1	—	—	—	—
Vladivostok	32.5	55	i 6 37	+ 3	—	—	—	—
Kizyl-Arvat	33.4	299	e 6 44	+ 2	—	—	—	—
Grozny	41.6	304	e 7 53	+ 2	e 14 6	- 2	—	—
Tiflis	42.3	302	e 7 57	0	—	—	—	—
Leninakan	43.0	300	e 8 6	+ 3	—	—	—	—
Borzhomi	43.4	302	e 8 7	+ 1	—	—	—	—
Moscow	48.2	321	e 8 44	0	e 15 40	- 3	—	—
Yalta	50.0	305	e 8 55	- 3	e 16 3	- 6	—	—
Ksara	50.1	291	i 9 3	+ 4	16 25?	+15	—	—
Pulkovo	52.6	325	i 9 18	0	16 43	- 1	—	—
Kishinev	53.5	310	e 9 21	- 3	—	—	—	—
Istanbul	54.1	302	e 9 25	- 4	e 17 0	- 5	—	—
Helsinki	55.3	326	e 9 37	- 1	e 17 14	- 7	—	27.8
Warsaw	58.0	317	e 9 57	0	e 17 57	0	15 7	PcS e 30.8
Skalnate Pleso	58.9	313	e 10 3	0	e 18 6	- 2	—	—
Timisoara	58.9	309	9 50?	-13	—	—	—	—
Upsala	59.0	325	e 10 3	- 1	i 18 5	- 5	e 12 11	PP e 29.8
Copenhagen	62.4	321	i 10 26	- 1	i 18 52	- 1	20 21	ScS 31.8
Prague	62.5	315	e 10 25	- 3	e 18 50	- 4	e 22 50	SS
Collmberg	63.1	316	e 10 29	- 3	—	—	—	—
Cheb	63.7	315	e 10 32	- 4	e 19 5	- 5	e 23 14	SS
Messina	64.9	302	e 10 46	+ 3	e 19 31	+ 7	—	—
Padova	65.6	309	e 10 48	0	19 28	- 5	—	—
Bologna	66.0	310	e 11 15	+25	—	—	—	—
Rome	66.0	306	e 10 46	- 4	e 19 31	- 7	e 13 14	PP 33.0
Stuttgart	66.1	314	10 50	- 1	19 34	- 5	—	—
Prato	66.3	308	e 10 50	- 2	19 34	- 8	—	—
Zürich	66.9	313	e 10 54	- 2	—	—	—	—
Strasbourg	67.1	315	i 10 56k	- 1	—	—	11 10	PcP e 34.8
De Bilt	67.5	319	i 10 59	- 1	e 19 56	0	—	e 32.8
Besançon	68.9	314	i 11 5	- 4	—	—	e 11 56	PcP
Paris	70.3	316	i 11 16	- 1	—	—	—	e 36.8
Kew	70.9	319	e 11 21	0	e 20 37	+ 1	—	e 35.8
Rathfarnham Castle	73.5	323	e 11 50	+14	—	—	—	e 36.8
College	74.4	23	i 11 41	- 1	—	—	—	—
Algiers Univ.	74.7	304	e 11 41	- 2	—	—	—	—
Tamanrasset	78.9	290	i 12 7k	0	e 12 14	PcP	e 15 5	PP
Brisbane	79.1	129	i 9 14	?	—	—	—	—
Granada	79.2	307	i 12 10a	+ 2	22 6	- 2	12 48	PcP i 45.2
Pretoria	84.3	236	i 12 37	+ 2	—	—	—	—
Pietermaritzburg	85.0	232	e 12 42	+ 4	—	—	—	—
Victoria	95.3	24	e 13 29	+ 2	—	—	—	—
Shasta Dam	102.3	28	—	—	e 23 41	[-57]	—	—
Overton	109.0	24	e 18 35	[+ 4]	e 23 55	?	i 19 3	PP
Boulder City	109.3	24	e 23 50	?	—	—	—	—
Pierce Ferry	109.5	24	e 18 38	[+ 6]	e 24 0	?	i 19 6	PP
Bogota	144.8	341	i 11 22	?	—	—	—	—
La Paz	160.0	305	i 19 4	[-57]	—	—	—	—

Additional readings :—

New Delhi SSEN = 6m.45s., SSSN = 6m.49s.

Warsaw eE = 18m.20s., eScSN = 19m.50s.?, eSS = 22m.6s., eN = 22m.42s.

Upsala eSE = 18m.17s., eSSN = 22m.50s.

Prague e = 11m.6s., 11m.36s., 12m.25s., and 14m.31s., eSSS = 25m.38s.

Cheb eSSS = 25m.56s.

Rome eSS = 23m.57s.

Strasbourg e = 11m.39s.

Granada IPP = 15m.7s., PPP = 16m.59s., SS = 27m.6s.

Long waves were also recorded at Aberdeen, Bergen, Potsdam, Clermont-Ferrand, and

Tortosa

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Aug. 17d. 8h. 5m. 6s. Epicentre 29°·2N, 95°·1E. (as at 5h.).

	$\Delta$ °	Az. °	P.		O-C. s.	S.		O-C. s.	Supp.		
			m.	s.		m.	s.		m.	s.	
New Delhi	15·7	272	e 3	41	- 3	e 6	32	- 7	—	—	
Murgab	19·8	304	e 4	35	0	—	—	—	—	—	
Naryn	19·8	315	e 4	33	- 2	—	—	—	—	—	
Almata	20·2	320	e 4	38	- 1	—	—	—	—	—	
Frunse	21·4	315	e 4	51?	0	e 9	3?	+18	—	—	
Andijan	21·8	308	e 4	56	0	9	7	+15	—	—	
Fergana	22·1	308	e 4	57	- 2	e 9	6	+ 8	—	—	
Bombay	22·8	249	e 6	54	?	—	—	—	—	—	
Obi-garm	23·0	301	i 5	9	+ 2	—	—	—	—	—	
Stalinabad	23·6	301	e 5	13	0	e 9	33	+ 8	—	—	
Tashkent	24·2	307	e 5	28	+ 9	—	—	—	—	—	
Samarkand	25·3	302	e 5	28	- 2	—	—	—	—	—	
Sverdlovsk	36·7	329	7	17	+ 7	—	—	—	—	—	
Collmberg	z. 63·1	316	e 11	15	+43	—	—	—	—	—	
Stuttgart	66·1	314	10	48	- 3	—	—	—	—	—	
College	74·4	23	e 11	33	- 9	e 14	29	?	e 16	51	PP
Tamanrasset	z. 78·9	290	i 12	4 <sub>a</sub>	- 3	e 12	14	P <sub>c</sub> P	e 15	9	PP
Pretoria	z. 84·3	236	e 12	30	- 5	—	—	—	—	—	—
Hungry Horse	98·5	19	e 13	33	- 9	—	—	—	—	—	—
Overton	z. 109·0	24	e 24	8	SKS	(e 24	8)	[-60]	—	—	—

Long waves were recorded at De Bilt.

Aug. 17d. 10h. 30m. 37s. Epicentre 25°·9N, 96°·8E. (as on 16d.).

	$\Delta$ °	Az. °	P.		O-C. s.	S.		O-C. s.	Supp.		
			m.	s.		m.	s.		m.	s.	
New Delhi	17·6	283	e 4	6	- 2	e 6	56	-27	—	—	
Przhevsk	22·4	322	i 5	2	0	e 8	59	- 5	—	—	
Murgab	22·9	308	e 5	5	- 1	e 9	3	-10	—	—	
Naryn	23·1	317	e 5	6	- 2	—	—	—	—	—	
Almata	23·7	322	i 5	13	- 1	e 9	23	- 4	—	—	
Frunse	24·8	317	e 5	23?	- 2	e 9	41?	- 5	—	—	
Andijan	25·1	310	e 5	27	- 1	e 9	41	-10	—	—	
Fergana	25·3	310	e 5	28	- 2	—	—	—	—	—	
Kulyab	25·8	304	e 5	33	- 1	e 9	56	- 6	—	—	
Obi-garm	26·1	306	i 5	33	- 4	—	—	—	—	—	
Stalinabad	26·8	306	e 5	41	- 3	e 10	7	-12	—	—	
Tashkent	27·4	310	e 5	48	- 1	—	—	—	—	—	
Sverdlovsk	40·3	330	i 7	41	+ 1	—	—	—	—	—	
Tiflis	45·3	303	e 8	30	+ 9	—	—	—	—	—	
Yalta	53·2	307	e 9	19?	- 3	e 16	40?	-12	—	—	
Prague	65·8	315	e 10	50?	+ 1	—	—	—	—	—	
Collmberg	z. 66·5	316	e 11	2	+ 8	—	—	—	—	—	
Jena	67·4	316	e 10	58	- 1	—	—	—	e 11	10	?
Stuttgart	69·5	315	11	10	- 2	—	—	—	—	—	—
Chur	69·8	313	e 11	12 <sub>a</sub>	- 2	—	—	—	—	—	—
Strasbourg	70·3	315	e 11	27	+10	—	—	—	—	—	—
Besançon	72·0	314	e 11	26	- 2	—	—	—	e 11	36	P
Paris	73·7	316	i 11	47	+ 9	—	—	—	—	—	—
College	76·8	23	e 11	56	+ 1	—	—	—	i 12	6	P <sub>c</sub> P
Algiers Univ.	z. 77·8	305	e 12	11	+10	25	57	SS	—	—	—
Tamanrasset	z. 81·4	291	e 12	21	+ 1	e 12	28	P <sub>c</sub> P	e 15	21	PP
Hungry Horse	101·1	20	e 13	55	+ 2	—	—	—	—	—	—
Overton	z. 111·3	27	e 19	20	PP	—	—	—	—	—	—
Pierce Ferry	111·8	26	e 19	22	PP	—	—	—	—	—	—

Additional readings :—

Prague e = 10m.56s., 11m.1s., 11m.44s., and 11m.56s.

Tamanrasset ePZ = 12m.32s., iP<sub>c</sub>PZ = 12m.39s., eZ = 12m.47s., ePPZ = 15m.33s.

Long waves were recorded at De Bilt.

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Aug. 17d. 14h. 43m. 55s. Epicentre 25°·9N. 96°·8E. (as at 10h.).

		$\Delta$ °	Az. °	P.		O-C. s.	S.		O-C. s.	Supp.		L. m.	
				m.	s.		m.	s.		m.	s.		
New Delhi		17·6	283	e 4	7	- 1	i 6	57	-26	7	13	SS	—
Nanking		20·3	67	e 4	45	+ 5	e 8	39	+16	—	—	—	e 10·7
Murgab		22·9	308	e 5	10	+ 4	e 9	13	0	—	—	—	—
Naryn		23·1	317	i 5	7	- 1	e 9	15	- 1	—	—	—	—
Bombay		23·2	256	e 5	28	+19	—	—	—	—	—	—	e 12·1
Almata		23·7	322	—	—	—	e 9	29	+ 2	—	—	—	—
Frunse		24·8	317	e 5	25?	0	e 9	49?	+ 3	—	—	—	—
Andijan		25·1	310	e 5	28	0	9	53	+ 2	—	—	—	—
Fergana		25·3	310	e 5	29	- 1	—	—	—	—	—	—	—
Kulyab		25·8	304	e 5	35	+ 1	e 10	2	0	—	—	—	—
Obi-garm		26·1	306	i 5	36	- 1	i 10	8	+ 1	—	—	—	—
Stalinabad		26·8	306	e 5	44	0	e 10	17	- 2	—	—	—	—
Tashkent		27·4	310	e 5	47	- 2	—	—	—	—	—	—	—
Samarkand		28·4	304	e 5	58	0	—	—	—	—	—	—	—
Vladivostok		33·3	50	—	—	—	e 12	0	- 2	—	—	—	—
Ashkabad		34·5	300	e 6	54	+ 2	—	—	—	—	—	—	—
Sverdlovsk		40·3	330	i 7	42	+ 2	—	—	—	—	—	—	—
Borzhom		46·4	304	e 8	34	+ 4	—	—	—	—	—	—	—
Moscow		51·8	321	e 9	15	+ 3	—	—	—	—	—	—	—
Collmberg	z.	66·5	316	e 10	53	- 1	—	—	—	—	—	—	—
Jena	E.	67·4	316	e 11	8	+ 9	—	—	—	—	—	—	—
Stuttgart		69·5	315	11	12	0	—	—	—	—	—	—	—
Chur		69·8	313	e 11	14k	0	—	—	—	—	—	—	—
Strasbourg		70·3	315	e 11	18	+ 1	—	—	—	—	—	—	—
College		76·8	23	i 11	56	+ 1	e 18	52	?	—	—	—	—
Tamanrasset	z.	81·4	291	e 12	18	- 2	i 12	55	P <sub>c</sub> P	e 15	27	PP	—
Pretoria	z.	83·8	237	i 12	37	+ 5	—	—	—	—	—	—	—
Hungry Horse		101·1	20	e 13	57	+ 4	—	—	—	—	—	—	—
Overton	z.	111·3	27	i 19	21	PP	—	—	—	—	—	—	—

Additional readings :—

Overton iZ = 19m.27s.

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

Aug. 17d. 16h. 15m. 25s. Epicentre 22°·3S. 179°·2W. Depth of focus 0·090.  
(as on 1949, December 20d.).

A = -·9260, B = -·0129, C = -·3773 ;  $\delta = 0$  ;  $h = +4$  ;  
D = -·014, E = +1·000 ; G = +·377, H = +·005, K = -·926.

		$\Delta$ °	Az. °	P.		O-C. s.	S.		O-C. s.	Supp.		L. m.	
				m.	s.		m.	s.		m.	s.		
Apia		11·0	41	i 2	28 <sub>a</sub>	- 1	e 4	24	- 4	e 13	45	S <sub>c</sub> S	—
Auckland	N.	15·4	198	i 3	15	+ 3	e 6	55	+69	—	—	—	—
Arapuni		16·3	194	3	23	+ 3	e 6	11	+ 9	—	—	—	—
Wellington		19·6	194	3	47	- 4	e 6	46	-11	14	3	S <sub>c</sub> S	—
Cobb River	E.	19·9	199	3	53	- 1	e 6	54	- 8	—	—	—	—
Kaimata	N.E.	21·6	199	e 4	7	- 2	e 7	25	- 4	—	—	—	—
Christchurch		22·2	175	e 4	14	- 1	e 7	35	- 4	i 14	15	S <sub>c</sub> S	—
Brisbane		25·7	253	i 4	43 <sub>a</sub>	- 3	i 8	29	- 5	i 6	1	pP	—
Riverview		28·5	239	i 5	8 <sub>a</sub>	- 2	i 9	13	- 5	i 6	41	pP	—
Guam		50·1	312	e 9	28	pP	—	—	—	—	—	—	—
Mizusawa	N.	71·5	330	(10	21)	- 1	10	21	P	—	—	—	—
Djakarta		72·9	271	e 10	25	- 5	e 19	3	- 6	—	—	—	—
Vladivostok		79·1	326	i 11	3	- 1	20	7	- 8	i 14	15	PP	—
Santa Clara		80·1	43	i 11	7	- 2	i 20	33	+ 8	—	—	—	—
Nanking		80·2	311	i 11	8k	- 2	i 20	25	- 1	e 12	52	pP	29·4
Berkeley		80·3	43	e 11	10 <sub>a</sub>	0	e 20	30	+ 3	e 13	18	pP	—
Lick		80·3	43	i 11	11k	+ 1	e 20	33	+ 6	i 13	22	pP	—
Ferndale		80·7	40	—	—	—	e 20	39	+ 8	—	—	—	—
Pasadena		80·7	48	i 11	14k	+ 2	e 20	24	- 7	i 13	21	pP	—
Riverside		81·2	48	i 11	16	+ 1	i 20	40	+ 4	—	—	—	—

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.	
Fresno	81.2	45	i 11 15k	0	e 20 37	+ 1	e 13 15	pP	—
Shasta Dam	81.9	40	i 11 18	0	e 20 40	- 3	e 13 29	pP	—
Haiwee	82.0	46	i 11 20k	+ 1	e 20 47	+ 3	i 13 29	pP	—
Mineral	z. 82.2	41	e 11 20	0	e 20 53	+ 7	e 14 28	sP	—
Tinemaha	82.4	45	i 11 21	0	i 20 46	- 2	i 13 31	pP	—
Reno	82.8	43	e 11 23	0	i 21 50	SP	e 13 34	pP	—
Overton	z. 84.6	47	e 11 33	+ 1	i 21 6	- 3	i 13 45	pP	—
Pierce Ferry	84.7	48	i 11 33	+ 1	e 21 6	- 4	e 13 45	pP	—
Tucson	84.9	52	e 11 35	+ 2	e 21 23	+11	i 13 45	pP	—
Seattle	86.3	35	i 11 42k	+ 2	e 21 27	+ 2	i 13 56	pP	—
Victoria	86.3	34	i 11 38k	- 2	21 28	+ 3	i 13 51	pP	—
Sitka	87.2	22	i 11 45	+ 1	i 21 36	+ 3	e 13 59	pP	—
Tacubaya	88.4	69	e 11 54	+ 4	e 21 27	[+ 6]	—	—	—
Salt Lake City	88.5	44	e 11 49	- 1	i 21 23	[+ 1]	e 14 0	pP	—
Logan	89.1	44	i 11 54	+ 1	i 21 56	+ 6	i 14 9	pP	—
College	89.8	13	i 11 55	- 1	i 21 58	+ 2	i 14 6	pP	—
Butte	N. 90.8	40	e 14 20	pP	e 26 37	sSP	e 31 19	sSS	e 41.3
Hungry Horse	91.2	37	i 12 2	- 1	i 21 38	[ 0]	i 14 17	pP	—
Bozeman	91.6	41	e 14 18	pP	i 22 18	+ 6	e 21 41	SKS	—
Saskatoon	97.2	37	—	—	22 7	[- 3]	i 23 7	S <sub>c</sub> S	—
Huancayo	98.0	106	e 12 39	+ 5	i 23 0	- 6	22 19	SKS	—
La Paz	102.3	114	12 39	-13	i 22 35	[+ 1]	e 17 37	PP	—
St. Louis	102.8	53	e 15 10	pP	i 23 56	+10	e 22 33	SKS	—
Florissant	102.8	53	—	—	e 22 31	[- 5]	i 23 58	S	—
Bogota	105.7	91	—	—	e 22 50	[+ 1]	i 23 42	S	—
Kodaikanal	E. 106.1	275	—	—	e 23 43	S	—	—	—
Galerazamba	106.8	85	—	—	e 23 2	[+ 8]	e 23 56	S	—
Cincinnati	107.2	54	—	—	i 22 50	[- 6]	i 26 25	SP	—
Cleveland	110.0	52	i 17 24	[+ 1]	i 23 8	[ 0]	e 18 8	PP	—
Bombay	113.1	281	e 12 35	P	e 25 11	S	—	—	—
Przhevalsk	113.6	309	i 17 34	[+ 4]	e 23 24	[+ 2]	—	—	—
Philadelphia	114.5	55	—	—	e 23 26	[+ 1]	e 25 36	S	e 48.1
Ottawa	114.8	48	e 17 31	[- 2]	e 23 26	[ 0]	e 25 37	S	—
Almata	114.8	309	i 17 33	[ 0]	—	—	i 18 43	PP	—
Naryn	115.2	307	i 17 32	[- 1]	—	—	—	—	—
Murgab	116.4	303	e 17 38	[+ 2]	e 23 30	[- 2]	—	—	—
Frunse	116.5	308	e 17 36	[ 0]	—	—	—	—	—
Shawinigan Falls	N. 117.0	48	e 17 37	[ 0]	e 23 30	[- 4]	—	—	—
Harvard	117.5	52	i 17 38	[ 0]	e 27 53	PS	e 19 57	pPKP	—
San Juan	117.6	79	—	—	i 23 36	[ 0]	i 24 57	SKKS	—
Weston	117.7	52	e 17 35	[- 3]	i 23 37	[ 0]	e 18 55	PP	—
Andijan	117.9	305	e 17 38	[- 1]	e 23 41	[+ 4]	e 19 3	PP	—
Fergana	118.3	305	e 17 38	[- 2]	—	—	—	—	—
Seven Falls	E. 118.4	47	e 17 38	[- 2]	e 23 38	[- 1]	e 25 4	SKKS	—
Grahamstown	119.5	205	i 17 43	[+ 1]	e 27 57	S	e 19 15	pPKP	—
Kulyab	119.6	302	e 17 42	[ 0]	—	—	—	—	—
Obi-garm	119.7	303	i 17 40	[- 2]	—	—	i 21 14	PKS	—
Tashkent	120.3	306	i 17 42	[- 2]	e 23 42	[- 3]	i 19 19	PP	—
Stalinabad	120.4	303	e 17 40	[- 4]	—	—	—	—	—
Pietermaritzburg	z. 121.0	211	i 17 45	[ 0]	i 27 52	S	—	—	—
Bermuda	121.8	64	—	—	e 23 51	[+ 1]	e 25 29	SKKS	—
Samarkand	121.9	303	e 17 46	[- 1]	—	—	—	—	—
Fort de France	121.9	86	e 17 44	[- 3]	e 25 22	SKKS	—	—	—
Sverdlovsk	124.8	325	i 17 42	[-11]	—	—	19 43	PP	—
Pretoria	z. 125.3	211	e 17 48	[- 5]	i 27 35	S	e 19 52	pPKP	—
Mary	125.8	301	e 18 7	[+13]	—	—	—	—	—
Ashkabad	128.6	301	18 0	[ 0]	—	—	—	—	—
Kizyl-Arvat	130.2	304	18 4	[+ 2]	—	—	i 20 23	PP	—
Moscow	136.9	330	e 18 6	[- 9]	e 24 11	[-17]	e 20 14?	pPKP	—
Pulkovo	137.2	339	i 20 54	PP	i 21 50	PKS	24 12	PPP	—
Grozny	137.4	311	e 18 5	[-11]	—	—	i 21 53	PKS	—
Tiflis	138.5	308	e 18 12	[- 6]	—	—	i 21 58	PKS	—
Helsinki	138.5	343	e 21 50	PKS	—	—	—	—	—
Gori	138.9	309	e 18 14	[- 5]	—	—	e 21 57	PKS	—
Leninakan	139.4	308	e 18 19	[- 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.
Borzhomi	139.5	309	18 16	[- 4]	—	—	—	—
Upsala	140.6	347	e 19 6	[+44]	i 24 2	[-32]	i 21 57	PKS e 34.6
Yalta	144.8	317	i 18 28	[- 2]	e 22 0	PP	e 20 52	pPKP
Copenhagen	145.5	349	i 18 30	[ 0]	24 37	[- 4]	20 51	pPKP
Warsaw	146.3	337	i 18 34	[+ 2]	e 24 52	[+10]	e 20 41	pPKP
Kishinev	146.6	325	e 18 31	[- 1]	—	—	e 20 56	PP
Ksara	147.1	297	i 18 34	[+ 1]	21 56	PP	20 54	pPKP
Potsdam	148.5	346	e 18 43	[+ 8]	—	—	e 21 5	PP
Rathfarnham Castle	148.6	8	i 18 34	[- 1]	e 38 25	SS	i 21 14	pPKP
Skalnate Pleso	149.1	335	e 18 37	[+ 1]	e 24 53	[+ 7]	e 20 59	pPKP
Raciborzu	149.1	339	e 18 36	[ 0]	e 20 59	PP	i 18 48	PKP <sub>2</sub>
Collmburg	z. 149.5	345	e 18 36	[ 0]	—	—	i 21 5	pPKP
Bucharest	149.7	323	e 18 43	[+ 6]	—	—	—	—
Istanbul	149.7	314	e 18 37	[ 0]	—	—	e 21 4	PP
De Bilt	150.0	355	i 18 38	[+ 1]	e 32 2	PSKS	e 20 59	pPKP
Jena	E. 150.2	345	e 18 38	[+ 1]	e 23 23	PP	e 21 12	pPKP
Prague	150.3	343	e 18 37	[- 1]	e 24 49	[+ 2]	e 20 59	pPKP
Cheb	150.8	345	e 18 44	[+ 5]	e 24 57	[+ 9]	e 21 7	pPKP
Kew	150.9	1	i 18 37 <sub>a</sub>	[- 2]	e 30 8	SP	e 21 2	pPKP
Budapest	E. 150.9	334	e 18 39	[ 0]	—	—	—	—
Ogyalla	150.9	336	e 18 47	[+ 8]	e 28 59	SKKS	e 21 7	pPKP
Vienna	151.3	338	e 18 40	[+ 1]	e 22 23	PKS	i 20 13	pPKP
Timisoara	151.3	330	e 18 49	[+10]	—	—	—	—
Helwan	z. 151.6	292	e 18 38 <sub>k</sub>	[- 2]	24 44	[- 5]	21 4	pPKP
Kalossa	N. 151.7	334	18 47	[+ 7]	—	—	e 21 16	pPKP
Sofia	152.3	323	e 17 43	[-58]	—	—	—	—
Karlsruhe	152.7	349	e 18 35 <sub>?</sub>	[- 6]	—	—	—	—
Stuttgart	152.8	348	i 18 41 <sub>k</sub>	[- 1]	e 26 4	?	e 21 5	pPKP
Strasbourg	153.2	349	i 18 42 <sub>k</sub>	[ 0]	e 24 46	[- 5]	e 21 18	pPKP
Paris	153.5	357	e 18 39	[- 3]	i 25 9	[+17]	i 19 6	PKP <sub>2</sub>
Zürich	154.2	348	e 18 42 <sub>a</sub>	[- 1]	—	—	e 21 15	pPKP
Basle	154.2	349	e 18 43	[ 0]	e 24 35	[-17]	e 19 12	PKP <sub>2</sub>
Triest	z. 154.4	339	i 18 44 <sub>k</sub>	[+ 1]	—	—	i 21 14	pPKP
Chur	154.5	346	i 18 43 <sub>a</sub>	[ 0]	—	—	i 19 11	PKP <sub>2</sub>
Besançon	154.8	351	i 18 44	[ 0]	i 18 55	PKP <sub>2</sub>	e 20 55	pPKP
Athens	154.9	313	e 18 52	[+ 8]	—	—	i 19 12	?
Padova	156.0	341	e 18 51	[+ 5]	e 19 19	PKP <sub>2</sub>	i 22 10	PKS
Bologna	156.2	342	e 17 49	[-57]	e 25 51	[+57]	—	—
Pavia	156.2	346	e 18 55	[+ 9]	—	—	—	—
Clermont-Ferrand	156.5	356	e 18 46	[ 0]	e 43 0	SS	i 21 16	pPKP
Prato	156.9	341	e 18 45	[- 2]	—	—	e 20 55	pPKP
Florence Xim	156.9	341	i 18 41	[- 6]	—	—	i 21 14	pPKP
Rome	z. 158.1	333	i 18 48 <sub>k</sub>	[ 0]	i 27 35	SKKS	i 19 27	PKP <sub>2</sub>
Messina	159.7	325	e 18 55	[+ 5]	e 22 47	PKS	i 19 39	PKP <sub>2</sub>
Tortosa	N. 161.5	0	20 15	PKP <sub>2</sub>	29 0	?	—	—
Toledo	z. 162.0	12	i 18 55	[+ 3]	23 32	PP	i 19 44	PKP <sub>2</sub>
Alicante	164.0	4	19 55	PKP <sub>2</sub>	30 51	SKKS	20 46	PKP <sub>2</sub>
Granada	164.7	13	—	—	38 59	SS	—	—
Algiers Univ.	z. 165.4	352	i 18 55 <sub>k</sub>	[ 0]	i 19 58	PKP <sub>2</sub>	e 21 15	pPKP
Tamanrasset	z. 175.6	—	19 2 <sub>k</sub>	[+ 1]	i 20 45	PKP <sub>2</sub>	e 21 28	pPKP

Additional readings and notes :—

Apia eEN = 3m.0s. and 4m.12s.

Wellington i = 4m.51s.

Cobb River eE = 4m.53s.

Christchurch S = 6m.51s., eEN = 11m.15s.; true S is given as eEN.

Brisbane iPN = 4m.46s., isPZ = 7m.29s., iE = 11m.31s.

Riverview isPEZ = 7m.55s., iP<sub>c</sub>PEZ = 8m.4s., iS<sub>c</sub>PN = 10m.43s., iN = 12m.17s., isSE =

12m.24s., iS<sub>c</sub>SN = 14m.39s.

Mizusawa SE = 10m.24s.

Nanking i = 11m.58s., iZ = 13m.26s. and 13m.37s., iEZ = 14m.12s., PPEZ = 14m.24s.,

SS?E = 25m.28s.

Berkeley isPZ = 14m.25s., i = 20m.34s., eSP = 21m.19s.

Lick iZ = 11m.17s., isPZ = 14m.25s.

Pasadena iNZ = 13m.29s., isPEN = 14m.25s., i = 19m.47s., isE = 20m.34s., eSPZ =

21m.15s., ePKP,PKPZ = 37m.42s., eSKP,PKP?Z = 40m.17s.

Fresno eSPN = 14m.33s., eSN = 20m.43s.

Continued on next page,



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Shasta Dam e = 15m.9s. and 28m.50s., ePKP,PKP = 37m.35s., i = 37m.45s.  
Haiwee ePKP,PKPZ = 37m.54s.  
Mineral eZ = 11m.49s., esSS?Z = 29m.43s., ePKP,PKPZ = 37m.46s., eSKP,PKP?Z = 40m.19s.  
Tinemaha ePKP,PKPZ = 37m.51s.  
Reno eN = 11m.43s., eNZ = 21m.44s.  
Overton iPPZ = 15m.0s., eZ = 19m.56s., ePKKP?Z = 29m.41s., iZ = 30m.37s., ePKP,PKPZ = 37m.36s.  
Pierce Ferry ePP = 14m.43s., e = 19m.54s., iPKKP = 29m.40s., i = 30m.48s., ePKP,PKP = 37m.39s., ipPKP,PKP? = 40m.5s.  
Tucson iPP = 15m.2s., e = 17m.45s., eSKS = 21m.5s., eSP? = 22m.2s., iPKKP? = 29m.38s., ePKP,PKP = 37m.39s., eSKP,PKP = 40m.8s.  
Seattle esP = 15m.1s., iS = 21m.12s., eSP = 21m.50s., eSPP = 22m.46s., and other unidentified e and i readings.  
Victoria SKS = 21m.19s., i = 22m.25s.  
Sitka eSKS = 21m.10s., eSP = 22m.40s., esPS = 26m.23s., iSS = 27m.39s.  
Salt Lake City ePP = 16m.7s., epPP = 17m.38s., eSKKS = 21m.58s., eSP = 23m.2s.  
Logan ePP = 16m.5s., iSKS = 21m.27s., esPS = 26m.32s.  
College eSKS = 21m.27s., eS = 21m.47s., e = 27m.19s., ePKP,PKP? = 37m.21s.  
Butte iN = 27m.12s.  
Hungry Horse ePP = 15m.48s., PKKP = 29m.18s., iPKP,PKP = 37m.15s., ePKP,PKP,PKP = 58m.16s.  
Bozeman esS = 26m.16s., esPS = 27m.10s.  
Huancayo eSS = 30m.23s.  
La Paz iS = 25m.31s., iPS = 26m.47s., iSS = 31m.3s.  
St. Louis ePP? = 17m.19s., iSKKS = 23m.21s., e = 25m.35s., isSKS = 26m.38s., isS = 28m.3s., iSS = 31m.18s.  
Florissant iSKKS = 23m.21s., e = 25m.34s., isSKS = 26m.37s., eSS = 31m.12s.  
Galerazamba ePSEN = 34m.10s.  
Cincinnati i = 21m.54s.  
Cleveland iSKKSEN = 24m.9s., eSN = 24m.58s., eE = 25m.10s., iSPE = 26m.42s., esSKSN = 27m.5s., esSKKSN = 28m.6s., esSN = 29m.3s., esSPN = 30m.22s., esSPE = 30m.29s., eSSN = 32m.57s.  
Philadelphia eSKKS? = 24m.39s., eSP = 27m.33s., esPS = 31m.9s., iSS = 33m.56s., e = 40m.2s.  
Ottawa e = 24m.41s., 27m.27s., and 28m.49s.  
Harvard iPP = 19m.0s., epPP = 21m.1s., esPP = ePPP = 21m.57s., e = 27m.38s., iPKKP = 28m.3s., ePS = 28m.59s., e = 31m.10s., esSP = 31m.38s., e = 31m.58s., eSS = 34m.32s., e = 35m.52s., eSSS = 39m.18s.  
San Juan e = 27m.48s.  
Andijan eSKSP = 28m.1s.  
Grahamstown e = 18m.20s.  
Tashkent ePKS = 21m.22s., ePPP = 21m.59s., eSP = 28m.1s.  
Bermuda eSKSP? = 28m.11s., ePS = 28m.38s., esPS = 31m.24s., eSS? = 34m.51s., i = 35m.52s., esSS = 37m.41s.  
Sverdlovsk ePPP = 22m.35s.?  
Pretoria eZ = 17m.53s.  
Moscow ePP = 20m.52s., ePKS = 21m.49s., epPP = 23m.13s., eSKKS = 26m.41s., ePS = 31m.11s.  
Upsala eN = 19m.22s., eE = 20m.12s., iN = 21m.23s.  
Copenhagen 21m.55s., 22m.9s., 34m.5s., and 35m.25s.  
Warsaw ePKP?EN = 18m.39s., PKP<sub>2</sub>?Z = 18m.56s., ePKP<sub>2</sub>?EN = 18m.59s., SKPZ = 20m.58s., eSKPE = 21m.1s., esPKP?E = 21m.49s., ePPZ = 22m.1s., ePKSNZ = 22m.35s., PPPZ = 25m.25s., PKKPEZ = 27m.17s., and other unidentified e readings.  
Rathfarnham Castle iZ = 18m.44s. and 18m.56s., eEN = 21m.37s., ePP = 22m.10s.  
Skalnate Pleso iPKP = 18m.41s., e = 18m.47s., iPKP<sub>2</sub>N = 18m.58s., eN = 19m.19s. and 20m.22s., e = 21m.2s., epPKP<sub>2</sub> = 21m.15s., esPKP = 21m.53s., esPKP<sub>2</sub> = 22m.11s., eN = 22m.57s.  
Raciborzu eE = 18m.40s. and 18m.51s.  
Collmberg iZ = 18m.41s., 18m.49s., and 18m.58s., eN = 19m.43s. and 20m.59s., eZ = 21m.9s., eN = 21m.56s. and 23m.2s.  
De Bilt e = 40m.51s.  
Jena iPKPE = 18m.41s., iPKP<sub>2</sub>N = 18m.46s., iE = 18m.56s.  
Prague iPKP<sub>2</sub> = 18m.53s., epPKP<sub>2</sub> = 21m.8s., esPKP = 21m.59s., esPKP<sub>2</sub> = 22m.8s., ePP = 22m.35s., epPP = 24m.35s., eSKKS = 27m.46s., eSKSP = 31m.25s., and other unidentified readings.  
Cheb e = 18m.52s., ePKP<sub>2</sub> = 19m.1s., esPKP = 22m.0s., ePP = 22m.26s.  
Kew eNZ = 22m.26s., eN = 32m.31s.  
Budapest PEN = 18m.45s.  
Ogyalla ePKP<sub>2</sub> = 18m.57s., e = 19m.59s., esPKP = 21m.58s., esPKP<sub>2</sub> = 22m.13s., ePP = 22m.46s.  
Vienna esPKP = 21m.13s.  
Helwan PKP<sub>2</sub>Z = 18m.59s., PPZ = 22m.27s., eZ = 23m.2s. and 32m.38s.  
Kalossa iN = 18m.50s., iE = 19m.11s.  
Sofia e = 17m.50s. and 18m.5s.  
Stuttgart iPKP = 18m.49s., ePKP<sub>2</sub>Z = 19m.2s., ePP = SKP = 22m.36s., ePSKS = 32m.55s., eSS? = 41m.21s.

*Continued on next page.*

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Strasbourg  $iPKP_1 = 18m.51s.$ ,  $i = 19m.5s.$  and  $19m.19s.$ ,  $ePP = 22m.38s.$ ,  $e = 29m.55s.$ ,  
 $ePSKS = 33m.2s.$ ,  $eSS? = 40m.5s.$ ,  $eSSS = 46m.35s.?$   
 Paris  $i = 18m.44s.$ ,  $e = 18m.50s.$ ,  $iSKP = 21m.14s.$ ,  $iSPKP? = 21m.47s.$ ,  $iPP = 22m.35s.$ ,  
 $e = 23m.54s.$ ,  $iPPP = 26m.23s.$ ,  $e = 27m.27s.$ ,  $eSKKS = 28m.19s.$ ,  $eSSS = 46m.24s.$   
 Zürich  $i = 19m.1s.$   
 Trieste  $iZ = 18m.52s.$  and  $19m.9s.$   
 Besançon  $e = 19m.10s.$  and  $21m.27s.$   
 Clermont-Ferrand  $iPKP = 18m.49s.$ ,  $iPKP_2 = 19m.19s.$ ,  $ePP = 22m.56s.$ ,  $ePPP =$   
 $26m.35s.$ ,  $ePPS = 36m.25s.$ ,  $eSS = 43m.0s.$ ,  $eSSS = 48m.10s.$   
 Rome  $i = 23m.7s.$   
 Toledo  $PPPZ = 27m.23s.$   
 Alicante  $PP = 24m.21s.$ ,  $PPP = 27m.57s.$ ,  $PPS = 37m.29s.$ ,  $SS = 44m.9s.$ ,  $SSP = 45m.13s.$ ,  
 $SSS = 50m.35s.$ ,  $Q = 66m.19s.$   
 Algiers Univ.  $eZ = 19m.33s.$ ,  $epPKP_2Z = 22m.14s.$ ,  $iPPZ = 23m.47s.$ ,  $epPPZ = 25m.57s.$ ,  
 $ePPPZ = 28m.14s.$ ,  $eZ = 30m.48s.$   
 Tamanrasset  $epPKP_2Z = 22m.53s.$ ,  $iPPZ = 24m.36s.$ ,  $epPPZ = 26m.49s.$ ,  $ePPPZ =$   
 $28m.49s.$ ,  $eSKKSZ = 30m.34s.$ ,  $epPPPZ = 30m.54s.$ , and other unidentified readings  
 for vertical component.

Aug. 17d. 23h. 56m. 15s. Epicentre  $33^\circ.9N.$   $139^\circ.6E.$  Depth of focus 0.010.  
 (as on 1949, October 1d.).

Intensity II-III at Tukubasan and Ajiro.

Epicentre  $34^\circ.1N.$   $139^\circ.9E.$  Depth 80km. Macroseismic radius 200-300km.

The Seismological Bulletin of the C.M.O., Japan, for the year 1950. Tokyo, 1952, p.36,  
 with macroseismic chart.

$A = -.6334$ ,  $B = +.5391$ ,  $C = +.5552$ ;  $\delta = +7$ ;  $h = +1$ ;  
 $D = +.648$ ,  $E = +.762$ ;  $G = -.423$ ,  $H = +.360$ ,  $K = -.832$ .

	$\Delta$	Az.	P.	O-C.	S.	O-C.
	$^\circ$	$^\circ$	m. s.	s.	m. s.	s.
Mera	1.0	11	0 23	+ 3	0 36	0
Misima	1.3	336	0 27	+ 3	0 43	+ 1
Omaesaki	1.3	301	0 31	+ 7	0 51	+ 9
Yokohama	1.5	1	0 28	+ 1	0 47	0
Hunatu	1.7	336	0 31	+ 2	0 51	0
Tokyo	1.8	4	0 29	- 1	0 48	- 5
Kumagaya	2.2	355	0 34k	- 2	0 57	- 5
Tukubasan	2.3	10	0 35	- 2	0 57	- 8
Maebasi	2.5	350	0 38	- 2	1 4	- 6
Mito	2.6	16	0 41	0	1 3	- 9
Utunomiya	2.6	5	0 38	- 3	1 5	- 7
Gihu	2.8	303	1 25	S	(1 25)	+ 8
Kameyama	2.8	290	0 49	+ 5	1 22	+ 5
Onahama	3.2	19	0 43	- 7	1 16	-11
Toyama	3.4	326	1 18	S	(1 18)	-14
Hokusima	3.9	10	0 55	- 4	1 33	-11
Mizusawa	E. 5.4	12	—	—	2 6	-15
Morioka	5.9	11	1 25	- 1	2 21	-12

Aug. 17d. 23h. 56m. 34s. Epicentre  $27^\circ.9N.$   $91^\circ.9E.$  (as on 16d.).

Intensity VI at Gauhati and Tezpur.

Epicentre near  $28^\circ.N.$   $92^\circ.5E.$  (Strasbourg).

Seismological Bulletin Government of India, August, 1950, p. 21.

$A = -.0293$ ,  $B = +.8846$ ,  $C = +.4654$ ;  $\delta = -3$ ;  $h = +3$ .

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.
	$^\circ$	$^\circ$	m. s.	s.	m. s.	s.	m. s.
New Delhi	13.0	277	e 3 10	+ 1	—	—	3 20 PP
Przhevalsk	18.2	328	i 4 21	+ 5	—	—	—
Naryn	18.8	321	4 26	+ 3	—	—	—
Almata	19.5	327	i 4 34	+ 3	—	—	—
Bombay	19.6	247	—	—	e 5 36	?	—
Andijan	20.5	314	e 4 44	+ 2	e 8 51	+24	—
Frunse	20.5	322	e 4 43	+ 1	e 8 51	+24	—
Fergana	20.7	314	e 4 45	+ 1	—	—	—
Obi-garm	21.4	308	e 4 56	+ 5	e 9 9	+24	—
Tashkent	22.8	312	e 5 8	+ 3	—	—	—

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	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.
	$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.
Samarkand	23.7	306	5 15	+ 1	—	—	—
Sverdlovsk	36.4	332	e 7 8	0	—	—	—
Collmberg	z. 62.0	316	e 10 22	- 2	—	—	—
Stuttgart	z. 65.0	314	e 10 40	- 4	—	—	—
Strasbourg	65.9	314	i 10 48	- 2	—	—	—
Besançon	67.4	313	e 10 55	- 4	—	—	—
Paris	69.2	316	i 11 8	- 2	—	—	—
College	76.7	23	i 11 48	- 7	—	—	—
Tamanrasset	z. 76.7	290	i 11 53	- 2	—	—	e 14 50 PP
Pretoria	z. 82.1	236	e 12 16	- 3	—	—	—
Shasta Dam	104.7	26	(e 14 15?)	+ 6	—	—	—

Shasta Dam reading has been increased by 10 minutes.

Aug. 17d. Readings also at 0h. (Almata, Andijan, Frunse, Kulyab, Przhevalsk, Samarkand, Stalinabad, Sverdlovsk, Bombay, Stuttgart (2), Tamanrasset, and College), 1h. (Collmberg, Jena, Copenhagen, and Stuttgart (2)), 2h. (Overton, Pierce Ferry, Przhevalsk, near Almata, Naryn, and near Istanbul), 4h. (Bombay, Ashkabad, Trieste, and College), 5h. (Almata, Andijan, Frunse, Collmberg, Prague, Stuttgart, Tamanrasset (3), Pretoria, College (2), and Hungry Horse), 6h. (near Istanbul), 7h. (Kew, Tucson, and College), 8h. (Stuttgart, Tamanrasset, near Obi-garm, and near Yalta), 9h. (Tinemaha, Tucson, Boulder City, Overton (2), Pierce Ferry (2), Lick, College (2), and Tamanrasset), 10h. (Bombay, near Mizusawa, and near Obi-garm), 11h. (Almata), 13h. (College (2), and Lick), 14h. (Haiwee, Pasadena, Riverside, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Fresno, Shasta Dam, Lick, Hungry Horse, College (2), Collmberg, Brisbane, and near Apia), 15h. (Pierce Ferry, Tinemaha, Hungry Horse, College (2), Tamanrasset, and near Zürich), 16h. (Brisbane, Ottawa, Berkeley, Reno, Lick (2), Fresno, and Victoria), 17h. (Ashkabad, College, Tamanrasset, and near Athens), 18h. (Padova, Zürich, Tamanrasset, Frunse, Naryn, Tashkent, near Andijan, Fergana, Kulyab, Murgab, Obi-garm, and Stalinabad), 19h. (Tamanrasset and near Leninakan), 20h. (Pierce Ferry (2), Shasta Dam, College, and Stuttgart), 21h. (Basle and College), 22h. (College), 23h. (Shasta Dam, Hungry Horse, College (2), Collmberg, Stuttgart, and Tamanrasset).

Aug. 18d. 1h. 7m. 47s. Epicentre  $28^{\circ}7'N$ .  $96^{\circ}6'E$ . (as on 16d.).

Intensity V at Tezpur, Gauhati, and Silcher. Epicentre  $29^{\circ}5'N$ .  $97^{\circ}0'E$ .  
Seismological Bulletin, August 1950, Government of India, p. 21.

$A = -0.1010$ ,  $B = +0.8727$ ,  $C = +0.4777$ ;  $\delta = 0$ ;  $h = +2$ .

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Dehra Dun	N. 16.2	280	e 4 34	+44	e 6 37	-14	—	e 9.0
New Delhi	17.0	274	e 3 53	- 8	7 3	- 7	4 21 PPP	6.7
Nanking	19.4	75	4 26	- 4	8 17	+13	—	—
Hyderabad	20.1	239	i 4 39	+ 1	i 8 19	0	—	10.2
Przhevalsk	20.2	317	i 4 42	+ 3	i 8 19	- 2	—	—
Naryn	21.1	313	i 4 43	- 5	e 8 25	-14	—	—
Murgab	21.2	303	i 4 45	- 4	i 8 27	-14	—	—
Almata	21.5	319	i 4 48	- 4	i 8 39	- 8	—	—
Zi-ka-wei	21.6	77	e 4 21	-33	i 8 21	-28	—	—
Frunse	22.7	314	i 5 2?	- 2	i 9 8?	- 1	—	—
Poona	23.1	249	5 10	+ 2	9 13	- 3	—	9.5
Andijan	23.2	307	i 5 7	- 2	9 12	- 6	—	—
Fergana	23.5	307	i 5 9	- 3	i 9 15	- 8	—	—
Bombay	23.8	251	5 17	+ 2	9 27	- 1	9 57 Q	10.7
Irkutsk	24.2	11	i 5 22?	+ 3	—	—	—	—
Obi-garm	24.4	302	i 5 20	- 1	i 9 33	- 6	—	—
Semipalatinsk	25.0	336	e 5 24	- 3	—	—	—	—
Stalinabad	25.1	301	i 5 26	- 2	i 9 42	- 9	—	—
Tashkent	25.5	307	i 5 31	- 1	e 9 51	- 6	—	—
Kodaikanal	E. 25.7	229	i 5 36	+ 3	i 10 4	+ 3	—	—
Samarkand	26.7	302	i 5 39	- 4	10 4	-13	—	—
Vladivostok	31.7	54	i 6 31	+ 4	—	—	—	—
Ashkabad	33.1	297	e 6 36	- 4	11 44	-15	—	—
Kizyl-Arvat	34.8	299	i 7 51	+57	—	—	—	—
Djakarta	36.0	162	e 7 15	+10	e 13 0	+16	—	—

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	$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.
	°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.
Sverdlovsk	37.8	328	i 7	18	- 2	i 13	3	- 8	—	—	—
Mizusawa	38.1	62	e 7	27	+ 5	13	14	- 2	—	—	—
Baku	39.8	300	e 7	38?	+ 2	e 13	30?	-12	—	—	—
Grozny	43.0	304	e 8	5	+ 2	i 14	22	- 7	—	—	—
Tiflis	43.7	302	i 8	8	0	e 14	32	- 7	—	—	—
Gori	44.2	302	8	11?	- 1	—	—	—	—	—	—
Leninakan	44.4	301	e 8	15	+ 1	—	—	—	—	—	—
Borzhom	44.7	302	i 8	16	0	—	—	—	—	—	—
Piatigorsk	45.0	305	e 8	17	- 2	i 14	48	-10	—	—	—
Sotchi	47.4	305	e 8	45	+ 7	—	—	—	—	—	—
Moscow	49.4	321	i 8	52	- 1	i 15	52	- 8	—	—	—
Theodosia	50.4	307	e 8	58	- 3	e 16	3	-11	—	—	—
Yalta	51.4	306	e 9	6	- 3	i 16	19	- 9	—	—	—
Ksara	51.5	292	i 9	7	- 2	i 16	27	- 2	—	—	—
Pulkovo	53.8	326	i 9	26	0	i 16	53	- 8	—	—	—
Kishinev	54.8	309	e 9	32	- 2	e 17	5	- 9	—	—	—
Istanbul	55.5	302	e 9	37	- 2	e 17	15	- 9	—	—	—
Helwan	56.2	289	e 9	43	- 1	17	21	-12	e 12	0	PP
Helsinki	56.5	326	e 9	44	- 2	e 17	28	- 9	e 19	30	S <sub>c</sub> S
Bucharest	57.1	307	i 9	48 <sub>a</sub>	- 2	i 17	38	- 7	i 19	39	S <sub>c</sub> S
Warsaw	59.2	317	9	54	-11	i 18	7	- 5	e 12	17	PP
Athens	60.2	300	e 10	9 <sub>a</sub>	- 3	i 18	15	-10	—	—	e 29.2
Skalnate Pleso	60.2	313	i 10	11	- 1	e 18	16	- 9	e 22	13	SS
Timisoara	60.2	309	e 10	38?	+26	e 18	22	- 3	—	—	—
Upsala	60.2	326	i 10	9 <sub>a</sub>	- 3	e 18	16?	- 9	e 12	9	PP
Budapest	61.3	311	10	20	0	18	32	- 7	e 22	26	SS
Raciborzu	61.4	315	e 10	18	- 2	—	—	—	e 10	21	P
Kalossa	61.6	311	10	22	0	e 18	35	- 8	i 20	14	S <sub>c</sub> S
Ogyalla	61.8	312	e 10	24	+ 1	e 18	39	- 7	e 12	51	PP
Copenhagen	63.6	322	i 10	33	- 2	i 19	2	- 6	20	27	S <sub>c</sub> S
Prague	63.7	315	10	33	- 3	e 19	0	-10	e 13	19	PP
Potsdam	64.0	318	i 10	36	- 2	i 19	8	- 5	i 23	27	SS
Collnberg	64.3	317	e 10	37	- 2	e 19	9	- 8	e 20	33	S <sub>c</sub> S
Cheb	65.0	316	10	40	- 4	e 19	20	- 6	e 14	43	PPP
Jena	65.3	316	e 10	43	- 3	e 20	39	S <sub>c</sub> S	e 13	4	PP
Triest	65.3	310	i 10	44 <sub>a</sub>	- 2	i 19	24?	- 5	—	—	—
Bergen	66.1	328	10	49	- 2	19	34	- 5	14	54	PPP
Messina	66.3	302	e 10	55	+ 3	e 19	30	-12	—	—	29.7
Padova	66.9	309	10	54	- 2	19	39	-10	13	26	PP
Bologna	67.3	310	e 11	21?	+22	e 19	50	- 4	e 13	56	PP
Rome	67.4	306	i 10	56	- 3	i 19	44	-11	e 13	28	PP
Stuttgart	67.4	315	i 10	57 <sub>a</sub>	- 2	e 19	49	- 6	e 13	15	PP
Florence Xim	67.6	309	e 10	55	- 6	i 19	43	-14	i 23	59	SS
Prato	67.7	309	e 10	57	- 4	i 19	46	-12	—	—	—
Chur	67.8	312	e 10	59 <sub>a</sub>	- 3	e 19	49	-11	—	—	—
Karlsruhe	67.8	316	i 11	1	- 1	e 19	57	- 3	—	—	e 39.2
Zürich	68.2	314	e 11	2 <sub>a</sub>	- 2	e 19	55	- 9	e 13	30	PP
Strasbourg	68.3	315	i 11	3 <sub>a</sub>	- 2	i 20	0	- 6	e 13	30	PP
De Bilt	68.7	319	i 11	7	0	i 20	7	- 3	e 13	35	PP
Basle	68.8	314	e 11	6	- 2	e 20	6	- 5	e 13	39	PP
Besançon	69.9	314	i 11	13	- 2	—	—	—	e 13	53	PP
Aberdeen	70.8	326	—	—	—	i 20	32	- 3	i 24	59	SS
Durham	71.5	323	i 11	28	+ 4	i 20	41	- 2	i 21	30	PPS
Paris	71.5	316	i 11	24	0	i 20	36	- 7	i 14	1	PP
Edinburgh	71.9	325	—	—	—	e 20	43	- 5	i 21	28	PPS
Scoresby Sund	72.0	343	e 11	29	+ 1	i 20	46	- 3	14	7	PP
Kew	72.2	320	i 11	27 <sub>k</sub>	- 2	i 20	45	- 6	i 21	34	PPS
Clermont-Ferrand	72.3	313	i 11	28	- 1	i 20	48	- 4	i 14	10	PP
Jersey	74.1	318	e 11	39	- 1	e 21	22	+10	—	—	e 35.2
College	74.3	24	i 11	42	+ 1	e 21	19	+ 4	i 14	30	PP
Rathfarnham Castle	74.7	323	i 11	42	- 1	e 21	15	- 4	e 26	2	SS
Algiers Univ.	76.1	305	i 11	50 <sub>a</sub>	- 1	—	—	—	i 14	39	PP
Tortosa	76.1	309	11	54	+ 3	i 21	28	- 7	12	2	P <sub>c</sub> P
Brisbane	77.7	130	i 12	10 <sub>a</sub>	+10	—	—	—	—	—	e 37.2
Alicante	77.9	307	e 12	6	+ 5	i 21	48	- 6	15	4	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.	
Toledo		79.6	310	i 12 11	+ 1	i 22 9	- 3	e 15 7	PP	41.9
Granada		80.6	307	i 12 17k	+ 1	i 22 19	- 4	i 15 5	PP	i 43.3
Tamanrasset	z.	80.6	291	i 12 16	0	e 22 13	-10	e 15 22	PP	e 42.6
Riverview		80.8	136	i 12 31k	+14	i 22 40	+15	i 23 31	PPS	—
Malaga	z.	81.4	307	i 12 20k	0	i 22 34	+ 3	i 15 24	PP	48.2
Lisbon		83.6	311	i 12 32 a	+ 1	22 48	- 5	22 51	S	41.2
Sitka		83.9	26	i 12 37	+ 4	e 22 58	+ 2	e 15 31	PP	e 46.2
Pretoria	z.	85.1	238	i 12 12	-27	—	—	—	—	—
Pietermaritzburg	z.	85.8	233	i 12 16	-26	—	—	—	—	—
Ivigtut		86.0	344	i 12 34	- 9	e 22 56	[-11]	—	—	46.2
Grahamstown		90.6	232	e 13 11	+ 6	—	—	—	—	e 45.2
Victoria		95.2	25	13 30	+ 3	24 5	[+ 3]	17 16	PP	—
Seattle		96.3	25	e 13 38	+ 6	e 24 53	+ 4	e 17 29	PP	e 48.2
Saskatoon		97.0	14	17 31	PP	24 12	[ 0]	24 57	S	—
Hungry Horse		98.5	20	i 13 44	+ 2	e 24 26	[+ 6]	i 17 45	PP	—
Butte	N.	101.1	20	e 18 6	PP	e 24 34	[+ 2]	e 27 21	PS	e 52.8
Bozeman		101.8	19	e 18 9	PP	e 24 37	[+ 1]	e 32 43	SS	e 53.4
Shasta Dam		102.1	29	e 14 0	+ 2	e 24 38	[+ 1]	e 17 58	PP	—
Mineral	z.	102.7	28	e 17 56	?	—	—	e 18 17	PP	—
Seven Falls	E.	103.7	352	—	—	e 24 41	[- 4]	—	—	—
Reno		104.1	28	e 14 12k	+ 5	e 24 47	[+ 1]	e 18 26	PP	—
Berkeley		104.4	30	e 18 26k	PP	e 24 51	[+ 3]	e 20 41	PPP	e 56.0
Shawinigan Falls	N.	104.5	353	—	—	e 24 47	[- 1]	—	—	—
Halifax		104.8	345	e 17 13	?	—	—	—	—	—
Santa Clara		105.0	30	e 18 41	PP	i 25 1	[+10]	—	—	e 57.9
Lick	z.	105.1	30	e 18 34 a	PP	—	—	—	—	—
Logan		105.1	21	e 14 15	+ 4	e 24 47	[- 4]	e 18 32	PP	e 57.0
Ottawa	z.	105.9	355	—	—	i 24 52	[- 3]	—	—	—
Salt Lake City		106.0	22	e 18 33	PP	e 24 53	[- 2]	e 20 58	PPP	e 54.6
Fresno	N.	106.5	29	e 18 41	PP	e 25 1	[+ 4]	—	—	—
Tinemaha	z.	106.8	28	e 18 35	[+ 8]	—	—	e 18 48	PP	—
Harvard		108.3	349	e 18 31	[+ 1]	e 28 11	PS	e 29 11	PPS	e 58.3
Weston		108.4	349	e 18 50	PP	e 25 6	[+ 1]	e 28 6	PS	—
Overton	z.	108.9	26	e 18 2	[-29]	e 28 37	PS	e 14 34	P	—
Pasadena		109.4	29	e 19 3	PP	e 25 11	[+ 1]	—	—	e 52.3
Pierce Ferry		109.4	25	e 14 35	P	e 28 32	PS	i 19 6	PP	—
Cleveland	N.	110.1	358	e 19 6	PP	i 25 10	[- 3]	e 21 21	PPP	—
Pennsylvania	N.	110.7	355	e 21 38	PPP	i 25 13	[- 2]	i 26 10	SKKS	—
Philadelphia		111.3	352	e 19 36	PP	i 25 19	[+ 1]	e 21 22	PPP	e 53.2
Washington		112.5	353	e 18 31	[- 7]	e 28 18	PS	e 19 28	PP	e 51.6
Tucson		114.0	25	e 18 46	[+ 5]	e 25 34	[+ 6]	e 19 5	PP	e 60.2
Bermuda		116.7	341	e 19 59	PP	e 25 35	[- 3]	e 29 25	PS	e 61.3
Fort de France		131.8	330	e 22 44	SKP	—	—	—	—	—
Galerazamba		140.0	347	i 23 28	SKP	e 35 14	PPS	—	—	e 107.2
Bogota		145.7	343	i 19 44	[+ 4]	e 29 55	{+ 1}	e 23 26	SKP	—
Chinchina		145.7	345	i 19 38	[- 2]	—	—	i 19 49	PKP <sub>2</sub>	—
La Paz		161.4	308	e 20 23	[+21]	i 23 19	PKS	24 39	PP	92.9
Huancayo		161.8	334	e 20 18	[+15]	—	—	e 24 37	PP	—

Additional readings :—

New Delhi iSEN = 6m.46s., SSEN = 7m.23s.  
 Mizusawa PN = 7m.35s., SN = 13m.1s.  
 Helwan eZ = 10m.35s., iN = 19m.26s.  
 Helsinki eN = 19m.46s., 22m.0s., 23m.28s., and 23m.42s.  
 Warsaw eZ = 11m.9s., eE = 12m.54s., ePPZ = 13m.31s., eZ = 14m.16s., eE = 16m.42s.,  
 SZ = 18m.16s., iScSN = 19m.55s., eZ = 21m.26s., eSSN = 22m.5s., eSSSN = 24m.0s.  
 Skalnaté Pleso ePP = 13m.43s., ePPP = 14m.44s.  
 Upsala eN = 11m.44s., ePPP? = 13m.30s., iN = 18m.55s., iScS = 19m.57s., eSSE =  
 22m.13s.?, eSSSN = 24m.32s.  
 Budapest PN = 10m.23s., iEN = 20m.10s., eQN = 25.2m.  
 Kalossa ePN = 10m.25s.  
 Ogyalla ePPP = 13m.52s., eSS = 22m.50s., eSSS = 25m.1s.  
 Copenhagen 12m.55s., 19m.15s., 20m.42s., SSS = 25m.49s.  
 Prague eE = 11m.25s., ePPE = 14m.31s., ePS = 19m.17s., e = 20m.42s., eSS = 23m.7s.,  
 eSSS = 25m.25s., e = 26m.28s.  
 Potsdam ePSE = 19m.18s., iEN = 20m.32s., iN = 26m.38s.  
 Collmberg eN = 11m.37s., ePPP = 15m.1s., N = 20m.49s., eSSN = 23m.25s.

Continued on next page.



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Cheb ePP = 13m.31s.  
 Jena ePN = 10m.46s., eN = 20m.22s.  
 Padova i = 20m.29s.  
 Rome PS = 20m.13s., i = 20m.55s., iSS = 24m.6s., i = 27m.27s.  
 Stuttgart ePPP = 15m.25s., eScS = 20m.53s., eSS = 24m.1s., eSSS = 27m.13s.  
 Strasbourg ePPP = 15m.19s., ePcS = 15m.40s., iPS = 20m.16s., e = 20m.28s., eScS = 20m.58s., i = 21m.20s., eSS = 24m.13s., eSSS = 27m.40s., e = 28m.6s. and 29m.13s.  
 De Bilt iPPP = 15m.15s., ePS = 20m.19s., eScS = 21m.9s.  
 Besançon iPcP = 11m.34s., e = 13m.28s., ePPP = 15m.28s.  
 Aberdeen eSSSEN = 28m.13s.?  
 Paris i = 11m.32s., 11m.55s., and 13m.11s., ePPP = 15m.38s., iPS = 20m.52s., iSKS = 21m.31s., iSS = 25m.16s., iSSS = 28m.34s.  
 Edinburgh eE = 28m.13s.  
 Scoresby Sund 15m.47s.  
 Kew eSSSEN = 25m.38s., eSSSN = 29m.0s.  
 Clermont-Ferrand ePcP = 11m.48s., ePPP = 15m.57s.  
 College e = 21m.30s., ePKP, PKP = 39m.15s.  
 Rathfarnham Castle iZ = 13m.43s.  
 Algiers Univ. eZ = 13m.16s.  
 Tortosa PSE? = 22m.5s., PPSEN = 22m.16s., SSN = 26m.24s., eQN = 31.2m.  
 Alicante PPP = 16m.38s., ScS = 22m.14s., PS = 22m.28s., SS = 26m.48s., SSS = 30m.10s., Q = 32m.26s.  
 Granada PcP = 12m.48s., ePPP = 17m.53s., PS = 23m.15s., iSS = 27m.35s., SSS = 31m.38s.  
 Tamanrasset iPcPZ = 12m.24s., eZ = 14m.28s., ePKP, PKPZ = 39m.11s.  
 Riverview iSKSN = 22m.45s.  
 Malaga ePPPZ = 17m.18s.  
 Sitka e = 14m.59s., ePPP? = 17m.50s., eScS = 23m.14s., ePSPS = 31m.49s.  
 Victoria PS = 24m.49s.  
 Seattle e = 17m.49s., 18m.9s., 18m.43s., and 20m.19s., iSKS = 24m.13s., eSKKS = 24m.29s., eSS = 31m.23s., e = 45m.28s.  
 Saskatoon SKKS = 24m.26s., PS = 26m.20s., SS = 31m.36s., SSS = 35m.27s.  
 Hungry Horse ePP = 17m.20s., ePKKP? = 30m.26s., ePKP, PKP? = 40m.8s.  
 Shasta Dam ePKKP = 30m.3s.  
 Reno eN = 18m.9s., eE = 26m.18s., ePS?Z = 27m.37s.  
 Berkeley eN = 25m.37s., eE = 55m.31s.  
 Logan ePS? = 27m.41s., eSS = 32m.51s.  
 Salt Lake City eSKKS = 25m.41s., e = 27m.58s.  
 Fresno ePKPZ = 18m.47s.  
 Tinemaha ePKKPZ = 29m.50s.  
 Harvard e = 18m.49s., i = 21m.12s., e = 43m.1s.  
 Overton iPPZ = 19m.5s.  
 Cleveland eN = 25m.24s., iSKKSN = 26m.6s., iN = 26m.20s.  
 Pennsylvania eN = 28m.31s., ePSN = 28m.46s., iPPSN = 29m.56s.  
 Philadelphia i = 26m.15s., eS = 26m.52s., ePS = 28m.42s., ePPS = 29m.45s., eSS = 33m.31s., e = 36m.34s., eSSS = 38m.19s.  
 Washington e = 33m.32s.  
 Tucson e = 19m.36s., eS? = 26m.42s., ePS = 29m.19s.  
 Bermuda ePPS = 30m.51s., eSS = 35m.49s., e = 36m.15s.  
 La Paz iPKPZ = 20m.41s.  
 Huancayo e = 20m.52s., 26m.19s., 28m.32s., and 42m.56s.  
 Long waves were also recorded at Christchurch, Wellington, and Columbia.

Aug. 18d. 11h. 20m. 22s Epicentre 29°·2N. 95°·1E. (as on 17d.).

A = -·0777, B = +·8709, C = +·4853;  $\delta = +2$ ;  $h = +2$ .

	$\Delta$	Az.	P.	O - C.	S.	O - C.	Supp.	L.
	$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Calcutta	E. 9·0	224	e 2 59	P <sub>z</sub>	e 5 16	S <sub>z</sub>	—	—
New Delhi	15·7	272	e 3 44	0	e 6 33	- 6	—	—
Przhevalsk	18·9	320	i 4 24	0	—	—	—	—
Murgab	19·8	304	4 35	0	8 19	+ 6	—	—
Naryn	19·8	315	e 4 33	- 2	—	—	—	—
Almata	20·2	320	e 4 39	0	e 8 30	+ 9	—	—
Nanking	20·6	75	e 4 44	+ 1	8 31	+ 2	—	e 10·4
Fergana	22·1	308	e 4 58	- 1	—	—	—	—
Bombay	22·8	249	e 4 59	- 6	e 9 23	+ 12	—	—
Kulyab	22·8	299	e 5 9	+ 4	—	—	—	—
Obi-garm	23·0	301	i 5 8?	+ 1	i 9 29?	+ 15	—	—
Stalinabad	23·6	301	i 5 17	+ 4	i 9 33	+ 8	—	—
Irkutsk	24·0	13	e 5 17	0	—	—	—	—
Tashkent	24·2	307	i 5 21	+ 2	—	—	—	—
Samarkand	25·3	302	5 31	+ 1	—	—	—	—

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	$\Delta$ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	Supp. m. s.	L. m.
Sverdlovsk	36.7	329	7 11	+ 1	17 57	ScS	—	—
Moscow	48.2	321	e 8 44	0	15 44	+ 1	—	—
Collnberg	z. 63.1	316	e 10 32	0	—	—	—	—
Stuttgart	z. 66.1	314	e 10 50	- 1	—	—	—	—
Strasbourg	67.1	315	e 10 57	0	—	—	—	—
Paris	70.3	316	e 11 17	0	—	—	—	—
College	74.4	23	e 11 39	- 3	—	—	e 14 25	PP
Tamanrasset	z. 78.9	290	i 12 9 <sub>a</sub>	+ 2	—	—	i 14 54	PP
Hungry Horse	98.5	19	i 13 43	+ 1	—	—	—	—
Overton	z. 109.0	24	e 19 1	PP	—	—	—	—
Pierce Ferry	109.5	24	e 18 57	PP	—	—	—	—

Calcutta gives also eSSE = 5m.29s., eSSSE = 5m.47s.  
Long waves were also recorded at Copenhagen.

Aug. 18d. 16h. 58m. 46s. Epicentre 28°·7N. 96°·6E. (as at 1h.).

	$\Delta$ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	Supp. m. s.	L. m.
Calcutta	E. 9.7	232	i 2 33	+11	4 30	SS	—	—
Dehra Dun	N. 16.2	280	e 4 47	?	e 7 38	SSS	—	9.8
New Delhi	17.0	274	i 4 0	- 1	i 7 3	- 7	4 14	PP
Nanking	19.4	75	i 4 28 <sub>k</sub>	- 2	i 8 2	- 2	i 5 1	PPP
Hyderabad	E. 20.1	239	i 4 46	+ 8	i 8 36	+17	—	10.9
Przhevalsk	20.2	317	i 4 34	- 5	i 8 12	- 9	—	—
Naryn	21.1	313	i 4 43	- 5	e 8 23	-16	—	—
Murgab	21.2	303	i 4 44	- 5	i 8 29	-12	—	—
Almata	21.5	319	i 4 48	- 4	i 8 38	- 9	—	—
Frunse	22.7	314	i 4 59	- 5	i 8 59	-10	—	—
Poona	23.1	249	5 14	+ 6	9 24	+ 8	10 7	SS
Andijan	23.2	307	i 5 6	- 3	i 9 14	- 4	—	—
Fergana	23.5	307	e 5 8	- 4	i 9 15	- 8	—	—
Bombay	23.8	251	i 5 22	+ 7	i 9 39	+11	5 57	PP
Irkutsk	24.2	11	i 5 14?	- 5	—	—	—	—
Kulyab	24.2	300	i 5 17	- 2	i 9 31	- 4	—	—
Obi-garm	24.4	302	i 5 20	- 1	i 9 39	0	—	—
Stalinabad	25.1	301	i 5 26	- 2	9 46	- 5	—	—
Tashkent	25.5	307	i 5 30	- 2	i 9 53	- 4	—	—
Samarkand	26.7	302	i 5 41	- 2	—	—	—	—
Colombo	E. 26.8	219	5 54	+10	10 34	+15	—	11.7
Mary	30.3	297	e 6 14?	- 1	—	—	—	—
Vladivostok	31.7	54	i 6 23	- 4	—	—	—	—
Ashkabad	33.1	297	i 6 49	+ 9	12 0	+ 1	—	—
Kizyl-Arvat	34.8	299	i 6 51	- 3	e 12 12?	-13	—	—
Djakarta	z. 36.0	162	e 7 16	+11	—	—	—	20.2
Sverdlovsk	37.8	353	7 14	- 6	i 13 1	-10	—	—
Baku	39.8	300	e 7 37	+ 1	—	—	—	—
Tiflis	43.7	302	i 8 7	- 1	i 14 31	- 8	—	—
Gori	44.2	302	8 11	- 1	e 14 33	-13	—	—
Borzhomei	44.7	302	8 16	0	e 14 48	- 6	—	—
Piatigorsk	45.0	305	e 7 59?	-20	e 14 48?	-10	—	—
Sotchi	47.4	305	e 8 37	- 1	15 28?	- 4	—	—
Moscow	49.4	321	i 8 53	0	e 15 45	-15	—	—
Theodosia	50.4	307	e 8 57	- 4	e 15 59	-15	—	—
Yalta	51.4	306	i 9 4	- 5	16 21?	- 7	—	—
Ksara	51.5	292	i 9 10	+ 1	16 38	+ 9	i 20 50	?
Pulkovo	53.8	326	i 9 23	- 3	e 16 46	-15	—	—
Istanbul	55.5	302	e 9 36	- 3	e 17 12	-12	—	—
Helwan	56.2	289	e 9 42	- 2	17 32	- 1	11 53	PP
Helsinki	56.5	326	e 9 42	- 4	e 17 24	-13	e 19 21	ScS
Bucharest	57.1	307	e 9 48	- 2	e 17 44	- 1	e 9 52	P
Warsaw	59.2	317	e 10 5	0	18 8	- 4	e 12 10	PP
Skalnate Pleso	E. 60.2	313	e 10 9	- 3	e 18 30	+ 5	—	e 28.2
Timisoara	60.2	309	9 14?	-58	—	—	—	—

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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		60.2	326	i 10 6k	- 6	e 18 12	-13	e 13 48	PPP	e 27.2
Budapest		61.3	311	10 17	- 3	e 20 14?	ScS	e 13 58	PPP	34.2
Raciborzu	z.	61.4	315	e 10 20	0	—	—	—	—	—
Kalossa		61.6	311	e 10 28	+ 6	e 20 15	ScS	e 14 2	PPP	—
Ogyalla		61.8	312	e 10 25	+ 2	e 18 44	- 2	e 14 1	PPP	—
Copenhagen		63.6	322	i 10 32	- 3	e 19 1	- 7	14 20	PPP	31.2
Prague		63.7	315	e 10 32	- 4	e 18 59	-11	23 14	SS	—
Potsdam		64.0	318	i 10 35	- 3	e 19 14	+ 1	e 23 20	SS	e 33.2
Collmberg		64.3	317	e 10 36	- 3	—	—	—	—	e 31.2
Cheb	N.	65.0	316	e 18 53	?	—	—	—	—	—
Jena		65.3	316	e 10 43	- 3	e 19 24	- 5	—	—	—
Triest		65.3	310	i 10 43	- 3	i 19 22	- 7	—	—	—
Bergen	E.	66.1	328	—	—	e 22 45	?	e 24 30	SS	—
Messina		66.3	302	e 10 55	+ 3	e 19 36	- 6	—	—	—
Padova		66.9	309	e 10 55	- 1	19 46	- 3	—	—	—
Bologna		67.3	310	e 10 54	- 5	—	—	—	—	—
Rome		67.4	306	i 10 55k	- 4	e 19 44	-11	e 13 30	PP	31.9
Stuttgart		67.4	315	i 10 56k	- 3	e 19 41	-14	e 13 23	PP	e 33.2
Florence, Xim.		67.6	309	e 13 35	PP	e 20 0	+ 3	—	—	—
Chur		67.8	312	e 10 58k	- 4	—	—	—	—	—
Karlsruhe		67.8	316	i 11 0	- 2	e 19 53	- 7	—	—	—
Zürich		68.2	314	e 10 59	- 5	—	—	—	—	—
Strasbourg		68.3	315	i 11 3k	- 2	e 20 0	- 6	e 13 35	PP	e 34.2
Basle		68.8	314	e 11 6	- 2	e 20 54	PPS	—	—	—
Neuchatel		69.4	314	e 11 8	- 4	—	—	—	—	—
Besançon		69.9	314	e 11 12	- 3	—	—	e 11 46	PcP	—
Aberdeen		70.8	326	—	—	i 20 22	-13	23 54	?	38.2
Paris		71.5	316	e 11 22	- 2	e 20 35	- 8	e 14 3	PP	e 37.2
Edinburgh	E.	71.9	325	—	—	e 25 29	SS	—	—	i 38.4
Scoresby Sund		72.0	343	11 24	- 4	20 45	- 4	13 57	PP	—
Kew		72.2	320	i 11 26k	- 3	e 20 44	- 7	(e 25 14?)	SS	e 25.2
Clermont-Ferrand		72.3	313	i 11 28	- 1	e 20 46	- 6	e 14 7	PP	—
College		74.3	24	i 11 36	- 5	e 21 11	- 4	i 14 22	PP	—
Rathfarnham Castle		74.7	323	i 11 41	- 2	e 21 14	- 5	e 30 34	Q	e 34.2
Algiers Univ.	z.	76.1	305	e 11 50	- 1	—	—	i 12 6	PcP	—
Tortosa		76.1	309	i 11 50	- 1	21 30	- 5	16 54	PPP	e 36.2
Resolute Bay		76.6	4	11 51	- 3	21 30	-10	e 22 31	PPS	—
Brisbane	z.	77.7	130	i 12 11a	+11	—	—	—	—	—
Alicante		77.9	307	e 11 54	- 7	i 21 34	-20	14 42	PP	e 36.5
Toledo	z.	79.6	310	i 12 10	0	—	—	e 14 54	PP	—
Granada		80.6	307	i 12 17k	+ 1	i 22 7	-16	15 7	PP	i 40.6
Tamanrasset	z.	80.6	291	12 16k	0	e 22 22	- 1	e 15 23	PP	—
Riverview	z.	80.8	136	i 12 26a	PcP	—	—	—	—	—
Malaga	z.	81.4	307	i 12 19k	- 1	i 22 43	+12	—	—	47.8
Sitka		83.9	26	e 12 53	PcP	—	—	—	—	e 37.2
Pretoria	z.	85.1	238	i 12 44	+ 5	—	—	—	—	—
Pietermaritzburg	z.	85.8	233	i 12 49	+ 7	—	—	—	—	—
Ivigtut		86.0	344	i 12 31	-12	—	—	—	—	40.2
Victoria	z.	95.2	25	e 22 25	?	—	—	—	—	—
Seattle		96.2	25	e 17 21	PP	—	—	—	—	e 37.2
Hungry Horse		98.5	20	i 13 40	- 2	i 23 17	[-62]	i 17 29	PP	e 36.7
Shasta Dam		102.1	29	e 13 57	- 1	—	—	e 17 55	PP	—
Reno	z.	104.1	28	e 18 6k	PKP	e 24 32	[-14]	e 18 22	PP	—
Berkeley		104.4	30	e 18 24	PKP	—	—	e 42 44	Q	e 43.6
Lick	z.	105.1	30	e 18 20	PKP	—	—	—	—	—
Fresno	z.	106.5	29	e 17 26	[-60]	e 24 50	[- 7]	e 22 2	PKS	—
Tinemaha	z.	106.8	28	e 18 23	[- 4]	—	—	e 18 39	PP	—
Harvard		108.3	349	e 18 48	PP	e 26 38	S	e 21 0	PPP	e 59.1
Weston		108.4	349	e 18 53	PP	—	—	—	—	—
Overton	z.	108.9	26	e 17 56	[-35]	—	—	i 18 54	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.
Boulder City	109.2	26	e 18 27	[- 4]	—	—	—	—
Pasadena	109.4	29	e 18 57	PP	—	—	—	e 44.0
Pierce Ferry	109.4	25	i 18 43	[+ 11]	—	—	e 17 53	?
Philadelphia	111.3	352	e 20 53	?	e 25 23	[+ 5]	e 28 39	PS
Tucson	114.0	25	e 18 44	[+ 3]	—	—	e 19 34	PP
Bermuda	116.7	341	—	—	e 29 39	PS	e 43 27	Q
Galerazamba	140.0	347	—	—	e 23 15	SKP	—	—
Bogota	145.7	343	i 19 42	[+ 2]	e 23 26	SKP	—	—
Huancayo	161.8	334	e 20 8	[+ 5]	—	—	e 20 53	PKP <sub>1</sub>

Additional readings :—

Calcutta ePPPE = 2m.59s., iSSE = 4m.40s., eSSSE = 5m.7s.

New Delhi SSN = 7m.20s.

Poona SSEN = 10m.38s., P<sub>c</sub>SEN = 12m.7s.

Bombay SSE = 10m.23s.

Helwan eZ = 10m.44s. and 11m.14s., PPPZ = 13m.6s.

Helsinki eN = 22m.42s.

Warsaw eP<sub>c</sub>PZ = 10m.57s., ePPEN = 12m.4s., ePPPE = 13m.30s., ePPPZ = 13m.38s., eZ = 14m.8s., eP<sub>c</sub>SE = 15m.14s., PSZ = 18m.19s., PSEN = 18m.28s., S<sub>c</sub>SE = 19m.0s., eE = 21m.41s., SSEN = 22m.10s.

Upsala eN = 19m.17s.?, eS<sub>c</sub>SE = 19m.45s., eE = 23m.1s., eN = 23m.12s., eQE = 25m.50s.

Budapest ePN = 10m.20s.

Kalossa eE = 11m.16s. and 14m.35s.

Ogyalla ePP = 12m.56s., eSS = 22m.50s., eSSS = 25m.14s.

Prague e = 10m.51s. and 11m.42s., ePP = 13m.19s., eSSS = 25m.50s.

Potsdam eSN = 19m.20s., iN = 19m.27s., eE = 27m.31s.

Collmberg eEZ = 10m.51s. and 11m.37s., eN = 12m.32s.

Rome e = 23m.34s.

Stuttgart eP<sub>c</sub>PZ = 11m.15s., eSS = 24m.2s., eSSS = 27m.32s.

Strasbourg e = 12m.0s. and 19m.55s., ePS = 20m.19s., eSS = 24m.23s., e = 24m.32s. and 26m.14s.

Paris iP<sub>c</sub>P = 11m.40s., iPPP = 15m.41s., eSSS = 28m.39s.

Scoresby Sund 15m.43s.

Clermont-Ferrand ePPP = 15m.56s., eSSS = 28m.40s.

College e = 25m.58s.

Algiers Univ. iZ = 12m.19s., eZ = 12m.49s.

Torto: a PSN = 22m.7s., SSN = 26m.14s.

Resolute Bay e = 12m.10s. and 19m.8s., L = 24m.26s.

Alicante PPP = 16m.24s., S<sub>c</sub>S = 22m.7s., PPS = 22m.34s., SS = 26m.38s., Q = 31m.16s.

Granada PS = 23m.7s., iSS = 27m.28s., SSS = 30m.52s.

Tamanrasset eP<sub>c</sub>PZ = 12m.22s., iZ = 13m.9s., eZ = 13m.17s., ePPPZ = 17m.14s.

Reno eN = 23m.30s.

Tinemaha ePKKPZ = 29m.55s.

Harvard e = 23m.10s.

Pierce Ferry iPP = 18m.58s.

Philadelphia eSSS = 38m.44s.

Huancayo e = 24m.31s.

Long waves were also recorded at Ottawa, Seven Falls, Chicago, and Salt Lake City.

August 18d. 18h. 29m. 54s. Epicentre 28°.7N. 96°.6E. (as at 16h.).

	$\Delta$ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.
Calcutta	E. 9.7	232	—	—	e 4 20	S*
New Delhi	17.0	274	e 3 42	-19	e 6 31	-39
Przhevsk	20.2	317	e 4 38	-1	e 8 18	-3
Murgab	21.2	303	e 4 45	-4	—	—
Almata	21.5	319	e 4 52	0	—	—
Frunse	22.7	314	e 5 4	0	e 9 10	+1
Andijan	23.2	307	e 5 6	-3	e 9 8	-10
Bombay	E. 23.8	251	e 5 21	+6	—	—
Kulyab	24.2	300	e 5 19	0	—	—
Stalinabad	25.1	301	e 5 21	-7	e 9 34	-17
College	74.3	24	e 11 47	+6	—	—

Bombay gives also eN = 5m.53s.

Long waves were recorded at Alicante and Malaga.

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August 18d. 22h. 17m. 39s. Epicentre 28°·7N. 96°·6E. (as at 18h.).

Felt at Gauhati. Epicentre 29°·25N., 95°·75E.

Seismological Bulletin, Government of India, August, 1950, p. 23.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.	
		°	°	m. s.	s.	m. s.	s.	m. s.	m.	
Calcutta	E.	9·7	232	e 2 7	-15	e 4 8	- 7	e 4 22	SS	4·0
Dehra Dun	N.	16·2	280	e 5 15	?	—	—	—	—	e 8·0
New Delhi		17·0	274	e 3 55	- 6	e 6 43	-27	—	—	6·6
Nanking		19·4	75	e 4 42	+12	8 31	SS	—	—	—
Hyderabad	E.	20·1	239	—	—	e 8 13	- 6	—	—	—
Przhevalsk		20·2	317	i 4 36	- 3	—	—	—	—	—
Naryn		21·1	313	e 4 45	- 3	e 8 31	- 8	—	—	—
Murgab		21·2	303	4 45	- 4	8 28	-13	—	—	—
Almata		21·5	319	i 4 50	- 2	—	—	—	—	—
Frunse		22·7	314	e 5 5	+ 1	9 4	- 5	—	—	—
Poona	E.	23·1	249	5 10	+ 2	9 12	- 4	—	—	—
Andijan		23·2	307	e 5 6	- 3	i 9 11	- 7	—	—	—
Fergana		23·5	307	e 5 8	- 4	e 9 14	- 9	—	—	—
Bombay		23·8	251	—	—	e 9 26	- 2	—	—	i 12·2
Irkutsk		24·2	11	e 5 26?	+ 7	—	—	—	—	—
Kulyab		24·2	300	e 5 16	- 3	e 9 27	- 8	—	—	—
Obi-garm		24·4	302	i 5 20	- 1	i 9 32	- 7	—	—	—
Stalinabad		25·1	301	i 5 24	- 4	9 42	- 9	—	—	—
Tashkent		25·5	307	e 5 28	- 4	—	—	—	—	—
Samarkand		26·7	302	i 5 37	- 6	—	—	—	—	—
Mary		30·3	297	e 6 51?	+36	—	—	—	—	—
Ashkabad		33·1	297	e 6 37	- 3	—	—	—	—	—
Kizyl-Arvat		34·8	299	e 6 49	- 5	—	—	—	—	—
Sverdlovsk		37·8	328	i 7 20	0	13 5	- 6	—	—	—
Moscow		49·4	321	e 8 53	0	e 15 49	-11	—	—	—
Yalta		51·4	306	e 9 6	- 3	e 16 18	-10	—	—	—
Ksara		51·5	292	e 9 10	+ 1	16 25	- 4	—	—	—
Pulkovo		53·8	326	i 9 27	+ 1	e 16 50	-11	—	—	—
Prague	E.	63·7	315	e 10 34	- 2	—	—	e 13 13	PP	—
Collmberg	Z.	64·3	317	e 10 38	- 1	—	—	—	—	—
Jena	E.	65·3	316	e 10 45	- 1	—	—	—	—	—
Stuttgart	Z.	67·4	315	e 10 58	- 1	—	—	—	—	—
Strasbourg		68·3	315	i 11 5	0	—	—	e 11 27	P <sub>c</sub> P	—
Besançon		69·9	314	e 11 14	- 1	—	—	—	—	—
Paris		71·5	316	i 11 25	+ 1	—	—	—	—	e 44·4
College		74·3	24	i 11 46	+ 5	e 21 43	PS	i 12 44	?	—
Algiers Univ.	Z.	76·1	305	e 11 51	0	—	—	—	—	—
Brisbane	Z.	77·7	130	i 12 12 <sub>k</sub>	+12	—	—	—	—	—
Tamanrasset	Z.	80·6	291	i 12 15 <sub>a</sub>	- 1	—	—	e 15 16	PP	—
Pretoria	Z.	85·1	238	i 12 12	-27	—	—	—	—	—
Pietermaritzburg	Z.	85·8	233	e 12 46	+ 4	—	—	—	—	—
Hungry Horse		98·5	20	i 13 47	+ 5	—	—	e 17 47	PP	—
Overton	Z.	108·9	26	i 19 6	PP	—	—	—	—	—
Pierce Ferry		109·4	25	i 19 9	PP	—	—	—	—	—
Bogota		145·7	343	i 19 45	[+ 5]	—	—	—	—	—

Additional readings :—

Calcutta eSSSE = 4m.34s.

Prague eE = 10m.57s., e = 11m.37s. and 17m.37s.

Collmberg eZ = 10m.45s.

Stuttgart eZ = 11m.5s.

Strasbourg e = 11m.12s.

Paris i = 11m.32s.

Algiers Univ. eZ = 11m.57s.

Tamanrasset iP<sub>c</sub>PZ = 12m.23s., ePPPZ = 17m.11s.

Long waves were also recorded at Warsaw, Copenhagen, Kew, and Granada.



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Aug. 18d. Readings also at 1h. (Cheb, Ogyalla, Skalnate Pleso, Overton, and Pierce Ferry), 2h. (Triest, Calcutta, College, Overton, Pierce Ferry, Andijan, near Murgab, Obi-garm, and Fergana), 4h. (Tamanrasset, Besançon, Strasbourg, Stuttgart, Collmberg, College (3), Hungry Horse, Shasta Dam, Overton, Pierce Ferry, and near Apia), 7h. (Stuttgart, Collmberg, College, Overton, and Pierce Ferry), 8h. (Ashkabad), 9h. (Prague and near Istanbul), 12h. (Shasta Dam), 13h. (Ashkabad and near Malaga (2)), 14h. (Calcutta, Stuttgart, and College (2)), 15h. (Berkeley, Fresno, Boulder City, Overton, Pierce Ferry, Salt Lake City, near Andijan, and Obi-garm), 16h. (near Tucson), 17h. (Scoresby Sund, Tamanrasset, Stuttgart, Collmberg, Pasadena, Tinemaha, Shasta Dam, Overton, Pierce Ferry, Tucson, and near Przhivalsk), 18h. (Algiers Univ., Frunse, Mary, Samarkand, near Kulyab, Obi-garm, Stalinabad, Murgab, Fergana, and Andijan), 19h. (Calcutta, Pretoria, College (3), Hungry Horse, Boulder City, Pierce Ferry, Algiers Univ., Tamanrasset (3), Paris, Stuttgart (2), Copenhagen, Warsaw, Andijan (2), Fergana, Murgab, near Obi-garm (2), Samarkand, Stalinabad, and Kulyab), 20h. (La Paz), 22h. (Besançon, Collmberg, Stuttgart, College, Shasta Dam, and Overton), 23h. (Besançon, Stuttgart (2), Collmberg, near Neuchatel, Basle, Zürich, near Athens, Andijan (2), Almata, near Obi-garm, Kulyab, and Przhivalsk).

Aug. 19d. 21h. 19m. 55s. Epicentre  $28^{\circ}7'N$ .  $96^{\circ}6'E$ . (as on 18d.).

$$A = -1010, B = +8727, C = +4777; \quad \delta = 0; \quad h = +2.$$

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Calcutta	E.	9.7	232	e 4 3	S	(e 4 3)	-12	—	—
New Delhi		17.0	274	e 3 57	- 4	e 6 43	-27	—	—
Przhivalsk		20.2	317	i 4 8	-31	—	—	—	—
Murgab		21.2	303	e 4 43	- 6	e 8 35	- 6	—	—
Almata		21.5	319	i 4 50	- 2	i 8 44	- 3	—	—
Frunse		22.7	314	e 5 3	- 1	e 9 11	+ 2	—	—
Poona	E.	23.1	249	e 5 9	+ 1	9 14	- 2	—	10.7
Andijan		23.2	307	e 5 6	- 3	9 19	+ 1	—	—
Fergana		23.5	307	e 5 9	- 3	—	—	—	—
Bombay		23.8	251	e 9 2	P <sub>c</sub> P	e 12 39	P <sub>c</sub> S	—	—
Irkutsk		24.2	11	e 5 24	+ 5	e 9 43	+ 8	—	—
Kulyab		24.2	300	e 5 23	+ 4	—	—	—	—
Obi-garm		24.4	302	i 5 18	- 3	i 9 35	- 4	—	—
Stalinabad		25.1	301	e 5 30	+ 2	e 9 56	+ 5	—	—
Tashkent		25.5	307	e 5 33?	+ 1	—	—	—	—
Tchimkent		25.7	308	i 5 26?	- 7	—	—	—	—
Samarkand		26.7	302	e 5 42	- 1	—	—	—	—
Sverdlovsk		37.8	328	e 7 26	+ 6	—	—	—	—
Moscow		49.4	321	9 1	+ 8	—	—	—	—
Ksara		51.5	292	e 12 19	PPP	e 16 53	PPS	—	—
Collmberg	Z.	64.3	317	e 10 44?	+ 5	—	—	e 11 20	P <sub>c</sub> P
Jena	N.	65.3	316	e 10 47	+ 1	—	—	—	—
Stuttgart	Z.	67.4	315	e 11 0	+ 1	—	—	—	—
Paris		71.5	316	e 11 15	- 9	—	—	—	e 43.1
College		74.3	24	i 11 43	+ 2	—	—	e 14 34	PP
Tamanrasset	Z.	80.6	291	e 12 14	- 2	—	—	—	—
Pretoria	Z.	85.1	238	i 12 40	+ 1	—	—	—	—
Pietermaritzburg	Z.	85.8	233	i 12 44	+ 2	—	—	—	—
Hungry Horse		98.5	20	e 17 12	PP	—	—	—	—
Overton	Z.	108.9	26	e 19 12	PP	—	—	—	—
Bogota	Z.	145.7	343	i 19 43	[+ 3]	—	—	—	—

Additional readings:—

Calcutta iSE = 5m.21s., eS\*E = 5m.46s., eS<sub>e</sub>E = 6m.4s.

Collmberg eZ = 11m.8s.

Paris i = 11m.32s.

Hungry Horse e = 17m.24s.

Long waves were also recorded at Rome, Copenhagen, De Bilt, and Kew.

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Aug. 19d. 21h. Undetermined shock.

La Plata P?E = 53m.12s., ePN = 53m.24s., SN = 55m.12s., LN = 55.7m.  
 La Paz P = 54m.2s., iS = 56m.25s., L = 58m.  
 Tucson eP? = 62m.14s.  
 Pierce Ferry iP = 62m.40s.  
 Boulder City eP = 62m.42s.  
 Riverside iPZ = 62m.42s.  
 Overton iPZ = 62m.44s.  
 Pasadena iPZ = 62m.45s.  
 Pretoria iZ = 63m.10s., eZ = 63m.46s.  
 Hungry Horse iP = 63m.28s.  
 Tamanrasset ePZ = 63m.28s., epPZ = 64m.3s.  
 College eP? = 65m.55s.  
 Paris i = 87m.27s.

Aug. 19d. 22h. 42m. 56s. Epicentre 36°·5N. 75°·5E. (as given by Strasbourg).

A = +·2018, B = +·7801, C = +·5922;  $\delta = -2$ ;  $h = 0$ ;  
 D = +·968, E = -·250; G = +·148, H = +·573, K = -·806.

	$\Delta$	Az.	P.		O - C.		S.		O - C.		Supp.		L. m.
			m.	s.	s.		m.	s.	s.	m.	s.		
Murgab	2.2	327	i 0	48	P <sub>g</sub>		i 1	28	S <sub>g</sub>				--
Kulyab	4.8	289	e 1	15	0		e 2	17	+ 5				--
Andijan	4.9	331	e 1	24	P*		i 2	58	S <sub>g</sub>				--
Fergana	4.9	324	e 1	22	+ 5		2	53	S <sub>g</sub>				--
Obi-garm	5.1	297	e 1	19?	- 1								--
Stalinabad	5.7	293	e 1	26	- 2		i 2	39	+ 1				--
Frunse	6.4	354	e 1	50	P*								--
Przhevalsk	6.4	20	i 1	54	P*								--
Tashkent	6.8	317	e 1	46	+ 2								--
Almata	6.9	9	e 1	58	P*								--
Samarkand	7.4	298	e 1	55	+ 3								--
Tchimkent	7.4	324	i 1	55	+ 3								--
New Delhi	8.0	170	i 1	50	-10		3	29	- 4	1	58	P	--
Ashkabad	13.7	281	e 3	10	- 8								--
Kizyl-Arvat	15.4	285	e 3	46	+ 6								--
Bombay	17.7	188					e 8	24	SSS				e 8.5
Poona	E. 18.0	185					e 7	12	-20				9.1
Sverdlovsk	22.7	339	5	10	+ 6		9	25	+16				--
Kodaikanal	E. 26.2	176	e 8	52	P <sub>c</sub> P								--
Collmberg	Z. 46.0	309	e 8	26	- 1								--
Stuttgart	Z. 48.8	307	e 8	46	- 3								--
Strasbourg	49.8	307	e 8	57	+ 1								--
College	73.4	18	e 11	38	+ 2								--

New Delhi gives also PPPEN = 2m.5s., iSEN = 3m.14s., SSSSEN = 3m.37s.  
 Long waves were also recorded at Calcutta, Paris, De Bilt, and Copenhagen.

Aug. 19d. Readings also at 0h. (La Paz), 1h. (Tashkent, Almata, Samarkand, near Andijan, Fergana, Tchimkent, Frunse, Naryn, Murgab, Obi-garm, and Przhevalsk), 2h. (La Paz, La Plata, College, near Obi-garm, near Bandung, and Djakarta), 3h. (Fergana, Murgab, Andijan, Przhevalsk, Tchimkent, Tashkent, Samarkand, Ashkabad, Mary, near Kulyab, Obi-garm, Stalinabad, Overton, Pierce Ferry, and Tucson), 4h. (College), 6h. (Strasbourg, College, Brisbane, and near Przhevalsk), 7h. (College (2) and near Andijan), 8h. (Basle, Shasta Dam, Ashkabad, and near Andijan), 10h. (Calcutta, Stuttgart, and College), 11h. (Calcutta, Collmberg, Stuttgart, and Pretoria), 12h. (Tamanrasset (2)), 13h. (College), 14h. (Tamanrasset), 16h. (near Leninakan), 17h. (Ashkabad), 18h. (Tamanrasset, Ksara (2), and near Ottawa), 19h. and 20h. (Tamanrasset), 21h. (College, Overton, and Pierce Ferry), 22h. (Tamanrasset, Tortosa, near Alicante, Granada, Toledo, Malaga, Murgab, near Obi-garm, Stalinabad, Fergana, and Samarkand), 23h. (Rathfarnham Castle, Ottawa, Tashkent, Murgab, Przhevalsk, near Obi-garm, Stalinabad, Kulyab, Fergana, Andijan, Samarkand, and Tchimkent).

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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Aug. 20d. 1h. 44m. 56s. Epicentre 47°·2N. 113°·5W.

Intensity VI at Desert Mountain, Mud Lake, and Niarada; V at Bungalow, Kalispell, and Seeley Lake. Macroseismic Area 4000 sq.m. Epicentre as adopted.

L. M. Murphy and F. P. Ulrich.

United States Earthquakes, 1950, Serial No. 755, Washington, 1952, p.7.

A = -·2719, B = -·6253, C = +·7314;  $\delta$  = -12; h = -4;  
D = -·917, E = +·399; G = -·292, H = -·671, K = -·682.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Butte	N.	1·4	152	i 0 23	- 4	i 0 39	- 7	—	i 0·7
Bozeman		2·3	132	e 0 37	- 3	i 1 7	- 2	e 0 59	—
Logan		5·6	167	i 1 30	+ 3	e 2 15	-18	e 1 42	i 2·9
Seattle		6·0	278	i 1 35 <sub>a</sub>	+ 3	i 2 43	0	i 2 9	i 3·2
Saskatoon		6·6	40	1 52	P*	3 16	S*	—	—
Victoria		6·8	285	e 1 41	- 3	3 36	S <sub>r</sub>	—	—
Reno		8·9	213	e 2 28	P*	i 3 39	-16	i 4 53	S <sub>r</sub> i 5·1
Mineral	z.	9·0	223	i 2 15	+ 2	e 3 48	-10	—	—
Shasta Dam		9·1	228	e 2 18	+ 4	e 4 7	+ 7	i 2 34	PP e 4·9
Overton	z.	10·7	184	e 2 38	0	—	—	—	i 5·7
Tinemaha	z.	10·7	201	e 2 37	- 1	—	—	—	i 5·8
Pierce Ferry		11·1	182	i 2 44	+ 1	—	—	—	i 5·9
Boulder City		11·3	186	e 2 46	0	e 5 54	+60	—	—
Fresno		11·5	206	e 2 50	+ 2	e 6 15	+76	—	—
Lick		11·5	214	e 2 49 <sub>a</sub>	+ 1	e 6 16	+77	—	—
Pasadena	z.	13·5	197	e 3 16	+ 1	—	—	—	e 8·2
Riverside	z.	13·5	194	i 3 24	+ 9	—	—	—	e 7·3
Tucson		15·1	171	e 3 37	+ 1	—	—	—	e 8·2
St. Louis		19·0	108	e 4 21	- 5	—	—	—	e 10·1
College		25·6	327	e 5 30	- 2	—	—	—	e 13·6
Ottawa	z.	26·0	80	—	—	e 10 34	+28	—	e 13·3
Shawinigan Falls	N.	27·6	75	—	—	e 10 22	-10	—	e 13·4
Harvard		29·8	83	—	—	e 13 46	SS	—	e 17·7

Additional readings:—

Logan e = 1m.45s.  
Seattle i = 1m.40s., iP\* = 1m.57s., i = 2m.25s. and 2m.46s., IS\* = 2m.58s.  
Victoria e = 2m.6s., P<sub>r</sub> = 2m.58s.  
Reno iZ = 2m.52s.  
Mineral iZ = 2m.27s.  
Tinemaha iZ = 2m.55s.  
Fresno eZ = 3m.36s., eN = 8m.16s. and 9m.21s.  
Lick iZ = 6m.20s.  
Pasadena iZ = 3m.23s. and 7m.24s., eZ = 7m.37s.  
St. Louis e = 3m.48s.  
Harvard e = 15m.20s.  
Long waves were also recorded at other American stations.

Aug. 20d. 9h. 3m. 34s. Epicentre 29°·2N. 95°·1E. (as on 18d.).

A = -·0777, B = +·8709, C = +·4853;  $\delta$  = +2; h = +2;  
D = +·996, E = +·089; G = -·043, H = +·483, K = -·874.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Calcutta	E.	9·0	224	e 2 21	+ 8	i 4 6	+ 8	—	—
Dehra Dun	N.	14·9	279	e 4 56	?	e 6 50?	+30	—	—
New Delhi		15·7	272	i 3 43	- 1	i 6 32	- 7	3 55	PP
Przhevsk		18·9	320	e 4 23	- 1	i 7 57	+ 4	—	—
Hyderabad		19·2	236	i 4 32	+ 4	8 8	+ 9	—	—
Naryn		19·8	315	i 4 32	- 3	i 8 14	+ 1	—	—
Almata		20·2	320	i 4 39	0	i 8 25	+ 4	—	—
Nanking		20·6	75	4 46	+ 3	i 8 34	+ 5	—	9·4
Frunse		21·4	315	i 4 51?	0	i 8 53?	+ 8	—	—
Andijan		21·8	308	4 57	+ 1	e 8 55	+ 3	—	—

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.
Fergana		22.1	308	4 56	- 3	8 58	0	—	—
Poona		22.1	246	5 3	+ 4	9 4	+ 6	9 52	SS
Bombay		22.8	249	i 5 11	+ 6	i 9 16	+ 5	—	—
Kulyab		22.8	299	i 5 5	0	e 9 13	+ 2	—	—
Obi-garm		23.0	301	i 5 6?	- 1	i 9 24?	+10	—	—
Stalinabad		23.6	301	i 5 16	+ 3	i 9 32	+ 7	—	—
Irkutsk		24.0	13	e 5 18	+ 1	i 9 42	+10	—	—
Tashkent		24.2	307	e 5 20?	+ 1	—	—	—	—
Tchimbkent		24.4	310	i 5 22	+ 1	i 9 46	+ 7	—	—
Kodaikanal	E.	25.1	226	i 5 34	+ 6	i 9 59	+ 8	—	—
Colombo	E.	26.4	216	e 5 56	+16	e 8 28	?	—	—
Mary		28.9	297	6 1	- 2	—	—	—	—
Ashkabad		31.7	297	e 6 28	+ 1	e 11 32	- 5	—	—
Vladivostok		32.5	55	e 6 34	0	e 11 46	- 3	—	—
Sverdlovsk		36.7	329	i 7 11	+ 1	12 55	+ 1	—	—
Bandong		37.9	158	e 7 19	- 1	—	—	—	—
Baku		38.4	300	e 7 30	+ 5	e 13 20	0	—	—
Tiflis		42.3	302	i 7 59	+ 2	e 14 21	+ 2	—	—
Leninakan		43.0	300	e 8 25	+22	—	—	—	—
Borzhom		43.4	302	8 6	0	—	—	—	—
Moscow		48.2	321	e 8 43	- 1	e 15 39	- 4	—	—
Yalta		50.0	305	e 8 57	- 1	e 16 7	- 2	e 10 53	PP
Ksara		50.1	291	i 9 1	+ 2	e 16 20?	+10	—	—
Pulkovo		52.6	325	i 9 18	0	i 16 42	- 2	—	—
Istanbul		54.1	302	e 9 28	- 1	e 16 31?	-34	—	—
Helwan		54.8	288	9 35	+ 1	e 17 16	+ 2	—	—
Warsaw		58.0	317	e 10 1	+ 4	e 18 2	+ 5	e 12 20	PP
Skalnate Pleso		58.9	313	e 10 0	- 3	e 18 4	- 4	e 13 38	PPP
Upsala		59.0	325	i 10 3	- 1	i 18 4	- 6	e 12 10	PP
Raciborzu	z.	60.1	314	e 9 5	-66	—	—	—	—
Copenhagen		62.4	321	i 10 26	- 1	e 18 47	- 6	—	—
Prague		62.5	315	e 10 27	- 1	e 18 52	- 2	e 12 49	PP
Potsdam		62.8	318	e 10 33	+ 3	e 19 1	+ 3	—	—
Collnberg		63.1	316	e 10 30	- 2	e 19 2	0	e 12 44	PP
Jena	E.	64.0	316	e 10 37	- 1	e 19 10	- 3	e 12 54	PP
Messina		64.9	302	e 10 47	+ 4	e 19 24	0	—	—
Padova		65.6	309	e 11 0	+12	—	—	—	—
Bologna		66.0	310	e 11 9	+19	e 20 12	+34	—	—
Rome		66.0	306	e 10 48	- 2	e 19 38	0	e 13 19	PP
Stuttgart		66.1	314	i 10 50k	- 1	e 19 31	- 8	e 13 18	PP
Chur		66.5	312	e 10 52	- 2	—	—	—	—
Zürich		66.9	313	e 10 54k	- 2	—	—	—	—
Strasbourg		67.1	315	e 10 56k	- 1	e 19 46	- 5	e 13 14	PP
Basle		67.5	313	e 10 59	- 1	—	—	—	—
De Bilt		67.5	319	i 11 0	0	e 19 56	0	—	—
Besançon		68.9	314	e 11 6	- 3	—	—	—	—
Aberdeen	E.	69.7	325	—	—	i 20 26	+ 4	e 27 46	SSS
Paris		70.3	316	i 11 17	0	e 20 29	0	e 11 38	P <sub>c</sub> P
Kew		70.9	319	i 11 21	0	e 20 33	- 3	—	—
Clermont-Ferrand		71.0	312	e 11 24	+ 2	e 20 35	- 2	e 14 1	PP
Jersey	E.	72.9	317	e 11 43	+10	—	—	—	—
Rathfarnham Castle		73.5	323	e 11 55	+19	—	—	—	—
College		74.4	23	i 11 40	- 2	e 21 52	+36	e 14 26	PP
Algiers Univ.	z.	74.7	304	i 11 42 <sub>a</sub>	- 1	—	—	—	—
Resolute Bay		76.2	3	e 11 46	- 6	—	—	—	—
Tamanrasset	z.	78.9	290	12 7k	0	e 22 9	+ 4	i 12 16	P <sub>c</sub> P
Brisbane	z.	79.1	129	i 12 13 <sub>a</sub>	+ 5	—	—	—	—
Riverview	z.	82.1	135	i 12 31 <sub>a</sub>	+ 7	—	—	—	—
Pretoria	z.	84.3	236	i 12 37?	+ 2	—	—	—	—
Pietermaritzburg	z.	85.0	232	e 12 45	+ 7	—	—	—	—
Seattle		96.4	24	e 13 36	+ 4	—	—	—	—
Hungry Horse		98.5	19	i 13 42	0	—	—	e 17 33	PP
Shasta Dam		102.3	28	e 17 54	PP	—	—	—	—
Overton	z.	109.0	24	e 19 0	PP	—	—	—	—
Pierce Ferry		109.5	24	i 18 56	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.
Tucson	114.1	24	e 18 48	[+ 7]	—	—	—	—
Bogota	144.8	341	i 19 41	[+ 2]	—	—	—	—
Chinchina	144.9	343	i 19 38	[- 1]	—	—	—	—
La Paz	160.0	305	e 20 16	[+15]	—	—	—	—

Additional readings :—

New Delhi PPPEN = 4m.7s., QEN = 6m.21s., SSEN = 6m.49s., SSSSEN = 7m.1s.

Nanking e = 4m.42s., iZ = 4m.50s.

Yalta ePPP = 11m.50s., eSS = 19m.42s.

Warsaw eZ = 10m.15s. and 11m.19s., ePSEN = 18m.22s., eS<sub>c</sub>SZ = 19m.54s.

Skalnate Pleso eSS = 22m.38s.?

Upsala eS<sub>1</sub>N = 18m.9s., eSSN = 22m.7s., e = 22m.54s., eN = 24m.50s.

Copenhagen i = 10m.31s.

Prague e = 10m.31s., 10m.52s., and 11m.11s., eN = 11m.40s., e = 14m.51s. and 15m.38s.

Collmberg eZ = 10m.36s. and 13m.37s.

Rome eE = 20m.48s. and 23m.34s.

Stuttgart eZ = 10m.55s., eS<sub>c</sub>S = 20m.46s., eSS? = 23m.38s.

Strasbourg i = 11m.3s., e = 11m.49s., eSS = 24m.16s., eSSS = 27m.44s.

De Bilt eZ = 12m.20s.

Besançon e = 11m.12s.

Paris i = 11m.20s., 13m.10s., and 14m.50s.

Kew eEN = 19m.35s.

Clermont-Ferrand ePPP = 15m.43s., eSS = 25m.12s., eSSS = 28m.25s.

Jersey eE = 12m.53s.

Algiers Univ. iZ = 11m.48s.

Tamanrasset iZ = 12m.24s., ePPZ = 15m.10s., ePPPZ = 16m.54s.

Hungry Horse iPP = 17m.43s., e = 21m.1s.

Long waves were also recorded at Christchurch, Bergen, Cheb, Helsinki, Tortosa, Malaga, Scoresby Sund, and Harvard.

Aug. 20d. 10h. 37m. 13s. Epicentre 29°·2N. 95°·1E. (as at 9h.).

	$\Delta$ °	Az. °	P. m. s.	O - C. s.	S. m. s.	O - C. s.	Supp. m. s.	L. m.
Calcutta	E. 9.0	224	e 3 27	S	(e 3 27)	-31	e 5 37 SS	(i 5.4)
Przhevalsk	18.9	320	e 4 27	+ 3	—	—	—	—
Frunse	21.4	315	e 4 52?	+ 1	e 8 59?	+14	—	—
Andijan	21.8	308	e 4 58	+ 2	9 1	+ 9	—	—
Fergana	22.1	308	4 56	- 3	9 4	+ 6	—	—
Bombay	N. 22.8	249	—	—	e 9 20	+ 9	—	—
Kulyab	22.8	299	5 5	0	9 24	+13	—	—
Obi-garm	23.0	301	e 5 6	- 1	e 9 15	+ 1	—	—
Irkutsk	24.0	13	e 5 17	0	—	—	—	—
Tashkent	24.2	307	e 5 17	- 2	e 9 41	+ 6	—	—
Moscow	48.2	321	e 8 43	- 1	—	—	—	—
Collmberg	Z. 63.1	316	e 10 36	+ 4	—	—	—	—
Bologna	66.0	310	e 12 37	PP	—	—	e 13 44 PPP	—
Rome	66.0	306	e 13 11	PP	—	—	—	—
Florence, Xim.	66.3	308	e 11 43	+51	—	—	i 12 51 PP	—
College	74.4	23	e 11 2	-40	—	—	i 11 40 pP	—
Tamanrasset	Z. 78.9	290	e 12 7	0	—	—	—	—
Hungry Horse	98.5	19	e 13 42	0	—	—	—	—

Additional readings and note :—

Calcutta readings are given as P, S, and SS.

Tamanrasset eZ = 12m.44s.

Long waves were also recorded at Stuttgart.

Aug. 20d. 10h. Italian shock.

Intensity III at Florence. Epicentre approximately 44°N. 11°E.  
Monthly Seismological bulletin, Rome, 1950, p.17.

Florence, Xim. iP<sub>g</sub> = 43m.38s., iS<sub>g</sub> = 43m.44s.

Prato iP<sub>g</sub> = 44m.5s., iS<sub>g</sub> = 44m.10s.

Bologna e = 44m.21s., 44m.30s., and 44m.34s.

Padova e = 44m.32s. and 45m.2s.

Chur eP<sub>g</sub> = 44m.54s., eS<sub>g</sub> = 45m.34s.

Rome e = 45m.1s.

Zürich eP<sub>g</sub>? = 45m.8s., eS<sub>g</sub> = 45m.56s.

Basle e = 45m.20s., eS<sub>g</sub> = 46m.15s.

Stuttgart eZ = 45m.44s.?, 46m.9s., and 46m.58s.



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Aug. 20d. 23h. 34m. 21s. Epicentre 14°·9S. 167°·1E. (as on 1950, February 7d.).

A = -·9424, B = +·2158, C = -·2555;  $\delta = -3$ ;  $h = +6$ ;  
D = +·223, E = +·975; G = +·249, H = -·057, K = -·967.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.	
	°	°	m. s.	s.	m. s.	s.	m. s.	m.	
Brisbane	18·1	224	i 4 13 <sub>a</sub>	- 1	i 7 40	+ 5	i 4 27	PP	—
Apia	20·5	90	e 4 42	0	—	—	—	—	—
Riverview	23·7	214	i 5 22 <sub>a</sub>	+ 8	e 9 33	+ 6	i 5 52	PP	—
Vladivostok	66·1	333	i 10 48	- 3	e 19 39	0	—	—	—
Berkeley	84·4	49	e 13 36	+60	—	—	—	—	e 39·4
Lick	z. 84·6	49	i 12 38 <sub>a</sub>	+ 2	i 12 44	P <sub>c</sub> P	e 15 53	PP	—
Shasta Dam	85·5	46	e 12 37	- 4	—	—	e 13 4	P <sub>c</sub> P	—
Fresno	z. 85·8	50	e 12 40 <sub>a</sub>	- 2	e 13 56	P <sub>c</sub> P	e 16 9	PP	—
Mineral	z. 85·9	47	e 12 40	- 3	—	—	—	—	—
Pasadena	86·1	54	i 12 41	- 3	—	—	i 12 50	pP	e 41·6
College	86·5	18	e 12 42	- 4	—	—	e 16 0	PP	—
Riverside	86·6	54	i 12 44	- 2	—	—	i 12 54	pP	—
Palomar	86·8	55	e 12 46	- 1	—	—	—	—	—
Tinemaha	z. 87·1	51	e 12 47	- 2	—	—	e 12 57	pP	—
Victoria	z. 88·0	39	e 12 50	- 3	—	—	—	—	—
Boulder City	89·3	53	i 12 57	- 2	—	—	e 16 31	PP	—
Overton	z. 89·7	52	i 13 0	- 1	—	—	—	—	—
Pierce Ferry	90·0	53	i 13 1	- 2	—	—	—	—	—
Tucson	91·3	57	i 13 8	- 1	—	—	—	—	—
Hungry Horse	93·8	41	e 13 18	- 2	—	—	e 38 38	P'P'	—
Ottawa	z. 119·5	45	i 18 49	[- 3]	—	—	—	—	—
Harvard	122·9	48	e 18 56	[- 2]	—	—	—	—	e 67·6
Ksara	132·2	302	e 19 17	[+ 1]	—	—	e 21 42	PP	—
Collmberg	z. 138·1	335	e 19 25	[- 2]	—	—	e 22 7	PP	—
Prague	138·5	333	e 19 14	[- 14]	—	—	e 23 15	PP	—
De Bilt	140·2	342	22 24	PP	—	—	—	—	e 50·6
Stuttgart	z. 141·7	336	e 19 26	[- 7]	—	—	e 22 45	PP	—
Strasbourg	142·3	337	e 19 29 <sub>a</sub>	[- 6]	—	—	e 22 47	PP	—
Zürich	143·0	336	e 19 29	[- 7]	—	—	—	—	—
Chur	143·1	334	e 19 34	[- 2]	—	—	—	—	—
Basle	143·3	337	e 20 8	[+ 32]	—	—	—	—	—
Padova	143·8	329	e 19 39	[+ 2]	—	—	e 20 40	?	—
Paris	143·9	342	i 19 34	[- 3]	—	—	i 22 50	PP	e 80·6
Bologna	144·0	330	i 19 34	[- 3]	—	—	—	—	—
Neuchatel	144·0	336	e 19 35	[- 2]	—	—	—	—	—
Besançon	144·1	337	i 19 35	[- 3]	—	—	—	—	—
Rome	145·3	326	i 19 38 <sub>a</sub>	[- 2]	—	—	—	—	—
Messina	145·8	318	e 19 41	[ 0]	—	—	e 20 31	?	—
Clermont-Ferrand	146·4	339	i 19 41	[- 1]	—	—	—	—	—
Algiers Univ.	z. 154·0	329	e 19 59	[+ 6]	—	—	—	—	—
Tamanrasset	z. 160·9	298	i 20 2 <sub>k</sub>	[ 0]	—	—	e 20 38	PKP <sub>2</sub>	—

Additional readings:—

Brisbane iSZ = 7m.45s.

Riverview iN = 8m.9s. and 9m.50s., iE = 10m.1s.

College i = 12m.53s.

Tucson i = 13m.18s.

Ottawa i = 18m.59s.

Strasbourg e = 19m.36s., 22m.24s., and 22m.32s.

Zürich e = 19m.41s.

Paris i = 19m.46s.

Bologna i = 19m.41s.

Besançon i = 19m.45s.

Rome i = 20m.13s.

Clermont-Ferrand i = 19m.52s.

Tamanrasset iPKPZ = 20m.44s., iP<sub>c</sub>PZ = 20m.53s., ePP?Z = 23m.42s., eZ = 24m.25s.

and 26m.8s.

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Aug. 20d. Readings also at 0h. (Puebla, Tacubaya, Pasadena, Riverside, Tucson, Boulder City, Overton, Pierce Ferry, Lick, and Reno), 1h. (Tacubaya, Harvard, Philadelphia, Bozeman, Butte, Ashkabad, and Granada), 2h. (Lick, Ksara, Strasbourg, and near Collmberg), 4h. (Hungry Horse, College, Bombay, Calcutta, Andijan (2), Przhevalsk, Tashkent, Tchimkent, and near Garm), 5h. (Rome (2), Hungry Horse, and College (2)), 6h. (Algiers Univ., Istanbul, and near Athens), 7h. (Rome, College (2), near Andijan, and near Alicante), 8h. (Harvard, Seattle, Hungry Horse, near Malaga, and near Florence Xim), 9h. (Stuttgart, Tinemaha, and near Obi-garm), 10h. (College, Collmberg, Florence Xim, Rome, and near Istanbul), 11h. (Calcutta, Almata, Andijan, Frunse, Tamaprasset (2), Boulder City, Overton, Pierce Ferry, and College), 12h. (Calcutta, College, and near Alicante), 13h. (near Prague and near Yalta), 14h. (Brisbane, Bogota, Chinchina, La Paz, Overton, Pierce Ferry, and Tucson), 15h. (Pasadena, Riverside, Tinemaha, Overton, Pierce Ferry, and Tamaprasset), 16h. (Brisbane, Overton, Pierce Ferry, and College), 17h. (Overton, Florence Xim (2), Rome, Andijan, Murgab, Tchimkent, near Fergana, Garm, Kulyab, and Obi-garm), 18h. (Ksara), 20h. (Tucson, Overton, Pierce Ferry, Hungry Horse, College (3), Stuttgart, Calcutta (2), Andijan, Erevan, near Obi-garm, and near Leninakan), 21h. (Overton, Pierce Ferry, College, Collmberg, Stuttgart, near Kulyab, and Obi-garm), 22h. (near Obi-garm).

Aug. 21d. 5h. 51m. 36s. Epicentre  $28^{\circ}7'N$ .  $96^{\circ}6'E$ . (as on 19d.).

A = -0.1010, B = +0.8727, C = +0.4777;  $\delta = 0$ ;  $h = +2$ ;  
D = +0.993, E = +0.115; G = -0.055, H = +0.475, K = -0.879.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Calcutta	E.	9.7	232	e 2 15	- 7	4 1	-14	—	14.9
New Delhi		17.0	274	e 3 58	- 3	i 7 3	- 7	—	7.0
Nanking		19.4	75	4 27	- 3	e 8 1	- 3	—	9.1
Hyderabad		20.1	239	i 4 27	-11	8 13	- 6	—	10.1
Przhevalsk		20.2	317	i 4 46	+ 7	—	—	—	—
Naryn		21.1	313	e 4 53	+ 5	e 9 4	SS	—	—
Murgab		21.2	303	4 54	+ 5	9 4	SS	—	—
Almata		21.5	319	4 59	+ 7	9 11	SS	—	—
Frunse		22.7	314	i 5 11?	+ 7	—	—	—	—
Poona		23.1	249	5 0	- 8	9 0	-16	—	—
Andijan		23.2	307	e 5 21	+12	e 9 42	+24	—	—
Fergana		23.5	307	e 5 15	+ 3	—	—	—	—
Bombay		23.8	251	e 5 9	- 6	e 9 22	- 6	—	—
Irkutsk		24.2	11	i 5 34?	+15	e 9 57?	+22	—	—
Kulyab		24.2	300	e 5 22	+ 3	e 9 54	+19	—	—
Tashkent		25.5	307	e 5 36	+ 4	e 10 17	+20	—	—
Kodajkanal	E.	25.7	229	i 6 24	PPP	i 10 51	SS	—	—
Samarkand		26.7	302	e 5 45	+ 2	—	—	—	—
Bandong		37.0	160	—	—	e 12 28	-31	—	—
Sverdlovsk		37.8	328	i 7 26	+ 6	—	—	—	—
Baku		39.8	300	e 7 14?	-22	—	—	—	—
Leninakan		44.4	301	e 8 31?	+17	—	—	—	—
Moscow		49.4	321	e 8 0	-53	—	—	—	—
Yalta		51.4	306	9 8	- 1	16 36	+ 8	11 14	PP
Ksara		51.5	292	e 9 9	0	e 16 48	PPS	—	—
Helwan	Z.	56.2	289	e 9 41	- 3	—	—	e 8 44	?
Warsaw		59.2	317	e 10 3	- 2	e 15 16	PcS	e 12 23	PP
Copenhagen		63.6	322	i 10 35	0	19 24	PS	20 39	ScS
Prague		63.7	315	e 10 34?	- 2	e 19 12?	+ 2	e 13 19	PP
Collmberg	Z.	64.3	317	e 10 39	0	—	—	—	—
Jena	N.	65.3	316	e 10 44	- 2	—	—	—	—
Stuttgart		67.4	315	e 10 58	- 1	e 20 3	+ 8	e 13 36	PP
Strasbourg		68.3	315	e 11 4?	- 1	—	—	—	—
De Bilt		68.7	319	e 10 54	-13	e 20 24?	+14	—	—
Besançon		69.9	314	e 11 13	- 2	—	—	—	—
Paris		71.5	316	e 11 25	+ 1	—	—	—	e 38.4
Kew		72.2	320	e 11 33	+ 4	e 21 7	+16	e 21 51	PPS
Clermont-Ferrand		72.3	313	e 11 35	+ 6	—	—	—	—
College		74.3	24	i 11 39	- 2	—	—	e 14 29	PP
Rathfarnham C.	Z.	74.7	323	e 11 47?	+ 4	e 21 20	+ 1	—	e 38.4

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.
Brisbane	z.	77.7	130	i 11 47 <sub>a</sub>	-13	—	—	—	—
Tamanrasset	z.	80.6	291	e 12 10	-6	—	—	e 15 16	PP
Pretoria	z.	85.1	238	e 12 29?	-10	—	—	—	—
Hungry Horse		98.5	20	e 13 42	0	—	—	e 17 45	PP
Tucson		114.0	25	e 18 39	[-2]	—	—	—	—
Bogota		145.7	343	i 19 38	[-2]	—	—	—	—
Chinchina		145.7	345	i 19 35	[-5]	—	—	—	—

Additional readings:—

Warsaw ePPPZ = 13m.40s., eE = 16m.43s. and 17m.17s.

Prague e = 11m.6s. and 11m.26s., ePPP? = 14m.30s.

Besançon e = 11m.19s.

Paris i = 11m.29s.

Kew eSSSE = 29m.23s.

Tamanrasset iP<sub>c</sub>PZ = 12m.19s.

Long waves were also recorded at Upsala, Potsdam, and Rome.

Aug. 21d. 8h. 29m. 42s. Epicentre 33°·2N. 91°·8E.

A = -0.0263, B = +0.8381, C = +0.5450;  $\delta = +13$ ;  $h = +1$ ;  
D = +1.000, E = +0.031; G = -0.017, H = +0.545, K = -0.838.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Calcutta	E.	11.1	197	i 1 26	?	—	—	—	i 5.7
Dehra Dun	N.	12.0	260	e 3 36	+41	e 6 6	+55	—	8.6
New Delhi		13.3	254	e 3 9	-4	i 5 49	+7	i 5 22	?
Przhevalsk		14.0	315	i 3 20	-2	—	—	—	—
Naryn		15.0	308	e 3 33	-2	—	—	—	—
Almata		15.4	315	i 3 37	-3	i 6 33	+1	—	—
Murgab		15.4	295	3 38	-2	—	—	—	—
Frunse		16.6	311	3 54	-2	6 55	-5	—	—
Andijan		17.2	302	e 4 4	+1	e 7 15	+1	—	—
Fergana		17.5	301	e 4 4	-3	—	—	—	—
Stalinabad		19.4	294	e 4 27	-3	e 7 56	-8	—	—
Tashkent		19.6	302	e 4 30	-2	—	—	—	—
Tchinkent		19.7	305	i 4 34	0	—	—	—	—
Hyderabad		19.8	222	i 4 31	-4	e 8 15	+2	—	10.5
Samarkand		20.9	295	i 4 47	+1	—	—	—	—
Irkutsk		21.1	22	e 4 52	+4	—	—	—	—
Poona		21.7	233	4 51	-4	8 53	+2	—	9.3
Bombay		22.2	236	e 4 58	-2	—	—	—	—
Nanking		22.7	86	5 9	+5	9 22	+13	—	11.4
Mary		24.7	292	i 5 25	+1	—	—	—	—
Kodaikanal	E.	26.4	215	e 6 39	PPP	e 11 1	SS	—	—
Colombo	E.	28.4	207	e 12 39	SSS	—	—	—	20.5
Sverdlovsk		31.8	328	6 29	+1	e 11 40	+2	—	—
Vladivostok		32.8	61	e 6 39	+2	e 12 0	+6	—	—
Baku		34.1	296	—	—	e 12 0	-14	—	—
Leninakan		38.6	297	e 7 32?	+6	—	—	—	—
Bandong		42.6	156	e 8 22	+23	—	—	—	—
Moscow		43.4	319	e 8 6	0	e 14 33	-2	—	—
Yalta		45.4	303	(8 22)	0	(15 4)	0	(e 10 1)	PP
Ksara		46.1	287	i 8 30	+2	e 15 28	+14	—	—
Pulkovo		47.7	325	e 8 42	+2	e 15 38	+2	—	—
Helwan		51.0	284	e 9 4	-2	16 21	-1	e 19 0	ScS
Warsaw		53.2	314	e 9 25	+3	e 16 53	+1	11 35	PP
Upsala		54.1	324	e 6 42	?	e 17 8	+3	e 19 10	ScS
Timisoara		54.2	306	12 18?	PPP	—	—	13 18?	?
Copenhagen		57.5	320	i 9 58	+5	17 52	+2	19 53	ScS
Prague		57.7	313	e 9 56	+1	e 18 18	+25	e 12 7	PP
Collnberg	z.	58.2	314	e 10 11	+13	—	—	—	—
Jena		59.2	314	e 10 6	+1	—	—	e 10 11?	?
Stuttgart		61.3	313	e 10 18	-2	e 18 43	+4	—	e 24.3

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.
Rome	61.4	305	12 24	PP	e 18 39	- 1	—	—
Strasbourg	62.3	313	i 10 16	-10	e 18 52	0	e 10 24	P e 30.3
De Bilt	62.6	317	e 11 1	P <sub>c</sub> P	e 18 56	0	—	e 32.3
Besançon	63.8	312	e 10 34	- 2	—	—	—	—
Paris	65.4	314	e 10 46	- 1	e 26 32	SSS	e 10 59	P <sub>c</sub> P e 34.3
Kew	66.0	318	—	—	e 19 39	+ 1	e 27 4	SSS —
Clermont-Ferrand	66.3	311	e 10 52	0	e 19 42	0	e 23 57	SS 34.3
Scoresby Sund	66.4	342	—	—	20 48	S <sub>c</sub> S	—	35.3
Rathfarnham Castle	68.6	322	e 12 28	?	—	—	—	e 32.3
Tortosa	70.1	307	e 10 29	-47	—	—	—	e 40.3
College	71.8	23	i 11 27	+ 1	e 17 40	?	e 6 35	? —
Alicante	71.9	306	11 50	P <sub>c</sub> P	21 28	S <sub>c</sub> S	—	36.4
Toledo	z. 73.6	308	e 11 35	- 2	—	—	—	—
Granada	74.6	306	e 11 45	+ 2	21 18	0	26 27	SS 33.4
Tamanrasset	z. 74.9	288	i 11 43k	- 1	—	—	i 11 52	P <sub>c</sub> P —
Hungry Horse	95.6	18	e 13 32	+ 4	—	—	—	—

Additional readings and notes :—

Nanking i = 5m.15s., P<sub>c</sub>P?E = 7m.22s.

Yalta SS = (18m.22s.); readings reduced by 2 minutes.

Warsaw ePE = 9m.28s., eN = 16m.57s., SSE = 21m.23s., SSSE = 23m.57s.

Upsala eN = 7m.47s., eSE = 14m.45s., eS<sub>c</sub>SE = 16m.46s., eSSSE = 21m.21s.?, readings wrongly identified.

Prague e = 9m.59s., 10m.21s., and 10m.56s., eSS = 21m.48s., eSSS = 23m.36s.

Strasbourg e = 19m.22s., eSSS = 25m.40s., e = 29m.38s.

Clermont-Ferrand eSSS = 26m.54s.

Alicante PPP = 16m.36s., SS = 26m.18s., SSS = 29m.28s., Q = 32m.8s., readings wrongly identified.

Tamanrasset eZ = 12m.40s.

Long waves were also recorded at Helsinki, Budapest, Potsdam, and Tortosa.

Aug. 21d. 15h. 41m. 0s. Epicentre 20°·0N. 69°·5W. (as on 1948, May 25d.).

A = +·3293, B = -·8808, C = +·3400;  $\delta$  = -15; h = +5;

D = -·937, E = -·350; G = +·119, H = -·318, K = -·940.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Port au Prince	3.0	242	e 0 40	-10	i 1 10	-17	i 0 50	P* i 1.5
San Juan	3.6	116	e 1 4	P*	i 1 53	S*	i 1 8	P <sub>z</sub> i 2.2
Fort de France	9.6	122	e 2 32	+11	—	—	—	—
Galerazamba	10.7	212	i 2 40	+ 2	e 4 59	+20	—	e 7.3
Bogota	15.9	197	e 3 49	+ 2	e 6 45	+ 1	—	e 8.7
Weston	22.4	357	i 5 15	+13	i 9 12	+ 8	—	—
Harvard	22.5	357	e 5 9	+ 7	e 9 12	+ 7	—	—
Huancayo	32.4	191	e 6 32	- 2	—	—	—	—
Tucson	38.7	297	e 7 26	- 1	—	—	—	—
Pierce Ferry	42.0	302	i 7 53	- 1	—	—	—	—
Overton	z. 42.5	303	i 7 58	- 1	—	—	—	—
Boulder City	42.7	302	i 7 58	- 2	—	—	—	—
Riverside	z. 44.5	299	i 8 12	- 3	—	—	—	—
Mount Wilson	z. 45.2	299	i 8 17	- 3	—	—	—	—
Hungry Horse	45.5	319	e 8 20	- 3	—	—	—	—
Tinemaha	z. 45.6	303	i 8 21	- 3	—	—	—	—
Lick	z. 48.3	304	i 8 41k	- 4	—	—	—	—
Shasta Dam	49.3	307	i 8 47	- 6	—	—	—	—
College	67.1	333	e 10 55	- 2	—	—	—	—
Tamanrasset	z. 69.2	72	i 11 14a	+ 4	—	—	e 11 27	P <sub>c</sub> P —
Ksara	91.1	53	e 30 50	SSP	e 38 12?	?	—	—

Additional readings :—

Port au Prince ePNE = 46s.

Lick iZ = 8m.51s.

Long waves were also recorded at Bermuda, Granada, and Paris.

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Aug. 21d. 18h. 43m. 50s. Epicentre 29°·2N. 95°·1E. (as on 20d.).

A = -·0777, B = +·8709, C = +·4853;  $\delta = +2$ ;  $h = +2$ ;

	$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.
	°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.
New Delhi	15·7	272	e 3	35	- 9	e 6	34	- 5	—	—	—
Przhevalsk	18·9	320	i 4	27	+ 3	e 8	17	+24	—	—	—
Hyderabad	E. 19·2	236	—	—	—	e 7	50	- 9	—	—	10·0
Murgab	19·8	304	4	28	- 7	8	14	+ 1	—	—	—
Naryn	19·8	315	e 4	36	+ 1	e 8	28	+15	—	—	—
Almata	20·2	320	i 4	44	+ 5	e 8	36	+15	—	—	—
Nanking	20·6	75	i 4	39 <sup>a</sup>	- 4	8	33	+ 4	—	—	e 10·2
Frunse	21·4	315	e 4	25	-26	—	—	—	—	—	—
Andijan	21·8	308	e 4	58	+ 2	e 9	6	+14	—	—	—
Fergana	22·1	308	e 4	58	- 1	e 9	6	+ 8	—	—	—
Poona	22·1	246	4	55	- 4	8	46	-12	—	—	—
Bombay	22·8	249	e 5	1	- 4	e 9	6	- 5	—	—	—
Kulyab	22·8	299	e 5	7	+ 2	e 9	20	+ 9	—	—	—
Obi-garm	23·0	301	i 5	9	+ 2	i 9	21	+ 7	—	—	—
Stalinabad	23·6	301	i 5	14	+ 1	i 9	34	+ 9	—	—	—
Irkutsk	24·0	13	5	25 <sup>?</sup>	+ 8	9	58 <sup>?</sup>	+26	—	—	—
Tashkent	24·2	307	i 5	21	+ 2	e 9	50	+15	—	—	—
Tchimkent	24·4	310	i 5	22	+ 1	—	—	—	—	—	—
Kodaikanal	E. 25·1	226	e 5	26	- 2	e 9	50	- 1	—	—	—
Samarkand	25·3	302	e 5	31	+ 1	—	—	—	—	—	—
Ashkabad	31·7	297	e 6	28	+ 1	—	—	—	—	—	—
Vladivostok	32·5	55	e 6	38	+ 4	—	—	—	—	—	—
Sverdlovsk	36·7	329	i 7	15	+ 5	13	6	+12	—	—	—
Baku	38·4	300	e 7	33	+ 8	—	—	—	—	—	—
Moscow	48·2	321	e 8	44	0	e 15	53	+10	—	—	—
Ksara	50·1	291	1 8	59	0	e 16	22	+12	—	—	—
Prague	E. 62·5	315	e 10	25	- 3	e 18	44	-10	e 12	14	PP
Jena	64·0	316	e 10	37	- 1	—	—	—	—	—	—
Stuttgart	66·1	314	e 10	49	- 2	e 19	43	+ 4	e 10	53	P
Strasbourg	67·1	315	i 10	57 <sup>k</sup>	0	—	—	—	e 11	16	PcP
Besançon	68·9	314	e 11	5	- 4	—	—	—	—	—	—
Paris	70·3	316	i 11	16	- 1	—	—	—	e 13	48	PP
Kew	70·9	319	e 11	26	+ 5	—	—	—	—	—	e 43·2
Clermont-Ferrand	71·0	312	e 11	27	+ 5	—	—	—	—	—	e 36·2
College	74·4	23	i 11	41	- 1	—	—	—	—	—	—
Algiers Univ.	Z. 74·7	304	e 11	40	- 3	—	—	—	—	—	—
Resolute Bay	76·2	3	e 11	54	+ 2	—	—	—	—	—	—
Tamanrasset	Z. 78·9	290	12	4 <sup>a</sup>	- 3	—	—	—	e 15	3	PP
Pretoria	Z. 84·3	236	i 12	27 <sup>?</sup>	- 8	—	—	—	—	—	—
Overton	Z. 109·0	24	e 18	54	PP	—	—	—	—	—	—
Pierce Ferry	109·5	24	e 18	31	[- 1]	—	—	—	i 19	7	PP

Additional readings :—

New Delhi eSEN = 6m.17s., SSEN = 6m.45s.

Prague e = 10m.34s., 11m.21s., and 13m.38s., eN = 16m.17s.

Strasbourg i = 11m.1s.

Paris e = 11m.39s.

Overton iZ = 19m.4s.

Long waves were also recorded at Rome, Warsaw, Potsdam, Copenhagen, and De Bilt.



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Aug. 21d. 22h. 55m. 40s. Epicentre 28°·8N. 93°·7E. (as on 1947, July 29d.).

A = -·0566, B = +·8759, C = +·4793;  $\delta = +13$ ;  $h = +2$ ;  
D = +·998, E = +·065; G = -·031, H = +·478, K = -·878.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.	
		°	°	m. s.	s.	m. s.	s.	m. s.	m.	
New Delhi		14·5	273	e 3 28	0	i 6 10	- 1	6 27	SS	6·1
Hyderabad	E.	18·0	235	e 4 12	- 1	7 42	+10	—	—	—
Przhevsk		18·4	322	i 4 18	0	—	—	—	—	—
Murgab		19·0	307	4 23?	- 3	8 11?	+16	—	—	—
Naryn		19·1	316	e 4 29?	+ 2	e 8 16?	+19	—	—	—
Almata		19·7	323	i 4 36	+ 2	e 8 21	+11	—	—	—
Poona		20·8	246	4 53	+ 8	8 50	+17	9 15	Q	10·3
Andijan		21·1	311	e 4 50	+ 2	8 50	+11	—	—	—
Fergana		21·4	310	4 52	+ 1	e 8 55	+10	—	—	—
Bombay		21·5	248	e 4 57	+ 5	e 8 58	+11	—	—	—
Kulyab		21·9	302	e 4 57	0	e 9 2	+ 8	—	—	—
Nanking		21·9	75	e 4 45	-12	8 41	-13	—	—	e 10·1
Obi-garm		22·2	304	e 5 0?	0	i 9 2?	+ 2	—	—	—
Stalinabad		22·9	304	e 5 4	- 2	i 9 14	+ 1	—	—	—
Tashkent		23·5	310	e 5 13	+ 1	i 9 32	+ 9	—	—	—
Tchimkent		23·7	313	i 5 16	+ 2	—	—	—	—	—
Kodaikanal	E.	23·9	225	e 5 16	0	e 9 41	+11	—	—	—
Samarkand		24·5	304	e 5 23	+ 1	—	—	—	—	—
Irkutsk		24·7	15	i 5 22	- 2	—	—	—	—	—
Ashkabad		30·7	298	e 6 21	+ 2	—	—	—	—	—
Vladivostok		33·8	55	e 6 37	- 9	—	—	—	—	—
Sverdlovsk		36·4	331	i 7 9	+ 1	e 12 50	0	—	—	—
Leninakan		42·1	301	e 8 6?	+11	—	—	—	—	—
Moscow		47·7	322	e 8 40	0	e 15 34	- 2	—	—	—
Ksara		49·1	292	i 8 53	+ 2	e 16 15	+19	—	—	—
Pulkovo		52·2	326	i 9 15	0	16 44	+ 5	—	—	—
Holwan	N.	53·8	288	—	—	e 17 0	- 1	—	—	—
Upsala		58·6	326	i 16 56	?	e 18 2	- 2	e 19 41	ScS	e 32·3
Prague		61·8	315	e 10 21	- 2	e 18 52	+ 6	e 14 24	PPP	—
Copenhagen		61·9	322	i 10 22	- 2	—	—	—	—	34·3
Collmberg	Z.	62·5	316	e 10 25	- 3	—	—	—	—	—
Jena	E.	63·4	316	e 10 32	- 2	—	—	—	—	—
Bergen	N.	64·6	328	—	—	e 20 20?	ScS	—	—	—
Stuttgart		65·5	315	e 10 45 <sub>a</sub>	- 2	e 19 25	- 7	e 10 53	P	e 37·3
Strasbourg		66·4	315	i 10 51 <sub>a</sub>	- 2	e 19 55	+12	e 11 27	P <sub>c</sub> P	—
Besançon		68·0	313	e 11 1	- 2	—	—	e 11 28	P <sub>c</sub> P	—
Paris		69·7	316	i 11 12	- 2	—	—	e 13 46	PP	e 41·3
Clermont-Ferrand		70·4	313	11 16	- 2	—	—	—	—	—
Kew		70·4	320	i 11 16	- 2	e 20 31	+ 1	e 21 21	PPS	e 36·3
Rathfarnham Castle		73·0	323	i 11 31	- 2	e 20 21	-39	—	—	e 39·3
Algiers Univ.	Z.	73·9	304	i 11 36 <sub>a</sub>	- 3	—	—	e 11 50	P <sub>c</sub> P	—
College		75·3	24	i 11 42	- 5	—	—	—	—	—
Tamanrasset	Z.	77·9	290	i 12 0 <sub>a</sub>	- 1	—	—	e 14 58	PP	—
Pretoria	Z.	83·1	236	e 12 28	- 1	—	—	—	—	—
Tinemaha	Z.	107·9	26	e 19 2	PP	—	—	—	—	—
Overton	Z.	109·8	24	e 19 4	PP	—	—	—	—	—
Pierce Ferry		110·4	23	e 19 1	PP	—	—	—	—	—
Pasadena	Z.	110·5	27	e 19 6	PP	—	—	—	—	—
Riverside	Z.	111·0	27	e 19 10	PP	—	—	—	—	—
Bogota		144·8	338	i 19 36	{ - 3 }	—	—	—	—	—

Additional readings :—

New Delhi SSEN = 6m.39s.

Prague e = 10m.25s., 10m.51s., 11m.43s., and 12m.32s., ePP? = 13m.33s.

Collmberg eZ = 10m.37s. and 10m.52s.

Strasbourg eP<sub>c</sub>P = 10m.59s.

Paris i = 11m.20s.

Tamanrasset eP<sub>c</sub>PZ = 12m.9s.

Long waves were also recorded at Warsaw, De Bilt, Granada, Malaga, Scoresby Sund, Tuai, Wellington, and La Plata.

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Aug. 21d. Readings also at 0h. (Calcutta, Przhevalsk, Andijan, Frunse, Collmberg, Jena, Stuttgart, Strasbourg, Paris, Tamanrasset, College, Hungry Horse, and near Ashkabad), 1h. (Granada, Collmberg, Stuttgart (2), College, and near Obi-garm), 2h. (College, Taranto, near Andijan, near Kalossa, and Budapest), 3h. (Calcutta, near Bandong, and near Obi-garm), 4h. (College and De Bilt), 5h. (Calcutta, Poona, Przhevalsk, Frunse, Andijan, Sverdlovsk, Collmberg, Stuttgart, Strasbourg, Paris, Tamanrasset, College, and near Ashkabad), 6h. (Granada, Tamanrasset, Victoria, and near Santa Clara), 7h. (Triest, College, Hungry Horse, Ottawa (2), Victoria, and near Andijan (2)), 8h. (Przhevalsk, Tashkent, Collmberg, Stuttgart, and Tamanrasset), 9h. (Calcutta, Przhevalsk, Murgab, Almata, Frunse, Andijan, Tashkent, Tchimkent, Samarkand, and Irkutsk), 10h. (Sverdlovsk, Bombay, College (2), Hungry Horse, and De Bilt), 11h. (Tamanrasset, near Mary, near Samarkand, Garm, and Andijan), 13h. (near Tortosa and near Ashkabad), 14h. (Calcutta), 15h. (Stuttgart, Tamanrasset, College, Pretoria, and near Przhevalsk), 16h. (Frunse, Andijan, New Delhi, Bombay, Poona, Paris, and Kew), 17h. (College and Tamanrasset), 18h. (Tamanrasset and near Algiers Univ.), 20h. (near Galerazamba), 21h. (Overton and Pierce Ferry), 22h. (Overton, Pierce Ferry (2), Tucson, Shasta Dam, Ashkabad, and near Obi-garm), 23h. (near Athens).

Aug. 22d. 1h. 57m. 22s. Epicentre 27°·2N. 97°·4E.

A = -·1147, B = +·8832, C = +·4546;  $\delta = -14$ ;  $h = +3$ ;  
D = +·992, E = +·129; G = -·059, H = +·451, K = -·891.

		$\Delta$	Az.	P.	O - C.	S.	O - C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Calcutta	E.	9·4	243	e 4 7	S	(e 4 7)	0	—	—
New Delhi		17·9	279	e 4 6	- 6	e 6 58	-32	4 18	PP
Nanking		19·2	70	4 27 <sub>a</sub>	- 1	8 14	+15	—	e 9·6
Hyderabad		20·0	245	4 35	- 2	8 22	+ 5	—	—
Murgab		22·6	306	e 5 1?	- 2	—	—	—	—
Naryn		22·6	315	e 5 6	+ 3	e 9 13	+ 6	—	—
Almata		23·1	320	5 10	+ 2	9 20	+ 4	—	—
Poona		23·3	253	5 11	+ 1	9 20	0	—	—
Bombay		24·1	255	e 5 23	+ 5	e 9 33	- 1	—	—
Andijan		24·7	309	e 5 25	+ 1	9 49	+ 5	—	—
Fergana		24·9	309	e 5 28	+ 2	9 58	+11	—	—
Kodaikanal	E.	25·3	233	—	—	e 9 58	+ 4	—	—
Irkutsk		25·6	9	e 5 35?	+ 3	—	—	—	—
Stalinabad		26·5	304	e 5 39	- 2	e 10 28?	+14	—	—
Samarkand		28·1	304	e 5 45	-10	—	—	—	—
Ashkabad		34·5	298	e 6 51	- 1	—	—	—	—
Sverdlovsk		39·5	330	7 33	- 1	—	—	—	—
Baku		41·1	302	e 7 52	+ 5	—	—	—	—
Tiflis		45·1	303	e 8 20	0	—	—	—	—
Leninakan		45·8	302	e 8 45	+20	—	—	—	—
Moscow		51·1	322	e 9 8	+ 2	—	—	—	—
Ksara		52·7	293	e 9 20	+ 2	e 16 45	- 1	—	—
Pulkovo		55·4	326	e 9 19	-19	—	—	—	—
Prague		65·3	316	e 10 47	+ 1	—	—	e 13 10	PP
Collmberg	z.	65·9	316	e 10 29	-21	—	—	—	—
Jena		66·8	316	e 10 25	-31	—	—	—	—
Stuttgart	z.	68·9	315	e 11 7	- 2	—	—	—	—
Strasbourg		69·9	315	e 11 14	- 1	—	—	—	—
Paris		73·1	317	e 11 32	- 2	—	—	—	—
College		75·4	24	e 11 47	0	—	—	e 16 17	PPP
Tamanrasset	z.	81·5	292	e 12 20	- 1	—	—	—	—
Pretoria	z.	84·9	238	i 12 37	- 1	—	—	—	—
Hungry Horse		99·7	20	e 13 49	+ 2	—	—	—	—
Bogota		147·3	344	i 19 47	[+ 4]	—	—	—	—

Additional readings:—

Calcutta iSE = 5m.14s., eS\*E = 5m.34s., eS<sub>g</sub>E = 5m.48s.

New Delhi SSEN = 7m.13s.

Nanking iZ = 4m.30s.

Hyderabad SE = 8m.26s.

Prague e = 11m.28s. and 11m.55s.

Collmberg eZ = 10m.38s.

Jena eEN = 10m.28s. and 10m.34s., iEN = 10m.37s.

Paris i = 11m.39s.

Tamanrasset eZ = 13m.17s.

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Aug. 22d. 2h. 4m. 7s. Epicentre 35°·2N. 132°·7E.

Intensity VI at Shigaku (Shimane Prefecture), Nibu (Hiroshima Prefecture); V at Nanatsukahara, Funo, Kaminakayama, and Abire (Tottori Prefecture); IV at Matsunaga II-III at Yonago, Hiroshima, Matuyama, Tottori, Tokushima, and Hamada. Epicentre as adopted. Depth 30km. Macroseismic radius 200-300km.

Seismological Bulletin, Cent. Met. Obs., Japan, 1950. Tokyo, 1952, pp.36-37, with macroseismic chart.

$$A = -.5554, B = +.6019, C = +.5739; \quad \delta = +11; \quad h = 0;$$

$$D = +.735, E = +.678; \quad G = -.389, H = +.422, K = -.819.$$

	$\Delta$	Az.	P.		O - C.	S.		O - C.
	°	°	m.	s.	s.	m.	s.	s.
Hamada	0.4	240	0	9	- 4	0	17	- 4
Hiroshima	0.9	195	0	13 <sub>a</sub>	- 7	0	28	- 6
Matuyama	1.4	178	0	22 <sub>a</sub>	- 5	0	40	- 6
Kôti	1.8	157	0	32	0	0	54	- 2
Toyooka	1.8	79	0	32	0	0	56	0
Kobe	2.1	104	0	35	- 2	1	3	- 1
Ooita	2.2	204	0	38	0	1	9	+ 3
Muroto	2.3	148	0	38	- 2	1	6	- 3
Osaka	2.4	103	0	30	-11	1	9	- 3
Hukuoka	2.5	229	0	41	- 2	1	12	- 2
Kyoto	2.5	94	0	45	+ 2	1	15	+ 1
Hikone	2.9	89	0	54	+ 6	1	31	+ 7
Kumamoto	2.9	215	0	24	?	1	20	- 4
Kameyama	3.1	96	0	49	- 2	1	30	+ 1
Owase	3.1	111	0	53	+ 2	1	31	+ 2
Siomisaki	3.1	115	0	55	+ 4	—	—	—
Unzendake	3.2	219	0	40	-12	1	20	-12
Gihu	3.3	87	1	3	P <sub>g</sub>	1	44	S <sub>g</sub>
Miyazaki	3.4	198	0	53	- 2	1	40	+ 3
Nagasaki	3.4	224	0	59	+ 4	1	37	0
Nagoya	3.5	89	1	1	+ 4	1	49	S*
Toyama	3.9	67	1	16	P*	2	8	S <sub>g</sub> *
Kagosima	4.0	206	1	13	P*	2	7	S <sub>g</sub> *
Wazima	4.0	56	1	16	P <sub>g</sub>	1	49	- 3
Tomie	4.2	233	1	17	P*	2	9	S*
Omaesaki	4.6	96	1	30	P <sub>g</sub>	2	20	S*
Matusiro	4.7	72	1	48	P <sub>g</sub>	2	38	S <sub>g</sub> *
Nagano	4.7	70	1	24	P*	2	31	S <sub>g</sub> *
Shizuoka	4.7	91	1	25	P*	2	22	S <sub>g</sub> *
Maebasi	5.3	76	1	23	+ 1	2	43	S*
Kumagaya	5.5	79	1	29	+ 4	2	58	S <sub>g</sub> *
Yokohama	5.7	85	1	49	P <sub>g</sub>	3	1	S <sub>g</sub> *
Tokyo	5.8	83	1	54	P <sub>g</sub>	3	4	S <sub>g</sub> *
Mera	5.9	91	1	49	P*	—	—	—
Utunomiya	6.0	75	1	31	- 1	3	10	S <sub>g</sub>
Tukubasan	6.1	79	1	45	P*	—	—	—
Mito	6.4	77	1	59	P*	3	21	S*
Onahama	6.9	73	1	36	- 9	3	34	S*
Shasta Dam	77.7	48	e 11	59	- 1	—	—	—
Hungry Horse	77.8	38	e 11	59	- 2	—	—	—
Collmberg	z.	78.9	326	e 12	2	—	—	—
Overton	z.	85.2	48	e 12	20	—	—	—
Tucson		90.3	49	e 12	1	—	—	—

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Aug. 22d. 2h. 22m. 35s. Epicentre 30°·0N. 95°·5E.

A = -·0831, B = +·8635, C = +·4975;  $\delta = +4$ ;  $h = +2$ ;  
D = +·995, E = +·096; G = -·048, H = +·495, K = -·867.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Calcutta	E.	9·8	223	e 2 32	+ 8	i 4 14	- 3	—	—
Dehra Dun	N.	15·1	276	e 3 16	-20	—	—	—	e 10·3
New Delhi	N.	16·0	269	e 3 42	- 6	e 6 31	-15	3 53	PP
Naryn		19·5	312	e 4 30	- 1	e 8 7	+ 1	—	—
Almata		19·9	316	i 4 35	- 1	e 8 19	+ 4	—	—
Hyderabad	E.	20·0	235	i 4 39	+ 2	i 8 19	+ 2	—	—
Nanking		20·1	77	4 37	- 1	i 8 25	+ 6	—	i 9·8
Andijan		21·6	304	4 53	- 1	8 57	+ 8	—	—
Fergana		21·9	304	i 4 56	- 1	e 9 1	+ 7	—	—
Kulyab		22·7	296	e 5 4	0	e 9 15	+ 6	—	—
Poona		22·8	244	5 5	0	9 9	- 2	5 32	PP
Irkutsk		23·2	12	5 11?	+ 2	—	—	—	—
Bombay		23·4	247	e 5 11	0	e 9 20	- 1	—	—
Stalinabad		23·6	299	i 5 11	- 2	—	—	—	—
Tashkent		24·0	304	—	—	i 9 42	+10	—	—
Samarkand		25·2	299	e 5 29	0	—	—	—	—
Kodaikanal	E.	25·9	225	e 5 39	+ 4	e 10 6	+ 2	—	11·2
Colombo	E.	27·3	216	6 16	+28	10 51	+24	—	18·0
Ashkabad		31·6	294	e 6 30	+ 4	—	—	—	—
Vladivostok		31·8	54	e 6 29	+ 1	—	—	—	—
Sverdlovsk		36·2	328	7 6	0	12 46	- 1	—	—
Baku		38·3	298	e 7 30	+ 6	—	—	—	—
Tiflis		42·2	300	—	—	i 14 23	+ 6	—	—
Leninakan		42·9	299	e 8 18	+16	—	—	—	—
Moscow		47·8	319	e 8 41	0	e 15 35	- 3	—	—
Theodosia		48·9	305	e 8 52	+ 2	15 58	+ 5	—	—
Yalta		49·8	304	e 8 56	0	16 8	+ 2	—	—
Ksara		50·1	290	i 9 0	+ 1	e 16 20?	+10	—	—
Pulkovo		52·2	324	i 9 14	- 1	e 16 36	- 3	—	—
Istanbul		54·0	301	e 9 27	- 1	e 16 58	- 5	—	—
Helwan	N.	54·9	287	—	—	e 17 19	+ 3	e 19 31	—
Warsaw		57·6	315	—	—	e 17 54	+ 3	19 54	$S_cS$
Upsala		58·6	324	e 10 7	+ 6	e 18 2	- 2	—	e 28·4
Raciborzu	Z.	59·8	313	e 11 5	$P_cP$	—	—	—	e 29·4
Copenhagen		62·0	320	e 10 23	- 1	18 49	+ 1	20 9	$S_cS$
Prague		62·1	314	e 10 19	- 6	e 18 51	+ 2	e 13 3	PP
Potsdam	E.	62·4	317	e 10 31	+ 4	—	—	—	e 33·4
Collmberg		62·7	315	e 10 28	- 1	e 19 7	+10	—	e 36·4
Taranto		62·8	302	e 10 45	+15	—	—	—	e 33·4
Triest		63·8	309	e 9 31	-65	e 17 59	-72	—	—
Bergen	N.	64·5	327	—	—	e 22 27?	SS	—	—
Rome		65·8	305	e 12 2	?	e 19 33	- 2	—	—
Stuttgart		65·8	313	e 10 48k	- 1	e 19 30	- 5	e 23 43	SS
Florence, Xim.		66·0	308	—	—	e 19 46	PS	—	e 34·4
Zürich		66·6	312	e 10 53	- 1	—	—	—	—
Strasbourg		66·7	314	i 10 54k	- 1	e 19 51	+ 5	e 11 7	$P_cP$
De Bilt		67·1	318	i 10 56	- 1	e 19 55	+ 4	—	e 35·4
Basle		67·2	313	e 10 58	0	—	—	—	—
Besançon		68·3	313	e 11 4	- 1	—	—	e 11 18	$P_cP$
Durham	N.	69·9	322	—	—	i 20 35	+11	—	—
Paris		69·9	315	e 11 14	- 1	e 20 22	- 2	i 11 28	$P_cP$
Kew		70·5	318	i 11 19	+ 1	e 20 33	+ 1	e 21 26	PS
Scoresby Sund		70·5	341	—	—	20 31	- 1	—	38·4
Clermont-Ferrand		70·7	312	11 19	- 1	e 20 34	0	e 25 11	SS
Rathfarnham Castle		73·0	321	i 11 33	0	e 21 10	+10	e 29 21	SSS
College		73·5	23	i 11 37	+ 1	—	—	—	—
Algiers Univ.	Z.	74·5	303	e 11 40	- 2	—	—	e 11 54	$P_cP$
Tortosa	N.	74·5	308	11 48	+ 6	21 22	+ 5	—	e 44·4
Alicante		76·3	306	12 7	$P_cP$	21 41	+ 4	22 17	PS
Toledo	Z.	78·0	308	e 12 1	- 1	—	—	e 14 55	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.	
Tamanrasset	z.	78.9	289	e 12 7k	0	—	—	e 15 9	PP	—
Granada		79.0	306	e 11 26k	-41	22 3	- 3	27 17	SS	37.5
Brisbane	z.	79.3	129	e 12 14	+ 5	—	—	—	—	—
Malaga	z.	79.9	306	i 12 15k	+ 3	e 22 13	- 3	i 15 15	PP	37.7
Pretoria	z.	85.0	236	i 12 39	+ 1	—	—	—	—	—
Pietermaritzburg	z.	85.8	231	i 12 43	+ 1	—	—	—	—	—
Shasta Dam		101.4	28	e 14 3	+ 8	—	—	e 18 5	PP	—
Overton	z.	108.1	24	e 19 0	PP	—	—	—	—	—
Boulder City		108.5	25	e 18 49	PP	—	—	—	—	—
Pierce Ferry		108.6	24	e 19 0	PP	—	—	—	—	—
Tucson		113.2	22	e 19 21	PP	—	—	—	—	—
Bogota		144.2	342	i 19 38	[ 0 ]	—	—	—	—	—
Huancayo		160.2	333	e 20 7	[ + 6 ]	—	—	—	—	—

Additional readings :—

New Delhi PPPN = 4m.1s., SSE = 6m.48s.

Nanking eS? = 8m.2s.

Poona SSEN = 9m.53s.

Warsaw eSN = 18m.1s., SSSN = 24m.8s., SSSE = 24m.13s.

Prague i = 10m.29s., e = 10m.39s., 10m.49s., 11m.14s., 11m.37s., 12m.32s., 12m.46s., and 19m.33s.

Collmberg eZ = 10m.42s. and 10m.48s.

Stuttgart eZ = 11m.2s., e = 28m.37s.

Strasbourg e = 11m.0s., 11m.22s., 12m.34s., and 19m.25s., ePS = 20m.19s., e = 22m.25s., eSS = 24m.13s., e = 29m.25s.

Paris iPP = 13m.55s., e = 17m.51s. and 21m.35s., eSSS = 25m.15s.

Kew iZ = 11m.26s., ePKKP?EN = 28m.1s.

Clermont-Ferrand eSSS = 28m.16s.

Algiers Univ. eZ = 11m.45s. and 13m.3s., ePPZ = 14m.32s., ePPPZ = 15m.53s.

Alicante SSS = 30m.21s.

Toledo iZ = 12m.9s., eZ = 18m.8s.

Tamanrasset eZ = 12m.12s. and 17m.26s.

Long waves were also recorded at Aberdeen, Helsinki, Seattle, and Seven Falls.

Aug. 22d. 6h. 2m. 9s. Epicentre  $0^{\circ}\cdot 0$ .  $98^{\circ}\cdot 0E$ . (as on 1949, July 14d.).

A = - .1392, B = + .9903, C = .0000 ;  $\delta = +7$  ;  $h = +7$  ;

D = + .990, E = + .139 ; G = .000, H = .000, K = - 1.000.

		$\Delta$ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	Supp. m. s.	L. m.	
Bandong		11.8	126	e 2 57	+ 4	e 5 30	+ 24	—	—	
Colombo	E.	19.3	290	5 2	+ 33	—	—	—	—	
Kodaikanal	E.	22.8	298	e 5 0	- 5	e 9 18	+ 7	—	14.0	
Calcutta	E.	24.3	337	i 7 23	?	i 9 55	+ 18	—	—	
Hyderabad		25.9	313	e 5 40	+ 5	10 5	+ 1	11 8	SS	12.8
Bombay		31.0	308	e 6 20	- 1	e 11 28	+ 2	—	—	
New Delhi	N.	34.7	327	e 6 58	+ 4	e 15 24	Q	9 14	P <sub>c</sub> P	15.9
Murgab		44.1	332	8 10	- 2	i 14 43	- 2	—	—	
Naryn		45.8	338	8 26	+ 1	—	—	—	—	
Fergana		46.7	332	8 29	- 3	—	—	—	—	
Andijan		46.8	332	8 48?	+ 15	—	—	—	—	
Stalinabad		46.8	328	8 27	- 6	—	—	—	—	
Almata		47.0	339	8 35	0	i 15 35	+ 9	—	—	
Frunse		47.6	336	e 8 39	0	i 15 40	+ 5	—	—	
Tashkent		48.7	331	i 8 43?	- 5	i 15 41?	- 9	—	—	
Irkutsk		52.4	5	e 9 21?	+ 5	e 16 51?	+ 9	—	—	
Vladivostok		52.6	31	e 9 12	- 6	i 16 49	+ 5	—	—	
Baku		59.3	318	e 10 6	0	—	—	—	—	
Riverview		60.1	130	i 3 37	?	e 17 52	- 32	e 14 8	PP	e 33.6
Leninakan		63.6	317	e 10 49	+ 14	—	—	—	—	
Ksara		67.1	306	10 59	+ 2	21 12	S <sub>c</sub> S	—	—	
Helwan		69.9	302	e 11 13	- 2	20 15	- 9	—	—	
Moscow		73.8	330	e 11 42	+ 4	—	—	—	—	
Istanbul		74.2	313	e 11 32	- 8	e 18 28	?	—	—	
Warsaw		82.0	323	—	—	(e 21 51?)	- 46	—	—	e 21.8

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.
Rome		86.7	312	—	—	e 23 17	- 7	—	—
Collmberg	z.	86.9	321	e 13 2	+14	—	—	—	—
Copenhagen		87.5	326	—	—	23 27	- 4	—	—
Stuttgart		89.2	319	e 12 59	0	e 23 41	- 6	—	—
Strasbourg		90.2	318	e 13 5	+ 1	e 23 51	- 5	e 33 7	SSS
Besançon		91.4	317	e 13 12	+ 3	—	—	—	—
Tamanrasset	z.	92.3	293	e 13 6	- 7	—	—	e 16 42	PP
Paris		93.6	318	e 13 22	+ 3	e 24 14	-12	e 26 51?	PPS
Kew		95.2	321	—	—	e 24 40	0	—	e 57.8 e 42.8

Additional readings :—

New Delhi PcPN = 7m.33s., PSN = 15m.41s.

Riverview eQ?Z = 23m.39s.

Strasbourg e = 13m.57s. and 17m.30s., eSS? = 31m.9s., e = 37m.15s.

Long waves were also recorded at Tananarive and Granada.

Aug. 22d. 6h. 43m. 10s. Epicentre 28°.7N. 94°.2E.

A = -0643, B = +.8762, C = +.4777;  $\delta = +6$ ;  $h = +2$ ;

D = +.997, E = +073; G = -.035, H = +.476, K = -.879.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Calcutta	E.	8.1	222	e 2 10	+ 8	e 3 43	+ 8	e 4 14	S*
New Delhi		14.9	274	i 3 34	0	i 6 13	- 7	3 44	PP
Hyderabad	E.	18.3	236	i 4 20	+ 3	i 7 50	+11	—	—
Przhevalsk		18.8	322	i 4 22	- 1	—	—	—	—
Naryn		19.5	316	i 4 32	+ 1	e 8 6	0	—	—
Almata		20.1	322	i 4 40	+ 2	e 8 28	+ 9	—	—
Frunse		21.2	316	i 4 51	+ 2	i 8 47	+ 6	—	—
Poona	N.	21.2	246	4 54	+ 5	8 49	+ 8	9 10	Q
Andijan		21.5	309	4 55	+ 3	8 51	+ 4	—	—
Nanking		21.5	74	i 4 46 <sub>a</sub>	- 6	i 8 35	-12	—	—
Bombay		21.8	248	e 5 5	+ 9	e 9 0	+ 8	—	—
Fergana		21.8	309	e 4 56	0	e 8 59?	+ 7	—	—
Kulyab		22.3	300	e 5 2	+ 1	e 9 7	+ 5	—	—
Stalinabad		23.3	303	5 11	+ 1	9 21	+ 1	—	—
Tashkent		23.9	308	i 5 18	+ 2	—	—	—	—
Kodaikanal	E.	24.1	225	e 5 35	+17	e 9 56	+22	12 46	PcS
Irkutsk		24.7	13	i 5 22?	- 2	e 9 43?	- 1	—	—
Samarkand		24.9	303	i 5 27	+ 1	—	—	—	—
Mary		28.4	297	e 5 59	+ 1	—	—	—	—
Ashkabad		31.2	297	6 26	+ 3	—	—	—	—
Vladivostok		33.5	54	i 6 38	- 5	i 11 54	-11	—	—
Baku		37.9	300	e 7 25?	+ 5	—	—	—	—
Borzhomei		42.9	302	8 2	0	—	—	—	—
Moscow		48.1	321	i 8 43	0	i 15 39	- 3	—	—
Theodosia		48.7	306	e 8 49	- 1	e 15 51	+ 1	—	—
Ksara		49.5	291	i 8 57	+ 3	—	—	—	—
Yalta		49.6	305	8 56	+ 1	e 16 4	+ 1	e 10 56	PP
Pulkovo		52.6	325	i 9 18	0	i 16 42	- 2	—	—
Bucharest		55.4	307	e 9 43	+ 5	17 8	-14	—	—
Warsaw		57.8	317	e 9 56	+ 1	e 17 54	0	13 35	PPP
Skalnate Pleso		58.7	313	9 58	- 4	e 17 59	- 7	e 12 8	PP
Upsala		59.0	326	i 10 2 <sub>a</sub>	- 2	i 18 6	- 4	e 20 2	ScS
Budapest		59.7	311	10 8	- 1	—	—	e 13 45	PPP
Raciborzu		59.8	314	e 10 5	- 4	—	—	—	—
Kalossa		60.0	310	e 10 11	0	—	—	—	—
Prague		62.2	315	i 10 25 <sub>a</sub>	- 1	e 18 52	+ 1	e 12 45	PP
Copenhagen		62.3	322	i 10 26	0	i 20 21	ScS	—	e 33.3
Collmberg		62.9	316	i 10 29 <sub>a</sub>	- 1	e 18 56	- 4	—	—
Cheb	N.	63.5	315	e 10 50	+16	e 19 28	PS	—	e 33.8
Triest		63.7	310	i 10 34	- 2	e 19 7	- 3	—	—

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	$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.	
	°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.	
Jena	63.8	316	i 10	36	0	e 19	14	+ 3	e 13	16	PP	—
Messina	64.5	302	e 10	41	0	e 19	18	- 1	—	—	—	—
Bergen	65.0	328	—	—	—	e 18	52?	-34	—	—	—	35.8
Padova	65.3	309	e 10	48	+ 2	19	30	+ 1	e 20	46	S <sub>c</sub> S	—
Rome	65.6	306	i 10	48	0	19	32	- 1	—	—	—	—
Bologna	65.7	310	e 10	51	+ 3	—	—	—	—	—	—	—
Stuttgart	65.9	314	i 10	50 <sub>a</sub>	0	e 19	31	- 6	e 13	14	PP	e 35.8
Florence, Xim.	65.9	308	e 10	50	0	e 19	39	+ 2	—	—	—	—
Prato	66.0	308	e 10	50	0	e 19	39	+ 1	—	—	—	—
Chur	66.2	311	i 10	51 <sub>a</sub>	- 1	—	—	—	—	—	—	—
Zürich	66.7	313	e 10	53 <sub>a</sub>	- 2	e 19	40	- 6	e 13	0	PP	—
Strasbourg	66.8	314	i 10	55 <sub>a</sub>	- 1	e 20	1	+13	i 11	28	P <sub>c</sub> P	35.8
Pavia	67.0	311	e 10	57	0	—	—	—	—	—	—	—
Basle	67.3	313	i 10	57 <sub>a</sub>	- 2	—	—	—	—	—	—	—
De Bilt	67.3	319	e 10	59 <sub>a</sub>	0	e 19	50?	- 4	—	—	—	e 36.8
Besançon	68.4	313	i 11	4	- 2	—	—	—	e 13	7	PP	—
Aberdeen	69.6	325	e 15	35	PPP	i 20	35	PS	e 26	35	SSP	e 39.1
Paris	70.1	316	i 11	16	0	e 20	26	- 1	i 13	50	PP	e 40.8
Clermont-Ferrand	70.8	312	i 11	20	0	e 20	35	0	e 13	56	PP	33.8
Kew	70.8	319	i 11	20 <sub>a</sub>	0	e 20	43	+ 8	e 21	51	PPS	e 32.8
Rathfarnham C. z.	73.4	322	i 11	35	- 1	—	—	—	—	—	—	36.8
Algiers Univ. z.	74.3	303	i 11	40 <sub>a</sub>	- 1	e 11	51	P <sub>c</sub> P	e 14	29	PP	—
Tortosa	74.5	308	11	42	0	21	14	- 3	14	29	PP	e 33.8
College	75.2	23	i 11	42	- 4	e 21	13	-12	i 14	29	PP	—
Alicante	76.2	306	e 11	56	+ 4	21	46	+10	14	46	PP	e 37.8
Resolute Bay	76.7	2	e 10	54	-61	—	—	—	—	—	—	—
Toledo	78.0	308	i 12	3	+ 1	e 21	54	- 1	i 14	58	PP	—
Tamanrasset z.	78.3	290	i 12	5 <sub>a</sub>	+ 2	i 12	13	P <sub>c</sub> P	e 15	3	PP	—
Brisbane z.	79.4	129	e 12	24	P <sub>c</sub> P	—	—	—	—	—	—	—
Malaga z.	79.7	306	i 12	10 <sub>k</sub>	- 1	i 22	24	S <sub>c</sub> S	i 15	12	PP	46.8
Pretoria z.	83.4	236	i 12	39	+ 9	—	—	—	e 13	8	?	—
Pietermaritzburg z.	84.1	231	i 12	43	+ 9	—	—	—	—	—	—	—
Sitka	84.6	24	e 12	39	+ 3	e 22	57	S <sub>c</sub> S	e 23	16	S <sub>c</sub> S	e 45.8
Seattle	97.2	24	i 13	38	+ 2	—	—	—	—	—	—	e 55.8
Hungry Horse	99.2	19	e 13	43	- 2	e 24	20	[- 3]	e 17	28	PP	—
Shasta Dam	103.1	27	e 13	59	- 3	—	—	—	e 17	46	PP	—
Mineral z.	103.7	27	e 18	5	PKP	—	—	—	e 18	19	PP	—
Reno	105.1	26	e 18	28	[+ 5]	—	—	—	—	—	—	—
Lick	106.2	29	i 18	21 <sub>a</sub>	[- 5]	—	—	—	i 19	0	PP	—
Fresno z.	107.5	28	e 18	36 <sub>a</sub>	[+ 8]	—	—	—	—	—	—	—
Tinemaha z.	107.8	27	e 18	24	[- 5]	—	—	—	—	—	—	—
Overton z.	109.8	24	e 19	3	PP	—	—	—	—	—	—	—
Boulder City	110.1	24	e 18	31	[- 2]	—	—	—	—	—	—	—
Pierce Ferry	110.3	24	i 19	1	PP	—	—	—	—	—	—	—
Mount Wilson z.	110.4	28	e 18	31	[- 3]	—	—	—	—	—	—	—
Tucson	114.9	23	e 18	44	[+ 1]	—	—	—	—	—	—	—
Bogota	145.0	338	i 19	39	[0]	i 26	11	[- 36]	i 23	20	SKP	76.8
Chinchina	145.1	341	i 19	38	[- 1]	—	—	—	—	—	—	—
La Paz	159.7	304	e 20	12	[+ 12]	—	—	—	—	—	—	77.6
Huancayo	160.8	328	e 20	6	[+ 4]	—	—	—	—	—	—	—

Additional readings :—

New Delhi SSEN = 6m.31s.

Hyderabad SN = 7m.54s.

Warsaw P<sub>c</sub>SE = 14m.57s., ePSEN = 18m.7s., eS<sub>c</sub>S = 19m.58s., SSN = 21m.40s., SSE = 21m.52s.

Skalnate Pleso ePPP = 13m.16s., e = 17m.39s.

Upsala iSE? = 18m.10s., iN = 18m.17s., eN = 21m.6s.,

Prague eE = 10m.29s., eZ = 10m.34s., eN = 10m.54s. and 13m.4s., e = 16m.12s.

Collmberg eZ = 10m.33s.

Jena eE = 20m.28s.

Stuttgart iZ = 10m.59s.

Strasbourg i = 11m.5s., iPP = 13m.20s.

Besançon e = 11m.12s. and 11m.19s.

Paris i = 11m.26s. and 11m.48s., ePPP = 15m.30s.

Clermont-Ferrand eSS = 25m.9s.

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Algiers Univ. eZ = 12m.6s. and 14m.41s.  
 Tortosa PSE = 21m.52s.  
 Alicante S<sub>c</sub>S = 22m.8s., SS = 26m.36s.  
 Toledo iZ = 12m.10s. and 14m.44s.  
 Tamanrasset ePPPZ = 16m.2s.  
 Hungry Horse i = 17m.35s.  
 Shasta Dam e = 17m.9s.  
 Reno eN = 17m.32s.  
 Pierce Ferry i = 19m.8s.  
 Bogota iSKKSEN = 29m.47s.

Long waves were also recorded at Dehra Dun and other American and European stations.

Aug. 22d. 7h. 40m. 10s. Epicentre 53°·5N. 160°·0E.

A = -·5614, B = +·2043, C = +·8019; δ = -5; h = -7;  
 D = +·342, E = +·940.; G = -·754, H = +·274, K = -·597.

		Δ	Az.	P.	O - C.	S.	O - C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Mizusawa	E.	19·3	229	e 4 31	+ 2	7 59	- 3	—	—
Vladivostok		21·3	252	3 50	-60	9 6	+23	—	—
College		28·2	45	i 5 59	+ 3	e 10 47	+ 6	i 7 30	PP e 13·6
Sitka		35·8	57	e 7 14	+11	i 12 48	+ 7	—	—
Resolute Bay		43·0	23	3 30	?	e 14 39	+10	—	—
Seattle		47·4	64	e 8 43	+ 5	e 15 35	+ 3	e 10 19	PP —
Hungry Horse		51·3	58	e 9 9	+ 1	e 16 30	+ 4	—	—
Shasta Dam		51·8	71	i 9 12	0	e 16 35	+ 2	e 9 27	pP —
Mineral	z.	52·5	71	e 9 18	+ 1	—	—	e 10 35	PP —
Berkeley		53·8	73	i 9 27 <sub>a</sub>	+ 1	e 17 7	+ 6	e 9 44	pP e 26·1
Reno		54·1	70	e 9 29 <sub>k</sub>	0	e 17 2	- 3	e 9 51	pP —
Lick	z.	54·5	73	i 9 32 <sub>a</sub>	0	—	—	—	—
Fresno	z.	56·0	72	i 9 42 <sub>a</sub>	- 1	—	—	e 10 40	pP —
Tinemaha	z.	56·6	71	i 9 48	+ 1	—	—	i 10 6	pP —
Logan		56·9	63	e 9 51	+ 2	—	—	—	—
Haiwee	z.	57·5	72	i 9 53	0	—	—	—	—
Pasadena		58·8	73	i 10 1	- 1	i 18 8	+ 1	i 10 20	pP e 26·0
Overton	z.	59·2	69	i 10 6	+ 1	e 18 17	+ 5	—	—
Riverside	z.	59·3	73	i 10 5	- 1	—	—	i 10 23	pP —
Boulder City		59·4	70	e 10 6	0	—	—	e 10 22	pP —
Pierce Ferry		59·7	69	i 10 10	+ 1	i 18 25	+ 6	—	—
Palomar		60·1	73	e 10 10	- 1	i 18 27	+ 3	i 10 30	pP —
Upsala		63·0	341	i 10 31 <sub>a</sub>	0	i 18 45	-16	e 19 0	PS e 33·8
Tucson		64·3	70	i 10 40	+ 1	—	—	e 13 25	PP —
Copenhagen		68·0	342	i 11 4	+ 1	—	—	—	— 37·8
Warsaw		69·2	335	e 11 12	+ 2	e 21 4	PPS	—	— e 39·8
St. Louis		70·1	52	i 11 16	0	i 20 28	+ 1	i 11 36	pP —
Cleveland	N.	71·6	45	i 11 27	+ 2	—	—	i 11 45	pP —
Raciborzu	z.	71·9	336	e 11 20	- 7	—	—	—	—
Collmberg	z.	72·0	339	e 11 27	- 1	—	—	—	—
Skalnate Pleso		72·2	334	11 24	- 5	—	—	e 16 8	PPP —
Prague		72·8	338	e 11 31	- 1	e 20 56	- 2	e 14 14	PP e 40·8
Rathfarnham Castle		73·0	352	e 11 34	+ 1	e 32 58	Q	e 14 18	PP e 40·8
Kew		74·1	348	e 11 39	- 1	e 22 9	PPS	—	— e 39·8
Harvard		74·6	37	i 11 43	0	—	—	—	—
Weston		74·8	37	i 11 44	0	—	—	—	—
Stuttgart		75·1	341	e 11 46	0	—	—	—	— e 40·8
Strasbourg		75·6	342	i 11 46 <sub>a</sub>	- 2	e 18 16	?	e 14 29	PP e 37·8
Paris		76·3	346	11 53	+ 1	—	—	i 12 12	P <sub>c</sub> P e 37·8
Basle		76·6	342	e 11 55 <sub>a</sub>	+ 1	—	—	—	—
Zürich		76·6	342	e 11 54 <sub>a</sub>	0	—	—	—	—
Chur		76·9	340	e 11 56 <sub>a</sub>	0	—	—	—	—
Besançon		77·2	343	i 11 58	+ 1	—	—	—	—
Padova		78·6	338	e 12 0	- 5	22 10	+ 8	—	—
Pavia		78·6	340	e 12 7	+ 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.
Bologna		78.8	338	12 19	+13	—	—	—	—
Clermont-Ferrand		79.2	344	12 10	+ 2	—	—	—	39.8
Tacubaya		80.9	70	i 10 35	?	—	—	—	—
Rocca di Papa		81.0	336	e 13 35	+77	—	—	—	—
Rome		81.0	336	i 12 18 <sub>a</sub>	0	e 22 28	+ 1	e 23 7	PS e 41.5
Helwan	z.	85.8	317	i 12 41 <sub>a</sub>	- 1	—	—	—	—
Algiers Univ.	z.	87.9	342	e 12 50	- 3	—	—	—	—
Tamanrasset	z.	100.9	336	e 13 50	- 2	—	—	e 17 49	PP
La Paz		127.5	64	e 19 14	[+ 7]	—	—	—	—

Additional readings :—

College i = 6m.12s. and 6m.20s.  
 Resolute Bay eZ = 3m.40s.  
 Seattle e = 9m.0s., 9m.50s., 10m.59s., and 11m.14s.  
 Berkeley eE = 22m.32s.  
 Reno ePPZ = 11m.56s.  
 Lick iZ = 9m.53s.  
 Upsala eN = 21m.18s.  
 Warsaw eZ = 11m.33s. and 11m.59s., eE = 12m.21s.  
 St. Louis i = 11m.50s.  
 Raciborzu ePEN = 11m.24s.  
 Prague e = 11m.57s., eN = 19m.55s., eE = 20m.42s.  
 Paris ePP = 14m.44s.  
 Besançon i = 12m.3s., e = 12m.43s.  
 Clermont-Ferrand i = 12m.35s.  
 Tacubaya i = 11m.7s.  
 Rome e = 23m.24s.  
 Helwan eZ = 13m.9s.  
 Algiers Univ. eZ = 12m.29s.  
 Long waves were also recorded at Helsinki, Granada, and Bozeman.

Aug. 22d. 10h. 20m. 19s. Epicentre 35°·8N., 140°·1E. Depth of focus 0·005.  
 (as on 1945, June 16d.).

Intensity V at Tokyo; IV at Tukulbasan, Yokohama, Tomisaki, Hunatu, Ajiro, and Osima; II-III at Tyosi, Mito, Titibu, Kumagaya, Maebasi, Kohu, Shizuoka, Hatijojima, and Utunomiya.  
 Macroseismic radius 200-300km. Depth 40km. Epicentre 35°·7N. 140°·2E.

The Seismological Bulletin of the Central Meteorological Observatory, Japan, for the year 1950, Tokyo, 1952, p. 37-38, with macroseismic chart.

A = -·6237, B = +·5215, C = +·5823;  $\delta = +4$ ; h = 0;  
 D = +·641, E = +·767; G = -·447, H = +·374, K = -·813.

	$\Delta$	Az.	P.	O-C.	S.	O-C.
	$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.
Tokyo	0.3	253	0 8 <sub>k</sub>	- 4	0 17	- 3
Tukulbasan	0.4	0	0 11 <sub>a</sub>	- 1	0 19	- 3
Yokohama	0.5	225	0 13 <sub>k</sub>	0	0 21	- 2
Kumagaya	0.7	301	0 17	+ 2	0 29	+ 2
Mito	0.7	27	0 16 <sub>k</sub>	+ 1	0 27	0
Utunomiya	0.8	346	0 16	- 1	0 27	- 2
Mera	0.9	194	0 15	- 3	0 24	- 7
Maebasi	1.0	306	0 18	- 1	0 34	+ 1
Hunatu	1.1	255	0 18 <sub>k</sub>	- 2	0 31	- 5
Osima	1.2	210	0 17	- 5	0 29	- 9
Shizuoka	1.6	239	0 25	- 2	0 44	- 3
Matusiro	1.7	296	0 28	0	0 51	+ 1
Nagano	1.8	299	0 31	+ 1	0 53	+ 1
Omaesaki	1.9	232	0 35	+ 4	1 21	+27
Hokusima	2.0	9	0 34	+ 2	1 2	+ 5
Sendal	2.6	15	0 41	0	1 14	+ 2
Nagoya	2.7	256	0 44	+ 2	1 17	+ 3
Aikawa	2.7	326	0 41	- 1	1 22	+ 8
Gihu	2.7	262	0 45	+ 3	1 13	- 1
Wazima	3.0	302	0 49	+ 2	—	—

Continued on next page.

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		$\Delta$ °	Az. °	P.		O - C. s.	S.		O - C. s.
				m.	s.		m.	s.	
Kameyama		3.1	252	0	54	+ 6	1	28	+ 4
Hikone		3.2	260	0	57	+ 8	1	25	- 2
Mizusawa	E.	3.4	13	1	2	+10	1	37	+ 5
Owase		3.6	243	0	54	- 1	1	47	+10
Osaka		3.9	254	1	9	+10	—	—	—
Akita		3.9	0	1	6	+ 7	1	52	+ 8
Morioka		4.0	12	1	5	+ 4	1	46	- 1
Kobe		4.2	256	1	11	+ 8	—	—	—
Toyooka		4.3	268	1	39	+34	—	—	—
Sumoto		4.5	253	1	18	+11	2	3	+ 4
College		50.7	32	e 8	55	0	—	—	—
Shasta Dam		72.7	52	i 11	23	0	—	—	—
Tinemaha	z.	77.4	53	e 11	50	0	—	—	—
Mount Wilson	z.	79.2	55	e 12	0	0	—	—	—
Overton	z.	80.2	52	i 12	6	+ 1	—	—	—
Boulder City		80.3	52	i 12	5	0	—	—	—
Pierce Ferry		80.7	52	i 12	9	+ 1	—	—	—
Tucson		85.2	53	e 12	22	- 9	—	—	—

Aug. 22d. 13h. 22m. 19s. Epicentre 27°·2N. 97°·4E. (as at 1h.).

		$\Delta$ °	Az. °	P.		O - C. s.	S.		O - C. s.	Supp.		L. m.	
				m.	s.		m.	s.		m.	s.		
Calcutta	E.	9.4	243	e 2	24	+ 6	i 4	18	+11	i 4	41	SS	—
New Delhi		17.9	279	i 4	5	- 7	i 7	11	-19	4	19	PP	—
Nanking		19.2	70	e 4	30	+ 2	i 8	11	+12	—	—	—	i 9.0
Hyderabad	E.	20.0	245	i 4	36	- 1	i 8	15	- 2	8	29	SS	—
Przhevalsk		21.8	319	i 4	54	- 2	e 8	54	+ 2	—	—	—	—
Naryn		22.6	315	i 5	3	0	e 9	9	+ 2	—	—	—	—
Almata		23.1	320	i 5	8	0	i 9	18	+ 2	—	—	—	—
Poona		23.3	253	5	10	0	9	22	+ 2	—	—	—	9.7
Bombay		24.1	255	e 5	17	- 1	e 9	34	0	—	—	—	—
Frunse		24.3	316	i 5	20	0	e 9	45	+ 8	—	—	—	—
Andijan		24.7	309	e 5	24	0	9	47	+ 3	—	—	—	—
Fergana		24.9	309	i 5	24	- 2	e 9	51	+ 4	—	—	—	—
Kodaikanal	E.	25.3	233	e 5	41	+11	i 10	18	+24	—	—	—	—
Kulyab		25.5	302	e 5	32	0	i 10	3	+ 6	—	—	—	—
Irkutsk		25.6	9	i 5	39?	+ 7	—	—	—	—	—	—	—
Colombo	E.	26.2	223	6	22	PP	10	9	0	—	—	—	14.0
Stalinabad		26.5	304	i 5	35	- 6	i 10	12	- 2	—	—	—	—
Tashkent		27.1	309	i 5	44	- 2	—	—	—	—	—	—	—
Samarkand		28.1	304	e 5	54	- 1	—	—	—	—	—	—	—
Mary		31.6	299	e 6	24?	- 2	—	—	—	—	—	—	—
Vladivostok		32.1	51	e 6	33	+ 2	i 11	48	+ 5	—	—	—	—
Ashkabad		34.5	298	i 6	50	- 2	e 12	20	0	—	—	—	—
Sverdlovsk		39.5	330	i 7	34	0	i 13	34	- 3	—	—	—	—
Baku		41.1	302	e 7	58	+11	e 14	12	+11	—	—	—	—
Tiflis		45.1	303	8	18	- 2	—	—	—	—	—	—	—
Erevan		45.3	301	e 8	29	+ 8	—	—	—	—	—	—	—
Leninakan		45.8	302	e 8	27	+ 2	—	—	—	—	—	—	—
Borzhomi		46.1	303	8	28	0	—	—	—	—	—	—	—
Zugdidi		47.2	304	e 8	31	- 5	—	—	—	—	—	—	—
Moscow		51.1	322	e 9	7	+ 1	e 16	21	- 3	—	—	—	—
Theodosia		51.9	308	e 9	12	0	—	—	—	—	—	—	—
Ksara		52.7	293	i 9	20	+ 2	16	50	+ 4	—	—	—	—
Yalta		52.8	307	9	17	- 2	16	45	- 2	11	29	PP	—
Pulkovo		55.4	326	i 9	39	+ 1	e 17	21	- 1	—	—	—	—
Kishinev		56.3	311	e 9	43	- 2	—	—	—	—	—	—	—
Istanbul		56.9	303	e 9	48	- 1	e 17	38	- 4	—	—	—	—
Helwan		57.4	290	9	50	- 3	e 17	47	- 2	10	46	PcP	—
Warsaw		60.8	317	e 10	18	+ 2	e 18	33	0	e 12	38	PP	e 30.7
Upsala		61.8	326	i 10	22	- 1	e 18	44?	- 2	e 25	53	Q	e 28.7
Raciborzu	z.	62.9	315	e 9	55	-35	—	—	—	—	—	—	—

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.
Ogyalla	63.4	313	e 15 9	P <sub>c</sub> S	—	—	—	—
Copenhagen	65.2	322	e 10 45	0	20 47	S <sub>c</sub> S	—	e 29.7
Prague	65.3	316	e 10 44	- 2	e 19 17	-12	e 13 12	PP
Potsdam	65.6	318	i 10 52	+ 4	—	—	—	34.7
Collmberg	65.9	316	e 10 48	- 2	—	—	e 12 53	PP e 34.7
Cheb	66.6	316	e 10 56	+ 2	e 19 8	-37	—	—
Jena	66.8	316	e 10 55	- 1	—	—	e 13 21	PP
Triest	z. 66.8	311	i 10 54k	- 2	—	—	—	—
Messina	67.7	303	e 11 4	+ 3	e 20 21	+23	—	—
Padova	68.4	310	e 11 11	+ 5	e 20 7	0	—	—
Bologna	68.8	311	e 11 26	+18	e 21 33	S <sub>c</sub> S	—	—
Rome	68.8	307	e 10 56	-12	e 20 15	+ 4	e 20 48	PS e 32.9
Stuttgart	68.9	315	e 11 7a	- 2	e 20 16	+ 3	e 24 35	SS e 35.7
Florence Nim	69.1	310	e 11 15	+ 5	e 20 24	+ 9	—	—
Prato	69.2	310	e 11 16	+ 6	e 20 21	+ 5	—	—
Chur	69.3	313	e 11 9a	- 2	—	—	—	—
Karlsruhe	69.4	316	e 11 11	- 1	—	—	—	e 37.7
Zürich	69.8	314	e 11 12a	- 2	—	—	—	—
Strasbourg	69.9	315	e 11 14a	- 1	e 20 23	- 1	e 13 46	PP e 35.7
Pavia	70.1	312	e 10 53	-23	—	—	—	—
Basle	70.4	314	e 11 23	+ 5	—	—	—	—
Besançon	71.5	314	e 11 23	- 1	—	—	—	—
Paris	73.1	317	i 11 34	0	e 21 5	+ 4	e 14 17	PP e 37.7
Durham	73.1	323	—	—	e 21 7	+ 6	—	—
Kew	73.7	320	e 11 37	- 1	e 21 6	- 2	e 22 0	PPS e 30.7
Clermont-Ferrand	73.9	313	e 11 35	- 4	e 21 20	+10	e 14 27	PP 38.7
College	75.4	24	e 11 47	0	e 21 30	+ 3	—	—
Brisbane	z. 76.2	130	(i 11 54k)	+ 2	—	—	—	—
Rathfarnham Castle	76.3	323	i 11 53	+ 1	e 21 33	- 4	e 15 13	PP e 36.7
Algiers Univ.	z. 77.5	304	i 11 57k	- 2	—	—	—	—
Tortosa	77.6	309	12 4	+ 4	e 21 54	+ 3	—	e 37.7
Alicante	79.4	308	e 11 45	-24	22 15	+ 5	15 25	PP e 37.0
Toledo	81.1	311	i 12 19	+ 1	—	—	e 15 7	PP 42.4
Tamanrasset	z. 81.5	292	i 12 19k	- 2	e 12 27	P <sub>c</sub> P	e 15 23	PP
Granada	82.1	308	i 12 38a	+14	22 36	- 2	i 15 18	PP 40.6
Malaga	z. 82.9	308	i 12 27k	- 1	e 22 45	- 1	i 15 37	PP 46.8
Pretoria	z. 84.9	238	i 12 37	- 1	—	—	—	—
Sitka	85.1	26	—	—	e 23 17	+ 9	—	e 42.7
Hungry Horse	99.7	20	e 13 49	+ 2	—	—	—	—
Shasta Dam	102.9	30	e 15 8	+67	—	—	—	—
Overton	z. 109.9	27	e 18 43	PP	—	—	—	—
Pierce Ferry	110.4	26	e 18 42	PP	—	—	e 29 49	PKKP
Tucson	115.1	26	e 18 51	PP	—	—	—	—

Additional readings and note :—

New Delhi PPPEN = 4m.26s., SSE = 7m.32s., SSSE = 7m.44s.

Nanking i = 4m.35s., iZ = 4m.55s.

Yalta PPP = 12m.21s.

Warsaw eE = 12m.1s., ePPPE = 14m.0s., eP<sub>c</sub>S = 14m.45s., eE = 17m.51s., eS<sub>c</sub>SEN = 20m.13s., SSEN = 22m.35s.

Copenhagen i = 10m.49s.

Prague eE = 10m.52s. and 11m.53s., e = 13m.47s., eN = 14m.52s. and 15m.57s., e = 20m.45s.

Collmberg eZ = 10m.52s. and 11m.14s.

Jena iPN = 10m.58s.

Rome e = 21m.2s.

Stuttgart eZ = 11m.12s. and 11m.20s., eSSS = 27m.41s.

Strasbourg i = 12m.16s., e = 20m.33s., eS<sub>c</sub>S = 21m.18s., eSSS = 28m.21s. and 28m.33s.

Besançon i = 11m.27s.

Paris i = 11m.46s., ePPP = 15m.55s., e = 17m.8s.

Kew iZ = 11m.42s.

Brisbane readings have been increased by 20m.

Algiers Univ. Z = 11m.43s., eZ = 13m.0s.

Alicante PS = 23m.19s.

Tamanrasset eZ = 16m.35s., ePPPZ = 17m.20s., eZ = 17m.46s.

Granada pPP = 15m.33s., PPP = 17m.42s., PPS = 23m.52s., SS = 27m.36s.

Overton iZ = 19m.16s.

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

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Aug. 22d. 17h. 20m. 12s. Epicentre 29°·2N. 95°·1E. (as on 21d.).

		$\Delta$ °	Az. °	P.		O-C. s.	S.		O-C. s.	Supp.		
				m.	s.		m.	s.		m.	s.	
Calcutta	E.	9·0	224	e 4	4	S	(e 4 4)	+ 6	e 5	9	S <sub>E</sub>	—
New Delhi		15·7	272	e 3	36	- 8	i 6 28	-11	—	—	—	—
Przhevalsk		18·9	320	e 4	25	+ 1	—	—	—	—	—	—
Almata		20·2	320	e 4	42	+ 3	—	—	—	—	—	—
Andijan		21·8	308	e 4	55	- 1	9 6	+14	—	—	—	—
Fergana		22·1	308	e 5	7	+ 8	—	—	—	—	—	—
Bombay		22·8	249	—	—	—	e 9 10	- 1	—	—	—	—
Kulyab		22·8	299	—	—	—	e 9 14	+ 3	—	—	—	—
Obi-garm		23·0	301	i 5	8	+ 1	e 9 19	+ 5	—	—	—	—
Irkutsk		24·0	13	e 5	18	+ 1	e 9 48	+16	—	—	—	—
Tashkent		24·2	307	e 5	19?	0	e 9 46	+11	—	—	—	—
Ksara		50·1	291	—	—	—	e 15 23	-47	e 22	26	Q	—
Stuttgart	z.	66·1	314	e 10	53	+ 2	—	—	—	—	—	—
College		74·4	23	i 11	37	- 5	—	—	—	—	—	—
Tamanrasset	z.	78·9	290	e 12	4	- 3	—	—	—	—	—	—
Pretoria	z.	84·3	236	e 12	30	- 5	—	—	—	—	—	—
Pietermaritzburg	z.	85·0	232	e 12	34	- 4	—	—	—	—	—	—
Lick	z.	105·4	28	i 14	45k	P	—	—	—	—	—	—

Additional readings :—

Calcutta eS\*E = 5m.29s. ; S is given as P and S<sub>E</sub> as S.

Lick iZ = 14m.52s.

Long waves were recorded at Poona.

Aug. 22d. Readings also at 0h. (Collmberg, Overton, and College), 2h. (Pasadena, Riverside, Tucson, Boulder City, Overton (2), Pierce Ferry, and Harvard), 3h. (College, Tamanrasset (2) and Stuttgart), 4h. (Collmberg, Stuttgart (2)), Tamanrasset, and College), 5h. (Stuttgart), 7h. (La Plata, Grahamstown, Pretoria, College, Hungry Horse, Stuttgart, and near Athens), 8h. (Frunse, Samarkand, near Andijan, Fergana, Murgab, near Kulyab (2), near Rome (2), and Rocca di Papa (2)), 9h. (Rome), 10h. (Tamanrasset, Bucharest, Timisoara, near Athens, and Istanbul), 11h. (Huan-cayo, La Paz, Overton, Pierce Ferry, Pretoria, Kulyab, Samarkand, Stalinabad, near Andijan, Fergana, Frunse, Garm, Murgab, Naryn, and near Galerazamba), 12h. (near Tortosa and Toledo), 13h. (near Prague), 14h. (College and Stuttgart), 15h. (Hungry Horse, College, Tamanrasset, near Andijan, and near Mizusawa), 16h. (Pierce Ferry and near Andijan), 17h. (Andijan and Obi-garm), 18h. (Overton, Pierce Ferry, Shasta Dam, and College), 21h. (near Alicante), 22h. (Shasta Dam, Tucson, near Boulder City, Overton, and Pierce Ferry).

Aug. 23d. 3h. 9m. 19s. Epicentre 29°·2N. 95°·1E. (as on 22d.).

A = -·0777, B = +·8709, C = +·4853 ;  $\delta = +2$  ;  $h = +2$ .

		$\Delta$ °	Az. °	P.		O-C. s.	S.		O-C. s.	Supp.		L. m.
				m.	s.		m.	s.		m.	s.	
Calcutta	E.	9·0	224	e 2	7	- 6	i 3 47	-11	4 11	SS	—	
New Delhi	E.	15·7	272	i 3	41	- 3	6 34	- 5	3 54	PP	6·5	
Przhevalsk		18·9	320	i 4	25	+ 1	i 7 56	+ 3	—	—	—	
Hyderabad	E.	19·2	236	i 4	26	- 2	i 8 6	+ 7	—	—	—	
Murgab		19·8	304	4	35	0	8 11	- 2	—	—	—	
Naryn		19·8	315	i 4	35	0	e 8 13	0	—	—	—	
Almata		20·2	320	i 4	41	+ 2	i 8 28	+ 7	—	—	—	
Nanking		20·6	75	4 41 <sub>a</sub>	—	- 2	i 8 34	+ 5	i 4 52	PP	10·0	
Frunse		21·4	315	i 4	59	+ 8	i 8 56	+11	—	—	—	
Andijan		21·8	308	i 4	58	+ 2	i 8 57	+ 5	—	—	—	
Fergana		22·1	308	i 4	59	0	8 58	0	—	—	—	
Poona	E.	22·1	246	4 59	—	0	9 1	+ 3	—	—	—	
Bombay		22·8	249	e 5	8	+ 3	i 9 13	+ 2	—	—	—	
Kulyab		22·8	299	i 5	6	+ 1	i 9 11	0	—	—	—	
Zi-ka-wei	z.	22·9	78	i 5	5	- 1	i 9 26	+13	i 5 52	PPP	—	
Stalinabad		23·6	301	i 5	14	+ 1	i 9 23	- 2	—	—	—	
Irkutsk		24·0	13	i 5	19?	+ 2	9 38?	+ 6	—	—	—	
Tashkent		24·2	307	i 5	22	+ 3	e 9 35	0	—	—	—	
Kodaikanal	E.	25·1	226	i 5	26	- 2	i 9 58	+ 7	—	—	—	
Samarkand		25·3	302	i 5	33	+ 3	9 54	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.
Colombo	E.	26.4	216	5	51	+11	10	16	+4	—	—	17.5
Mary		28.9	297	e 6	2	-1	—	—	—	—	—	—
Vladivostok		32.5	55	i 6	33	-1	i 11	46	-3	—	—	—
Sverdlovsk		36.7	329	7	12	+2	12	54	0	—	—	—
Djakarta		37.0	159	i 7	12	-1	e 13	0	+1	—	—	—
Bandong		37.9	158	i 7	13	-7	e 12	56	-17	—	—	—
Baku		38.4	300	e 7	26	+1	—	—	—	—	—	—
Tiflis		42.3	302	7	58	+1	—	—	—	—	—	—
Gori		42.8	302	e 8	0	-1	—	—	—	—	—	—
Leninakan		43.0	300	e 8	8	+5	—	—	—	—	—	—
Borzhome		43.4	302	8	5	-1	—	—	—	—	—	—
Moscow		48.2	321	8	45	+1	i 15	42	-1	—	—	—
Yalta		50.0	305	8	58	0	16	4	-5	—	—	—
Ksara		50.1	291	i 9	0 <sub>a</sub>	+1	e 16	35?	+25	—	—	—
Pulkovo		52.6	325	i 9	17	-1	i 16	42	-2	—	—	—
Kishinev		53.5	310	e 9	23	-1	e 16	53	-4	—	—	—
Istanbul		54.1	302	e 9	28	-1	e 17	0	-5	—	—	—
Helwan		54.8	288	i 9	33	-1	i 17	14	0	e 19	19	ScS
Bucharest		55.7	306	e 9	44	+4	e 17	30	+4	—	—	—
Warsaw		58.0	317	e 9	57	0	e 17	58	+1	19	49	ScS e 30.7
Skalnate Pleso		58.9	313	e 10	5	+2	—	—	—	—	—	—
Timisoara		58.9	309	e 9	41?	-22	e 18	10	+2	e 10	5	P
Upsala		59.0	325	i 10	3 <sub>a</sub>	-1	i 18	6	-4	e 12	14	PP e 28.7
Raciborzu	Z.	60.1	314	e 9	38	-33	—	—	—	—	—	—
Ogyalla		60.5	312	e 12	11	PP	e 18	26	-3	—	—	—
Copenhagen		62.4	321	i 10	27	0	18	53	0	20	22	ScS 31.7
Prague		62.5	315	i 10	27	-1	e 18	51	-3	e 12	43	PP e 32.2
Potsdam		62.8	318	i 10	31	+1	i 18	56	-2	e 18	59	S e 34.7
Taranto		63.0	303	—	—	—	18	53	-8	—	—	—
Collmberg		63.1	316	e 10	30	-2	e 18	59	-3	e 26	11	SSS e 34.7
Cheb		63.7	315	—	—	—	e 19	5	-5	e 22	59	SS
Jena		64.0	316	e 10	37	-1	e 19	11	-2	e 19	57?	PPS
Triest		64.0	310	i 10	35 <sub>a</sub>	-3	i 19	10	-3	i 13	0	PP
Messina		64.9	302	e 10	44	+1	e 18	41?	-43	—	—	—
Padova		65.6	309	e 10	47	-1	e 19	31	-2	—	—	—
Rome		66.0	306	e 10	48	-2	e 19	33	-5	23	54	SS e 35.7
Stuttgart		66.1	314	i 10	51 <sub>a</sub>	0	e 19	35	-4	e 13	15	PP e 34.7
Florence Xim		66.3	308	e 10	53	+1	e 19	34	-8	—	—	—
Chur		66.5	312	e 10	52 <sub>a</sub>	-2	e 19	40	-4	—	—	—
Zürich		66.9	313	e 10	55 <sub>a</sub>	-1	e 19	42	-7	—	—	—
Strasbourg		67.1	315	i 10	57 <sub>a</sub>	0	e 19	49	-2	i 13	26	PP e 36.7
Basle		67.5	313	i 11	1	+1	e 19	57	+1	—	—	—
De Bilt		67.5	319	i 10	59	-1	e 19	55	-1	—	—	e 34.7
Besançon		68.9	314	i 11	5	-4	—	—	—	—	—	—
Aberdeen	N.	69.7	325	—	—	—	i 20	21	-1	e 28	21	SSS e 37.2
Paris		70.3	316	i 11	17	0	e 20	28	-1	e 13	54	PP e 37.7
Durham	E.	70.3	323	e 11	22	+5	e 21	44	?	—	—	—
Kew		70.9	319	i 11	20 <sub>a</sub>	-1	e 20	36	0	e 21	28	PPS e 35.7
Clermont-Ferrand		71.0	312	i 11	20	-2	e 20	37	0	e 13	59	PP 39.7
Scoresby Sund		71.1	342	i 11	22	0	i 20	40	+2	21	26	ScS 38.7
Rathfarnham Castle		73.5	323	i 11	35	-1	e 20	59	-7	e 14	19	PP e 34.7
College		74.4	23	i 11	40	-2	e 21	14	-2	i 14	27	PP
Algiers Univ.	Z.	74.7	304	i 11	41 <sub>a</sub>	-2	—	—	—	e 14	30	PP
Tortosa		74.8	309	11	44	0	21	16	-4	14	34	PP e 32.7
Alicante		76.5	307	e 11	54	0	e 21	42	+3	14	54	PP e 37.4
Toledo		78.3	310	i 12	4	+1	e 21	56	-3	i 15	2	PP 49.0
Tamanrasset	Z.	78.9	290	12	8 <sub>a</sub>	+1	—	—	—	e 15	6	PP
Brisbane	Z.	79.1	129	i 12	8 <sub>a</sub>	0	—	—	—	—	—	—
Granada		79.2	307	i 11	12 <sub>k</sub>	-56	22	22	+14	i 15	0	PP e 47.4
Malaga	Z.	80.0	307	i 12	14 <sub>k</sub>	+1	e 22	22	+5	i 15	14	PP 47.3

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.
Riverview	E.	82.1	135	—	—	i 22 41	+ 3	—	—
Sitka		83.8	25	e 12 34	+ 2	e 22 53	- 2	e 22 11	? e 48.7
Pretoria	Z.	84.3	236	i 12 36	+ 1	—	—	—	—
Pietermaritzburg	Z.	85.0	232	i 12 39	+ 1	—	—	—	—
Victoria	Z.	95.3	24	e 13 29	+ 2	—	—	—	—
Hungry Horse		98.5	19	i 13 42	0	—	—	e 17 22	PP
Butte	N.	101.0	18	e 17 56	PP	—	—	—	e 58.0
Shasta Dam		102.3	28	e 13 55	- 4	—	—	e 17 49	PP
Mineral	Z.	102.9	27	e 18 4	PP	—	—	e 20 29	PPP
Reno		104.3	26	e 18 5 <sub>a</sub>	?	—	—	e 18 27	PP
Logan		105.1	20	e 18 23	PP	—	—	—	—
Ottawa	Z.	105.3	352	e 18 27	PP	—	—	—	—
Lick	Z.	105.4	28	i 18 32 <sub>a</sub>	PP	—	—	—	—
Tinemaha	Z.	107.1	27	e 18 32	[+ 5]	—	—	i 18 47	PP
Harvard		107.6	349	i 18 46	PP	—	—	e 20 44	PPP e 58.9
Weston		107.7	349	e 18 49	PP	—	—	—	e 58.8
Haiwee	Z.	107.9	27	e 18 56	PP	—	—	—	—
Overton	Z.	109.0	24	e 18 59	PP	—	—	—	—
Boulder City		109.3	24	e 19 2	PP	—	—	—	—
Pierce Ferry		109.5	24	e 18 43	[+ 11]	—	—	i 19 3	PP
Pasadena		109.6	28	e 18 38	[+ 6]	—	—	i 19 1	PP e 57.7
Riverside	Z.	110.0	28	e 19 6	PP	—	—	—	—
Philadelphia		110.6	351	—	—	e 25 12	[- 3]	e 28 40	PS e 60.7
Tucson		114.1	24	e 19 16	PP	—	—	—	—
Bogota		144.8	341	i 19 39	[ 0]	i 29 47	{- 2}	i 23 19	SKP 80.7
Chinchina		144.9	343	i 20 40	[+ 61]	i 23 19	SKP	—	e 82.7
La Paz		160.0	305	20 3	[+ 2]	27 11	[+ 6]	24 27	PP
Huancayo		160.7	330	e 20 6	[+ 4]	—	—	e 20 48	PKP <sub>2</sub>

Additional readings :—

Calcutta iS\*E = 4m.35s.  
 New Delhi PPPE = 4m.0s., SSE = 6m.51s., SSSE = 7m.2s.  
 Nanking iZ = 6m.18s., eS?N = 8m.25s., Q = 9m.13s.  
 Zi-ka-wei eS?Z = 8m.51s., iZ = 10m.13s.  
 Warsaw SSE = 21m.41s., SSN = 21m.44s., SSSE = 24m.14s.  
 Upsala iE = 10m.11s., iPS = 18m.18s., eQ?N = 25m.23s.  
 Copenhagen 19m.5s. and 20m.34s.  
 Prague eE = 10m.48s. and 12m.11s., ePPPE = 14m.23s., e = 15m.9s., eN = 19m.1s., eE = 20m.21s., eSS = 23m.17s.  
 Stuttgart eZ = 10m.59s., eS<sub>c</sub>S = 20m.47s., eSS = 23m.59s.  
 Strasbourg i = 11m.5s., eP<sub>c</sub>P = 11m.11s., e = 12m.45s. and 13m.34s., ePS = 19m.59s., eSS = 24m.5s., e = 24m.11s., eSSS = 27m.33s.  
 Paris i = 11m.26s., e = 24m.59s.  
 Kew eSEN = 20m.50s., eEN = 28m.38s.  
 Clermont-Ferrand eSS = 24m.56s.  
 Scoresby Sund 13m.58s. and 15m.43s.  
 Rathfarnham Castle e = 23m.8s.  
 Algiers Univ. eZ = 11m.50s., eP<sub>c</sub>PZ = 11m.55s., eZ = 12m.7s.  
 Tortosa PSE = 21m.55s., SSN = 26m.13s., SSSN = 29m.48s.  
 Alicante PPP = 16m.36s., PS = 22m.14s.  
 Tamanrasset iP<sub>c</sub>PZ = 12m.16s., eZ = 13m.48s.  
 Granada PPP = 16m.34s., PS = 23m.16s., SS = 27m.28s., SSS = 31m.52s.  
 Malaga ePPPZ = 17m.14s.  
 Mineral iZ = 18m.15s.  
 Tinemaha iPKKPZ = 29m.47s.  
 Pasadena iPKKPZ = 29m.39s.  
 La Paz SKKS = 31m.13s.  
 Long waves were also recorded at Helsinki, Bergen, Edinburgh, Karlsruhe, Seattle, Cleveland, Bermuda, and Dehra Dun.

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Aug. 23d. 15h. 33m. 56s. Epicentre 27°·2N. 97°·4E. (as on 22d.).

A = -·1147, B = +·8832, C = +·4546;  $\delta = -14$ ;  $h = +3$ .

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Calcutta	E.	9·4	243	e 2 55	P*	i 3 56	-11	4 44	S*
New Delhi		17·9	279	e 4 5	- 7	i 7 19	-11	4 19	PP
Nanking		19·2	70	4 35	+ 7	i 8 14	+15		
Hyderabad		20·0	245	4 32	- 5	8 15	- 2	8 19	S
Zi-ka-wei	Z.	21·4	73	—	—	e 8 54	+ 9	—	i 11·8
Przhevalsk		21·8	319	i 4 54	- 2	e 8 56	+ 4	—	—
Murgab		22·6	306	5 2	- 1	—	—	—	—
Almata		23·1	320	i 5 8	0	i 9 20	+ 4	—	—
Poona		23·3	253	5 9	- 1	9 19	- 1	—	—
Bombay		24·1	255	e 5 16	- 2	e 9 31	- 3	—	—
Frunse		24·3	316	—	—	e 9 48	+11	—	—
Andijan		24·7	309	e 5 24	0	i 9 48	+ 4	—	—
Fergana		24·9	309	e 5 21	- 5	—	—	—	—
Kodaikanal	E.	25·3	233	e 5 33	+ 3	e 10 2	+ 8	—	—
Kulyab		25·5	302	e 5 31?	- 1	—	—	—	—
Irkutsk		25·6	9	e 5 37	+ 5	10 6	+ 7	—	—
Obi-garm		25·8	304	i 5 32	- 2	—	—	—	—
Tashkent		27·1	309	e 5 46	0	—	—	—	—
Vladivostok		32·1	51	—	—	e 11 38	- 5	—	—
Ashkabad		34·5	298	e 6 50	- 2	e 12 18	- 2	—	—
Sverdlovsk		39·5	330	i 7 35	+ 1	—	—	—	—
Borzhomi		46·1	303	8 27	- 1	—	—	—	—
Moscow		51·1	322	e 9 6	0	e 16 23	- 1	—	—
Ksara		52·7	293	i 9 18	0	16 50?	+ 4	—	—
Yalta		52·8	307	e 9 16	- 3	—	—	—	—
Copenhagen		65·2	322	e 10 44	- 1	—	—	—	33·1
Prague		65·3	316	e 10 46	0	—	—	e 13 8	PP
De Bilt		68·7	319	e 11 24	+17	e 20 16	+ 6	—	e 38·1
Stuttgart		68·9	315	e 11 7	- 2	e 19 47	-26	—	e 35·1
Strasbourg		69·9	315	e 11 13	- 2	—	—	—	e 36·1
Besançon		71·5	314	e 11 22	- 2	—	—	—	—
Paris		73·1	317	i 11 33	- 1	—	—	—	e 40·1
Kew		73·7	320	e 16 4?	PPP	—	—	—	e 36·1
College		75·4	24	i 11 47	0	—	—	—	—
Tamanrasset	Z.	81·5	292	12 20 <sub>a</sub>	- 1	—	—	i 15 32	PP
Pretoria	Z.	84·9	238	i 12 36	- 2	—	—	—	—
Hungry Horse		99·7	20	i 13 48	+ 1	—	—	—	—

Additional readings :—

Prague e = 10m.50s., 11m.26s. and 12m.46s.

Tamanrasset iP<sub>c</sub>PZ = 12m.26s., eZ = 12m.30s.

Long waves were also recorded at Warsaw, Upsala, Rome, and Granada.

Aug. 23d. 18h. 46m. 58s. Epicentre 28°·7N. 96°·6E. (as on 21d.).

A = -·1010, B = +·8727, C = +·4777;  $\delta = 0$ ;  $h = +2$ .

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Calcutta	E.	9·7	232	e 2 23	+ 1	i 4 9	- 6	i 5 2	S*
Dehra Dun	N.	16·2	280	—	—	e 6 26	-25	—	e 9·2
New Delhi		17·0	274	e 3 55	- 6	7 15	+ 5	4 8	PP
Nanking		19·4	75	i 4 33 <sub>a</sub>	+ 3	e 8 5	+ 1	4 50	PP
Hyderabad		20·1	239	i 4 31	- 7	i 8 16	- 3	—	10·5
Przhevalsk		20·2	317	i 4 41	+ 2	i 8 26	+ 5	—	—
Naryn		21·1	313	i 4 47	- 1	e 8 37	- 2	—	—
Murgab		21·2	303	e 4 48	- 1	8 41?	0	—	—
Almata		21·5	319	i 4 54	+ 2	i 8 55	+ 8	—	—
Zi-ka-wei	Z.	21·6	77	i 4 56	+ 2	i 9 0	+11	i 5 32	PPP

Continued on next page.



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		$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.
				m.	s.		m.	s.		m.	s.	
Frunse		22.7	314	e 5	6	+ 2	—	—	—	—	—	—
Poona		23.1	249	5	9	+ 1	i 9	14	- 2	9 52	SS	9.6
Andijan		23.2	307	i 5	10?	+ 1	9	30?	+12	—	—	—
Fergana		23.5	307	i 5	12	0	e 9	24	+ 1	—	—	—
Bombay		23.8	251	e 5	16	+ 1	i 9	27	- 1	—	—	11.3
Irkutsk		24.2	11	i 5	24?	+ 5	e 9	52?	+17	—	—	—
Kulyab		24.2	300	i 5	18	- 1	i 9	35	0	—	—	—
Obi-garm		24.4	302	i 5	22	+ 1	i 9	42	+ 3	—	—	—
Stalinabad		25.1	301	i 5	26	- 2	i 9	47	- 4	—	—	—
Tashkent		25.5	307	i 5	33	+ 1	e 10	13	+16	—	—	—
Kodaikanal	E.	25.7	229	i 5	33	0	i 10	3	+ 2	—	—	—
Samarkand		26.7	302	i 5	40	- 3	—	—	—	—	—	—
Colombo	E.	26.8	219	5	42	- 2	e 10	47	+28	—	—	16.8
Mary		30.3	297	e 6	12	- 3	—	—	—	—	—	—
Vladivostok		31.7	54	i 6	28	+ 1	e 11	38	+ 1	—	—	—
Ashkabad		33.1	297	6	39	- 1	e 12	0	+ 1	—	—	—
Kizyl-Arvat		34.8	299	e 6	56	+ 2	—	—	—	—	—	—
Bandong		37.0	160	e 7	7	- 6	e 12	52	- 7	—	—	—
Sverdlovsk		37.8	328	i 7	22	+ 2	—	—	—	—	—	—
Tiflis		43.7	302	i 8	8	0	—	—	—	—	—	—
Gori		44.2	302	8	9	- 3	—	—	—	—	—	—
Borzhome		44.7	302	8	16	0	—	—	—	—	—	—
Piatigorsk		45.0	305	8	12	- 7	—	—	—	—	—	—
Moscow		49.4	321	i 8	55	+ 2	i 16	1	+ 1	—	—	—
Yalta		51.4	306	9	7	- 2	16	24	- 4	—	—	—
Ksara		51.5	292	i 9	9	0	16	30	+ 1	—	—	—
Pulkovo		53.8	326	i 9	26	0	i 16	58	- 3	—	—	—
Kishinev		54.8	309	i 9	29	- 5	e 17	8	- 6	—	—	—
Istanbul		55.5	302	e 9	39	0	e 17	23	- 1	—	—	—
Helwan		56.2	289	i 9	42 <sub>a</sub>	- 2	17	28	- 5	11 54	PP	—
Helsinki		56.5	326	e 9	46	0	e 17	35	- 2	e 17 45	PS	—
Bucharest		57.1	307	i 9	49 <sub>a</sub>	- 1	e 17	44	- 1	—	—	—
Warsaw		59.2	317	e 10	7 <sub>k</sub>	+ 2	e 18	12	0	e 13 41	PPP	e 32.0
Athens		60.2	300	e 10	11 <sub>a</sub>	- 1	—	—	—	—	—	—
Skalnate Pleso		60.2	313	10	5	- 7	e 18	21	- 4	e 18 43	PS	—
Timisoara		60.2	309	i 10	14	+ 2	—	—	—	—	—	—
Upsala		60.2	326	i 10	10 <sub>a</sub>	- 2	i 18	24	- 1	e 12 22	PP	e 29.0
Budapest		61.3	311	i 10	20	0	(e 20	14)	S <sub>c</sub> S	i 12 36	PP	e 20.2
Raciborzu	z.	61.4	315	e 10	20	0	—	—	—	—	—	—
Kalossa		61.6	311	e 10	29	+ 7	(e 19	32)	+49	e 12 42	PP	e 19.5
Ogyalla		61.8	312	e 10	22	- 1	e 18	47	+ 1	e 13 2	PP	—
Copenhagen		63.6	322	i 10	34	- 1	e 19	8	0	20 29	S <sub>c</sub> S	33.0
Prague		63.7	315	i 10	34 <sub>a</sub>	- 2	e 19	10	0	e 11 19	P <sub>c</sub> P	—
Potsdam		64.0	318	i 10	39	+ 1	i 19	13	0	—	—	e 35.0
Collnberg		64.3	317	e 10	38	- 1	e 19	14	- 3	e 12 50	PP	e 37.0
Cheb	E.	65.0	316	—	—	—	e 19	24	- 2	—	—	—
Jena		65.3	316	e 10	45	- 1	e 19	27	- 2	e 13 9	PP	—
Triest		65.3	310	i 10	46	0	i 19	28	- 1	i 10 56	pP	—
Messina		66.3	302	e 10	50	- 2	e 19	37	- 5	i 11 1	pP	—
Padova		66.9	309	e 10	58	+ 2	19	45	- 4	—	—	—
Bologna		67.3	310	e 10	56	- 3	e 20	12	PS	—	—	—
Rome		67.4	306	i 10	56	- 3	i 19	49	- 6	24 15	SS	e 37.0
Stuttgart		67.4	315	i 10	58 <sub>a</sub>	- 1	e 19	53	- 2	e 13 24	PP	e 34.0
Florence, Xim.		67.6	309	e 10	58	- 3	e 19	42	-15	—	—	—
Prato		67.7	309	e 11	0	- 1	e 19	56	- 2	—	—	—
Chur		67.8	312	e 11	0 <sub>a</sub>	- 2	—	—	—	—	—	—
Karlsruhe	z.	67.8	316	e 11	2?	0	—	—	—	—	—	—
Zürich		68.2	314	e 11	3	- 1	e 20	2	- 2	—	—	—
Strasbourg		68.3	315	i 11	4 <sub>a</sub>	- 1	e 20	4	- 2	e 13 35	PP	e 35.0
Pavia		68.6	311	e 11	6	- 1	—	—	—	—	—	—
De Bilt		68.7	319	i 11	7 <sub>a</sub>	0	e 20	12	+ 2	i 11 17	?	e 37.0
Basle		68.8	314	e 11	7 <sub>a</sub>	- 1	e 20	10	- 1	e 13 18	PP	—
Neuchatel		69.4	314	e 11	10	- 2	—	—	—	—	—	—
Besançon		69.9	314	i 11	14	- 1	—	—	—	e 13 48	PP	—
Durham		71.5	323	—	—	—	i 20	49	+ 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.
Paris		71.5	316	i 11 25	+ 1	i 20 43	0	i 14 0	PP e 41.0
Scoresby Sund		72.0	343	e 11 26	- 2	i 20 53	+ 4	14 9	PP e 41.0
Kew		72.2	320	i 11 29	0	i 20 51	0	e 21 49	PPS e 33.0
Clermont-Ferrand		72.3	313	e 11 28	- 1	e 20 53	+ 1	e 14 10	PP
College		74.3	24	i 11 43	+ 2	e 21 16	+ 1	i 14 33	PP
Algiers Univ.	z.	76.1	305	i 11 50 <sup>a</sup>	- 1	—	—	e 14 37	PP
Tortosa		76.1	309	i 11 52	+ 1	21 32	- 3	—	— e 37.0
Resolute Bay		76.4	4	e 11 55	+ 2	e 21 46	+ 8	—	— e 36.6
Brisbane	z.	77.7	130	i 11 59 <sup>a</sup>	- 1	—	—	i 14 33	PP
Alicante		77.9	307	i 11 43	-18	i 20 55	-59	—	— e 40.4
Toledo		79.6	310	i 12 10	0	22 13	+ 1	15 10	PP
Granada		80.6	307	i 12 14 <sup>k</sup>	- 2	22 32	+ 9	15 20	PP 43.0
Tamanrasset	z.	80.6	291	i 12 14 <sup>a</sup>	- 2	e 22 15	- 8	e 15 14	PP
Riverview		80.8	136	i 12 25 <sup>a</sup>	P <sub>c</sub> P	i 22 28	+ 3	—	—
Malaga	z.	81.4	307	i 12 23 <sup>k</sup>	+ 3	i 21 57	-34	i 15 25	PP 51.2
Pretoria	z.	85.1	238	i 12 38	- 1	—	—	—	—
Pietermaritzburg	z.	85.8	233	i 12 41	- 1	—	—	—	—
Grahamstown		90.6	232	i 13 10	+ 5	—	—	—	—
Victoria		95.2	25	e 13 27	0	—	—	e 17 19	PP
Hungry Horse		98.5	20	i 14 43	+61	—	—	e 17 35	PP
Mineral		102.7	28	e 17 4	?	—	—	e 18 4	PP
Reno	z.	104.1	28	e 17 46	PP	—	—	—	—
Lick	z.	105.1	30	e 18 33 <sup>k</sup>	PP	—	—	—	—
Fresno	z.	106.5	29	e 18 36 <sup>k</sup>	PP	—	—	e 20 54	PPP
Tinemaha	z.	106.8	28	e 18 29	[+ 2]	—	—	e 18 48	PP
Harvard		108.3	349	e 18 52	PP	e 28 27	PS	e 21 23	PPP e 59.3
Overton	z.	108.9	26	e 17 55	?	—	—	i 19 2	PP
Boulder City		109.2	26	e 18 32	[ 0]	—	—	—	—
Pierce Ferry		109.4	25	e 17 53	?	—	—	i 19 6	PP
Pasadena		109.4	29	e 19 3	PP	—	—	e 29 41	PKKP e 63.0
Philadelphia		111.3	352	—	—	e 38 44	SSS	—	— e 64.4
Tucson		114.0	25	e 18 44	[+ 3]	—	—	—	—
Bogota		145.7	343	i 19 43	[+ 3]	i 29 52	{- 2}	i 22 46	SKP e 85.0
Chinchina		145.7	345	i 19 38	[- 2]	—	—	i 19 49	PKP <sub>1</sub>
La Paz		161.4	308	20 7	[+ 5]	—	—	—	74.5
Huancayo		161.8	334	e 20 5	[+ 2]	—	—	—	—

Additional readings and note :—

New Delhi SEN = 6m.57s., SSSEN = 7m.27s.

Nanking iSN = 8m.11s.

Warsaw eZ = 10m.16s., eEZ = 10m.45s., eZ = 11m.53s., ePPPE = 13m.32s., eP<sub>c</sub>SE =

14m.58s., eE = 18m.1s. and 18m.32s., eSSE = 21m.59s., eSSSE = 24m.19s.

Upsala iE = 10m.18s., i = 18m.33s., eN = 19m.30s., eS<sub>c</sub>SE = 20m.2s., eSSE = 22m.46s.,

eQ?E = 25m.44s.

Budapest i = 10m.28s.

Copenhagen 20m.43s.

Prague eEZ = 10m.42s., eSS = 24m.2s.

Collmberg eZ = 10m.48s.

Triest ePPZ = 13m.16s.

Rome i = 11m.5s.

Stuttgart e = 11m.8s., eSS = 24m.8s.

Strasbourg e = 11m.14s., iP<sub>c</sub>P = 11m.27s., iPP = 13m.28s., i = 14m.52s., iPPP = 15m.14s.,

eS = 20m.14s., ePS = 20m.19s., eS<sub>c</sub>S = 21m.17s., eSS = 24m.32s., eSSS = 27m.52s.

Besançon e = 11m.23s., eP<sub>c</sub>P = 11m.40s.

Paris i = 11m.35s. and 14m.4s., ePPP = 15m.55s., ePS = 21m.19s.

Scoresby Sund i = 21m.43s.

Kew eSKSN = 21m.2s.

Clermont-Ferrand ePPP = 15m.53s.

College ePKKP? = 29m.31s.

Algiers Univ. iZ = 11m.58s., eZ = 12m.7s., 12m.39s., and 13m.2s.

Brisbane iZ = 12m.9s. and 12m.18s.

Toledo iZ = 12m.18s. and 12m.35s.

Granada PS = 23m.11s., SS = 27m.26s.

Tamanrasset iZ = 12m.19s., iP<sub>c</sub>PZ = 12m.22s., eZ = 15m.1s.

Hungry Horse e = 14m.49s.

Mineral eZ = 17m.17s.

Tinemaha ePKKPZ = 29m.52s.

Overton ePKKP?Z = 29m.51s.

Pierce Ferry e = 29m.50s.

Long waves were also recorded at Bergen, Aberdeen, Ivigtut, Seattle, Seven Falls,

Weston and Bermuda.

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Aug. 23d. Readings also at 0h. (Granada), 1h. (Bombay, Calcutta, and Zi-ka-wei), 2h. (Granada, Calcutta, College, Pierce Ferry, and Shasta Dam), 3h. (Strasbourg, near Istanbul, and near Apla), 4h. (Boulder City and Shasta Dam), 7h. (College), 8h. (Tamanrasset, Granada, Frunse, near Almata, and Przhevalsk), 9h. (Upsala), 10h. (Hungry Horse, near Basle, and Zürich), 11h. (near Balse), 12h. (College and near Andijan), 14h. (Overton and Pierce Ferry), 16h. (Bandong), 17h. (Kulyab, Tashkent, Samarkand, near Garm, Obi-garm, Stalinabad, Fergana, Andijan, and near Alicante), 18h. (Kew), 19h. (Calcutta, New Delhi, Almata, Andijan, Frunse, Obi-garm, Kulyab, Stalinabad, Samarkand, Stuttgart (2), College, Tamanrasset, and Pretoria), 20h. (Ashkabad, near Yalta, and near Ottawa), 21h. (near Przhevalsk and near Yalta), 22h. (Lick and New Delhi), 23h. (Tashkent, Samarkand, Naryn, Frunse, near Murgab, Garm, Obi-garm, Kulyab, Fergana, Stalinabad, Andijan, and near Przhevalsk).

Aug. 24d. 1h. 27m. 44s. Epicentre 27°·5N. 96°·4E. (as on 16d.).

A = -·0990, B = +·8828, C = +·4593;  $\delta = +9$ ;  $h = +3$ ;  
D = +·994, E = +·111; G = -·051, H = +·456, K = -·888.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.	
		°	°	m. s.	s.	m. s.	s.	m. s.	m.	
Calcutta	E.	8·8	237	e 2 32	P*	e 4 13	+20	e 5 6	S <sub>g</sub>	—
Dehra Dun	N.	16·3	285	e 5 40	?	—	—	—	—	e 8·6
New Delhi		17·0	278	e 3 55	- 6	i 6 52	-18	—	—	—
Hyderabad	E.	19·3	242	e 4 44	+15	8 25	+23	—	—	10·8
Nanking		20·0	71	e 4 34	- 3	i 8 20	+ 3	i 4 38	PP	i 9·1
Przhevalsk		20·9	320	4 46	0	i 8 40	+ 5	—	—	—
Murgab		21·7	305	4 53	- 2	—	—	—	—	—
Naryn		21·7	315	e 4 52	- 3	e 8 52	+ 1	—	—	—
Zi-ka-wei	Z.	22·1	73	e 5 0	+ 1	i 9 3	+ 5	—	—	e 11·7
Almata		22·3	320	i 4 57	- 4	i 9 4	+ 2	—	—	—
Poona	E.	22·5	252	5 12	+10	9 18	+13	10 22	SSS	9·9
Bombay	E.	23·3	253	e 5 24	+14	e 9 31	+11	—	—	—
Frunse		23·4	316	e 5 9?	- 2	e 9 27?	+ 6	—	—	—
Andijan		23·8	309	e 5 15	0	i 9 32	+ 4	—	—	—
Fergana		24·0	309	e 5 17	0	—	—	—	—	—
Kulyab		24·6	302	e 5 32	+ 9	e 9 57	+15	—	—	—
Kodaikanal	E.	24·8	230	e 5 35	+10	e 10 5	+19	—	—	—
Irkutsk		25·5	10	5 31	- 1	9 55	- 2	—	—	—
Stalinabad		25·6	303	i 5 32	0	i 9 59	0	—	—	—
Colombo	E.	25·8	221	10 21	S	(10 21)	+19	—	—	23·3
Tashkent		26·1	309	e 5 38	+ 1	i 10 11	+ 4	—	—	—
Samarkand		27·2	304	e 5 49?	+ 2	—	—	—	—	—
Mary		30·6	298	e 6 19	+ 1	—	—	—	—	—
Vladivostok		32·6	52	e 6 32	- 3	—	—	—	—	—
Ashkabad		33·5	298	e 6 29	-14	—	—	—	—	—
Sverdlovsk		38·7	329	i 7 19	- 8	13 17	- 8	—	—	—
Tifis		44·1	303	e 8 27	+15	—	—	—	—	—
Moscow		50·3	321	e 8 59	- 1	e 16 13	0	—	—	—
Ksara		51·8	293	i 9 15	+ 3	16 40	+ 7	—	—	—
Yalta		51·9	307	e 9 10	- 2	e 16 32	- 3	—	—	—
Pulkovo		54·7	326	e 9 31	- 2	e 17 11	- 2	—	—	—
Warsaw		60·0	317	e 10 12	+ 1	e 18 22	PS	e 19 56	S <sub>c</sub> S	31·3
Prague		64·5	315	e 10 38	- 3	—	—	—	—	—
Jena	E.	66·0	316	e 10 49	- 1	—	—	—	—	—
Triest		66·0	311	e 10 48	- 2	e 19 34	- 4	—	—	—
Rome		67·9	307	e 11 23	+21	—	—	—	—	e 35·9
Stuttgart		68·1	315	e 11 2	- 2	e 20 2	- 1	—	—	—
Chur		68·4	313	e 11 4 <sub>k</sub>	- 2	—	—	—	—	—
Strasbourg		69·1	315	e 11 5	- 5	—	—	e 11 50	P <sub>c</sub> P	—
Basle		69·5	314	e 11 10	- 2	—	—	—	—	—
Besançon		70·6	314	e 11 16	- 3	—	—	—	—	—
Paris		72·3	316	e 11 28	- 1	—	—	e 14 20	PP	e 41·3
Kew		72·9	320	i 11 45	+12	e 21 3	+ 4	—	—	e 37·3
Clermont-Ferrand		73·0	313	e 11 33	0	e 21 2	+ 2	—	—	—
College		75·5	23	e 11 44	- 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.
Algiers Univ.	z.	76.6	304	e 11 53	- 1	—	—	—	—
Brisbane	z.	77.1	129	i 11 59	+ 2	—	—	—	—
Tamanrasset	z.	80.5	291	i 12 17k	+ 2	—	—	e 15 20	PP
Pretoria	z.	84.3	237	e 12 34	- 1	—	—	—	—
Hungry Horse		99.7	20	i 13 48	+ 1	—	—	—	—
Bogota		146.8	342	i 19 46	[+ 4]	—	—	—	—

Additional readings :—

Calcutta eS\*E = 4m.43s.

New Delhi iSE = 6m.55s.

Poona P<sub>c</sub>SE = 12m.12s.

Warsaw eZ = 10m.54s., eScSN = 20m.8s., eZ = 23m.3s., eN = 26m.9s.

Prague e = 10m.45s., 11m.28s., 11m.35s., and 12m.21s.

Strasbourg i = 11m.10s., e = 12m.21s. and 28m.11s.

Paris i = 11m.32s. and 11m.38s., ePPP = 15m.58s.

Tamanrasset eZ = 15m.46s.

Long waves were also recorded at other European stations.

Aug. 24d. 6h. 5m. 15s. Epicentre 31°·0N. 138°·5E. Depth of focus 0·040.

Intensity IV at Makabe (Ibaraki Prefecture); II-III at Yokohama and Utunomiya.  
Epicentre as adopted. Depth 150km. Macroseismic radius greater than 300km.

Seismo. Bull., Cent. Met. Obs., Japan, 1950. Tokyo, 1952, pp.38-39.

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.
	$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.
Siomisaki	3.4	318	1 1	+ 2	1 46	0
Omaesaki	3.6	356	1 14	+12	1 50	0
Owase	3.6	328	1 4 <sub>a</sub>	+ 2	1 48	- 2
Osima	3.8	11	1 7	+ 3	1 54	0
Shizuoka	4.0	359	1 8	+ 2	1 55	- 3
Mera	4.1	16	1 8	+ 1	1 56	- 4
Kameyama	4.2	337	1 9	+ 1	1 58	- 4
Nagoya	4.3	343	1 11 <sub>a</sub>	+ 2	2 0	- 4
Osaka	4.4	326	1 13 <sub>a</sub>	+ 2	2 2	- 4
Hunatu	4.5	3	1 13 <sub>k</sub>	+ 1	2 3	- 5
Sumoto	4.5	319	1 12 <sub>a</sub>	0	1 52	-16
Yokohama	4.5	12	1 15 <sub>a</sub>	+ 3	2 6	- 2
Gihu	4.6	342	1 12	- 1	2 3	- 7
Kohu	4.6	1	1 18	+ 5	2 10	0
Kyoto	4.6	331	1 14	+ 1	2 3	- 7
Hikone	4.7	337	1 14	0	2 5	- 7
Tokyo	4.8	13	1 15	0	2 7	- 7
Koti	4.9	302	1 17 <sub>a</sub>	+ 1	2 13	- 3
Kumagaya	5.2	8	1 20	0	2 15	- 7
Tukubasan	5.4	14	1 21	- 1	2 19	- 8
Maebasi	5.4	5	1 17	- 5	2 16	-11
Matusiro	5.5	358	2 19	+55	—	—
Matuyama	5.6	302	1 24	- 1	2 26	- 5
Mito	5.6	16	1 20	- 5	2 23	- 8
Nagano	5.6	358	1 5	-20	2 21	-10
Utunomiya	5.6	11	1 23	- 2	2 20	-11
Toyama	5.8	350	2 12	?	—	—
Miyazaki	6.1	280	1 35	+ 4	2 45	+ 3
Onahama	6.2	18	1 43	+11	2 32	-12
Ooita	6.2	293	1 41	+ 9	2 46	+ 2
Kagosima	6.8	277	2 0	+21	2 58	+ 1
Hokusima	6.9	13	1 37	- 4	2 46	-14
Aikawa	7.0	358	1 42	0	—	—
Hukuoka	7.3	293	1 45	- 1	3 5	- 3
Sendai	7.5	15	1 44	- 4	2 54	-19

Continued on next page.

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		$\Delta$	Az.	P.	O-C.	S.	O-C.
		$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.
Mizusawa	E.	8.4	14	—	—	3 18	-15
Morioka		8.9	13	1 57	- 8	3 28	-16
Miyako		9.1	17	3 16	+68	—	—
College		55.5	30	i 8 59	- 8	—	—
Victoria	z.	72.4	44	e 10 52	- 5	—	—
Shasta Dam		76.7	51	e 11 18	- 3	—	—
Mineral	z.	77.4	51	i 11 21	- 4	e 12 9	pP
Hungry Horse		77.9	41	i 11 23	- 5	—	—
Lick	z.	78.9	54	i 11 30 <sub>a</sub>	- 3	—	—
Tinemaha	z.	81.4	53	i 11 43	- 3	—	—
Haiwee	z.	82.1	53	i 11 46	- 4	—	—
Pasadena	z.	83.0	55	i 11 49	- 5	—	—
Riverside	z.	83.6	55	i 11 54	- 3	—	—
Overton	z.	84.2	51	i 11 58	- 2	—	—
Boulder City		84.3	52	i 11 57	- 4	—	—
Pierce Ferry		84.7	51	i 12 0	- 3	—	—
Stuttgart	z.	88.6	330	e 19 57	?	—	—
Tamanrasset	z.	110.1	314	i 21 14 <sub>a</sub>	PPP	—	—

Mizusawa also gives eSN = 3m.22s.

Aug. 24d. 17h. 45m. 31s. Epicentre 41°·8N. 126°·8W. (as on 1948, Jan. 10d.).

A = -·4479, B = -·5987, C = +·6641;  $\delta = +8$ ;  $h = -2$ ;  
D = -·801, E = +·599; G = -·398, H = -·532, K = -·748.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Ferndale		2.3	123	e 1 5	S	(e 1 5)	- 4	—	—
Shasta Dam		3.5	107	i 0 56	- 1	—	—	—	—
Mineral		4.2	108	e 1 5	- 2	e 1 56	- 1	—	e 3.7
Berkeley		5.2	137	i 1 23 <sub>k</sub>	+ 2	i 2 28	+ 6	—	—
Reno		5.8	111	e 1 31 <sub>a</sub>	+ 2	e 2 51	+13	—	—
Santa Clara		5.8	138	e 1 29	0	e 2 38	0	e 3 1	S* e 3.8
Lick		6.0	136	i 1 34 <sub>k</sub>	+ 2	i 2 45	+ 2	i 1 56	P* e 4.0
Seattle		6.6	27	i 1 39 <sub>k</sub>	- 2	i 2 48	-10	i 2 14	P* i 3.4
Victoria		7.1	18	e 1 40	- 8	e 2 50	-20	3 39	S* —
Fresno		7.4	131	e 2 1	+ 9	e 3 11	- 7	—	e 4.8
Tinemaha	z.	8.1	122	i 2 8	+ 6	i 3 52	S*	—	—
Haiwee	z.	8.9	127	e 2 25	P*	—	—	—	—
Pasadena		10.2	136	e 2 34	+ 3	—	—	—	i 4.6
Riverside	z.	10.8	133	i 2 41	+ 2	—	—	—	—
Overton	z.	10.9	114	e 2 45	+ 5	—	—	—	e 6.1
Boulder City		11.0	118	e 2 46	+ 4	—	—	—	—
Hungry Horse		11.2	50	e 2 34	-10	(e 4 29)	-23	—	e 4.5
Salt Lake City		11.3	90	e 2 32	-14	e 4 36	-18	—	e 5.2
Pierce Ferry		11.5	115	i 2 51	+ 3	—	—	—	e 6.3
Bozeman		12.0	66	e 2 49	- 6	(e 5 32)	+21	—	e 5.5
Tucson		15.9	122	e 3 50	+ 3	e 7 3	+19	i 4 8	PP e 7.2
College		26.0	339	e 5 35	- 1	—	—	—	—
St. Louis		28.0	85	e 5 53	- 2	e 10 39	+ 1	e 6 33	PP —
Cleveland		33.5	75	i 6 41 <sub>k</sub>	- 2	e 12 8	+ 3	—	—
Resolute Bay	E.	36.0	15	—	—	e 12 43	- 1	—	—
Philadelphia		38.6	75	—	—	e 13 32	+ 9	—	e 20.3

Additional readings :—

Berkeley iZ = 1m.29s., eEZ = 2m.41s., iEZ = 2m.54s., eZ = 3m.59s.

Lick iZ = 1m.38s.

Seattle i = 1m.46s. and 2m.53s.

Victoria S = 3m.15s.

Pasadena iZ = 2m.38s.

Tucson i = 4m.25s.

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



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Aug. 24d. Readings also at 0h. (Collmberg, near Almata, and Przhivalsk), 1h. (Collmberg, Jena, Stuttgart, Chur, Tamanrasset, Pretoria, and near Ashkabad), 2h. (Collmberg, and near Huancayo), 5h. (Chinchina and near Bogota), 6h. (Hungry Horse, College, near Oaxaca, Puebla, Tacubaya, and near Yalta), 7h. (Huancayo), 9h. (Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Shasta Dam, Hungry Horse, near Borzhomi, and near Garm), 10h. (Victoria (2), Stuttgart, Tamanrasset, Frunse, Murgab, Naryn, Samarkand, Mary, near Andijan, Fergana, Garm, Kulyab, Stalinabad, and Tashkent), 11h. (Kew, Clermont-Ferrand, Port au Prince, Bermuda, Harvard, Weston, Tinemaha, Tucson, Hungry Horse (2), Overton (2), Pierce Ferry (2), and College), 12h. (Overton, Pierce Ferry, Hungry Horse, and near Mizusawa), 13h. (Kew and near Garm), 14h. (Tamanrasset), 15h. (Prague and near Alicante), 16h. (Kew and Malaga), 17h. (Kulyab, near Andijan, Garm, Obigarm, and near Huancayo), 18h. (Stuttgart), 19h. (Stuttgart and near Garm), 20h. (near Ottawa), 22h. (La Paz, near Almata, Naryn, and Przhivalsk), 23h. (Stuttgart, Tamanrasset, and Overton).

Aug. 25d. 2h. 15m. 11s. Epicentre 49°·5N. 129°·0W.

A = -·4103, B = -·5067, C = +·7582;  $\delta = -4$ ;  $h = -5$ ;  
D = -·777, E = +·629; G = -·477, H = -·589, K = -·652.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m
Victoria	3·8	103	e 1 2	+ 1	1 50	+ 3	e 1 19	S* e 1·9
Seattle	4·8	110	—	—	e 2 5	- 7	i 2 37	S <sub>r</sub> i 3·2
Hungry Horse	9·9	91	e 2 28	+ 3	—	—	—	—
Shasta Dam	10·0	150	e 2 28	+ 1	—	—	—	—
Reno	11·9	143	e 2 55k	+ 1	—	—	—	—
Lick	z. 13·3	154	e 3 13a	0	—	—	—	—
Fresno	z. 14·4	149	e 3 27a	0	—	—	—	—
Tinemaha	z. 14·7	144	i 3 48	+17	—	—	—	—
Overton	z. 16·7	135	e 3 58	+ 1	—	—	—	—
Pasadena	z. 17·3	147	i 4 4	0	—	—	—	—
Pierce Ferry	17·3	134	i 4 7	+ 3	—	—	—	—
Riverside	z. 17·7	146	i 4 7	- 3	—	—	—	—
College	18·3	335	e 4 15	- 2	—	—	—	—
Palomar	18·5	145	e 4 20	+ 1	—	—	—	—
Tucson	21·9	135	e 4 56	- 1	—	—	—	—

Additional readings :—

Seattle e = 2m.14s., i = 2m.53s.

Reno eEN = 3m.22s.

Long waves were also recorded at other American stations.

Aug. 25d. 8h. 14m. 8s. Epicentre 29°·2N. 95°·1E. (as on 23d.).

	$\Delta$	Az.	P.	O-C.	S.	O-C.	L.
	°	°	m. s.	s.	m. s.	s.	m.
New Delhi	15·7	272	e 3 39	- 5	e 6 40	+ 1	—
Hyderabad	E. 19·2	236	e 4 21	- 7	e 8 2	+ 3	—
Murgab	19·8	304	4 32	- 3	—	—	—
Naryn	19·8	315	e 4 34	- 1	—	—	—
Almata	20·2	320	i 4 41	+ 2	—	—	—
Nanking	20·6	75	e 4 42	- 1	e 8 39	+10	e 9·9
Frunse	21·4	315	e 4 54?	+ 3	e 8 59?	+14	—
Andijan	21·8	308	e 4 57?	+ 1	9 5?	+13	—
Fergana	22·1	308	e 5 0	+ 1	e 9 4	+ 6	—
Poona	E. 22·1	246	4 53	- 6	8 59	+ 1	—
Bombay	22·8	249	4 59	- 6	e 9 10	- 1	11·6
Kulyab	22·8	299	e 5 9	+ 4	e 9 15	+ 4	—
Irkutsk	24·0	13	5 23	+ 6	9 52	+20	—
Tashkent	24·2	307	e 5 20	+ 1	—	—	—
Kodaikanal	E. 25·1	226	e 5 22	- 6	e 9 51	0	—
Samarkand	25·3	302	e 5 30	0	—	—	—
Ashkabad	31·7	297	e 6 35	+ 8	—	—	—
Vladivostok	32·5	55	e 6 33	- 1	e 11 51	+ 2	—
Sverdlovsk	36·7	329	7 16	+ 6	—	—	—
Moscow	48·2	321	e 8 44	0	—	—	—

Continued on next page.

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		$\Delta$	Az.	P.	O-C.	S.	O-C.	L.
		°	°	m. s.	s.	m. s.	s.	m.
Ksara		50.1	291	i 9 6	+ 7	e 16 58	+48	—
Collmberg	z.	63.1	316	e 10 35	+ 3	—	—	—
Stuttgart		66.1	314	e 10 50	- 1	e 19 40	+ 1	—
College		74.4	23	i 11 42	0	—	—	—
Tamanrasset	z.	78.9	290	e 12 5	- 2	—	—	—
Pretoria	z.	84.3	236	e 12 31	- 4	—	—	—
Pietermaritzburg	z.	85.0	232	e 12 35	- 3	—	—	—

Additional readings :—

Stuttgart eZ = 10m.55s.

Tamanrasset eZ = 12m.13s. and 12m.47s.

Long waves were also recorded at other European stations.

Aug. 25d. 13h. 3m. 30s. Epicentre 29°·2N. 95°·1E. (as at 8h.).

		$\Delta$	Az.	P.	O-C.	S.	O-C.	L.
		°	°	m. s.	s.	m. s.	s.	m.
Calcutta	E.	9.0	224	e 4 0	S	(e 4 0)	+ 2	i 5.4
Przhevalsk		18.9	320	e 4 26	+ 2	8 6	+13	—
Murgab		19.8	304	4 32	- 3	8 14	+ 1	—
Naryn		19.8	315	4 34	- 1	8 18	+ 5	—
Almata		20.2	320	4 39	0	8 33	+12	—
Frunse		21.4	315	e 4 53	+ 2	e 8 54	+ 9	—
Andijan		21.8	308	e 4 56?	0	e 9 3	+11	—
Fergana		22.1	308	e 4 59	0	—	—	—
Bombay	E.	22.8	249	—	—	e 9 18	+ 7	—
Kulyab		22.8	299	5 7	+ 2	9 14	+ 3	—
Irkutsk		24.0	13	5 17	0	—	—	—
Tashkent		24.2	307	i 5 22	+ 3	—	—	—
Sverdlovsk		36.7	329	e 7 10	0	—	—	—
Collmberg	z.	63.1	316	e 10 30	- 2	—	—	—
Stuttgart	z.	66.1	314	e 10 49	- 2	—	—	—
College		74.4	23	i 11 39	- 3	—	—	—
Tamanrasset	z.	78.9	290	e 12 7	0	—	—	—
Overton	z.	109.0	24	i 19 0	PP	—	—	—

Bombay gives also eN = 9m.52s.

Long waves were also recorded at Poona and De Bilt.

Aug. 25d. 16h. 57m. 29s. Epicentre 27°·2N. 97°·4E. (as on 23d.).

		$\Delta$	Az.	P.	O-C.	S.	O-C.	L.
		°	°	m. s.	s.	m. s.	s.	m.
Calcutta	E.	9.4	243	e 4 14	S	(e 4 14)	+ 7	(i 5.3)
New Delhi		17.9	279	e 4 0	-12	e 6 51	-39	—
Przhevalsk		21.8	319	e 4 56	0	—	—	—
Murgab		22.6	306	4 59	- 4	8 52	-15	—
Almata		23.1	320	e 5 11	+ 3	e 9 7	- 9	—
Poona	E.	23.3	253	—	—	i 11 45	Q	12.9
Bombay		24.1	255	e 5 19	+ 1	e 9 31	- 3	i 12.1
Frunse		24.3	316	e 5 19	- 1	e 9 26	-11	—
Andijan		24.7	309	5 24	0	e 9 34	-10	—
Fergana		24.9	309	e 5 27	+ 1	—	—	—
Kodaikanal	E.	25.3	233	e 6 26	PP	—	—	—
Kulyab		25.5	302	e 5 32	0	e 9 52	- 5	—
Obi-garm		25.8	304	i 5 34	0	i 9 57	- 5	—
Tashkent		27.1	309	e 5 46	0	—	—	—
Stuttgart	z.	68.9	315	e 11 14	+ 5	—	—	—
College		75.4	24	e 12 5	+18	—	—	—

Aug. 25d. Readings also at 3h. (Huancayo, La Paz, Bombay, Calcutta (2), and near Garm), 7h. (near Garm), 11h. (Grahamstown), 13h. (Calcutta and College), 14h. and 15h. (Huancayo), 16h. (Ksara), 17h. (near Garm), 18h. (Besançon, Andijan, Ashkabad, Mary, Samarkand, near Kulyab, Obi-garm, Stalinabad, and near Ottawa (2)), 19h. (Kulyab, Samarkand, near Andijan, Garm, Fergana, Frunse, Murgab, Naryn, Stalinabad and Tashkent), 22h. (near Andijan), 23h. (Jena).

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Aug. 26d. 1h. Assam-Burma frontier region.

Przhevalsk eP = 34m.32s.  
 Naryn P = 34m.40s., eS = 38m.27s.  
 Almata iP = 34m.46s., S = 38m.44s.  
 Frunse eP = 34m.58s.?, eS = 39m.5s.?.  
 Andijan eP = 35m.3s.  
 Kulyab eP = 35m.6s., eS = 39m.19s.  
 Stalinabad eP = 35m.21s.  
 Irkutsk eP = 35m.23s.?.  
 Tashkent eP = 35m.28s.  
 Samarkand eP = 35m.39s.  
 Sverdlovsk eP = 37m.15s.  
 Bombay eN = 38m.54s., eE = 39m.33s., iN = 42m.21s.  
 Stuttgart eZ = 40m.57s.  
 College eP = 41m.45s., e = 44m.33s.  
 Tamanrasset eP?Z = 42m.25s., ePPZ = 45m.9s.  
 Hungry Horse eP? = 43m.39s., e = 43m.51s.

Aug. 26d. 4h. 39m. 27s. Epicentre 65°·0N, 162°·0W.

Felt at Nome, Kotzebue, and Wales. Epicentre 65°N, 162°W.

L. M. Murphy and F. P. Ulrich.

United States Earthquakes, 1950, Serial No. 755, Washington, 1952, p.17.

A = -·4042, B = -·1313, C = +·9052;  $\delta = 0$ ;  $h = -10$ ;  
 D = -·309, E = +·951; G = -·861, H = -·280, K = -·425.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
College	6·0	85	e 1 30	- 2	—	—	—	—
Resolute Bay	23·6	38	e 5 18	+ 5	e 9 29	+ 4	e 5 56	PPP 11·8
Victoria	26·2	109	i 5 38k	0	10 16	+ 7	—	—
Seattle	27·4	109	i 5 51a	+ 2	i 10 44	+16	i 6 43	PP e 13·8
Hungry Horse	30·2	99	i 6 13	- 1	e 11 20	+ 7	—	e 16·3
Saskatoon	30·5	87	—	—	11 20	+ 2	—	—
Butte	32·7	100	e 7 43	PP	e 11 53	+ 1	—	e 13·9
Shasta Dam	33·2	116	i 6 41	+ 1	—	—	—	—
Bozeman	33·6	99	e 6 50	+ 6	e 12 8	+ 2	e 8 8	PP e 14·3
Mineral	33·8	116	i 6 45	- 1	—	—	e 7 39	PP
Reno	35·2	114	e 6 58k	0	—	—	e 8 58	PPP
Berkeley	35·7	118	i 7 3	+ 1	e 12 31	- 8	e 15 9	SSS e 17·6
Santa Clara	36·3	118	e 7 15	+ 8	e 12 28	-20	—	e 22·1
Lick	36·4	118	e 7 7k	- 1	—	—	e 8 50	PPP e 22·0
Salt Lake City	37·3	104	e 6 59	-17	e 12 52	-12	e 8 13	PP e 15·6
Fresno	37·6	116	e 7 19k	+ 1	—	—	e 8 49	PP
Tinemaha	37·9	115	i 7 20k	0	e 13 21	+ 8	i 8 27	PP
Rapid City	38·2	93	e 7 27	+ 4	e 13 17	0	—	e 16·2
Halwee	38·8	115	i 7 30	+ 2	—	—	—	—
Overton	39·9	111	i 7 38	+ 1	e 13 27	-16	—	e 22·6
Boulder City	40·2	112	i 7 41	+ 1	—	—	—	—
Pierce Ferry	40·4	111	i 7 42	+ 1	e 13 27	-23	e 9 3	PP e 22·4
Pasadena	40·5	116	i 7 41k	- 1	i 13 55	+ 3	e 9 21	PP e 17·0
Riverside	41·0	116	i 7 47	+ 1	—	—	e 9 28	PP
Palomar	41·7	115	i 7 53	+ 1	—	—	—	—
Scoresby Sund	42·0	19	—	—	e 14 22	+ 8	—	— 20·6
Vladivostok	42·1	272	—	—	e 14 6	-10	—	—
Ivigut	44·9	39	e 8 18	0	e 15 3	+ 7	—	— 22·6
Tucson	45·1	110	e 8 20	0	e 15 6	+ 7	e 10 1	PP e 22·4
Irkutsk	46·1	302	e 8 24	- 4	—	—	—	—
Chicago	46·7	82	e 8 33	+ 1	e 15 13	- 9	e 18 27	SS e 18·6
Florissant	48·0	86	e 8 41	- 2	i 15 41	0	e 10 37	PP
St. Louis	48·2	86	e 8 43	- 1	e 15 42	- 1	—	—
Ottawa	48·6	69	i 8 45a	- 2	15 46	- 3	19 8	SS
Shawinigan Falls N.	48·8	66	8 47	- 2	e 14 50	-62	—	—

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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.	
Seven Falls	E.	49.1	65	8 52	+ 1	14 58	-58	19 25	SS	—
Cleveland		49.4	77	e 8 53 <sup>a</sup>	0	i 16 2	+ 2	e 19 36	SS	e 23.6
Cincinnati		50.2	81	e 12 10	PPP	e 16 10	- 1	—	—	e 26.0
Pennsylvania	N.	51.5	75	—	—	i 16 30	+ 1	e 20 8	SS	—
Harvard		52.6	68	i 9 19	+ 1	e 20 45	SS	i 11 20	PP	e 26.2
Weston		52.8	68	i 9 17	- 2	i 16 47	0	i 11 23	PP	—
Philadelphia		53.3	72	e 15 18	?	e 16 54	0	e 20 51	SS	e 23.2
Washington		53.4	74	i 9 27	+ 3	e 21 20	?	—	—	e 27.0
Halifax		53.9	60	—	—	e 21 19	?	—	—	e 26.1
Bergen	E.	54.6	8	—	—	e 17 56	PPS	—	—	—
Helsinki		55.0	357	—	—	e 17 16	- 1	—	—	26.6
Pulkovo		55.2	353	e 9 33	- 4	e 17 16	- 4	—	—	—
Upsala		55.5	1	e 11 53	PP	e 17 20	- 4	e 17 51	PPS	—
Columbia		56.0	81	—	—	e 17 33	+ 3	—	—	e 24.0
Nanking		56.9	276	—	—	e 17 39	- 3	e 23 53	SSS	e 26.7
Aberdeen		57.2	13	e 12 3	PP	i 18 33	+47	i 13 3	PPP	—
Edinburgh	E.	58.3	14	—	—	e 17 55	- 6	—	—	—
Moscow		58.7	348	e 9 59	- 3	e 17 59	- 7	—	—	—
Copenhagen		59.6	5	e 10 6	- 2	18 19	+ 2	—	—	26.6
Durham		59.6	14	—	—	i 18 26	+ 9	—	—	—
Tacubaya		61.2	106	e 10 11	- 8	—	—	—	—	e 32.8
Almata		62.7	316	e 10 30	+ 1	—	—	—	—	—
De Bilt		62.8	10	e 10 31	+ 1	e 19 9	+11	—	—	e 36.6
Kew		63.0	14	—	—	e 19 3	+ 2	e 22 57	SS	e 30.6
Warsaw		63.1	358	e 10 34	+ 2	19 6	+ 4	e 11 16	P <sub>c</sub> P	e 28.6
Frunse		63.8	318	e 10 34	- 2	e 19 11	0	—	—	—
Collmberg		64.0	4	e 10 35	- 3	e 20 3	PPS	e 10 42	P	e 32.6
Bermuda		64.1	68	—	—	e 19 15	+ 1	e 20 10	PPS	e 26.4
Jena		64.3	5	e 10 38	- 1	e 19 23	+ 6	e 13 9	PP	—
Naryn		64.7	316	e 10 40	- 2	—	—	—	—	—
Cheb		65.2	5	e 10 55	+10	e 21 22	?	e 26 31	SSS	—
Prague		65.2	3	e 10 46	+ 1	e 19 31	+ 3	e 14 51	PPP	—
Tchimkent		65.7	321	i 10 44	- 4	—	—	—	—	—
Paris		65.9	13	i 10 51	+ 1	e 20 19	PPS	e 24 1?	SS	e 30.6
Skalnate Pleso		66.1	358	e 10 49	- 2	e 19 40	+ 1	e 19 50	PS	—
Andijan		66.4	318	e 10 52	- 1	—	—	—	—	—
Stuttgart		66.4	7	e 10 51	- 2	e 19 43	0	e 24 15	SS	e 31.6
Strasbourg		66.5	8	e 10 52	- 2	e 19 46	+ 2	e 13 4	PP	e 27.7
Tashkent		66.7	321	e 10 53	- 2	e 19 43	- 3	—	—	—
Fergana		66.9	318	e 10 55	- 1	—	—	—	—	—
Besançon		67.7	10	e 10 59	- 2	—	—	e 11 57	?	—
Zürich		67.7	8	e 10 46 <sup>k</sup>	-15	—	—	—	—	—
Kishinev		68.0	353	e 10 59	- 4	e 19 55	- 7	—	—	—
Samarkand		68.9	322	e 11 9	0	—	—	—	—	—
Clermont-Ferrand		69.0	12	e 11 12	+ 3	e 20 19	+ 5	e 13 47	PP	33.6
Kulyab		69.8	319	e 11 17	+ 3	—	—	—	—	—
Yalta		70.1	348	e 11 15	- 1	e 20 26	- 1	—	—	—
Bucharest		70.7	354	e 10 51	-29	—	—	—	—	—
Tiflis		71.6	340	e 11 20	- 5	—	—	—	—	—
Mary		72.1	325	i 11 28	0	—	—	—	—	—
Ashkabad		72.6	328	e 11 32	+ 1	e 20 56	0	—	—	—
Leninakan		72.6	340	e 11 11?	-20	—	—	—	—	—
Rome		73.4	5	e 13 29	?	e 21 3	- 2	e 25 39	SS	e 29.8
Tortosa		73.6	14	—	—	21 12	+ 5	—	—	e 32.6
Toledo		74.0	18	e 11 39	0	e 21 30	+19	e 14 30	PP	38.2
Lisbon	z.	74.5	22	11 45	+ 3	—	—	—	—	—
Alicante		76.0	15	e 12 2	+11	i 21 38	+ 4	22 26	PPS	e 37.3
New Delhi		76.1	309	e 11 48	- 3	e 21 34	- 1	e 10 55	?	—
Granada		76.8	18	i 12 0 <sup>k</sup>	+ 5	21 48	+ 6	22 30	PS	i 39.0
Malaga	z.	77.1	18	i 11 54 <sup>k</sup>	- 3	e 21 48	+ 2	i 14 52	PP	40.4

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.	
Messina		77.1	3	e 14 1	?	e 25 25	?	e 14 58	PP	—
Algiers Univ.	z.	77.9	13	e 11 56	- 5	—	—	e 14 55	PP	—
Ksara		80.5	346	i 12 18	+ 3	e 22 54	PS	—	—	—
Fort de France		81.3	73	—	—	e 22 26	- 4	—	—	—
Chinchina		84.0	90	—	—	e 23 7	+10	—	—	e 41.6
Helwan	z.	84.9	349	e 12 38	0	—	—	—	—	—
Bogota		85.0	89	—	—	e 23 16	+ 9	e 24 37	PPS	e 44.8
Bombay		86.6	309	—	—	e 23 0	[-11]	e 23 30	ScS	—
Tamanrasset	z.	92.0	12	e 13 11	- 1	—	—	e 16 53	PP	—
La Paz		106.4	93	e 14 13	P	—	—	—	—	e 57.0
Pretoria	z.	140.2	345	e 19 36	[+ 5]	—	—	—	—	—
Grahamstown		147.8	346	e 19 51	[+ 7]	—	—	—	—	—

Additional readings :—

Seattle eSS = 11m.38s., eP<sub>c</sub>P = 12m.34s., and other unidentified readings.

Lick iZ = 7m.49s.

Fresno eZ = 7m.59s., eN = 11m.33s.

Riverside iZ = 7m.52s.

Florissant eSS = 19m.10s.

Ottawa i = 8m.48s.

Cleveland iPEZ = 8m.57s., eZ = 9m.40s., eE = 19m.54s.

Upsala eSS?E = 21m.33s. i.

Aberdeen iE = 19m.43s., eSSSE = 24m.18s.

Warsaw ePSEN = 19m.21s., eS<sub>c</sub>SE = 20m.26s., eSSN = 22m.47s., eSSSE = 25m.42s.

Jena eN = 10m.44s., 12m.47s., and 19m.6s., eSE = 19m.26s.

Prague e = 10m.53s., 11m.20s., 11m.37s., 11m.59s., 12m.43s., and 12m.50s., ePP = 13m.50s., e = 18m.38s., eSS = 23m.51s., eSSS = 26m.27s.

Paris i = 10m.55s., e = 12m.15s. and 22m.12s., eSSS = 26m.22s.

Stuttgart eZ = 10m.57s., e = 14m.13s. and 21m.51s.

Strasbourg i = 10m.59s., iP<sub>c</sub>P = 11m.9s., eSS = 24m.12s., eSSS = 27m.9s.

Clermont-Ferrand eSS = 24m.51s.

Toledo P<sub>c</sub>PZ = 11m.46s., eN = 26m.21s. and 29m.40s.

Alicante SSS = 29m.14s.

Granada PP = 15m.30s., SS = 24m.36s., SSS = 28m.30s.

Algiers Univ. eP<sub>c</sub>PZ = 12m.5s., eZ = 12m.44s.

Bogota eSSSEN = 37m.12s.

Tamanrasset ePPPZ = 18m.56s.

Long waves were also recorded at Potsdam, Calcutta, Christchurch, Wellington, Tanana-  
rive, Huancayo, and San Juan.

Aug. 26d. 6h. 33m. 6s. Epicentre 26°·8N. 95°·0E.

A = -·0779, B = +·8904, C = +·4485;  $\delta$  = +3;  $h$  = +3;  
D = +·996, E = +·087; G = -·039, H = +·447, K = -·894.

		$\Delta$ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	Supp. m. s.	L. m.	
Calcutta	E.	7.4	236	i 2 5	P*	i 3 45	S*	—	—	
Dehra Dun	N.	15.3	287	e 5 12	?	—	—	—	e 9.2	
New Delhi		15.9	281	e 3 43	- 4	6 45	+ 1	6 59	SS	6.5
Hyderabad	E.	17.9	242	i 4 9	- 3	7 40	+10	—	—	9.7
Przhevsk		20.7	323	i 4 43	- 1	i 8 28	- 3	—	—	—
Murgab		21.1	308	4 45	- 3	8 29	-10	—	—	—
Poona		21.2	251	i 4 50	+ 1	i 8 48	+ 7	5 18	PP	10.2
Nanking		21.4	70	i 4 51	0	i 8 41	- 4	e 4 45	?	10.1
Naryn		21.4	317	e 4 48	- 3	e 8 38	- 7	—	—	—
Bombay		21.9	253	e 4 56	- 1	e 8 56	+ 2	—	—	11.4
Almata		22.0	323	i 4 56	- 2	—	—	—	—	—
Frunse		23.1	318	i 5 7	- 1	i 9 15	- 1	—	—	—
Andijan		23.3	312	5 10	0	e 9 22	+ 2	—	—	—
Fergana		23.5	312	5 11	- 1	9 22	- 1	—	—	—
Zi-ka-wei	N.	23.5	72	e 5 16	+ 4	9 20	- 3	—	—	—
Kulyab		24.0	303	e 5 15?	- 2	—	—	—	—	—
Colombo	E.	24.5	218	5 24	+ 2	9 56	+16	—	—	15.8
Stalinabad		24.9	306	i 5 24	- 2	i 9 40	- 7	—	—	—
Tashkent		25.6	311	i 5 30	- 2	—	—	—	—	—
Tchimkent		25.9	313	i 5 35	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.
Irkutsk	26.4	11	e 5 40	0	—	—	—	—
Samarkand	26.6	305	e 5 44	+ 2	—	—	—	—
Mary	29.9	300	e 6 11	- 1	—	—	—	—
Ashkabad	32.7	299	e 6 40	+ 4	—	—	—	—
Vladivostok	34.0	51	e 6 46	- 2	i 12 3	-10	—	—
Djakarta	34.7	158	e 7 0	+ 6	e 17 36	L	—	(e 17.6)
Sverdlovsk	38.7	330	i 7 25	- 2	i 13 20	- 5	—	—
Tiflis	43.5	303	e 8 9	+ 2	—	—	—	—
Gori	44.0	303	e 8 11	0	—	—	—	—
Borzhomi	44.5	303	e 8 19	+ 4	—	—	—	—
Moscow	50.0	322	e 8 57	- 1	e 16 1	- 8	—	—
Ksara	50.9	292	i 9 11	+ 6	i 16 32	+11	—	—
Yalta	51.3	306	e 9 7	- 1	16 20	- 6	—	—
Pulkovo	54.5	326	e 9 31	- 1	e 17 3	- 7	—	—
Istanbul	55.3	303	e 9 41	+ 3	e 17 18	- 3	—	—
Helwan	55.5	289	e 9 16	-23	—	—	e 9 33	P
Bucharest	57.1	307 (e 10 6)	—	+16	(e 18 40)	+55	—	—
Helsinki	57.3	327	—	—	e 17 40	- 7	e 17 51	PS
Warsaw	59.6	317	e 10 3	- 5	e 18 11	- 6	e 18 31	PS
Timisoara	60.3	309	11 54	?	—	—	12 54?	?
Upsala	60.9	325	e 10 19	+ 2	e 18 28	- 6	e 12 27	PP
Budapest	61.5	312	e 10 49	+28	e 18 54?	+12	e 30 49	Q
Prague	64.1	315	e 18 39	?	e 19 2	-12	e 19 24	PS
Copenhagen	64.2	322	e 10 36	- 3	19 12	- 4	20 10	ScS
Potsdam	64.5	318	—	—	i 19 25	+ 6	—	e 34.9
Collmberg	64.7	316	e 10 42	0	e 19 18?	- 4	—	e 33.0
Cheb	65.4	316	—	—	e 19 21	- 9	e 23 0	SS
Jena	E. 65.7	316	e 10 50	+ 2	e 19 27	- 7	e 11 23	PcP
Bergen	E. 66.9	328	—	—	e 19 47	- 2	—	—
Padova	67.0	310	e 11 54	+57	19 56	+ 6	—	32.9
Rome	67.3	307	e 11 50	+51	e 19 54	0	e 14 1	PP
Florence, Xim.	67.7	309	—	—	e 19 59	+ 1	—	e 32.4
Stuttgart	67.7	315	e 10 58	- 3	e 19 53	- 5	e 24 30	SS
Chur	68.0	312	e 11 0	- 3	e 19 55	- 7	—	e 35.9
Zürich	68.5	313	e 11 4	- 2	e 20 1	- 7	—	e 39.9
Strasbourg	68.7	315	e 11 7	0	e 20 4	- 6	e 11 35	PcP
De Bilt	69.2	319	e 11 0	-10	e 20 4	-12	—	e 27.9
Besançon	70.2	314	11 12	- 5	—	—	e 11 36	PcP
Aberdeen	71.6	325	e 12 44	?	20 41	- 3	e 15 48	PPP
Paris	71.9	316	e 11 30	+ 3	i 20 42	- 6	e 13 55	PP
Durham	E. 72.2	323	—	—	i 21 0	+ 9	i 24 38	?
Clermont-Ferrand	72.6	313	e 11 21	-10	e 20 51	- 5	e 25 44	SS
Kew	72.7	319	i 12 4	PcP	i 20 52	- 5	e 29 18	Q
Algiers Univ.	z. 75.9	304	e 11 52	+ 2	—	—	—	e 33.9
Tortosa	76.2	308	—	—	e 21 29	- 7	30 17	Q
Alicante	77.9	307	e 12 12	+11	e 21 51	- 3	22 47	PPS
Tamanrasset	z. 79.6	290	e 12 11	+ 1	—	—	e 15 15	PP
Toledo	79.7	309	e 12 10	- 1	—	—	—	e 37.2
Pretoria	z. 82.9	236	i 12 30	+ 2	—	—	—	e 34.1
Hungry Horse	100.8	18	e 13 48	- 4	—	—	—	—
Harvard	109.9	349	—	—	e 25 22 [+10]	—	e 27 49	?
Overton	z. 111.2	24	e 19 15	PP	—	—	—	e 57.6
Pierce Ferry	111.7	24	e 19 16	PP	—	—	—	—
Bogota	147.0	340	e 19 40	[- 3]	—	—	—	—
Chinchina	147.2	342	e 19 51	[+ 8]	—	—	—	—
La Paz	161.3	300	—	—	—	—	e 75 10	Q

Additional readings and note :—

Calcutta iS\*E = 4m.20s., iS<sub>z</sub>E = 4m.46s.

New Delhi iSEN = 6m.33s.

Helwan eEZ = 9m.24s.

Bucharest readings have been increased by 12 minutes.

Warsaw eScS = 20m.6s., eSS = 22m.0s., eSSS = 24m.34s.

Upsala ePPPN = 13m.31s., e = 18m.39s., eScS?E = 20m.14s., eN = 20m.24s.

Jena eE = 19m.40s.

Continued on next page.

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Stuttgart e = 11m.3s., eSSS? = 27m.24s.  
 Zürich e = 11m.52s. and 12m.22s.  
 Strasbourg ePP = 13m.15s., e = 17m.44s. and 20m.14s., eSS = 24m.40s., eSSS = 27m.30s.  
 Aberdeen SSEN = 24m.54s., iEN = 26m.49s., eN = 30m.1s., eE = 30m.49s.  
 Paris e = 12m.38s., ePS = 21m.1s., e = 29m.10s.  
 Alicante SS = 26m.59s.  
 Tamanrasset iZ = 13m.0s., eZ = 13m.58s.  
 Toledo iZ = 12m.39s. and 13m.32s.  
 Long waves were also recorded at Edinburgh, Malaga, Scoresby Sund, Christchurch, Bermuda, and at other North American stations.

Aug. 26d. 7h. New Hebrides region. Suggested depth. 100 km.

Brisbane iPZ = 16m.25s.a.  
 Berkeley iPZ = 25m.3s.a, eN = 26m.24s., ePPPEN = 30m.54s., eSE = 35m.27s., eN = 36m.12s.  
 Lick iPZ = 25m.4s.a.  
 Pasadena iPZ = 25m.8s., eZ = 25m.46s., eLE = 28.8m.  
 Fresno ePZ = 25m.9s.a.  
 Shasta Dam eP = 25m.10s.  
 Mineral ePZ = 25m.11s.  
 Riverside iPZ = 25m.11s.  
 Palomar iPEN = 25m.12s.  
 Haiwee iPZ = 25m.13s.  
 Reno ePZ = 25m.14s.a.  
 Tinemaha iPZ = 25m.15s., eZ = 25m.58s.  
 Overton iPZ = 25m.27s.  
 Pierce Ferry iP = 25m.28s.  
 Tucson iP = 25m.32s.  
 College eP? = 25m.33s.  
 Collmberg eZ = 31m.54s. and 32m.44s.  
 Stuttgart ePKPZ = 32m.4s.  
 Tamanrasset iPKPZ = 33m.23s.k, epPZ = 34m.0s.  
 Huancayo e = 61m.6s., 65m.24s., and 79m.48s.

Aug. 26d. 13h. 34m. 18s. Epicentre 32°·0N. 95°·0E.

Epicentre given by Strasbourg.

A = -·0741, B = +·8464, C = +·5273;  $\delta = -7$ ;  $h = +1$ ;  
 D = +·996, E = +·087; G = -·046, H = +·525, K = -·850.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	E.	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Calcutta		11·1	214	e 5 6	SS	i 6 44	L	—	(i 6·7)
New Delhi		15·8	262	e 3 41	- 4	6 45	+ 3	e 6 30	? 6·4
Przhevalsk		16·8	314	3 58	0	7 18	+13	—	—
Naryn		17·9	306	e 4 12	0	7 35	+ 5	—	—
Almata		18·2	314	e 4 12	- 4	—	—	—	—
Murgab		18·4	296	e 4 20	+ 2	—	—	—	—
Frunse		19·5	309	e 4 27	- 4	—	—	—	—
Andijan		20·2	301	e 4 34	- 5	8 25	+ 4	—	—
Nanking		20·2	83	e 4 40	+ 1	e 8 19	- 2	—	e 10·3
Fergana		20·5	301	e 4 37	- 5	—	—	—	—
Kulyab		21·5	293	e 4 53	+ 1	e 8 51	+ 4	—	—
Stalinabad		22·4	295	i 4 58	- 4	i 9 3	- 1	—	—
Tashkent		22·6	302	i 5 1	- 2	i 9 11	+ 4	—	—
Samarkand		23·9	296	e 5 15	- 1	e 9 30	0	—	—
Bombay		24·0	242	—	—	e 9 37	+ 5	—	i 12·9
Mary		27·7	292	e 5 54	+ 2	—	—	—	—
Ashkabad		30·5	292	e 6 14	- 3	—	—	—	—
Moscow		46·1	319	e 8 27	- 1	—	—	—	—
Ksara		49·1	290	e 8 51	0	e 16 20	+24	—	—
College		71·3	24	e 11 23	0	—	—	—	—
Tamanrasset	z.	77·9	290	e 12 3	+ 2	e 16 22	PPP	e 14 56	PP

Long waves were also recorded at Upsala, Copenhagen, De Bilt, Potsdam, Stuttgart, Paris, Clermont-Ferrand, and Rome.

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Aug. 26d. Readings also at 0h. (Collmberg), 1h. (Bermuda), 2h. (Stuttgart, Harvard, Weston, Hungry Horse, Overton, Tucson (2), and near San Juan), 3h. (Aberdeen, Calcutta, New Delhi, Bombay, Nanking, Przhevalsk, Naryn, Almata, Frunse, Andijan, Fergana, Kulyab, Tashkent, Samarkand, Tchimkent, Sverdlovsk, Prague, Collmberg, Stuttgart, and College), 4h. (College, Santa Clara, Bogota, Pretoria, Aberdeen, Tamanrasset (2), and near Djakarta), 5h. (Boulder City and Tamanrasset), 6h. (Kodaikanal, Overton, Pierce Ferry, Kulyab, Samarkand, Fergana, Tashkent, Murgab, near Stalinabad, Andijan, near Ashkabad, near Puebla, Tacubaya, Vera Cruz, Oaxaca, and Guadalajara), 7h. (Kodaikanal and near Stalinabad), 9h. (Bogota, Huancayo, Overton, Pierce Ferry, Ottawa, Borzhomi, Erevan, Leninakan, near Tiflis, and near Garm), 10h. (College, Pasadena, Riverside, Palomar, Haiwee, Tinemaha, Lick, Mineral, Shasta Dam, Hungry Horse, Boulder City, Overton, Pierce Ferry, Tucson, New Delhi, Poona, Bombay, Przhevalsk, Naryn, Almata, Frunse, Andijan, Fergana, Kulyab, Stalinabad, Tashkent, Tchimkent, Samarkand, Irkutsk, Sverdlovsk, Stuttgart, Tamanrasset, and near Tananarive), 11h. (Paris, De Bilt, Tiflis, Zugdidi, near Borzhomi, and Leninakan), 12h. (Apia and near Taranto), 14h. (Kodaikanal, Apia, Ksara, and Tamanrasset), 15h. (College, Tashkent, Samarkand, Kulyab, Stalinabad, near Naryn, Murgab, Przhevalsk, Frunse, Almata, Andijan, Fergana, Obi-garm, and near Ottawa), 16h. (Riverview, Cebb River, Wellington, Kew, and Rome), 17h. (Kulyab, Obi-garm, Fergana, Andijan, Naryn, Stalinabad, Frunse, Tashkent, Samarkand, Przhevalsk, near Murgab, and near Victoria), 19h. (Tamanrasset (2), Pierce Ferry, and near Fort de France), 21h. (Frunse, Tashkent, near Przhevalsk, Almata, Naryn, and Andijan).

Aug. 27d. 10h. 59m. 58s. Epicentre 29°·2N. 95°·1E. (as on 25d.).

Intensity VI at Dibrugarh, Seismo. Bull. Gov. of India, p. 36.

A = -·0777, B = +·8709, C = +·4853;  $\delta = +2$ ;  $h = +2$ ;  
D = +·996, E = +·089; G = -·043, H = +·483, C = -·874.

		$\Delta$	Az.	P.	O - C.	S.	O - C.	Supp.	L.	
		°	°	m. s.	s.	m. s.	s.	m. s.	m.	
Calcutta	E.	9·0	224	—	—	e 3 44	-14	i 3 58	S	—
New Delhi		15·7	272	e 3 41	- 3	e 6 26	-13	—	—	6·3
Hyderabad	E.	19·2	236	4 30	+ 2	7 55	- 4	—	—	9·9
Murgab		19·8	304	4 30	- 5	8 10	- 3	—	—	—
Naryn		19·8	315	e 4 33	- 2	e 8 13	0	—	—	—
Almata		20·2	320	i 4 40	+ 1	—	—	—	—	—
Nanking		20·6	75	4 47 <sup>k</sup>	+ 4	i 8 53	+24	—	—	11·2
Frunse		21·4	315	i 4 53	+ 2	e 8 51	+ 6	—	—	—
Andijan		21·8	308	4 58	+ 2	e 9 1	+ 9	—	—	—
Fergana		22·1	308	e 4 58	- 1	e 8 57	- 1	—	—	—
Poona		22·1	246	5 2	+ 3	9 0	+ 2	—	—	—
Bombay		22·8	249	—	—	e 9 6	- 5	—	—	e 11·3
Kulyab		22·8	299	i 5 4	- 1	e 9 9	- 2	—	—	—
Stalinabad		23·6	301	i 5 14	+ 1	i 9 29	+ 4	—	—	—
Irkutsk		24·0	13	i 5 24	+ 7	—	—	—	—	—
Tashkent		24·2	307	e 5 21	+ 2	—	—	—	—	—
Tchimkent		24·4	310	i 5 23	+ 2	—	—	—	—	—
Kodaikanal	E.	25·1	226	e 5 35	+ 7	e 9 59	+ 8	—	—	—
Samarkand		25·3	302	e 5 32	+ 2	—	—	—	—	—
Mary		28·9	297	e 6 19	+16	—	—	—	—	—
Ashkabad		31·7	297	e 6 27	0	—	—	—	—	—
Sverdlovsk		36·7	329	i 7 12	+ 2	e 12 56	+ 2	—	—	—
Moscow		48·2	321	e 8 44	0	e 15 40	- 3	—	—	—
Yalta		50·0	305	e 8 57	- 1	—	—	—	—	—
Ksara		50·1	291	e 8 59	0	e 16 23	+13	—	—	—
Pulkovo		52·6	325	e 9 17	- 1	16 44	0	—	—	—
Prague		62·5	315	e 10 26	- 2	—	—	e 13 40	PP	—
Collmberg	z.	63·1	316	e 10 31	- 1	—	—	—	—	—
Jena	E.	64·0	316	e 10 36	- 2	—	—	e 12 57	PP	—
Triest	z.	64·0	310	i 10 36 <sup>a</sup>	- 2	—	—	—	—	—
Stuttgart		66·1	314	i 10 51 <sup>a</sup>	0	e 19 32	- 7	—	—	—
Strasbourg		67·1	315	i 10 56 <sup>a</sup>	- 1	—	—	e 11 24	P <sub>c</sub> P	—
De Bilt		67·5	319	e 10 50	-10	—	—	—	—	e 37·0
Paris		70·3	316	i 11 18	+ 1	e 20 55	PS	e 21 34	PPS	e 43·0
Clermont-Ferrand		71·0	312	e 11 21	- 1	—	—	—	—	44·0

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.
College	74.4	23	i 11 44	+ 2	—	—	—	—
Algiers Univ.	z. 74.7	304	i 11 42 <sub>a</sub>	- 1	—	—	e 11 54	P <sub>c</sub> P
Resolute Bay	z. 76.2	3	e 11 56	+ 4	—	—	—	—
Tamanrasset	z. 78.9	290	i 12 6 <sub>a</sub>	- 1	i 12 14	P <sub>c</sub> P	e 15 5	PP
Pretoria	z. 84.3	236	e 12 38	+ 3	—	—	—	—
Hungry Horse	98.5	19	e 13 43	+ 1	—	—	e 17 44	PP
Shasta Dam	102.3	28	e 17 46	PKP	—	—	e 18 11	PP
Reno	z. 104.3	26	e 18 30	[+ 8]	—	—	—	—
Overton	z. 109.0	24	e 18 35	[+ 4]	—	—	i 19 4	PP
Boulder City	109.3	24	e 19 2	PP	—	—	—	—
Pierce Ferry	109.5	24	e 18 22	[-10]	—	—	i 19 9	PP
Riverside	z. 110.0	28	e 18 36	[+ 3]	—	—	—	—
Tucson	114.1	24	e 19 45	PP	—	—	—	—
Begota	144.8	341	i 19 42	[+ 3]	—	—	—	—

Additional readings :—

Prague e = 10m.45s., eN = 11m.14s., e = 11m.31s.

Collmberg eZ = 10m.37s.

Jena eN = 10m.46s., eE = 10m.49s.

Stuttgart e = 10m.58s.

Strasbourg i = 11m.4s.

Paris i = 11m.24s.

Algiers Univ. iZ = 11m.49s.

Tamanrasset iZ = 12m.22s., eZ = 14m.5s., ePPPZ = 16m.53s.

Long waves were also recorded at Copenhagen, Upsala, Potsdam, and Kew.

Aug. 27d. 22h. 3m. 5s. Epicentre 39°·3N. 41°·2E. (as on 1948, June 20d.).

A = +·5838, B = +·5111, C = +·6308;  $\delta$  = -5;  $h$  = -1;  
D = +·659, E = -·752; G = +·475, H = +·416, K = -·776.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	I.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Leninakan	2.6	54	i 0 45?	+ 1	i 1 21?	+ 4	—	—
Erevan	2.7	71	0 51	+ 6	1 30	S <sub>g</sub>	—	—
Zugdidi	3.3	9	0 56	+ 3	—	—	—	—
Gori	3.5	39	0 57	0	—	—	—	—
Tiflis	3.6	48	0 56	- 2	—	—	—	—
Piatigorsk	4.9	15	e 1 21	+ 4	—	—	—	—
Baku	6.8	78	e 2 9	P <sub>g</sub>	—	—	—	—
Ksara	7.0	220	e 1 49?	+ 3	3 27	S*	—	—
Theodosia	7.2	324	e 1 57	+ 8	—	—	—	—
Yalta	7.4	317	e 1 56	+ 4	—	—	—	—
Istanbul	9.4	285	e 2 26	+ 8	e 4 59	S <sub>g</sub>	—	—
Helwan	z. 12.6	224	3 1	- 2	5 40	+14	3 12	PP
Ashkabad	13.5	90	e 3 16	+ 1	—	—	—	—
Moscow	16.6	354	e 3 54	- 2	e 7 8	+ 8	—	—
Warsaw	19.0	321	e 4 18	- 8	e 8 5	+10	e 8 30	SS e 9.9
Raciborzu	z. 19.5	312	e 4 30	- 1	—	—	—	—
Samarkand	19.9	81	e 4 33	- 3	—	—	—	—
Messina	20.0	276	e 4 38	+ 1	e 8 16	- 1	—	—
Triest	21.2	298	e 4 40	- 9	e 8 50	+ 9	—	—
Stalinabad	21.5	82	i 4 50	- 2	—	—	—	—
Tashkent	21.5	75	e 4 50?	- 2	e 8 56?	+ 9	—	—
Pulkovo	21.6	345	i 4 52	- 2	e 8 52	+ 3	—	—
Sverdlovsk	21.7	30	i 4 52	- 3	8 55	+ 4	—	—
Prague	21.8	310	e 4 55	- 1	e 9 4	+12	e 5 13	PP
Rome	21.9	288	4 56	- 1	e 9 5	+11	—	—
Obi-garm	22.1	82	i 4 57	- 2	i 9 12	+14	—	—
Kulyab	22.3	84	e 4 55	- 6	—	—	—	—
Padova	22.4	294	e 5 41	PP	—	—	—	—
Bologna	22.8	294	e 5 23	+18	—	—	—	—
Collmberg	z. 23.0	311	e 5 9	+ 2	—	—	—	—
Fergana	23.5	77	e 5 11?	- 1	—	—	—	—
Jena	N. 23.8	310	e 5 14	- 1	—	—	—	—
Andijan	23.9	77	e 5 15	- 1	e 9 32	+ 2	—	—
Stuttgart	24.7	305	e 5 23	- 1	e 9 51	+ 7	e 11 22	SSS e 14.9
Zürich	24.9	301	i 5 25 <sub>a</sub>	- 1	e 10 24	+37	—	—

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.
Copenhagen	25.2	321	i 5 28	- 1	e 9 55	+ 3	—	12.9
Frunse	25.3	70	5 29	- 1	—	—	—	—
Basle	25.6	301	e 5 35	+ 3	—	—	—	—
Strasbourg	25.6	304	e 5 31	- 1	e 10 17	+18	e 8 34	P <sub>c</sub> P
Neuchatel	26.0	301	e 5 36	0	—	—	—	—
De Bilt	27.9	310	—	—	e 10 55?	+18	—	—
Paris	29.5	303	e 6 3	- 5	—	—	e 7 11	PP e 18.9
Tamanrasset	z. 34.4	252	6 52 <sub>a</sub>	+ 1	—	—	e 8 7	PP
Pretoria	z. 65.8	193	e 10 47	- 2	—	—	—	—
Ottawa	z. 78.5	320	e 12 3	- 1	—	—	—	—
Hungry Horse	90.0	344	e 13 2	- 1	—	—	—	—
Pierce Ferry	101.5	339	e 13 57	+ 2	—	—	—	—

Additional readings :—

Helwan iZ = 9m.16s.

Warsaw eSSS = 8m.47s.

Raciborz ePE = 4m.33s.

Prague e = 6m.35s.

Collmberg eZ = 5m.27s.

Jena eN = 5m.24s.

Basle e = 5m.47s.

Strasbourg e = 6m.43s., 7m.21s., 10m.42s. and 14m.55s.?, eS<sub>c</sub>S? = 16m.8s.

Tamanrasset iZ = 6m.56s., eZ = 7m.4s., ePPPZ = 8m.28s.

Aug. 27d. Readings also at 0h. (Collmberg, Stuttgart, Cleveland, Harvard, Weston, Ottawa, Pennsylvania, Chicago, Bozeman, Butte, Salt Lake City, Resolute Bay, Haiwee, Palomar, Riverside, Pasadena, Tinemaha, Tucson, Boulder City, Overton (2), Pierce Ferry (2), Fresno, Lick, Mineral, Shasta Dam, Saskatoon, Hungry Horse, Seattle, Victoria, and College (2)), 1h. (Paris, Rome, Sverdlovsk, Granada, Galerazamba, and Washington), 2h. (Strasbourg), 3h. (Seven Falls, San Juan, and Rome), 4h. (Tamanrasset, Upsala, Almata, Frunse, Samarkand, near Andijan, Fergana, and Garm (2)), 5h. (Collmberg, Jena, and Stuttgart), 6h. (Pretoria, Tamanrasset, and near Hungry Horse), 7h. (Brisbane), 8h. (Tananarive, Harvard, Weston, and Hungry Horse), 9h. (Ashkabad), 10h. (Mount Wilson, Riverside, Tinemaha, Tucson, Overton, Pierce Ferry, Hungry Horse, College, Tortosa, and near Alicante (2)), 12h. (Tucson, Overton, Shasta Dam, and College), 13h. (Yalta, Messina, near Rocca di Papa, and Rome), 14h. (Mount Wilson, Riverside, Tinemaha, Tucson, Overton, Pierce Ferry, Hungry Horse, College, Tamanrasset, Tananarive, La Paz, near Huancayo, near Garm (2), and near Yalta), 15h. (Pasadena, Riverside, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Shasta Dam, Hungry Horse, Seattle, College, near Garm (2), and near Huancayo), 16h. (Pennsylvania, Bombay, Calcutta, New Delhi, Andijan, and Tashkent), 18h. (Shasta Dam, Hungry Horse, Victoria, and College), 19h. (Pasadena, Riverside, Tinemaha, Tucson (2), Boulder City, Overton (2), Pierce Ferry (2), and Hungry Horse), 22h. (Overton (2), Shasta Dam, and near Messina (2)).

Aug. 28d. 17h. 32m. 5s. Epicentre 36°·8N. 71°·4E. Depth of focus 0·015.

(as on 1948, Dec. 2d.).

A = +·2560, B = +·7607, C = +·5964;  $\delta$  = -11;  $h$  + 0;  
D = +·948, E = -·319; G = +·190, H = +·565, K = -·803.

	$\Delta$ °	Az. °	P. m. s.	O - C. s.	S. m. s.	O - C. s.
Kulyab	1.7	311	e 0 36	+ 5	e 1 5	+11
Obi-garm	2.3	325	i 0 41	+ 3	i 1 15	+ 8
Garm	2.4	338	i 0 43	+ 3	—	—
Murgab	2.5	52	e 0 46	+ 5	e 1 24	+12
Stalinabad	2.7	310	i 0 44	0	i 1 20	+ 3
Fergana	3.6	5	i 0 57	+ 1	1 44	+ 6
Samarkand	4.5	312	e 1 6	- 2	—	—
Tashkent	4.8	341	e 1 12	0	i 2 8	+ 1
Tchimkent	5.7	347	i 1 25	+ 1	i 2 30	+ 2
Naryn	5.8	36	e 1 24	- 1	e 2 31	0
Frunse	6.5	21	e 1 35	0	i 2 50	+ 2
Mary	7.7	279	—	—	i 3 12	- 5
Almata	7.8	32	—	—	e 3 21	+ 2
Przhevalsk	7.8	41	i 1 53	+ 1	—	—
New Delhi	9.5	147	e 2 5	-10	e 3 47	-13
Ashkabad	10.4	280	e 2 28	+ 1	—	—



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Aug. 28d. Readings also at 0h. (near Christchurch, Cobb River, Kaimata, and Wellington), 2h. (Boulder City), 3h. (Messina), 4h. (Istanbul and Jena), 5h. (Lick), 7h. (Brisbane, Almata, Andijan, Tamanrasset, and College), 8h. (Pasadena (2), Riverside (2), Tinemaha (2), Tucson (2), Boulder City, Overton (2), Pierce Ferry (2), Hungry Horse, College (2), Stuttgart, and Tamanrasset), 12h. (Guam), 13h. (Haiwee, Palomar, Pasadena, Riverside, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Lick, Reno, Shasta Dam, Hungry Horse, Seattle, Victoria, College, Resolute Bay, and Tamanrasset), 14h. (Geri, Tiflis, and near Borzhomi), 19h. (Shasta Dam, near Boulder City, Overton, and Pierce Ferry), 20h. (Barcelona), 21h. (near Garm (2)), 22h. (Huancayo and near Obi-garm), 23h. (Boulder City, Pierce Ferry, Lick (2), Shasta Dam, Hungry Horse, and College).

Aug. 29d. 9h. 5m. 4s. Epicentre 29°·2N. 95°·1E. (as on 27d.).

A = -·0777, B = +·8709, C = +·4853 ;  $\delta = +2$  ;  $h = +2$  ;  
D = +·996, E = +·089 ; G = -·043, H = +·483, K = -·874.

	$\Delta$ °	Az. °	P.		O-C. s.	S.		O-C. s.
			m.	s.		m.	s.	
New Delhi	15·7	272	e 3	38	- 6	e 6	13	-26
Murgab	19·8	304	e 4	33	- 2	8	13	0
Naryn	19·8	315	e 4	36	+ 1	e 8	16	+ 3
Almata	20·2	320	i 4	40	+ 1	e 8	31	+10
Frunse	21·4	315	e 4	52?	+ 1	e 8	54?	+ 9
Andijan	21·8	308	e 4	56	0	e 8	56	+ 2
Fergana	22·1	308	e 4	57	- 2	e 8	57	- 1
Bombay	22·8	249	e 1	18	?	e 5	42	PP
Kulyab	22·8	299	e 5	4?	- 1	9	8?	- 3
Stalinabad	23·6	301	e 5	15	+ 2	e 9	29	+ 4
Irkutsk	24·0	13	5	22	+ 5	—	—	—
Tashkent	24·2	307	i 5	21	+ 2	—	—	—
Tchimkent	24·4	310	i 5	26	+ 5	—	—	—
Sverdlovsk	36·7	329	e 7	13	+ 3	—	—	—
Erevan	42·5	299	6	29	?	—	—	—
Gori	42·8	302	6	34	?	—	—	—
Leninakan	43·0	300	e 6	37	?	—	—	—
Borzhomi	43·4	302	e 6	38	?	—	—	—
Collmberg	z. 63·1	316	e 10	31	- 1	—	—	—
Stuttgart	z. 66·1	314	e 10	50	- 1	—	—	—
College	74·4	23	i 11	44	+ 2	—	—	—
Tamanrasset	z. 78·9	290	e 12	6	- 1	—	—	—
Hungry Horse	98·5	19	e 13	49	+ 7	—	—	—
Overton	z. 109·0	24	e 19	5	PP	—	—	—
Pierce Ferry	109·5	24	e 19	8	PP	—	—	—

Additional readings :—

Stuttgart eZ = 10m.59s.

Tamanrasset eZ = 12m.15s.

Aug. 29d. 17h. 42m. 10s. Epicentre 0°·0 98°·0E. (as on 22d.).

A = -·1392, B = +·9903, C = ·0000 ;  $\delta = +7$  ;  $h = +7$  ;  
D = +·990, E = +·139 ; G = 000, H = 000, K = -1·000

		$\Delta$ °	Az. °	P.		O-C. s.	S.		O-C. s.	Supp.		L. m.
				m.	s.		m.	s.		m.	s.	
Djakarta		10·7	125	(e 2	54)	+16	i 4	31	- 8	—	—	—
Bandong		11·8	126	(e 2	50)	- 3	e 5	28	+22	—	—	—
Colombo	E.	19·3	290	4	56	+27	8	36	+34	—	—	12·7
Kodaikanal	E.	22·8	298	e 5	7	+ 2	e 9	32	+21	—	—	—
Calcutta	E.	24·3	337	—	—	—	e 9	43	+ 6	—	—	—
Bombay		31·0	308	e 9	57	P <sub>c</sub> P	e 11	40	+14	—	—	—
Nanking		37·5	29	—	—	—	e 13	19	+12	—	—	e 19·2
Murgab		44·1	332	8	12	0	14	56	+11	—	—	—
Kulyab		45·8	329	e 8	22	- 3	e 15	14	+ 5	—	—	—
Naryn		45·8	338	i 8	24	- 1	e 15	14	+ 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.
Przhevalsk	45.8	340	i 8 27	+ 2	e 15 25	+16	—	—
Obi-garm	46.5	330	i 8 28	- 3	i 15 26	+ 7	—	—
Fergana	46.7	332	i 8 32?	0	e 15 31?	+ 9	—	—
Andijan	46.8	332	e 8 34	+ 1	15 36	+12	—	—
Almata	47.0	339	i 8 35	0	i 15 41	+15	—	—
Frunse	47.6	336	i 8 40	+ 1	i 15 48	+13	—	—
Tashkent	48.7	331	i 8 47	- 1	i 16 2	+12	—	—
Tchimkent	49.3	332	i 8 54	+ 1	i 16 12	+13	—	—
Mary	50.1	323	e 8 57	- 2	—	—	—	—
Irkutsk	52.4	5	e 9 12	- 4	e 16 50	+ 8	—	—
Ashkabad	52.5	321	e 9 16	- 1	—	—	—	—
Vladivostok	52.6	31	i 9 8?	-10	e 16 55?	+11	—	—
Tiflis	63.4	318	i 10 29	- 5	i 19 11	+ 5	—	—
Ksara	67.1	306	e 10 55	- 2	—	—	—	—
Helwan	N. 69.9	302	—	—	e 20 30	+ 6	—	—
Pretoria	Z. 71.9	243	e 10 11?	?	—	—	—	—
Moscow	73.8	330	11 34	- 4	e 21 10	+ 1	—	—
Istanbul	74.2	313	—	—	e 21 38	PS	—	50.8
Rome	86.7	312	—	—	e 23 43	+19	—	—
Collmberg	Z. 86.9	321	e 12 42	- 6	—	—	—	—
Jena	N. 87.7	321	e 13 30	+38	—	—	—	—
Stuttgart	Z. 89.2	319	e 12 52	- 7	—	—	—	—
Tamanrasset	Z. 92.3	293	e 13 5	- 8	—	—	e 16 49	PP
College	100.1	22	e 17 48	PP	—	—	—	—
Hungry Horse	124.4	25	i 18 48	[-13]	—	—	—	—
Shasta Dam	125.4	36	e 18 49	[-14]	—	—	—	—
Tinemaha	Z. 130.1	38	e 19 1	[-11]	—	—	e 21 20	PP
Logan	130.5	28	e 19 1	[-12]	—	—	e 22 25	PKS
Pasadena	Z. 132.0	41	e 19 3	[-13]	e 22 27	PKS	i 21 23	PP
Overton	Z. 132.8	35	e 19 7	[-10]	i 22 32	PKS	e 21 28	PP
Boulder City	133.0	36	e 19 5	[-13]	—	—	—	—
Pierce Ferry	133.4	35	e 17 57	?	—	—	i 21 36	PP
Tucson	137.9	37	e 19 6	[-21]	—	—	e 22 4	PP

Bandong and Djakarta P readings have been increased by 2m.

Tamanrasset gives also eZ = 13m.12s.

Long waves were also recorded at Kew and Harvard.

Aug. 29d. 22h. 27m. 14s. Epicentre 0°-0 98°-0E. (as at 17h.).

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Djakarta	10.7	125	(e 2 45)	+ 7	e 4 42	+ 3	—	—
Bandong	11.8	126	(e 3 3)	+10	e 5 12	+ 6	—	—
Colombo	E. 19.3	290	4 37	+ 8	8 32	+30	—	13.1
Kodaikanal	E. 22.8	298	e 5 8	+ 3	e 9 32	+21	—	—
Calcutta	E. 24.3	337	e 4 46	-34	e 10 11	+34	—	—
Poona	E. 30.0	310	—	—	e 13 16	PcS	i 14 4	Q
Bombay	31.0	308	e 7 53	PP	e 11 6	-20	—	—
Nanking	37.5	29	—	—	e 13 14	+ 7	—	e 18.8
Murgab	44.1	332	8 12	0	14 54	+ 9	—	—
Kulyab	45.8	329	i 8 25	0	i 15 17	+ 8	—	—
Naryn	45.8	338	8 24	- 1	e 15 18	+ 9	—	—
Przhevalsk	45.8	340	i 8 26	+ 1	—	—	—	—
Garm	46.4	331	e 8 28	- 2	—	—	—	—
Obi-garm	46.5	330	i 8 35	+ 4	—	—	—	—
Fergana	46.7	332	e 8 31	- 1	e 15 32	+10	—	—
Andijan	46.8	332	e 8 32	- 1	15 34	+10	—	—
Almata	47.0	339	i 8 34	- 1	i 15 39	+13	—	—
Frunse	47.6	336	i 8 39	0	e 15 46	+11	—	—
Samarkand	48.6	327	e 8 45	- 2	—	—	—	—
Tashkent	48.7	331	i 8 47	- 1	i 16 1	+11	—	—

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	$\Delta$	Az.	P.		O - C.	S.		O - C.	Supp.		L.
	°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.
Tchimkent	49.3	332	i 8	53	0	—	—	—	—	—	—
Mary	50.1	223	i 9	2	+ 3	—	—	—	—	—	—
Irkutsk	52.4	5	e 9	11	- 5	e 16	48	+ 6	—	—	—
Ashkabad	52.5	321	e 9	16	- 1	—	—	—	—	—	—
Vladivostok	52.6	31	i 9	8?	-10	e 16	54?	+10	—	—	—
Tiflis	63.4	318	i 10	29	- 5	e 19	12	+ 6	—	—	—
Sverdlovsk	63.5	338	i 10	33	- 1	e 19	21	+14	—	—	—
Ksara	67.1	306	e 10	53	- 4	20	2	+11	—	—	—
Helwan	N. 69.9	302	—	—	—	e 20	28	+ 4	—	—	—
Pretoria	Z. 71.9	243	e 10	35?	?	—	—	—	—	—	—
Moscow	73.8	330	11	32	- 6	e 21	8	- 1	—	—	—
Istanbul	74.2	313	—	—	—	e 21	16	+ 2	—	—	48.8
Rome	86.7	312	e 12	39	- 8	e 23	24	0	—	—	—
Collmberg	Z. 86.9	321	e 12	41	- 7	—	—	—	—	—	—
Stuttgart	89.2	319	e 12	51	- 8	—	—	—	e 15	16	P <sub>c</sub> S e 54.8
Tamanrasset	Z. 92.3	293	i 13	5k	- 8	—	—	—	—	—	—
College	100.1	22	e 17	8	PP	—	—	—	e 17	50	PKP
Hungry Horse	124.4	25	i 18	48	[-13]	—	—	—	—	—	—
Shasta Dam	125.4	36	e 18	49	[-14]	—	—	—	—	—	—
Lick	Z. 127.9	39	e 18	55k	[-13]	—	—	—	e 20	58	PP
Tinemaha	Z. 130.1	38	e 20	40	?	—	—	—	e 21	52	PP
Logan	130.5	28	e 19	1	[-12]	—	—	—	e 22	24	PKS
Pasadena	Z. 132.0	41	i 19	3	[-13]	—	—	—	i 19	25	PKP <sub>1</sub>
Mount Wilson	Z. 132.1	41	e 19	3	[-13]	—	—	—	e 21	23	PP
Riverside	Z. 132.6	41	e 19	28	[+11]	—	—	—	e 21	27	PP
Overton	Z. 132.8	35	e 19	1	[-16]	i 22	32	PKS	e 21	27	PP
Boulder City	133.0	36	e 19	6	[-12]	—	—	—	—	—	—
Pierce Ferry	133.4	35	e 19	1	[-17]	—	—	—	i 21	42	PP
Tucson	137.9	37	e 19	6	[-21]	—	—	—	e 22	3	PP

Additional readings and note :—

Bandong and Djakarta P have been increased by 1m.

Calcutta eP<sub>c</sub>PE = 7m.19s., eP<sub>c</sub>SE = 11m.13s., eSSE = 12m.15s., eSSSE = 12m.40s.

Collmberg eZ = 12m.46s.

Tamanrasset iZ = 13m.12s., eZ = 13m.31s.

Long waves were also recorded at Kew, Granada, Seven Falls, and Harvard.

Aug. 29d. Readings also at 1h. (Tucson, Overton, Pierce Ferry, Lick, Shasta Dam, Hungry Horse, College, near Istanbul, and near Stalinabad), 2h. (College and near Garm), 3h. (near Garm (2)), 5h. (Overton, Pierce Ferry, Lick, College, Bermuda, near San Juan, Fort de France, Kulyab, near Andijan, and Garm), 6h. (near Mizusawa), 7h. (Pierce Ferry (2), Lick, College, and Logan), 8h. (Tashkent, near Andijan, Fergana, Garm, Kulyab, and Stalinabad), 9h. (College, near Boulder City, Overton, Pierce Ferry, near Garm), 12h. (near Garm), 14h. (Frunse, Naryn, Obi-garm, Samarkand, Tashkent, Tchimkent, near Andijan (2), near Fergana, Garm, Kulyab, Stalinabad, and Murgab), 15h. (Haiwee, Pasadena, Riverside, Tinemaha, Boulder City, Overton, Pierce Ferry, Lick, Shasta Dam, Hungry Horse, College, La Plata, Andijan, Obi-garm, near Kizyl-Arvat, and near Stalinabad), 16h. (Pierce Ferry), 17h. (Chinchina, near Andijan, and near Messina), 19h. (Ashkabad and near Mizusawa), 20h. (Riverside, Boulder City, Pierce Ferry, Lick, Shasta Dam, Hungry Horse, College, and near Guam), 21h. (Bogota, Huancayo, La Paz, Tucson, Boulder City, Overton, Pierce Ferry, Hungry Horse, College, and near Garm), 22h. (near Prague), 23h. (New Delhi, Collmberg, Stuttgart, Tamanrasset, Overton, Pierce Ferry and College (2)).

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Aug. 30d. 5h. 20m. 34s. (I) } Epicentre 19°·08. 169°·5E.  
 9h. 13m. 37s. (II) } (as on 1948, December 18d.).  
 23h. 13m. 51s. (III) }

A = -·9304, B = +·1724, C = -·3236;  $\delta = +8$ ;  $h = +5$ ;  
 D = +·182, E = +·983; G = +·318, H = -·059, K = -·946.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.	
		°	°	m. s.	s.	m. s.	s.	m. s.	m.	
II	Brisbane	17·3	238	i 4 3 <sub>a</sub>	- 1	i 7 16	0	i 4 34	PP	—
III		17·3	238	i 4 5	+ 1	—	—	—	—	—
III	Apia	18·5	78	e 4 19	0	—	—	e 4 36	PP	—
I	Riverview	22·0	225	4 58	0	i 8 58	+ 2	i 5 23	PP	e 10·5
II		22·0	225	e 4 58	0	i 8 58	+ 2	i 9 10	sS	e 10·4
III		22·0	225	i 4 58 <sub>a</sub>	0	i 9 3	+ 7	i 5 7	pP	e 10·6
II	Wellington	22·7	171	—	—	e 9 3	- 6	—	—	13·4
I	Christchurch	24·6	175	—	—	e 9 26 <sub>?</sub>	-16	—	—	—
II		24·6	175	—	—	e 9 59	+17	—	—	e 13·0
II	Berkeley	85·4	48	i 12 57	+17	—	—	—	—	e 42·4
I	Lick	z. 85·6	48	i 12 42 <sub>a</sub>	+ 1	—	—	—	—	—
II		z. 85·6	48	i 12 59 <sub>k</sub>	+18	—	—	—	—	—
III		z. 85·6	48	e 12 45 <sub>k</sub>	+ 4	—	—	—	—	—
I	Fresno	z. 86·7	50	e 12 52 <sub>a</sub>	+ 5	—	—	—	—	—
II		z. 86·7	50	e 13 3 <sub>a</sub>	+16	—	—	e 16 27	PP	—
III		z. 86·7	50	e 12 50 <sub>a</sub>	+ 3	—	—	—	—	—
II	Pasadena	z. 86·7	53	i 13 2	+15	—	—	—	—	—
III	Shasta Dam	86·7	46	e 12 50	+ 3	—	—	—	—	—
I	Mount Wilson	z. 86·8	53	e 12 48	+ 1	—	—	—	—	—
III		z. 86·8	53	e 12 50	+ 3	—	—	—	—	—
II	Mineral	z. 87·0	46	e 13 5	+17	—	—	—	—	—
I	Riverside	z. 87·2	53	e 12 47	- 2	—	—	—	—	—
II		z. 87·2	53	i 13 5	+16	—	—	—	—	—
III		z. 87·2	53	i 12 50	+ 1	—	—	—	—	—
II	Tinemaha	z. 87·9	51	i 13 8	+15	—	—	—	—	—
III		z. 87·9	51	i 12 58	+ 5	—	—	—	—	—
II	Reno	z. 87·9	48	e 13 9 <sub>a</sub>	+16	—	—	—	—	—
III		z. 87·9	48	e 13 1 <sub>k</sub>	+ 8	—	—	—	—	—
I	College	89·7	17	e 12 58	- 3	—	—	—	—	—
II		89·7	17	e 13 14	+13	—	—	—	—	—
III		89·7	17	e 13 4	+ 3	—	—	—	—	—
I	Boulder City	89·9	53	e 13 4	+ 2	—	—	—	—	—
II		89·9	53	e 13 19	+17	—	—	—	—	—
III		89·9	53	i 13 5	+ 3	—	—	—	—	—
I	Overton	z. 90·5	53	e 13 7	+ 2	—	—	—	—	—
II		z. 90·5	53	e 13 21	+16	—	—	—	—	—
III		z. 90·5	53	(e 13 8)	+ 3	—	—	—	—	—
I	Pierce Ferry	90·6	52	e 13 3	- 2	—	—	—	—	—
II		90·6	52	i 13 22	+17	—	—	—	—	—
III		90·6	52	i 13 8	+ 3	—	—	—	—	—
I	Tucson	91·6	57	e 13 9	- 1	—	—	—	—	—
II		91·6	57	e 13 27	+17	—	—	—	—	—
III	Ksara	136·3	298	e 22 18	PKS	—	—	e 38 58	P'P'	—
III	Potsdam	z. 142·0	337	e 19 34	[ 0]	—	—	(e 29 9?)	PKKP	e 29·2
I	Collmburg	z. 142·8	335	e 19 38 <sub>?</sub>	[+ 3]	—	—	—	—	—
III		z. 142·8	335	e 19 37	[+ 2]	—	—	—	—	—
III	Prague	143·2	333	e 19 38	[+ 2]	—	—	—	—	—
III	Jena	N. 143·7	335	e 19 39	[+ 2]	—	—	—	—	—
III	De Bilt	144·8	343	i 19 42	[+ 3]	—	—	—	—	—
I	Stuttgart	z. 146·3	336	e 19 41	[ 0]	—	—	—	—	—
II		z. 146·3	336	i 19 57 <sub>k</sub>	[+16]	—	—	—	—	—
III		146·3	336	e 19 44	[+ 3]	—	—	e 23 19	PP	—
I	Kew	z. 146·6	348	e 11 46	?	—	—	—	—	—
II		146·6	348	e 18 57	[-45]	—	—	—	—	—
III		146·6	348	e 19 49	[+ 7]	—	—	—	—	—
II	Strasbourg	147·0	337	e 19 57 <sub>k</sub>	[+14]	—	—	e 23 23	PP	—
III		147·0	337	i 19 49 <sub>a</sub>	[+ 6]	—	—	e 23 9	PKS	—

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 Chur	147.7	335	e 20 0	[+16]	—	—	—	—
II Zürich	147.7	336	e 19 59	[+15]	—	—	—	—
II Paris	148.5	343	i 20 2	[+17]	—	—	—	—
III	148.5	343	e 19 53	[+ 8]	—	—	—	—
II Rome	z. 150.0	324	e 20 4	[+17]	—	—	—	—
III	150.0	324	e 19 56	[+ 9]	—	—	—	—
II Clermont-Ferrand	151.0	340	e 20 13	[+24]	—	—	e 23 49	PP
III	151.0	340	e 19 56	[+ 7]	—	—	e 23 42	PP
I Tamanrasset	z. 164.6	287	e 19 54	[-11]	—	—	e 21 10	PKP <sub>2</sub>
II	z. 164.6	287	20 17	[+12]	e 31 48	{+12}	e 21 12	PKP <sub>2</sub>
III	z. 164.6	287	e 20 8	[+ 3]	—	—	e 21 6	PKP <sub>2</sub>

Additional readings:—

Riverview I iN = 9m.17s., iE = 9m.34s., iN = 10m.3s., and 10m.28s., II iE = 9m.1s., eQN = 9m.17s., iSSZ = 9m.41s., III iPPPZ = 5m.36s., iE = 9m.13s., iSN = 9m.18s.

Berkeley II iZ = 13m.35s. and 14m.30s.

Lick I iZ = 13m.8s., II eZ = 13m.45s.

Fresno III eZ = 13m.45s.

Mount Wilson I iZ = 13m.14s.

Reno III eZ = 13m.39s.

Overton III reading increased by 3 minutes.

Tucson I e = 13m.19s.

Prague III e = 19m.42s., 19m.50s., 20m.11s., 20m.36s., and 21m.26s.

Jena III eN = 19m.47s.

Stuttgart II eZ = 20m.8s., III iZ = 19m.48s.

Strasbourg II e = 20m.5s. and 20m.45s., III e? = 20m.27s.

Paris II i = 20m.8s. and 20m.25s., III e = 19m.59s., 20m.11s., and 20m.45s.

Tamanrasset II eZ = 21m.16s., ePPZ = 24m.57s., III eZ = 24m.28s., ePPZ = 24m.52s.

Long waves were also recorded to shock II at Harvard and shock III at Christchurch and Wellington.

Aug. 30d. 6h. 24m. 34s. Epicentre 28°.7N. 96°.6E. (as on 23d.).

A = -0.1010, B = +0.8727, C = +0.4777;  $\delta = 0$ ; h = +2;  
D = +0.993, E = +0.115; G = -0.055, H = +0.475, K = -0.879.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Calcutta	9.7	232	e 4 10	S	(e 4 10)	- 5	e 5 21	S <sub>g</sub>
Naryn	21.1	313	e 4 43	- 5	e 8 26	-13	—	—
Almata	21.5	319	e 4 48	- 4	8 38	- 9	—	—
Frunse	22.7	314	e 5 6	+ 2	e 9 8	- 1	—	—
Andijan	23.2	307	e 5 11	+ 2	9 15	- 3	—	—
Fergana	23.5	307	e 5 19	+ 7	—	—	—	—
Bombay	23.8	251	—	—	e 9 25	- 3	—	i 12.0
Irkutsk	24.2	11	e 5 34?	+15	—	—	—	—
Kulyab	24.2	300	—	—	9 23	-12	—	—
Tashkent	25.5	307	e 5 29	- 3	—	—	—	—
Samarkand	26.7	302	e 5 42	- 1	—	—	—	—
College	74.3	24	e 11 54	+13	—	—	—	—
Tamanrasset	z. 80.6	291	e 12 17	+ 1	—	—	e 15 17	PP

Calcutta gives also iSE = 5m.6s., eS<sub>g</sub>E = 5m.31s., the reading entered as S<sub>g</sub> is given a S\*E.

Aug. 30d. 6h. 51m. 0s. Epicentre 4°.1S. 129°.3E.

A = -0.6318, B = +0.7719, C = -0.0710;  $\delta = +4$ ; h = +7;  
D = +0.774, E = +0.633; G = +0.045, H = -0.055, K = -0.997.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Bandong	21.7	263	e 5 51	+56	e 10 27	Q	—	—
Djakarta	22.5	265	e 5 16	+14	i 9 57	+52	—	—
Guam	23.2	40	5 4	- 5	—	—	—	—
Brisbane	32.5	137	i 6 33 <sub>a</sub>	- 1	i 11 53	+ 4	i 7 52	PP
Riverview	35.9	148	i 7 5 <sub>a</sub>	+ 1	e 12 48	+ 6	i 7 16	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.
Zi-ka-wei	z.	35.9	349	7 8	+ 4	—	—	—	—
Nanking		37.3	345	i 7 14 <sub>a</sub>	- 2	12 19	-45	i 8 29	PP 14.1
Mizusawa	N.	44.4	14	8 17	+ 3	e 14 47	- 2	—	—
Vladivostok		47.1	3	i 8 35	0	i 15 26	- 2	—	—
Calcutta	E.	48.0	306	e 8 48	+ 5	e 15 52	+11	e 10 45	PP —
Kodaikanal	E.	53.5	287	i 9 27	+ 3	i 16 57	0	—	— 24.5
Hyderabad	E.	54.5	295	9 31	- 1	17 5	- 5	20 58	SS 26.4
Christchurch		54.8	142	e 10 0	+26	e 17 40	+26	e 24 45	Q e 28.3
Wellington		55.0	139	e 9 34	- 1	—	—	e 24 0?	Q e 29.0
Tuai	N.	55.4	135	e 9 42	+ 4	—	—	—	—
Poona	E.	59.0	295	10 4	0	18 4	- 6	10 50	P <sub>c</sub> P —
New Delhi		59.7	307	e 10 8	- 1	i 18 13	- 6	19 55	S <sub>c</sub> S —
Irkutsk		60.0	343	10 11	0	18 18	- 5	—	—
Bombay		60.1	295	e 10 11	0	e 18 13	-11	22 7	Q 28.2
Przhevalsk		65.3	322	i 10 47	+ 1	—	—	—	—
Murgab		66.3	316	10 55	+ 3	—	—	—	—
Naryn		66.3	319	e 10 50	- 2	e 19 36	- 6	—	—
Almata		66.6	322	i 10 54	0	e 19 44	- 1	—	—
Frunse		68.0	320	e 11 3	0	e 19 59	- 3	—	—
Andijan		68.5	317	e 11 5	- 1	e 20 2	- 6	e 15 35	PP —
Fergana		68.7	317	e 11 8	+ 1	e 20 7	- 3	e 11 18	pP —
Kulyab		69.1	313	e 11 12	+ 2	—	—	—	—
Garm		69.2	315	i 11 12	+ 2	—	—	—	—
Obi-garm		69.5	315	i 11 14	+ 2	—	—	—	—
Stalinabad		70.1	314	i 11 16	0	e 20 23	- 4	—	—
Tashkent		70.8	317	i 11 20	0	e 20 32	- 3	—	—
Samarkand		71.8	314	e 11 28	+ 2	—	—	—	—
Mary		74.9	311	i 11 46	+ 2	—	—	—	—
Ashkabad		77.6	310	i 12 4	+ 4	—	—	—	—
Kizyl-Arvat		79.5	312	i 12 16	+ 6	—	—	—	—
Tiflis		88.6	312	i 12 58	+ 2	—	—	—	—
Borzhomei		89.7	312	e 13 6	+ 5	—	—	—	—
College		90.7	25	e 13 4	- 2	e 30 20	PKKP	e 16 17	PP —
Moscow		94.3	326	e 13 24	+ 1	e 24 29	- 3	—	—
Ksara		95.1	303	e 17 5	PP	e 26 23	PPS	—	—
Yalta		96.5	314	13 44	+12	24 24	{- 5}	e 17 4	PP —
Pulkovo		98.0	330	i 17 54	PP	i 24 14	[- 3]	e 32 20	SSP —
Helwan	E.	98.9	299	—	—	e 34 36	?	—	—
Istanbul		100.4	311	e 13 52	+ 2	—	—	e 17 52	—
Upsala		104.3	331	—	—	e 34 28	?	e 37 27	SSS e 48.0
Warsaw		104.4	323	e 18 18	PP	e 24 43	[- 5]	e 20 38	PPP e 53.0
Seattle		105.4	42	—	—	e 25 12	[+20]	e 28 12	PS —
Timisoara		105.5	316	18 0?	PP	—	—	—	—
Shasta Dam		106.5	49	14 26	P	28 7	PS	e 28 45	PPS —
Berkeley		107.0	52	i 14 28 <sub>k</sub>	P	i 24 53	[- 6]	i 18 48	PP e 41.4
Ogyalla		107.1	319	e 19 16	PP	e 25 25	[+25]	e 22 17	PPP —
Mineral	z.	107.2	49	e 18 41	PP	—	—	—	—
Santa Clara		107.4	52	—	—	e 25 12	[+11]	—	e 61.4
Lick	z.	107.6	52	i 14 32 <sub>k</sub>	P	—	—	e 18 51	PP —
Reno		108.7	49	e 14 29 <sub>k</sub>	P	—	—	e 18 48	PP —
Prague		108.9	322	e 18 27	[- 4]	e 25 14	[+ 6]	e 19 10	PP e 49.0
Potsdam		109.0	325	e 19 30	PP	e 28 48	PS	e 22 6	PKS e 56.0
Fresno	z.	109.2	52	e 14 36 <sub>k</sub>	P	e 19 27	PP	18 46	PKP —
Collenberg		109.4	323	e 18 40	[+ 8]	e 25 30	[+20]	e 19 17	PP e 55.0
Cheb		110.2	323	e 19 26	PP	e 25 30	[+17]	e 29 48	PPS —
Tinemaha	z.	110.3	52	e 14 51	PP	—	—	—	—
Hungry Horse		110.6	39	e 14 44	P	e 18 38	PKP	e 29 33	PKKP —
Pasadena		110.9	55	e 18 37	[+ 2]	e 28 30	PS	e 18 57	PP e 52.2
Mount Wilson	z.	111.0	55	e 14 47	P	—	—	—	—
Scoresby Sund		111.1	350	(20 0?)	PP	—	—	—	20.0

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		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.	
	z.	°	°	m. s.	s.	m. s.	s.	m. s.	m.	
Riverside		111.6	55	e 14 47	P	e 19 18	PP	e 18 39	PKP	—
Padova		112.2	317	e 19 32	PP	—	—	—	—	—
Rome		112.5	314	e 18 55	[+17]	e 27 5	S	e 21 55	PPP	—
Stuttgart		112.6	322	e 18 30?	[- 8]	e 25 20	[- 3]	e 19 27	PP	e 57.0
Boulder City		113.2	52	e 18 42	[+ 2]	—	—	e 19 31	PP	—
Overton	z.	113.4	52	e 18 43	[+ 3]	e 29 29	PKKP	e 19 41	PP	—
Bczeman		113.4	41	—	—	e 25 29	[+ 3]	e 30 34	PPS	e 48.5
Zürich		113.5	321	e 18 47	[+ 7]	—	—	—	—	—
Strasbourg		113.6	322	e 19 26	PP	e 26 22	[- 8]	e 22 22	PKS	e 61.0
De Bilt		113.7	326	—	—	e 24 0?	?	—	—	—
Pierce Ferry		113.9	52	i 18 43	[+ 2]	—	—	e 29 26	PKKP	—
Aberdeen		114.8	333	i 23 55	?	i 25 56	[+25]	i 29 11	PS	e 55.8
Paris		116.6	324	e 18 47	[+ 1]	—	—	e 19 59	PP	e 59.0
Kew		117.0	328	e 15 10	P	e 29 28	PS	—	—	e 49.0
Tucson		117.3	55	e 18 51	[+ 4]	e 29 19	PKKP	e 20 10	PP	—
Clermont-Ferrand		117.6	320	e 19 59	PP	e 24 26	?	e 29 41	PKKP	—
Rathfarnham Castle		119.0	332	e 19 0?	[+ 9]	—	—	—	—	e 49.0
Algiers Univ.	z.	121.1	311	e 19 6	[+11]	—	—	e 20 40	PP	—
Tortosa		121.4	316	i 20 32	PP	27 30	{+ 7}	—	—	40.4
Tamanrasset	z.	122.6	295	e 19 0	[+ 2]	e 27 47	{+16}	e 20 42	PP	—
Alicante		123.1	314	19 41	[+42]	27 0	{-35}	—	—	e 57.2
Toledo	z.	124.9	317	e 19 3	[+ 1]	—	—	e 20 55	PP	—
Granada		125.8	314	e 20 49 <sub>a</sub>	PP	27 16	{-37}	24 8	PPP	i 64.3
Malaga	z.	126.6	314	19 9 <sub>k</sub>	[+ 4]	22 57	PKS	i 20 25	PP	75.8
Chicago		130.1	36	e 22 25	?	e 38 26	SS	—	—	e 53.8
St. Louis		130.3	41	e 19 17	[+ 4]	i 22 36	PKS	e 21 34	PP	—
Ottawa		133.4	24	e 19 21	[+ 3]	i 22 55	PKS	—	—	—
Cleveland		133.7	32	e 22 48	PKS	e 29 52	{+69}	—	—	—
Pennsylvania	n.	136.0	29	e 23 0	PKS	—	—	—	—	—
Harvard		137.5	22	i 19 30	[+ 4]	e 26 42	[+ 7]	e 22 29	PP	e 65.0
Weston		137.7	22	i 19 16	[-10]	i 26 25	[-10]	i 23 7	PKS	—
Washington		137.9	30	e 19 30	[+ 3]	e 44 15	SSS	e 22 11	PP	—
Philadelphia		138.0	28	e 23 22	PKS	e 32 19	PS	e 33 19	PPS	e 57.6
Bermuda		149.0	23	e 20 47	?	e 30 22	{+ 9}	e 23 2	PP	e 73.8
Huancayo		150.7	124	e 19 55	[+ 7]	e 43 18	SSP	e 23 36	PP	e 71.5
La Paz		153.2	142	i 20 4 <sub>a</sub>	[+12]	31 4	{+28}	i 24 1	PP	73.5
Chinchina		155.2	85	i 19 56	[+ 1]	—	—	e 23 51	PKS	—
Bogota		156.7	87	e 19 59	[+ 2]	e 27 34	[+33]	e 35 31	PSKS	—
Fort de France		165.2	43	e 21 12	PKP <sub>2</sub>	—	—	—	—	—

Additional readings :—

Brisbane eE = 7m.35s.

Riverview iPPZ = 8m.28s., iSN = 12m.53s., iSSZ = 15m.23s., iSSSN = 15m.46s.

Nanking iZ = 7m.25s. and 7m.45s., i = 12m.54s.

Calcutta eSS?E = 19m.38s., eSSSE = 20m.50s.

Pocna PPE = 12m.16s., PSE = 18m.13s., PPSE = 18m.31s.

Fergana ePPP = 15m.12s.

College i = 13m.19s., e = 17m.0s.

Warsaw eE = 19m.28s., ePPPE = 20m.44s., eE = 24m.27s., eSKKS = 25m.9s., eZ =

25m.21s., ePS = 27m.25s., ePPS = 28m.27s., eSS = 33m.4s.

Berkeley iSKKSE = 25m.37s., iE = 28m.25s., eE = 34m.20s.

Ogyalla e = 27m.42s., eSS? = 34m.24s.

Lick iZ = 14m.48s.

Prague e = 17m.55s.? and 19m.57s., ePPP? = 22m.0s., e = 23m.9s., and 25m.39s.,

eSKKS? = 26m.12s., ePS? = 28m.43s., ePPS? = 29m.30s., eSS? = 34m.24s.

Potsdam eE = 29m.38s.

Collmberg eE = 26m.18s., ePSEN = 28m.18s., eN = 31m.0s., eE = 33m.24s., eSSN =

34m.42s.

Cheb e = 19m.43s., 21m.33s., 22m.47s., and 28m.28s., eSS = 34m.18s., eSSS = 39m.30s.

Pasadena e?Z = 14m.43s., iEZ = 19m.11s.

Stuttgart eZ = 20m.0s., ePPP = 22m.0s., e = 22m.57s., eSKKS = 26m.9s., ePKKP =

29m.37s., ePPS = 30m.12s., e = 32m.30s., eSSS = 39m.6s., e = 46m.48s.

Overton eZ = 15m.5s., iPKKPZ = 29m.37s.

Strasbourg e = 20m.9s., 20m.26s., 22m.6s., and 23m.45s., eS = 27m.26s., ePS = 29m.8s.,

ePPS = 30m.32s., e = 30m.37s., eSS = 35m.16s., eSSP = 35m.29s., eSSS = 40m.18s.,

e = 43m.18s.

Pierce Ferry eP = 14m.57s.

Aberdeen eEN = 36m.48s.

Paris e = 20m.10s.

Continued on next page.

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Algiers Univ. eZ = 20m.11s., ePPPZ = 23m.11s.  
 Tamanrasset eZ = 19m.28s., eSKPZ = 22m.30s., ePPPZ = 23m.24s., eZ = 23m.43s.,  
 27m.56s., and 32m.33s.  
 Granada PP = 21m.40s., iSKKS = 28m.19s., S = 29m.7s., PS = 32m.13s., iSS = 38m.34s.  
 Chicago e = 29m.43s. and 30m.7s.  
 Cleveland iSKPE = 22m.51s., iN = 23m.1s., and 23m.5s.  
 Harvard ePKS = 22m.56s.  
 Bermuda ePPS = 36m.25s., e = 39m.41s., eSS = 41m.45s.  
 La Paz iZ = 20m.34s. and 21m.12s., SS = 43m.30s.  
 Bogota iZ = 20m.43s.  
 Long waves were also recorded at Bergen, Seven Falls, and La Plata.

Aug. 30d. Readings also at 0h. (Tamanrasset), 1h. (College, Pierce Ferry, and near Overton),  
 3h. (Collmberg, Bologna, near Rocca di Papa, and Rome), 4h. (Pasadena, Riverside,  
 Tucson (2), Boulder City, Overton (3), Pierce Ferry (3), Fresno, Lick, Shasta Dam,  
 College (2), Hungry Horse (2), Tamanrasset, Prague, Stuttgart, Algiers Univ.,  
 Kodaikanal, Bandung, Andijan, and near Garm), 5h. (Pretoria, Granada, Scoresby  
 Sund, Seattle, Harvard, College, Andijan, Fergana, Garm, Obi-garm, Samarkand,  
 Tashkent, near Kulyab, and Stalinabad), 6h. (Ashkabad (2), Ksara, Pasadena,  
 Riverside, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Fresno, Lick,  
 Reno, Mineral, Shasta Dam, Hungry Horse (2), and College), 7h. (New Plymouth,  
 Wellington, near Cobb River, and Kaimata), 8h. (Brisbane, Riverview, Tucson,  
 Overton, Pierce Ferry, College, Tamanrasset, Collmberg, and Stuttgart), 9h.  
 (Brisbane, Riverside, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry,  
 Lick, College, Strasbourg, and Stuttgart), 10h. (Algiers Univ.), 12h. (Overton,  
 Pierce Ferry, College, Vera Cruz, Puebla, near Oaxaca, Tacubaya, and near Apia),  
 13h. (Messina (2), Naryn, Tchimkent, near Andijan, Fergana, Murgab, and near  
 Ashkabad), 14h. (Tchimkent, near Andijan, Fergana, Kulyab, Mary, Samarkand,  
 Tashkent, and near Naryn), 15h. (Ashkabad, near Garm (2), and near Ottawa),  
 16h. (Brisbane, Tinemaha, Boulder City, Overton (2), Pierce Ferry (2), College (2),  
 Collmberg, Stuttgart, Tamanrasset, Ashkabad, and near Garm), 18h. (Ashkabad),  
 19h. (near Andijan), 20h. (Ashkabad (2), Stuttgart, and College), 22h. (La Paz  
 and near Huancayo).

Aug. 31d. 1h. 26m. 20s. Epicentre 27°·5N. 96°·4E. (as on 24d.).

Intensity V at Dibrugarh. Seismo. Bull. Gov. of India, Aug. 1950, p. 38.

A = -·0990, B = +·8828, C = +·4593;  $\delta$  = +9;  $h$  = +3;  
 D = +·994, E = +·111; G = -·051, H = +·456, K = -·888.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Calcutta		8·8	237	e 3 33	S	(e 3 33)	-20	e 4 24	S*
New Delhi		17·0	278	e 3 53	- 8	e 6 47	-23	—	—
Murgab		21·7	305	4 48?	- 7	8 42?	- 9	—	—
Zi-ka-wei	z.	22·1	73	—	—	e 9 46	SS	—	e 12·8
Almata		22·3	320	i 5 3	+ 2	e 8 56	- 6	—	—
Bombay		23·3	253	—	—	e 9 16	- 4	—	—
Frunse		23·4	316	e 5 17	+ 6	e 9 23	+ 2	—	i 11·8
Andijan		23·8	309	e 5 18	+ 3	9 29	+ 1	—	—
Fergana		24·0	309	e 5 16	- 1	e 9 26	- 6	—	—
Kulyab		24·6	302	e 5 18?	- 5	e 9 35?	- 7	—	—
Kodaikanal	E.	24·8	230	e 5 5	-20	e 9 29	-17	—	—
Stalinabad		25·6	303	—	—	e 10 2	+ 3	—	—
Tashkent		26·1	309	e 6 0?	+23	—	—	—	—
Tchimkent		26·3	310	e 5 37	- 2	—	—	—	—
Samarkand		27·2	304	e 5 48	+ 1	—	—	—	—
College		75·5	23	e 11 55	+ 7	—	—	—	—
Tamanrasset	z.	80·5	291	e 12 31	+16	—	—	—	—

Calcutta gives also iS\*E = 4m.44s., iS<sub>2</sub>E = 4m.56s.  
 Long waves were also recorded at Hyderabad and Poona.

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Aug. 31d. 1h. 51m. 53s. Epicentre 39°·2N. 20°·0E.

A = +·7302, B = +·2658, C = +·6295;  $\delta = +11$ ;  $h = -1$ ;  
D = +·342, E = -·940; G = +·591, H = +·215, K = -·777.

		$\Delta$ °	Az. °	P.		O-C.	S.		O-C.	Supp.		
				m.	s.	s.	m.	s.	m.	s.		
Taranto		2·5	301	0	44	+ 1	1	18	+ 4	e 1	24	$S_g$
Athens		3·2	113	e 0	51	- 1	e 1	20	-12	i 1	34	$S_g$
Messina		3·6	256	1	2	+ 4	e 1	42	0	e 2	7	$S_g$
Sofia		4·3	35	e 1	11	+ 3	e 2	16	$S_g^*$	—	—	—
Rome		6·3	298	e 2	11?	$P_g$	e 3	32	$S_g$	—	—	—
Bucharest		6·9	39	e 1	37	- 8	e 3	19	+14	i 3	48	$S_g$
Istanbul		7·2	72	e 1	55	+ 6	e 3	52	$S_g$	—	—	—
Triest		7·9	327	e 2	44	$P_g$	i 4	44	$S_g$	—	—	—
Bologna		8·3	312	—	—	—	e 4	1	$S_g^*$	e 5	1	L
Prague		11·6	342	e 3	25	+35	e 5	24	+23	—	—	—
Stuttgart		12·3	325	e 2	51	- 8	e 6	55	L	—	—	—
Collmberg	z.	13·1	340	e 3	13	+ 3	—	—	—	—	—	—
Tamanrasset	z.	20·5	221	e 4	34	- 8	—	—	—	—	—	—

Additional readings and note :—

Rome 1 = 4m.2s.

Collmberg reading has been increased by 5m.

Tamanrasset eZ = 4m.40s.

Long waves were recorded at other European stations.

Aug. 31d. 7h. 5m. 47s. Epicentre 5°·5N. 126°·0E. Depth of focus 0·010.

(as on 1950, June 25d.).

A = -·5851, B = +·8054, C = +·0952;  $\delta = +7$ ;  $h = +7$ ;  
D = +·809, E = +·588; G = -·056, H = +·077, K = -·996.

		$\Delta$ °	Az. °	P.		O-C.	S.		O-C.	Supp.		L. m.	
				m.	s.	s.	m.	s.	m.	s.			
Guam		20·1	64	4	29	+ 1	—	—	—	—	—	—	
Bandong		22·1	238	e 4	46	- 2	e 8	49	+ 9	—	—	—	
Djakarta		22·4	240	i 4	56k	+ 5	i 9	5	+19	—	—	—	
Zi-ka-wei	z.	25·9	352	i 5	27	+ 2	i 9	47	+ 2	—	—	—	
Nanking		27·2	346	e 5	36	0	i 10	17	+11	—	—	—	
Mizusawa	N.	36·2	19	e 6	57	+ 2	12	29	+ 2	—	—	—	
Perth		38·5	193	i 8	3	PP	13	9	+ 7	9	6	PPP	—
Calcutta	E.	40·1	299	e 7	22	- 6	i 13	20	- 6	i 16	48	SSS	—
Brisbane		41·9	142	i 7	47	+ 5	i 13	58	+ 5	i 9	30	PP	117·4
Riverview		45·8	150	i 8	17k	+ 3	i 15	2	+13	i 8	50	pP	—
Colombo	E.	45·9	274	8	18	+ 4	14	53	+ 2	—	—	—	22·6
Hyderabad		47·9	288	i 8	28	- 2	i 15	16	- 3	10	22	PP	22·5
Kodaikanal	E.	48·3	279	i 8	38	+ 5	i 15	34	+ 9	10	28	PP	21·5
Irkutsk		49·9	342	8	48	+ 2	15	47	0	—	—	—	—
Dehra Dun	N.	51·4	305	e 7	10	?	e 15	22	?	—	—	—	—
New Delhi		51·6	302	e 8	57	- 1	i 16	9	- 1	19	37	SS	23·3
Poona		52·4	289	9	5	+ 1	i 16	24	+ 3	9	17	PcP	23·2
Bombay		53·5	290	i 9	16	+ 3	i 16	33	- 3	21	0	SS	—
Przhevalsk		55·9	319	i 9	28	- 2	—	—	—	—	—	—	—
Naryn		57·0	318	e 9	36	- 2	e 17	22	- 1	—	—	—	—
Almata		57·2	320	i 9	36	- 3	i 17	24	- 1	—	—	—	—
Murgab		57·3	313	9	41?	+ 1	17	26?	- 1	—	—	—	—
Frunse		58·6	318	e 9	47	- 2	i 17	45	+ 1	—	—	—	—
Andijan		59·3	315	e 9	51	- 3	i 17	52	- 1	—	—	—	—
Fergana		59·6	314	e 9	53	- 3	e 17	56	- 1	—	—	—	—
Garm		60·2	312	i 9	58?	- 2	—	—	—	—	—	—	—
Kulyab		60·3	311	e 9	58	- 3	e 18	5	- 1	—	—	—	—
Obi-garm		60·6	312	i 9	56?	- 7	i 18	8?	- 2	—	—	—	—
Stalinabad		61·2	312	i 10	4	- 3	i 18	15	- 2	—	—	—	—
Tashkent		61·7	315	i 10	5	- 5	i 18	18	- 5	—	—	—	—

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		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Tchimkent		61.8	316	i 10 8	- 3	i 18 25	0	—	—
Auckland	N.	62.0	137	e 10 18	+ 6	—	—	—	—
New Plymouth	E.	62.7	139	e 10 24	+ 7	—	—	—	—
Samarkand		62.9	312	e 10 15	- 3	e 18 36	- 3	—	—
Cobb River	E.	63.0	141	e 10 21	+ 2	e 18 50	+10	e 12 45	PP
Kaimata	N.E.	63.1	143	e 10 28	+ 8	—	—	—	—
Arapuni		63.2	138	e 10 19	- 1	—	—	—	—
Christchurch		64.4	143	i 10 32	+ 4	18 59	+ 2	e 13 23	PP
Wellington		64.4	141	10 30	+ 2	e 18 43	-14	i 12 55	PP
Tuai	N.	64.6	138	e 10 32	+ 3	e 19 3	+ 3	—	—
Apia	Z.	64.6	108	e 10 35	+ 6	—	—	e 10 58	pP
Mary		66.2	309	i 10 39	- 1	i 19 25	+ 6	—	—
Ashkabad		69.1	308	e 10 56	- 2	—	—	—	—
Sverdlovsk		72.1	329	e 11 11	- 5	20 21	- 8	—	—
Baku		75.9	311	i 11 43	+ 5	e 21 15	+ 4	—	—
Tiflis		79.8	312	e 11 57	- 2	i 21 52	- 1	—	—
Erevan		80.0	310	—	—	e 21 57	+ 2	—	—
Gori		80.3	312	e 11 49	-13	e 21 47	-11	—	—
Leninakan		80.5	310	e 12 8	+ 5	—	—	—	—
Borzhomi		80.9	311	e 12 2	- 3	—	—	—	—
Tananarive		80.9	250	e 12 10	+ 5	e 22 2	- 2	22 53	PS
Piatigorsk		81.1	313	12 11	+ 5	22 7	+ 1	—	—
Zugdidi		82.0	311	e 12 10	- 1	—	—	—	—
College		83.4	25	i 12 16	- 2	e 22 35	+ 6	e 15 25	PP
Moscow		84.6	325	e 12 21	- 3	e 22 36?	- 5	—	—
Ksara		87.1	303	e 12 38	+ 2	23 14	+ 9	13 10	pP
Yalta		87.5	314	12 42	+ 4	—	—	—	—
Pulkovo		88.2	330	i 12 40	- 1	i 23 12	- 4	—	—
Sitka		90.1	32	e 12 54	+ 4	i 23 43	+10	i 16 5	PP
Helsinki		90.7	331	e 12 55	+ 2	e 23 35	- 3	e 24 50	PS
Kishinev		90.9	317	e 12 56	+ 2	—	—	—	—
Helwan		91.3	300	e 16 58	PP	e 23 46	+ 2	e 23 19	SKS
Istanbul		91.6	312	e 13 1	+ 4	e 23 21	[+ 2]	—	—
Bucharest		93.2	314	e 13 12	+ 7	e 23 27	[- 1]	e 16 55	PP
Upsala		94.4	331	e 15 51	?	i 24 6	- 5	i 23 30	SKS
Warsaw		94.8	323	e 13 15	+ 3	24 18	+ 4	17 8	PP
Skalnate Pleso		96.1	320	e 17 16	PP	e 24 23	- 2	e 23 42	SKS
Resolute Bay	Z.	96.2	10	e 13 19	+ 1	—	—	—	—
Raciborzu	Z.	97.1	322	e 13 27	+ 5	—	—	—	—
Budapest		97.3	319	e 16 13?	?	e 23 50	[ 0]	e 27 18	PPS
Ogyalla		97.7	320	e 13 40	+15	e 24 21	SKKS	e 23 56	SKS
Copenhagen		98.4	329	e 13 32	+ 4	i 24 1	[+ 4]	17 33	PP
Prague		99.3	323	e 13 32	0	e 24 2	[+ 2]	e 17 13	PP
Victoria		99.4	40	e 13 32	- 1	e 24 57	+ 4	e 24 12	SKS
Potsdam		99.4	325	e 13 35	+ 2	i 24 0	[- 1]	e 14 6	pP
Pretoria	Z.	99.4	246	e 13 36	+ 3	—	—	i 17 38	PP
Collnberg		99.8	323	e 13 32	- 3	e 24 55	- 1	e 18 2	PP
Bergen		99.8	335	—	—	24 5	[+ 2]	26 59	PPS
Seattle		100.3	40	e 13 42 <sup>a</sup>	+ 5	e 24 27	SKKS	e 24 49	SKKS
Cheb		100.6	323	e 14 6	+28	i 24 12	[+ 5]	e 17 44	PP
Jena	N.	100.8	323	e 13 48	+ 9	—	—	e 17 7	PP
Scoresby Sund		101.2	349	i 13 46	+ 5	25 13	+ 5	24 42	SKKS
Shasta Dam		102.5	47	i 13 47	0	—	—	e 17 15	PP
Stuttgart		103.0	322	e 13 48	- 1	e 25 30	+ 7	e 18 7	PP
Padova		103.0	318	e 14 35	?	e 24 19	[+ 1]	—	—
Mineral	Z.	103.2	47	e 13 50	0	—	—	e 18 7	PP
Bologna		103.4	317	e 14 37	?	e 24 25	[+ 5]	e 17 55	PP
Karlsruhe		103.4	323	e 13 53	+ 3	e 24 23	[+ 3]	—	—
Rome		103.5	315	e 13 53	+ 2	i 24 19	[- 1]	e 18 11	PP
Berkeley		103.5	49	i 13 55 <sup>k</sup>	+ 4	e 24 17	[- 3]	e 18 7	PP
Florence Xim		103.7	318	i 18 25	PP	i 27 36	PS	—	—
Prato		103.7	318	e 17 29	PKP	i 25 41	+12	—	—
De Bilt		103.9	328	e 13 58	+ 5	e 25 37	+ 7	e 18 37	PP
Santa Clara	E.	103.9	49	e 18 58	PP	e 24 32	[+10]	e 29 8	PKKP
Strasbourg		104.0	323	e 13 57 <sup>a</sup>	+ 4	e 25 25	- 6	e 18 13	PKP

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.	
Zürich	104.0	321	e 13 55	+ 2	e 24 23	[ 0]	e 18 7	PP	—
Lick	104.1	49	i 13 55 <sub>a</sub>	+ 2	e 24 30	[+ 7]	i 18 14	PP	—
Basle	104.5	322	e 18 43	PP	—	—	—	—	e 56.8
Pavia	104.5	319	e 17 48?	PKP	—	—	—	—	—
Reno	104.8	46	e 13 58	+ 2	e 24 33	[+ 6]	e 18 13	PP	—
Aberdeen	104.8	335	i 13 59	P	i 24 31	[+ 4]	i 20 34	PPP	52.7
Hungry Horse	105.1	37	i 13 58	P	e 24 32	[+ 4]	e 17 23	PP	—
Fresno	z. 105.7	49	e 14 3 <sub>a</sub>	P	e 23 37	[-54]	e 18 17	PP	—
Durham	105.9	331	e 18 40	PP	i 24 37	[+ 6]	i 19 5	pPP	—
Edinburgh	E. 106.0	332	e 18 28	PP	24 42	[+10]	27 41	PS	—
Tinemaha	z. 106.8	49	e 18 17	[+ 4]	—	—	—	—	—
Paris	107.0	325	e 14 3	P	e 24 39	[+ 3]	e 18 36	PP	—
Kew	107.1	328	e 14 10	P	e 24 39	[+ 3]	e 19 2	PP	e 37.2
Butte	N. 107.1	38	e 17 44	PKP	e 24 41	[+ 5]	e 25 28	SKKS	e 49.4
Haiwee	z. 107.3	50	i 14 13	P	—	—	—	—	—
Saskatoon	107.3	31	18 37	PP	24 43	[+ 6]	26 5	S	—
Pasadena	107.8	51	i 14 13 <sub>k</sub>	P	i 24 46	[+ 6]	i 18 17	PKP	e 43.7
Bozeman	108.2	38	e 14 15	P	e 24 55	[+13]	e 18 44	PP	e 48.3
Riverside	z. 108.5	51	e 14 15	P	e 29 35	PKKP	i 18 19	PKP	—
Clermont-Ferrand	108.7	322	e 14 15	P	e 24 46	[+ 2]	e 18 41	PP	—
Rathfarnham Castle	109.0	332	e 18 25	[+ 7]	e 20 14	?	—	—	e 49.2
Palomar	109.1	52	e 14 18	P	—	—	—	—	—
Logan	109.5	42	e 14 24	P	e 24 57	[+11]	e 18 43	PP	e 50.9
Boulder City	109.8	48	e 14 20	P	—	—	—	—	—
Overton	z. 109.8	48	e 14 21	P	i 29 41	PPS	e 18 24	PKP	—
Salt Lake City	109.9	43	e 18 33	[+13]	e 24 32	[-16]	e 27 43	S	e 50.8
Pierce Ferry	110.3	49	e 14 23	P	i 25 0	[+10]	i 18 26	PP	—
Tortosa	112.1	318	18 54	PP	25 0	[+ 3]	21 22	PPP	e 54.2
Algiers Univ.	z. 112.2	312	e 18 26	[+ 2]	e 29 20	PS	e 19 2	PP	—
Ivigtut	113.4	357	—	—	35 6	SS	40 13	Q	55.2
Alicante	114.0	317	14 35	P	21 33	PPP	—	—	e 49.4
Tucson	114.3	50	e 15 10	P	e 26 27	SKKS	e 18 8	PKP	e 46.8
Tamanrasset	z. 115.4	298	e 14 41	P	e 24 55	[-15]	e 18 31	PKP	—
Toledo	115.6	318	e 18 30	[- 1]	25 13	[+ 2]	e 19 26	PP	59.9
Granada	116.7	317	19 43 <sub>a</sub>	PP	i 29 10	PS	20 22	pPP	i 60.3
Malaga	z. 117.5	317	i 18 35 <sub>k</sub>	[ 0]	i 25 51	[+33]	i 19 55	PP	55.0
Lincoln	E. 119.6	35	e 29 49	PS	e 36 19	SS	—	—	e 48.7
Chicago	123.8	30	e 20 34	PP	e 25 26	[-13]	e 30 21	PS	e 49.5
Florissant	124.5	34	e 20 39	PP	e 28 18	S	e 26 39	SKKS	—
St. Louis	124.7	34	e 18 49	[+ 1]	e 25 51	[+ 9]	e 30 16	PS	—
Seven Falls	E. 125.5	13	18 54	[+ 4]	i 37 31	SS	e 20 38	PP	—
Ottawa	125.7	18	e 18 41	[- 9]	30 26	PS	20 29	PP	—
Cleveland	126.9	26	i 18 54 <sub>a</sub>	[+ 1]	e 22 14	PKS	i 20 53	PP	—
Cincinnati	127.4	29	i 19 0	[+ 7]	—	—	i 20 54	PP	—
Pennsylvania	N. 129.0	24	e 19 3	[+ 6]	e 31 6	PS	i 21 3	PP	—
Tacubaya	129.1	60	e 18 57	[ 0]	—	—	e 22 15	PKS	—
Harvard	129.6	15	i 18 58	[ 0]	e 22 58	PKS	e 20 57	PP	e 64.1
Weston	129.8	15	i 19 1	[+ 3]	e 27 49	SKKS	i 21 5	PP	—
Philadelphia	130.7	22	e 21 18	PP	i 22 32	PKS	e 23 23	PPP	—
Washington	130.9	24	i 19 4	[+ 5]	i 22 18	PKS	i 21 14	PP	—
Washington	N.R.L. 130.9	24	e 19 18	[+19]	e 22 31	PKS	—	—	—
Vera Cruz	131.8	57	e 19 6	[+ 4]	e 22 13	PKS	—	—	—
Bermuda	141.0	15	e 19 20	[+ 1]	e 23 39	PKS	i 22 26	PP	e 56.6
La Plata	E. 150.5	173	19 55	[+20]	26 7	[-24]	23 31	PP	78.0
	N. 150.5	173	19 50	[+15]	26 55	[+24]	23 7	PP	73.7
Balboa Heights	150.8	59	e 19 55	[+20]	—	—	—	—	—
San Juan	153.4	26	e 19 51	[+12]	—	—	e 23 23	PP	—
Chinchina	156.0	63	(i 19 52)	[+10]	(i 25 7)	?	(i 20 19)	PKP <sub>2</sub>	—
Bogota	157.6	64	i 19 50	[+ 6]	e 30 49	SKKS	i 20 25	PKP <sub>2</sub>	—
Huancayo	157.9	110	e 19 51	[+ 6]	e 34 35	PSKS	i 24 10	PP	—
Fort de France	158.7	20	e 46 56	?	—	—	—	—	—
La Paz	162.4	129	e 19 56 <sub>k</sub>	[+ 6]	i 31 13	SKKS	20 50	PKP <sub>2</sub>	9.2

For Notes see next page.

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NOTES TO AUGUST 31d. 7h. 5m. 47s.

Additional readings :—

Zi-ka-wei eZ = 5m.23s., iZ = 5m.58s., 6m.31s., and 10m.29s.  
Nanking i = 5m.41s., iE = 9m.54s.  
Mizusawa SE = 12m.32s.  
Perth SSS = 16m.1s.  
Calcutta iE = 14m.23s.  
Riverview i = 8m.23s., iPPZ = 10m.8s., iSSN = 18m.26s., iSSZ = 18m.29s., iE = 18m.33s. and 18m.49s.  
Hyderabad iN = 16m.9s., SSN = 18m.56s.  
Kodaikanal QE = 19m.19s.  
New Delhi iN = 16m.29s. and 20m.25s.  
Poona PPEN = 10m.58s., S<sub>c</sub>SEN = 18m.33s., SSE = 19m.39s., SSSE = 21m.13s.  
Cobb River S<sub>c</sub>SE = 20m.11s.  
Christchurch iNZ = 10m.36s., eEZ = 15m.13s., eSSEN = 23m.13s., eQEN = 26m.18s., eZ = 28m.58s.  
Wellington S<sub>c</sub>S = 20m.20s., eSS = 22m.43s.  
Tananarive SS = 27m.17s.  
College ePKKP = 29m.36s., ePKP,PKP = 38m.23s.  
Sitka iP = 12m.57s., iSKS = 23m.17s., iPS? = 24m.24s., iPS = 24m.32s., ePPS? = 25m.34s.  
Helsinki eE = 28m.18s.  
Helwan eN = 25m.19s.  
Upsala eE = 17m.19s., eN = 17m.25s., eE = 19m.23s. and 24m.39s., eN = 24m.57s., ePPSE = 26m.3s., eSS? = 30m.56s., eSSSE = 34m.19s., eQ = 39.2m.  
Warsaw eZ = 13m.35s. and 14m.11s., eNZ = 16m.37s., e = 17m.33s., PPPZ = 19m.19s., eZ = 22m.59s., SKS = 23m.42s., SKKSEN = 24m.2s., e = 24m.53s., PS = 25m.33s., PPSE = 26m.27s., PPSZ = 26m.33s., PPSN = 26m.40s., eE = 28m.27s., SS = 30m.47s., SSSE = 34m.19s., SSSN = 34m.22s.  
Skalnate Pleso e = 17m.41s., eS? = 25m.26s., ePS = 25m.44s., ePPS = 26m.40s., e = 27m.19s., eSS = 32m.7s.  
Ogyalla e = 13m.49s. and 20m.19s., ePS = 25m.55s., eSS? = 30m.49s., eSSS = 35m.43s.  
Copenhagen 20m.13s.  
Prague e = 14m.4s., 14m.26s., 14m.57s., 15m.27s., 15m.42s., and 16m.39s., ePP = 17m.58s., e = 18m.38s. and 20m.13s., eE = 20m.49s., eSKKS? = 24m.43s., ePS = 26m.1s. and 26m.43s., ePPS = 27m.25s., eSS = 31m.37s., eSSS = 35m.31s.  
Potsdam ePP?N = 18m.1s., iPP?Z = 18m.8s., ePP?E = 20m.23s., eSKSN = 23m.55s., eSKSEN = 24m.55s., iSE = 25m.17s., eSN = 25m.49s., iPSE = 26m.57s.  
Collmberg eZ = 13m.55s. and 14m.34s., eSKSE = 24m.1s., ePSEN = 26m.13s., eN = 26m.55s., iSSE = 32m.13s., eN = 32m.43s.  
Bergen eE = 27m.50s., SSN = 31m.40s.  
Seattle e = 14m.47s., 18m.29s., and 37m.35s.  
Cheb e = 14m.53s., 19m.38s., and 23m.36s., eSKKS = 25m.2s., e = 26m.4s., ePPS = 27m.10s., e = 31m.6s., eSS = 32m.37s., eSSS = 36m.56s.  
Jena eN = 18m.42s.  
Scoresby Sund 18m.2s., i = 24m.17s., SP = 27m.1s., SS = 32m.13s., SSS = 36m.31s.  
Stuttgart e = 14m.14s., eZ = 14m.48s., e = 18m.43s., ePPP = 20m.37s., e = 23m.1s., eSKS = 24m.13s., ePS = 26m.48s., ePPS = 30m.7s., eSSS = 37m.25s., e = 43m.13s., eQ = 51.2m.  
Mineral iZ = 13m.55s., eZ = 17m.5s.  
Bologna e = 18m.37s.  
Berkeley eZ = 18m.53s., eN = 24m.23s., ePS?E = 27m.19s., ePSPS?Z = 33m.13s.  
De Bilt ePPP = 20m.31s., eSKS = 24m.26s., ePS = 27m.3s., iZ = 30m.13s.  
Santa Clara eP<sub>c</sub>S, S<sub>c</sub>PE = 33m.27s.  
Strasbourg e = 14m.21s. and 17m.43s., ePP = 18m.23s., e = 18m.38s., ePPP = 20m.43s., eSKS = 24m.23s., e = 26m.22s. and 27m.3s., ePS = 27m.43s. and 27m.55s., ePPS = 28m.34s. and 28m.39s., e = 31m.23s., eSS = 33m.34s., eSSS? = 38m.27s.  
Zürich eS? = 25m.0s.  
Lick iZ = 15m.16s., eZ = 29m.47s.  
Reno eEZ = 14m.3s.  
Aberdeen eEN = 18m.24s., iPSN = 27m.54s., iPPSEN = 29m.0s., iE = 31m.20s., eSSN = 33m.38s., eE = 38m.3s.  
Hungry Horse eS = 25m.50s.  
Fresno eN = 18m.25s. and 23m.40s.  
Edinburgh SKKSE = 25m.24s.  
Paris e = 14m.29s., eS = 26m.1s., e = 27m.5s., ePPS = 28m.26s.  
Kew ePPS? = 28m.36s.  
Butte ePSN = 27m.49s., eSSN = 33m.23s.  
Saskatoon SKKS = 25m.31s., PS = 27m.55s., PPS = 28m.43s., SS = 33m.37s., SSS = 37m.53s.  
Pasadena iPPZ = 18m.33s., ePSZ = 27m.46s., ePKKPZ = 29m.37s., eSSE = 33m.43s., eSSSEZ = 37m.43s.  
Bozeman eS? = 25m.45s., ePS = 27m.58s., eSS = 34m.2s., ePSPS = 34m.28s.  
Clermont-Ferrand e = 14m.41s. and 19m.11s., eS = 26m.11s., ePS = 28m.15s. and 28m.46s., PPS? = 29m.51s., ePKKS = 32m.31s., eSSS? = 39m.36s.  
Logan eSKKS = 25m.40s., iPPS = 28m.44s., eSS? = 32m.41s., eSSS = 37m.58s.  
Overton ePKP,PKPZ = 37m.24s.  
Salt Lake City eSKKS? = 25m.17s., e = 26m.3s.  
Pierce Ferry e = 29m.13s.

Continued on next page.

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Tortosa SKSN = 24m.39s., SKKSE = 25m.45s., PSE = 28m.29s., PPSE = 29m.32s., SSE? = 34m.16s.  
 Algiers Univ. eZ = 19m.31s. and 20m.12s., ePPPZ = 21m.55s., eZ = 29m.33s.  
 Tucson ePKP = 18m.33s., iPP = 19m.30s., ePS = 28m.52s., eSS = 34m.57s., eSSS = 39m.22s.  
 Tamanrasset ePPZ = 19m.37s., iZ = 20m.13s., ePPPZ = 21m.44s., eZ = 22m.25s., ePS?Z = 29m.51s., eZ = 31m.57s., iPKKSZ = 33m.13s.  
 Toledo PPPZ = 21m.55s., PS?E = 29m.16s.  
 Granada PP = 21m.13s., SKP = 23m.0s., ePPP = 24m.28s., PPS = 33m.1s., SS = 36m.10s.  
 Malaga PPPZ = 22m.23s., SKKSZ = 27m.5s.  
 Chicago eSS = 37m.3s., eSSS = 41m.43s.  
 Florissant ePS = 30m.26s.  
 St. Louis iPKP = 18m.54s., i = 19m.11s., iPP = 20m.38s., i = 20m.49s., 21m.9s., and 21m.32s.  
 Ottawa i = 18m.50s. and 20m.40s., e = 28m.37s., SS = 37m.37s.  
 Cleveland iPKPE = 18m.59s., iPPZ = 20m.56s., iPPE = 21m.2s., ePSE = 30m.48s., eSSN = 37m.49s., eSSE = 37m.57s., eE = 40m.29s.  
 Pennsylvania i = 20m.51s. and 22m.23s.  
 Harvard e = 18m.46s., i = 21m.14s., iPPP = 23m.14s., e = 24m.17s. and 30m.23s., iSKSP = 30m.56s., ePPS = 32m.35s., ePPPS? = 33m.35s., e = 35m.28s., iSS = 38m.31s., eScSScS = 40m.53s.  
 Weston iPKS = 22m.16s.  
 Philadelphia eSKSP = 31m.20s., i = 34m.29s., eSS = 38m.31s., eSSS = 42m.38s., e = 49m.12s.  
 Bermuda e = 27m.25s., iSS? = 40m.42s., eSSS = 46m.13s.  
 La Plata E = 28m.25s., N = 30m.7s., E = 30m.19s., 31m.43s., 33m.31s., and 35m.31s., N = 35m.37s., E = 42m.31s. and 46m.19s., N = 47m.31s. and 48m.19s., E = 49m.7s., 51m.25s., and 55m.25s., N = 59m.49s.  
 San Juan e = 20m.29s., 21m.5s., 57m.36s., and 63m.48s.  
 Chinchina ePSKS = (34m.11s.) the timing is in error.  
 Bogota eSKP = 24m.3s.  
 Huancayo e = 20m.30s., 31m.39s., and 40m.51s., eSS = 44m.49s.  
 La Paz iPKPZ = 20m.1s., PKS = 23m.17s., iPPZ = 24m.28s., PPP = 28m.27s., i = 34m.53s., iSS = 44m.53s., iSSP = 45m.43s.

Aug. 31d. 17h. 22m. 12s. Epicentre 44°·9N. 17°·4E.

Intensity VIII at Drugovici; VI at Prnjavor, Slatina; V at Lisnja, Laktasi, Piscavica, Banja Luka; IV at Celinac Bos-Dubica, and Zagreb; III-IV at Triest.  
 Epicentre as adopted. Macroseismic radius 260km.

M. Uzelac.

Annuaire Macroséismique de l'Institut Séismologique de Beograd, 1950. Nouvelle Série No. 10, Belgrade, 1951, pp. 56-58.

A = +·6782, B = +·2125, C = +·7035;  $\delta$  = +2; h = -3;  
 D = +·299, E = -·954; G = +·671, H = +·210, K = -·711.

	N.	$\Delta$		Az.		P.		O - C.		S.		O - C.		Supp.		L. m.
		°	'	m.	s.	m.	s.	m.	s.	m.	s.	m.	s.			
Kalossa		2·0	34	e 0	34	- 1	1 0	- 2	0 40	P <sub>g</sub>	1·1					
Belgrade		2·2	92	i 0	36k	- 2	i 1 10	+ 4								
Triest		2·7	286	e 0	45a	0	i 1 16	- 3	i 0 54	P <sub>g</sub>						
Timisoara		2·8	72	e 0	50?	+ 3	e 1 33	S <sub>g</sub>	e 0 56	P <sub>g</sub>						
Budapest		2·9	24	0	42	- 6	1 34	S <sub>g</sub>	1 1	P <sub>g</sub>	2·1					
Ogyalla		3·0	11	e 1	6	P <sub>g</sub>	e 1 27	0	i 1 38	S <sub>g</sub>						
Vienna		3·4	348	i 0	55	0	e 1 56	S <sub>g</sub>	e 1 2	P*						
Padova		4·0	266	e 1	13	P*	i 2 8	S*								
Bologna		4·4	267	e 1	17	P*	e 2 3	+ 1	e 1 31	P <sub>g</sub>						
Taranto		4·4	181	1	21	P*	2 5	+ 3								
Florence, Xim.		4·6	258	i 1	30	P <sub>g</sub>	i 2 16	S*								
Prato		4·6	260	e 1	12	0	i 2 12	+ 5								
Rocca di Papa		4·6	229	e 1	6	- 6	e 1 50	-17								
Rome		4·7	232	1	10	- 4	i 2 9	- 1	i 1 32	P <sub>g</sub>						
Skalnate Pleso		4·7	23	e 1	46	P <sub>g</sub>	2 19	+ 9	e 2 35	S <sub>g</sub>						
Sofia		4·8	115	e 1	15	0	i 2 6	-6	i 2 39	S <sub>g</sub>						
Raciborzu		5·2	6	e 1	26	+ 5										
Prague		5·5	340	i 1	25	0	e 2 22	- 8	e 1 51	P*						
Chur		5·8	292	e 1	29	0	e 2 53	S*								
Pavia		5·9	276	e 1	32	+ 1	e 2 28	-12								

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.	
Ravensburg	6.1	301	e 1 32	- 2	e 3 18	S <sub>g</sub>	e 1 42	P*	e 3.6
Bucharest	6.2	91	e 1 40	+ 5	e 2 42	- 6	i 2 5	P <sub>g</sub>	—
Cheb	6.2	329	e 1 33	- 2	e 2 49	+ 1	e 1 52	P*	—
Zürich	6.6	295	e 1 38	- 3	e 3 25	S*	e 2 3	P <sub>g</sub>	—
Ebingen	6.7	303	e 2 1	P*	e 3 8	+ 8	e 3 40	S <sub>g</sub>	—
Messina	6.8	192	e 2 6	P*	e 3 24	S*	e 3 53	S <sub>g</sub>	—
Stuttgart	z. 6.8	308	e 1 40	- 4	e 2 58	- 5	e 2 10	P <sub>g</sub>	—
Collmburg	z. 7.1	337	e 1 44	- 4	i 3 13	+ 3	i 3 49	S <sub>g</sub>	—
Jena	7.2	329	e 1 46	- 3	e 3 12	- 1	i 3 54	S <sub>g</sub>	—
Basle	7.3	295	e 1 48	- 2	e 3 38	S*	e 2 7	P*	—
Karlsruhe	7.4	307	e 1 48?	- 4	e 4 4	S <sub>g</sub>	e 2 32	P*	—
Neuchatel	7.6	290	e 1 51	- 4	e 3 31	+ 8	e 4 6	S <sub>g</sub>	—
Strasbourg	7.6	303	e 1 51	- 4	e 3 20	- 3	i 2 32	P*	—
Potsdam	8.0	341	e 2 18	P*	e 3 35	+ 2	i 4 7	S*	—
Athens	8.4	143	e 2 4	- 2	e 3 40	- 3	—	—	—
Istanbul	9.4	110	e 3 13	P <sub>g</sub>	e 4 39	S*	—	—	—
Clermont-Ferrand	10.1	280	e 2 32	+ 3	—	—	—	—	—
De Bilt	10.9	316	—	—	e 5 13	S*	—	—	e 5.8
Paris	11.0	297	e 2 26	-16	e 5 6	+19	—	—	e 7.1
Yalta	12.0	86	e 2 55	0	—	—	—	—	—
Upsala	15.0	0	i 3 41	+ 6	e 6 39	+16	—	—	e 7.8
Durham	15.7	316	—	—	e 6 59	+20	e 7 16	SS	e 8.4
Toledo	z. 16.6	260	e 4 58	+62	—	—	—	—	e 12.8
Moscow	16.8	43	e 3 55	- 3	—	—	—	—	—
Aberdeen	17.3	322	i 5 43	?	i 7 29	+13	i 8 1	SS	c 9.6
Granada	17.6	252	i 4 2k	- 6	7 29	+ 6	i 5 2	PP	i 9.6
Rathfarnham Castle	17.6	307	—	—	e 7 28	+ 5	—	—	e 8.9
Zugdidi	17.9	88	e 4 19	+ 7	—	—	—	—	—
Ksara	18.0	122	i 4 14	+ 1	7 47	+15	—	—	—
Borzhomi	19.1	89	e 4 28	+ 1	—	—	—	—	—
Gori	19.6	89	e 4 38	+ 6	—	—	—	—	—
Tiflis	20.2	89	e 4 37	- 2	i 8 31	+10	—	—	—
Tamanrasset	z. 24.1	207	i 5 16k	- 2	—	—	e 5 44	PP	—
Reykjavik	29.1	325	i 7 42	?	—	—	—	—	—
Sverdlovsk	29.3	49	—	—	e 11 29	+30	—	—	—
College	70.0	353	e 11 8	- 7	—	—	—	—	—
Hungry Horse	77.9	329	i 11 59	- 2	—	—	—	—	—

Additional readings :—

Kalossa P<sub>g</sub>E = 43s., iEN = 53s.

Triest iS<sub>g</sub> = 1m.26s.

Timisoara ePE = 53s.

Budapest P = 55s., P<sub>g</sub> = 1m.6s.

Ogyalla e = 1m.24s., eS\* = 1m.33s.

Vienna eP = 1m.2s.

Bologna e = 1m.22s., 2m.16s., and 2m.32s.

Skalnate Pleso eS<sub>g</sub> = 2m.44s.

Sofia i = 2m.21s. and 3m.18s.

Prague e = 1m.31s., iP\* = 1m.37s., e = 1m.42s., 1m.46s., 2m.1s., and 2m.12s., iS\* = 2m.35s., eS<sub>g</sub> = 3m.2s.

Chur i = 1m.33s.

Ravensburg eZ = 1m.35s.

Bucharest iP<sub>g</sub>E = 2m.11s., iS<sub>g</sub>N = 3m.27s., iS<sub>g</sub>E = 3m.31s.

Cheb eP\* = 1m.42s., eS = 2m.20s., eS\* = 2m.39s.

Stuttgart eZ = 1m.43s., 1m.53s., and 1m.58s., eP<sub>g</sub>Z = 2m.3s., eZ = 2m.34s. and 2m.47s., eS<sub>g</sub>Z = 2m.54s., eZ = 3m.28s., and 3m.38s., eS<sub>g</sub>Z = 3m.49s. and 3m.54s., eZ = 3m.59s. and 4m.15s.

Collmburg iZ = 1m.47s., eN = 3m.4s., 3m.16s., and 3m.27s., iZ = 3m.33s., eSN = 3m.38s., iZ = 4m.40s.

Jena eEN = 1m.52s., eE = 2m.45s., iS\*?E = 3m.19s., iS<sub>g</sub>E = 3m.36s., iS<sub>g</sub>N = 3m.40s.

Basle e = 3m.8s.

Karlsruhe eEN = 4m.8s.

Neuchatel e = 2m.54s.

Strasbourg e = 3m.12s., iS\* = 3m.52s., e = 4m.4s., iS<sub>g</sub> = 4m.9s., i = 4m.23s.

Potsdam eN = 3m.15s., eZ = 3m.54s., iE = 4m.39s.

Paris eP = 2m.41s., e = 3m.44s., 4m.18s., 4m.28s., 5m.37s., 5m.56s., 6m.1s., and 6m.43s.

Upsala e = 7m.37s.

Tamanrasset eZ = 5m.28s., iZ = 6m.45s.

Reykjavik iE = 7m.45s.

Long waves were also recorded at Kew, Copenhagen, Bergen, Malaga, and Tortosa.

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Aug. 31d. 18h. 47m. 48s. Epicentre 42°·0N. 125°·1W. (as on 1950, Jan. 27d.).

A = -·4286, B = -·6098, C = +·6666;  $\delta = -9$ ;  $h = -2$ ;  
D = -·818, E = +·575; G = -·383, H = -·545, K = -·745.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	L.
		°	°	m. s.	s.	m. s.	s.	m.
Shasta Dam		2·4	123	i 0 42	+ 1	—	—	—
Mineral	z.	3·1	120	e 0 52	+ 1	—	—	—
Berkeley		4·7	151	e 1 11 <sub>a</sub>	- 3	e 2 32	S <sub>g</sub> ?	—
Reno		4·7	119	e 1 16	+ 2	e 1 56	?	—
Lick	z.	5·3	149	i 1 21 <sub>k</sub>	- 1	—	—	—
Seattle		6·0	18	e 1 25	- 7	e 2 23	-20	e 4·2
Victoria	z.	6·6	10	1 23	-18	2 35	-23	—
Fresno	z.	6·6	140	e 1 45 <sub>k</sub>	+ 4	—	—	—
Tinemaha	z.	7·3	131	e 1 57	+ 7	—	—	—
Pasadena	z.	9·6	143	i 2 21	0	—	—	—
Overton	z.	9·9	120	e 2 31	+ 6	—	—	—
Boulder City		10·0	124	e 2 31	+ 4	—	—	—
Riverside	z.	10·0	140	i 2 28	+ 1	—	—	—
Hungry Horse		10·1	47	i 2 19	- 9	—	—	—
Pierce Ferry		10·4	120	i 2 36	+ 2	—	—	—
Tucson		15·0	126	e 3 36	+ 1	—	—	—

Additional readings :

Berkeley eE = 2m.41s., eZ = 3m.18s.  
Reno eN = 3m.18s.  
Lick iZ = 1m.24s.  
Seattle e = 1m.37s.

Aug. 31d. 19h. 52m. 36s. Epicentre 29°·2N. 95°·1E. (as on 29d.).

A = -·0777, B = +·8709, C = +·4853;  $\delta = +2$ ;  $h = +2$ ;  
D = +·996, E = +·089; G = -·043, H = +·483, K = -·874.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Calcutta	E.	9·0	224	—	—	e 3 44	-14	—	i 4·9
New Delhi		15·7	272	e 3 40	- 4	i 6 35	- 4	6 52	SS
Przhevalsk		18·9	320	i 4 27	+ 3	i 8 6	+13	—	—
Hyderabad	E.	19·2	236	e 4 20	- 8	8 0	+ 1	—	—
Murgab		19·8	304	4 35	0	e 8 17	+ 4	—	—
Naryn		19·8	315	e 4 37?	+ 2	e 8 15?	+ 2	—	—
Almata		20·2	320	i 4 42	+ 3	i 8 33	+12	—	—
Nanking		20·6	75	4 36 <sub>a</sub>	- 7	e 8 22	- 7	—	i 10·2
Frunse		21·4	315	i 4 54	+ 3	i 8 54	+ 9	—	—
Andijan		21·8	308	e 5 1	+ 5	9 1	+ 9	—	—
Fergana		22·1	308	e 5 0	+ 1	—	—	—	—
Poona	E.	22·1	246	4 56	- 3	9 0	+ 2	—	—
Garm		22·7	304	5 6	+ 2	—	—	—	—
Kulyab		22·8	299	e 5 5	0	e 9 14	+ 3	—	—
Bombay		22·8	249	e 5 4	- 1	e 9 12	+ 1	—	11·7
Zi-ka-wei	z.	22·9	78	5 0	- 6	e 9 12	- 1	—	—
Stalinabad		23·6	301	i 5 15	+ 2	e 9 32?	+ 7	—	—
Irkutsk		24·0	13	5 20	+ 3	e 9 41?	+ 9	—	—
Tashkent		24·2	307	i 5 21	+ 2	—	—	—	—
Tchimkent		24·4	310	i 5 23	+ 2	e 9 45	+ 6	—	—
Ashkabad		31·7	297	e 6 36	+ 9	—	—	—	—
Vladivostok		32·5	55	e 6 30	- 4	e 11 44	- 5	—	—
Sverdlovsk		36·7	329	i 7 12	+ 2	12 57	+ 3	—	—
Tiflis		42·3	302	e 8 3	+ 6	—	—	—	—
Gori		42·8	302	e 8 10	+ 9	—	—	—	—
Borzhomi		43·4	302	e 8 7	+ 1	—	—	—	—
Abastumanj		43·8	302	e 8 10	+ 1	—	—	—	—
Zugdidi		44·5	303	e 8 17	+ 2	—	—	—	—
Moscow		48·2	321	e 8 44	0	e 15 45	+ 2	—	—
Yalta		50·0	305	e 8 57	- 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.
Ksara		50.1	291	e 9 3	+ 4	(e 16 23)	+13	—	—
Pulkovo		52.6	325	e 9 18	0	e 16 46	+ 2	—	—
Istanbul		54.1	302	e 9 27	- 2	e 17 1	- 4	—	—
Copenhagen		62.4	321	—	—	18 57	+ 4	20 24	ScS 33.4
Prague		62.5	315	e 10 32	+ 4	e 11 7	PcP	e 13 2	PP
Potsdam		62.8	318	e 10 35	+ 5	—	—	e 29 24	Q 32.8
Collmburg	z.	63.1	316	e 10 31	- 1	—	—	e 10 35	P
Rome		66.0	306	e 10 50	0	e 20 38	ScS	—	—
Stuttgart		66.1	314	e 10 50	- 1	e 19 40	+ 1	—	e 36.4
Strasbourg		67.1	315	i 11 1 <sub>a</sub>	+ 4	—	—	e 13 30	PP
De Bilt		67.5	319	e 11 1	+ 1	e 19 59	+ 3	—	e 36.4
Paris		70.3	316	e 11 14	- 3	—	—	e 12 57	PP e 38.4
Kew		70.9	319	e 11 26	+ 5	e 20 39	+ 3	—	e 37.4
Rathfarnham C. College	z.	73.5	323	e 11 49	+13	e 19 10	?	—	—
		74.4	23	i 11 38	- 4	—	—	e 14 34	PP
Algiers Univ.	z.	74.7	304	e 11 46	+ 3	—	—	—	—
Tamanrasset	z.	78.9	290	i 12 5 <sub>k</sub>	- 2	—	—	i 15 6	PP
Pretoria	z.	84.3	236	i 12 31	- 4	—	—	—	—
Pietermaritzburg	z.	85.0	232	e 12 35	- 3	—	—	—	—
Overton	z.	109.0	24	e 19 0	[+29]	—	—	—	—
Pierce Ferry		109.5	24	e 18 51	[+19]	—	—	—	—

Additional readings :—

Ksara S reading has been reduced by 20m.

Prague i = 10m.36s., e = 11m.28s., 11m.41s., 12m.17s., and 13m.40s.

Stuttgart e = 10m.55s.

Paris i = 11m.22s.

Tamanrasset iZ = 12m.11s., eZ = 13m.44s., ePPPZ = 16m.58s.

Long waves were also recorded at Dehra Dun, Aberdeen, Clermont-Ferrand, Granada, and Malaga.

Aug. 31d. Readings also at 0h. (Granada, Harvard, Hungry Horse, and near College), 2h. (near Prague), 3h. (Malaga and near Lisbon), 6h. (College, Frunse, Murgab, Tchimkent, near Andijan, Fergana, Garm, and near La Paz), 7h. (College), 8h. (Seattle and near Victoria), 10h. (College), 11h. (La Paz, Overton, and Hungry Horse), 12h. (Messina, Tamanrasset, and near Balboa Heights), 13h. (College), 14h. (Pasadena, Tinemaha, and College), 15h. (College), 17h. (Upsala), 18h. (Calcutta), 19h. (near La Paz), 20h. (Ashkabad), 22h. (Riverside, Tinemaha, Mount Wilson, Tucson, Boulder City, Pierce Ferry, Lick, Shasta Dam, Hungry Horse, College, and Messina), 23h. (Garm, Kulyab, Stalinabad, Tchimkent, near Almata, Andijan, Fergana, Frunse, Murgab, Naryn, Przhevalsk, and Tashkent).

Sept. 1d. 2h. 46m. 56s. Epicentre 3°·3S. 89°·0E.

Epicentre given by Strasbourg.

$$A = +.0174, B = +.9982, C = -.0572; \quad \delta = -2; \quad h = +7;$$

$$D = +1.000, E = -.018; \quad G = -.001, H = -.057, K = -.998.$$

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Colombo	E.	13.6	318	3 14	- 3	5 40	-10	—	9.3
Kodaikanal	E.	17.7	320	i 4 14	+ 4	i 7 37	+11	4 40	PPP 8.6
Djakarta	E.	18.0	99	i 4 10	- 3	i 7 32	0	—	—
Bandong		18.9	100	i 4 21	- 3	i 7 51	- 2	—	—
Hyderabad		23.1	334	i 5 7	- 1	i 9 18	+ 2	i 9 22	S 11.6
Calcutta	E.	25.7	359	e 5 38	+ 5	e 10 12	+11	e 11 30	SSS 11.2
Poona		26.3	327	5 41	+ 2	10 12	+ 1	11 20	Q 12.8
Bombay		27.2	325	e 5 49	+ 2	e 10 31	+ 6	11 19	Q 12.9
New Delhi		33.7	342	e 6 44	- 1	i 12 13	+ 5	14 2	SS 15.7
Dehra Dun	N.	35.0	345	e 1 13	?	e 14 52	SS	—	e 22.4
Murgab		43.8	343	8 9	0	14 38	- 2	—	—
Kulyab		44.7	342	e 8 17	+ 1	—	—	e 10 6	PP
Nanking		45.1	36	i 8 21 <sub>a</sub>	+ 1	i 15 4	+ 5	10 4	PP e 21.0
Garm		45.5	340	8 22	- 1	—	—	—	—
Stalinabad		45.7	338	i 8 23	- 1	e 15 4	- 4	—	—

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.	
Naryn		46.1	348	e 8 26	- 2	—	—	10 5	PcP	—
Fergana		46.2	343	i 8 29	+ 1	e 15 15	0	e 10 22	PP	—
Andijan		46.4	343	8 30	0	i 15 22	+ 4	10 23	PP	—
Przhevalsk		46.6	351	i 8 31	- 1	—	—	—	—	—
Frunse		47.2	346	i 8 40	+ 4	e 15 39	+10	e 10 35	PP	—
Samarkand		47.3	337	e 8 38	+ 1	—	—	—	—	—
Mary		47.9	331	i 8 36	- 6	—	—	e 10 30	PP	—
Tashkent		47.9	340	i 8 42	0	i 15 38	- 1	e 10 38	PP	—
Tchimkent		48.7	343	i 8 47	- 1	—	—	—	—	—
Ashkabad		49.9	329	e 8 57	0	—	—	—	—	—
Kizyl-Arvat		51.9	328	e 9 10	- 2	16 25	-10	—	—	—
Lenkoran		55.9	323	9 0?	-42	16 40?	-49	—	—	—
Baku		56.3	325	e 9 32	-13	e 17 39	+ 5	—	—	—
Irkutsk		56.9	11	e 9 45?	- 4	—	—	e 12 4	PP	—
Vladivostok		60.2	35	e 10 12	0	—	—	—	—	—
Grozny		60.6	326	10 21	+ 6	—	—	—	—	—
Gori		60.7	324	e 10 16?	+ 1	—	—	—	—	—
Borzhomi		61.1	323	e 10 16?	- 2	—	—	—	—	—
Pietermaritzburg z.		61.3	239	i 10 20	0	—	—	—	—	—
Ksara		62.1	311	e 10 28	+ 3	18 54	+ 5	—	—	—
Pretoria	z.	62.4	244	i 10 28	+ 1	—	—	e 12 37	PP	—
Zugdidi		62.4	323	e 10 27	0	—	—	—	—	—
Helwan	N.	64.2	305	—	—	e 19 16	0	e 20 34	ScS	—
Sverdlovsk		64.2	344	i 10 37	- 2	19 12	- 4	i 12 55	PP	—
Brisbane	z.	65.5	119	i 10 45	- 2	—	—	—	—	—
Grahamstown		65.8	235	i 10 48	- 1	—	—	—	—	—
Istanbul		70.1	317	e 11 16	0	e 20 24	- 3	—	—	—
Moscow		72.2	333	e 11 28	- 1	e 20 46	- 5	—	—	—
Kishinev		72.7	322	e 11 31	- 1	e 20 51?	- 6	—	—	—
Pulkovo		77.7	334	e 11 59	- 1	e 21 46	- 6	—	—	—
Taranto		78.4	313	—	—	e 21 44	-16	—	—	—
Triest		82.1	317	e 12 23	- 1	e 22 39	+ 1	e 15 37	PP	e 43.1
Rome		82.2	313	e 12 22	- 2	e 22 38	- 1	—	—	—
Prague		82.7	322	e 12 27	0	e 22 45	+ 1	e 15 41	PP	—
Florence Xim		83.4	315	—	—	e 22 50	- 1	—	—	—
Upsala		83.6	332	—	—	i 22 49	- 4	e 30 42	?	e 39.1
Collmberg	z.	83.8	322	e 12 32	0	—	—	e 12 41	PcP	—
Potsdam		84.1	324	e 12 34	0	i 22 54	- 4	e 23 4	S	e 45.1
Jena		84.6	322	e 12 38	+ 2	—	—	e 16 17?	PP	—
Chur		85.2	317	e 12 39 <sup>a</sup>	0	e 23 4	[+ 2]	—	—	—
Copenhagen		85.2	327	—	—	23 12	+ 3	—	—	43.1
Tamanrasset	z.	85.3	294	i 12 42 <sup>a</sup>	+ 2	e 23 13	+ 3	e 16 4	PP	—
Stuttgart		85.8	320	e 12 42	0	e 23 5	[- 1]	e 16 14	PP	e 45.1
Zürich		85.9	318	e 12 43 <sup>a</sup>	0	—	—	e 16 0	PP	—
Basle		86.6	318	e 12 43	- 3	—	—	e 12 59	PcP	—
Strasbourg		86.7	320	e 12 54 <sup>a</sup>	PcP	e 23 12	[ 0]	e 16 24	PP	e 44.1
Algiers Univ.	z.	88.7	307	i 12 56 <sup>k</sup>	- 1	—	—	e 16 25	PP	—
De Bilt		88.8	323	e 13 4	PcP	e 23 26	[+ 1]	e 16 40	PP	e 43.1
Paris		90.2	319	i 13 3	- 1	e 23 57	+ 1	e 16 39	PP	e 46.1
Alicante		91.6	308	e 13 39	+29	e 24 15	+ 6	25 27	PPS	e 43.7
Kew		92.1	322	e 13 19	+ 7	e 23 44	[- 1]	e 25 27	PS	e 46.1
Granada		94.0	307	—	—	31 1	SS	—	—	45.9
Malaga	z.	94.7	307	e 13 15	- 9	—	—	17 9	PP	49.8
Rathfarnham Castle		95.8	324	e 16 53	PP	e 24 54	+ 9	e 29 30	?	47.6
College		106.6	22	e 18 24	[- 2]	—	—	i 18 48	PP	—
Victoria	z.	127.1	26	i 19 6 <sup>k</sup>	[ 0]	—	—	—	—	—
Hungry Horse		131.0	20	e 19 12	[- 2]	i 22 49	PKS	i 22 37	?	—
Shasta Dam		133.2	32	e 19 13	[- 5]	—	—	—	—	—
Mineral	z.	133.9	32	e 19 20	[+ 1]	—	—	e 21 51	PP	—
Reno	z.	135.5	32	e 19 30	[+ 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.
Lick	z. 136.0	35	e 19 23 <sub>a</sub>	[ 0]	—	—	—	—
Harvard	137.3	339	e 19 27	[+ 1]	—	—	—	e 74.8
Weston	137.3	339	e 19 27	[+ 1]	—	—	—	—
Tinemaha	z. 138.1	33	e 19 29	[+ 2]	—	—	—	—
Palisades	139.4	340	e 22 43	PP	e 40 47	SS	—	—
Pasadena	140.2	35	i 19 38	[+ 7]	—	—	—	e 75.1
Overton	z. 140.5	30	e 19 33	[+ 2]	—	—	—	—
Boulder City	140.7	31	e 19 34	[+ 2]	—	—	—	—
Riverside	z. 140.8	35	e 19 31	[- 1]	—	—	—	—
Pierce Ferry	141.0	30	e 19 28	[- 4]	—	—	e 22 31	PP
Washington	142.4	342	e 19 43	[+ 8]	e 23 21	PKS	—	—
Tucson	145.7	30	i 19 42	[+ 2]	—	—	i 19 51	PKP <sub>2</sub>
La Paz	150.0	230	i 19 55 <sub>a</sub>	[+ 8]	30 10	{- 8}	e 23 42	PP
Huancayo	158.2	226	e 20 11	[+12]	—	—	e 24 16	PP
Bogota	163.1	277	e 20 56	PKP <sub>2</sub>	e 31 4	{-24}	e 24 41	PP
Chinchina	164.6	280	e 20 5	[ 0]	—	—	—	—

Additional readings :—

Kodaikanal SSSE = 8m.11s.  
 Calcutta ePPE = 8m.19s., eE = 10m.29s., eSSSE = 11m.47s.  
 Poona SSSE = 11m.58s.  
 Nanking PPP? = 11m.0s., eS = 14m.37s., SS? = 18m.42s.  
 Andijan SS = 19m.1s.  
 Frunse eSS = 19m.19s.  
 Tashkent ePPP = 11m.21s., eSS = 19m.8s.  
 Irkutsk ePPP = 13m.28s.  
 Pretoria eP<sub>c</sub>PZ = 11m.13s.  
 Sverdlovsk iPPP = 14m.32s., iPS = 19m.19s.?, SS = 23m.27s.  
 Trieste ePPP = 17m.26s., ePS = 23m.24s., eSS = 28m.16s.  
 Prague e = 12m.32s., i = 12m.38s., e = 12m.42s., 12m.57s., 13m.1s., 13m.9s., 13m.43s., 13m.55s., 14m.7s., and 14m.46s.  
 Collnberg eZ = 16m.2s.  
 Jena eE = 12m.48s.  
 Tamanrasset eZ = 12m.45s., iZ = 12m.53s., ePPPZ = 17m.59s., eZ = 20m.3s.  
 Stuttgart eZ = 12m.52s., ePPS = 25m.24s.  
 Strasbourg e = 13m.26s., ePS = 24m.37s., eSS = 29m.19s.  
 Algiers Univ. iZ = 13m.5s., eZ = 13m.53s.  
 De Bilt ePS = 24m.54s., eSS = 29m.44s.  
 Paris i = 13m.14s. and 13m.34s., ePS = 24m.59s., eSSS = 33m.35s.  
 Alicante PP = 17m.7s., SS = 30m.27s.  
 Kew eSS = 30m.15s.  
 Malaga iZ = 14m.41s.  
 Mineral eZ = 19m.30s.  
 La Paz PPS = 36m.16s.  
 Huancayo e = 20m.39s.  
 Long waves were also recorded at Helsinki, Tortosa, and Seven Falls.

Sept. 1d. 7h. 12m. 0s. Epicentre 30°-0N. 95°-5E. (as on Aug. 22d.).

A = -0.0831, B = +0.8635, C = +0.4975;  $\delta = +4$ ;  $h = +2$ ;  
 D = +0.995, E = +0.096; G = -0.048, H = +0.495, K = -0.867.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Calcutta	E. 9.8	223	e 4 10?	S	(e 4 10?)	- 7	i 5 33?	S <sub>z</sub>
New Delhi	N. 16.0	269	e 3 40	- 8	6 50	+ 4	4 1	PP
Przhevalsk	18.5	315	i 4 21	+ 2	e 7 51	+ 7	—	—
Naryn	19.5	312	e 4 30	- 1	e 7 58	- 8	—	—
Murgab	19.7	300	4 33	- 1	8 12	+ 2	—	—
Almata	19.9	316	i 4 36	0	i 8 21	+ 6	—	—
Hyderabad	20.0	235	e 4 27	-10	e 8 13	- 4	e 4 30	P
Nanking	20.1	77	4 37 <sub>k</sub>	- 1	8 28	+ 9	i 9 7	Q
Frunse	21.1	312	i 4 48	0	i 8 53	+14	—	—
Andijan	21.6	304	e 4 54	0	9 0	+11	—	—
Fergana	21.9	304	e 4 56	- 1	e 8 56	+ 2	—	—
Zi-ka-wei	z. 22.3	78	e 5 2	+ 1	i 9 14	+12	—	—
Garm	22.6	300	5 3	0	—	—	—	—
Kulyab	22.7	296	5 5	+ 1	9 11	+ 2	—	—
Poona	22.8	244	5 6	+ 1	9 17	+ 6	—	10.8

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.
Obi-garm	22.9	299	i 5 4	- 2	—	—	—	—
Irkutsk	23.2	12	5 11?	+ 2	9 30?	+ 12	—	—
Bombay	23.4	247	e 5 9	- 2	e 9 22	+ 1	—	—
Stalinabad	23.6	299	i 5 14	+ 1	e 9 27	+ 2	—	—
Tashkent	24.0	304	e 5 18	+ 1	e 9 35	+ 3	—	—
Tchimkent	24.1	307	i 5 20	+ 2	—	—	—	—
Samarkand	25.2	299	e 5 29	0	—	—	—	—
Mary	28.8	295	e 6 6	+ 4	—	—	—	—
Ashkabad	31.6	294	e 6 28	+ 2	—	—	—	—
Vladivostok	31.8	54	e 6 27	- 1	e 11 44	+ 6	—	—
Kizyl-Arvat	33.3	297	e 6 42	+ 1	—	—	—	—
Sverdlovsk	36.2	328	i 7 5	- 1	12 47	0	—	—
Tiflis	42.2	300	e 7 57?	+ 1	—	—	—	—
Moscow	47.8	319	e 8 41?	0	e 15 38?	0	—	—
Yalta	49.8	304	e 8 55	- 1	—	—	—	—
Ksara	50.1	290	e 9 1	+ 2	e 16 27	PPS	—	—
Pulkovo	52.2	324	e 9 13	- 2	e 16 37	- 2	—	—
Upsala	58.6	324	i 12 45	PP	i 18 25	PS	—	e 32.4
Prague	62.1	314	e 10 24	- 1	—	—	e 11 2	P <sub>c</sub> P
Collmberg	z. 62.7	315	e 10 27	- 2	—	—	—	—
Jena	E. 63.7	314	e 10 34	- 2	—	—	e 12 54	PP
Stuttgart	65.8	313	e 10 48	- 1	—	—	—	e 36.0
De Bilt	67.1	318	—	—	(e 23 0)?	?	—	e 23.0
Kew	70.5	318	e 11 18	0	—	—	—	e 35.0
College	73.5	23	e 11 35	- 1	—	—	e 14 20	PP
Tamanrasset	z. 78.9	289	e 12 6	- 1	—	—	e 15 5	PP
Brisbane	z. 79.3	129	i 12 7 <sup>k</sup>	- 2	—	—	—	—
Pretria	z. 85.0	236	e 12 36	- 2	—	—	—	—
Hungry Horse	97.6	19	e 13 38	0	—	—	e 17 36	PP
Shasta Dam	101.4	28	e 18 4	PP	—	—	—	—
Mineral	z. 102.0	27	e 17 50	PP	—	—	—	—
Reno	z. 103.4	26	e 18 20	PP	—	—	—	—
Overton	z. 108.1	24	e 18 27	[- 2]	—	—	e 18 49	PP
Pierce Ferry	108.6	24	e 18 41	[+ 11]	—	—	—	—
Tucson	113.2	22	e 19 18	PP	—	—	—	—
Bogota	144.2	342	e 19 37	[- 1]	—	—	—	—

Additional readings :—

New Delhi PPN = 3m.51s., QN = 6m.26s., eSN = 6m.33s.

Tamanrasset eZ = 16m.3s.

Long waves were also recorded at Potsdam and Granada.

Sept. 1d. 7h. Assam-Burma frontier region.

Nanking P = 37m.24s., eSE = 41m.10s.

Przhevalsk eP = 37m.47s.

Almata eP = 38m.8s., eS = 42m.16s.

Frunse iP = 38m.13s., eS = 42m.30s.

Andijan eP = 38m.17s., S = 42m.45s.

Calcutta eE = 38m.36s.

Stuttgart eZ = 44m.0s.

College iP? = 44m.41s.

Tamanrasset ePZ = 45m.11s.

Hungry Horse eP = 46m.40s.

Tucson eP? = 51m.37s.

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Sept. 1d. 23h. 44m. 39s. Epicentre 30°·0N. 95°·5E. (as at 7h. 12m.).

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Calcutta	E.	9·8	223	—	—	2 4	-15	—	i 5·2
New Delhi	N.	16·0	269	e 3 43	- 5	6 51	+ 5	3 54 PP	6·4
Przhevalsk		18·5	315	e 4 20	+ 1	e 7 55	+11	—	—
Naryn		19·5	312	i 4 30	- 1	e 8 7	+ 1	—	—
Murgab		19·7	300	4 34?	0	8 10?	0	—	—
Almata		19·9	316	i 4 37	+ 1	i 8 22	+ 7	—	—
Hyderabad	E.	20·0	235	e 4 29	- 8	e 8 9	- 8	—	—
Nanking	E.	20·1	77	e 4 39	+ 1	e 8 37	SS	—	e 10·7
Frunse		21·1	312	e 4 48	0	8 49	+10	—	—
Andijan		21·6	304	4 54	0	8 54	+ 5	—	—
Fergana		21·9	304	i 4 56	- 1	8 57	+ 3	—	—
Garm		22·6	300	i 5 2	- 1	—	—	—	—
Poona		22·8	244	5 8	+ 3	9 11	0	—	—
Obi-garm		22·9	299	i 5 6	0	i 9 16	+ 3	—	—
Irkutsk		23·2	12	5 15?	+ 6	—	—	—	—
Bombay	E.	23·4	247	e 5 13	+ 2	e 9 20	- 1	—	—
Stalinabad		23·6	299	i 5 11	- 2	i 9 28	+ 3	—	—
Tashkent		24·0	304	i 5 18	+ 1	i 9 35	+ 3	—	—
Tchimkent		24·1	207	i 5 18	0	i 9 39	+ 5	—	—
Samarkand		25·2	299	i 5 31	+ 2	e 9 59	+ 7	—	—
Mary		28·8	295	e 5 52?	-10	—	—	—	—
Ashkabad		31·6	294	6 27	+ 1	—	—	—	—
Kizyl-Arvat		33·3	297	e 6 43	+ 2	—	—	—	—
Sverdlovsk		36·2	328	i 7 6	0	e 12 51?	+ 4	—	—
Tiflis		42·2	300	e 7 56	0	—	—	—	—
Gori		42·7	300	e 8 1	+ 1	—	—	—	—
Borzheimi		43·2	300	e 8 4	0	—	—	—	—
Zugdidi		44·3	301	e 8 25?	+12	—	—	—	—
Moscow		47·8	319	e 8 43	+ 2	e 15 40?	+ 2	—	—
Yalta		49·8	304	e 8 55	- 1	—	—	—	—
Pulkovo		52·2	324	e 9 15	0	16 38	- 1	—	—
Copenhagen		62·0	320	i 10 24	0	e 18 51	+ 3	—	32·4
Prague		62·1	314	e 10 25	0	—	—	e 12 52	PP
Collmberg	Z.	62·7	315	e 10 28	- 1	—	—	—	—
Jena	N.	63·7	314	e 10 35	- 1	—	—	—	—
Stuttgart		65·8	313	e 10 48	- 1	e 19 27	- 8	e 13 13	PP
Strasbourg		66·7	314	e 10 56	+ 1	—	—	i 11 3	P
Paris		69·9	315	e 11 15	0	—	—	—	e 43·4
College		73·5	23	i 11 38	+ 2	—	—	—	—
Tamanrasset	Z.	78·9	289	e 12 4	- 3	—	—	e 15 3	PP
Granada		79·0	306	—	—	(e 25 21)	?	—	i 25·4
Hungry Horse		97·6	19	i 13 41	+ 3	—	—	—	—

Additional readings :—

New Delhi SN = 6m.34s.

Prague e = 10m.43s. and 11m.37s.

Tamanrasset eZ = 14m.27s.

Long waves were also recorded at Warsaw, Potsdam, De Bilt, and Kew.

Sept. 1d. Readings also at 0h. (College, Overton, near Arapuni, New Plymouth, Tuai, Auckland, Wellington, Cobb River, Kaimata, and Christchurch), 1h. (La Paz), 2h. (near Mizusawa), 3h. (College), 4h. (near Garm), 6h. (Rome), 7h. (College, Victoria, Hungry Horse, Shasta Dam, Mineral, Lick, Pasadena, Riverside, Tinemaha, Boulder City, Overton, Pierce Ferry, Tucson, and near Garm), 8h. (Riverside, Tinemaha, Hungry Horse, Overton, Pierce Ferry, Mary, near Kizyl-Arvat, and Ashkabad), 9h. (College, Hungry Horse, Overton, Tucson, and Tinemaha), 10h. (Naryn, Kulyab, near Fergana, and Andijan), 12h. (Tamanrasset), 13h. (Brisbane, College, Mount Wilson, Riverside, Tinemaha, Boulder City, Overton, Pierce Ferry, and Tucson), 14h. (College, Lick (2), Brisbane, Christchurch, Wellington, Tamanrasset (3), Copenhagen, Belgrade, Bucharest, Timisoara, Sofia, near Athens, Istanbul, and near Alicante), 16h. (Calcutta, New Delhi, Poona, Bombay, College, Kizyl-Arvat (2), and near Ashkabad (2)), 18h. (Pierce Ferry), 19h. (near Stalinabad), 20h. (Calcutta, New Delhi, Poona, Bombay, Przhevalsk, and near Andijan), 21h. (Copenhagen), 22h. (near Andijan).



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Sept. 2d. 2h. 47m. 13s. Epicentre 52°·5N. 170°·0W. (as on 1950, April 26d.).

A = -·6020, B = -·1062, C = +·7914;  $\delta=0$ ;  $h=-6$ ;  
D = -·174, E = +·985; G = -·779, H = -·137, K = -·611.

		$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.	
				m.	s.		m.	s.		m.	s.		
College		16·8	34	e 3	57	- 1	i 7	7	+ 2	e 4	13	PP	e 8·4
Sitka		20·4	63	e 4	34	- 7	e 8	26	+ 1	i 5	3	pP	e 10·3
Victoria		29·5	79	6	6	- 2	11	1	- 1	—	—	—	—
Seattle		30·5	80	e 6	29k	+12	e 11	19	+ 1	i 6	45	pP	e 14·3
Honolulu		32·5	157	—	—	—	e 11	52	+ 3	—	—	—	e 13·6
Shasta Dam		34·2	91	e 6	49	0	i 13	1	PcS	e 7	6	pP	—
Ukiah		34·6	93	e 6	45	- 8	i 12	41	+19	—	—	—	e 14·7
Mineral	z.	34·9	91	e 6	53	- 2	—	—	—	—	—	—	—
Hungry Horse		35·1	74	i 6	55	- 2	e 12	25	- 5	i 9	27	PcP	—
Berkeley	z.	36·0	95	e 7	12a	+ 7	e 12	29	-15	—	—	—	—
Reno	z.	36·5	90	e 7	7	- 2	e 12	46	- 5	—	—	—	—
Santa Clara		36·5	95	e 7	20	+11	e 12	53	+ 2	—	—	—	e 17·2
Lick	z.	36·7	95	e 7	14k	+ 4	e 13	15	+21	—	—	—	e 16·0
Butte	N.	37·2	75	e 7	16	+ 1	e 12	56	- 6	—	—	—	e 16·0
Saskatoon		37·6	65	7	16	- 2	13	2	- 6	8	47	PP	—
Fresno		38·2	94	e 7	29a	+ 6	—	—	—	—	—	—	—
Bozeman		38·3	75	e 7	21	- 3	e 13	13	- 6	e 7	33	pP	e 17·5
Tinemaha		39·0	93	e 7	30	0	—	—	—	i 13	53	PcS	—
Vladivostok		39·1	280	i 7	32	+ 1	i 13	31	0	e 9	37	PcP	—
Haiwee	z.	39·7	93	e 7	42	+ 6	—	—	—	—	—	—	—
Logan		40·0	81	e 7	37	- 1	e 13	27	-17	e 10	16	PPP	e 16·9
Salt Lake City		40·5	82	e 7	35	- 7	e 13	36	-16	e 7	52	pP	e 17·6
Pasadena		40·9	95	e 7	49	+ 3	i 13	53	- 5	e 9	35	PP	i 16·9
Riverside	z.	41·5	95	e 7	49	- 1	e 14	4	- 3	—	—	—	—
Overton	z.	41·6	90	i 7	50	- 1	—	—	—	e 9	49	PcP	—
Boulder City		41·8	91	e 7	50	- 3	e 14	9	- 2	i 13	34	PcS	—
Pierce Ferry		42·2	90	i 7	55	- 1	i 14	14	- 3	i 8	16	pP	—
Palomar		42·3	95	e 7	58	+ 1	i 14	15	- 4	—	—	—	—
Tucson		46·7	92	e 8	31	- 1	e 15	17	- 5	i 8	49	pP	e 20·4
Irkutsk		49·3	307	8	53	0	e 16	15	PS	10	14	PcP	—
Lincoln	E.	49·6	72	e 9	3	+ 8	e 15	54	- 9	e 18	39	ScS	e 20·8
Zi-ka-wei	z.	53·2	275	i 9	24	+ 2	e 16	53	+ 1	—	—	—	—
Chicago		54·1	66	e 9	23	- 6	e 16	51	-14	e 21	21	SS	e 22·0
Nanking		54·2	278	i 9	27a	- 2	17	2	- 4	i 14	30	PcS	e 24·5
Florissant		54·6	70	e 9	31	- 1	i 17	3	- 8	i 17	21	sS	e 27·2
St. Louis		54·7	70	i 9	30	- 3	i 17	6	- 7	i 9	42	pP	e 27·3
Scoresby Sund		55·2	14	i 9	36	- 1	17	29	+ 9	—	—	—	26·8
Ivigut		57·6	31	e 9	52	- 2	e 17	47	- 4	—	—	—	27·8
Cincinnati		57·7	66	9	50	- 5	i 17	44	- 9	i 19	59	ScS	—
Cleveland		57·7	63	i 9	49k	- 6	i 17	44	- 9	i 10	2	pP	e 28·8
Ottawa		58·0	56	9	53	- 4	17	51	- 6	12	0	PP	—
Shawinigan Falls	N.	58·7	53	e 9	59	- 3	—	—	—	—	—	—	—
Seven Falls	E.	59·2	52	10	4	- 1	18	5	- 7	—	—	—	—
Pennsylvania		60·1	61	i 10	11	0	i 18	22	- 2	e 12	16	PP	e 24·4
Washington		61·9	62	i 10	21	- 3	e 18	35	-12	—	—	—	e 34·0
Palisades		62·1	58	i 10	23	- 2	i 18	46	- 3	e 12	41	PP	e 27·6
Philadelphia		62·2	60	e 10	29	+ 3	e 18	51	0	e 23	14	SS	e 25·9
Harvard		62·2	56	i 10	23	- 3	e 18	40	-11	e 12	34	PP	e 34·2
Weston		62·4	56	i 10	24	- 3	e 18	43	-10	i 10	53	pP	—
Tacubaya		63·2	93	e 10	30	- 2	e 18	58	- 5	i 10	52	pP	—
Sverdlovsk		63·4	332	i 10	33	- 1	19	3	- 3	14	29	PPP	—
Halifax		64·5	49	—	—	—	e 19	14	- 5	—	—	—	—
Pulkovo		66·9	349	e 10	55	- 1	e 19	46	- 3	—	—	—	—
Helsinki		67·0	353	e 10	56	- 1	e 20	3	+13	—	—	—	31·8
Bergen	N.	67·4	4	e 14	53	PPP	e 30	0	Q	—	—	—	e 35·8
Upsala	N.	67·8	357	e 11	0a	- 2	e 20	26	PS	e 24	47?	SS	e 31·8
Almata		68·6	314	11	7	0	—	—	—	—	—	—	—
Moscow		69·7	344	e 11	15	+ 1	e 20	20	- 2	21	11?	ScS	—
Frunse		69·9	315	i 11	15	0	e 20	24	0	e 15	25	PPP	—
Aberdeen	N.	70·2	8	—	—	—	i 22	49	?	e 27	47?	Q	e 35·4

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	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Naryn	70.4	314	e 11 19	+ 1	—	—	—	—
Copenhagen	72.2	359	i 11 28	- 1	e 20 47	- 4	—	24.8
Tchimkent	72.5	318	i 11 21	- 9	—	—	—	—
Andijan	72.6	315	11 32	+ 1	e 20 53	- 3	15 47	PPP
Durham	E. 72.7	8	e 12 9	pP	—	—	—	—
Fergana	73.1	315	11 34	0	—	—	—	—
Tashkent	73.4	317	i 11 33	- 3	e 21 3	- 2	e 11 48	PcP
Bermuda	73.4	58	—	—	e 21 0	- 5	e 25 51	SS
Rathfarnham C.	z. 73.7	11	e 11 36	- 2	e 21 7	- 1	e 14 25	PP
Garm	74.9	316	i 11 46	+ 2	—	—	—	e 35.4
Warsaw	75.2	354	e 11 46	0	e 21 25	0	e 16 17	PPP
Obi-garm	75.4	316	i 11 47	0	—	—	—	e 33.8
Potsdam	75.5	358	i 11 48 <sub>a</sub>	0	e 21 28	0	—	e 36.8
De Bilt	75.7	4	i 11 49 <sub>a</sub>	0	e 21 31	+ 1	e 14 37	PP
Samarkand	75.7	318	e 11 53	+ 4	—	—	—	e 33.8
Stalinabad	75.9	316	i 11 45	- 5	—	—	—	—
Kew	76.0	7	i 11 50 <sub>a</sub>	- 1	e 21 31	- 3	—	e 32.8
Collmberg	76.5	358	e 11 52	- 2	e 21 41	+ 2	e 15 2	PP
Jena	N. 76.9	359	e 11 57	+ 1	e 22 0	+17	—	e 36.8
Raciborzu	z. 77.6	355	i 12 0	0	—	—	—	—
Prague	77.7	357	e 12 2 <sub>a</sub>	+ 2	e 22 5	+13	e 12 21	pP
Paris	78.9	7	i 12 6	- 1	e 22 25	+20	i 12 44	sP
Stuttgart	79.1	1	e 12 7	- 1	e 22 11	+ 4	e 14 53	PP
Strasbourg	79.3	2	e 12 11	+ 2	e 22 12	+ 3	e 14 57	PP
Kishinev	79.6	347	e 12 9	- 1	—	—	—	e 37.8
Mary	79.6	322	e 12 10	0	—	—	—	e 38.8
Basle	80.3	2	e 12 15 <sub>a</sub>	+ 1	—	—	—	e 37.8
Kizyl-Arvat	80.4	326	e 12 17	+ 2	—	—	—	e 37.8
Zürich	80.5	2	e 12 13	- 2	—	—	—	e 33.2
Ashkabad	80.6	324	e 12 17	+ 1	—	—	—	—
Chur	81.0	1	e 12 18	0	—	—	—	—
Baku	81.2	331	e 12 22	+ 3	e 23 32	PS	—	—
Yalta	81.2	343	e 12 20	+ 1	—	—	—	—
Tiflis	81.4	335	i 12 22	+ 2	—	—	—	—
Triest	82.2	358	e 12 26	+ 2	e 22 38	- 1	e 23 24	PS
Bucharest	82.5	348	e 12 27	+ 1	e 22 45	+ 3	—	—
Belgrade	82.6	353	e 12 28 <sub>k</sub>	+ 2	e 24 5	PPS	e 15 56	PP
San Juan	83.7	68	e 12 31	- 1	i 22 52	- 2	—	e 48.5
Florence, Xim.	84.1	359	e 12 45	+11	e 23 19	+21	—	e 41.4
Istanbul	85.4	346	i 12 41	+ 1	e 23 49	+38	—	—
Rome	86.0	358	e 12 44	+ 1	e 23 8	[+ 1]	e 24 12	PS
Taranto	87.2	355	—	—	e 23 43	+15	—	e 38.8
Toledo	z. 87.2	12	e 12 50	+ 1	e 18 56	PPP	e 17 27	PP
Alicante	89.1	9	e 12 51	- 7	e 23 44	- 2	16 28	PP
Messina	89.5	356	e 13 5	+ 5	—	—	e 18 33	PPP
Granada	89.9	11	i 13 5 <sub>a</sub>	+ 3	23 56	+ 2	i 30 20	SS
Bogota	90.0	83	e 13 12	+ 9	e 23 44	{+ 2}	e 16 34	PP
Malaga	z. 90.3	12	i 13 2 <sub>k</sub>	- 2	i 24 0	+ 3	i 16 48	PP
Algiers Univ.	z. 90.9	5	e 13 6	- 1	—	—	—	45.5
Helwan	N. 95.9	341	—	—	e 24 5	[- 1]	—	—
Huancayo	102.3	93	e 18 29	PP	e 24 32	[- 6]	e 33 0	SS
Tamanrasset	z. 104.9	4	e 14 9	- 1	—	—	e 18 30	PP
La Paz	110.1	90	i 19 16	PP	25 11	[- 2]	26 5	SKKS
Pretoria	z. 150.0	326	i 19 48	[+ 1]	i 25 59	[-55]	e 20 42	PKP <sub>2</sub>
Pietermaritzburg	z. 152.6	319	i 19 59	[+ 8]	—	—	e 20 42	PKP <sub>2</sub>
Grahamstown	157.4	322	e 19 58	[ 0]	—	—	i 20 32	PKP <sub>2</sub>

Additional readings :—

Sitka i = 5m.39s., iS = 8m.29s., iPcP = 8m.45s.

Seattle ePP = 7m.17s., ePcP = 9m.29s., eScP = 12m.21s., and other unidentified readings.

Hungry Horse iScP = 12m.56s.

Lick i = 7m.25s., eZ = 8m.5s.

Saskatoon SS = 15m.47s., ScS = 17m.25s.

Bozeman ePP = 9m.1s.

Tinemaha iZ = 7m.47s.

Vladivostok eScS = 17m.40s.

Continued on next page.

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Haiwee iZ = 7m.49s. and 7m.53s.  
 Logan i = 7m.48s.  
 Salt Lake City ePP? = 9m.32s., eSS? = 16m.54s.  
 Pasadena iZ = 7m.57s.  
 Riverside iZ = 8m.1s. and 8m.6s.  
 Pierce Ferry isPP = 10m.8s.  
 Palomar iEN = 8m.4s. and 8m.10s., iZ = 8m.46s.  
 Tucson ePP = 10m.21s., eScS = 18m.24s., eSS = 18m.51s.  
 Irkutsk PP = 10m.50s., SS = 19m.57s.  
 Lincoln eSS?E = 19m.35s.  
 Chicago eScS = 19m.5s.  
 Nanking eScS?N = 19m.13s.  
 Florissant iScS? = 19m.17s.  
 St. Louis i = 9m.46s. and 15m.48s., isS = 17m.27s., iScS? = 19m.17s., eSS = 20m.58s.  
 Cincinnati i = 19m.39s.  
 Cleveland eN = 17m.53s., iE = 18m.1s., iEN = 19m.37s., eSSE = 21m.29s., eE = 24m.29s.  
 Ottawa e = 15m.59s., ScS = 19m.43s.  
 Pennsylvania iEN = 19m.59s.  
 Palisades e = 10m.43s.  
 Philadelphia e = 20m.17s., esSS = 23m.38s.  
 Harvard i = 10m.34s., e = 13m.38s.  
 Upsala eE = 20m.36s.  
 Frunse eScS = 21m.17s.  
 Warsaw ePcS = 19m.35s., ePS = 21m.54s., ePPSE = 22m.9s., ePPSN = 22m.14s., eSSN = 26m.16s., eSSE = 26m.20s., eSSSN = 28m.37s., eSSSE = 28m.41s.  
 Andijan eScS = 21m.36s.  
 Durham eE = 10m.17s.  
 Tashkent iPS = 21m.40s., eSS = 25m.56s.  
 Rathfarnham Castle i = 17m.30s., e = 22m.15s. and 29m.12s.  
 De Bilt ePS = 22m.25s., eSS = 26m.47s.?  
 Collmberg eZ = 11m.56s., ePSN = 23m.11s., eSSSN = 31m.5s.  
 Prague e = 12m.9s., esP = 12m.34s., e = 12m.47s., 13m.22s., 13m.50s., and 14m.37s., ePP = 15m.12s.?  
 Paris ePP? = 15m.25s., ePPP = 17m.20s., e = 21m.0s.  
 Stuttgart eSS = 27m.47s., eSSS = 31m.35s.  
 Strasbourg ePPP = 17m.22s., e = 23m.11s., eSS = 27m.13s.  
 Rome eSS = 29m.20s.  
 Alicante SKS = 23m.18s., PS = 24m.52s., PPS = 25m.32s., SS = 29m.36s., SSS = 33m.14s., Q = 37m.40s.  
 Granada pPP = 17m.20s., SSS = 33m.44s.  
 Bogota ePPS = 25m.17s.  
 Malaga iPPPZ = 19m.10s.  
 Huancayo e = 25m.34s.  
 Tamnasset eZ = 17m.18s., epPPZ = 18m.50s.  
 La Paz iPS = 28m.37s., PPS = 29m.43s., SS = 33m.47s.  
 Pretoria iZ = 19m.53s., eZ = 20m.16s.  
 Pietermaritzburg eZ = 20m.11s.  
 Long waves were also recorded at Bombay, New Delhi, Christchurch, Wellington, Tortosa, and La Plata.

Sept. 2d. 4h. 19m. 32s. Epicentre 41°·6N. 46°·0E.

A = +·5210, B = +·5395, C = +·6614;  $\delta = -5$ ;  $h = -2$ ;  
 D = +·719, E = -·695; G = +·459, H = +·476, K = -·750.

	$\Delta$	Az.	P.	O - C.	S.	O - C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Tifis	0·9	277	i 0 23	+ 3	i 0 39	+ 5	—	—
Geri	1·5	285	i 0 26	- 2	0 46	- 3	—	—
Grozny	1·7	356	e 0 33	+ 2	—	—	—	—
Erevan	1·8	219	e 0 40	+ 8	i 1 8?	+12	—	—
Leninakan	1·8	243	i 0 24?	P*	i 0 51?	S*	—	—
Borzhomi	2·0	277	0 39	P <sub>r</sub>	i 1 6	S*	—	—
Shemakla	2·2	116	0 39	+ 1	i 1 14	S <sub>r</sub>	—	—
Abastumanj	2·4	274	0 43?	+ 2	i 1 15?	S*	—	—
Baku	3·2	249	e 0 58	P*	—	—	—	—
Zugdidi	3·2	288	e 1 3?	P <sub>r</sub>	—	—	—	—
Piatigorsk	3·3	320	e 0 54	+ 1	i 1 45	S*	—	—
Kizyl-Arvat	8·3	105	—	—	i 3 27?	-13	—	—
Yalta	9·1	292	e 2 20	P*	—	—	—	—
Ashkabad	10·2	107	e 2 27	- 4	i 4 21	- 6	—	—
Istanbul	12·7	273	e 3 15	+10	e 6 52	SSS	—	—

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.	
Mary	12.9	103	3	13	+ 6	e 5	33	0	—	—	—
Kishinev	13.5	300	3	14	- 1	—	—	—	—	—	—
Moscow	15.2	342	e 3	33	- 5	e 6	17?	- 11	—	—	—
Samarkand	16.1	90	e 3	48	- 1	—	—	—	—	—	—
Lwow	17.4	307	4	4	- 2	—	—	—	—	—	—
Tashkent	17.5	83	e 4	3	- 4	e 7	17?	- 4	—	—	—
Tchimkent	17.6	79	i 4	5	- 3	—	—	—	—	—	—
Stalinabad	17.7	90	e 4	7	- 3	e 7	26?	0	—	—	—
Sverdlovsk	17.9	26	4	28?	PP	7	40	SS	—	—	—
Obi-garm	18.4	90	e 4	14	- 4	—	—	—	—	—	—
Fergana	19.5	84	e 4	25	- 6	—	—	—	—	—	—
Andijan	19.8	84	e 4	32	- 3	—	—	—	—	—	—
Warsaw	20.0	312	e 2	23	?	—	—	—	—	—	e 9.8
Pulkovo	20.6	338	e 4	40	- 3	e 8	22	- 7	—	—	—
Frunse	21.2	76	e 4	45	- 4	—	—	—	—	—	—
Murgab	21.6	89	4	53	- 1	8	47	- 2	—	—	—
Naryn	22.4	78	e 5	1	- 1	e 8	57?	- 7	—	—	—
Prague	23.4	304	e 5	13	+ 2	—	—	—	e 5	44	PP
Przhevalsk	24.0	76	e 5	14	- 3	—	—	—	—	—	—
Collmberg	z. 24.6	305	e 5	23	0	—	—	—	e 5	38	pP
Jena	N. 25.4	303	e 5	29?	- 2	—	—	—	—	—	—
Copenhagen	26.0	316	e 5	35	- 1	—	—	—	—	—	—
Stuttgart	z. 26.7	300	e 5	42	- 1	—	—	—	—	—	—
Tamanrasset	z. 38.6	254	7	29k	+ 3	—	—	—	—	—	—
College	73.3	7	i 11	32	- 3	—	—	—	—	—	—
Hungry Horse	88.7	347	i 12	54	- 3	—	—	—	—	—	—

Additional readings :—

Grozny i = 0m.39s., 0m.45s., and 0m.51s.  
 Shemakla i = 0m.42s. and 0m.54s.  
 Warsaw eN = 7m.15s., eE = 8m.57s., eN = 9m.20s.  
 Prague e = 6m.2s., 6m.19s., and 7m.0s.  
 Jena eN = 5m.37s.  
 Tamanrasset iZ = 7m.46s.  
 Long waves were recorded at Potsdam.

Sept. 2d. 13h. Undetermined shock.

Cobb River eE = 22m.47s., P?E = 23m.53s.  
 Christchurch iPNZ = 23m.6s., eZ = 24m.30s., eS?N = 26m.17s., eSN = 26m.30s., eSEN = 26m.50s., LZ = 27m.50s.  
 Kaimata eNE = 23m.30s., eLNE = 29.7m.  
 Wellington iP = 23m.32s., eS? = 26m.35s., LZ = 29.1m.  
 Arapuni eP = 24m.6s.  
 Perth i = 29m.9s., 33m.52s., and 37m.50s.  
 Grahamstown e = 30m.44s.  
 Auckland eN = 31m.  
 Pretoria eZ = 31m.19s.?  
 La Paz PZ = 31m.32s., SKS = 42m.14s., S = 42m.26s., iPS = 43m.30s., L = 61.7m.  
 Huancayo e = 31m.40s., 32m.25s., 42m.17s., 43m.42s., and 48m.52s., eL = 55m.1s.  
 Brisbane eE = 31m.45s. and 34m.43s., eN = 34m.57s.  
 Shasta Dam eP? = 33m.20s.  
 Tamanrasset eZ = 37m.4s. and 37m.57s., iPKPZ = 38m.5s., eZ = 40m.18s., ePPZ = 40m.57s.  
 Pierce Ferry ePKP = 37m.21s., e = 46m.58s.  
 Istanbul e = 37m.22s., L = 94m.  
 Victoria eZ = 37m.34s.  
 Resolute Bay eZ = 37m.35s., e = 38m.30s., eE = 49m.11s., LE = 83m.7s.  
 Hungry Horse iPKP = 37m.46s., i = 38m.39s.  
 Tashkent eP = 37m.49s., eS = 41m.20s.  
 College ePKP = 37m.50s., e = 39m.11s., ePP = 40m.26s., e = 41m.26s., PPS? = 51m.58s., eSS = 57m.40s., eL = 69m.12s.  
 Ksara e = 38m.7s. and 50m.7s.  
 Overton ePPZ = 38m.37s.  
 Warsaw ePKP?Z = 38m.22s., eZ = 38m.53s., 39m.29s., and 40m.39s., eSKP?Z = 41m.47s., eZ = 43m.4s. and 43m.42s., eSKS?EZ = 45m.30s., eZ = 46m.24s. and 47m.31s., eEN = 49m.37s. and 53m.23s., eL = 107m.  
 Algiers Univ. ePKPZ = 38m.29s., eZ = 39m.2s.  
 Collmberg eZ = 38m.35s.? and 39m.29s., eL = 60m.

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Malaga iPKPZ = 38m.42s. a, iPPZ = 42m.18s., iPPPZ = 45m.44s., LZ = 92m.12s.  
 Granada iP = 38m.50s. a, iPP = 42m.23s.  
 Copenhagen e = 39m.0s.  
 Potsdam e = 39m.0s., eL = 99m.  
 Scoresby Sund eP = 39m.2s., L = 96m.  
 De Bilt ePKP? = 39m.5s., eL = 105m.  
 Alicante PKP = 39m.12s., PP = 43m.6s., SKS = 46m.18s., SS = 62m.4s., Q = 81m.52s., eL = 91m.0s.  
 Stuttgart eZ = 39m.19s.?, e = 40m.30s., 57m.37s., 58m.30s., 63m.24s., and 69m.0s., eQ = 98m., R = 100m.  
 Helwan eN = 41m.42s. and 43m.30s.  
 Strasbourg e? = 46m.36s., eSKKS = 50m.48s., eSKKS<sub>2</sub> = 52m.31s., eSS = 63m.38s., e = 69m.20s., and 79m.6s., L = 102m.  
 Rathfarnham Castle eZ = 47m., eEN = 49m.20s.  
 Bombay eEN = 49m.  
 Rome e = 53m.33s. and 62m.13s.  
 Sitka eSS = 57m.2s., eL = 74m.6s.  
 Santa Clara eE = 69m.22s., eLEZ = 81m.28s.  
 Long waves were also recorded at La Plata and other American and European stations.

Sept. 2d. 16h. 14m. 35s. Epicentre 28°·7N. 96°·6E. (as on Aug. 30d.).

A = -·1010, B = +·8727, C = +·4777; δ = 0; h = +2;  
 D = +·993, E = +·115; G = -·055, H = +·475, K = -·879.

		Δ	Az.	P.	O - C.	S.	O - C.	Supp.	L.	
		°	°	m. s.	s.	m. s.	s.	m. s.	m.	
Calcutta	E.	9·7	232	i 2 39	PP	i 4 33	SS	e 4 45	SSS	—
Dehra Dun	N.	16·2	280	e 5 1	?	e 7 22	SS	—	—	—
New Delhi	N.	17·0	274	e 4 2	+ 1	i 7 2	- 8	7 29	SS	6·9
Nanking	E.	19·4	75	i 4 28k	- 2	i 8 4	0	i 4 59	PPP	i 9·3
Przhevalsk		20·2	317	i 4 34	- 5	i 8 15	- 6	—	—	—
Naryn		21·1	313	i 4 44	- 4	8 28	- 11	—	—	—
Almata		21·5	319	i 4 49	- 3	i 8 37	- 10	—	—	—
Zi-ka-wei	Z.	21·6	77	4 55	+ 1	8 53	+ 4	—	—	10·3
Frunse		22·7	314	i 5 2?	- 2	i 9 9?	0	—	—	—
Poona	E.	23·1	249	i 5 16	+ 8	9 32	+ 16	6 0	PPP	10·1
Andijan		23·2	307	e 5 9	0	9 11	- 7	—	—	—
Fergana		23·5	307	i 5 10	- 2	i 9 21	- 2	—	—	—
Bombay		23·8	251	i 5 24	+ 9	i 9 42	+ 14	5 53	P	11·4
Garm		24·0	303	5 17	0	—	—	—	—	—
Irkutsk		24·2	11	i 5 14	- 5	i 9 29	- 6	—	—	—
Obi-garm		24·4	302	5 22	+ 1	—	—	—	—	—
Tashkent		25·5	307	i 5 31	- 1	i 9 53	- 4	—	—	—
Kodaikanal	E.	25·7	229	i 5 48	+ 15	i 10 18	+ 17	—	—	11·6
Tchimkent		25·7	308	i 5 32	- 1	—	—	—	—	—
Samarkand		26·7	302	i 5 44	+ 1	—	—	—	—	—
Colombo	E.	26·8	219	5 55	+ 11	10 43	+ 24	—	—	—
Mary		30·3	297	e 6 15	0	—	—	—	—	—
Valdivostok		31·7	54	i 6 23	- 4	i 11 28	- 9	—	—	—
Ashkabad		33·1	297	i 6 42?	+ 2	—	—	—	—	—
Bandong		37·0	160	e 7 36	+ 23	—	—	—	—	—
Sverdlovsk		37·8	328	i 7 16	- 4	i 13 1	- 10	—	—	—
Baku		39·8	300	e 7 38	+ 2	—	—	—	—	—
Shemakla		40·8	300	7 45	0	—	—	i 9 29	P	—
Grozny		43·0	304	e 8 4	+ 1	—	—	—	—	—
Tiflis		43·7	302	i 8 8	0	i 14 29	- 10	—	—	—
Erevan		43·9	299	e 8 17	+ 7	—	—	—	—	—
Gori		44·2	302	8 10	- 2	e 14 45	PS	—	—	—
Leninakan		44·4	301	e 8 14?	0	—	—	—	—	—
Borzhomj		44·7	302	i 8 17	+ 1	e 14 47	PS	—	—	—
Abastumanj		45·1	302	8 15?	- 5	—	—	—	—	—
Moscow		49·4	321	i 8 51	- 2	e 15 52	- 8	—	—	—
Yalta		51·4	306	9 7	- 2	16 28	0	e 11 4	PP	—
Ksara		51·5	292	i 9 12k	+ 3	16 40	+ 11	—	—	—
Pulkovo		53·8	326	i 9 21	- 5	e 16 46	- 15	—	—	—
Istanbul		55·5	302	e 9 38	- 1	e 17 9	- 15	—	—	—

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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.	
Helwan	56.2	289	e 9 45	+ 1	e 17 34	+ 1	13 7	PPP	—
Helsinki	56.5	326	e 9 43	- 3	e 17 28	- 9	—	—	—
Bucharest	57.1	307	i 9 53	+ 3	i 17 56	PS	i 18 15	PPS	—
Warsaw	59.2	317	e 10 3 <sub>a</sub>	- 2	e 18 12	0	e 12 17	PP	e 27.4
Skalnate Pleso	60.2	313	10 10	- 2	e 18 15	-10	e 13 49	PPP	—
Timisoara	60.2	309	e 10 14	+ 2	e 18 38	+13	—	—	—
Upsala	60.2	326	i 10 9 <sub>k</sub>	- 3	e 18 17	- 8	e 22 14	SS	e 26.4
Belgrade	61.0	308	e 10 16	- 2	e 18 48	+13	e 22 27	SS	e 35.6
Budapest	61.3	311	10 19	- 1	e 18 55	PS	—	—	e 31.9
Raciborz	61.4	315	e 10 4 <sub>?</sub>	-16	—	—	e 14 4	PPP	—
Kalossa	61.6	311	e 10 19	- 3	e 18 37	- 6	e 14 11	PPP	—
Copenhagen	63.6	322	i 10 33	- 2	e 19 0	- 8	20 32	ScS	29.4
Prague	63.7	315	i 10 35 <sub>a</sub>	- 1	e 19 5	- 5	e 13 9	PP	e 35.0
Potsdam	64.0	318	i 10 37 <sub>k</sub>	- 1	19 10	- 3	i 23 13	SS	e 31.4
Cöllnberg	64.3	317	e 10 36	- 3	e 19 13	- 4	e 26 31	SSS	e 34.4
Taranto	64.4	304	e 11 21	P <sub>c</sub> P	e 19 16	- 2	—	—	—
Cheb	65.0	316	e 10 43 <sub>?</sub>	- 1	i 19 23	- 3	e 13 5	PP	—
Jena	65.3	316	e 10 44	- 2	e 19 30 <sub>?</sub>	+ 1	e 13 13	PP	—
Triest	65.3	310	i 10 43	- 3	i 19 26	- 3	e 13 4	PP	—
Messina	66.3	302	e 10 59	+ 7	—	—	e 14 36	PPP	—
Rome	67.4	306	e 10 57	- 2	e 19 38	-17	e 23 58	SS	—
Stuttgart	67.4	315	i 10 57 <sub>k</sub>	- 2	e 19 45	-10	e 13 25	PP	e 35.4
Florence, Xim.	67.6	309	e 11 6	+ 5	e 20 25	PS	—	—	—
Prato	67.7	309	e 11 3	+ 2	—	—	—	—	—
Chur	67.8	312	e 10 59 <sub>k</sub>	- 3	—	—	—	—	—
Karlsruhe	67.8	316	e 10 57	- 5	—	—	e 20 35	PPS	—
Zürich	68.2	314	e 11 1 <sub>k</sub>	- 3	e 19 54	-10	e 13 29	PP	—
Strasbourg	68.3	315	i 11 4 <sub>k</sub>	- 1	e 20 1	- 5	e 27 34	SSS	—
De Bilt	68.7	319	i 11 7 <sub>a</sub>	0	e 19 55	-15	—	—	e 33.4
Basle	68.8	314	e 11 5 <sub>k</sub>	- 3	—	—	—	—	—
Aberdeen	70.8	326	—	—	i 20 9	- 26	e 27 36	SSS	e 38.4
Durham	71.5	323	e 11 30	+ 6	i 28 42	SSS	—	—	—
Paris	71.5	316	i 11 24	0	—	—	i 14 1	PP	—
Kew	72.2	320	i 11 27 <sub>k</sub>	- 2	e 20 45	- 6	—	—	e 35.4
College	74.3	24	i 11 37	- 4	i 21 7	- 8	e 25 39	SS	e 30.1
Rathfarnham Castle	74.7	323	e 11 43	0	—	—	e 12 8	P <sub>c</sub> P	29.4
Algiers Univ.	z. 76.1	305	i 11 50	- 1	—	—	e 12 7	P <sub>c</sub> P	—
Tortosa	n. 76.1	309	11 51	0	22 12	ScS	14 55	PP	e 41.1
Resolute Bay	76.6	4	e 11 51	- 3	—	—	—	—	31.6
Alicante	77.9	307	(e 11 57)	- 4	(21 37)	-17	(16 35)	PPP	(e 37.6)
Toledo	79.6	310	i 12 10	0	e 22 8	- 4	—	—	—
Granada	80.6	307	i 12 19 <sub>a</sub>	+ 3	—	—	12 24	P <sub>c</sub> P	—
Tamanrasset	z. 80.6	291	i 12 16 <sub>k</sub>	0	e 22 13	-10	e 17 5	PPP	—
Malaga	z. 81.4	307	i 12 20 <sub>a</sub>	0	i 22 28	- 3	15 26	PP	44.9
Pretoria	z. 85.1	238	i 12 45 <sub>?</sub>	+ 6	—	—	—	—	—
Pietermaritzburg	z. 85.8	233	i 12 50	+ 8	—	—	—	—	—
Grahamstown	90.6	232	i 13 12	+ 7	—	—	e 16 49	PP	—
Hungry Horse	98.5	20	e 13 41	- 1	—	—	e 17 29	PP	—
Tinemaha	z. 106.8	28	e 18 39	PP	—	—	—	—	—
Overtcn	z. 108.9	26	e 18 56	PP	—	—	e 30 2	PKKP	—
Boulder City	109.2	26	e 18 31	[ 0]	—	—	—	—	—
Pasadena	z. 109.4	29	e 18 58	PP	—	—	—	—	—
Pierce Ferry	109.4	25	e 18 59	PP	—	—	e 30 1	PKKP	—
Riverside	z. 109.9	29	e 19 2	PP	—	—	—	—	—
Philadelphia	111.3	352	e 28 47	PS	—	—	—	—	e 53.5
Tucson	114.0	25	e 18 45	[+ 4]	—	—	e 19 30	PP	—
Galerazamba	140.0	347	i 23 17	PKS	—	—	—	—	—
Bogota	145.7	343	i 19 44	[+ 4]	e 23 24	PKS	—	—	—
Chinchina	145.7	345	i 19 43	[+ 3]	—	—	—	—	—
La Paz	z. 161.4	308	i 19 2	[-60]	—	—	—	—	—

Additional readings and note :—

New Delhi PP = 4m.15s., PPP = 4m.22s., SS = 7m.18s.

Nanking iE = 4m.44s., iPPE = 4m.49s., Q?E = 8m.27s., P<sub>c</sub>P?E = 8m.39s.

Poona PP = 5m.48s., P<sub>c</sub>P = 8m.46s.

Continued on next page.

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Bombay  $iEN = 9m.53s.$ ,  $SSE = 10m.27s.$ ,  $SSN = 10m.52s.$ ,  $SSSE = 11m.1s.$   
 Warsaw  $eZ = 10m.16s.$ ,  $ePPEN = 12m.24s.$ ,  $eEN = 13m.2s.$ ,  $eZ = 13m.16s.$ ,  $ePS = 18m.28s.$ ,  $eScSEN = 19m.51s.$ ,  $eSS = 21m.57s.$   
 Skalnaté Pleso  $e = 10m.37s.$  and  $12m.5s.$ ,  $ePS = 18m.27s.$ ,  $e = 18m.52s.$ ,  $eSS = 22m.43s.$   
 Upsala  $eSE = 18m.10s.$ ,  $eSSSN = 24m.10s.$   
 Belgrade  $e = 12m.29s.$   
 Budapest  $eE = 14m.4s.$ ,  $eN = 18m.7s.$   
 Raciborzu  $ePE = 10m.9s.?$ ,  $ePZ = 10m.18s.$ ,  $ePPEN = 12m.30s.$   
 Kalossa  $eN = 10m.50s.$ ,  $eE = 12m.48s.$ ,  $eN = 12m.56s.$ ,  $eE = 19m.4s.$   
 Prague gives many other unidentified  $e$  readings.  
 Potsdam  $ePPZ = 12m.56s.$ ,  $eSZ = 19m.1s.$ ,  $eSN = 19m.6s.$ ,  $iSSSZ = 26m.14s.$ ,  $iSSSE = 26m.17s.$ ,  $iSSSSE = 27m.2s.$   
 Collmberg  $eZ = 11m.35s.$ ,  $ePPZ = 12m.57s.$ ,  $eN = 16m.37s.$ ,  $eSE = 19m.1s.$   
 Cheb  $e = 10m.50s.$  and  $11m.14s.$ ,  $ePS = 19m.33s.$   
 Jena  $eS?E = 19m.35s.$   
 Trieste  $i = 14m.50s.$   
 Stuttgart  $ePPP = 15m.27s.$ ,  $eSS = 24m.4s.$ ,  $eSSS = 27m.29s.$   
 Zürich  $e = 11m.28s.$   
 Aberdeen  $iE = 22m.44s.$   
 Strasbourg  $e = 12m.49s.$ ,  $ePP = 13m.30s.$ ,  $eSS = 24m.27s.$   
 Durham  $iEN = 29m.14s.$   
 Kew  $eEN = 17m.31s.$   
 Paris  $i = 11m.37s.$ ,  $iPcP = 11m.47s.$ ,  $i = 12m.44s.$ ,  $iPPP = 15m.41s.$   
 College  $iScS = 21m.48s.$   
 Algiers  $eZ = 12m.21s.$ ,  $ePPZ = 14m.40s.$   
 Tortosa  $S?N = 21m.55s.$ ,  $PPS?N = 23m.7s.$ ,  $SSS?E = 30m.33s.$   
 Alicante  $PPS = (22m.25s.)$ . Readings increased by one minute.  
 Granada  $iPP = 15m.1s.$   
 Tamanrasset  $eZ = 12m.25s.$ ,  $iZ = 13m.57s.$ ,  $iPPZ = 15m.16s.$   
 Malaga  $iZ = 13m.6s.$ ,  $SSZ = 27m.52s.$   
 Hungry Horse  $ePKKP? = 30m.17s.$   
 La Paz  $iZ = 20m.1s.$   
 Long waves were also recorded at Sitka, Harvard, Djakarta, and Bergen.

Sept. 2d. Readings also at 2h. (Collmberg, Lick, and Resolute Bay), 3h. (Collmberg, Stuttgart, Tamanrasset, Overton, and near Leninakan), 4h. (near Shasta Dam), 5h. (College), 8h. (Grozny), 9h. (Overton, Pierce Ferry, Santa Clara, Shasta Dam, Hungry Horse, College, Tamanrasset, Grahamstown, Pretoria, and La Paz), 10h. (College, Calcutta, Ksara, Stuttgart, Kew, and near Garm), 11h. (near Ashkabad (2)), 12h. (Tinemaha, Tucson, Pierce Ferry, Shasta Dam, Victoria, Hungry Horse, Resolute Bay, College, Mizusawa, Gori, Grozny, near Leninakan, and near Alicante (2)), 13h. (Kew and Helwan), 15h. (Aberdeen), 16h. (College and Tamanrasset), 17h. (College, Hungry Horse, Almata, Andijan, and near Ashkabad), 18h. (near Zürich (2)), 19h. (Tucson, Pierce Ferry, Hungry Horse, Resolute Bay, College, and near Andijan), 20h. (New Delhi, Andijan, Fergana, Frunse, Garm, Mary, Murgab, Naryn, Samarkand, Tashkent, Tchimkent, and College), 21h. (Tucson), 23h. (Pierce Ferry).

Sept. 3d. 2h. 55m. 1s. Epicentre  $28^{\circ}7'N$ .  $94^{\circ}2'E$ . (as on Aug. 22d.).

$A = -.0643$ ,  $B = +.8762$ ,  $C = +.4777$ ;  $\delta = +6$ ;  $h = +2$ ;  
 $D = +.997$ ,  $E = +.073$ ;  $G = -.035$ ,  $H = +.476$ ,  $K = -.879$ .

		$\Delta$	Az.	P.	O - C.	S.	O - C.	Supp.	L.
		$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Calcutta	E.	8.1	222	e 2 30	P*	e 4 2	S*	e 4 32	e 4.9
New Delhi	N.	14.9	274	e 3 29	- 5	6 22	+ 2	3 41	—
Przhevalsk		18.8	322	e 4 28	+ 5	e 8 8	+18	—	—
Murgab		19.4	305	4 35	+ 5	8 19	+15	—	—
Naryn		19.5	316	—	—	8 17	+11	—	—
Almata		20.1	322	e 4 41	+ 3	e 8 33	+14	—	—
Poona	E.	21.2	246	4 43	- 6	8 37	- 4	—	—
Frunse		21.2	316	e 4 53?	+ 4	e 9 3?	+22	—	—
Andijan		21.5	309	e 4 57	+ 5	8 58	+11	—	—
Bombay		21.8	248	e 4 56	0	e 9 0	+ 8	—	—
Fergana		21.8	309	e 5 1	+ 5	—	—	—	—
Garm		22.3	304	e 5 8	+ 7	—	—	—	—
Obi-garm		22.6	304	i 5 2	- 1	i 9 15	+ 8	—	—
Tashkent		23.9	308	e 5 18	+ 2	e 9 38	+ 8	—	—
Tchimkent		24.1	311	i 5 21	+ 3	—	—	—	—

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.
Samarkand	24.9	303	e 5 30	+ 4	—	—	—	—
Ashkabad	31.2	297	e 6 28	+ 5	—	—	—	—
Vladivostok	33.5	54	e 6 35	- 8	e 10 45	-80	—	—
Sverdlovsk	36.7	330	7 13	+ 3	12 59	+ 5	—	—
Tiflis	41.9	302	e 7 53	- 1	—	—	—	—
Moscow	48.1	321	e 8 43	0	—	—	—	—
Collmberg	z. 62.9	316	e 10 27	- 3	—	—	—	—
Stuttgart	z. 65.9	314	e 10 48	- 2	—	—	—	—
Strasbourg	66.8	314	e 10 55	- 1	—	—	—	—
Paris	70.1	316	e 11 7	- 9	—	—	—	e 39.3
College	75.2	23	e 11 44	- 2	—	—	—	—
Tamanrasset	z. 78.3	290	i 12 1k	- 2	—	—	e 14 58	PP
Pretoria	z. 83.4	236	e 12 23?	- 7	—	—	—	—
Hungry Horse	99.2	19	e 13 48	+ 3	—	—	—	—
Bogota	145.0	338	i 19 38	[- 1]	—	—	—	—

Additional readings :—

New Delhi PPPN = 3m.44s., eSN = 6m.12s., SSSN = 6m.46s.

Tamanrasset iZ = 12m.44s.

Long waves were also recorded at Potsdam and Copenhagen.

Sep . 3d. 4h. 5m. 17s. Epicentre 11°·3S. 163°·2E.

A = -·9390, B = +·2835, C = -·1946 ;  $\delta$  = -4 ;  $h$  = +6 ;  
D = +·289, E = +·957 ; G = +·186, H = -·056, K = -·981.

	$\Delta$ °	Az. °	P. m. s.	P-C. s.	S. m. s.	O-C. s.	Supp. m. s.	L. m.
Brisbane	18.7	209	i 4 22k	0	i 8 0	+12	i 4 28	?
Apia	24.6	98	e 5 28	+ 5	—	—	—	—
Riverview	N. 25.0	203	—	—	i 10 0	+11	i 11 21	Q
Vladivostok	61.2	335	e 10 20	+ 1	e 18 27	-11	—	e 12.3
Irkutsk	80.9	328	e 12 19	+ 2	e 22 12?	-14	—	—
College	84.3	19	i 12 30	- 5	i 23 9	+ 9	e 28 51	SS
Berkeley	z. 85.0	50	i 12 37 <sub>a</sub>	- 1	—	—	e 12 51	P <sub>c</sub> P
Lick	z. 85.3	50	i 12 39 <sub>a</sub>	- 1	—	—	i 12 53	P <sub>c</sub> P
Mineral	z. 86.2	47	e 12 43	- 1	—	—	—	—
Fresno	z. 86.5	51	e 12 45 <sub>a</sub>	- 1	—	—	—	—
Pasadena	87.0	54	i 12 47 <sub>a</sub>	- 1	—	—	i 13 2	pP
Reno	87.3	49	e 12 48 <sub>a</sub>	- 2	—	—	e 13 1	pP
Riverside	z. 87.6	54	e 12 50 <sub>a</sub>	- 1	—	—	i 13 5	pP
Haiwee	z. 87.7	52	e 12 51	- 1	—	—	e 13 4	pP
Tinemaha	z. 87.8	52	i 12 52	0	—	—	—	—
Palomar	87.9	55	i 12 52	- 1	—	—	—	—
Seattle	88.1	41	—	—	e 22 43? [-38]	—	—	—
Boulder City	90.1	53	e 13 2	- 1	—	—	—	—
Overton	z. 90.6	53	i 13 6	+ 1	—	—	i 16 54	PP
Pierce Ferry	90.8	53	i 13 6	0	—	—	e 16 42	?
Tucson	92.6	58	e 13 13	- 2	—	—	—	e 43.7
Hungry Horse	93.6	42	i 13 17	- 2	—	—	i 13 38	?
La Paz	122.2	117	e 19 1	[+ 4]	—	—	—	—
Potsdam	132.5	336	—	—	—	—	e 69 43?	Q
Collmberg	z. 133.3	334	e 19 13	[- 5]	e 23 1	PKS	e 21 49	PP
Stuttgart	z. 136.8	334	e 19 21	[- 4]	—	—	—	—
Strasbourg	137.5	336	e 19 25	[- 1]	—	—	—	—
Algiers Univ.	z. 149.0	328	e 19 46	[ 0]	—	—	e 19 57	PKP <sub>2</sub>
Granada	151.6	338	20 22k	PKP <sub>2</sub>	—	—	23 43	PP
Tamanrasset	z. 155.8	302	e 19 52	[- 3]	e 23 32	PKS	i 20 27	PKP <sub>2</sub>

Additional readings :—

Lick iZ = 13m.1s., 13m.11s., and 13m.44s.

Boulder City e = 13m.11s. and 13m.17s.

Collmberg eZ = 19m.27s.

Tamanrasset iZ = 20m.3s. and 20m.14s., eZ = 20m.44s., ePPZ = 23m.48s., eZ = 24m.52s.

Long waves were also recorded at Christchurch, Wellington, Sitka, Philadelphia, Palisades, Paris, and Malaga.

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Sept. 3d. 19h. Undetermined shock.

Puebla P = 21m.51s., S = 23m.8s.  
 Tacubaya P = 22m.3s., S = 23m.29s.  
 Oaxaca e = 23m.0s.  
 Chinchina iP = 23m.55s.  
 Bogota eP = 24m.1s., ePcP = 27m.51s., eS = 28m.32s.  
 Tucson eP = 24m.47s., ePP? = 24m.49s., eS = 29m.19s., eL = 32m.56s.  
 Pierce Ferry iP = 25m.28s.  
 Boulder City eP = 25m.31s.  
 Overton iPZ = 25m.33s.  
 Riverside eZ = 25m.50s.  
 Tinemaha eZ = 25m.56s.  
 College eP? = 29m.49s., iPcP = 30m.28s.  
 Harvard iP = 33m.30s., eL = 41.1m.  
 Long waves were also recorded at Fort de France, Seven Falls, Palisades, Philadelphia, Pasadena, Berkeley, Seattle, and Tamanrasset.

Sept. 3d. 22h. 41m. 20s. Epicentre 42°·8N. 13°·3E.

Intensity VI at Venarotta; II-III in the province of Ascoli Piceno.  
 Epicentre 42°49'N. 13°17'E.  
 Monthly Bulletin of Rome, Istituto Nazionale di Geofisica, September, 1950, p. 3.

A = +·7163, B = +·1693, C = +·6770;  $\delta$  = +8; h = -3;  
 D = +·230, E = -·973; G = +·659, H = +·156, K = -·736.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Rocca de Papa	1.1	202	e 0 22	0	e 0 40	+ 1	—	—
Rome	1.1	214	e 0 20	- 2	e 0 37	- 2	e 0 52	?
Florence Xim	1.8	303	e 0 35	P <sub>g</sub>	i 0 57	+ 1	—	—
Prato	1.9	304	e 0 34	0	i 1 8	S <sub>g</sub>	—	—
Padova	2.0	329	e 0 48	P <sub>g</sub>	1 33	?	—	—
Bologna	2.2	321	e 0 44	P <sub>g</sub>	e 1 14	S <sub>g</sub>	e 1 23	S <sub>g</sub>
Triest	2.9	6	e 0 49	+ 1	i 1 19	- 5	i 1 34	S <sub>g</sub>
Pavia	3.8	310	—	—	e 1 50	+ 3	e 2 17	S <sub>g</sub>
Chur	4.9	328	e 1 9	- 8	e 2 9	- 6	—	—
Zürich	5.6	325	e 1 22	- 5	e 2 36	+ 3	—	—
Basle	6.2	321	e 1 58	P <sub>g</sub>	e 2 42	- 6	e 3 27	S <sub>g</sub>
Stuttgart	z.	6.6	e 1 34?	- 7	e 2 51	- 7	e 2 6	P <sub>g</sub>
Strasbourg		7.0	e 1 41	- 5	e 2 50	- 18	e 3 25	S <sub>g</sub>
Prague		7.3	6	e 1 46	- 4	e 3 15	0	e 3 59
Jena	N.	8.2	352	—	e 3 34	- 4	e 4 56	S <sub>g</sub>
Collnberg	z.	8.5	359	e 2 8	+ 1	e 4 48	S <sub>g</sub>	—
Potsdam		9.6	359	—	—	e 5 10	S <sub>g</sub>	—
Tamanrasset	z.	21.0	200	e 4 49	+ 2	—	e 4 0	?

Additional readings:—

Triest iP<sub>g</sub>P<sub>g</sub>P<sub>g</sub> = 1m.10s.  
 Basle e = 2m.25s.  
 Stuttgart eP\*?Z = 1m.51s.  
 Prague e = 2m.42s., 2m.52s., and 3m.1s., eS = 3m.9s., eS\* = 3m.39s., e = 3m.48s.

Sept. 3d. 23h. 30m. 44s. Epicentre 29°·2N. 95°·1E. (as on August 31d.).

A = -·0777, B = +·8709, C = +·4853;  $\delta$  = +2; h = +2;  
 D = +·996, E = +·089; G = -·043, H = +·483, K = -·874.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Calcutta	E.	9.0	224	e 4 2	S	(e 4 2)	+ 4	—
New Delhi	N.	15.7	272	e 3 46	+ 2	e 6 31	- 8	3 56
Przhevalsk		18.9	320	i 4 27	+ 3	—	—	PP
Murgab		19.8	304	e 4 36	+ 1	8 18	+ 5	—
Naryn		19.8	315	e 4 35	0	e 8 17	+ 4	—
Almata		20.2	320	i 4 42	+ 3	e 8 28?	+ 7	—
Nanking		20.6	75	4 39	- 4	e 8 28	- 1	—
Frunse		21.4	315	e 4 54	+ 3	e 8 55	+ 10	—
Andijan		21.8	308	e 4 59	+ 3	9 4	+ 12	—
Fergana		22.1	308	e 5 2	+ 3	i 9 7	+ 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.
Poona		22.1	246	5 2	+ 3	9 7	+ 9	—	9.8
Garm		22.7	304	5 8	+ 4	—	—	—	—
Stalinabad		23.6	301	i 5 17	+ 4	i 9 34	+ 9	—	—
Irkutsk		24.0	13	e 5 16?	- 1	—	—	—	—
Tashkent		24.2	307	e 5 22	+ 3	e 9 41	+ 6	—	—
Tchimkent		24.4	310	i 5 25	+ 4	—	—	—	—
Samarkand		25.3	302	e 5 33	+ 3	—	—	—	—
Ashkabad		31.7	297	e 6 34	+ 7	—	—	—	—
Sverdlovsk		36.7	329	i 7 10	0	12 53	- 1	—	—
Borzhomi		43.4	302	e 8 6	0	—	—	—	—
Moscow		48.2	321	e 8 44	0	e 15 43	0	—	—
Ksara		50.1	291	e 12 3	PPP	e 19 30	SS	—	—
Pulkovo		52.6	325	i 9 17	- 1	e 16 44	0	—	—
Prague		62.5	315	e 10 14	-14	—	—	e 10 33	P
Collmberg	z.	63.1	316	e 10 30	- 2	—	—	—	—
Stuttgart	z.	66.1	314	e 10 50	- 1	—	—	—	—
Chur		66.5	312	e 9 52	-62	—	—	—	—
Zürich		66.9	313	e 10 10	-46	—	—	—	—
Strasbourg		67.1	315	e 10 56	- 1	—	—	—	—
Paris		70.3	316	i 11 16	- 1	—	—	—	—
College		74.4	23	i 11 37	- 5	—	—	e 14 27	PP
Tamanrasset	z.	78.9	290	e 12 6	- 1	—	—	e 15 10	PP
Pretoria	z.	84.3	236	i 12 34	- 1	—	—	—	—
Pietermaritzburg	z.	85.0	232	e 12 38	0	—	—	—	—
Hungry Horse		98.5	19	i 13 39	- 3	—	—	e 14 55	?
Overton	z.	109.0	24	e 18 55	PP	—	—	—	—
Pierce Ferry		109.5	24	e 18 58	PP	—	—	—	—

Additional readings and note :—

Calcutta S is given as P and L as S.

New Delhi PPPN = 4m.3s., QN = 6m.20s., SSN = 6m.50s., SSSN = 7m.1s.

Prague e = 11m.11s.

Stuttgart eZ = 10m.57s.

Paris i = 11m.24s.

Tamanrasset iZ = 12m.14s., eZ = 12m.56s.

Long waves were recorded at De Bilt, Potsdam, and Granada.

Sept. 3d. Readings also at 0h. (Apia, Tamanrasset (3), Collmberg (2), Stuttgart, Rome, La Paz, Lick, Fresno, Pasadena, Riverside, Tinemaha, Tucson (2), Boulder City, Overton, Pierce Ferry, Hungry Horse (2), College, Victoria, Weston (2), and Harvard), 1h. (Tamanrasset, Hungry Horse, and Tucson), 3h. (Collmberg and near La Paz), 6h. (Tucson, near Oaxaca, Puebla, Tacubaya, and near Ashkabad), 7h. (Hungry Horse), 8h. (near Alicante (2)), 9h. (Sitka and near College), 11h. (Fergana, Tashkent, near Obi-garm, Stalinabad, Andijan, and Samarkand), 14h. (Hungry Horse), 15h. (near Garm), 16h. (Rome and Tamanrasset), 17h. (Tiflis, near Leninakan, and near Garm), 18h. (Leninakan, Erevan, near Tiflis, and near Garm), 19h. (College), 21h. (near Garm), 22h. (Logan), 23h. (Overton (2), Pierce Ferry, Poona, Garm, near Andijan, Fergana, and near Obi-garm).

Sept. 4d. 6h. 19m. 0s. Epicentre 28°·7N. 96°·6E. (as on 2d.).

A = -·1010, B = +·8727, C = +·4777;  $\delta = 0$ ;  $h = +2$ ;  
D = +·993, E = +·115; G = -·055, H = +·475, K = -·879.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
New Delhi	E.	17.0	274	e 3 54	- 7	7 2	- 8	4 8	PP
Nanking		19.4	75	i 4 32 <sub>a</sub>	+ 2	e 8 14	+10	i 4 44	PP
Hyderabad		20.1	239	4 35	- 3	8 20	+ 1	—	e 9.5
Przhevalsk		20.2	317	i 4 39	0	i 8 21	0	—	10.2
Naryn		21.1	313	e 4 46	- 2	e 8 39	0	—	—
Murgab		21.2	303	4 48	- 1	8 41	0	—	—
Almata		21.5	319	i 4 53	+ 1	—	—	—	—
Zi-ka-wei	z.	21.6	77	e 4 56	+ 2	e 8 58	+ 9	—	—
Frunse		22.7	314	e 5 6	+ 2	i 9 15	+ 6	—	—
Poona	E.	23.1	249	e 5 4	- 4	e 9 18	+ 2	9 42	Q

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.
Andijan	23.2	307	e 5 10	+ 1	i 9 20	+ 2	—	—
Fergana	23.5	307	i 5 13	+ 1	i 9 24	+ 1	—	—
Bombay	23.8	251	e 5 18	+ 3	e 9 30	+ 2	—	—
Garm	24.0	303	5 17	0	—	—	—	—
Irkutsk	24.2	11	i 5 21	+ 2	—	—	—	—
Semipalatinsk	25.0	336	e 5 18	- 9	—	—	—	—
Stalinabad	25.1	301	i 5 27	- 1	i 9 54	+ 3	—	—
Tashkent	25.5	307	i 5 33	+ 1	—	—	—	—
Tchimkent	25.7	308	i 5 34	+ 1	—	—	—	—
Samarkand	26.7	302	e 5 42	- 1	—	—	—	—
Mary	30.3	297	e 6 21	+ 6	—	—	—	—
Vladivostok	31.7	54	i 6 28	+ 1	—	—	—	—
Ashkabad	33.1	297	e 6 33	- 7	—	—	—	—
Kizyl-Arvat	34.8	299	e 6 49	- 5	—	—	—	—
Sverdlovsk	37.8	328	i 7 19	- 1	i 13 9	- 2	—	—
Tiflis	43.7	302	—	—	e 14 45	+ 6	—	—
Borzhomi	44.7	302	e 8 17	+ 1	—	—	—	—
Moscow	49.4	321	e 8 53	0	e 15 58	- 2	—	—
Ksara	51.5	292	e 9 18	+ 9	e 16 34	+ 5	—	—
Pulkovo	53.8	326	i 9 27	+ 1	e 16 56?	- 5	—	—
Istanbul	55.5	302	—	—	e 17 19	- 5	e 18 55	?
Helwan	N. 56.2	289	—	—	e 17 28	- 5	e 17 42	PS
Warsaw	59.2	317	—	—	e 18 14	+ 2	—	e 30.0
Copenhagen	63.6	322	i 10 35	0	20 30	?	—	35.0
Potsdam	N. 64.0	318	—	—	i 19 13	0	—	35.0
Collmberg	z. 64.3	317	e 10 39	0	—	—	—	—
Jena	N. 65.3	316	e 10 45	- 1	—	—	e 13 7	PP
Stuttgart	67.4	315	e 10 59	0	e 19 50	- 5	—	e 38.0
Strasbourg	68.3	315	e 11 5	0	e 20 6	0	—	—
De Bilt	68.7	319	e 20 0	S	(e 20 0)	-10	—	e 35.0
Paris	71.5	316	i 11 25	+ 1	—	—	—	—
Kew	72.2	320	e 11 56	+27	e 20 49	- 2	—	e 36.0
College	74.3	24	i 11 40	- 1	—	—	e 14 28	PP
Algiers Univ.	z. 76.1	305	e 11 50	- 1	—	—	—	—
Alicante	77.9	307	—	—	32 30	?	—	e 52.0
Toledo	z. 79.6	310	e 12 11	+ 1	e 21 46	-26	—	—
Tamanrasset	z. 80.6	291	e 12 15 <sub>a</sub>	- 1	—	—	e 15 24	PP
Malaga	z. 81.4	307	(e 12 14)	- 6	(e 22 14)	- 7	(e 15 22)	PP
Pretoria	z. 85.1	238	i 12 40	+ 1	—	—	—	—
Pietermaritzburg	z. 85.8	233	i 12 44	+ 2	—	—	—	—
Hungry Horse	98.5	20	i 13 43	+ 1	—	—	—	—
Shasta Dam	102.1	29	e 18 2	PKP	—	—	—	—
Overton	z. 108.9	26	e 18 44	[+13]	—	—	i 19 1	PP
Boulder City	109.2	26	e 18 39	[+ 7]	—	—	e 19 4	PP
Pierce Ferry	109.4	25	e 19 20	PP	—	—	—	—
Riverside	z. 109.9	29	e 19 7	PP	—	—	—	—
Washington	112.5	353	(i 18 39)	[+ 1]	—	—	—	—
Tucson	114.0	25	e 18 44	[+ 3]	—	—	—	—
Bogota	145.7	343	i 19 43	[+ 3]	—	—	i 20 5	PKP <sub>2</sub>
Chinchina	145.7	345	e 19 42	[+ 2]	—	—	e 20 2	PKP <sub>2</sub>

Additional readings and notes :—

New Delhi ePE = 3m.59s., PPPE = 4m.17s., QE = 6m.44s., SSE = 7m.15s.

Warsaw eSE = 18m.21s.

Jena eN = 11m.17s.

Stuttgart e = 11m.8s., eS? = 19m.0s.

Algiers Univ. eZ = 12m.1s.

Toledo eZ = 13m.48s.

Tamanrasset iPZ = 12m.24s., ePZ = 12m.32s., eZ = 14m.3s.

Malaga PPPZ = 17m.12s., all readings except L have been reduced by 10m.

Boulder City e = 18m.57s.

Washington reading has been reduced by 10m.

Long waves were also recorded at Granada.

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Sept. 4d. 7h. 27m. 56s. Epicentre 10°·4S. 123°·9E.

A = -·5487, B = +·8166, C = -·1794;  $\delta = +9$ ;  $h = +6$ ;  
D = +·830, E = +·558; G = +·100, H = -·149, K = -·984.

	$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		
	°	°	m.	s.	s.	m.	s.	s.	m.	s.	
Bandong	16·4	281	i 3	52	- 1	i 7	1	+ 5	—	—	
Djakarta	17·4	284	e 4	6	0	e 7	21	+ 2	—	—	
Brisbane	z. 32·2	125	i 6	32k	0	—	—	—	—	—	
Riverview	34·2	137	i 7	4a	+15	i 12	18	+ 2	—	—	
Przhevalsk	67·1	326	e 10	55	- 2	—	—	—	—	—	
Murgab	67·3	320	10	59?	0	e 19	47?	- 7	—	—	
Naryn	67·8	325	e 11	7	+ 5	—	—	—	—	—	
Almata	68·4	326	e 11	4	- 2	—	—	—	—	—	
Frunse	69·5	324	e 11	14	+ 2	—	—	—	—	—	
Andijan	69·6	321	e 11	12	- 1	e 20	15	- 6	—	—	
Fergana	69·8	321	e 11	12	- 2	—	—	—	—	—	
Tashkent	71·9	320	e 11	23	- 4	—	—	—	—	—	
Tchimkent	72·2	321	e 11	28	- 1	—	—	—	—	—	
Samarkand	72·5	318	e 11	32	+ 2	—	—	—	—	—	
Ashkabad	77·8	313	e 12	0	- 1	—	—	—	—	—	
Sverdlovsk	84·6	331	i 12	35	- 1	—	—	—	—	—	
Tiflis	88·8	313	i 12	57	0	e 23	28	[+ 3]	—	—	
Gori	89·4	313	e 13	4	+ 4	—	—	—	—	—	
Borzhom	89·9	312	e 13	8	+ 6	—	—	—	—	—	
Zugdidi	91·1	313	e 13	24	+16	—	—	—	—	—	
Ksara	94·1	303	—	—	—	e 33	35	?	e 41	1	Q
Tinemaha	z. 118·4	53	i 18	52	[+ 2]	—	—	—	—	—	—
Hungry Horse	118·8	40	i 18	51	[+ 1]	—	—	—	—	—	—
Pasadena	z. 118·8	57	i 18	52	[+ 2]	—	—	—	i 19	8	pP
Riverside	z. 119·5	57	e 18	52	[ 0]	—	—	—	—	—	—
Boulder City	121·3	54	e 18	57	[+ 2]	—	—	—	—	—	—
Overton	z. 121·5	53	i 18	58	[+ 2]	—	—	—	—	—	—
Pierce Ferry	121·9	54	i 18	59	[+ 3]	—	—	—	—	—	—
Tucson	125·2	57	e 19	20	[+17]	—	—	—	—	—	—
Harvard	145·3	20	i 19	40	[ 0]	—	—	—	i 19	54	pP
Weston	145·5	20	i 19	41	[+ 1]	—	—	—	—	—	—
Palisades	145·7	24	(i 19	43k)	[+ 3]	—	—	—	—	—	—
Huancayo	150·6	139	e 19	9	[-39]	—	—	—	—	—	—
La Paz	z. 150·7	156	e 19	41	[- 7]	—	—	—	—	—	—

Weston gives also  $i = 19m.55s.$   
Palisades reading has been increased by 10m.  
Long waves were recorded at Christchurch.

Sept. 4d. 8h. 12m. 28s. Epicentre 28°·7N. 96°·6E. (as at 6h.).

	$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.	
	°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.	
New Delhi	N. 17·0	274	e 4	12	+11	e 7	0	-10	4	21	PP	7·7
Nanking	19·4	75	e 4	31a	+ 1	e 8	11	+ 7	e 5	2	PP	e 9·3
Hyderabad	N. 20·1	239	e 4	50	+12	e 8	54	+35	—	—	—	11·1
Przhevalsk	20·2	317	e 4	37	- 2	e 8	17	- 4	—	—	—	—
Naryn	21·1	313	i 4	46	- 2	e 8	33	- 6	—	—	—	—
Murgab	21·2	303	4	50	+ 1	8	41	0	—	—	—	—
Almata	21·5	319	i 4	52	0	i 8	44	- 3	—	—	—	—
Zi-ka-wei	z. 21·6	77	e 4	56	+ 2	e 8	58	+ 9	—	—	—	—
Frunse	22·7	314	i 5	4	0	e 9	10	+ 1	—	—	—	—
Andijan	23·2	307	5	9	0	9	18	0	—	—	—	—
Fergana	23·5	307	e 5	11?	- 1	e 9	19?	- 4	—	—	—	—
Bombay	23·8	251	—	—	—	e 9	47	+19	—	—	—	—
Garm	24·0	303	5	20	+ 3	—	—	—	—	—	—	—
Irkutsk	24·2	11	e 5	16	- 3	—	—	—	—	—	—	—
Stalinabad	25·1	301	i 5	29?	+ 1	i 9	52?	+ 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.
Tashkent	25.5	307	i 5 33	+ 1	i 9 55	- 2	—	—
Tchimkent	25.7	308	e 5 34	+ 1	—	—	—	—
Samarkand	26.7	302	e 5 43	0	—	—	—	—
Ashkabad	33.1	297	e 6 40	0	—	—	—	—
Sverdlovsk	37.8	328	i 7 19	- 1	e 13 5	- 6	—	—
Moscow	49.4	321	e 8 52	- 1	e 15 53	- 7	—	—
Ksara	51.5	292	i 9 16	+ 7	—	—	e 11 17	PP
Pulkovo	53.8	326	e 9 26	0	e 16 53	- 8	—	—
Potsdam	64.0	318	—	—	e 19 14	+ 1	—	e 27.5
Collmberg	z. 64.3	317	e 11 37	+58	—	—	—	—
Stuttgart	z. 67.4	315	e 10 59	0	—	—	—	—
College	74.3	24	i 11 38	- 3	—	—	—	—
Tamanrasset	z. 80.6	291	e 12 18	+ 2	—	—	—	—

Additional readings:—

New Delhi PPPN = 4m.29s., QN = 6m.57s., SSN = 7m.19s., SSSN = 7m.32s., P<sub>c</sub>PN = 9m.12s.

Long waves were also recorded at Warsaw and De Bilt.

Sept. 4d. 11h. 26m. 11s. Epicentre 41°·0N. 143°·3E. Depth of focus 0·010.  
(as on 1949, May 8d.).

Intensity II-III at Kusiro and Morioka. Epicentre 41°·3N. 143°·4E. Depth 30-100km.  
Macroseismic radius 200-300km.  
Seismo. Bull. Cent. Met. Obs., Japan for 1950. Tokyo 1952, pp. 39, 40, with macroseismic chart.

A = -·6069, B = +·4523, C = +·6535;  $\delta = -3$ ;  $h = -2$ ;  
D = +·598, E = +·802; G = -·524, H = +·391, K = -·757.

	$\Delta$	Az.	P.	O-C.	S.	O-C.
	°	°	m. s.	s.	m. s.	s.
Miyako	1.7	216	0 26	- 3	0 49	- 2
Aomori	1.9	264	0 34	+ 2	0 57	+ 2
Morioka	2.1	232	0 34	0	1 2	+ 2
Mizusawa	2.5	222	0 40	0	1 10	0
Sapporo	2.5	325	0 40	0	1 25	+15
Akita	2.8	242	0 45	+ 1	1 22	+ 5
Nemuro	2.9	44	0 38	- 7	1 6	-13
Sendai	3.3	214	0 52	+ 1	1 34	+ 5
Hukushima	3.9	214	0 58	- 1	1 45	+ 1
Mito	5.1	206	1 1	-15	1 57	-17
Tukubasan	5.4	208	1 17	- 3	2 19	- 2
Kumagaya	5.7	213	1 27	+ 3	2 31	+ 3
Maebasi	5.7	217	1 33	+ 9	2 31	+ 3
Nagano	5.9	224	1 39	+13	2 34	+ 1
Tokyo	6.0	206	1 26	- 2	—	—
Yokohama	6.3	208	1 36	+ 4	—	—
Hunatu	6.5	213	1 50	+15	2 48	0
Misima	6.8	211	1 54	+15	—	—
Kameyama	8.2	221	2 16	+18	—	—
College	45.0	35	e 8 7	0	—	—
Shasta Dam	67.6	55	e 11 30	pP	—	—
Overton	z. 75.1	54	e 11 35	+ 2	—	—
Pierce Ferry	75.6	54	i 11 38	+ 2	—	—
Collmberg	z. 78.4	331	e 11 52	0	—	—
Tucson	80.1	56	e 12 3	+ 2	—	—

Sendai gives also S = 1m.40s.  
Collmberg eZ = 12m.0s.

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Sept. 4d. 12h. 17m. 5s. Epicentre 40°·8N. 34°·4E., given by U.S.S.R.

A = +·6264, B = +·4289, C = +·6509;  $\delta=0$ ;  $h=-2$ ;  
D = +·565, E = -·825; G = +·537, H = +·368, K = -·759.

		$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.
		°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.
Istanbul		4·0	275	e 1	9	P*	i 2	7	S*	—	—	—
Simferopol		4·1	357	e 1	6	+ 1	1	53	- 2	—	—	—
Theodosia		4·3	9	i 1	7	- 1	—	—	—	—	—	—
Sotchi		4·8	53	1	9	- 6	2	3	- 9	—	—	—
Bucharest		7·1	303	e 1	49	+ 1	i 3	6	- 4	i 3	35	S <sub>r</sub>
Ksara		7·1	170	i 1	55	+ 7	i 3	28	+18	—	—	—
Kishinev		7·3	329	1	47	- 3	3	8	- 7	—	—	—
Athens		8·7	255	e 2	17	+ 7	e 3	53	+ 3	—	—	—
Belgrade		11·0	296	e 5	16	S	(e 5	16)	+29	—	—	e 6·5
Helwan	N.	11·2	194	e 2	51	+ 7	—	—	—	—	—	—
Kalossa	E.	12·5	303	e 4	47	?	—	—	—	—	—	e 6·3
Budapest	N.	12·9	306	e 4	15	?	e 8	1	L	—	—	(e 8·0)
Skalnate Pleso	N.	13·0	315	e 3	7	- 2	e 5	25	-10	e 3	15	PP
Moscow		15·1	7	e 3	31	- 5	e 6	9	-16	—	—	—
Triest		15·8	295	—	—	—	e 6	47	+ 5	e 7	1	SS
Prague		16·7	310	e 3	57	0	e 7	1	- 2	e 4	22	PP
Collmberg		18·1	313	e 4	14	0	e 7	43	+ 8	e 4	23	PP
Potsdam		18·6	316	i 4	16 <sup>k</sup>	- 5	i 7	50 <sup>?</sup>	+ 4	—	—	e 10·9
Ashkabad		18·7	90	e 4	28	+ 6	e 8	5	+17	—	—	—
Jena		18·8	310	e 4	22	- 1	e 8	2	+12	e 4	32	PP
Pulkovo		19·2	353	i 4	24	- 4	—	—	—	—	—	—
Stuttgart		19·5	303	i 4	29 <sup>a</sup>	- 2	e 8	7	+ 1	—	—	e 11·7
Zürich		19·6	298	e 4	31 <sup>a</sup>	- 1	—	—	—	—	—	—
Basle		20·3	298	e 4	40 <sup>a</sup>	0	—	—	—	e 8	41	P <sub>c</sub> P
Helsinki		20·3	346	e 4	38	- 2	e 8	20	- 3	e 5	13	PPP
Strasbourg		20·4	302	i 4	40	- 1	e 8	29	+ 4	—	—	e 11·9
Copenhagen		20·7	323	e 4	42	- 2	e 8	25	- 6	—	—	—
Upsala		21·8	336	i 4	45	-11	i 8	36	-16	i 5	14	PPP
De Bilt		22·9	310	e 5	7	+ 1	e 9	24	+11	—	—	e 11·9
Sverdlovsk		23·4	37	5	12	+ 1	9	18	- 3	—	—	—
Paris		23·9	301	e 5	21	+ 5	e 11	19	Q	i 6	13	PPP
Kew		26·1	306	e 7	55 <sup>?</sup>	?	—	—	—	—	—	—
Tashkent		26·2	76	5	43	+ 5	—	—	—	—	—	—
Alicante		26·9	277	5	42	- 3	10	18	- 2	—	—	e 13·6
Aberdeen		28·6	317	e 6	55 <sup>?</sup>	PP	—	—	—	—	—	e 14·9
Toledo	z.	29·2	281	i 6	6	+ 1	e 10	59	+ 1	e 7	39	PPP
Granada		29·6	276	i 5	54 <sup>a</sup>	-15	10	33	-31	12	6	SS
Rathfarnham Castle		30·0	309	i 6	33	+21	e 11	55	+45	e 13	33	SSS
Tamanrasset	z.	30·2	242	e 6	19	+ 5	e 11	32	+19	e 7	24	PP
Pretoria	z.	66·5	186	i 10	59	+ 5	—	—	—	—	—	—
Harvard		73·5	312	e 11	37	+ 1	—	—	—	—	—	—
Weston		73·5	312	i 11	39	+ 3	—	—	—	—	—	—
Ottawa	z.	73·9	317	e 11	39	0	—	—	—	—	—	—
College		74·7	2	i 11	43	0	—	—	—	e 14	29	PP
Hungry Horse		86·9	340	i 12	50	+ 2	—	—	—	—	—	—
Victoria	z.	88·9	345	e 12	59	+ 1	—	—	—	—	—	—
Overton	z.	97·9	335	—	—	—	i 31	18	SS	—	—	—
Pierce Ferry		98·1	334	i 13	43	+ 3	—	—	—	—	—	—
Tinemaha	z.	98·6	338	e 13	46	+ 4	—	—	—	—	—	—
Tucson		100·5	330	e 13	53	+ 2	—	—	—	—	—	—

Additional readings :—

Bucharest iS\*N = 3m.32s.

Skalnate Pleso eN = 3m.21s., 5m.34s., 6m.9s., and 6m.19s.

Triest eSSS = 8m.34s.

Prague e = 4m.9s., eN = 4m.40s., e = 4m.49s., 5m.4s., and 5m.19s., eN = 5m.30s., e = 5m.39s. and 5m.55s., eSS = 7m.43s., e = 8m.16s.

Potsdam ePE = 4m.20s.

Jena eN = 6m.23s.

Upsala eE = 4m.55s.?, i = 5m.30s., eE = 6m.6s. and 7m.29s., iSS = 9m.0s., iSSS = 9m.24s., eN = 10m.5s., i = 11m.14s. and 11m.41s.

Paris e = 5m.29s. and 5m.35s.

Rathfarnham Castle e = 12m.35s.

Tamanrasset eZ = 6m.33s., ePPPZ = 7m.38s., eP<sub>c</sub>PZ = 9m.5s., eSSZ = 12m.53s.

Long waves were also recorded at Rome and Malaga.

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1950

705

Sept. 4d. 14h. 1m. 15s. Epicentre  $41^{\circ}9'N$ .  $143^{\circ}6'E$ . Depth of focus 0.010.  
(as on 1950, Feb. 3d.).

Intensity IV at Urakawa ; II-III at Aomori, Miyako, Morioka, and Hatinche. Epicentre  $41^{\circ}9'N$ .  $142^{\circ}9'E$ . Depth 30-100km. Macroseismic radius 200-300km.  
Seismo. Bull. Cent. Met. Obs., Japan, 1950. Tokyo, 1952, p.40, with macroseismic chart.

$\Delta = -0.6009$ ,  $B = +0.4430$ ,  $C = +0.6653$ ;  $\delta = -5$ ;  $h = -2$ ;  
 $D = +0.593$ ,  $E = +0.805$ ;  $G = -0.536$ ,  $H = +0.395$ ,  $K = -0.747$ .

	$\Delta$	Az.	P.	O-C.	S.	O-C.
	$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.
Nemuro	2.0	46	0 47	+14	1 10	+13
Sapporo	2.0	305	0 23k	-10	0 40	-17
Hatinohe	2.1	229	0 27	-7	1 7	+7
Aomori	2.4	243	0 33	-5	0 55	-12
Miyako	2.6	208	0 37	-4	1 4	-8
Morioka	2.9	220	0 39	-6	1 10	-9
Akita	3.4	232	0 55	+3	—	—
Mizusawa	3.4	316	0 52	0	e 1 31	-1
Sendai	4.2	211	1 2	-1	1 41	-10
Hukushima	4.8	212	1 8	-3	2 1	-5
Aikawa	5.6	229	1 17	-5	—	—
Mito	6.0	205	1 21	-7	—	—
Tukubasan	6.3	207	1 35	+3	2 33	-10
Maebasi	6.5	214	1 51	+16	—	—
Kumagaya	6.6	211	1 56	+20	—	—
Nagano	6.7	221	1 38	+1	3 13	+20
Tokyo	6.8	207	2 51	S	(2 51)	-4
Yokohama	7.1	207	1 56	+13	—	—
Hunatu	7.4	213	1 37	-10	—	—
College	44.1	35	i 8 4	+4	—	—
Shasta Dam	66.9	56	i 10 50	+6	—	—
Overton	z. 74.3	55	i 11 35	+7	—	—
Pierce Ferry	74.9	55	e 11 38	+6	—	—
Collmberg	z. 77.7	331	e 11 46	-2	—	—
Stuttgart	z. 81.2	322	e 12 5	-1	—	—
Weston	90.4	26	i 12 55	+3	—	—

Mizusawa gives also SE = 1m.25s.

Sept. 4d. 22h. 29m. 2s. Epicentre  $28^{\circ}7'N$ .  $96^{\circ}6'E$ . (as at 8h.).

	$\Delta$	Az.	P.	O-C.	S.	O-C.
	$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.
Naryn	21.1	313	e 4 50	+2	8 34	-5
Murgab	21.2	303	4 49	0	8 37	-4
Almata	21.5	319	e 4 52	0	e 8 43	-4
Frunse	22.7	314	e 4 56	-8	e 9 5	-4
Fergana	23.5	307	e 5 12	0	—	—
Irkutsk	24.2	11	e 5 15	-4	—	—
Kulyab	24.2	300	e 5 22	+3	—	—
Stalinabad	25.1	301	i 5 30	+2	9 50	-1
Tashkent	25.5	307	i 5 35	+3	—	—
Samarkand	26.7	302	e 5 44	+1	—	—
College	74.3	24	i 11 38	-3	—	—
Hungry Horse	98.5	20	e 13 41	-1	—	—

Long waves were recorded at Nanking.

Sept. 4d. Readings also at 0h. (De Bilt), 1h. (Huancayo, Pierce Ferry, and near Ottawa), 4h. (Collmberg and near Raciborzu), 5h. (Zürich and near Overton), 7h. (College and Overton), 8h. and 9h. (College), 11h. (Mizusawa, Malaga, and near Garm), 14h. (Garm and near Vladivostok), 15h. (Collmberg and near Ottawa), 18h. (Ashkabad, Andijan, Tamanrasset (2), Hungry Horse, College, and Huancayo), 19h. (Stuttgart, Overton, Pierce Ferry, near Huancayo, and La Paz), 20h. (Bogota), 21h. (Strasbourg, Stuttgart, Paris, Kew, Collmberg, Potsdam, Tamanrasset, Tucson, Overton, Pierce Ferry, Hungry Horse, College, and near Ashkabad), 22h. (College).



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1950

706

Sept. 5d. 4h. 4m. 36s. Epicentre 42°·6N. 13°·5E. (as on 1950, March 7d.).

Foreshock of destructive earthquake at 4h. 9m.

	$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.	
	°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.	
Rocca di Papa	1·0	214	0	16	- 5	0	30	- 6	—	—	—	
Rome	1·0	230	i 0	24 <sub>a</sub>	+ 3	i 0	28	- 8	—	—	—	
Florence, Xim.	2·0	306	e 0	39	+ 4	i 1	1	- 1	—	—	—	
Padova	2·2	328	e 0	54	?	1	52	?	—	—	—	
Prato	2·2	306	i 0	39	+ 1	i 1	6	0	—	—	—	
Bologna	2·5	323	e 0	45	+ 2	i 1	19	+ 5	i 1	30	S <sub>g</sub>	
Triest	3·1	3	e 0	56	P*	i 1	34	S*	e 1	5	P <sub>g</sub>	
Taranto	3·5	126	0	59	+ 2	1	21	?	—	—	—	
Salo	3·7	325	e 0	54	- 6	1	45	0	1	3	P*	
Pavia	4·1	311	e 1	19 <sub>a</sub>	P <sub>g</sub>	e 2	3	S*	e 1	35	?	
Chur	5·1	328	e 1	20	0	e 2	24	+ 4	—	—	—	
Belgrade	5·5	65	e 1	52	P <sub>g</sub>	e 2	46	S*	i 2	56	S <sub>g</sub>	
Kalossa	5·5	43	e 2	8	?	e 2	28	- 2	3	23	S <sub>g</sub>	
Ravensburg	5·9	332	e 1	6	- 25	e 2	55	S*	e 3	35	S <sub>g</sub>	
Zürich	5·9	325	e 1	28	- 3	e 2	37	- 3	—	—	—	
Ogyalla	6·2	31	e 2	5	P <sub>g</sub>	e 2	50	+ 2	e 3	40	S <sub>g</sub>	
Budapest	6·3	37	e 2	17	P <sub>g</sub>	3	47	S <sub>g</sub>	—	—	—	
Neuchatel	6·4	315	e 1	30	- 8	e 2	44	- 9	—	—	—	
Basle	6·5	321	e 1	33	- 6	e 2	48	- 7	—	—	—	
Stuttgart	z.	6·9	335	e 1	43 <sub>?</sub>	- 2	e 3	27	S*	e 2	6	P*
Strasbourg	7·2	328	e 1	52	+ 3	—	—	—	—	—	e 4·3	
Sofia	7·2	86	e 1	54	+ 5	—	—	—	—	—	e 4·1	
Karlsruhe	7·3	333	e 1	54	+ 4	—	—	—	—	—	—	
Cheb	N.	7·5	355	e 1	54	+ 1	e 3	30	+ 10	e 4	3	S <sub>g</sub>
Prague	7·5	5	e 1	57	+ 4	e 3	24	+ 4	e 2	33	P <sub>g</sub>	
Skalnate Pleso	N.	8·1	33	e 2	8	+ 6	—	—	—	—	—	
Raciborzu	8·2	22	—	—	—	e 4	4	S*	e 10	12	P <sub>c</sub> P	
Jena	8·4	352	e 2	16	+ 10	e 4	24	S*	e 3	4	P <sub>g</sub>	
Collmberg	z.	8·7	358	e 2	9 <sub>?</sub>	- 1	e 3	45	- 5	e 4	36	S*
Bucharest	9·3	75	e 2	28	+ 11	—	—	—	—	—	—	
Potsdam	9·8	358	—	—	—	e 4	48	S*	i 5	38	S <sub>g</sub>	
Paris	9·9	313	e 2	30	+ 5	e 4	49	S*	—	—	—	
Istanbul	11·7	92	e 4	9	?	—	—	—	—	—	—	
Jersey	E.	12·7	307	e 3	40	?	e 4	50	- 38	—	—	
Tamanrasset	z.	20·8	201	i 4	44 <sub>a</sub>	- 1	e 8	26	- 7	i 5	3	PP
Hungry Horse	78·3	327	e 11	55	- 8	—	—	—	—	—	—	
Victoria	z.	81·7	333	e 14	57	PP	—	—	—	—	—	
Shasta Dam	88·0	328	e 11	46	- 67	—	—	—	—	—	—	

Additional readings :—

Triest iS<sub>g</sub> = 1m.48s.

Salo i = 1m.34s.

Belgrade i = 3m.34s. and 3m.59s., e = 4m.35s.

Kalossa eE = 3m.36s., iN = 3m.45s., eE = 3m.58s., iE = 4m.31s.

Ogyalla e = 3m.9s.

Stuttgart eP\*Z = 1m.53s.

Cheb eN = 2m.59s. and 3m.8s., eSN = 3m.12s.

Prague eP\*? = 2m.16s., e = 3m.44s., eS\*? = 3m.49s., eS<sub>g</sub> = 4m.13s.

Raciborzu eN = 4m.12s.

Jena eN = 2m.25s., eS<sub>g</sub>?E = 4m.38s.

Collmberg eZ = 2m.14s., 4m.7s., 5m.7s., and 5m.38s.

Potsdam eZ = 5m.0s., iE = 5m.41s., iZ = 6m.4s., eN = 6m.18s., iE = 6m.32s.

Paris e = 2m.44s., 3m.2s., and 3m.52s.

Tamanrasset iZ = 4m.47s. and 4m.51s., ePPPZ = 5m.13s.

Long waves were also recorded at Warsaw, Clermont-Ferrand, and De Bilt.

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1950

707

Sept. 5d. 4h. 9m. 0s. Epicentre 42°·6N. 13°·5E. (as at 4h. 4m.).

Earthquake destructive on the foot-hills of the Grand Sasso of Italy. Intensity VIII at Amatrice and in parts of the provinces of Aquila and Teramo. Energy  $10^{21}$  ergs. Suggested Epicentre 42°30'·5N. 13°21'E.

D. Di Filippo and L. Marcelli.

Uno studio sul terremoto del Gran Sasso d'Italia del 5 Sett. 1950. *Annali de Geofisica*, Vol. IV, No. 2, April, 1951, p.214-239 with 10 figures and macroseismic map p.216.

A = +·7180, B = +·1724, C = +·6744;  $\delta = +6$ ;  $h = -3$ ;  
D = +·233, E = -·972; G = +·656, H = +·157, K = -·738.

	$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.
	°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.
Rocca di Papa	1·0	214	i 0	16	- 5	i 0	30	- 6	—	—	—
Rome	1·0	230	i 0	15	- 6	i 0	28	- 8	—	—	—
Florence, Xim.	2·0	306	i 0	37	+ 2	i 0	59	- 3	—	—	—
Padova	2·2	328	0	57	?	1	26	S <sub>g</sub>	1	5	S*
Prato	2·2	306	i 0	36	- 2	i 1	0	- 6	—	—	—
Bologna	2·5	323	i 0	46 <sub>a</sub>	+ 3	i 1	19	+ 5	i 0	57	P <sub>g</sub>
Triest	3·1	3	e 0	49	- 2	i 1	28	- 1	e 0	57	P*
Taranto	3·5	126	1	1	P*	1	43	+ 3	—	—	e 1·8
Salo	3·7	325	i 0	58 <sub>a</sub>	- 2	i 1	42	- 3	i 1	12	P <sub>g</sub>
Pavia	4·1	311	e 1	6	+ 1	i 1	52	- 3	i 1	33	P <sub>g</sub>
Messina	4·7	160	e 1	13	- 1	i 2	14	+ 4	i 1	41	P <sub>g</sub>
Chur	5·1	328	e 1	21	+ 1	—	—	—	—	—	—
Belgrade	5·5	65	e 1	28 <sub>k</sub>	+ 3	i 2	44	S*	i 1	51	P <sub>g</sub>
Kalossa	E. 5·5	43	e 1	50	P <sub>g</sub>	3	10	S <sub>g</sub>	i 2	43	S*
	N. 5·5	43	1	53	P <sub>g</sub>	3	5	S <sub>g</sub>	i 2	40	S*
Ravensburg	5·9	332	e 1	45?	P*	—	—	—	—	—	e 2·6
Zürich	5·9	325	e 1	29	- 2	e 2	39	- 1	—	—	—
Vienna	6·0	19	e 1	35	+ 3	i 2	42	- 1	e 2	0	P <sub>g</sub>
Ogyalla	6·2	31	e 2	8	P <sub>g</sub>	e 3	40	S <sub>g</sub>	—	—	—
Budapest	6·3	37	e 1	30	- 6	2	58	+ 8	2	7	P <sub>g</sub>
Ebingen	6·4	332	1	43?	+ 5	2	49	- 4	e 2	10	P <sub>g</sub>
Neuchatel	6·4	315	e 1	36	- 2	e 2	45	- 8	—	—	—
Basle	6·5	321	e 1	38	- 1	e 2	51	- 4	—	—	—
Stuttgart	6·9	335	e 1	44	- 1	e 2	32	-33	e 2	16	P <sub>g</sub>
Strasbourg	7·2	328	e 1	48	- 1	e 3	6	- 7	—	—	e 3·3
Sofia	7·2	86	i 1	51	+ 2	i 3	44	S <sub>g</sub>	—	—	i 4·2
Karlsruhe	7·3	333	e 1	41	- 9	e 2	47	-28	—	—	e 3·4
Cheb	N. 7·5	355	e 1	50	- 3	e 3	31	+11	i 2	16	P*
Prague	7·5	5	e 1	55	+ 2	i 3	14	- 6	i 2	32	P <sub>g</sub>
Clermont-Ferrand	8·1	296	i 1	58	- 4	i 3	29	- 6	i 2	41	P <sub>g</sub>
Skalnate Pleso	8·1	33	e 2	1	- 1	e 3	31	- 4	e 4	2	S*
Jena	8·4	352	e 2	8	+ 2	e 3	42	- 1	e 3	10	P <sub>g</sub>
Barcelona	8·5	266	2	1	- 6	—	—	—	—	—	e 4·1
Collmberg	8·7	358	e 2	8	- 2	i 3	48	- 2	e 4	40	S <sub>g</sub>
Athens	9·1	117	—	—	—	e 3	52	- 8	—	—	—
Bucharest	9·3	75	i 2	20	+ 3	e 4	4	- 1	e 4	3	S <sub>g</sub>
Potsdam	9·8	358	i 2	22	- 2	i 4	36	+19	—	—	5·0
Algiers Univ.	z. 9·9	237	e 2	21	- 4	—	—	—	e 2	51	PPP
Paris	9·9	313	i 2	25	0	i 4	12	- 8	i 2	35	PP
Tortosa	9·9	264	i 2	23	- 2	i 4	23	+ 3	8	31	P <sub>c</sub> P
Warsaw	10·9	25	2	38	- 2	e 4	50	+ 6	—	—	e 5·7
De Bilt	11·0	332	—	—	—	e 4	48	+ 1	—	—	e 5·5
Alicante	11·5	253	2	54	+ 6	i 5	18	+19	3	0	pP
Istanbul	11·7	92	—	—	—	e 5	17	+13	—	—	—
Kishinev	11·7	63	2	54	+ 3	—	—	—	—	—	—
Kew	12·9	318	i 3	6	- 1	i 5	55	+22	—	—	i 6·5
Copenhagen	13·1	357	e 3	12	+ 2	—	—	—	—	—	6·5
Toledo	13·5	264	i 3	13	- 2	e 5	50	+ 3	e 3	30	PP
Granada	14·2	253	i 3	23 <sub>k</sub>	- 1	i 5	46	-18	i 3	50	PP
Malaga	z. 15·0	253	i 3	36 <sub>k</sub>	+ 1	i 6	28	+ 5	—	—	7·7
Yalta	15·1	76	3	35	- 1	e 6	29	+ 4	—	—	—
Theodosia	16·0	74	e 3	47	- 1	—	—	—	—	—	—
Rathfarnham Castle	17·0	317	e 4	1	0	i 6	50	-20	e 4	12	PP
Edinburgh	E. 17·2	327	3	37	-26	6	31	-43	3	54	PP
Upsala	17·5	5	i 4	6	- 1	e 7	25	+ 4	e 4	31	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.
Aberdeen	17.6	332	e 4 8	0	i 7 31	+ 8	—	i 10.2
Lisbon	17.6	265	4 16 <sub>a</sub>	+ 8	7 26	+ 3	—	8.4
Helsinki	18.9	16	e 4 24	0	e 7 54	+ 1	—	—
Helwan	19.1	126	i 4 24	- 3	i 7 58	+ 1	—	i 8.4
Pulkovo	20.1	25	i 4 36	- 2	e 8 15	- 4	—	—
Moscow	20.4	41	e 4 40	- 1	e 8 23	- 2	—	—
Tamanrasset	z. 20.8	201	e 4 43	- 2	e 8 23	- 10	e 5 2	PP
Piatigorsk	21.5	76	4 56	+ 4	8 58	+ 11	—	—
Abastumanj	21.7	82	5 15	+ 20	—	—	—	—
Tiflis	22.1	81	i 5 12	+ 13	—	—	—	—
Leninakan	22.7	83	e 5 5	+ 1	—	—	—	—
Grozny	23.5	77	e 5 18	+ 6	—	—	—	—
Lenkoran	26.9	86	i 6 6	+ 21	i 10 47	+ 27	—	—
Baku	27.2	82	e 5 51?	+ 4	e 10 36	+ 11	—	—
Sverdlovsk	32.9	48	i 6 39	+ 1	11 56	0	—	—
Mary	36.9	81	e 7 19?	+ 7	—	—	—	—
Samarkand	39.8	76	e 7 39	+ 3	—	—	—	—
Tashkent	40.9	72	e 7 46	0	e 13 57	- 1	—	—
Stalinabad	41.6	76	i 7 53	+ 2	—	—	—	—
Garm	42.5	75	e 8 0	+ 1	—	—	—	—
Kulyab	42.5	77	e 8 4	+ 5	—	—	—	—
Fergana	43.0	72	i 8 5	+ 2	e 14 32	+ 3	—	—
Andijan	43.2	72	e 8 9	+ 5	e 14 36	+ 4	—	—
Frunse	44.0	68	e 8 14	+ 3	e 14 45	+ 2	—	—
Murgab	45.3	74	8 27	+ 6	15 9?	+ 7	—	—
Almata	45.4	66	8 25	+ 3	—	—	—	—
Naryn	45.5	68	e 8 26	+ 3	e 15 9	+ 4	—	—
Irkutsk	58.3	46	e 10 0	+ 1	e 18 2?	+ 1	—	—
Pretoria	z. 69.3	166	e 11 10	- 1	—	—	—	—
College	71.9	352	e 11 26	- 1	—	—	—	—
Hungry Horse	78.3	327	e 12 2	- 1	—	—	—	—
Vladivostok	78.3	41	e 12 2	- 1	e 22 45	PS	e 26 53	SS
Victoria	z. 81.7	333	e 10 33	?	—	—	—	—
Shasta Dam	88.0	328	e 14 20	?	—	—	—	—
Pierce Ferry	88.2	320	e 12 54	0	—	—	—	—
Tucson	89.7	316	e 13 1	0	—	—	—	e 50.8

Additional readings :—

Padova  $S_g$ ? = 1m.48s.  
 Bologna  $i$  = 1m.33s.  
 Trieste  $iS_g$  = 1m.41s.  
 Salo  $iZ$  = 1m.22s.,  $iN$  = 2m.12s.  
 Pavia  $iS_gE$  = 2m.11s.  
 Messina  $iN$  = 1m.29s.  
 Belgrade  $iS_g$  = 3m.13s.  
 Kalossa  $iE$  = 2m.6s.,  $PPN$  = 2m.23s.,  $iEN$  = 3m.17s.,  $SSE$  = 3m.39s.  
 Vienna  $eP^*$  = 1m.49s.,  $eS^*$  = 3m.8s. and 3m.19s.?,  $eS_g$  = 3m.24s.  
 Ogyalla  $eN$  = 2m.34s.,  $eE$  = 2m.37s.,  $e$  = 3m.30s.  
 Budapest  $e$  = 2m.15s.,  $SS$  = 2m.45s.  
 Stuttgart  $e$  = 2m.4s., 2m.11s., 2m.48s., 2m.56s., 3m.2s., 3m.8s., and 3m.20s.,  $eS_g$ ? = 3m.33s.  
 Cheb  $eN$  = 3m.16s.,  $iS_gN$  = 3m.54s.  
 Prague  $e$  = 2m.5s.,  $iP^*$  = 2m.10s.,  $i$  = 2m.54s. and 3m.2s.,  $eS^*$  = 3m.34s.,  $eS_g$  = 4m.13s.  
 Clermont-Ferrand  $e$  = 3m.44s.,  $eS^*$  = 4m.0s.,  $iS_g$  = 4m.14s.  
 Skalnate Pleso  $eP_g$  = 2m.18s.,  $e$  = 2m.31s. and 2m.39s.,  $eS$  = 3m.13s.  
 Jena  $eE$  = 2m.41s.,  $eS?E$  = 3m.36s.,  $eEN$  = 4m.12s.,  $iS_gE$  = 4m.36s.,  $iS_gN$  = 4m.40s. and 4m.56s.  
 Collmberg  $eZ$  = 3m.22s.,  $iZ$  = 3m.44s. and 4m.54s.  
 Bucharest  $eE$  = 2m.27s.,  $iS_gN$  = 5m.9s.  
 Potsdam  $iZ$  = 4m.44s.  
 Paris  $iPPP$  = 2m.40s.,  $i$  = 3m.6s.,  $e$  = 3m.22s. and 4m.3s.,  $iSS$  = 4m.29s.,  $iSSS$  = 4m.42s.  
 Warsaw  $ePN$  = 2m.41s.,  $eZ$  = 3m.19s.,  $eN$  = 3m.22s.,  $eE$  = 3m.38s.,  $eN$  = 3m.47s.,  $eZ$  = 3m.52s.,  $eNZ$  = 4m.41s.,  $eSE$  = 4m.56s.,  $eSZ$  = 5m.0s.  
 Alicante  $PP$  = 3m.6s.,  $PPP$  = 3m.11s.,  $SS$  = 5m.36s.,  $SSS$  = 5m.44s.,  $P_cP$  = 8m.26s.,  $P_cS$  = 12m.14s.,  $S_cS$  = 16m.20s.  
 Toledo  $eZ$  = 4m.7s.,  $eE$  = 7m.1s.  
 Granada  $iSS$  = 6m.22s.  
 Rathfarnham Castle  $eZ$  = 4m.46s. and 7m.1s.,  $e$  = 7m.59s.  
 Edinburgh  $SSE$  = 6m.56s.,  $P_cPE$  = 8m.39s.,  $S_cSE$  = 15m.49s.  
 Tamanrasset  $iZ$  = 4m.49s.,  $ePPPZ$  = 5m.12s.,  $eSSZ$  = 8m.50s.,  $iSSSZ$  = 9m.11s.,  $eZ$  = 9m.31s.

Long waves were also recorded at Jersey, Durham, Philadelphia, Seven Falls, and La Paz.

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Sept. 5d. 8h. 25m. 37s. Epicentre  $0^{\circ}4S$ .  $98^{\circ}8E$ . (as on 1942, Oct. 25d.).

A = -0.1530, B = +0.9882, C = -0.0069;  $\delta = 0$ ;  $h = +7$ ;  
D = +0.988, E = +0.153; G = +0.001, H = -0.007, K = -1.000.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Djakarta	9.8	126	e 2 14	-10	e 5 9	S*	—	—
Bandong	10.9	126	e 2 5	-35	i 4 53	+ 9	—	—
Kodaikanal	E. 23.7	298	e 6 23	?	—	—	—	—
Poona	E. 30.9	309	—	—	e 12 33	SS	—	14.9
Zi-ka-wei	Z. 38.1	32	e 7 25	+ 3	—	—	—	e 16.9
Naryn	46.5	337	e 8 34	+ 3	—	—	—	—
Kulyab	46.6	329	e 8 31	- 1	e 15 20	- 1	—	—
Garm	47.1	331	e 8 37	+ 2	—	—	—	—
Andijan	47.5	332	e 8 39	+ 1	15 35	+ 1	—	—
Fergana	47.5	332	e 8 40	+ 2	e 15 36	+ 2	—	—
Stalinabad	47.6	329	e 8 39	0	—	—	—	—
Almata	47.7	339	e 8 42	+ 2	e 15 41	+ 5	—	—
Frunse	48.3	336	e 8 46	+ 1	e 15 50	+ 5	—	—
Samarkand	49.3	327	e 8 53	0	—	—	—	—
Tashkent	49.4	331	e 8 53	0	i 16 1	+ 1	—	—
Tchimkent	50.0	332	i 8 58	0	—	—	—	—
Mary	50.9	323	—	—	e 16 27	+ 6	—	—
Vladivostok	52.5	30	e 9 17	0	—	—	—	—
Ashkabad	53.3	321	e 9 23	0	—	—	—	—
Sverdlovsk	64.8	338	10 41	- 2	19 22	- 1	—	—
Ksara	68.0	306	e 11 3	0	—	—	—	—
Helwan	N. 70.7	301	—	—	e 20 35	+ 1	—	—
Moscow	74.5	329	e 11 40	- 2	e 21 13	- 4	—	—
Istanbul	75.1	313	e 19 1	?	—	—	—	—
Prague	86.7	320	e 15 29	PP	—	—	—	—
Collmberg	Z. 87.7	321	e 12 50	- 2	—	—	—	—
Potsdam	87.7	322	e 16 59	PP	—	—	—	—
Stuttgart	Z. 90.0	319	e 13 1	- 2	—	—	—	—
Zürich	90.4	318	e 13 20	+16	e 14 36	?	—	—
Tamanrasset	Z. 93.2	292	e 13 17	0	—	—	—	—
Kew	96.0	322	e 14 23?	+53	—	—	—	—
College	100.1	23	e 17 55	PP	—	—	—	e 57.7
Hungry Horse	124.4	25	e 18 58	[- 3]	—	—	—	—
Overton	Z. 132.7	36	e 19 22	[+ 5]	—	—	i 22 43	PKS
Pierce Ferry	133.2	36	e 19 24	[+ 6]	—	—	—	—
Tucson	137.7	39	e 19 28	[+ 2]	—	—	—	—

Additional readings :—

Prague e = 15m.39s., 15m.48s., 15m.52s., 16m.8s., 16m.18s., and 16m.38s.

Potsdam eE = 17m.17s.

Tamanrasset iZ = 13m.24s., eZ = 15m.21s.

Tucson e = 19m.45s.

Long waves were also recorded at Nanking and Granada.

Sept. 5d. 19h. 19m. 55s. Epicentre  $33^{\circ}9N$ .  $116^{\circ}7W$ . (as on 1944, Oct. 28d.).

Intensity VI at Banning, Beaumont, and Elsinore; V at San Bernardino; IV at Riverside.  
Epicentre  $33^{\circ}39'N$ .  $116^{\circ}45'W$ . Macroseismic area 27,500 sq.km.

L. M. Murphy and F. P. Ulrich.

United States Earthquakes, 1950, serial No. 755, Washington, 1952, p.12.

A = -0.3737, B = -0.7431, C = +0.5552;  $\delta = +10$ ;  $h = +1$ ;  
D = -0.893, E = +0.449; G = -0.249, H = -0.496, K = -0.832.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Riverside	0.5	280	i 0 14 <sub>a</sub>	0	i 0 22	- 1	—	—
Palomar	0.6	194	i 0 9 <sub>k</sub>	- 6	—	—	—	—
La Jolla	1.1	204	i 0 18 <sub>k</sub>	- 4	i 0 30	- 9	—	—
Pasadena	1.3	282	i 0 25 <sub>a</sub>	0	i 0 41	- 3	—	—
Boulder City	2.6	36	i 0 47	+ 3	i 1 24	+ 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.
Pierce Ferry		3.1	45	i 0 53	+ 2	i 1 46	S <sub>g</sub>	—	—
Overton	z.	3.2	35	i 0 55	+ 3	i 1 35	S <sub>g</sub>	—	—
Fresno		3.8	319	e 0 53	- 8	i 1 57	S <sub>g</sub> *	—	—
Tucson		5.2	107	e 1 20	- 1	e 2 26	+ 4	i 1 41	P <sub>g</sub> *
Lick		5.3	312	i 1 22	0	e 2 54	S <sub>g</sub>	i 1 38	P <sub>g</sub> *
Berkeley		6.0	312	i 1 32 <sub>k</sub>	0	e 2 4	P <sub>g</sub>	i 1 39	P*
Reno		6.2	337	e 1 41 <sub>a</sub>	+ 6	e 2 26	-22	e 3 27	S <sub>g</sub>
Mineral	z.	7.5	330	e 1 58	+ 5	—	—	—	—
Shasta Dam		8.2	328	e 2 23	P*	—	—	—	i 4.3
Hungry Horse		14.6	7	e 3 34	+ 4	—	—	—	e 8.1
Tamanrasset	z.	101.3	53	e 18 4	PP	—	—	e 20 1	PPP

Additional readings :—

Boulder City i = 52s. and 1m.33s.

Fresno i = 1m.15s.

Tucson i = 1m.49s., iS = 2m.43s.

Lick eN = 1m.58s. and 2m.10s.

Hungry Horse i = 3m.38s.

Tamanrasset P?Z = 15m.53s.

Long waves were also recorded at Seattle.

Sept. 5d. 20h. 18m. 14s. Epicentre 29°·3N. 92°·0E.

A = -·0305, B = +·8729, C = +·4869;  $\delta = -4$ ;  $h = +2$ ;  
D = +·999, E = +·035; G = -·017, H = +·487, K = -·873.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Calcutta	E.	7.5	207	e 3 19	S	(e 3 19)	- 1	—	—
New Delhi		13.0	270	e 3 7	- 2	e 5 23	-12	3 26	PPP
Murgab		17.5	307	4 3	- 4	7 13	- 8	—	—
Naryn		17.8	321	e 4 12	+ 1	e 7 28	0	—	—
Almata		18.5	325	i 4 18	- 1	e 7 48	+ 4	—	—
Frunse		19.5	320	—	—	e 8 16	+10	—	—
Andijan		19.7	311	e 4 38	+ 4	8 17	+ 7	—	—
Poona	E.	19.7	241	e 4 33	- 1	e 8 19	+ 9	—	—
Fergana		19.9	311	e 4 35	- 1	—	—	—	—
Bombay		20.3	244	i 4 45	+ 5	e 8 37	+14	—	—
Garm		20.4	305	—	—	e 8 25	0	—	—
Kulyab		20.4	302	e 4 39	- 2	e 8 21	- 4	—	—
Obi-garm		20.7	305	i 4 44	0	—	—	—	—
Stalinabad		21.3	304	4 53	+ 3	i 8 41	- 2	—	—
Tashkent		22.0	310	i 4 57	- 1	e 9 0	+ 4	—	—
Tchimkent		22.2	313	e 5 0	0	—	—	—	—
Samarkand		23.0	304	e 5 7	0	—	—	—	—
Irkutsk		24.7	18	e 5 24	0	e 9 47	+ 3	—	—
Sverdlovsk		35.2	331	e 6 55	- 3	—	—	—	—
Ksara		47.5	291	e 10 50	PP	e 18 6	SS	—	—
Tamanrasset	z.	76.3	289	e 11 50	- 2	—	—	—	—

Additional readings :—

Calcutta iSE = 4m.23s., iS\*E = 4m.42s., iS<sub>g</sub>E = 4m.54s.

New Delhi SSN = 5m.34s., SSSN = 5m.41s.

Sept. 5d. Readings also at 1h. (near Andijan), 2h. (Tamanrasset, Arapuni, Christchurch, Kaimata, near Cobb River, New Plymouth, Tuai, Wellington, near Garm, and near Athens), 3h. (Brisbane), 4h. (College, near Rocca di Papa (8), and Rome (4)), 5h. (Alicante, Tamanrasset, Collmberg, Potsdam, Prague, Stuttgart, Pavia, Florence Xim., Padova (2), Bologna (2), Trieste (2), near Rocca di Papa (2), and Rome), 6h. (Rocca di Papa and Rome), 8h. (Tamanrasset, Ksara, Collmberg, Stuttgart, Prague, Zürich, Padova (2), Pavia, near Bologna (2), Florence Xim., Rocca di Papa (2), Rome (2), and near Garm), 9h. (Brisbane, Hungry Horse, and near College), 10h. (Overton), 11h. (Rocca di Papa and near Rome), 13h. (Bologna, Padova, Stuttgart, near Rocca di Papa (2), Rome, near Andijan, Fergana, Garm, Obi-garm, Samarkand, and Stalinabad), 14h. (Rocca di Papa and Stuttgart), 15h. (College), 16h. (Overton, Pierce Ferry, Stuttgart, near Garm, Obi-garm, and near Granada), 17h. (Brisbane, Almata, Frunse, Kulyab, Mary, Naryn, Obi-garm, Samarkand, Tchimkent, Kizyl-Arvat, near Andijan, Fergana, Garm, Murgab, Stalinabad, and Tashkent), 18h. (Tamanrasset), 19h. and 22h. (near Garm).



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Sept. 6d. 7h. 37m. 8s. Epicentre 30°·2N. 70°·0E. (as on 1948, June 10d.).

A = +·2961, B = +·8135, C = +·5005;  $\delta$  = -4; h = +2;  
D = +·940, E = -·342; G = +·171, H = +·470, K = -·866.

		$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.
		°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.
New Delhi	N.	6·5	102	e 1	35	- 4	2	57	+ 2	1	39	2·6
Dehra Dun	N.	7·0	87	e -0	8	?	e 3	22	+14	—	—	—
Kulyab		7·7	359	e 2	5	+ 9	e 3	47	S*	—	—	—
Stalinabad		8·4	353	i 2	13	+ 7	—	—	—	—	—	—
Obi-garm		8·5	358	e 2	17	+10	—	—	—	—	—	—
Garm		8·8	1	e 2	17	+ 6	—	—	—	—	—	—
Murgab		8·8	21	e 2	4	- 7	—	—	—	—	—	—
Samarkand		9·8	346	e 2	26	+ 2	—	—	—	—	—	—
Fergana		10·3	8	e 2	38	+ 6	e 4	44	+14	—	—	—
Andijan		10·7	10	e 2	45	+ 7	e 4	56	+17	—	—	—
Tashkent		11·1	357	—	—	—	e 5	16	+27	—	—	—
Poona		12·1	162	2	51	- 6	—	—	—	—	—	6·7
Tchimkent		12·1	359	i 3	2	+ 5	—	—	—	—	—	—
Ashkabad		12·3	311	e 3	5	+ 6	—	—	—	—	—	—
Frunse		13·2	15	e 3	16	+ 5	e 5	53	+13	—	—	—
Almata		14·2	21	e 3	27	+ 3	—	—	—	—	—	—
Kizyl-Arvat		14·3	312	e 3	41	PP	—	—	—	—	—	—
Tamanrasset	z.	57·5	280	e 9	50	- 3	—	—	—	—	—	—
College		80·8	15	e 12	17	0	—	—	—	—	—	—
Shasta Dam		108·5	10	e 10	28	?	—	—	—	—	—	—

New Delhi gives also PPPN = 1m.46s., eSN = 2m.42s., SSSN = 3m.5s. True P is given as PP and S as SS.

Long waves were also recorded at Hyderabad.

Sept. 6d. Readings also at 0h. (Tamanrasset and near Lisbon), 1h. (near Huancayo, near Garm, near Ashkabad, and near Algiers Univ.), 2h. (Huancayo, Tiflis, near Frunse, and near Leninakan), 4h. (College, Hungry Horse, and Tucson), 5h. (College), 6h. (La Paz, College, and Hungry Horse), 7h. (Bombay, Leninakan, near Grozny, Mary, Kizyl-Arvat, Samarkand, Frunse, Almata, Tashkent, near Murgab, Kulyab, Garm, Obi-garm, Fergana, Stalinabad, Andijan, Naryn, Tchimkent, and near Granada), 8h. (Tamanrasset), 11h. (near Garm), 13h. (near Huancayo), 14h. and 16h. (Tucson), 18h. (near Ashkabad), 19h. (College, Shasta Dam, Mineral, Pasadena, Riverside, Tinemaha, Boulder City, Overton, Pierce Ferry, Tucson, and Logan), 20h. (Apia and Ashkabad), 21h. (Hungry Horse), 22h. (Collmberg and near Kizyl-Arvat), 23h. (Pretoria, Garm, Kulyab, Fergana, near Obi-garm, and Stalinabad).

Sept. 7d. 14h. 58m. 55s. Epicentre 32°·5S. 179°·0W. Depth of focus 0·005.  
(as on 1949, Oct. 11d.).

A = -·8449, B = -·0147, C = -·5347;  $\delta$  = -2; h = +1;  
D = -·017, E = +1·000; G = +·535, H = +·009, K = -·845.

		$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.
		°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.
Auckland	N.	6·7	228	e 1	45	+ 7	i 3	15	+21	—	—	—
Tuai	N.	7·0	205	i 1	43	+ 1	i 2	56	- 5	—	—	—
Arapuni		7·1	216	e 1	52	+ 8	—	—	—	e 2	24	?
New Plymouth	E.	8·6	219	i 2	5	+ 1	e 4	3	+22	—	—	—
Wellington		10·1	208	e 2	16	- 9	e 4	2	-15	—	—	—
Cobb River	E.	10·8	215	e 2	37	+ 3	i 4	24	-10	—	—	—
Kaimata	N.E.	12·5	214	e 2	52	- 5	5	0	-15	—	—	—
Christchurch		12·9	209	e 2	54	- 8	e 5	7	-18	—	—	—
Brisbane		24·7	276	i 5	18	+ 2	—	—	—	e 5	33	pP
Riverview		25·0	259	i 5	37k	+18	i 9	53	+17	i 5	47	pP
Pasadena	z.	87·5	47	i 12	42	0	—	—	—	i 12	45	P <sub>c</sub> P
Berkeley	z.	87·7	42	i 12	46 <sub>a</sub>	+ 3	—	—	—	—	—	—
Lick	z.	87·7	42	e 12	43	0	—	—	—	e 13	5	pP
Vladivostok		87·7	327	e 13	0	pP	e 22	56	[- 7]	—	—	—
Palomar		87·8	48	i 12	44	+ 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.	
Fresno	z.	88.3	44	e 12 44 <sub>a</sub>	- 2	—	—	e 13 8	pP	—
Haiwee	z.	89.0	45	e 12 48	- 1	—	—	e 13 10	pP	—
Tinemaha		89.5	44	e 12 51	0	—	—	e 13 13	pP	—
Shasta Dam		89.6	39	e 12 51	- 1	—	—	—	—	—
Boulder City		90.8	46	i 12 58	+ 1	—	—	—	—	—
Tucson		91.0	51	i 12 59	+ 1	—	—	i 13 2	P <sub>c</sub> P	—
Overton	z.	91.4	46	i 13 1	+ 1	—	—	—	—	—
Pierce Ferry		91.4	47	i 13 1	+ 1	—	—	—	—	—
Hungry Horse		99.2	37	e 13 26	-10	—	—	—	—	—
College		100.1	12	e 13 35	- 5	—	—	—	—	e 43.3
Resolute Bay	z.	119.5	17	e 18 44	[+ 2]	—	—	—	—	—
Ksara		150.8	281	e 20 3	PKP <sub>2</sub>	—	—	23 47?	PP	—
Collmberg	z.	159.2	338	e 20 28	PKP <sub>2</sub>	—	—	—	—	—
Stuttgart	z.	162.6	341	e 20 42	PKP <sub>2</sub>	—	—	—	—	—
Tamanrasset	z.	169.5	—	e 20 1	[+ 1]	—	—	e 20 33	pPKP	—

Additional readings :—

Riverview iZ = 6m.7s., iPPPZ = 6m.25s., iN = 10m.25s., SSN = 10m.49s.

Tinemaha iZ = 12m.55s.

Hungry Horse e = 13m.35s. and 13m.40s.

Sept. 7d. Readings also at 0h. (Brisbane, College, Hungry Horse, Shasta Dam, Lick, Pasadena, Riverside, Tinemaha, Boulder City, Overton, and Tucson), 1h. (Apia), 2h. (College, Hungry Horse, Shasta Dam, Lick, Mount Wilson, Tinemaha, Pierce Ferry, Tucson, Collmberg, and Stuttgart), 3h. (Collmberg (2)), 5h. (Przhevalsk, Frunse, Andijan, Fergana, Kulyab, Obi-garm, Stalinabad, Tashkent, Tchimkent, Samarkand, Stuttgart, College, and Tamanrasset), 8h. (La Paz, Ashkabad, Mary, Samarkand, Tchimkent, near Fergana, Kulyab, Stalinabad, Obi-garm, Garm, Murgab, and Andijan), 10h. (Bogeta, Chinchina, Tucson, Pierce Ferry, Overton, Mineral, and near La Paz), 14h. (near Apia), 15h. (Brisbane, College, Pasadena, Mount Wilson, Tinemaha, Overton, Pierce Ferry, Tucson, and Collmberg), 17h. (near Ottawa), 18h. (Tamanrasset, near Garm, and Obi-garm), 20h. (near Rome and Rocca di Papa, near Kizyl-Arvat, near Erevan, and Tiflis), 21h. (Huancayo), 23h. (Overton and Pierce Ferry.).

Sept. 8d. 6h. 58m. 24s. Epicentre 21°·0S. 178°·0W. Depth of focus 0·080.  
(as on 1944, April 23d.).

A = -·9338, B = -·0326, C = -·3563 ;  $\delta = -1$  ;  $h = +4$  ;  
D = -·035, E = +·999 ; G = +·356, H = +·012, K = -·934.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Apia		9.3	41	e 2 14	+ 3	3 56	0	—	—
Arapuni		17.9	197	e 3 36	- 1	e 6 30	- 3	—	—
Cobb River	E.	21.5	200	e 4 9	- 2	e 7 26	- 7	—	—
Kaimata	N.E.	23.2	200	e 4 25	- 1	e 7 55	- 5	—	—
Brisbane	z.	27.2	251	i 5 1k	- 1	—	—	i 6 18	PP
Lick	z.	78.6	43	e 11 16k	+ 9	—	—	—	—
Berkeley	z.	78.7	43	i 11 16k	+ 9	—	—	—	—
Vladivostok		78.7	326	e 11 14	+ 7	e 20 41	+21	—	—
Pasadena	z.	79.0	48	i 11 17	+ 8	—	—	e 13 3	pP
Fresno	z.	79.5	45	e 11 20k	+ 8	—	—	—	—
Palomar	z.	79.5	49	i 11 21	+ 9	—	—	—	—
Riverside	z.	79.5	48	i 11 19	+ 7	—	—	—	—
Shasta Dam		80.2	40	i 11 25	+10	—	—	—	—
Haiwee	z.	80.3	46	i 11 25	+ 9	—	—	—	—
Mineral	z.	80.5	40	e 11 26	+ 9	—	—	—	—
Tinemaha	z.	80.6	46	i 11 27	+10	—	—	—	—
Reno		81.1	42	e 11 29k	+ 9	—	—	—	—
Boulder City		82.3	47	e 11 35	+ 9	—	—	e 13 23	pP
Overton	z.	82.9	47	i 11 38	+ 9	—	—	i 13 23	pP
Pierce Ferry		83.0	47	i 11 39	+10	—	—	e 13 24	pP
Tucson		83.2	52	i 11 40	+10	—	—	e 13 25	pP
Victoria		84.9	34	e 11 46	+ 7	—	—	—	—
Logan		87.4	43	e 11 58	+ 7	—	—	e 13 46	pP
College		88.7	13	i 12 3	+ 6	e 22 3	+ 6	e 13 50	pP
Hungry Horse		89.5	36	e 12 4	+ 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.
Ksara	147.5	300	e 19 30?	[+50]	e 29 10	PS	—	—
Collmberg	z. 148.5	347	e 18 54	[+13]	—	—	e 22 26	PP
Stuttgart	z. 151.7	349	e 18 54	[+ 8]	—	—	e 20 54	pPKP
Tamanrasset	z. 176.3	—	i 19 17 <sub>a</sub>	[+10]	i 21 1	PKP <sub>a</sub>	e 21 35	pPKP

Additional readings :—

Mineral eZ = 11m.36s.

Overton iZ = 12m.29s., epPP = 16m.30s.

College e = 15m.12s.

Hungry Horse e = 12m.7s.

Collmberg eZ = 18m.59s., 20m.48s., 20m.56s., and 21m.14s.

Stuttgart eZ = 19m.1s.

Tamanrasset epPKP<sub>a</sub>Z = 22m.36s., ePPZ = 24m.53s.

Sept. 8d. 7h. 15m. 2s. Epicentre 15°·5N. 96°·7W. (as on 1946, Sept. 2d.).

A = -·1125, B = -·9575, C = +·2656;  $\delta = +1$ ;  $h = +6$ ;  
D = -·993, E = +·117; G = -·030, H = -·264, K = -·964.

	$\Delta$ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	Supp. m. s.	L. m.
Oaxaca	1.5	358	0 26	- 2	—	—	—	1.6
Vera Cruz	3.7	8	1 0	0	—	—	e 1 30	1.7
Puebla	3.8	337	1 5	+ 4	—	—	—	1.9
Tacubaya	4.5	329	1 14	+ 3	—	—	—	2.2
Merida	8.6	50	2 8	- 1	3 46	- 2	—	—
Tucson	21.1	326	i 4 47	- 1	—	—	—	e 11.4
Palomar	25.5	319	i 5 32	0	—	—	—	—
Pierce Ferry	25.7	327	i 5 33	0	—	—	—	—
Boulder City	26.0	326	e 5 37	+ 1	—	—	—	—
Overton	z. 26.2	327	i 5 39	+ 1	—	—	—	—
Riverside	z. 26.2	319	i 5 38	0	—	—	—	—
Pasadena	z. 26.8	319	e 5 33	-11	—	—	—	—
Haiwee	z. 28.0	322	e 5 55	0	—	—	—	—
Tinemaha	z. 28.8	323	i 5 55	- 7	—	—	—	—
Ottawa	z. 34.6	26	i 6 46 <sub>a</sub>	- 7	—	—	—	—
Hungry Horse	35.7	341	e 6 58	- 4	—	—	—	—
College	60.1	338	e 10 8	- 3	—	—	—	—

Pasadena gives also eZ = 5m.44s.

Sept. 8d. 15h. 26m. 6s. Epicentre 25°·9N. 96°·8E. (as on 1950, Aug. 17d.).

A = -·1066, B = +·8944, C = +·4344;  $\delta = +2$ ;  $h = +3$ ;  
D = +·993, E = +·118; G = -·051, H = +·431, K = -·901.

	$\Delta$ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	Supp. m. s.	L. m.
Murgab	22.9	308	5 3	- 3	9 3	-10	—	—
Naryn	23.1	317	e 5 6	- 2	e 9 6	-10	—	—
Almata	23.7	322	i 5 12	- 2	—	—	—	—
Frunse	24.8	317	e 5 24	- 1	—	—	—	—
Andijan	25.1	310	e 5 28	0	e 9 49	- 2	—	—
Fergana	25.3	310	e 5 29	- 1	—	—	—	—
Garm	25.8	307	e 5 37	+ 3	—	—	—	—
Kulyab	25.8	304	e 5 39	+ 5	10 4	+ 2	—	—
Stalinabad	26.8	306	i 5 44	0	—	—	—	—
Tashkent	27.4	310	e 5 50	+ 1	—	—	—	—
Tchimkent	27.7	313	i 5 52	0	—	—	—	—
Samarkand	28.4	304	e 6 2	+ 4	—	—	—	—
Ksara	52.8	293	e 9 34	+15	—	—	12 10	PP
Collmberg	z. 66.5	316	e 10 59?	+ 5	—	—	—	—
Stuttgart	z. 69.5	315	e 11 18	+ 6	—	—	—	—
College	76.8	23	e 12 7	+12	—	—	—	—
Tamanrasset	z. 81.4	291	12 35 <sub>k</sub>	+15	—	—	e 15 34	PP

Tamanrasset gives eZ = 12m.44s.

Long waves were recorded at Bombay and Calcutta.

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Sept. 8d. Readings also at 0h. (College), 2h. (near Istanbul), 3h. (Hungry Horse, near Tacubaya, and near Resolute Bay), 5h. (near Garm (2)), 6h. (College), 8h. (Ksara), 10h. (Tucson, near Boulder City, Overton (2), and Pierce Ferry), 11h. (Helwan, Ksara, and Tamanrasset (2)), 14h. (La Paz, Potsdam, Tamanrasset (3), Andijan, Fergana, Murgab, Naryn, Samarkand, Stalinabad, Sverdlovsk, and near Irkutsk), 16h. (Hungry Horse and near College), 17h. (Calcutta, Przhevalsk, Tashkent, Tchimkent, near Almata, Frunse, Murgab, and Naryn), 19h. (Tucson, Boulder City, Overton, Pierce Ferry, Hungry Horse, and College (2)), 21h. (Przhevalsk and near Andijan), 22h. (Nanking, Shasta Dam, College, and Huancayo).

Sept. 9d. 5h. 37m. 38s. Epicentre 27°·0S. 70°·6W. (as on 1947, Jan. 22d.).

Intensity V-VI between South latitudes 27°-28°. Suggested Epicentre 27°·5S. 71°W.

F Greve.

Boletín del Año, 1950 Instituto sismológico, Santiago, 1951, p.9.

A = +·2964, B = -·8415, C = -·4516;  $\delta$  = -8; h = +3;  
D = -·943, E = -·332; G = -·150, H = +·426, K = -·892.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
La Paz	10·7	13	i 2 36	- 2	i 4 50	+11	i 5 2 SS	5·5
La Plata	13·4	129	3 24	+10	5 40	- 5	3 52 PP	6·6
Huancayo	15·5	341	e 3 43	+ 1	i 6 52	+17	—	—
Bogota	31·6	354	i 6 26	0	e 13 52	SS	—	18·4
Weston	69·0	0	i 11 9	0	—	—	—	—
Harvard	69·2	0	i 11 10	0	—	—	—	—
Tucson	70·3	326	i 11 19	+ 2	—	—	—	—
Ottawa	z. 72·2	357	e 11 27	- 2	—	—	—	—
Palomar	N. 74·4	321	i 11 45	+ 3	—	—	—	—
Pierce Ferry	74·9	325	i 11 47	+ 3	—	—	—	—
Riverside	z. 75·1	321	i 11 48 <sub>a</sub>	+ 2	—	—	—	—
Boulder City	75·3	324	i 11 48	+ 1	—	—	—	—
Overton	z. 75·5	325	e 11 51	+ 3	—	—	—	e 33·0
Pasadena	z. 75·7	321	i 11 51 <sub>a</sub>	+ 2	—	—	—	—
Haiwee	z. 77·1	323	i 11 58	+ 1	—	—	—	—
Tinemaha	z. 77·9	323	i 12 4 <sub>a</sub>	+ 3	—	—	—	—
Logan	78·3	330	e 12 4	+ 1	—	—	—	—
Fresno	z. 78·5	323	e 12 5	+ 1	—	—	—	—
Lick	z. 80·0	322	e 12 16 <sub>a</sub>	+ 3	—	—	—	—
Berkeley	z. 80·7	322	e 12 19 <sub>a</sub>	+ 3	—	—	—	—
Shasta Dam	82·8	323	i 12 27	0	—	—	—	—
Hungry Horse	84·5	333	i 12 38	+ 2	—	—	—	—
Tamanrasset	z. 88·6	63	13 0 <sub>a</sub>	+ 4	e 18 24	PPP	e 16 28 PP	—
Stuttgart	z. 103·5	42	—	—	e 24 32	[-12]	—	—
College	108·9	334	—	—	e 25 25	[+17]	—	—

Additional readings:—

La Plata P?EN = 3m.27s., E = 3m.57s., N = 5m.8s., SE = 5m.52s., S?E = 5m.58s.

Huancayo i = 3m.48s.

Palomar eE = 12m.1s.

Riverside eZ = 11m.59s.

Shasta Dam e = 12m.37s.

Tamanrasset eZ = 13m.27s. and 14m.0s., iZ = 16m.50s.

Long waves were also recorded at Potsdam.

Sept 9d. 10h. 21m. 39s. Epicentre 4°·5S. 152°·7E. (as on 1942, Dec. 23d.).

A = -·8859, B = +·4573, C = -·0779;  $\delta$  = +1; h = +7  
D = +·459, E = +·889; G = +·069, H = -·036, K = -·997.

	$\Delta$	Az	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Brisbane	22·9	178	i 5 10 <sub>a</sub>	+ 4	e 9 23	+10	i 5 52 PP	—
Riverview	29·2	183	i 6 10 <sub>a</sub>	+ 5	i 11 7	+ 9	i 7 10 PP	e 14·4
Auckland	N. 38·2	150	e 7 31	+ 8	—	—	e 9 11 PP	e 18·4
Arapuni	39·4	152	e 7 41	+ 8	—	—	—	—
Cobb River	E. 40·6	157	e 7 48	+ 5	e 14 5	+11	—	—

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.
Tuani	N.	40.7	150	e 7 32	-12	e 13 21	-34	—	—
Mera		41.0	344	e 9 51	PP	—	—	—	—
Kaimata	N.E.	41.4	159	e 7 51	+ 1	e 14 11	+ 6	—	—
Miyazaki		41.5	333	i 7 46	- 4	e 13 47	-20	—	—
Wellington		41.6	155	i 7 55	+ 4	e 14 13	+ 5	e 17 25	SS
Tokyo		41.8	344	e 8 0	+ 7	e 14 26	+15	e 9 41	PP
Koti		42.0	336	e 8 37	+43	e 14 1	-13	e 10 3	PP
Kumagaya		42.3	344	e 8 49	+52	—	—	—	—
Matuyama		42.5	336	e 7 56	- 3	—	—	—	e 17.8
Maebasi		42.6	344	e 7 59	0	—	—	—	—
Christchurch		42.7	159	i 8 8	+ 8	14 30	+ 6	e 10 11	PP
Matusiro		43.0	344	8 4	+ 1	14 13	-16	—	—
Hukuoka		43.4	333	8 0 <sub>a</sub>	- 6	e 14 21	-14	—	—
Toyama		43.5	342	e 8 5	- 2	—	—	e 9 50	PP
Sendai		43.9	348	e 8 3	- 7	e 15 7	+25	e 18 53	SSS
Perth		44.0	227	—	—	14 53	+10	17 46	SS
Aomori		46.4	348	8 28	- 2	—	—	—	—
Zi-ka-wei	Z.	46.4	323	8 26	- 4	e 15 15	- 3	—	—
Sapporo		48.4	350	e 8 38	- 8	e 15 36	-10	—	—
Nanking		48.6	321	i 8 43	- 4	i 15 44	- 5	10 11	P <sub>c</sub> P
Vladivostok		51.0	341	i 9 0	- 6	e 16 20	- 2	—	—
Honolulu		54.8	60	e 9 52	+18	e 17 37	+23	e 11 50	PP
Irkutsk		69.8	331	11 9	- 5	20 19?	- 4	—	—
Kodaikanal	E.	76.3	281	e 13 21	?	—	—	—	—
Hyderabad	E.	76.4	289	e 11 56	+ 3	e 21 39	+ 1	—	—
Poona	E.	80.9	289	i 14 51	PP	i 21 31	-55	—	—
Przhevalsk		81.5	315	e 12 18	- 3	—	—	—	—
College		81.6	22	e 12 18	- 3	i 22 28	- 5	e 15 22	PP
Bombay		81.9	289	e 11 21?	-62	—	—	—	—
Almata		82.8	315	e 12 30	+ 3	e 22 48	+ 3	—	—
Naryn		83.0	313	e 12 26	- 2	—	—	—	—
Murgab		84.0	309	12 32	- 1	22 52	- 5	—	—
Sitka		84.1	32	e 12 31	- 3	e 22 51	- 7	e 16 1	PP
Frunse		84.4	313	e 12 33	- 3	e 22 59	- 2	—	—
Andijan		85.6	311	12 41	0	23 10	- 3	—	—
Fergana		86.0	311	e 12 42	- 1	—	—	—	—
Kulyab		87.2	308	e 12 44	- 5	e 23 17	[+ 2]	—	—
Tchimkent		87.9	312	i 12 50	- 3	—	—	—	—
Stalinabad		88.0	309	i 12 51	- 2	i 23 31	- 5	—	—
Tashkent		88.0	311	i 12 51	- 2	i 23 33	- 3	—	—
Ukiah		88.2	51	e 16 2	PP	e 24 2	+24	e 29 26	SS
Berkeley		88.8	52	e 13 22 <sub>a</sub>	+25	e 23 27	[+ 2]	—	—
Santa Clara		89.0	52	e 13 37	+39	—	—	e 25 27	PPS
Shasta Dam		89.0	49	e 12 56	- 2	—	—	—	—
Lick	Z.	89.3	52	e 12 54 <sub>a</sub>	- 5	—	—	e 16 29	PP
Samarkand		89.5	309	e 13 4	+ 4	—	—	—	—
Mineral	Z.	89.6	49	e 12 59	- 2	—	—	—	—
Victoria		89.8	41	e 11 57	-65	e 24 3	+10	—	—
Seattle		89.9	42	i 14 13	+71	e 23 54	0	e 17 7	PP
Fresno	Z.	90.7	53	—	—	e 28 5	?	—	—
Pasadena		91.8	56	e 13 9	- 2	e 24 41	+30	i 16 49	PP
Tinemaha	Z.	91.8	53	e 13 11	0	—	—	—	—
Riverside	Z.	92.4	56	e 13 12	- 2	—	—	—	—
Palomar	N.	92.8	57	e 13 23	+ 7	—	—	—	—
Boulder City		94.6	54	e 13 22	- 2	—	—	—	—
Overton	Z.	94.9	53	e 13 25	0	—	—	—	—
Sverdlovsk		94.9	326	i 13 22	- 3	24 32	- 5	—	—
Pierce Ferry		95.3	54	e 13 26	- 1	—	—	—	—
Hungry Horse		95.5	42	e 13 16	-12	—	—	—	—
Butte	N.	96.5	43	—	—	e 24 10	[+ 1]	e 30 31	SS

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.
Salt Lake City	97.0	49	—	—	—	e 24	43	-12	e 31	31	SS e 43.8
Logan	97.1	48	e 14	2	+27	e 26	4	PS	e 18	3	PP e 45.7
Bozeman	97.6	44	e 14	1	+23	e 24	16	[+ 1]	e 25	30	S e 40.3
Tucson	97.8	58	e 13	49	+11	e 25	28	+26	e 17	41	PP e 40.6
Kizyl-Arvat	97.8	309	e 13	44	+ 6	—	—	—	—	—	—
Resolute Bay	E. 100.1	14	e 19	12	PPP	e 25	4	{+ 9}	(e 33	9)	SSP e 33.2
Saskatoon	100.1	38	—	—	—	e 25	36	+15	—	—	—
Baku	102.3	310	e 18	8	PP	—	—	—	—	—	—
Tiflis	106.3	312	i 18	40	PP	e 28	13?	PS	—	—	—
Moscow	107.7	327	e 18	55	PP	e 28	4	PS	—	—	—
Lincoln	E. 108.5	47	—	—	—	e 31	25	?	—	—	e 52.0
Yalta	113.3	317	e 19	39	PP	e 29	4	PS	—	—	—
St. Louis	113.8	49	e 19	27	PP	e 25	46	[+19]	—	—	—
Ksara	114.7	304	e 15	0	P	29	35	PS	19	43	PP
Chicago	114.8	45	—	—	—	e 29	28	PS	e 35	25	SS e 48.4
Upsala	115.1	337	—	—	—	e 35	32	SS	—	—	e 50.4
Istanbul	117.9	314	e 18	43	[- 6]	e 24	57	[-46]	—	—	—
Cleveland	E. 119.3	44	—	—	—	e 27	18	{+ 9}	e 36	30	SS
Helwan	N. 119.3	301	—	—	—	e 36	33	SS	—	—	—
Skalnate Pleso	120.0	326	e 20	15	PP	e 27	5	{- 9}	e 36	51	SS
Ottawa	121.4	37	e 18	55	[ 0]	e 31	38	PPS	e 36	33	SS
Potsdam	121.8	332	e 20	23	?	e 27	9	{-17}	e 20	45	PP e 58.4
Belgrade	122.1	322	—	—	—	e 28	58	?	e 36	54	SS e 64.9
Pennsylvania	122.1	43	e 21	12	PKS	e 25	55	[- 2]	e 37	8	SS
Collmberg	122.5	331	e 19	0	[+ 2]	e 37	33	SS	20	41	PP e 58.4
Prague	122.6	329	e 20	32	PP	e 25	51	[- 8]	e 23	36	PPP e 50.4
Seven Falls	E. 123.4	33	—	—	—	e 37	27	SS	—	—	—
Vermont	123.4	37	—	—	—	e 30	36	PS	e 36	26	SS e 49.7
Jena	123.5	330	e 19	6	[+ 6]	e 26	32?	[+31]	e 20	47	PP
Aberdeen	123.8	343	—	—	—	e 39	51	P'P'	i 43	13	SSS e 57.7
Philadelphia	124.3	43	—	—	—	e 37	55	SS	—	—	e 51.5
Palisades	124.7	41	e 18	59	[- 3]	—	—	—	e 52	33	Q e 59.2
De Bilt	125.5	336	e 20	57	PP	e 30	45	PS	e 32	56	PPS e 52.4
Harvard	125.5	38	e 19	8	[+ 5]	e 25	47	[-20]	e 31	29	PS e 59.0
Weston	125.7	38	i 19	5	[+ 1]	—	—	—	42	37	SSS
Triest	125.7	326	e 20	30	PP	e 25	48	[-20]	e 23	24	PPP e 57.4
Stuttgart	126.1	330	e 19	5	[+ 1]	e 26	41	[+32]	e 21	1	PP 67.4
Strasbourg	126.9	331	e 19	6	[ 0]	e 22	25	PKS	e 20	45	PP 58.4
Kew	128.1	338	e 19	1	[- 7]	e 35	6	?	e 21	30	PP e 53.4
Florence Xim	128.2	325	—	—	—	e 42	38	SSS	—	—	—
Rathfarnham Castle	128.4	344	e 19	29?	[+20]	e 27	44	{-25}	e 22	54	PKS
Rome	128.6	321	e 19	16	[+ 7]	e 42	46	SSS	e 21	15	PP e 56.4
Paris	129.1	334	e 19	15	[+ 5]	e 26	13	[- 5]	e 21	25	PP e 64.4
Huancayo	129.5	109	e 19	16	[+ 5]	e 26	32	[+13]	i 22	41	PKS e 54.6
Chinchina	131.9	85	e 19	40	[+24]	e 22	44	PKS	—	—	—
Bogota	133.4	87	e 19	23	[+ 5]	e 25	50	[-38]	e 22	57	PKS 64.4
La Paz	134.6	118	19	26	[+ 5]	28	33	[-16]	i 22	57	PKS 68.8
Bermuda	135.3	47	—	—	—	e 40	36	SS	—	—	e 57.6
Tortosa	E. 136.1	329	e 23	8	PKS	26	41	[+ 8]	24	49	PPP e 62.4
Toledo	Z. 139.0	332	e 19	27	[- 2]	—	—	—	e 22	18	PP
San Juan	139.6	66	e 19	29	[- 1]	42	39	SS	e 23	6	PP e 58.4
Granada	140.9	329	22	41 <sub>a</sub>	PP	29	35	PKKP	33	17	PS i 79.0
Malaga	Z. 141.6	330	i 19	36 <sub>k</sub>	[+ 3]	25	50	PPP	23	2	PP 83.0
Tamanrasset	Z. 143.4	303	e 19	35	[- 1]	e 25	50	PPP	e 22	52	PP
Fort de France	145.2	71	e 20	42	PKP <sub>a</sub>	—	—	—	—	—	—

Additional readings :—

Brisbane ePE = 5m.15s., iSZ = 9m.27s.

Riverview iNZ = 6m.50s., iPPPZ = 7m.25s., iZ = 8m.2s., iE = 11m.13s., iSSE = 12m.44s., iE = 13m.17s.

Tokyo e = 8m.12s., PPP? = 11m.11s., S = 15m.22s., SS? = 18m.40s.

Koti e = 10m.38s. and 17m.24s.

Christchurch eP<sub>c</sub>P?N = 14m.5s., eSSNZ = 17m.46s., QEN = 18m.1s.

Perth SSS = 18m.46s.

Nanking P<sub>c</sub>S? = 13m.47s., SS? = 18m.35s.

Continued on next page.

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College e = 17m.6s., eSS = 28m.5s., eSKP,PKP = 42m.52s.  
 Sitka iS<sub>c</sub>S = 13m.17s., e = 27m.51s.  
 Ukiab e = 17m.56s.  
 Berkeley eZ = 14m.36s., eN = 36m.39s.?, and 39m.39s.  
 Shasta Dam i = 13m.18s.  
 Lick eZ = 14m.35s.  
 Seattle ePPP = 18m.58s., eS = 24m.25s., ePPS = 26m.2s., eSS = 30m.45s., and numerous other e readings.  
 Fresno eZ = 28m.30s. and 31m.40s.  
 Pasadena iZ = 13m.31s., eZ = 14m.36s., iZ = 17m.6s.  
 Riverside iZ = 13m.22s., eZ = 13m.35s.  
 Boulder City e = 13m.45s.  
 Pierce Ferry e = 13m.53s.  
 Logan e = 29m.51s.  
 Bozeman e = 29m.30s., eSS? = 33m.10s.  
 Tucson e = 14m.5s. and 19m.35s., ePS? = 26m.45s.  
 Skalnate Pleso e = 22m.52s.  
 Potsdam eE = 20m.27s., eN = 27m.15s., ePSZ = 30m.33s., ePSN = 30m.39s., eQN = 54.4m.  
 Pennsylvania eN = 28m.52s., eE = 31m.4s.  
 Collmberg eSSN = 41m.39s.  
 Prague eN = 21m.6s., e = 21m.45s., eSKKS = 27m.21s., e = 28m.21s., ePS = 30m.42s., ePPS = 31m.46s., e = 32m.54s., eSS = 37m.21s., eSSS = 42m.9s.  
 Vermont e = 41m.41s.  
 De Bilt eSS = 37m.51s.  
 Harvard eSS = 38m.17s.  
 Trieste eSKKS = 26m.57s., PPS = 31m.56s., eSS = 37m.10s.  
 Stuttgart ePKPZ = 19m.10s., eZ = 19m.41s., e = 21m.13s., 21m.48s., and 24m.51s., ePS = 31m.27s., eSS = 37m.45s., eSSS = 42m.39s., eQ = 59.4m.  
 Strasbourg ePS = 31m.28s., e = 33m.30s., eSS = 37m.53s., eSSS = 42m.31s.  
 Rathfarnham Castle eZ = 19m.57s., ePPP? = 26m.9s., eSKSP? = 31m.49s., eSS = 38m.21s.  
 Rome e = 33m.46s.?  
 Paris e = 19m.21s., 22m.15s., and 23m.11s., i = 23m.31s. and 29m.37s., ePS = 31m.29s., eSS = 38m.31s.  
 Huancayo e = 19m.42s. and 19m.59s., eSS = 38m.46s., e = 47m.53s.  
 Bogota ePPEN = 24m.46s., ePPSEN = 32m.24s.  
 La Paz SS = 40m.11s.  
 Granada SKSP = 35m.48s., PPS = 40m.14s., iSS = 44m.11s., Q = 68.0m.  
 Malaga iZ = 20m.42s.  
 Tamanrasset iZ = 19m.41s. and 23m.49s.  
 Long waves were also recorded at Apia, Galerazamba, Tananarive, Ivigtut, Scoresby Sund, Washington, Halifax, Columbia, and other European stations.

Sept. 9d. 14h. South Pacific shock.

Brisbane iPEZ = 31m.51s. a, iPPEZ = 32m.17s., iSE = 35m.22s., eSE = 35m.25s.?  
 Auckland eN = 32m.?  
 Cobb River eE = 32m.34s.  
 Riverview iS?EN = 36m.47s., iE = 37m.20s., iSS?N = 37m.33s., eLZ = 38.3m.  
 Wellington e = 39m.?  
 Berkeley ePZ = 40m.28s. a.  
 Lick 40m.30s. k.  
 Shasta Dam eP = 40m.33s.  
 Fresno 40m.35s. a.  
 Pasadena ePZ = 40m.35s.  
 Riverside ePZ = 40m.36s.  
 Palomar ePEN = 40m.39s.  
 Haiwee ePZ = 40m.41s.  
 Tinemaha ePZ = 40m.41s.  
 Boulder City eP? = 40m.45s.  
 College eP = 40m.49s.  
 Victoria eZ = 40m.51s.  
 Overton ePZ = 40m.52s.  
 Pierce Ferry iP = 40m.53s.  
 Tucson eP = 40m.56s.  
 Collmberg eZ = 47m.21s.  
 Athens ePKP = 47m.24s.  
 Prague ePKP = 47m.24s., eN = 47m.30s., e = 47m.40s., 48m.14s., and 48m.45s., eN = 48m.58s.  
 Jena ePKP?E = 47m.24s., ePKP?N = 47m.29s.?  
 Stuttgart ePKPZ = 47m.29s. and 47m.32s., eZ = 47m.45s.  
 Strasbourg iPKP = 47m.34s., e = 48m.17s.  
 Zürich ePKPZ = 47m.35s.  
 Basle ePKP = 47m.36s.  
 Paris iPKP = 47m.38s., e = 47m.56s.  
 Tamanrasset ePKPZ = 47m.53s., iPKP,Z = 48m.52s., ePPZ = 52m.35s.  
 Ksara e? = 50m.6s. and 53m.34s.  
 Long waves were recorded at Granada.

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Sept. 9d. Readings also at 0h. (College), 1h. (near Ashkabad), 2h. (College), 3h. (Ashkabad, Collmberg, near Prague, and near Garm), 4h. (near Garm), 5h. (Almata, Andijan, Fergana, Frunse, Kulyab, Murgab, Naryn, Samarkand, Tchimkent, and near Obi-garm), 6h. (Bombay, Poona, and Tamanrasset), 7h. (Boulder City, near Overton, Pierce Ferry, near La Paz, and near Garm), 9h. (Brisbane, College, and Tamanrasset), 10h. (near Apia), 12h. (Palomar, Pasadena, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Lick, Mineral, Shasta Dam, Hungry Horse, College, and near Apia), 13h. (Brisbane, Poona, Pretoria, and Collmberg), 14h. (Harvard, La Paz, near Garm, and Obi-garm), 15h. (near Garm (2)), 16h. (Fergana, Murgab, Samarkand, near Andijan, Garm, Kulyab, Obi-garm (2), and Stalinabad), 17h. (Berkeley and near Garm (2)), 18h. (near Overton), 19h. (Rome and College), 20h. (Rome and College), 21h. (near Pierce Ferry and Overton), 22h. (College (2) and near Garm), 23h. (College and near Garm (5)).

September 10d. 3h. 21m. 22s. Epicentre 35°·5N. 140°·4E. (as on 1947, August 13d.).

Intensity VI at Tyosi and Yokohama; V at Mera, Tokyo, Mito, Utunomiya, Tukubasan, Misima, Hunatu, Kohu, and Hatidojima; IV at Aijiro, Osima, Kumagaya, Titibu, Oiwake, Shizuoka, and Hukusima; II-III at Maebasi, Shirakawa, Inawasio, Iida, and Sendai.

Epicentre 35°·3N. 140°·5E. Depth 30-40km. Macro seismic radius >300km.

The Seismological Bulletin of the C.M.O., Japan, for the year 1950, Tokyo, 1952, pp. 41-42 with macro seismic chart.

$$A = -0.6287, B = +0.5201, C = +0.5781; \quad \delta = -3; \quad h = 0; \\ D = +0.637, E = +0.771; \quad G = -0.445, H = +0.368, K = -0.816.$$

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Tokyo	0.6	289	0 16 <sub>a</sub>	+ 1	0 27	+ 1	—	—
Mera	0.7	219	0 15 <sub>k</sub>	- 2	—	—	—	—
Yokohama	0.7	264	0 21	+ 4	0 27	- 1	—	—
Tukubasan	0.8	341	0 20	+ 2	0 29	- 2	—	—
Mito	0.9	3	0 20 <sub>k</sub>	0	0 29	- 5	—	—
Kumagaya	1.0	309	0 25 <sub>a</sub>	+ 4	0 43	+ 7	—	—
Osima	1.1	229	0 22 <sub>k</sub>	0	0 28	-11	—	—
Utunomiya	1.1	338	0 20 <sub>k</sub>	- 2	0 31	- 8	—	—
Misima	1.2	252	0 25	+ 1	0 40	- 1	—	—
Hunatu	1.3	270	0 27 <sub>k</sub>	+ 2	0 51	+ 7	—	—
Maebasi	1.3	313	0 29 <sub>a</sub>	+ 4	0 50	+ 6	—	—
Shizuoka	1.7	252	0 33 <sub>k</sub>	+ 2	0 55	+ 1	—	—
Omaesaki	2.0	243	0 37 <sub>k</sub>	+ 2	1 3	+ 1	—	—
Matusiro	2.1	301	0 40 <sub>a</sub>	+ 3	1 8	+ 4	—	—
Nagano	2.2	203	0 40	+ 2	1 13	S <sub>a</sub>	—	—
Hukusima	2.3	1	0 40 <sub>k</sub>	0	1 15	S <sub>a</sub>	—	—
Nagoya	2.8	263	0 50	+ 3	1 25	+ 3	—	—
Sendai	2.8	8	0 47 <sub>k</sub>	0	1 27	+ 5	—	—
Toyama	2.8	294	0 50 <sub>a</sub>	+ 3	1 37	S <sub>a</sub>	—	—
Gihu	3.0	268	1 13	+23	1 55	+28	—	—
Aikawa	3.1	325	0 51	0	1 34	+ 5	—	—
Kameyama	3.3	261	0 59	P*	1 53	S <sub>a</sub>	—	—
Tu	3.3	258	0 58	P*	1 54	S <sub>a</sub>	—	—
Hikone	3.4	269	0 58	+ 3	1 56	S <sub>a</sub>	—	—
Wazima	3.4	306	0 55	0	1 52	S <sub>a</sub>	—	—
Mizusawa	E. 3.7	8	1 1	+ 1	1 53	S*	—	—
Owase	3.8	249	1 0 <sub>k</sub>	- 1	1 58	S*	—	—
Kyoto	3.9	262	1 3	+ 1	2 2	S*	—	—
Osaka	4.1	260	1 8	+ 3	2 8	S*	—	—
Akita	4.2	356	1 10 <sub>k</sub>	+ 3	2 4?	S*	—	—
Morioka	4.2	6	1 7 <sub>k</sub>	0	2 7	S*	—	—
Miyako	4.3	16	1 8 <sub>k</sub>	0	2 4	+ 4	—	—
Kobe	4.4	259	1 10 <sub>k</sub>	0	2 12	S*	—	—
Toyooka	4.6	275	1 22	P*	2 22	S*	—	—
Sumoto	4.7	257	1 14 <sub>k</sub>	0	2 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.
Hatinohe	5.1	10	1 17 <sup>k</sup>	- 3	—	—	—	—
Aomori	5.3	3	1 26	+ 4	2 52	S <sub>g</sub>	—	—
Muroto	5.6	249	1 28	+ 1	2 39	+ 6	—	—
Koti	6.0	254	1 32	0	2 46	+ 3	—	—
Matuyama	6.5	258	1 40	+ 1	3 21	S*	—	—
Mori	6.6	1	1 48	+ 7	3 21	S*	—	—
Simidu	6.7	249	1 42	0	3 45	S <sub>g</sub>	—	—
Ooita	7.6	256	2 0	+ 5	3 50	S*	—	—
Sapporo	7.6	5	1 55	0	3 29	+ 6	—	—
Miyazaki	8.3	247	2 5 <sup>k</sup>	+ 1	4 44	S <sub>g</sub>	—	—
Hukuoka	8.5	260	2 6	- 1	4 12	S*	—	—
Kumamoto	8.5	255	2 16	+ 9	4 38	S <sub>g</sub>	—	—
Nemuro	8.8	25	2 7	- 4	4 2	+ 9	—	—
Unzendake	8.9	255	2 22	+10	5 0	S <sub>g</sub>	—	—
Nagasaki	9.1	256	1 38 <sup>?</sup>	-36	—	—	—	—
Vladivostok	10.1	322	i 2 30	+ 1	i 4 25	0	—	—
Zi-ka-wei	z. 16.4	260	i 3 54	+ 1	i 7 8	SS	17 28	SSS
Nanking	18.3	267	4 16	- 1	i 7 39	0	14 31	PP
Irkutsk	30.5	315	e 6 15	- 2	e 11 14 <sup>?</sup>	- 4	—	—
Przhevalsk	47.7	300	i 8 39	- 1	e 15 34	- 2	—	—
Almata	48.6	301	i 8 47	0	e 15 47	- 2	—	—
Naryn	49.7	299	i 8 55	- 1	e 16 2	- 2	—	—
Frunse	50.4	300	i 9 0	- 1	i 16 12	- 2	—	—
College	50.8	32	e 9 3	- 1	i 16 18	- 2	e 19 58	SSS
Murgab	52.2	295	9 14 <sup>?</sup>	- 1	16 35 <sup>?</sup>	- 4	—	—
Andijan	52.8	298	e 9 15 <sup>?</sup>	- 4	i 16 41 <sup>?</sup>	- 6	—	—
Fergana	53.1	298	e 9 20	- 1	e 16 44	- 7	—	—
New Delhi	N. 53.2	282	e 12 42	PPP	e 16 57	+ 5	e 15 19	?
Tchimkent	54.1	301	i 9 27	- 2	—	—	—	—
Garm	54.6	307	e 9 30	- 2	—	—	—	—
Tashkent	54.6	300	i 9 32	0	e 17 4	- 7	—	—
Honolulu	55.1	87	e 10 6	+30	—	—	e 10 33	P <sub>c</sub> P
Obi-garm	55.2	297	e 9 35	- 2	—	—	—	—
Kulyab	55.4	295	e 9 36 <sup>?</sup>	- 2	e 17 20 <sup>?</sup>	- 2	—	—
Sverdlovsk	55.8	312	i 9 39	- 2	17 22	- 6	—	—
Stalinabad	55.9	297	i 9 39	- 3	i 17 23	- 6	—	—
Samarkand	56.8	299	e 9 48	0	—	—	—	—
Sitka	58.1	40	e 9 58	0	i 17 56	- 2	e 13 28	PPP
Poona	z. 60.6	274	i 10 12	- 3	—	—	—	—
Bombay	61.3	275	e 18 34	S	(e 18 34)	- 5	—	—
Mary	61.3	298	10 17	- 3	—	—	—	—
Brisbane	z. 63.8	167	i 10 32 <sup>a</sup>	- 4	—	—	—	—
Resolute Bay	64.3	14	i 10 38	- 1	e 19 26	+ 9	20 31	S <sub>c</sub> S
Kizyl-Arvat	64.7	303	e 10 43	+ 1	—	—	—	—
Moscow	68.0	325	e 11 1	- 2	e 19 56	- 6	—	—
Victoria	z. 68.1	45	i 13 2 <sup>a</sup>	PP	—	—	—	—
Baku	68.6	306	e 11 7	0	e 20 6	- 3	—	—
Pulkovo	69.1	330	e 11 7	- 3	i 20 8	- 7	—	—
Seattle	69.1	46	i 11 11 <sup>a</sup>	+ 1	i 20 18	+ 3	i 13 40	PP
Grozny	69.7	310	e 11 13	- 1	—	—	—	—
Lenkoran	70.0	305	10 46 <sup>?</sup>	-29	19 48 <sup>?</sup>	-38	—	—
Tiflis	71.1	309	11 22	0	i 20 37	- 1	—	—
Gori	71.4	309	e 11 24	0	—	—	—	—
Borzhomi	72.0	309	11 27	- 1	—	—	—	—
Leninakan	72.2	308	11 42 <sup>?</sup>	+13	—	—	—	—
Shasta Dam	72.7	53	i 11 30	- 2	—	—	e 14 41	PP
Ukiah	73.1	54	—	—	e 20 53	- 8	—	e 30.0
Sotchi	73.3	312	e 11 36	+ 1	—	—	—	—
Mineral	z. 73.4	52	e 11 34	- 2	—	—	e 13 3	?
Hungry Horse	73.5	42	i 11 36	0	e 21 3	- 3	i 14 15	PP
Berkeley	74.3	55	e 11 40 <sup>a</sup>	- 1	e 21 13	- 2	e 26 9	SS
Santa Clara	74.8	55	e 12 16	+32	e 21 25	+ 5	—	e 30.9
Reno	75.0	52	e 11 46 <sup>a</sup>	+ 1	e 21 22	- 1	e 21 58	PS
Butte	N. 75.6	43	e 11 46	- 2	e 21 27	- 2	—	—
Yalta	76.1	315	11 50	- 1	21 29	- 6	—	—

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		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.	
		°	°	m. s.	s.	m. s.	s.	m. s.	m.	
Fresno		76.5	54	e 11 52 <sup>a</sup>	- 2	—	—	e 14 59	PP	—
Tinemaha		77.4	54	i 11 58	0	—	—	—	—	—
Kishinev		77.5	321	e 11 57	- 2	—	—	—	—	—
Warsaw		77.9	328	e 12 0	- 1	e 21 53	- 1	e 15 4	PP	e 38.6
Haiwee		78.1	54	i 12 2	0	—	—	—	—	—
Logan		78.6	47	i 12 4	- 1	—	—	—	—	—
Copenhagen		78.9	334	i 12 5	- 2	21 59	- 6	27 19	SS	38.6
Pasadena		79.1	56	i 12 6	- 2	—	—	i 12 19	pP	e 32.4
Salt Lake City		79.2	47	e 12 8	0	e 22 5	- 3	—	—	—
Riverside		79.7	56	e 12 10	- 1	—	—	—	—	—
Overton	z.	80.2	52	i 12 14	0	—	—	e 14 35	?	—
Boulder City		80.3	53	i 12 14	0	—	—	i 12 26	pP	—
Skalnate Pleso		80.4	326	e 12 24	+ 9	e 22 19	- 2	e 15 20	PP	—
Palomar		80.5	56	i 12 15	0	—	—	i 12 34	?	—
Pierce Ferry		80.7	52	i 12 16	0	e 22 24	0	e 15 12	PP	—
Istanbul		81.1	315	e 12 19	+ 1	e 22 25	- 3	—	—	—
Potsdam		81.2	332	i 12 19 <sup>a</sup>	0	i 22 31?	+ 2	e 15 20	PP	e 41.6
Collmberg		82.0	330	e 12 21 <sup>k</sup>	- 2	e 22 38	+ 1	e 15 29	PP	e 44.6
Budapest		82.1	325	e 12 30	+ 6	e 22 30	- 8	e 31 18	SSS	43.6
Ogyalla		82.3	326	e 12 46	+21	e 22 34	- 6	e 15 48	PP	—
Prague		82.3	329	i 12 24	- 1	e 22 38	- 2	e 15 53	PP	e 39.6
Timisoara		82.3	323	e 12 15	-10	e 22 36	- 4	12 38?	?	—
Aberdeen		82.4	341	—	—	i 22 45	+ 4	e 28 20	SS	e 40.6
Jena		82.9	331	e 12 26	- 2	e 22 41	- 5	e 12 51	?	—
Belgrade		83.3	322	e 12 29 <sup>a</sup>	- 1	e 22 47	- 3	e 15 46	PP	e 48.8
Durham	E.	84.3	339	—	—	e 22 51	- 9	i 28 51	SS	—
De Bilt		84.4	335	e 12 38	+ 2	e 22 56	- 5	e 28 38?	SS	e 39.6
Tucson		85.2	54	i 12 39	0	e 23 7	- 2	e 15 54	PP	e 36.1
Stuttgart		85.5	330	e 12 39	- 2	e 22 59	[- 5]	e 12 49	PcP	e 45.6
Triest		86.0	326	e 12 41	- 2	e 23 19	+ 2	e 13 22	pP	e 41.6
Athens		86.3	315	e 12 44	- 1	—	—	—	—	—
Strasbourg		86.3	331	e 12 43	- 2	e 23 6	[- 3]	e 16 24	PP	e 42.6
Kew		86.8	337	i 12 46	- 1	e 23 9	[- 4]	e 28 41	SS	e 38.6
Helwan	n.	86.9	305	e 16 18	PP	—	—	—	—	e 33.3
Zürich		86.9	330	e 12 46	- 2	e 23 6	[- 7]	e 23 46	?	—
Rathfarnham Castle		87.0	341	i 12 47	- 1	e 23 13	[- 1]	e 29 17	SS	e 38.6
Basle		87.2	330	e 12 47 <sup>a</sup>	- 2	e 23 19	[+ 4]	—	—	—
Salo		87.5	328	e 12 47	- 4	e 24 1	+30	e 14 0	?	—
Padova		87.7	326	e 13 0	+ 8	e 23 10	[- 9]	e 16 28	PP	—
Bologna		88.0	327	e 12 56	+ 3	e 23 53	+17	e 16 27	PP	—
Paris		88.0	334	i 12 51	- 2	e 23 30	{+ 3}	e 16 12	PP	e 46.6
Pavia		88.4	328	e 13 17	+22	e 24 1	+21	—	—	—
Florence Xim		88.5	326	e 16 47	PP	e 23 19	[- 5]	—	—	—
Rome		89.4	324	e 12 57	- 3	i 23 45	- 4	e 13 58	pP	e 41.6
Florissant		92.4	37	e 25 47	PPS	e 24 14	- 2	e 23 43	SKS	—
St. Louis		92.6	37	e 13 13	- 2	i 24 14	- 4	e 16 59	PP	—
Ottawa	z.	93.1	24	e 13 25	+ 8	—	—	—	—	—
Vermont		94.2	23	—	—	e 23 57	[ 0]	e 25 52	PS	e 42.9
Cleveland		94.3	30	i 13 23 <sup>a</sup>	0	e 23 48	[- 9]	e 24 24	SKKS	—
Pennsylvania		96.3	28	—	—	i 24 47	- 2	i 26 15	PS	—
Harvard		97.0	22	i 13 36	+ 1	e 26 11	?	—	—	e 49.2
Weston		97.2	22	e 13 36	0	—	—	e 17 26	PP	—
Palisades		97.6	24	e 26 19	PS	e 24 12	[- 3]	e 25 3	S	—
Algiers Univ.	z.	97.9	326	e 16 34	?	—	—	—	—	—
Alicante		98.1	330	14 9	+29	25 37	+33	18 13	PP	e 47.4
Philadelphia		98.1	26	—	—	e 24 5	[-13]	e 26 44	PS	e 47.0
Toledo		98.1	333	e 13 37	- 3	—	—	e 17 32	PP	50.3
Granada		100.3	332	17 58 <sup>a</sup>	PP	24 49	{- 7}	i 32 9	SS	i 51.0
Malaga	z.	101.1	332	i 17 58 <sup>k</sup>	PP	—	—	—	—	e 58.3
Tamanrasset	z.	108.0	316	e 17 49	[-40]	e 22 22	SKP	e 18 50	PP	—
Pretoria	z.	121.9	259	e 18 55	[- 1]	—	—	—	—	—
Fort de France		126.0	25	e 19 28	[+24]	—	—	—	—	—
Chinchina		127.4	47	—	—	e 47 8	?	—	—	e 77.1
Bogota		128.6	46	e 19 10	[+ 1]	—	—	—	—	93.6
Huancayo		140.1	62	e 19 34	[+ 3]	—	—	—	—	—
La Paz		148.3	60	i 19 48 <sup>a</sup>	[+ 3]	i 28 18	?	i 20 0	PKP <sub>2</sub>	73.6

For Notes see next page.



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NOTES TO SEPTEMBER 10d. 3h. 21m. 22s.

Additional readings :—

Nanking iNZ = 4m.37s.  
 College e = 11m.42s.  
 Sitka eSS? = 22m.36s.  
 Resolute Bay ePPP = 14m.49s., iN = 14m.59s., e = 19m.3s., PSN = 20m.0s., SSN = 24m.26s.  
 Seattle iPcP = 11m.41s. and other unidentified i readings.  
 Shasta Dam e = 11m.41s.  
 Berkeley eZ = 14m.31s.  
 Warsaw eZ = 12m.5s. and 12m.17s., ePE = 12m.32s., eZ = 13m.28s., 14m.13s., and 14m.56s., ePPZ = 15m.8s., eScSE = 22m.12s., eScSN = 22m.18s., ePSEN = 22m.33s., ePPSN = 22m.52s., eSSE = 26m.53s.  
 Copenhagen 22m.17s.  
 Skalnaté Pleso e = 22m.46s.  
 Potsdam iSN = 22m.23s., iScSEN = 22m.49s.  
 Budapest PE = 12m.48s.  
 Prague ePP = 16m.2s., ePPP = 18m.20s., ePS = 23m.26s., ePPS = 23m.48s., eSS = 28m.14s., and other unidentified e readings.  
 Aberdeen eQE = 35m.2s.  
 Durham iN = 22m.56s., iE = 23m.21s.  
 Trieste ePP = 16m.4s., eSKS = 23m.1s., eSKKS = 23m.13s.  
 Strasbourg eS = 23m.8s., e = 23m.39s., eSS = 28m.38s.  
 Kew iZ = 12m.56s., ePS = 23m.43s.  
 Rathfarnham Castle iZ = 12m.56s., ePSEN = 24m.8s.  
 Paris i = 13m.3s. and 13m.15s., ePS = 24m.28s., e = 39m.45s.  
 Pavia e = 14m.12s. and 15m.45s.  
 Rome iPP = 16m.32s., SKS? = 23m.24s., PS = 24m.52s., SS = 29m.48s.  
 St. Louis e = 17m.17s., eSKS? = 23m.29s., ePS = 25m.25s.  
 Cleveland ePSE = 25m.41s., eN = 32m.43s.  
 Pennsylvania iN = 25m.10s.  
 Alicante SS = 32m.9s.  
 Granada PP = 18m.40s., PPP = 20m.28s., SSS = 35m.58s.  
 Tamanrasset eZ = 19m.4s., iZ = 19m.24s., ePPPZ = 21m.5s.  
 La Paz iPPS = 37m.8s.  
 Long waves were also recorded at Helsinki, Upsala, Tortosa, Seven Falls and Scoresby Sund.

Sept. 10d. 10h. 30m. 25s. Epicentre 29°·2N. 95°·1E. (as on 3d.).

A = -·0777, B = +·8709, C = +·4853;  $\delta = +2$ ;  $h = +2$ ;

	$\Delta$	Az.	P.	O - C.	S.	O - C.	Supp.	L.
	$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Calcutta	E. 9·0	224	e 3 40	S	(e 3 40)	-18	—	—
Przheval'sk	18·9	320	e 4 25	+ 1	e 8 1?	+ 8	—	—
Murgab	19·8	304	4 37	+ 2	8 19	+ 6	—	—
Naryn	19·8	315	e 4 38	+ 3	—	—	—	—
Almata	20·2	320	i 4 42	+ 3	e 8 28	+ 7	—	—
Nanking	20·6	75	e 4 40	- 3	e 8 24	- 5	—	e 10·2
Frunse	21·4	315	i 4 54	+ 3	e 8 50	+ 5	—	—
Andijan	21·8	308	e 4 59	+ 3	i 9 7	+15	—	—
Fergana	22·1	308	e 5 2	+ 3	—	—	—	—
Bombay	22·8	249	—	—	e 8 35	-36	e 11 58	Q e 12·7
Kulyab	22·8	299	e 5 11	+ 6	e 9 18	+ 7	—	—
Stalinabad	23·6	301	i 5 17	+ 4	i 9 31	+ 6	—	—
Tashkent	24·2	307	i 5 24	+ 5	—	—	—	—
Tchimkent	24·4	310	i 5 23	+ 2	—	—	—	—
Samarkand	25·3	302	e 5 34	+ 4	—	—	—	—
Sverdlovsk	36·7	329	7 11	+ 1	—	—	—	—
Collmberg	z. 63·1	316	e 10 30	- 2	—	—	—	—
Stuttgart	z. 66·1	314	e 10 51	0	—	—	—	—
Strasbourg	67·1	315	e 11 1	+ 4	—	—	—	—
Paris	70·3	316	e 11 17	0	—	—	—	—
College	74·4	23	e 11 39	- 3	—	—	—	—
Tamanrasset	z. 78·9	290	e 12 13	+ 6	—	—	—	—
Hungry Horse	98·5	19	e 13 42	0	—	—	—	—

Calcutta gives also eSE = 5m.17s., iS\*E = 5m.50s., eS<sub>2</sub>E = 6m.14s.  
 Long waves were also recorded at Poona, Potsdam, De Bilt and Granada.

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Sept. 10d. 15h. 16m. 14s. Epicentre 14°·9S., 167°·1E.. Depth of focus 0·015.  
(as on August 20d.).

A = -·9424, B = +·2158, C = -·2555;  $\delta = -3$ ;  $h = +6$ ;  
D = +·223, E = +·975; G = +·249, H = -·057, K = -·967.

		$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.	
		°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.	
Brisbane		18·1	224	i 4	5 <sub>a</sub>	+ 1	i 7	31	+12	i 4	48	PPP	—
Apia		20·5	90	4	30	0	e 8	7	0	e 8	17	S	—
Auckland	N.	22·9	164	i 4	55	+ 2	i 9	2	+12	i 5	9	pP	—
Riverview		23·7	214	i 5	2 <sub>a</sub>	+ 1	i 9	0	- 3	i 5	32	pP	—
Arapuni		24·3	164	e 5	6	- 1	e 9	17	+ 4	—	—	—	—
New Plymouth	E.	24·9	166	e 5	38 <sub>?</sub>	pP	e 9	31 <sub>?</sub>	+ 7	i 16	0 <sub>?</sub>	S <sub>c</sub> S	—
Tuai	N.	25·4	162	e 5	18	+ 1	e 9	34	+ 2	i 16	0	S <sub>c</sub> S	—
Cobb River	E.	26·6	170	e 5	25	- 3	e 9	53	+ 2	—	—	—	—
Wellington		27·1	167	i 5	26	- 7	i 10	27	+27	16	8	S <sub>c</sub> S	—
Kaimata	N.E.	27·8	173	e 5	40	+ 1	e 10	13	+ 2	e 6	31	PP	—
Christchurch		28·9	171	i 5	46	- 3	10	8	-20	16	37	PP	e 12·9
Guam		35·8	320	6	56	+ 7	—	—	—	—	—	—	—
Perth		49·5	241	i 9	31	?	15	46	+10	11	21	PPP	—
Honolulu		49·8	45	e 8	37	- 5	e 15	22	-18	e 16	16	sS	e 20·3
Yokohama		56·4	333	9	40	+10	e 17	11	+ 2	e 14	37	?	—
Shizuoka		56·6	332	9	35	+ 3	17	13	+ 1	10	29	P <sub>c</sub> P	23·7
Tokyo		56·6	334	e 9	37	+ 5	17	10	- 2	—	—	—	—
Hunatu		56·9	333	9	34	0	i 17	15	- 1	19	15	S <sub>c</sub> S	—
Mito		56·9	335	9	48	+14	i 17	18	+ 2	e 18	46 <sub>?</sub>	S <sub>c</sub> S	—
Owase	z.	56·9	329	9	36	+ 2	e 17	18	+ 2	—	—	—	—
Kumagaya		57·1	334	e 9	40	+ 5	—	—	—	—	—	—	—
Yakusuma		57·2	322	e 9	44	+ 8	17	26	+ 6	e 10	14	pP	—
Utunomiya		57·3	334	e 9	34	- 3	e 17	20	- 1	—	—	—	—
Kameyama		57·4	331	9	44	+ 7	e 18	27	?	19	22	S <sub>c</sub> S	—
Nagoya		57·4	332	e 9	42	+ 5	17	26	+ 4	i 19	23	S <sub>c</sub> S	—
Maebasi		57·5	333	e 9	40	+ 2	e 17	19	- 4	—	—	—	—
Simidu		57·6	326	e 9	32	- 7	17	46	+21	—	—	—	—
Osaka		57·7	330	9	44	+ 5	e 17	27	+ 1	—	—	—	—
Miyazaki		57·8	325	i 9	29	-11	i 17	32	+ 5	i 19	25	S <sub>c</sub> S	—
Sumoto		57·8	330	i 9	43	+ 3	i 17	30	+ 3	—	—	—	e 29·5
Kobe		57·9	329	e 9	44	+ 3	e 17	32	+ 3	e 10	14	pP	—
Koti		57·9	328	i 9	44	+ 3	i 17	30	+ 1	i 10	13	pP	—
Kyoto		57·9	330	e 9	42	+ 1	e 17	32	+ 3	—	—	—	—
Hukusima		58·0	337	9	41	- 1	i 17	32	+ 2	i 19	18	S <sub>c</sub> S	—
Matusino		58·0	333	e 9	40	- 2	17	27	- 3	19	19	S <sub>c</sub> S	24·9
Nagano		58·1	333	e 9	43	+ 1	e 17	32	+ 1	11	34	PP	—
Sendai		58·3	337	9	42	- 2	17	36	+ 2	19	24	S <sub>c</sub> S	24·1
Matuyama		58·5	327	e 9	47	+ 2	i 17	40	+ 4	i 10	20	pP	—
Ooita		58·6	326	e 9	53	+ 7	i 17	43	+ 5	—	—	—	—
Toyama		58·6	332	e 9	47	+ 1	e 17	40	+ 2	e 10	56	pP	—
Bandong		58·8	272	i 9	46	- 1	i 17	43	+ 3	—	—	—	—
Kumamoto		58·8	325	e 9	52	+ 5	17	46	+ 6	—	—	—	—
Mizusawa	E.	59·0	337	9	50	+ 2	17	43	0	—	—	—	—
Miyako		59·1	338	e 9	47	- 2	e 17	36 <sub>?</sub>	- 8	—	—	—	—
Aikawa		59·2	334	9	53	+ 3	17	46	0	—	—	—	—
Morioka		59·5	337	e 9	50	- 2	e 17	50	+ 1	—	—	—	—
Hukuoka		59·6	325	e 9	53	0	e 17	54	+ 3	e 12	18	PP	—
Djakarta		59·7	272	i 9	37	-16	i 17	38	-14	—	—	—	—
Akita		59·9	336	9	58 <sub>k</sub>	+ 3	i 17	48	- 7	—	—	—	e 31·2
Nemuro		61·2	343	e 10	6	+ 3	e 18	23	+12	—	—	—	e 25·1
Sapporo		62·3	340	e 10	14	+ 3	e 18	25	0	i 19	54	S <sub>c</sub> S	—
Zi-ka-wei	z.	63·4	317	i 10	19	+ 1	i 18	39	0	i 10	54	P <sub>c</sub> P	—
Nanking		65·7	316	i 10	30 <sub>k</sub>	- 3	e 18	43	-24	11	4	P <sub>c</sub> P	—
Vladivostok		66·1	333	e 10	33	- 3	i 19	15	+ 3	i 11	9	P <sub>c</sub> P	—
Ferndale	E.	84·1	45	e 11	22	-56	e 21	31	-59	—	—	—	—

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.	
Ukiah		84.2	48	e 12 17	- 1	e 22 29	- 2	e 12 57	pP	e 35.0
Berkeley		84.4	49	i 12 14k	- 5	e 22 31	- 2	i 12 21	P	—
Santa Clara		84.4	49	i 12 32	PcP	i 22 32	- 1	i 15 41	PP	e 40.0
Lick		84.6	49	e 12 16k	- 4	e 22 34	- 1	i 12 22	P	—
Shasta Dam		85.5	46	e 12 17	- 8	e 22 33	[- 1]	e 15 36	PP	—
Calcutta	E.	85.6	294	i 12 29	+ 4	i 22 40	- 5	i 13 7	pP	—
Fresno		85.8	50	e 12 20 <sub>a</sub>	- 6	e 22 38	[+ 2]	i 13 10	sP	—
Mineral		85.9	47	e 12 28	+ 1	e 22 37	[+ 0]	e 15 46	PP	—
Irkutsk		86.0	327	12 28	+ 1	i 22 41	[+ 3]	e 13 0 <sup>?</sup>	pP	—
Pasadena		86.1	54	e 12 24	- 4	i 22 38	[+ 0]	i 12 46	pP	e 34.7
Sitka		86.3	28	e 12 24	- 5	i 22 39	[- 1]	i 23 46	SP	e 35.4
College		86.5	18	e 12 22	- 8	i 22 39	[- 2]	i 13 5	sP	—
Riverside		86.6	54	e 12 30	0	e 22 46	[+ 4]	e 13 20	sP	—
Palomar		86.8	55	i 12 29	- 2	i 22 47	[+ 4]	i 12 50	pP	—
Reno		86.8	48	e 12 30k	- 1	e 22 54	- 2	e 13 2	pP	—
Haiwee		86.9	52	e 12 29	- 2	—	—	i 12 33	P	—
Tinemaha		87.1	51	e 12 27	- 5	i 22 0	- 59	i 13 1	pP	—
Victoria		88.0	39	e 12 39	+ 2	23 8	+ 1	16 8	PP	—
Seattle		88.3	40	e 12 37 <sub>a</sub>	- 1	e 22 56	[+ 3]	e 16 4	PP	e 38.3
Colombo	E.	89.1	277	12 48	+ 6	23 3	[+ 5]	—	—	40.8
Boulder City		89.3	53	e 12 37	- 6	e 23 21	+ 2	e 16 9	PP	—
Overton	Z.	89.7	52	i 12 40	- 5	e 23 16	- 7	i 16 10	PP	—
Pierce Ferry		90.0	53	i 12 41	- 5	e 23 7	[+ 4]	i 16 22	PP	e 46.8
Tucson		91.3	57	e 12 48	- 4	e 23 42	+ 5	e 16 22	PP	e 37.0
Kodaikanal	E.	92.2	281	e 12 56	0	i 23 17	[+ 1]	e 16 41	PP	—
Salt Lake City		93.0	48	e 13 0	0	i 23 53	+ 1	e 16 47	PP	e 42.5
Hyderabad	E.	93.1	287	e 13 1	+ 1	i 23 15	[- 6]	—	—	41.1
Logan		93.3	47	e 12 59	- 2	e 24 50	sS	i 16 44	PP	—
Hungry Horse		93.8	41	e 13 0	- 4	e 23 24	[- 1]	e 18 46	PPP	—
Butte	N.	94.0	43	e 13 15	+ 10	e 23 27	[+ 1]	e 17 9	PP	e 38.6
Bozeman		94.9	44	e 13 12	+ 3	e 24 13	+ 5	e 17 8	PP	—
Dehra Dun	N.	96.6	299	e 24 16	S	(e 24 16)	- 7	—	—	—
New Delhi	N.	96.9	298	e 13 16	- 2	i 24 27	+ 2	i 23 49	SKS	44.8
Poona	E.	97.6	287	i 13 18	- 3	i 24 31	0	i 23 47	SKS	—
Bombay	E.	98.7	287	e 13 29	+ 3	—	—	e 16 54	?	—
Przhevalsk		99.0	311	e 13 30	+ 3	i 23 56	[+ 4]	—	—	—
Almata		100.2	313	e 13 34	+ 1	i 24 2	[+ 4]	—	—	—
Naryn		100.5	310	e 17 49	PP	i 24 2	[+ 3]	—	—	—
Vera Cruz		101.0	73	e 17 16	PP	e 28 15	?	—	—	e 51.0
Murgab		101.5	307	13 40	+ 1	i 24 8	[+ 4]	17 55	PP	—
Frunse		101.8	312	e 17 54	PP	—	—	e 18 27	pPP	—
Andijan		103.1	309	e 13 48	+ 2	i 24 16	[+ 4]	e 25 26	S	—
Fergana		103.5	309	e 13 48	+ 1	e 24 16	[+ 2]	14 21	pP	—
Lincoln	E.	104.3	51	e 13 44	- 7	e 24 14	[- 3]	e 18 8	PP	—
Kulyab		104.7	306	e 14 1	+ 8	—	—	—	—	—
Tchimkent		105.4	311	e 13 57	P	—	—	i 18 50	pPP	—
Tashkent		105.5	310	i 13 58	P	i 24 26	[+ 3]	i 14 30	pP	—
Stalinabad		105.6	307	i 13 58	P	i 24 28	[+ 5]	14 37	pP	—
Resolute Bay		106.4	16	e 14 1	P	i 24 29	[+ 2]	25 34	S	—
Merida		107.4	72	e 18 1	PP	e 27 17	SP	—	—	—
St. Louis		109.0	53	e 14 15	P	e 25 52	SKKS	e 18 26	PP	—
Mary		110.9	305	e 18 23	[+ 5]	—	—	—	—	—
Chicago		111.1	49	e 19 4	PP	e 24 55	[+ 9]	e 26 39	S	e 49.0
Sverdlovsk		111.4	325	i 14 23	P	i 24 52	[+ 4]	e 15 0	pP	—
Tananarive		111.7	242	—	—	24 54	[+ 5]	28 22	SP	50.5
Huancayo		112.6	110	e 14 32	P	i 24 59	[+ 7]	i 19 14	PP	e 51.3
La Plata		114.6	140	19 4	pPKP	25 52	SKKS	19 22	PP	35.6
Kizyl-Arvat		115.3	306	e 18 29	[+ 2]	i 25 6	[+ 3]	—	—	—
Cleveland		115.7	50	e 18 26 <sub>a</sub>	[- 1]	i 25 6	[+ 2]	e 18 30	PP	—
Columbia		116.2	59	e 19 18	PP	e 26 18	SKKS	e 29 26	PS	e 49.1

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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.
Pittsburgh	N.W.	116.9	51	i 19	44	pPP	i 22	11	PKS	—	—	—
La Paz		117.2	117	i 18	32	[+ 2]	i 25	15	[+ 5]	i 14	55	P
Chinchina		117.6	91	i 18	32	[+ 1]	e 29	40	PS	e 35	56	SS
Pennsylvania		118.5	51	e 18	43	[+10]	i 25	14	[ 0]	i 19	9	pPKP
Grahamstown		119.0	218	i 18	31	[- 3]	—	—	—	e 19	52	PP
Bogota		119.0	92	e 18	38	[+ 4]	e 29	51	PS	e 19	56	PP
Pietermaritzburg	z.	119.1	223	i 18	37	[+ 3]	—	—	—	—	—	—
Galerazamba		119.2	86	e 19	54	PP	e 31	6	PSS	—	—	e 59.8
Washington		119.2	53	i 18	37	[+ 3]	e 29	48	PS	e 19	54	PP
Ottawa		119.5	45	18	29	[- 5]	25	18	[ 0]	19	51	PP
Baku		120.2	308	e 18	41	[+ 6]	—	—	—	e 20	17	PP
Philadelphia		120.6	52	i 20	10	PP	e 26	28	SKKS	i 29	49	SP
Pallsades		121.4	50	e 18	37	[- 1]	i 30	1	PS	i 20	11	PP
Vermont		121.4	47	e 20	10	PP	e 25	30	[+ 6]	e 30	4	PS
Fordham		121.5	50	i 18	41	[+ 3]	—	—	—	i 20	12	PP
Seven Falls	E.	122.5	43	20	22	PP	30	14	PS	36	50	SS
Grozny		122.8	312	e 18	46	[+ 5]	27	8	SKKS	—	—	—
Harvard		122.9	48	i 18	42	[+ 1]	e 27	9	SKKS	i 20	21	PP
Weston		123.1	48	i 18	41	[ 0]	i 25	34	[+ 5]	e 20	16	PP
Pretoria	z.	123.1	225	e 18	39?	[- 2]	—	—	—	e 20	28?	PP
Tiflis		123.8	310	18	46	[+ 3]	i 25	36	[+ 5]	i 20	32	PP
Moscow		123.9	328	e 18	44	[+ 1]	e 25	34	[+ 2]	e 19	34	pPKP
Gori		124.2	310	e 15	48?	P	—	—	—	—	—	—
Scoresby Sund		124.2	4	20	18	PP	i 25	37	[+ 4]	i 27	17	SKKS
Erevan		124.3	308	e 18	50	[+ 6]	—	—	—	—	—	—
Piatigorsk		124.6	314	18	47	[+ 3]	i 25	37	[+ 3]	i 20	31	PP
Leninakan		124.7	310	e 18	51	[+ 7]	—	—	—	—	—	—
Pulkovo		125.2	335	i 18	49	[+ 4]	i 25	40	[+ 4]	20	40	PP
Sotchi		127.0	314	e 20	55	PP	—	—	—	—	—	—
Helsinki		127.1	338	e 18	14	[-35]	e 25	44	[+ 3]	e 22	9	SKP
Ivigtut		127.3	21	e 18	45	[- 5]	—	—	—	e 21	55	?
Halifax		128.0	44	21	1	PP	22	16	SKP	32	28	PPS
San Juan		129.0	77	e 18	54	[+ 1]	e 25	40	[- 7]	e 21	0	PP
Upsala		129.9	340	e 19	6	[+11]	i 22	6	SKP	e 21	3	PP
Bermuda		130.0	60	e 21	10	PP	i 22	27	PKS	e 38	15	SS
Yalta		130.5	316	18	57	[+ 1]	27	59	SKKS	—	—	—
Ksara		132.2	302	i 19	2 <sub>a</sub>	[+ 3]	22	4	SKP	19	40	pPKP
Bergen		132.7	348	e 19	4	[+ 5]	i 22	18	SKP	22	32	PKS
Kishinev		132.8	322	19	0	[ 0]	—	—	—	—	—	—
Fort de France		133.4	84	e 19	2	[+ 1]	—	—	—	e 21	32	PP
Lwow		134.0	327	i 19	11	[+ 9]	31	33	SKSP	—	—	—
Warsaw		134.0	332	e 19	4	[+ 2]	e 26	5	[+ 6]	e 21	37	PP
Copenhagen		134.9	340	e 19	1	[- 3]	i 22	25	SKP	39	40	SS
Istanbul		135.3	314	e 18	57	[- 8]	e 31	58	PS	—	—	—
Bucharest		135.8	320	i 19	10	[+ 4]	e 22	27	SKP	e 28	29	SKKS
Skalnate Pleso		136.4	328	e 19	12	[+ 5]	e 26	25	[+22]	e 21	52	PP
Helwan		136.7	297	e 19	12	[+ 5]	e 28	36	SKKS	20	6	pPKP
Raciborzu		136.8	331	e 19	1	[- 6]	—	—	—	e 19	4	PKP
Aberdeen		137.0	351	e 19	15	[+ 7]	i 28	36	SKKS	i 21	59	PP
Potsdam		137.5	337	e 19	1	[- 8]	e 26	16	[+12]	i 19	49	pPKP
Timisoara		138.0	324	e 19	15?	[+ 5]	e 28	42?	SKKS	e 22	51	PKS
Collmberg		138.1	335	e 19	1	[- 9]	e 28	46	SKKS	i 19	15	pPKP
Budapest		138.1	327	19	5	[- 5]	32	8	PS	i 22	49	PKS
Ogyalla		138.3	328	e 19	15	[+ 5]	e 26	18	[+12]	e 21	50	PP
Edinburgh	E.	138.4	352	e 19	9	[- 1]	26	18	[+12]	40	7	SS
Sofia		138.4	319	e 19	15	[+ 5]	i 27	46	?	i 21	7	?
Prague		138.5	333	e 19	9	[- 1]	e 28	38	SKKS	e 21	46	PP
Kalossa		138.7	327	19	15	[+ 4]	28	51	SKKS	22	50	PKS
Vienna		138.9	330	e 19	14	[+ 3]	e 28	48	SKKS	e 22	11	PP
Belgrade		139.0	323	e 19	8 <sub>k</sub>	[- 3]	i 22	28	SKP	i 28	49	SKKS

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	$\Delta$	Az.	P.	O - C.	S.	O - C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Jena	139.0	335	e 19 6	[- 5]	e 29 15	SKKS	e 20 6	pPKP e 62.8
Durham	139.3	350	i 19 16	[+ 4]	i 22 54	PKS	i 28 49	SKKS —
De Bilt	140.2	342	i 19 10k	[- 3]	i 28 57	SKKS	i 19 46	pPKP e 63.8
Athens	140.3	312	e 19 7	[- 7]	—	—	22 54	PKS —
Rathfarnham Castle	141.3	353	i 19 17	[+ 1]	e 29 3	SKKS	i 20 0	pPKP e 58.6
Stuttgart	141.7	336	e 19 10	[- 6]	e 26 59	[+48]	e 19 50	pPKP e 62.8
Karlsruhe	141.8	337	e 19 17	[ 0]	e 22 33	SKP	e 29 5	SKKS e 63.8
Triest	142.0	329	19 12	[- 5]	e 29 6	SKKS	i 21 38	PP e 65.5
Kew	142.1	347	i 19 15k	[- 2]	e 29 8	SKKS	i 20 2	pPKP e 58.8
Strasbourg	142.3	337	e 19 14	[- 4]	i 26 6	[- 6]	i 20 10	pPKP 63.8
Zürich	143.0	336	e 19 11	[- 8]	e 29 8	SKKS	i 19 17	PKP —
Chur	143.1	334	e 19 11	[- 8]	e 29 11	SKKS	i 19 17	PKP —
Basle	143.3	337	e 19 14	[- 5]	e 29 24	SKKS	e 19 20	PKP —
Taranto	143.4	320	19 20	[+ 1]	—	—	e 19 55	pPKP 63.8
Salo	143.6	332	i 19 16a	[- 4]	e 29 29	SKKS	e 22 18	PP —
Padova	143.8	329	i 19 18	[- 2]	i 29 12	SKKS	22 26	PP —
Paris	143.9	342	e 19 13k	[- 7]	i 26 30	[+ 5]	i 19 57	pPKP e 65.8
Bologna	144.0	330	e 19 17	[- 3]	e 29 13	SKKS	i 19 25	PKP <sub>2</sub> —
Neuchatel	144.0	336	e 19 15	[- 5]	e 29 18	SKKS	e 19 24	PKP <sub>2</sub> —
Pavia	144.0	333	e 19 18a	[- 2]	e 29 20	SKKS	i 19 25	PKP <sub>2</sub> —
Florence Xim.	144.6	329	i 19 18	[- 3]	i 29 21	SKKS	—	—
Jersey E.	144.7	348	e 19 25	[+ 4]	e 29 22	SKKS	i 19 36	PKP <sub>2</sub> 63.8
Rocca di Papa	145.3	326	i 19 25	[+ 2]	—	—	—	—
Rome	145.3	326	i 19 19a	[- 4]	e 29 10	SKKS	i 20 0	pPKP e 68.8
Messina	145.8	318	i 19 27	[+ 3]	—	—	i 20 18	pPKP —
Clermont-Ferrand	146.4	339	i 19 21	[- 3]	e 29 34	SKKS	i 20 9	pPKP —
Barcelona	150.5	338	i 19 38	[+ 7]	i 29 53	SKKS	i 30 59	? —
Tortosa	151.7	338	i 19 38	[+ 5]	i 30 1	SKKS	23 19	PP e 64.8
Toledo	153.9	344	i 19 38	[+ 2]	30 16	SKKS	i 20 1	pPKP 64.8
Algiers Univ. z.	154.0	329	e 19 37	[+ 1]	e 26 37	[+ 9]	e 20 2	pPKP —
Alicante	154.2	337	19 42	[+ 6]	26 42	[+14]	e 20 8	pPKP e 70.4
Lisbon	156.0	353	i 10 40a	[+ 1]	30 25	SKKS	i 20 11	pPKP —
Granada	156.3	342	i 19 42k	[+ 3]	i 30 24	SKKS	20 18	pPKP i 73.3
Malaga	157.0	342	i 19 44k	[+ 4]	26 48	[+17]	i 20 18	pPKP 79.5
Tamanrasset z.	160.9	298	e 19 44	[ 0]	e 26 50	[+15]	e 20 32	PKP <sub>2</sub> —

Additional readings and notes :—

Auckland PPN = 5m.36s., PcPN = 8m.37s., isSN = 9m.41s., eSSN = 10m.50s., iPcSN = 11m.36s., iScSN = 15m.56s., iN = 20m.49s.,  
 Riverview iP = 5m.8s., iPP = 5m.38s., iPPPE = 5m.48s., iSE = 9m.5s., isSN = 9m.46s., iScSN = 15m.58s., and numerous unidentified i readings.  
 Wellington e = 5m.34s., i = 6m.0s., iZ = 6m.20s.  
 Kaimato iNE = 7m.20s.  
 Christchurch iZ = 5m.50s., eZ = 6m.19s., and 7m.14s., eNZ = 9m.40s., SN = 10m.2s., eZ = 12m.12s.  
 Perth i = 16m.41s., SS = 19m.26s.  
 Honolulu iP = 8m.42s., isP = 9m.9s., i = 10m.6s., esPP = 11m.7s., e = 11m.32s., and 18m.29s.  
 Shizuoka PP = 11m.25s., PcS = 14m.17s., ScS = 19m.13s., SS = 20m.43s.  
 Tokyo eN = 10m.55s., SE = 17m.13s., i = 18m.12s., 19m.9s., and 19m.57s.  
 Nagoya eE = 10m.19s., eN = 13m.18s.  
 Osaka e = 13m.41s., iNZ = 17m.24s.  
 Miyazaki iEN = 10m.13s.  
 Kobe e = 12m.16s., eE = 18m.1s., eEN = 19m.25s.  
 Koti iScS = 19m.23s.  
 Matusiro SSN = 20m.32s., QN = 23m.19s.  
 Sendai SS = 20m.13s.  
 Matuyama i = 19m.29s.  
 Toyama ePcP = 10m.19s., esP = 11m.29s., ePP = 11m.37s., ePPP = 13m.21s., esPP = 13m.51s.  
 Hukuoka e = 10m.28s.  
 Sapporo esS = 21m.23s.  
 Zi-ka-wei iPPZ = 12m.32s., iPPPZ = 13m.38s., iScSZ = 20m.14s.  
 Nanking iP = 10m.33s., iZ = 10m.52s. and 11m.26s., ePPZ = 12m.38s., i = 13m.5s., PPPZ = 13m.39s., iPPS = 19m.8s., iQ? = 24.8m.  
 Vladivostok iScP = 11m.29s., ePP = 13m.15s., iPS = 19m.53s., iSS = 23m.33s., iSSS = 26m.58s.  
 Ukiah e = 15m.3s., ePS? = 23m.15s., eSS = 28m.5s.  
 Berkeley epPPZ = 15m.37s., eN = 24m.18s., 28m.4s., and 34m.46s., ePKP,PKPZ = 38m.35s., eZ = 41m.52s.

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Lick esP?Z = 13m.14s., ePP?Z = 15m.13s., ePPP?Z = 17m.17s., ePKP,PKPZ = 38m.31s., eZ = 41m.49s. and 59m.6s.  
 Shasta Dam i = 12m.24s., iPKKP? = 30m.29s., ePKP,PKP = 38m.23s., eSKP,PKP? = 41m.25s.  
 Calcutta iScSE = 22m.53s., isS?E = 23m.45s., eSSE = 27m.44s., eSSSE = 31m.0s.  
 Fresno iPP?Z = 15m.45s., eZ = 22m.48s., eN = 36m.16s., ePKPPK<sub>2</sub> = 38m.33s., eZ = 41m.46s., eN = 43m.46s.  
 Mineral eZ = 14m.29s., ePPP?Z = 17m.7s., ePKP,PKPZ = 38m.31s.  
 Irkutsk iSS = 28m.44s.  
 Pasadena iZ = 12m.28s., isP?Z = 13m.8s., iPPZ = 15m.48s., isPP?Z = 16m.38s., iPPP?Z = 17m.49s., iN = 22m.50s., eSP?Z = 23m.48s., eSSSN = 28m.32s., iPKP,PKPZ = 38m.39s.  
 Sitka ePP = 16m.36s., i = 18m.54s. and 23m.54s., eSS = 28m.40s.  
 College i = 12m.30s. and 15m.36s., ePP? = 16m.14s., isS = 23m.23s., iPS? = 23m.44s., eSS = 28m.26s., ePKKP = 30m.19s., eSSS? = 31m.56s., ePKP,PKP = 38m.8s., eSKP,PKP = 41m.53s.  
 Palomar iN = 13m.8s., iPPN = 15m.57s., iE = 16m.52s.  
 Tinemaha i = 12m.34s., iPPZ = 15m.59s., ePKP,PKPZ = 38m.28s.  
 Victoria S = 22m.49s., PS = 24m.9s., SS = 28m.54s.  
 Seattle iP? = 12m.41s., 12m.55s., and 13m.34s., ePP? = 16m.18s. and 16m.56s., ePPP? = 17m.56s., 18m.20s., and 18m.56s., eSKS? = 23m.9s., ePS? = 24m.22s., ePPS? = 24m.42s., eSS? = 29m.11s. and 30m.8s., and many other unidentified readings. Four shocks suggested.  
 Boulder City i = 12m.45s., eSKS = 23m.1s., ePKKP = 30m.11s., ePKP,PKP = 38m.24s.  
 Overton iZ = 12m.47s. and 16m.20s., iPKP,PKPZ = 38m.34s.,  
 Pierce Ferry i = 12m.48s., iPKKP = 30m.21s., ePKP,PKP = 37m.57s., eSKP,PKP = 41m.34s.  
 Tucson i = 12m.54s. and 13m.35s., iPPP = 16m.47s., iPS = 24m.46s., esPS? = 25m.33s., eSS = 29m.51s., ePKKP = 30m.15s., esSS = 30m.19s., eSSS = 33m.22s., ePKP,PKP = 38m.14s.  
 Kodaikanal SE = 23m.52s., PSE = 24m.52s., SSE = 29m.27s., SSSE = 33m.12s.  
 Salt Lake City eSKS = 23m.24s., e = 24m.29s., eSS = 30m.13s.  
 Logan iP = 13m.2s., ePKP,PKP = 38m.22s.  
 Hungry Horse iP = 13m.4s., i = 13m.44s., iPP? = 16m.16s., eS? = 23m.44s., iPKKP = 30m.10s., iPKP,PKP = 38m.21s., eSKP,PKP = 41m.47s.  
 Butte iSN = 24m.2s., ePS?N = 24m.57s., eN = 29m.35s.  
 Bozeman iS = 24m.37s., e = 25m.18s., esPS = 26m.20s.  
 Dehra Dun eN = 35m.40s. and 43m.46s.  
 New Delhi PSN = 25m.35s., PPSN = 26m.17s., SSN = 30m.38s., SSSN = 34m.23s., QN = 38.8m.  
 Poona SKKSE = 24m.1s., PSE = 26m.3s., PPSE = 26m.43s., SSE = 31m.11s., SSPE = 31m.21s.  
 Fergana ePP = 18m.7s., eS = 25m.22s., ePS = 27m.18s.  
 Lincoln eSE = 25m.34s., ePS?E = 27m.4s., eSS?E = 32m.10s., eSSS?E = 36m.54s.  
 Tashkent eSKKS = 25m.13s., eS = 25m.42s., iPS = 27m.33s.  
 Stalinabad PP = 18m.24s., SKKS = 25m.13s., iS = 25m.50s.  
 Resolute Bay PKP = 18m.13s., PP = 18m.58s., SKKS = 25m.16s., PS = 27m.35s., PPS = 28m.16s., PKKP = 29m.34s., SSE = 33m.13s.  
 St. Louis e = 26m.16s.  
 Chicago eSP = 28m.27s., eSS = 34m.7s., iSSS = 34m.25s.  
 Sverdlovsk PKP = 18m.22s., epPKP = 18m.52s., iSKKS = 25m.50s., iPS = 28m.17s., SS = 34m.17s., SSS = 38m.34s.  
 Tananarive SS = 34m.32s., SSS = 38m.22s.  
 Huancayo e = 22m.12s., eS = 27m.0s., iPS = 28m.53s., iSS = 35m.0s., e = 38m.58s.  
 La Plata PcSE = 24m.52s., SSE = 28m.40s., PSN = 28m.52s., L?N = 34m.58s., readings wrongly identified.  
 Cleveland iPKPEZ = 18m.29s., eSKPE = 20m.10s., eSE = 26m.16s., ePSN = 28m.8s. and 28m.15s., ePPSE = 29m.10s., ePPSN = 29m.15s., and other unidentified readings.  
 Columbia eSS? = 34m.54s.  
 La Paz iPPZ = 19m.42s., iZ = 20m.33s., iPKS = 22m.6s.?, iSKKS = 26m.34s., iPS = 29m.30s., iPPS = 31m.52s., iSS = 35m.56s., i = 36m.49s., iSSS = 40m.16s., Q = 49.3m.  
 Chinchina ePKP<sub>2</sub> = 19m.56s., ePPSEN = 30m.22s., eSSSEN = 39m.38s., eEN = 48m.34s.  
 Pennsylvania iPSN = 30m.22s., iSSE = 36m.13s., iPKP,PKPE = 37m.35s., and other unidentified readings.  
 Grahamstown iPPP? = 22m.1s., iPKKP = 28m.53s.  
 Bogota ePKPEN = 18m.43s., eEN = 34m.55s.  
 Galerazamba ePKPEN = 20m.36s., eSSN = 46m.41s., eSSSEN = 50m.11s.  
 Washington e = 21m.56s. and 32m.3s.  
 Ottawa i = 18m.35s., e = 19m.17s., PPPZ = 21m.57s., PS = 29m.29s., SS = 36m.4s.  
 Philadelphia eS = 27m.38s., epS = 28m.7s., e = 33m.59s., iSSS? = 41m.27s.  
 Palisades iSS = 36m.35s.  
 Vermont eSKKS? = 26m.50s., eSS = 36m.30s., e = 47m.20s.  
 Seven Falls eE = 26m.23s.  
 Harvard e = 20m.56s. and 28m.33s., ePS = 30m.49s., iPPS = 32m.27s., e = 32m.58s., 36m.0s., and 37m.8s., eSS = 37m.51s., e = 38m.16s., eScS,ScS? = 41m.4s., eSSS = 41m.55s.  
 Weston iSS = 37m.6s.

*Continued on next page.*

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Pretoria iZ = 18m.43s?, eZ = 19m.8s.?, iZ = 21m.3s.?, ePPP?Z = 22m.8s.?.  
Tiflis iSKKS = 27m.15s.  
Moscow iPP = 20m.29s., iSKKS = 27m.15s.  
Scoresby Sund 23m.20s., PS = 30m.17s., 35m.56s.  
Piatigorsk iPPP = 23m.34s., SKKS = 27m.29s.  
Pulkovo SKKS = 27m.20s., IPS = 30m.18s.  
Helsinki eE = 22m.58s., eSKKS = 27m.32s.  
Halifax SS = 37m.46s.  
San Juan i = 19m.59s., iPKS = 22m.11s., e = 23m.6s., eSS = 38m.25s., e = 41m.46s.  
Upsala iPKS = 22m.16s., isPKS = 22m.52s., eSKSP = 31m.0s., ePSN = 31m.29s.,  
ePPS? = 33m.16s., iSS?E = 38m.4s., eSS?N = 38m.7s., eSSS?N = 43m.52s., and  
numerous unidentified readings.  
Bermuda e = 32m.7s.  
Bergen e = 23m.17s., PPSN = 33m.5s., eE = 34m.23s., 40m.5s., and 41m.6s.  
Warsaw iPKP?Z = 19m.7s., ePKP,?Z = 19m.12s., ePPE = 21m.43s., iSKPZ = 22m.22s.,  
iSKPEN = 22m.35s., ePPNZ = 24m.41s., ePPE = 24m.44s., SKKSZ = 28m.20s.,  
iSKKSE = 28m.29s., iPKKSZ = 31m.33s., ePPSZ = 33m.39s., eSSN = 39m.21s.,  
eSSSE = 44m.39s., and many unidentified readings.  
Copenhagen i = 19m.6s., 22m.39s., 23m.18s., 25m.9s., 28m.24s., 34m.46s.  
Bucharest ePKPEN = 19m.13s., iZ = 22m.23s., iSE = 28m.32s., ePSN = 28m.56s.  
Skalnate Pleso eSKP = 22m.42s., eSKKS = 28m.34s., eSKSP? = 31m.46s., ePS? =  
33m.1s., ePPS = 34m.9s., eSS = 39m.27s., eSSS = 44m.16s., and other unidentified  
e readings.  
Helwan PPE = 22m.31s., PPSN = 23m.10s., eN = 30m.16s.  
Raciborzu ePKPZ = 16m.41s., ePPE = 22m.4s., ePPNZ = 22m.34s.  
Aberdeen iEN = 19m.28s., iSKPEN = 22m.33s., iEN = 23m.36s., iN = 32m.13s., iEN =  
35m.29s., iSSN = 39m.50s.  
Potsdam iPKPZ = 19m.10s., iPKPNZ = 19m.13s., iPPZ = 21m.53s., iPPEN = 21m.59s.,  
iPPPZ = 22m.32s., iPPN = 22m.35s., iPPE = 22m.40s., iPKSEN = 22m.49s.,  
iPSKN = 26m.49s., iPSKSE = 26m.54s., iSKKSEN = 28m.39s.?, iSKKPN =  
31m.31s., iSKKPZ = 31m.35s., iSPPZ = 33m.52s., eSSSE = 40m.34s., eSSSE =  
45m.10s., and other unidentified readings.  
Timisoara eSKS?E = 28m.46s.?.  
Collmberg iPKP,Z = 19m.12s., iPP = 22m.45s., ePP?Z = 23m.40s., ePPSN = 34m.46s.?,  
eSSN = 41m.52s., eSSN = 45m.46s., and other unidentified e readings.  
Budapest iE = 19m.14s., iEN = 28m.46s., ePPSE = 31m.50s., eN = 34m.19s., eSSSE =  
39m.57s., eN = 40m.54s.  
Ogyalla iSKP = 22m.39s., ePPP = 25m.10s., eSKKS = 28m.42s., eSKSP = 32m.20s.,  
ePS = 33m.22s., ePPSN = 34m.15s., ePPSE = 34m.27s., eSS = 40m.9s., eSSS =  
45m.40s.  
Prague iPKP,NZ = 19m.14s., iPKP,E = 19m.17s., iSKP = 22m.41s., ePPP = 25m.14s.,  
eSKKSP = 32m.32s., ePS = 33m.2s., ePPS = 34m.1s., eSS = 40m.16s., eSSS =  
45m.34s., and many other unidentified e readings.  
Kalossa eN = 19m.25s., PKSE = 22m.53s., eE = 31m.59s., ePSN = 32m.19s., ePSE =  
32m.22s., eSSN = 40m.9s.,  
Vienna ePKS = 23m.40s.  
Belgrade i = 22m.48s., e = 34m.10s. and 41m.45s.  
Jena ePPNZ = 22m.6s., ePPE = 22m.10s., ePP?N = 22m.50s., ePP?E = 22m.53s.,  
ePPP?E = 24m.6s., and many unidentified e readings.  
Durham iN = 19m.29s. and 23m.46s.  
De Bilt iPP = 22m.16s., iPPP = 22m.57s., iPPP = 25m.46s., eSS = 40m.31s., eSSS =  
45m.46s.?.  
Rathfarnham Castle eZ = 20m.48s., ePP = 22m.15s., iPKS? = 22m.56s., eEN = 24m.27s.,  
33m.6s., and 36m.19s., eSSN = 43m.16s.  
Stuttgart iPKP = 19m.16s., iZ = 19m.20s., i = 19m.24s., ePP = 22m.17s., eSKP =  
22m.58s., eSKKS = 29m.2s., eSKKS? = 29m.26s., ePS = 34m.16s., e = 36m.16s.,  
eSS = 41m.40s., eL? = 56.7m.  
Triest iPKS = 22m.59s., iPKKS = 31m.12s., iSS = 40m.48s.  
Kew isPKP?Z = 21m.3s., iPP = 22m.29s., iPKS = 23m.1s., ePPP = 25m.51s., ePS? =  
34m.2s., eSS = 41m.46s.  
Strasbourg i = 19m.18s., iPP = 22m.27s., iPPP = 23m.5s., e = 28m.20s., iSKKS = 29m.9s.,  
i = 29m.22s., e = 30m.40s. and 30m.48s., ePS = 34m.39s., iSS = 40m.48s.  
Zürich ePP = 22m.30s.  
Basle ePP = 22m.31s.  
Taranto e = 24m.15s. and 28m.13s., ePSKS = 33m.25s., e = 37m.45s.  
Salo iZ = 19m.23s., 19m.28s., and 20m.36s., eSKP = 22m.47s., e = 31m.35s.  
Padova SKP = 23m.0s.  
Paris iPKP = 19m.19s., iPP = 22m.35s., iPPP = 23m.5s., iSKKS = 29m.18s., ePS =  
33m.26s., ePPS? = 35m.20s., eSS = 41m.11s., and other unidentified readings.  
Bologna e = 21m.54s.  
Pavia e = 24m.6s. and 30m.10s.  
Jersey eE = 19m.46s.  
Rome i = 19m.25s. and 20m.7s., ePP = 22m.20s., ePSKS = 32m.50s., ePPS = 35m.46s.?,  
eSS = 42m.0s.  
Messina i = 19m.33s., ePP? = 22m.39s., ePSKS = 33m.9s.  
Clermont-Ferrand i = 19m.28s., 20m.20s., 21m.22s., 23m.47s., and 24m.46s.  
Tortosa iPKP,EN = 19m.44s., iEN = 24m.11s., PPP?N = 26m.40s., iN = 30m.44s.,  
iE = 31m.3s., PPSE = 36m.0s., SSN = 42m.27s., SSSN = 48m.4s.

Continued on next page.

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Toledo iZ = 20m.39s., PPZ = 23m.21s., PPPN = 26m.46s., SSN = 43m.1s., SSPEN = 43m.46s., SSSN = 48m.46s.  
 Algiers Univ. iZ = 19m.48s. and 20m.59s., iPPZ = 23m.38s., ePPPZ = 27m.20s., eSKSP?Z = 33m.37s.  
 Alicante PP = 23m.40s., PPP = 27m.14s., SKKS = 30m.20s., SKSP = 33m.36s., SS = 42m.56s., SSP = 42m.59s., SSS = 49m.2s., Q = 63m.8s.  
 Lisbon PKP,E = 20m.17s., PPNZ = 23m.46s., iPPZ = 23m.50s., E = 24m.59s., N = 37m.34s., SSP = 44m.10s.  
 Granada sPKP = 20m.36s., iPP = 23m.27s., sPP = 24m.24s., iSKS = 25m.48s., pPPP = 27m.24s., SKSP = 32m.24s., pPPS = 38m.10s., iSS = 44m.0s., SSS = 47m.51s., Q = 64.9m.  
 Malaga iPP?Z = 23m.50s., QZ = 68m.26s.  
 Tamanrasset iZ = 19m.50s., eZ = 20m.27s., iPPZ = 24m.19s., ePPPZ = 27m.59s., eSKKSZ = 30m.43s.

Sept. 10d. Readings also at 0h. (Garm), 1h. (near Garm (2)), 2h. (near Leninakan), 3h. (La Paz, Strasbourg and Tamanrasset), 4h. (College and near Garm), 5h. (Overton, Stuttgart, near Strasbourg and near Garm), 6h. (Hungry Horse, Shasta Dam, Mineral, Fresno, Lick, Reno, Tinemaha, Boulder City, Overton, Pierce Ferry, Tucson, Logan, Collmberg, Stuttgart, Tamanrasset, and Pretoria), 7h. (New Delhi, Tortosa and near Alicante (2)), 8h. (Tamanrasset, College, Hungry Horse and near Obi-garm), 12h. (College, Huancayo, Tananarive and Granada), 13h. (Granada), 14h. (Brisbane, La Paz, College, Shasta Dam, Lick, Mount Wilson, Tinemaha, Boulder City, Overton, Pierce Ferry, Tucson, and Tamanrasset), 15h. (Seattle), 16h. (Tucson, near Garm (2), and near Reykjavik), 18h. (College, Kulyab, near Obi-garm and near Garm), 19h. (Overton, Fergana, Kulyab, Stalinabad, Samarkand, near Garm, Obi-garm, Andijan, Murgab, near Reykjavik and near Santa Clara), 20h. (near Seattle), 21h. (near Garm and Obi-garm), 22h. (near Balboa Heights).

Sept. 11d. 0h. 18m. 22s. Epicentre 26°·8N., 95°·0E. (as on 1950 Aug. 26d.).

A = -·0779, B = +·8904, C = +·4485;  $\delta = +3$ ;  $h = +3$ ;  
 D = +·996, E = +·087; G = -·039, H = +·447, K = -·894.

		$\Delta$	Az.	P.	O - C.	S.	O - C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Calcutta	E.	7.4	236	—	—	e 3 30	+12	—	—
New Delhi	N.	15.9	281	e 3 46	- 1	e 6 36	- 8	6 57	SS
Przhevalsk		20.7	323	i 4 41	- 3	e 8 18	-13	—	—
Murgab		21.1	308	4 45	- 3	8 27	-12	—	—
Poona	E.	21.2	251	5 2	+13	8 58	+17	9 48	SSS
Nanking		21.4	70	4 52	+ 1	—	—	—	—
Naryn		21.4	317	e 4 47	- 4	—	—	—	—
Bombay		21.9	253	e 5 8	+11	e 9 10	+16	—	—
Almata		22.0	323	i 4 53	- 5	i 8 47	- 9	—	i 11.7
Frunse		23.1	318	e 5 6	- 2	i 9 12	- 4	—	—
Andijan		23.3	312	e 5 9	- 1	i 9 13	- 7	—	—
Fergana		23.5	312	e 5 9	- 3	e 9 16	- 7	—	—
Zi-ka-wei	z.	23.5	72	i 5 15	+ 3	e 9 30	+ 7	—	—
Garm		24.0	307	e 5 14	- 3	—	—	—	—
Kulyab		24.0	303	5 16	- 1	9 26	- 6	—	—
Stalinabad		24.9	306	i 5 24	- 2	—	—	—	—
Tashkent		25.6	311	e 5 32	0	e 9 50	- 9	—	—
Irkutsk		26.4	11	e 5 35	- 5	e 9 42	-30	—	—
Samarkand		26.6	305	e 5 43	+ 1	—	—	—	—
Kizyl-Arvat		34.5	302	e 6 53	+ 1	—	—	—	—
Sverdlovsk		38.7	330	i 7 24	- 3	13 14	-11	—	—
Gori		44.0	303	e 8 14?	+ 3	—	—	—	—
Borzhom		44.5	303	e 8 15	0	—	—	—	—
Moscow		50.0	322	i 8 56	- 2	e 15 59	-10	—	—
Ksara		50.9	292	e 9 0?	- 5	e 16 16	- 5	—	—
Prague		64.1	315	e 11 37	+59	—	—	e 11 53	?
Copenhagen		64.2	322	i 10 38	- 1	—	—	—	—
Potsdam		64.5	318	e 10 40	- 1	—	—	—	—
Collmberg	z.	64.7	316	e 10 40k	- 2	—	—	—	35.6
Jena	E.	65.7	316	e 10 47	- 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.
Stuttgart		67.7	315	i 11 1k	0	—	—	—	e 37.6
Strasbourg		68.7	315	i 11 7	0	e 20 2	- 8	e 11 32	—
De Bilt		69.2	319	e 11 12	+ 2	e 20 13	- 3	—	e 36.6
Paris		71.9	316	i 11 27	0	—	—	—	e 43.6
Algiers Univ.	z.	75.9	304	e 11 51	+ 1	—	—	—	—
College		76.6	23	e 11 52	- 2	—	—	—	—
Tamanrasset	z.	79.6	290	e 12 15	+ 5	—	—	e 15 15	PP
Pretoria	z.	82.9	236	i 12 45	+17	—	—	—	—
Pietermaritzburg	z.	83.5	232	e 12 42	+11	—	—	—	—
Hungry Horse		100.8	18	e 13 56	+ 4	—	—	—	—
Overton	z.	111.2	24	e 19 12	PP	—	—	—	—
Pierce Ferry		111.7	24	e 19 10	PP	—	—	i 19 16	PP

Additional readings :—

Calcutta iE = 4m.25s.

Bombay eEN = 6m.46s.

Strasbourg e = 11m.21s. and 14m.7s.

Tamanrasset eZ = 12m.27s., 13m.7s., 14m.5s., and 18m.14s.

Long waves were also recorded at Dehra Dun, Resolute Bay, Granada and Kow.

Sept. 11d. 9h. 39m. 47s. Epicentre 29°·2N. 95°·1E. (as on 10d.).

A = -·0777, B = +·8709, C = +·4853;  $\delta$  = +2; h = +2;  
D = +·996, E = +·089; G = -·043, H = +·483, K = -·874.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Dehra Dun	N.	14.9	279	e 7 43	Q	e 9 43	?	—	—
Przhevalsk		18.9	320	i 4 28	+ 4	—	—	—	—
Murgab		19.8	304	4 31	- 4	8 4	- 9	—	—
Naryn		19.8	315	i 4 34	- 1	—	—	—	—
Almata		20.2	320	i 4 43	+ 4	i 8 29	+ 8	—	—
Nanking		20.6	75	4 52	+ 9	8 46	+17	9 25	Q 10.8
Frunse		21.4	315	i 4 52	+ 1	e 8 46	+ 1	—	—
Fergana		22.1	308	i 4 58	- 1	e 8 56	- 2	—	—
Poona	E.	22.1	246	4 52	- 7	8 38	-20	9 12	SS 8.8
Bombay		22.8	249	e 4 58	- 7	e 8 52	-19	9 2	Q 10.0
Kulyab		22.8	299	e 5 2	- 3	e 9 7	- 4	—	—
Zi-ka-wei	z.	22.9	78	e 5 23	+17	—	—	—	—
Stalinabad		23.6	301	i 5 12	- 1	i 9 22	- 3	—	—
Irkutsk		24.0	13	5 27	+10	—	—	—	—
Tashkent		24.2	307	i 5 17	- 2	—	—	—	—
Tchimkent		24.4	310	i 5 21	0	—	—	—	—
Kodaikanal	E.	25.1	226	—	—	e 9 42	- 9	—	—
Samarkand		25.3	302	e 5 28	- 2	—	—	—	—
Kizyl-Arvat		33.4	299	e 7 1	+19	—	—	—	—
Sverdlovsk		36.7	329	i 7 15	+ 5	12 57	+ 3	—	—
Grozny		41.6	304	e 8 5?	+14	—	—	e 10 15	PPP
Tiflis		42.3	302	7 56	- 1	—	—	—	—
Gori		42.8	302	e 7 57	- 4	—	—	—	—
Leninakan		43.0	300	e 7 56	- 7	—	—	—	—
Borzhomi		43.4	302	e 8 2	- 4	—	—	—	—
Abastumanj		43.8	302	e 8 3	- 6	—	—	—	—
Yalta		50.0	305	e 8 56	- 2	—	—	—	—
Ksara		50.1	291	i 8 58	- 1	16 19?	+ 9	—	—
Pulkovo		52.6	325	i 9 19	+ 1	e 16 43	- 1	—	—
Istanbul		54.1	302	e 9 25	- 4	—	—	—	—
Helwan	N.	54.8	288	—	—	e 17 5	- 9	—	—
Prague		62.5	315	i 9 26	-62	—	—	e 11 41	PcP
Potsdam		62.8	318	e 10 27	- 3	—	—	—	e 33.2
Collmborg	z.	63.1	316	e 10 40	+ 8	—	—	—	—
Jena	N.	64.0	316	e 10 37	- 1	e 19 27	+14	—	—

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		$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.
		°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.
Triest	z.	64.0	310	i 10	34	- 4	—	—	—	—	—	—
Stuttgart		66.1	314	i 10	49 <sub>a</sub>	- 2	e 19	33	- 6	—	—	e 38.2
Zürich		66.9	313	e 10	53	- 3	—	—	—	—	—	—
Strasbourg		67.1	315	e 10	55 <sub>a</sub>	- 2	—	—	—	e 12	44	PP
De Bilt		67.5	319	e 11	2	+ 2	—	—	—	—	—	e 35.2
Paris		70.3	316	i 11	17	0	e 20	28?	- 1	e 15	37	PPP
Kew		70.9	319	e 11	19	- 2	—	—	—	—	—	e 41.2
Rathfarnham Castle		73.5	323	e 11	33	- 3	—	—	—	—	—	e 40.2
College		74.4	23	e 11	46	+ 4	e 21	27	+11	—	—	e 40.2
Algiers Univ.	z.	74.7	304	e 11	41	- 2	—	—	—	e 14	32	PP
Tamanrasset	z.	78.9	290	i 12	4 <sub>a</sub>	- 3	—	—	—	i 12	13	P <sub>c</sub> P
Pretoria	z.	84.3	236	e 12	30	- 5	—	—	—	—	—	—
Pietermaritzburg	z.	85.0	232	e 12	40	+ 2	—	—	—	—	—	—
Hungry Horse		98.5	19	e 13	52	+10	—	—	—	e 17	47	PP
Shasta Dam		102.3	28	e 18	6	PKP	—	—	—	—	—	—
Tinemaha	z.	107.1	27	e 18	51	PP	—	—	—	—	—	—
Overton	z.	109.0	24	e 19	6	PP	—	—	—	—	—	—
Mount Wilson	z.	109.5	28	e 19	5	PP	—	—	—	—	—	—
Pierce Ferry		109.5	24	e 19	11	PP	—	—	—	—	—	—
Tucson		114.1	24	e 19	31	PP	—	—	—	—	—	—

Additional readings :—

Poona SSSE = 9m.23s.

Jena eN = 10m.47s.

Triest eZ = 11m.32s.

Paris e = 11m.25s.

Algiers Univ. eZ = 12m.38s.

Tamanrasset eZ = 13m.43s., ePPZ = 15m.2s., eZ = 16m.31s.

Long waves were also recorded at Butte, Resolute Bay and other European stations.

Sept. 11d. Readings also at 0h. (Haiwee, Palomar, Pasadena (2), Riverside, Tinemaha, Tucson, Overton, Pierce Ferry, Manzanillo, Vera Cruz, near Guadalajara, Puebla, Tacubaya, near Garm and Kulyab), 1h. (Tucson, Overton (2), Pierce Ferry, Shasta Dam, Hungry Horse, College (3), Strasbourg, Stuttgart, Tamanrasset, near Athens (2) and near Apia), 2h. (Alicante, Granada and College), 4h. (College, near Manzanillo, near Garm (2) and near Istanbul), 5h. (Overton, Pierce Ferry, College and near Garm), 7h. (Guadalajara, Puebla, Manzanillo, and near Tacubaya), 8h. (near Garm), 9h. (Poona), 10h. (near Garm), 11h. (Tamanrasset, near Ashkabad and Kizyl-Arvat), 13h. (Overton), 14h. (Bogota), 15h. (Granada), 16h. (near Rome), 17h. (near Garm and near Mizusawa), 19h. (Fergana, Garm, Murgab, Obi-Garm, near Andijan, Kulyab, Stalinabad, near Santa Clara and near La Paz), 20h. (Huancayo (2)), 21h. (Boulder City), 22h. (Tamanrasset), 23h. (near Garm).

Sept. 12d. 6h. 16m. 12s. Epicentre 36°·2N. 73°·0E.

A = +·2365, B = +·7735, C = +·5880;  $\delta = -2$ ;  $h = 0$ ;

D = +·956, E = -·292; G = +·172, H = +·562, K = -·809.

	$\Delta$	Az.	P.		O-C.	S.		O-C.
	°	°	m.	s.	s.	m.	s.	s.
Murgab	2.3	19	0	40	0	1	17	S <sub>g</sub>
Kulyab	3.1	304	0	52	+ 1	1	47	S <sub>g</sub>
Garm	3.5	323	e 0	58	+ 1	2	1	S <sub>g</sub>
Obi-garm	3.6	315	1	1	+ 3	—	—	—
Stalinabad	4.1	306	1	5	0	2	20	S <sub>g</sub>
Fergana	4.3	347	1	9	+ 1	—	—	—
Andijan	4.6	354	1	13	+ 1	e 2	40	S <sub>g</sub>
Naryn	5.7	23	1	28	0	e 2	50	S <sub>g</sub> *
Samarkand	5.9	308	e 1	32	+ 1	2	42	+ 2
Tashkent	5.9	332	e 1	29	- 2	e 2	39	- 1
Tchimkent	6.6	338	1	41	0	—	—	—
Frunse	6.8	10	1	43	- 1	3	3	0
Przhevalsk	7.6	32	e 1	49	- 6	—	—	—
Almata	7.7	22	1	53	- 3	4	18	S <sub>g</sub>
Sverdlovsk	22.3	342	i 4	56	- 5	—	—	—

Long waves were also recorded at Dehra Dun, Bombay and Poona.



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Sept. 12d. 20h. 31m. 34s. Epicentre 28°·7N. 96°·6E. (as on 4d.).

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Calcutta	E.	9·7	232	e 4 8	S	(e 4 8)	- 7	—	(e 5·0)
New Delhi	E.	17·0	274	e 3 54	- 7	e 6 43	-27	4 5	PP
Przhevalsk		20·2	317	e 4 41	+ 2	—	—	—	—
Murgab		21·2	303	4 47	- 2	8 33	- 8	—	—
Almata		21·5	319	e 4 55	+ 3	e 8 48	+ 1	—	—
Frunse		22·7	314	e 5 7	+ 3	e 9 13	+ 4	—	—
Poona	E.	23·1	249	5 2	- 6	8 58	-18	9 36	SS
Andijan		23·2	307	e 5 10	+ 1	e 9 19	+ 1	—	—
Fergana		23·5	307	e 5 12?	0	e 9 18?	- 5	—	—
Irkutsk		24·2	11	e 5 36?	+17	—	—	—	—
Kulyab		24·2	300	e 5 21	+ 2	—	—	—	—
Stalinabad		25·1	301	e 5 28	0	e 9 47	- 4	—	—
Tashkent		25·5	307	i 5 34	+ 2	e 9 57	0	—	—
Samarkand		26·7	302	e 5 36	- 7	—	—	—	—
Sverdlovsk		37·8	328	i 7 27	+ 7	e 13 11	0	—	—
Collmberg	Z.	64·3	317	e 10 44	+ 5	—	—	—	—
Stuttgart	Z.	67·4	315	e 10 58	- 1	—	—	—	—
College		74·3	24	e 11 51	+10	—	—	—	—
Tamanrasset	Z.	80·6	291	i 12 14k	- 2	—	—	—	—
Pretoria	Z.	85·1	238	—	—	e 32 2	SSS	—	—

Additional readings and note :—

Calcutta gives S as P and L as S.

New Delhi PPPE = 4m.23s., QE = 6m.37s., SSE = 6m.57s., SSSE = 7m.8s.

Poona QE = 9m.18s., SSSE = 9m.54s.

Stuttgart eZ = 11m.3s.

Long waves were also recorded at Nanking, Potsdam and De Bilt.

Sept. 12d. Readings also at 0h. (Collmberg), 1h. (Mount Wilson, Tinemaha, Tucson, Pierce Ferry, Shasta Dam, Hungry Horse, College, Pretoria, Garm, Kulyab, Tashkent, Tchimkent, near Almata, Andijan, Fergana, Frunse, Murgab, Naryn, and Przhevalsk), 2h. (Collmberg, Paris, Strasbourg (3), Stuttgart, Tamanrasset, Palisades, Wellington, and near Seattle), 3h. (Collmberg, Istanbul, Nanking, Manila, and Vladivostok), 4h. (Collmberg, Paris, Potsdam, Istanbul, Sverdlovsk, Shasta Dam, Hungry Horse, College and near Santa Clara), 5h. (La Paz, Tamanrasset, Algiers Univ., Kew, Stuttgart, and near Garm), 6h. (Rome, Paris, Alicante, Algiers Univ. and Tamanrasset), 9h. (Tucson, Overton, Pierce Ferry, Shasta Dam, Hungry Horse, College and near Garm), 10h. (La Paz), 11h. (Brisbane, Pasadena, Riverside, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, College, and Stuttgart), 12h. (Chicago, Rapid City and near Garm), 13h. (Overton, near Garm, near Huancayo and near Fort de France), 17h. (Overton, Pierce Ferry and near Obi-garm), 19h. (Ksara and near Garm), 20h. (College, Tamanrasset, Collmberg, Stuttgart, Gori, near Borzhomi, Leninakan, Tiflis, near Samarkand and Stalinabad), 23h. (Tamanrasset (2), and near Fergana).

Sept. 13d. 0h. 3m. 5s. Epicentre 23°·5N. 103°·0E.

A = -2065, B = +·8945, C = +·3965;  $\delta$  = -2;  $h$  = +4;  
D = +·974, E = +·225; G = -·089, H = +·386, K = -·918.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Calcutta	E.	13·6	269	e 4 50	?	i 5 55	+ 5	—	—
Nanking		16·4	55	3 48	- 5	6 54	- 2	14 10	PP
Zi-ka-wei	Z.	18·1	60	e 4 17	+ 3	i 7 50	+15	—	—
Dehra Dun	N.	23·2	293	e 5 14	+ 5	e 9 30	+12	10 26	SS
Poona	E.	27·6	266	5 47	- 4	10 34	+ 2	—	—
Przhevalsk		27·8	321	e 5 52	- 1	—	—	—	—
Bombay	E.	28·5	267	—	—	e 10 21	-25	—	e 12·8
Murgab		28·9	309	6 0	- 3	10 52	- 1	—	—
Almata		29·2	320	e 6 5	0	—	—	—	—
Frunse		30·4	317	e 6 16	0	e 11 24	+ 8	—	—
Andijan		30·9	311	e 6 21	+ 1	—	—	—	—
Vladivostok		30·9	44	e 6 17	- 3	—	—	—	—
Fergana		31·2	311	e 6 20	- 3	—	—	—	—
Kulyab		31·8	305	e 6 31	+ 3	e 11 45	+ 7	—	—
Stalinabad		32·7	307	i 6 35	- 1	e 11 51	- 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.
Tashkent		33.3	311	e 6 39	- 2	e 12 2	0	—	—
Samarkand		34.4	307	e 6 51	0	—	—	—	—
Mary		37.8	303	e 7 21	+ 1	—	—	—	—
Sverdlovsk		45.2	330	i 8 20	0	15 0	- 1	—	—
Baku		47.4	305	e 8 42?	+ 4	—	—	—	—
Tiflis		51.3	306	e 9 6	- 2	—	—	—	—
Gori		51.8	306	e 9 12	0	—	—	—	—
Borzhomi		52.4	306	e 9 14	- 2	—	—	—	—
Moscow		57.1	323	e 9 50	0	e 17 43	- 2	—	—
Ksara		58.9	296	e 10 1	- 2	e 20 14	S <sub>c</sub> S	—	—
Pulkovo		61.3	328	e 10 16	- 4	e 18 38	- 1	—	—
Istanbul		63.2	306	e 10 31	- 1	e 19 7	+ 4	—	—
Warsaw		67.0	320	—	—	e 27 14	SSS	—	e 34.9
Potsdam		71.7	321	e 11 28	+ 2	e 29 1	SSS	—	e 34.9
Collmberg		72.0	319	e 11 26	- 2	—	—	e 14 9	PP e 40.9
Jena	E.	73.0	319	e 11 32	- 1	—	—	—	—
Rome		75.1	310	—	—	25 55?	SS	—	e 36.9
Stuttgart		75.1	318	e 11 44	- 2	e 21 19	- 5	e 29 37	SSS e 39.9
Zürich		76.0	317	e 11 49 <sub>a</sub>	- 2	—	—	—	—
Strasbourg		76.1	318	e 11 52	+ 1	—	—	e 29 55	SSS e 38.9
College		76.7	24	e 11 54	- 1	—	—	—	e 37.4
Paris		79.2	320	e 12 9	+ 1	—	—	—	e 45.9
Kew		79.8	322	—	—	e 31 33	?	—	e 41.9
Algiers Univ.	z.	83.7	307	e 12 31	- 1	—	—	—	—
Pretoria	z.	87.4	241	e 12 51	+ 1	—	—	—	—
Tamanrasset	z.	87.6	294	e 12 51	0	—	—	e 16 10	PP
Granada		88.3	311	i 19 17	?	i 22 59	?	—	50.0
Overton	z.	110.6	32	e 19 15	PP	—	—	—	—

Additional readings :—

Nanking iZ=4m.42s., i=7m.7s.

Dehra Dun SSSN=10m.41s.

Poona PZ=5m.54s.

Stuttgart e=15m.19s.

Algiers Univ. eZ=12m.39s. and 12m.45s.

Tamanrasset ePPPZ=18m.17s.

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

Sept. 13d. 11h. 7m. 27s. Epicentre 27°·5N. 96°·4E. (as on 1950 August 31d.).

Intensity VII at Gauhati, V at Tezpur and Dibrugarh. Seismo. Bull., Sept. 1950. Gov. India, p.10 and p.26.

A = -·0990, B = +·8828, C = +·4593;  $\delta$  = +9;  $h$  = +3;  
D = +·994, E = +·111; G = -·051, H = +·456, K = -·888.

		$\Delta$ °	Az. °	P. m. s.	O-C. s.	S. m. s.	O-C. s.	Supp. m. s.	L. m.
Calcutta	N.	8.8	237	e 2 11	0	i 3 38	-15	i 4 23	S*
Dehra Dun	N.	16.3	285	e 7 5	S	(e 7 5)	+12	—	—
New Delhi	N.	17.0	278	e 3 45	-16	6 36	-34	4 10	P
Nanking		20.0	71	4 57 <sub>a</sub>	+20	i 8 46	+29	—	—
Przhevalsk		20.9	320	i 4 47	+ 1	e 8 27?	- 8	—	—
Murgab		21.7	305	4 52	- 3	8 42	- 9	—	—
Naryn		21.7	305	i 4 55	0	e 8 42	- 9	—	—
Almata		22.3	320	i 5 0	- 1	i 8 58	- 4	—	—
Poona	E.	22.5	252	i 5 0	- 2	8 54	-11	5 22	PP
Bombay		23.3	253	e 5 10	0	i 9 12	- 8	5 34	PP
Frunse		23.4	316	i 5 12	+ 1	i 9 22	+ 1	—	—
Andijan		23.8	309	e 5 14	- 1	i 9 25	- 3	—	—
Fergana		24.0	309	i 5 16	- 1	e 9 26	- 6	—	—
Kulyab		24.6	302	e 5 22	- 1	e 9 36	- 6	—	—
Kodaikanal	E.	24.8	230	e 6 6	PP	9 38	- 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.
Irkutsk	25.5	10	e 5 44?	+12	—	—	—	—
Stalinabad	25.6	303	i 5 29	- 3	e 9 46	-13	—	—
Colombo	25.8	221	10 2	S	(10 2)	0	—	(15.7)
Tashkent	26.1	309	e 5 37	0	i 10 1	- 6	—	—
Samarkand	27.2	304	e 5 47	0	—	—	—	—
Ashkabad	33.5	298	e 6 44	+ 1	11 56	- 9	—	—
Kizyl-Arvat	35.2	301	e 6 59	+ 1	—	—	—	—
Sverdlovsk	38.7	329	7 31	+ 4	13 22	- 3	—	—
Baku	40.2	302	—	—	i 13 42	- 6	—	—
Grozny	43.5	305	e 8 7	0	e 14 30	- 6	—	—
Tiflis	44.1	303	e 8 12	0	—	—	—	—
Borzhomi	45.2	303	e 8 21	+ 1	—	—	—	—
Sotchi	47.9	306	e 8 40	- 2	—	—	—	—
Moscow	50.3	321	e 8 59?	- 1	e 16 7	- 6	—	—
Ksara	51.8	293	e 9 12	0	e 16 30	- 3	—	—
Yalta	51.9	307	9 11	- 1	16 27	- 8	—	—
Pulkovo	54.7	326	i 9 36	+ 3	e 17 9	- 4	—	—
Istanbul	56.0	303	e 9 42	- 1	e 17 22	- 8	—	—
Helwan	56.4	289	—	—	e 17 25	-11	—	—
Bucharest	57.7	308	e 5 3	?	e 17 51	- 2	—	32.6
Warsaw	60.0	317	—	—	e 18 20	- 3	e 20 8	ScS e 29.6
Skalnate Pleso	60.9	314	e 11 47	PP	e 18 33	- 1	e 14 16	PPP e 32.0
Upsala	61.1	326	—	—	e 18 32?	- 5	e 26 14	SSS e 31.6
Belgrade	61.6	308	e 13 8k	PP	e 18 25	-18	e 20 42	ScS e 34.8
Budapest	62.0	312	—	—	e 16 33?	?	—	e 35.6
Prague	64.5	315	e 10 47	+ 6	e 19 16	- 3	—	— e 30.6
Potsdam	64.8	318	e 10 39	- 4	e 19 19	- 4	e 28 33	Q e 33.6
Collmberg	65.1	316	e 10 51?	+ 6	e 34 33?	L	—	(e 34.6)
Jena	66.0	316	e 10 53?	+ 3	—	—	—	—
Triest	66.0	311	e 11 49	+59	e 19 27?	-11	e 25 41	SSP —
Rome	67.9	307	—	—	e 19 51	-10	e 23 57	SS 35.6
Stuttgart	68.1	315	e 11 4	0	e 19 55	- 8	e 11 18	PcP e 36.6
Strasbourg	69.1	315	e 11 13	+ 3	e 20 9	- 6	e 24 40	SS e 34.6
De Bilt	69.5	319	—	—	e 20 9	-11	—	e 35.6
Aberdeen	71.7	326	i 15 55	PPP	i 20 12	-33	i 28 28	SSS e 36.7
Paris	72.3	316	e 11 22?	- 7	e 29 11	SSS	e 11 56	PcP e 36.6
Kew	72.9	320	e 17 0	?	—	—	—	e 37.6
College	75.5	23	e 11 59	+11	e 30 32	SSS	e 12 49	PcP e 41.4
Rathfarnham Castle	75.5	323	e 17 3	?	—	—	—	e 35.6
Algiers Univ.	z. 76.6	304	e 11 55	+ 1	—	—	—	—
Toledo	z. 80.2	310	e 12 17	+ 3	—	—	—	—
Tamanrasset	z. 80.5	291	e 12 17	+ 2	e 12 26	PcP	e 15 22	PP —
Granada	81.2	308	—	—	22 47	+18	27 3	SS 39.6
Pretoria	z. 84.3	237	e 12 37	+ 2	—	—	—	—
Pietermaritzburg	z. 84.9	233	e 13 14	+36	—	—	—	—
Overton	Z. 110.0	26	e 19 24	PP	—	—	—	—
Pierce Ferry	110.5	25	e 19 14	PP	—	—	—	—

Additional readings :—

Calcutta eS\*N=4m.4s.  
 Dehra Dun eS?N=9m.57s.  
 New Delhi SSN=6m.51s., SSSN=7m.4s.  
 Poona PPPE=5m.34s., QE=9m.6s., SSE=9m.26s., SSSE=9m.40s.  
 Bombay PPN=5m.40s., iN=9m.16s., iSSE=9m.51s., iSSN=9m.54s.  
 Colombo gives S as P and L as S.  
 Warsaw eSSE=22m.19s., eSSSE=24m.45s., eSSSN=24m.57s.  
 Upsala eN=27m.41s. and 30m.15s.  
 Prague e=11m.25s. and 11m.48s.  
 Potsdam iSE=19m.23s.  
 Jena eE=11m.3s., eN=11m.6s.  
 Stuttgart eZ=12m.10s.  
 Strasbourg e=11m.24s. and 11m.56s., i=12m.26s., eSSS=28m.3s.  
 Aberdeen iN=17m.15s.  
 Paris i=12m.23s.  
 Toledo eZ=13m.25s.

Long waves were also recorded at Bandung, Christchurch, Pasadena, Sitka, Tucson, Bermuda, Scoresby Sund and other European stations.

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Sept. 13d. 11h. 59m. 35s. Epicentre 76°·7N. 7°·8E. (as on 1938 July 27d.).

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

	$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.
	°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.
Pulkovo	18·7	143	i 4	17	- 5	e 7	45	- 3	—	—	—
Resolute Bay	22·4	318	5	9	+ 7	9	0	- 4	—	—	—
Potsdam	z. 24·5	172	e 5	19	- 3	—	—	—	—	—	—
Collmberg	z. 25·6	172	e 5	36	+ 4	—	—	—	—	—	—
Jena	25·9	173	e 5	35	0	—	—	—	e 6	1	PP
Prague	26·9	170	e 5	42?	- 3	—	—	—	e 6	58	PP
Sverdlovsk	27·2	107	e 5	52	+ 5	—	—	—	—	—	—
Stuttgart	z. 28·0	177	e 5	54	- 1	—	—	—	—	—	—
Strasbourg	28·2	179	i 6	5k	+ 9	—	—	—	i 6	39	PP
Istanbul	36·9	153	e 7	12	0	—	—	—	—	—	—
Toledo	z. 37·3	194	e 7	15	- 1	—	—	—	e 9	16	PP
College	37·9	344	e 7	23	+ 3	—	—	—	—	—	—
Algiers Univ.	z. 40·0	185	e 7	39	+ 1	—	—	—	—	—	—
Hungry Horse	50·0	313	i 8	56	- 2	—	—	—	—	—	—
Tamanrasset	z. 54·0	183	i 9	26	- 2	—	—	—	—	—	—
Shasta Dam	58·8	318	i 10	1	- 1	—	—	—	—	—	—
Overton	z. 61·5	310	i 10	21	0	—	—	—	—	—	—
Tinemaha	z. 61·6	313	i 10	28	+ 6	—	—	—	—	—	—
Pierce Ferry	61·8	309	i 10	23	0	—	—	—	—	—	—
Lick	z. 61·9	317	e 10	25a	+ 1	—	—	—	—	—	—
Boulder City	62·1	310	e 10	25	0	—	—	—	—	—	—
Haiwee	z. 62·5	312	e 10	28	0	—	—	—	—	—	—
Pasadena	z. 64·5	312	i 10	40	- 1	—	—	—	—	—	—
Riverside	z. 64·5	312	e 10	40	- 1	—	—	—	—	—	—
Tucson	65·0	305	e 10	44	0	—	—	—	—	—	—
La Paz	102·7	252	14	25?	+ 25	—	—	—	—	—	38·4

Additional readings :—

Collmberg eZ = 5m.42s.  
Jena eN = 5m.39s., eE = 7m.17s.  
Prague e = 6m.7s.  
Stuttgart eZ = 5m.58s.  
College e = 8m.6s.  
Algiers Univ. iZ = 7m.43s.  
Tamanrasset iZ = 9m.34s.  
Shasta Dam i = 10m.8s.  
Haiwee iZ = 10m.34s.  
Lick eZ = 10m.31s.  
Boulder City e = 10m.32s.  
Pasadena iZ = 10m.47s.  
Tucson i = 10m.51s.

Sept. 13d. Readings also at 0h. (Bogota, Tamanrasset, La Paz, Dehra Dun, and Poona), 3h. (Ivigtut and near Garm), 5h. (Tacubaya), 6h. (Mount Wilson, Riverside, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Shasta Dam, Hungry Horse, College, and near Mizusawa), 7h. (near Garm (2)), 8h. (College, Bombay, Taranto, and near Garm), 9h. (College, Ashkabad, and near Fergana), 10h. (Leninakan, Piatigorsk, Tiflis, near Borzhomi, Grozny, and near Santa Clara), 11h. (Ashkabad (3)), 13h. (College and Clermont-Ferrand), 15h. (Nanking, College, and Taranto), 17h. (Upsala, Frunse, Kulyab, Stalinabad, Tchimkent, near Andijan, Fergana, Garm, Murgab, Naryn, Przhevalsk, near Messina, and near Istanbul), 19h. (College, New Delhi, Almata, Frunse, Kulyab, Naryn, Przhevalsk, Samarkand, Tchimkent, Mary, Borzhomi, Kizyl-Arvat, Tiflis, Sverdlovsk, near Fergana, Andijan, Garm, Murgab, Stalinabad, and Tashkent), 20h. (Brisbane, Riverview, Christchurch, Wellington, Palomar, Pasadena, Riverside, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Lick, Shasta Dam, College, and near Garm), 21h. (Tucson, Boulder City, Hungry Horse, Fresno, College, Pretoria, Ksara, and near Garm), 22h. (Granada, La Paz, Mount Wilson, Palomar, Riverside, Tinemaha, Tucson, Shasta Dam, and Hungry Horse), 23h. (Grozny, Garm, Kulyab, Stalinabad, Tashkent, near Almata, Andijan, Fergana, Frunse, Murgab, Naryn, and Przhevalsk).

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Sept. 14d. 2h. 31m. 32s. Epicentre 29°·2N. 95°·1E. (as on 11d.).

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
New Delhi	N.	15·7	272	e 3 41	- 3	6 32	- 7	3 58 PP	6·1
Przhevalsk		18·9	320	e 4 24	0	—	—	—	—
Almata		20·2	320	e 4 39	0	e 8 31	+10	—	—
Nanking		20·6	75	4 46	+ 3	e 8 59	+30	—	e 11·2
Frunse		21·4	315	—	—	e 9 3	+18	—	—
Fergana		22·1	308	e 4 59	0	—	—	—	—
Poona	E.	22·1	246	4 48	-11	8 48	-10	—	—
Bombay		22·8	249	—	—	e 9 1	-10	—	—
Kulyab		22·8	299	e 5 9	+ 4	—	—	—	—
Stalinabad		23·6	301	e 5 13	0	—	—	—	—
Tashkent		24·2	307	e 5 19	0	e 9 41	+ 6	—	—
Tchimkent		24·4	310	e 5 24	+ 3	—	—	—	—
Samarkand		25·3	302	e 5 34	+ 4	—	—	—	—
Ksara		50·1	291	e 9 1	+ 2	e 16 23	+13	—	—
Collmberg	Z.	63·1	316	e 10 32	0	—	—	—	—
Stuttgart	Z.	66·1	314	e 10 46	- 5	—	—	—	—
Strasbourg		67·1	315	i 11 1	+ 4	—	—	—	—
College		74·4	23	i 11 42	0	—	—	—	—
Pretoria	Z.	84·3	236	e 12 31	- 4	—	—	—	—
Overton	Z.	109·0	24	e 19 5	PP	—	—	—	—

Additional readings :—

New Delhi eSN = 6m.17s., SSSN = 6m.43s.

Stuttgart eZ = 10m.52s.

College i = 11m.49s.

Sept. 14d. 7h. 52m. 31s. Epicentre 19°·3S. 63°·8W. Depth of focus 0·090.  
(as on 1949, Dec. 21d.).

A = +·4170, B = -·8475, C = -·3285;  $\delta$  = +6;  $h$  = +5;  
D = -·897, E = -·442; G = -·145, H = +·295, K = -·944.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
La Paz		5·0	303	i 1 33k	- 1	i 2 47	- 1	i 1 45 PP	—
Huancayo		13·2	301	i 2 52	+ 2	i 5 14	+ 7	—	—
La Plata	N.	16·4	133	3 12	- 9	5 53	-10	—	—
Bogota		25·8	336	i 4 46	- 1	i 8 35	- 1	i 14 30 S <sub>c</sub> S	—
Chinchina		26·8	334	i 4 51	- 4	i 8 44	- 7	e 14 38 S <sub>c</sub> S	—
Fort de France		33·9	5	i 5 57	+ 1	i 10 39	- 1	—	—
San Juan		37·4	357	i 6 24	0	i 11 25	- 7	—	1 15·4
Merida		47·4	327	e 11 55	P <sub>c</sub> S	i 14 2	+ 8	—	—
Tacubaya		51·8	316	e 8 32	+17	e 15 5	+12	i 17 5 S <sub>c</sub> S	—
Washington		59·2	349	i 9 5	- 1	—	—	—	—
Palisades		60·7	353	i 9 16	0	—	—	—	—
Weston		61·8	354	i 9 22	- 1	—	—	—	—
Harvard		61·9	354	i 9 23	- 1	—	—	—	—
Ottawa	Z.	65·3	351	i 9 44k	- 1	—	—	—	—
Shawinigan Falls	N.	66·0	354	e 9 48	- 2	—	—	—	—
Seven Falls	E.	66·4	355	i 9 51	- 1	i 17 54	- 2	—	—
Tucson		68·2	319	i 10 3	0	e 19 9	S <sub>c</sub> S	i 10 21 P <sub>c</sub> P	—
Pierce Ferry		72·7	320	i 10 31	+ 2	e 19 10	+ 3	—	—
Palomar	Z.	72·8	316	i 10 30k	0	—	—	—	—
Boulder City		73·2	319	i 10 33	+ 1	e 19 16	+ 3	—	—
Overton	Z.	73·3	320	i 10 33	0	e 19 19	+ 5	—	—
Riverside		73·5	316	i 10 35k	+ 1	e 19 20	+ 4	—	—
Pasadena		74·2	316	i 10 38k	0	i 19 25	+ 1	—	—
Haiwee		75·2	318	i 10 43	0	e 19 38	+ 4	—	—
Logan		75·2	326	—	—	e 19 39	+ 5	—	—
Tinemaha		76·0	318	i 10 48	0	e 19 45	+ 2	—	—
Lick	Z.	78·3	317	i 11 1k	+ 1	—	—	—	—
Berkeley		79·0	317	i 11 4k	0	e 20 15	+ 1	—	—
Malaga	Z.	79·0	45	i 11 2 <sub>a</sub>	- 2	—	—	i 16 32 PPP	—
Grahamstown		80·0	121	i 11 9	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.
Mineral	80.0	319	e 11 9	0	e 20 12	-12	—	—
Shasta Dam	80.7	319	i 11 12	0	i 20 31	0	—	—
Hungry Horse	80.9	329	i 11 13	0	e 20 30	-3	—	—
Pretoria	z. 83.5	115	i 11 27	+ 1	—	—	—	—
Algiers Univ.	z. 84.1	48	i 11 30k	+ 1	—	—	e 13 34	pP
Seattle	z. 84.7	325	i 11 33	+ 1	—	—	—	—
Victoria	z. 85.9	325	i 11 37 <sub>a</sub>	- 1	—	—	—	—
Resolute Bay	z. 95.8	353	e 12 26	+ 2	—	—	—	—
Collmberg	z. 96.9	38	e 12 29	0	—	—	—	—
College	104.8	335	e 13 5	+ 2	—	—	e 17 16	PKP

Additional readings :—

La Paz iSS = 3m.5s.  
 Huancayo e = 3m.53s. and 5m.5s.  
 Riverside eZ = 10m.51s.  
 Pasadena iZ = 10m.54s.  
 Tinemaha iZ = 11m.6s.  
 Berkeley iZ = 11m.14s., 11m.23s., and 11m.47s.  
 Grahamstown e = 11m.31s.  
 Mineral eZ = 11m.30s.  
 Algiers Univ. iZ = 11m.40s., ePPZ = 14m.56s.  
 Seattle iEZ = 11m.39s., iZ = 11m.48s.

Sept. 14d. 9h. 5m. 44s. Epicentre 0°·2N. 125°·2E. Depth of focus 0·010.  
 (as on 1950, July 19d.).

A = -·5764, B = +·8171, C = +·0035;  $\delta$  = -10;  $h$  = +7;  
 D = +·817, E = +·576; G = -·002, H = +·003, K = -1·000.

Fore shock of large earthquake at 9h. 5m. 59s.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Zi-ka-wei	z. 31.0	354	e 6 15	+ 5	—	—	—	—
Nanking	32.3	349	e 6 24	+ 2	11 52	sS	13 42	SS
Irkutsk	54.8	345	e 9 23	+ 1	—	—	—	—
Przhevalsk	59.4	322	i 9 55	+ 1	—	—	—	—
Murgab	60.4	315	10 0	- 1	18 9	+ 2	—	—
Naryn	60.4	318	e 10 0	- 1	—	—	—	—
Almata	60.7	322	i 10 5	+ 2	—	—	—	—
Frunse	62.0	320	10 13	+ 1	e 18 36	+ 9	—	—
Andijan	62.5	317	e 10 14	- 2	—	—	—	—
Fergana	62.8	317	10 16	- 2	18 41	+ 4	—	—
Kulyab	63.2	313	e 10 17	- 3	—	—	—	—
Tashkent	64.9	317	e 10 30	- 1	—	—	—	—
Tchimkent	65.1	317	i 10 32	0	—	—	—	—
Samarkand	65.9	314	e 10 27	-11	—	—	—	—
Kizyl-Arvat	73.6	312	e 11 24	0	—	—	—	—
Sverdlovsk	76.3	330	i 11 39	- 1	e 21 36	+21	—	—
Honolulu	77.8	68	e 11 48	0	—	—	—	—
Baku	78.7	312	e 14 41	PP	—	—	—	—
Borzhomi	83.8	312	e 12 20	0	—	—	—	—
Piatigorsk	84.2	314	e 12 22	0	—	—	—	—
College	88.5	26	e 12 43	0	e 29 3	SS	—	—
Moscow	88.5	326	e 12 41	- 2	e 23 19	+ 1	—	—
Ksara	89.3	304	e 12 48	+ 2	—	—	—	—
Pulkovo	92.3	330	e 12 58	- 2	23 53	+ 1	—	—
Istanbul	94.5	312	12 52	-18	—	—	—	—
Lwow	97.1	320	i 13 21	- 1	—	—	—	—
Resolute Bay	101.5	10	e 13 40	- 2	(25 16)	+ 6	—	25.3
Collmberg	z. 103.6	323	e 13 51	0	—	—	—	—
Rome	106.4	314	—	—	e 25 41	-10	—	—
Pasadena	z. 111.7	53	i 18 26	[+ 3]	—	—	—	—
Boulder City	113.8	50	e 18 32	[+ 5]	—	—	—	—
Overton	z. 113.9	50	e 18 31	[+ 3]	—	—	e 29 16	pPKKP
Pierce Ferry	114.4	50	e 18 32	[+ 3]	—	—	—	—
Tucson	118.1	52	e 18 38	[+ 2]	—	—	—	—
Ottawa	131.0	19	e 19 1	[ 0]	e 22 23	PKS	—	—
Weston	135.1	17	i 19 8	[ 0]	i 22 38	PKS	—	—
Chinchina	158.6	74	e 19 45	[- 1]	—	—	—	—

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Sept. 14d. 9h. 5m. 59s. Epicentre  $0^{\circ}2N$ .  $125^{\circ}2E$ . Depth of focus 0.010  
(as on 1950 July 19d., and see 5m.44s. above)

$\Delta = -0.5764$ ,  $B = +0.8171$ ,  $C = +0.0035$ ;  $\delta = -10$ ;  $h = +7$ ;  
 $D = +0.817$ ,  $E = +0.576$ ;  $G = -0.002$ ,  $H = +0.003$ ,  $K = -1.000$ .

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Manila	14.9	344	e 3 19	+12	e 4 28	-69	—	—
Djakarta	19.4	251	i 4 12	-9	i 8 17	+27	—	—
Guam	23.4	54	4 57	-4	—	—	—	—
Zi-ka-wei	z. 31.0	354	e 6 13	+3	e 11 41	sS	i 7 31	PP
Perth	33.2	195	i 7 46	PP	i 11 39	-2	i 13 21	PcS
Brisbane	38.4	138	i 7 14	+1	i 12 57	-4	i 15 30	SS
Mizusawa	41.4	19	e 7 43	+5	e 13 55	+9	e 13 58	PS
Riverview	41.7	147	i 7 39k	-2	i 13 54	+4	i 16 58	SS
Vladivostok	43.2	7	i 7 56	+3	i 14 22	+10	—	e 20.8
Kodaikanal	48.5	284	e 8 41	+6	e 15 29	+2	10 16	PcP
Poona	E. 53.6	293	e 17 21	PPS	—	—	—	—
Bombay	54.6	293	—	—	e 16 51	0	—	—
Irkutsk	54.8	345	i 9 23	+1	e 17 1	+7	—	—
Murgab	60.4	315	i 9 59	-2	18 8	+1	—	—
Naryn	60.4	318	i 10 0	-1	e 18 9	+2	—	—
Almata	60.7	322	i 10 3	0	18 18	+7	—	—
Christchurch	60.7	142	10 23	pP	18 9	-2	e 21 56	Q
Wellington	60.9	140	—	—	i 18 15	+2	e 23 4	SS
Frunse	62.0	320	i 10 12	0	18 35	+8	—	e 34.0
Andijan	62.5	317	10 17	+1	18 40	+6	—	—
Fergana	62.8	317	i 10 16	-2	e 18 41	+4	—	—
Kulyab	63.2	313	10 18	-2	—	—	—	—
Tashkent	64.9	317	i 10 31	0	—	—	—	—
Tchimkent	65.1	317	i 10 33	+1	—	—	—	—
Samarkand	65.9	314	e 10 42	+4	—	—	—	—
Mary	69.0	311	i 11 0	+3	—	—	—	—
Kizyl-Arvat	73.6	312	i 11 25	+1	—	—	—	—
Sverdlovsk	76.3	330	11 39	-1	21 16	+1	—	—
Honolulu	77.8	68	e 12 20	pP	e 21 54	+23	e 12 38	sP
Tananarive	78.4	251	12 0	+8	21 41	+3	22 56	PS
Baku	78.7	312	i 11 56	+3	e 21 56	+15	—	—
Tiflis	82.7	312	e 12 15	+1	—	—	—	—
Leninakan	83.3	311	e 12 14	-3	—	—	—	—
Piatigorsk	84.2	314	i 12 23	+1	e 22 28	S <sub>c</sub> S	—	—
College	88.5	26	e 13 25	pP	e 23 8	[+7]	e 16 40	PPP
Moscow	88.5	326	i 12 43	0	i 23 21	+3	e 24 20	PS
Ksara	89.3	304	e 12 49	+3	24 26	PS	—	—
Yalta	90.6	315	12 53	0	—	—	16 24	PP
Pulkovo	92.3	330	e 12 59	-1	e 23 54	+2	e 16 38	PP
Helwan	E. 93.3	300	—	—	e 23 37	[+8]	e 25 37	PS
Istanbul	94.5	312	—	—	e 20 30	?	—	—
Sitka	94.9	33	—	—	e 23 49	[+11]	e 31 21	SS
Pretoria	z. 96.4	244	e 13 12	-7	—	—	e 17 10	PP
Lwow	97.1	320	i 13 22	0	i 24 10	SKKS	i 17 21	PP
Grahamstown	97.3	237	e 13 21	-2	—	—	—	—
Warsaw	98.5	323	e 13 31	+2	e 24 44	-1	e 17 36	PP
Upsala	98.6	331	e 27 9	PPS	e 32 1?	SSP	—	e 50.0
Skalnate Pleso	99.6	320	e 13 35	+1	e 24 18	[+16]	e 31 43	SS
Raciborzu	z. 100.7	321	e 13 38	-1	—	—	e 17 13	PP
Copenhagen	102.5	328	i 18 8	PP	—	—	—	48.0
Prague	103.0	322	e 13 51	+2	e 24 31	[+13]	e 18 12	PP
Potsdam	103.2	342	e 17 49	PP	e 28 13	PPS	—	e 55.0
Taranto	103.5	312	—	—	e 30 44	PKKP	—	—
Collnberg	103.6	323	e 13 52	+1	—	—	e 18 11	PP
Triest	104.7	318	i 13 54	-2	e 24 43	[+17]	i 20 34	PPP

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.
Seattle	104.8	40	e 18 15	PP	—	—	—	e 56.0
Stuttgart	106.7	322	e 14 6	P	—	—	e 18 33	PP
Shasta Dam	106.7	47	e 13 45	P	—	—	i 18 16	PP
Florence Xim.	107.0	316	e 13 33	P	e 24 24	[-12]	—	—
Mineral	z. 107.4	47	e 17 48	?	—	—	e 21 12	PPP
Berkeley	107.5	50	—	—	e 24 54	[+15]	e 34 4	SSP
Strasbourg	107.7	323	i 18 39 <sub>a</sub>	PP	—	—	e 28 1	PS
Santa Clara	E. 107.9	50	—	—	e 25 36	-26	—	—
Lick	z. 108.1	50	i 18 18	PP	—	—	—	—
Hungry Horse	109.8	37	e 18 0	[-20]	—	—	e 14 2	P
Paris	110.8	324	e 18 57	PP	—	—	—	e 62.0
Tinemaha	z. 110.8	50	e 18 37	[+15]	—	—	—	—
Kew	111.1	327	e 29 36	PPS	—	—	—	e 54.0
Haiwee	z. 111.3	51	e 18 26	[+ 3]	—	—	—	—
Pasadena	z. 111.7	53	e 18 25	[+ 2]	—	—	e 19 15	PP
Riverside	z. 112.4	53	e 18 28	[+ 3]	—	—	e 19 26	PP
Palomar	z. 113.0	53	i 18 30	[+ 4]	—	—	—	—
Boulder City	113.8	50	e 18 31	[+ 4]	—	—	—	—
Logan	113.9	43	e 18 30	[+ 2]	—	—	—	—
Pierce Ferry	114.4	50	e 18 34	[+ 5]	—	—	—	—
Algiers Univ.	z. 115.2	312	e 18 32	[+ 2]	—	—	e 19 20	PP
Alicante	117.2	314	18 51	[+17]	—	—	—	e 55.3
Tucson	118.1	52	i 19 56	PP	e 29 40	PS	—	e 54.2
Granada	119.9	314	20 23 <sub>k</sub>	PP	26 23	[+57]	—	i 72.5
Malaga	z. 120.7	314	i 18 41 <sub>k</sub>	[ 0]	—	—	i 20 7	PP
Seven Falls	E. 130.8	14	e 22 27	PKS	—	—	—	—
Shawinigan Falls	N. 130.8	15	e 21 41	?	—	—	—	—
Tacubaya	132.3	63	e 19 7	[+ 4]	e 22 58	PKS	—	—
Washington	134.0	25	e 19 13	[+ 7]	i 22 43	PKS	e 21 55	PP
Pennsylvania	134.1	24	i 22 40	pPP	e 39 26	SS	—	—
Palisades	135.5	20	e 19 6	[- 3]	e 22 40	PKS	—	—
Huancayo	156.4	120	e 19 49	[+ 6]	e 30 27	SKKS	e 49 27	SSS
San Juan	158.4	29	e 20 9	[+23]	—	—	—	—
Chinchina	158.6	74	e 19 45	[- 1]	e 30 49	SKKS	—	44.0
La Paz	159.1	139	i 19 53 <sub>a</sub>	[+ 6]	e 30 55	SKKS	i 44 59	SSP
Bogota	160.2	74	i 19 53	[+ 5]	e 44 25	SS	e 21 55	PKP <sub>2</sub>
Fort de France	163.9	22	e 19 52	[+ 2]	—	—	—	—

Additional readings :—

Brisbane iNE = 8m.37s., iE = 15m.41s.  
 Riverview iZ = 7m.47s., 7m.55s., 8m.0s., and 8m.52s., ePP = 9m.19s., eN = 13m.40s.,  
 eE = 15m.5s., iN = 17m.7s., iE = 17m.14s.  
 Christchurch eS?N = 17m.17s.  
 Tananarive e = 30m.44s.  
 College e = 15m.50s.  
 Yalta PPP = 18m.32s.  
 Helwan eE = 26m.19s.  
 Lwow ePS = 26m.30s.  
 Warsaw eE = 23m.50s., eSKS = 24m.8s., eSSE = 31m.44s.  
 Skalnate Pleso ePPE = 17m.45s., eN = 20m.32s., ePPS = 27m.25s.  
 Prague ePKP = 17m.31s., ePPP = 20m.29s., ePPS? = 28m.19s., eSS = 32m.49s., and  
 other unidentified e readings.  
 Potsdam eE = 17m.55s., iZ = 18m.11s.  
 Trieste ePKP? = 17m.46s., iPP = 18m.15s.  
 Seattle e = 18m.21s. and 18m.45s.  
 Stuttgart eZ = 17m.12s.  
 Shasta Dam e = 18m.34s.  
 Berkeley epS?N = 26m.6s., eSSN = 32m.42s.  
 Strasbourg i = 18m.42s. and 19m.4s., e = 19m.9s., 43m.19s., and 44m.1s.  
 Hungry Horse i = 18m.7s.  
 Paris e = 19m.3s.  
 Tinemaha eZ = 20m.50s.  
 Pasadena eSKKP?Z = 33m.19s.  
 Malaga PPPZ = 22m.43s.  
 Granada PPS = 30m.2s., iSS = 37m.31s.  
 Tacubaya epPKS? = 22m.47s.  
 Pennsylvania eN = 28m.47s., iN = 29m.2s., ipPSN = 33m.8s.  
 Huancayo e = 36m.8s., eSS = 44m.8s.  
 La Paz PKP<sub>2</sub>Z = 20m.45s., iPKS = 22m.17s., iPPZ = 24m.20s., SKKSE = 31m.11s.,  
 PPS = 38m.1s.  
 Long waves were also recorded at Bergen, Helsinki, De Bilt, Rathfarnham Castle, and  
 Scoresby Sund.

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Sept. 14d. Readings also at 2h. (near College), 3h. (Palomar Pasadena, Tinemaha, Tucson, Overton, Pierce Ferry, Lick, Shasta Dam, Stuttgart, near Basle, Neuchatel and Zürich), 4h. (near Garm and near Istanbul), 6h. (Tacubaya and Wellington), 7h. (Haiwee, Palomar (2), Pasadena (2), Riverside, Tinemaha (2), Tucson (2), Boulder City, Overton, Pierce Ferry (2), Berkeley, Lick, Shasta Dam, Mineral, Hungry Horse, Seattle, Victoria, College (2), Resolute Bay, Logan, Weston, Pretoria and near Alicante), 8h. (La Paz and near Santa Clara), 9h. (Pierce Ferry), 11h. Huancayo, La Paz, College and near Algiers Univ.), 12h. (Huancayo and near Mizusawa), 13h. (College, Ashkabad, Murgab, Naryn, Tashkent and near Strasbourg), 14h. (Strasbourg and near Przhevalsk), 15h. (College and near Huancayo), 16h. (College and Collmberg), 17h. (Andijan, Fergana, Kulyab, Obi-garm, Samarkand, near Murgab and Stalinabad), 18h. (Shasta Dam, Hungry Horse, College and near Piatigorsk), 19h. (Shasta Dam, Hungry Horse, Victoria and near Mizusawa), 20h. (College), 21h. (Ashkabad, Kulyab, Tchimkent, near Andijan, Samarkand, Fergana, Murgab, Obi-garm, Stalinabad, Algiers Univ., Stuttgart, Grahamstown, Johannesburg, Pietermaritzburg, and Pretoria), 22h. (Ksara, Granada, Pasadena, Riverside, Tinemaha, Tucson, Boulder City, Pierce Ferry, Hungry Horse, Victoria, and College).

Sept. 15d. 4h. 11m. 41s. Epicentre  $46^{\circ}3N$ ,  $7^{\circ}5E$ . (as on 1950 March 6d.).

Intensity IV-V at Sion, IV at Montana and Leukerbad, III at Chateau d'Oex.  
Epicentre as adopted. Macroseismic radius 20km.

E. Wanner.

Jahresbericht des Erdbebendienstes der Schweiz im Jahre 1950. Zürich 1951, p.3, macroseismic chart fig. 6.

$$A = +.6874, B = +.0905, C = +.7206; \quad \delta = -3; \quad h = -4;$$

$$D = +.131, E = -.991; \quad G = +.714, H = +.094, K = -.693.$$

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Neuchatel	0.8	332	e 0 18	0	i 0 26	- 5	—	—
Basle	1.3	3	e 0 26	+ 1	e 0 44	0	—	—
Zürich	1.3	35	e 0 25	0	e 0 44	0	—	—
Chur	1.5	68	0 33	+ 5	e 0 56	+ 7	—	—
Ravensburg	2.1	44	e 0 44	$P_g$	e 1 6	$S^*$	e 1 12	$S_g$
Strasbourg	2.3	5	e 0 50	$P_g$	e 1 24	$S_g$	—	—
Stuttgart	z. 2.7	24	e 0 44	- 1	e 1 33	$S_g$	e 0 53	$P_g$
Paris	4.2	308	e 1 21	$P_g$	—	—	—	—
Jena	5.3	29	e 0 47?	?	e 1 8	?	e 0 55	?
Prague	6.0	48	—	—	i 3 14	$S_g$	—	—
Collmberg	z. 6.2	34	—	—	e 3 27	$S_g$	—	—
Rathfarnham C.	z. 11.3	313	e 1 48	?	—	—	—	e 8.5

Additional readings :—

Strasbourg e = 1m.35s. and 1m.45s.

Stuttgart eZ = 1m.37s.

Prague e = 3m.22s., 3m.29s., 3m.53s., and 4m.46s.

Collmberg eZ = 3m.34s.

Sept. 15d. 14h. 14m. 33s. Epicentre  $25^{\circ}3S$ ,  $175^{\circ}4W$ . Depth of focus 0.010  
(as on 1949 April 10d.).

$$A = -.9022, B = -.0726, C = -.4250; \quad \delta = -14; \quad h = +3;$$

$$D = -.080, E = +.997; \quad G = +.424, H = +.034, K = -.905.$$

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Apia	11.9	17	e 2 50	+ 2	e 4 56	- 3	—	—
Auckland	N. 14.2	214	i 3 17	- 1	—	—	—	—
Arapuni	14.8	209	i 3 22	- 3	—	—	—	—
Tuai	N. 14.9	203	e 4 27?	+60	—	—	—	—
Wellington	17.9	205	—	—	e 7 27?	+10	—	—
Cobb River	E. 18.6	209	e 4 13	+ 1	e 6 46	-47	—	—
Kaimata	N.E. 20.3	209	—	—	e 7 27?	-40	—	—
Christchurch	20.7	205	i 7 28	S	(i 7 28)	-47	—	—
Brisbane	28.3	259	i 5 51k	+ 5	—	—	—	—
Riverview	N. 30.2	246	—	—	e 11 7	+13	i 12 54	SS e 14.0

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.		
Berkeley		80.2	41	i 12	0k	- 1	e 22 7	+10	i 12 16	pP	e 35.2
Lick	z.	80.2	41	e 12	1a	0	—	—	—	—	—
Pasadena		80.3	46	i 12	1	- 1	e 22 6	+ 8	—	—	—
Palomar		80.6	47	i 12	2	- 1	i 22 15	+14	—	—	—
Riverside	z.	80.7	46	i 12	2	- 2	—	—	—	—	—
Fresno	z.	80.9	42	e 13	4a	+59	—	—	e 13 24	pP	—
Haiwee	z.	81.7	44	i 12	8	- 1	—	—	—	—	—
Shasta Dam		82.1	38	i 12	9	- 2	—	—	i 12 26	pP	—
Tinemaha		82.1	43	e 12	11	0	e 22 29	+13	—	—	—
Mineral	z.	82.3	38	e 12	10	- 2	—	—	e 12 29	pP	—
Boulder City		83.6	46	e 12	19	0	—	—	—	—	—
Tucson		84.0	50	i 12	21	0	—	—	—	—	—
Overton	z.	84.1	45	i 12	22	+ 1	—	—	—	—	—
Pierce Ferry		84.2	46	i 12	22	0	—	—	—	—	—
Seattle		86.9	33	e 12	34	- 1	e 23 15	+12	—	—	—
Victoria	z.	86.9	32	e 12	32	- 3	—	—	—	—	—
Logan		88.9	43	e 12	43	- 2	—	—	—	—	—
Hungry Horse		91.6	36	e 12	49	- 8	—	—	—	—	—
College		92.4	11	i 12	54	- 7	23 50	- 3	e 23 17	SKS	—
Copenhagen		149.1	352	i 19	28	[- 5]	—	—	—	—	—
Raciborzu	z.	153.1	341	e 19	38	[- 1]	—	—	—	—	—
Collmberg	z.	153.2	348	e 19	37	[- 2]	—	—	—	—	—
Prague		154.1	346	e 19	50	[+10]	—	—	e 20 5	pPKP	—
Stuttgart	z.	156.3	353	e 19	34	[- 9]	e 23 35	SKP	e 20 3	pPKP	—
Strasbourg		156.6	354	i 20	5a	[+22]	—	—	—	—	—

Additional readings :—

Berkeley iZ = 12m.52s., eN = 29m.54s.  
 Lick eZ = 12m.49s.  
 Fresno ePP?Z = 15m.27s.  
 Seattle e = 12m.44s., 13m.19s., and 23m.51s.  
 College e = 16m.8s.  
 Raciborzu ePKP?Z = 19m.48s.  
 Collmberg eZ = 19m.43s. and 19m.50s.  
 Prague e = 21m.33s.  
 Strasbourg e = 20m.10s.

Sept. 15d. 19h. 5m. 12s. Epicentre 15°.4S. 174°.6W. Depth of focus 0.030.  
 (as on 1950 Feb. 11d.).

A = -.9603, B = -.0908, C = -.2639;  $\delta = +6$ ;  $h = +6$ ;  
 D = -.096, E = +.996; G = +.263, H = +.025, K = -.965.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.		
		$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.		
Apia	z.	3.2	60	i 0	58	+ 4	1 42	+ 7	—	—	—
Brisbane	z.	32.3	243	i 6	3a	- 7	—	—	—	—	—
Riverview	z.	35.9	233	i 7	14	+34	—	—	—	—	—
Berkeley	z.	72.2	41	i 11	3k	+ 1	—	—	i 12 2	pP	—
Lick	z.	72.3	41	e 11	4a	+ 1	—	—	e 12 5	pP	—
Pasadena	z.	72.8	46	i 11	6	0	—	—	e 12 5	pP	—
Fresno	z.	73.2	43	e 11	8a?	0	—	—	e 12 9?	pP	—
Palomar	z.	73.3	48	i 11	10	+ 1	—	—	i 12 10	pP	—
Riverside	z.	73.3	46	e 11	9	0	—	—	e 12 8	pP	—
Shasta Dam		73.9	39	e 11	12	0	—	—	e 12 13	pP	—
Haiwee	z.	74.1	44	i 11	14	+ 1	—	—	—	—	—
Mineral	z.	74.1	40	e 11	15	+ 2	—	—	e 12 16	pP	—
Tinemaha	z.	74.4	43	i 11	15	0	—	—	—	—	—
Boulder City		76.1	47	i 11	26	+ 1	—	—	e 12 27	pP	—
Overton	z.	76.7	46	i 11	29	+ 1	—	—	e 12 26	pP	—
Pierce Ferry		76.8	47	i 11	29	+ 1	—	—	i 12 30	pP	—
Tucson		77.2	50	i 11	36	+ 5	—	—	e 12 30	pP	—
Victoria	z.	78.2	32	e 11	35	- 1	—	—	—	—	—
Logan		81.1	42	e 11	52	0	—	—	—	—	—
College		82.6	11	i 11	59	0	—	—	i 13 2	pP	—

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	$\Delta$	Az.	P.		O-C.	S.	O-C.	Supp.		L.	
	$^{\circ}$	$^{\circ}$	m.	s.	s.	m.	s.	m.	s.	m.	
Hungry Horse	83.1	36	i 12	2	0	—	—	e 38	22	P'P'	—
Collmberg	z. 143.7	351	i 19	6k	[- 2]	—	—	—	—	—	—
Raciborzu	z. 143.9	347	e 19	7	[- 2]	—	—	—	—	—	—
Jena	144.2	351	e 19	9	[ 0]	—	—	e 20	17	pPKP	—
Prague	144.7	350	i 19	11	[+ 1]	—	—	e 20	20	pPKP	—
Paris	146.6	3	e 19	12	[- 1]	—	—	—	—	—	—
Stuttgart	z. 146.6	355	e 19	12	[- 1]	—	—	—	—	—	—
Strasbourg	146.8	357	i 19	16a	[+ 2]	—	—	e 20	19	pPKP	—
Istanbul	147.2	327	e 20	19	pPKP	—	—	—	—	—	—

Additional readings :—

Collmberg eZ = 19m.11s.

Jena eN = 19m.24s.

Prague e = 19m.16s., esPKP = 20m.49s.

Paris 1PKP? = 19m.15s.

Stuttgart eZ = 19m.15s.

Strasbourg e = 19m.31s. and 19m.47s., esPKP = 20m.36s.

Sept. 15d. Readings also at 2h. (Kishinev and near Andijan), 4h. (Palomar, Pasadena, Riverside, Tinemaha, Tucson and Granada), 5h. (College), 6h. (La Paz and College), 7h. (near Alicante (2) ), 8h. (La Paz, Shasta Dam, Hungry Horse, College and Nanking), 9h. (Leninakan, near Borzhomi, Grozny, Tiflis and near Balboa Heights), 10h. (near Garm), 11h. (near Bandung), 12h. (Grahamstown and College), 13h. (Tucson, Boulder City, Overton, Pierce Ferry, Victoria, College, Rome and near Garm (2) ), 14h. 15h. 17h. and 18h. (near Garm), 19h. (Christchurch, Kaimata, Wellington, Riverview and Collmberg), 20h. (Collmberg, College, near Sitka and near Garm (4) ), 21h. (Overton, Hungry Horse, College and near Borzhomi), 23h. (Frunse, near Andijan, Fergana, Murgab, Naryn and Przhevalsk).

Sept. 16d. 0h. 55m. 31s. Epicentre  $4^{\circ}6'S$ .  $105^{\circ}1'W$ .

A = -0.2597, B = -0.9624, C = -0.0796;  $\delta = -1$ ;  $h = +7$ .

D = -0.965 E = +0.260; G = +0.021, H = +0.077, K = -0.997.

	$\Delta$	Az.	P.		O-C.	S.	O-C.	Supp.		L.		
	$^{\circ}$	$^{\circ}$	m.	s.	s.	m.	s.	m.	s.	m.		
Puebla	24.5	14	e 5	20	- 2	e 9	32	- 8	e 10	44	SS	e 11.5
Tacubaya	24.6	13	e 5	28	+ 5	i 9	43	+ 1	—	—	—	i 11.7
Guadalajara	25.2	3	e 5	33	+ 4	i 10	1	+ 9	—	—	—	—
Vera Cruz	25.2	20	e 5	38	+ 9	i 10	9	+17	—	—	—	—
Huancayo	30.3	106	i 6	17	+ 2	i 11	26	+11	i 7	5	PP	i 14.0
Chinchina	30.9	71	i 6	20	0	i 11	27	+ 3	i 13	29	ScP	—
Bogota	32.3	73	i 6	33	0	i 11	54	+ 8	i 14	12	SSS	—
Galerazamba	33.4	62	e 7	1	+19	e 12	11	+ 8	e 14	23	SSS	—
Tucson	37.0	352	e 7	14	+ 1	e 13	8	ScP	e 8	44	PP	e 17.7
La Paz	38.1	110	i 7	23k	+ 1	i 13	19	+ 3	i 16	13	SS	18.8
Palomar	z. 39.3	345	i 7	33	+ 1	—	—	—	i 9	44	PPP	—
Riverside	z. 40.1	344	i 7	39	0	—	—	—	i 9	50	PcP	—
Pasadena	40.5	344	i 7	43a	+ 1	i 13	59	+ 7	i 9	47	PcP	i 19.0
Boulder City	41.4	348	e 7	51	+ 1	e 13	54	ScP	—	—	—	—
Pierce Ferry	41.4	349	e 7	51	+ 1	—	—	—	—	—	—	e 21.0
Overton	z. 41.8	349	i 7	55	+ 2	—	—	—	e 9	48	PP	e 21.6
Haiwee	z. 42.3	345	e 7	53	- 4	—	—	—	e 10	9	PPP	—
Tinemaha	z. 43.2	345	e 8	5	+ 1	—	—	—	e 10	12	PPP	—
Fresno	43.4	343	e 8	7	+ 1	e 14	45	+10	e 10	27	PPP	—
San Juan	44.4	58	e 8	14	0	e 14	52	+ 3	—	—	—	e 20.0
Lick	44.5	341	e 8	16k	+ 1	—	—	—	—	—	—	e 21.2
Santa Clara	44.6	341	e 8	20	+ 4	e 14	59	+ 7	—	—	—	e 22.4
Columbia	44.6	28	—	—	—	e 14	51	- 1	—	—	—	e 22.0
Berkeley	45.2	341	e 8	23a	+ 3	e 15	4	+ 3	i 10	2	PcP	e 19.4
Saint Louis	45.2	16	e 8	21	+ 1	i 15	3	+ 2	i 18	28	SS	—

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	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Florissant	45.3	16	e 8 22	+ 1	i 15 4	+ 2	i 18 33	SS
Salt Lake City	45.6	353	e 8 57	+33	e 15 12	+ 6	(e 18 55)	SS
Logan	46.5	354	e 8 32	+ 1	e 15 39	PPS	—	e 25.2
Ukiah	46.6	341	—	—	e 15 30	+ 9	—	e 21.2
Mineral	z. 47.2	343	e 8 38	+ 2	e 14 31	S <sub>c</sub> P	—	e 23.5
Fort de France	47.6	65	e 9 33	P <sub>c</sub> P	—	—	—	—
Shasta Dam	47.8	342	e 8 37	- 4	—	—	i 8 40	P
Rapid City	E. 48.5	3	e 8 49	+ 3	e 15 53	+ 5	—	e 19.9
Bozeman	50.3	355	—	—	e 16 15	+ 2	—	e 22.4
Pittsburgh	N.W. 50.4	24	i 16 38	PPS	—	—	—	—
Washington	50.5	28	e 9 1	- 1	—	—	e 10 49	PP
Cleveland	50.7	23	i 9 2k	- 1	e 16 16	- 2	e 19 46	SS
Butte	N. 50.8	354	e 9 10	+ 6	e 16 34	+14	—	e 24.2
Pennsylvania	51.6	26	—	—	i 16 34	+ 3	e 20 2	SS
Philadelphia	52.2	29	e 9 41	+26	e 16 43	+ 4	e 20 20	SS
La Plata	N. 53.0	130	9 17	- 4	16 41	- 9	10 29	P <sub>c</sub> P
	E. 53.0	130	10 35	P <sub>c</sub> P	16 53	PS	—	26.0
Bermuda	53.2	43	—	—	e 17 3	PPS	e 19 9	S <sub>c</sub> S
Hungry Horse	53.3	353	e 9 21	- 2	—	—	i 11 31	PP
Palisades	53.6	29	i 9 27	+ 2	i 16 49	- 9	e 17 4	PS
Seattle	54.2	346	e 8 57	-32	e 17 10	+ 4	e 20 14	SS
Victoria	55.3	346	e 9 36	- 2	17 27	+ 6	—	—
Harvard	55.9	29	e 9 42	0	—	—	e 11 22	PP
Weston	55.9	29	e 9 34	- 8	e 17 20	- 9	e 21 18	SS
Ottawa	56.3	24	e 9 42	- 3	17 37	+ 3	—	—
Saskatoon	56.5	358	—	—	e 17 37	0	—	—
Honolulu	57.7	300	—	—	e 18 11	+18	—	—
Seven Falls	59.7	26	—	—	e 18 22	+ 3	—	—
Sitka	66.6	343	e 10 51	- 3	e 19 41	- 4	e 14 57	PPP
College	76.1	343	e 11 51	0	e 21 36	+ 1	e 13 55	P <sub>c</sub> P
Resolute Bay	79.4	3	12 18	+ 9	22 12	+ 2	27 23	SS
Granada	101.9	53	—	—	32 57	SSP	—	—
Alicante	104.3	52	14 6	- 2	—	—	27 32	PS
De Bilt	106.0	57	—	—	e 33 29?	SS	—	e 51.5
Rome	113.4	46	e 19 15	PS	e 35 45	SSP	e 30 20	PPS

Additional readings :—

Puebla e = 6m.14s.  
 Huancayo i = 7m.11s., iQ = 13m.2s.  
 Tucson e = 10m.8s., eSS = 15m.45s.  
 La Paz iPPZ = 8m.49s., iP<sub>c</sub>PZ = 9m.43s., eS = 13m.10s., iS<sub>c</sub>S = 17m.47s.  
 Pasadena iQ = 17.0m.  
 Fresno eZ = 12m.21s. and 16m.33s.  
 Berkeley iPZ = 8m.31s., ePPZ = 10m.29s., eE = 10m.58s., iSN = 15m.9s., eN = 17m.21s., eS<sub>c</sub>S?N = 18m.41s.  
 Saint Louis i = 17m.13s.  
 Florissant i = 17m.10s.  
 Shasta Dam e = 9m.51s.  
 Rapid City e = 17m.59s.  
 Cleveland iE = 9m.25s., ePPE = 10m.39s., iZ = 11m.10s., eEN = 18m.29s., eE = 20m.3s., iSSN = 20m.40s., eN = 21m.18s.  
 Pennsylvania iN = 16m.56s., iS<sub>c</sub>SEN = 18m.45s.  
 Philadelphia eS<sub>c</sub>S = 18m.55s.  
 La Plata S<sub>c</sub>SN = 18m.53s., QN = 22.9m., SSS?E = 23m.11s.  
 Palisades iP<sub>c</sub>P = 10m.29s., ePP = 11m.29s., eS<sub>c</sub>S = 19m.6s., eQ = 22m.29s.  
 Seattle e = 9m.34s., 17m.41s., 18m.11s., and 24m.9s.  
 Harvard e = 22m.11s.  
 Sitka e = 11m.57s. and 20m.11s.  
 Resolute Bay PSE = 24m.24s.  
 Long waves were also recorded at Manzanillo, Lincoln, Christchurch and at other European stations.

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Sept. 16d. 12h. 30m. 50s. Epicentre 49°·5N. 156°·2E. (as on 1947 Oct. 20d.).  
(Foreshock of larger earthquake).

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.
		°	°	m.	s.	s.
College		32·7	40	i 6	33	- 3
Victoria	z.	50·3	58	e 8	58	- 2
Hungry Horse		55·5	54	i 9	37	- 2
Shasta Dam		55·5	66	i 9	40	+ 1
Mineral	z.	56·2	66	i 9	44	0
Tinemaha		60·3	68	i 10	13	0
Haiwee	z.	61·1	68	i 10	19	+ 1
Pasadena	z.	62·3	70	i 10	26	0
Riverside	z.	62·9	70	i 10	29	- 1
Overton	z.	62·9	64	i 10	31	+ 1
Boulder City		63·1	66	e 10	32	0
Pierce Ferry		63·5	65	i 10	35	+ 1
Palomar	z.	63·6	70	i 10	36	+ 1
Tucson		68·0	67	e 11	3	0

Pasadena gives also  $i = 10m.36s.$

Sept. 16d. 12h. 39m. 20s. Epicentre 49°·5N. 156°·2E. (as at 12h. 30m.).

		$\Delta$	Az.	P.		O-C.	S.	O-C.	Supp.		L.
		°	°	m.	s.	s.	m.	s.	m.	s.	m.
Vladivostok		17·9	258	e 4	3	- 9	e 7	34	+ 4	—	—
College		32·7	40	i 6	40	+ 4	e 11	50	- 2	e 9	28
Sitka		40·0	53	—	—	—	e 13	56	+12	—	—
Resolute Bay		47·6	20	8	47	+ 8	15	51	+16	—	—
Victoria	z.	50·3	58	e 9	0	0	e 18	52	S <sub>c</sub> S	—	—
Sverdlovsk		53·2	318	e 9	21	- 1	—	—	—	—	—
Frunse		54·3	297	e 9	26	- 4	—	—	—	—	—
Shasta Dam		55·5	66	i 9	38	- 1	—	—	—	—	—
Hungry Horse		55·5	54	i 9	39	0	—	—	—	—	—
Andijan		56·9	296	e 9	45	- 4	e 17	42	0	—	—
Berkeley	z.	57·4	68	i 9	22	-31	—	—	—	e 10	26
Fergana		57·5	296	e 9	48	- 5	—	—	—	—	—
Garm		59·2	296	e 10	2	- 3	—	—	—	—	—
Fresno	z.	59·6	67	e 10	6 <sub>a</sub>	- 2	—	—	—	—	—
Tinemaha	z.	60·3	68	i 10	12	- 1	—	—	—	—	—
Kulyab		60·3	295	e 9	58 <sub>?</sub>	-15	—	—	—	—	—
Stalinabad		60·4	296	i 10	8	- 5	—	—	—	—	—
Samarkand		60·7	298	e 10	12 <sub>?</sub>	- 3	—	—	—	—	—
Pasadena	z.	62·3	70	e 10	24	- 2	—	—	—	—	—
Riverside	z.	62·9	70	e 10	32	+ 2	—	—	—	—	—
Overton	z.	62·9	65	i 10	30	0	—	—	—	—	—
Boulder City		63·1	66	e 10	31	- 1	—	—	—	—	—
Pierce Ferry		63·5	65	i 10	33	- 1	—	—	—	—	—
Palomar	z.	63·6	70	e 10	38	+ 3	—	—	—	—	—
Rapid City	E.	63·9	52	e 10	41	+ 4	e 19	20	+ 8	—	—
Tucson		68·0	67	e 11	3	0	—	—	—	—	—
Tiflis		71·1	313	i 11	20	- 2	e 20	37	- 1	—	—
Sotchi		72·0	317	e 11	28	0	e 20	46	- 3	—	—
Leninakan		72·2	313	e 11	20 <sub>?</sub>	- 9	—	—	—	—	—
Raciborzu	z.	74·5	334	e 11	44	+ 2	—	—	—	—	—
Collmberg	z.	74·8	337	e 13	43 <sub>a</sub>	?	—	—	—	—	—
Ottawa	z.	75·2	35	e 11	45	- 1	—	—	—	—	—
Jena		75·5	338	e 11	48	0	—	—	—	—	—
Prague		75·5	336	e 11	48	0	e 21	36	+ 8	e 13	48
Rathfarnham C.	z.	76·5	350	i 12	9	+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.
Stuttgart	z. 78.1	339	e 12 2	0	—	—	—	—
Strasbourg	78.6	340	i 12 6k	+ 1	—	—	—	—
Harvard	79.3	34	i 12 9	0	—	—	—	—
Paris	79.5	343	i 12 11	+ 1	—	—	i 12 27	pP
Zürich	79.5	339	i 12 9a	- 1	—	—	—	—
Basle	79.6	340	e 12 12	+ 2	—	—	—	—
Ksara	81.6	313	i 11 40?	-41	—	—	—	—
Tamanrasset	z. 103.5	332	e 14 3	- 1	—	—	e 18 19	PP
La Paz	z. 131.4	63	e 19 25	[+10]	—	—	—	—

Additional readings :—

Shasta Dam i = 9m.56s.

Tinemaha iZ = 11m.12s.

Pasadena iZ = 10m.59s.

Palomar eZ = 10m.53s.

Collmberg eZ = 13m.47s., 13m.50s., and 13m.59s.

Jena eN = 12m.19s.

Prague e = 11m.59s., 12m.9s., 12m.17s., 12m.56s., and 13m.14s.

Stuttgart eZ = 12m.28s.

Strasbourg e = 12m.20s. and 12m.59s.

Tamanrasset eZ = 17m.16s.

Long waves were also recorded at Potsdam.

Sept. 16d. 12h. 48m. 43s. Epicentre 32°·7N. 131°·5E. Depth of focus 0·015.

Intensity VI at Kawaminami, and Mitai (Miyazaki Prefecture), V at Ooita, Kumamoto and Kôti, IV at Miyazaki, Hukuoka, Simidu, Uwazima, and Unzendake, II-III at Saga, Matuyama, Hirosima, Tokusima, Sumoto, Himeji, Siomisaki, and Tottori. Epicentre as adopted. Depth of focus 110 km. Macro seismic radius >300 km.

Seismo. Bull. Cent. Met. Obs. Japan for 1950. Tokyo 1952, p.p. 42, 43, with macro seismic chart.

$$A = -0.5587, B = +0.6315, C = +0.5377; \quad \delta = +6; \quad h = +1;$$

$$D = +0.749, E = +0.663; \quad G = -0.356, H = +0.403, K = -0.843.$$

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Ooita	0.5	10	0 17	- 2	0 27	- 7	—	—
Kumamoto	0.7	280	0 20k	- 1	0 35	- 1	—	—
Miyazaki	0.8	184	0 23a	+ 1	0 38	0	—	—
Simidu	1.2	86	0 25a	0	0 45	0	—	—
Hukuoka	1.3	314	0 23k	- 3	0 40	- 6	—	—
Matuyama	1.6	43	0 28a	- 2	0 50	- 2	—	—
Hirosima	1.8	25	0 30	- 2	0 53	- 3	—	—
Kôti	1.9	63	0 33a	0	0 56	- 2	—	—
Muroto	2.3	76	0 38a	0	1 5	- 2	—	—
Tomie	2.3	268	0 36	- 2	1 3	- 4	—	—
Yakusima	2.4	201	0 36	- 4	1 4	- 6	—	—
Sumoto	3.3	60	0 51a	- 1	1 24	- 7	—	—
Kobe	3.7	56	0 57a	0	1 38	- 2	—	—
Siomisaki	3.7	77	0 56	- 1	1 36	- 4	—	—
Osaka	3.9	59	1 0	+ 1	1 43	- 2	—	—
Kyoto	4.2	56	1 3	0	1 53	+ 1	—	—
Owase	4.2	70	1 2a	- 1	1 49	- 3	—	—
Hikone	4.7	56	1 12a	+ 2	2 5	+ 1	—	—
Kameyama	4.7	61	1 10	0	2 1	- 3	—	—
Gihu	5.1	57	1 18k	+ 2	2 15	+ 1	—	—
Nagoya	5.2	60	1 17	0	2 15	- 1	—	—
Shizuoka	6.2	67	1 25	- 5	2 44	+ 3	—	—
Wazima	6.4	42	1 35	+ 2	2 47	+ 2	—	—
Kohu	6.5	62	1 40	+ 5	2 54	+ 6	—	—
Hunatu	6.6	63	1 36	0	2 50	0	—	—
Matusiro	6.7	53	1 36	- 1	2 47	- 6	—	—
Nagano	6.8	52	1 46	+ 7	3 17	+22	—	—
Kumagaya	7.3	60	1 50	+ 5	3 12?	+ 5	—	—
Mera	7.3	70	1 46	+ 1	—	—	—	—
Tokyo	7.4	64	1 58	+11	3 21	+11	—	—

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.
Utunomiya		7.9	59	1 32	-21	3 6	-16	—	—
Zi-ka-wei	z.	8.7	263	e 2 3	-1	i 3 43	+2	—	—
Sendai		9.5	51	2 16	+1	4 7	+7	—	—
Nanking		10.7	270	i 3 40 <sub>a</sub>	+69	5 50	+81	—	6.3
College		57.0	30	i 9 34	0	e 17 22	+5	—	—
Resolute Bay	z.	68.7	12	e 10 53	+1	—	—	—	—
Shasta Dam		80.1	48	i 11 57	0	—	—	i 12 28	pP
Hungry Horse		80.4	38	i 11 59	0	—	—	i 12 27	pP
Collmberg	z.	80.4	326	e 11 57	-2	—	—	e 12 27	pP
Prague		80.6	325	e 11 47	-13	—	—	e 12 12	pP
Mineral	z.	80.8	48	e 12 2	+1	—	—	—	—
Berkeley	z.	81.8	50	i 12 7 <sub>a</sub>	+1	—	—	i 12 38	pP
Lick	z.	82.5	50	e 12 10 <sub>a</sub>	0	—	—	e 12 41	pP
Stuttgart	z.	84.0	326	e 12 14	-3	—	—	e 12 45	pP
Fresno	z.	84.1	50	e 12 17	-1	—	—	i 12 50	pP
Tinemaha	z.	84.9	49	i 12 22	0	—	—	i 12 53	pP
Zürich		85.2	326	e 12 17 <sub>?</sub>	-6	—	—	—	—
Haiwee	z.	85.6	49	e 12 27	+2	—	—	i 12 57	pP
Logan		85.8	42	e 12 29	+3	—	—	e 12 58	pP
Pasadena	z.	86.7	51	e 12 30	0	—	—	i 13 2	pP
Riverside	z.	87.3	51	e 12 33	0	—	—	e 13 3	pP
Overton	z.	87.6	48	i 12 32	-3	—	—	i 13 7	pP
Boulder City		87.7	48	e 12 37	+2	—	—	i 13 8	pP
Palomar		88.1	51	i 13 8	pP	—	—	—	—
Pierce Ferry		88.1	48	i 12 39	+2	—	—	i 13 10	pP
Tucson		92.7	49	i 13 0	+1	—	—	i 13 31	pP
Tamanrasset	z.	104.5	310	16 38	PP	—	—	—	—
Huancayo		147.9	56	e 19 33	[+6]	—	—	i 20 5	pPKP

Additional readings :—  
 Zi-ka-wei iZ = 6m.9s.  
 Collmberg eZ = 12m.31s.  
 Prague e = 13m.4s.  
 Tamanrasset PP?Z = 17m.43s.

Sept. 16d. 21h. 58m. 17s. Epicentre 52°·0N. 177°·1E. Depth of focus 0·010.  
 (as on 1939, Aug. 21d.).

A = -·6174, B = +·0313, C = +·7860;  $\delta$  = -4;  $h$  = -6;  
 D = +·051, E = +·999; G = -·785, H = +·040, K = -·618.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
College		22.1	41	e 4 46	-2	i 8 41	+1	i 5 7	pP
Sitka		27.6	59	e 5 39	-1	e 10 8	-5	e 6 1	pP
Vladivostok		31.3	271	i 6 15	+2	i 11 18	+6	i 6 49 <sub>?</sub>	pP
Victoria		37.3	70	i 7 2 <sub>a</sub>	-2	e 12 59	+15	i 9 22	PP
Seattle		38.3	71	i 7 13 <sub>a</sub>	+1	e 13 13	+14	i 7 38	pP
Resolute Bay		40.2	23	i 7 31	+3	13 31	+3	e 9 32	PP
Shasta Dam		42.1	80	i 7 43	-1	i 13 16	ScP	i 8 8	pP
Hungry Horse		42.8	65	i 7 48	-2	i 13 30	ScP	e 8 8	pP
Mineral		42.8	80	e 7 49	-1	e 13 19	ScP	e 8 14	pP
Irkutsk		42.9	300	e 7 52	+2	—	—	—	—
Berkeley		43.9	83	i 7 57 <sub>a</sub>	-2	e 14 19	-3	e 8 19	pP
Santa Clara		44.4	83	e 8 3	0	e 14 33	+4	e 8 27	pP
Lick	z.	44.6	83	e 8 4 <sub>a</sub>	0	e 13 27	ScP	i 8 26	pP
Butte	N.	44.9	67	e 9 6	PP	e 13 36	-61	—	e 17.9
Zi-ka-wei	z.	45.3	265	i 8 15	+5	—	—	i 8 47	sP
Fresno		46.2	82	i 8 16 <sub>a</sub>	-1	e 13 33	ScP	e 8 39	pP
Nanking		46.3	268	i 7 40 <sub>k</sub>	-38	9 35	PP	—	—
Tinemaha		46.9	82	i 8 21 <sub>a</sub>	-1	i 13 37	ScP	i 8 45	pP
Haiwee		47.7	83	i 8 26	-3	i 13 40	ScP	i 8 51	pP
Logan		47.8	72	i 8 27	-2	i 13 41	ScP	—	—

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.	
Pasadena		48.9	84	i 8 36 <sup>a</sup>	- 2	e 15 38	+ 5	i 8 59	pP	e 21.7
Riverside		49.4	84	i 8 39	- 3	i 13 46	S <sub>c</sub> P	i 9 4	pP	—
Overton	z.	49.6	79	i 8 42	- 1	—	—	—	—	—
Boulder City		49.7	80	e 8 42	- 2	e 15 45	+ 1	i 9 5	pP	—
Pierce Ferry		50.1	79	i 8 47	0	e 15 48	- 2	i 13 48	S <sub>c</sub> P	—
Palomar		50.2	84	i 8 46 <sup>a</sup>	- 2	i 15 52	+ 1	i 9 9	pP	—
Rapid City	E.	51.4	65	e 8 57	0	e 18 33	S <sub>c</sub> S	e 10 51	PP	e 26.7
Tucson		54.6	80	i 9 20	- 1	e 16 52	+ 1	i 9 44	pP	e 25.8
Sverdlovsk		59.7	325	i 9 58	+ 1	18 5	+ 7	i 10 27?	pP	—
Ivigutut		61.5	23	9 49	-20	19 43	S <sub>c</sub> S	—	—	—
St. Louis		62.2	62	e 10 10	- 4	i 18 24	- 6	i 10 35	pP	—
Przhevalsk		62.6	305	i 10 18	+ 2	—	—	—	—	—
Almata		62.8	306	i 10 18	0	—	—	e 10 51	pP	—
Frunse		64.2	307	i 10 30	+ 3	e 19 2	+ 7	11 4	pP	—
Naryn		64.6	306	i 10 30	+ 1	—	—	e 11 4	pP	—
Ottawa		64.6	47	i 10 26 <sup>k</sup>	- 3	e 18 52	- 8	i 10 51	pP	—
Cleveland		64.7	54	i 10 30 <sup>a</sup>	0	i 18 57	- 4	i 10 52	pP	—
Seven Falls	E.	65.4	43	i 10 37	+ 3	i 19 1	- 8	—	—	—
Andijan		66.9	307	i 10 46	+ 2	e 19 34	+ 6	—	—	—
Pennsylvania	N.	67.1	52	i 11 2	pP	i 19 19	-11	—	—	—
Upsala		67.3	350	i 10 44?	- 2	e 19 30	- 2	e 20 8	PS	e 34.7
Fergana		67.5	307	i 10 48	0	e 19 39	+ 4	—	—	—
Moscow		67.5	337	e 10 48	0	i 19 37	+ 2	11 23	pP	—
Murgab		68.0	304	10 54	+ 3	19 46	+ 5	11 27	pP	—
Tashkent		68.0	309	i 10 53	+ 2	—	—	e 11 24?	pP	—
Harvard		68.7	47	i 10 53	- 2	—	—	i 11 19	pP	—
Palisades		68.8	50	e 10 54	- 2	e 19 44	- 6	e 11 17	pP	—
Fordham		68.8	50	i 10 55	- 1	e 19 47	- 3	i 11 21	pP	30.2
Washington		68.9	52	e 10 56	0	—	—	e 11 20	pP	—
Weston		68.9	47	i 11 4	+ 8	—	—	i 11 31	pP	—
Philadelphia		69.0	51	—	—	e 19 51	- 2	i 20 48	PS	e 30.6
Garm		69.3	307	e 11 1	+ 2	—	—	—	—	—
Kulyab		70.4	306	11 7	+ 1	e 20 13	+ 4	—	—	—
Samarkand		70.4	310	11 8	+ 2	—	—	—	—	—
Stalinabad		70.4	308	i 11 6	0	i 20 11	+ 2	—	—	—
Copenhagen		71.9	352	i 11 0	-14	—	—	—	—	—
Mary		74.4	312	e 11 32	+ 3	—	—	—	—	—
Lwow		76.0	342	i 11 39	+ 1	e 21 13	+ 1	—	—	—
Collmberg	z.	76.2	349	e 11 39	0	—	—	e 11 50	pP	—
Jena	N.	76.7	350	e 11 43	+ 1	—	—	e 12 6	pP	—
Raciborzu	z.	76.7	346	e 11 43	+ 1	—	—	—	—	—
Baku		77.2	321	i 11 48	+ 3	—	—	—	—	—
Prague		77.2	349	e 11 46	+ 1	e 21 24	- 1	e 14 44	PP	—
Gori		77.9	326	11 53	+ 4	—	—	—	—	—
Sotchi		77.9	329	e 11 41?	- 8	—	—	—	—	—
Tiflis		77.9	326	i 11 51	+ 2	—	—	—	—	—
Borzhom		78.3	327	11 53	+ 2	—	—	—	—	—
Yalta		78.7	334	e 11 54	+ 1	—	—	—	—	—
Leninakan		79.1	326	12 16	P <sub>c</sub> P	—	—	—	—	—
Stuttgart	z.	79.1	352	i 11 55	0	—	—	—	—	—
Strasbourg		79.4	353	i 11 58 <sup>k</sup>	+ 1	—	—	i 12 24	pP	—
Paris		79.5	356	i 11 59	+ 1	—	—	i 12 25	pP	—
Bermuda		80.1	49	—	—	e 21 59	+ 3	—	—	e 32.8
Basle		80.4	352	e 12 3	+ 1	—	—	—	—	—
Zürich		80.5	352	i 12 3 <sup>k</sup>	0	—	—	e 12 27	pP	—
Chur		81.0	351	e 12 6 <sup>k</sup>	0	—	—	—	—	—
Istanbul		83.2	336	e 12 18	+ 1	e 22 31	+ 4	—	—	—
Rome		85.5	348	—	—	e 22 55	+ 5	—	—	e 48.9
Ksara		88.0	329	e 12 41	+ 1	16 15	PP	13 19	pP	—
Alicante		90.0	358	13 4	+14	23 40	+ 8	18 32	PPP	e 42.8

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.
San Juan		91.0	57	e 12 57	+ 3	e 23 37	- 4	—	—
Granada		91.2	0	e 13 43k	+48	23 54	+11	33 0	SSS
Helwan	N.	93.1	331	—	—	i 23 29	[+ 1]	e 24 17	S
Chinchina		96.6	73	—	—	e 22 40	?	—	—
Bogota		97.8	72	—	—	e 23 52	[- 1]	e 24 41	S
Tamanrasset	z.	105.2	352	13 59 <sub>a</sub>	+ 1	—	—	i 14 25	pP
Pretoria	z.	144.8	306	i 19 27	[+ 1]	e 22 45	PKS	e 19 54	pPKP
Pietermaritzburg	z.	146.8	299	i 19 33	[+ 4]	—	—	e 20 7	pPKP
Grahamstown		151.7	299	i 19 39	[+ 2]	—	—	i 19 46	pPKP

Additional readings :—

College i = 5m.41s., iScP = 12m.8s., iScS = 15m.53s.  
 Sitka ePP = 6m.33s., iS = 10m.28s., isS? = 11m.11s., iScS = 16m.14s.  
 Seattle isP = 7m.54s., iPP = 8m.13s., iPcP = 9m.30s., ipPcP = 10m.0s., iScS = 17m.19s.,  
 and many other unidentified readings.  
 Resolute Bay eE = 14m.2s.  
 Shasta Dam iScS = 17m.39s.  
 Hungry Horse iPcP = 9m.40s., eScS = 17m.33s.  
 Mineral ePPZ = 9m.31s.  
 Berkeley eZ = 8m.8s., eK = 8m.34s., ePPZ = 9m.41s., iScP = 13m.24s.  
 Santa Clara esSE = 15m.23s.  
 Lick iZ = 8m.8s., iPPZ = 9m.46s.  
 Fresno ePP = 9m.28s., eE = 10m.20s., eZ = 10m.57s., eEN = 18m.3s.  
 Tinemaha iZ = 8m.28s. and 9m.7s., iPcPZ = 9m.52s., iScSEN = 18m.5s.  
 Haiwee iPcPZ = 9m.57s., iZ = 10m.9s., eScSEN = 18m.11s.  
 Pasadena ePcPZ = 9m.56s., epPcPZ = 10m.23s., iPPZ = 10m.51s., iScPZ = 13m.44s.,  
 iScSEN = 18m.16s., esSEN = 19m.31s.  
 Riverside iPcPZ = 10m.2s., eScSE = 18m.19s.  
 Boulder City iPcP = 10m.5s., iScP = 13m.48s., iScS = 18m.25s.,  
 Palomar iZ = 8m.56s., iScP = 13m.49s., iScS = 18m.28s.  
 Rapid City ePPP?E = 11m.55s.  
 Tucson epPP? = 11m.59s., eScP = 14m.9s., eScS = 18m.59s.  
 St. Louis isS = 19m.3s.  
 Cleveland epPE = 10m.56s., isSE = 19m.42s., esSE = 19m.46s.  
 Seven Falls iE = 20m.46s.  
 Pennsylvania iN = 11m.49s.  
 Palisades eScS = 20m.31s., e = 21m.18s., eSS = 24m.9s.  
 Prague e = 13m.0s. and 13m.41s., eN = 14m.13s., e = 15m.43s., 17m.50s., and 20m.0s.,  
 ePS = 21m.49s.  
 Strasbourg e = 12m.59s. and 13m.36s.  
 Paris i = 12m.34s., isP = 12m.38s., i = 12m.53s. and 13m.6s.  
 Alicante PPS = 25m.14s., SSS = 33m.38s.  
 Tamanrasset eZ = 17m.16s. and 17m.38s., ePPZ = 18m.21s.  
 Pretoria eZ = 20m.9s.

Sept. 16d. Readings also at 0h. (Samarkand, near Garm, near Ashkabad, and near Tacu-  
 baya), 3h. (College and near La Paz), 6h. (Ashkabad and near Rome), 7h. (College,  
 Tiflis, near Borzhomi, Grozny, Leninakan, and near Mizusawa), 9h. (Overton,  
 Pierce Ferry, Berkeley, Lick, Mineral, Shasta Dam, Logan, near Garm (2), Obi-  
 garm, and Stalinabad), 10h. (near Garm and near Mizusawa), 11h. (Mizusawa),  
 12h. (Taranto (2), Tamanrasset, near Athens, and near Garm), 13h. (Mount Wilson,  
 Tinemaha, Tucson, Boulder City, and College), 14h. (Tucson, Victoria, and near  
 Garm), 16h. (Huancayo and near Garm), 17h. (near Garm (2)), 18h. (near Garm  
 (2) and near Irkutsk), 19h. (Upsala, Obi-garm, near Andijan, Fergana, Garm,  
 Kulyab, Samarkand, and Stalinabad), 20h. (Huancayo, Lick, and Upsala), 21h.  
 (La Paz, near Overton, and Pierce Ferry), 22h. (Overton).

Sept. 17d. 15h. 55m. 58s. (I) } Epicentre 32°·5N., 94°·0E. (as on 1940, Feb. 16d.).  
 21h. 33m. 21s. (II) }

A = -·0589, B = +·8429, C = +·5347;  $\delta$  = -15;  $h$  = +1;  
 D = +·998, E = +·070; G = -·037, H = +·553, K = -·845.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
I Calcutta	E.	11.2	208	—	—	e 4 46	- 6	—	—
I Almata		16.9	314	i 4 4	+ 5	e 7 18	+11	—	—
II		16.9	314	e 4 5	+ 6	e 7 24	+17	—	—
I Naryn		16.9	307	e 4 0	+ 1	e 7 3	- 4	—	—
II		16.9	307	e 4 0	+ 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.
I	Murgab	17.4	295	4	5	- 1	7	17	- 2	—	—	—
II		17.4	295	4	6	0	7	21	+ 2	—	—	—
I	Frunse	18.5	309	i 4	22	+ 3	i 7	52	+ 8	—	—	—
II		18.5	309	i 4	22	+ 3	i 7	56	+12	—	—	—
I	Andijan	18.9	302	e 4	30	+ 6	i 8	7	+14	—	—	—
II		18.9	302	e 4	31	+ 7	i 8	9	+16	—	—	—
I	Fergana	19.5	301	e 4	31	0	e 8	5	- 1	—	—	—
II		19.5	301	i 4	32	+ 1	—	—	—	—	—	—
I	Kulyab	20.5	293	e 4	40	- 2	—	—	—	—	—	—
II		20.5	293	e 4	42	0	—	—	—	—	—	—
I	Irkutsk	20.7	17	e 4	49	+ 5	—	—	—	—	—	—
II		20.7	17	e 4	48	+ 4	e 8	45	+14	—	—	—
I	Hyderabad	N. 20.9	227	e 4	39	- 7	e 8	35	0	—	—	11.2
I	Nanking	21.1	84	e 4	48	0	8	38	- 1	—	—	e 9.6
II		21.1	84	e 4	46	- 2	e 8	49	+10	—	—	e 9.8
I	Tashkent	21.3	302	i 4	53	+ 3	—	—	—	—	—	—
II		21.3	302	i 4	53	+ 3	—	—	—	—	—	—
I	Stalinabad	21.4	295	i 4	48	- 3	—	—	—	—	—	—
II		21.4	295	i 4	48	- 3	e 8	43	- 2	—	—	—
I	Poona	22.8	237	5	2	- 3	9	13	+ 2	9	37	Q 10.6
II		E. 22.8	237	5	6	+ 1	9	14	+ 3	9	36	Q 10.7
I	Samarkand	22.9	295	e 5	3	- 3	—	—	—	—	—	—
II		22.9	295	e 5	6	0	—	—	—	—	—	—
I	Zi-ka-wei	z. 23.3	85	5	12	+ 2	e 9	23	+ 3	—	—	—
I	Bombay	23.6	241	e 5	7	- 6	e 9	24	- 1	—	—	11.4
II		23.6	241	e 12	24	P <sub>c</sub> S	—	—	—	—	—	—
II	Mary	26.7	292	e 5	42	- 1	—	—	—	—	—	—
I	Kodaikanal	E. 27.3	220	e 12	37	P <sub>c</sub> S	—	—	—	—	—	—
I	Ashkabad	29.5	291	e 6	7	- 1	—	—	—	—	—	—
I	Kizyl-Arvat	31.2	295	e 6	27	+ 4	—	—	—	—	—	—
I	Vladivostok	31.5	60	e 6	14	-12	—	—	—	—	—	—
I	Sverdlovsk	33.0	328	6	41	+ 2	11	58	+ 1	—	—	—
I	Moscow	45.1	319	e 8	19	- 1	—	—	—	—	—	—
II		45.1	319	e 8	18	- 2	—	—	—	—	—	—
I	Ksara	48.1	288	i 8	44	+ 1	—	—	—	10	44	PP
I	Collmberg	z. 60.1	315	e 10	8	- 3	—	—	—	e 10	14	P
II		z. 60.1	315	e 10	8	- 3	—	—	—	—	—	—
I	Stuttgart	z. 63.2	313	e 10	30	- 2	—	—	—	—	—	—
II		z. 63.2	313	e 10	29	- 3	—	—	—	—	—	—
I	College	71.8	24	i 11	24	- 2	—	—	—	e 15	48	PPP
II		71.8	24	i 11	23	- 3	—	—	—	—	—	—
II	Tamanrasset	z. 76.9	289	i 11	54 <sub>a</sub>	- 2	—	—	—	—	—	—
II	Victoria	z. 92.7	24	e 13	13	- 2	—	—	—	—	—	—
I	Hungry Horse	95.7	19	e 13	27	- 2	—	—	—	—	—	—
II		95.7	19	e 13	27	- 2	—	—	—	—	—	—

Calcutta gives also for shock I  $eS_1E = 6m.1s.$ ,  $eS^*E = 6m.25s.$ ,  $eS_2E = 6m.42s.$   
 Long waves were also recorded to shock I at Upsala and Dehra Dun; and to shock II at Calcutta and Tananarive.

Sept. 17d. Readings also at 0h. (near Huancayo and near Garm), 1h. (near Garm), 2h. (La Paz and near Huancayo), 4h. (near Ksara and near Chinchina), 5h. (Fergana, Samarkand, near Obi-garm, Stalinabad, Kulyab, Andijan, and Murgab), 7h. (Pierce Ferry), 8h. and 10h. (Huancayo), 12h. (near Prague), 13h. (Brisbane, Almata, near Frunse, Naryn, and Andijan), 14h. (Pasadena, Palomar, and Tinemaha), 16h. (2) and 18h. (College), 19h. (La Paz, Berkeley, Fresno, Perris, near Pasadena, La Jolla, Riverside, Boulder City, Overton, Pierce Ferry, and Tucson), 21h. (Kodaikanal, Nanking, Vladivostok, Sverdlovsk, College, and near Fergana).

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Sept. 18d. 19h. Assam-China border region.

New Delhi ePN = 10m.29s.  
 Dehra Dun ePN = 10m.45s., eSN = 13m.51s.  
 Naryn eP = 10m.49s.  
 Murgab P = 10m.53s., S = 13m.56s.  
 Almata eP = 10m.54s., iS = 13m.51s.  
 Frunse eP = 11m.7s., eS = 14m.21s.  
 Andijan eP = 11m.15s., eS = 14m.39s.  
 Fergana P = 11m.19s., S = 14m.41s.  
 Kulyab eP = 11m.30s.  
 Nanking eP = 11m.40s., S = 15m.48s., eL = 16.8m.  
 Stalinabad eP = 11m.41s., eS = 15m.26s.  
 Tashkent eP = 11m.43s.  
 Tchimkent iP = 11m.47s.  
 Samarkand eP = 12m.0s.  
 Poona PE = 12m.10s., S?E = 16m.2s., S? = 16m.16s., SS = 16m.36s., SSS = 16m.54s.  
 Calcutta ePE = 12m.11s., iSE = 13m.55s., iS<sub>e</sub>E = 14m.57s.  
 Ashkabad eP = 13m.5s.  
 Bombay ePEN = 16m.33s., eSEN = 20m.0s., LE = 21m.6s.  
 Kodaikanal eE = 16m.41s.  
 College eP? = 18m.19s.  
 La Paz iPZ = 29m.34s.  
 Ksara eP? = 33m.22s., eS? = 39m.8s., times in error.  
 Long waves were also recorded at Potsdam, Kew, De Bilt, Paris, Copenhagen, Rome, and Granada.

Sept. 18d. 19h. 36m. 44s. Epicentre 8°·2S. 71°·0W. Depth of focus 0·090.  
 (as on 1950, July 21d.).

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 42	+ 3	i 3 1	+ 3	—	—
La Paz	8·7	162	i 2 7	+ 1	i 3 49	+ 1	2 15	PP 4·3
Bogota	13·1	346	i 2 55	+ 6	i 5 15	+ 9	—	—
Chinchina	13·9	340	—	—	i 5 24	+ 4	—	—
Galerazamba	19·3	348	i 3 52	+ 5	i 7 59	+ 67	1 4 14	pP —
Fort de France	24·8	24	e 4 13	-25	e 7 48	-32	—	—
San Juan	26·9	10	i 4 56	0	i 8 47	- 6	1 14 36	S <sub>c</sub> S e 18·8
Merida	34·3	328	—	—	e 10 50	+ 4	e 13 26	sS —
Puebla	38·1	316	e 6 32	+ 2	e 11 30	-13	e 11 6	S <sub>c</sub> P —
Tacubaya	39·0	316	e 6 40 <sub>a</sub>	+ 3	i 11 57	+ 1	i 12 12	P <sub>c</sub> S —
Bermuda	40·8	9	—	—	e 12 30	+ 8	—	—
Washington	47·2	355	i 7 40	- 1	—	—	1 8 56	P <sub>c</sub> P —
Palisades	49·0	358	i 7 54	- 1	—	—	—	—
Weston	50·3	1	i 8 3	- 1	—	—	—	—
Harvard	50·5	1	i 8 4	- 2	—	—	1 11 7	sP —
Ottawa	z. 53·5	357	i 8 26 <sub>k</sub>	- 1	—	—	—	—
Lincoln	E. 54·2	337	e 10 37	PP	—	—	—	e 28·7
Shawinigan Falls	N. 54·5	359	e 8 31	- 3	—	—	—	—
Tucson	55·3	320	i 8 38	- 2	e 15 38	- 1	1 10 40	pP —
Rapid City	E. 59·6	334	i 9 10	+ 1	i 16 34	0	—	—
Pierce Ferry	59·8	321	i 9 10	0	e 16 34	- 2	1 11 11	pP —
Boulder City	60·2	320	e 9 12	- 1	—	—	e 12 24	sP —
Overton	z. 60·3	321	i 9 13	0	—	—	1 11 31	pP —
Riverside	60·8	317	i 9 15 <sub>k</sub>	- 2	e 17 50	S <sub>c</sub> S	1 11 19	pP —
Pasadena	61·4	317	i 9 19 <sub>k</sub>	- 1	e 16 56	0	1 11 23	pP —
Haiwee	z. 62·4	319	i 9 25	- 2	—	—	—	—
Tinemaha	63·1	319	i 9 31 <sub>k</sub>	- 1	—	—	e 11 36	pP —
Fresno	63·9	318	e 9 36 <sub>k</sub>	0	e 17 34	+ 8	e 11 58	pP —
Lick	65·5	318	i 9 46 <sub>k</sub>	0	—	—	e 11 51	pP —
Berkeley	z. 66·2	318	i 9 50 <sub>k</sub>	- 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.
Mineral	z.	67.1	320	e 9 54	- 2	—	—	—	—
Hungry Horse		67.8	331	i 10 0	0	i 18 10	- 2	i 12 28	PP
Shasta Dam		67.8	320	e 9 59	- 1	e 18 8	- 4	e 12 4	pP
Seattle		71.7	327	i 10 24k	0	—	—	i 10 47	PcP
Victoria	z.	72.8	327	i 10 29	- 1	—	—	—	—
Malaga	z.	76.6	49	i 10 52k	+ 1	i 19 52	+ 3	i 13 2	pP
Granada		77.4	49	11 29a	+34	—	—	12 20	pP
Toledo	z.	78.0	47	i 10 59	+ 1	—	—	e 12 53	pP
Alicante		80.1	49	8 25	?	18 39	?	13 31	pP
Tamanrasset	z.	80.9	65	i 11 14k	+ 1	—	—	i 13 26	pP
Tortosa		81.6	47	e 11 22	+ 5	i 20 41	+ 1	22 8	?
Algiers Univ.	z.	82.3	51	i 11 20k	0	—	—	e 11 35	PcP
Paris		85.4	39	i 11 35	- 1	i 21 13	- 4	e 14 50?	PP
Strasbourg		88.1	41	e 11 50	- 1	—	—	e 12 29	?
Stuttgart	z.	89.7	41	e 11 54a	- 2	—	—	e 14 11	pP
Jena		91.7	39	e 12 4	- 1	e 21 37	[- 3]	—	—
College		91.8	335	i 12 3	- 3	e 22 6	- 8	i 14 18	pP
Grahamstown		91.8	124	i 12 3	- 3	—	—	—	—
Collmberg	z.	92.6	39	e 12 8	- 1	—	—	—	—
Prague		93.3	39	e 12 49	+37	—	—	—	—
Pretoria	z.	94.7	117	i 12 16	- 3	—	—	—	—
Istanbul		102.9	49	—	—	e 22 31	[- 6]	—	—

### Additional readings :—

Huancayo i = 2m.12s. and 2m.51s.  
 La Paz SS = 4m.13s.  
 Bogota ePcPZ = 8m.23s., i = 9m.16s.  
 Galerazambo iEN = 8m.17s., isSEN = 8m.39s.  
 San Juan iPcS = 11m.39s.  
 Merida e = 11m.11s.  
 Tucson ePcP = 9m.28s., ePP? = 10m.55s.  
 Overton iZ = 9m.29s., ePKP, PKP?Z = 38m.26s.  
 Pasadena ePcP?Z = 9m.52s., isPZ = 12m.28s., eScSE = 18m.5s.  
 Tinemaha iZ = 10m.0s.  
 Fresno eN = 11m.6s.  
 Lick eN = 11m.57s.  
 Berkeley eZ = 9m.58s.  
 Seattle i = 10m.30s., 10m.38s., and 11m.6s., ipP? = 11m.55s., e = 13m.48s.  
 Malaga PPPZ = 15m.40s.  
 Granada pPP = 20m.8s.  
 Toledo eZ = 13m.44s.  
 Alicante PP = 11m.43s.,  
 Tamanrasset iPPZ = 14m.30s.  
 Paris e = 15m.59s. and 25m.3s.  
 Stuttgart ePPZ = 15m.35s.  
 College ePP? = 15m.48s., eSKS? = 21m.34s.

Sept. 18d. Readings also at 0h. (College, Bermuda, Trieste, Bologna, Florence Xim, Prato and near Rome (2) ), 3h. (near Tortosa), 4h. (College, Seattle, Zugdidi, near Tiflis, Gori, Grozny, Erevan, Borzhomi, Shemakla and Baku), 6h. (Berkeley, Pasadena, Palomar, Boulder City, Overton, Pierce Ferry and Tucson), 7h. (Overton), 8h. (Murgab, Fergana, near Naryn and Andijan), 10h. (near Huancayo), 11h. (Brisbane, College and Overton), 14h. (Christchurch, Overton, Pierce Ferry, Granada and near Obi-garm), 15h. (Overton, Hungry Horse, College and near San Juan), 17h. (College, Overton, Pierce Ferry, near Apia and near Istanbul), 18h. (near San Juan), 19h. (near Istanbul), 20h. (Tacubaya, Hungry Horse, Shasta Dam, Fergana, Samarkand, Tashkent, near Obi-garm, Kulyab, Stalinabad, Andijan and Murgab), 21h. (College, Hungry Horse, Shasta Dam, Overton, Lick, Mount Wilson, Riverside, Tiflis and near Gori).



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Sept. 19d. 20h. 29m. 46s. Epicentre 2° 1S. 138° 5E.

A = -0.7485, B = +0.6622, C = -0.0364;  $\delta = +9$ ;  $h = +7$ ;  
D = +0.663, E = +0.749; G = +0.027, H = -0.024, K = -0.999.

		$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.
		°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.
Manila		24.0	314	i 5	15	- 2	e 9	25	- 7	—	—	—
Brisbane		28.8	152	i 6	4	+ 2	i 10	50	- 1	i 7	4	PP i 13.8
Bandong		31.1	260	e 7	19	PP	e 13	1	SS	—	—	—
Riverview		33.7	160	i 6	48k	+ 3	i 12	12	+ 4	i 8	9	PP
Miyazaki		34.5	350	6	49	- 3	12	20	0	—	—	—
Kumamoto		35.5	349	e 6	55	- 5	—	—	—	—	—	e 17.4
Koti		35.8	353	e 7	5	+ 2	e 12	36	- 5	e 7	34	pP 16.3
Owase		36.0	357	e 7	1	- 4	e 13	21	+37	—	—	—
Matuyama		36.2	352	e 7	7	+ 1	e 12	46	- 1	—	—	e 17.3
Hukuoka		36.3	349	e 6	53	-14	e 11	30	-78	—	—	—
Sumoto		36.4	356	i 7	9	+ 1	e 12	46	- 4	—	—	16.1
Perth		36.6	212	i 7	49	+39	13	9	+16	9	4	PPP
Kobe		36.7	356	e 7	11	+ 1	e 13	24	+30	—	—	e 15.7
Osaka		36.7	356	e 7	12	+ 2	e 12	34	-20	—	—	16.4
Zi-ka-wei	z.	36.9	336	i 7	10	- 2	i 12	32	-26	i 8	36	PP i 15.7
Hunatu		37.4	1	e 7	22	+ 6	—	—	—	—	—	—
Matusiro		38.4	0	e 7	12	-13	13	16	- 4	—	—	16.2
Nanking		38.8	332	i 7	26a	- 2	i 13	24	- 2	9	0	P i 16.0
Hokusima		39.7	3	7	44	+ 8	e 13	45	+ 5	—	—	e 17.8
Sendai		40.2	4	e 7	38	- 2	e 13	32	-16	—	—	e 17.1
Mizusawa	E.	41.1	3	7	55	+ 8	14	2	+ 1	—	—	—
Sapporo		45.0	3	e 8	33	+14	e 14	59	+ 1	—	—	e 18.2
Vladivostok		45.4	353	i 8	21	- 1	i 15	3	- 1	—	—	—
Auckland	N.	48.1	139	i 8	36	- 7	i 15	49	+ 7	11	48	PPP 21.2
New Plymouth	E.	49.0	142	e 9	59	PP	—	—	—	—	—	—
Arapuni		49.4	140	e 8	49	- 4	e 16	32	+32	—	—	—
Cobb River	E.	49.6	145	e 8	54	- 1	e 16	5	+ 2	—	—	—
Kaimata	N.E.	49.9	148	e 8	57	0	e 16	8	+ 1	—	—	—
Apia		50.5	105	e 9	5	+ 3	e 16	24	+ 8	e 10	50	PP e 23.2
Tuai	N.	50.8	140	e 9	4	0	16	18	- 2	—	—	—
Wellington		50.9	144	i 9	4	- 1	e 16	12	- 9	i 10	11	PcP 24.0
Christchurch		51.2	148	e 9	5	- 2	—	—	—	10	10	PcP 24.6
Calcutta	E.	54.7	299	e 9	41	+ 8	i 17	25	+12	e 10	37	PcP
Colombo	E.	59.2	279	10	5	0	18	25	+13	—	—	33.3
Irkutsk		61.4	337	10	19	- 1	18	40	0	—	—	—
Kodaikanal	E.	62.0	283	e 9	43	-41	e 17	33	-75	11	50	PcP 24.2
Hyderabad	N.	62.3	291	e 10	27	+ 1	i 18	50	- 2	13	29	PP
Dehra Dun	N.	65.9	305	e 15	26	PPP	e 23	8	SS	—	—	—
New Delhi	N.	66.1	303	e 10	49	- 2	i 19	30	- 9	12	27	PcP 30.2
Honolulu		66.4	65	e 10	53	0	i 19	46	+ 3	e 24	3	SS e 27.9
Poona	E.	66.8	291	e 10	52	- 4	19	36	-12	11	16	PcP 32.0
Bombay		67.8	291	e 11	3	+ 1	i 19	57	- 3	i 11	37	PcP 31.6
Przhevalsk		69.9	317	i 11	14	- 1	i 20	26	+ 2	—	—	—
Almata		71.2	317	i 11	22	- 1	e 20	40	0	—	—	—
Naryn		71.2	314	i 11	20	- 3	i 20	38	- 2	—	—	—
Murgab		71.6	311	11	23	- 2	20	42	- 2	—	—	—
Frunse		72.6	316	i 11	30	- 1	i 20	57	+ 1	—	—	—
Andijan		73.5	313	e 11	36	0	i 21	5	- 1	—	—	—
Fergana		73.8	313	i 11	37	- 1	e 21	9	0	—	—	—
Kulyab		74.7	310	e 11	45	+ 2	e 21	21	+ 2	—	—	—
Stalinabad		75.6	311	i 11	48	0	i 21	27	- 2	—	—	—
Tashkent		75.9	313	i 11	49	- 1	i 21	23?	- 9	—	—	—
Tchimkent		76.0	314	i 11	54	+ 3	—	—	—	—	—	—
Samarkand		77.2	311	11	59	+ 2	e 21	47	0	—	—	—
Mary		80.7	308	e 12	17	+ 1	—	—	—	—	—	—
Ashkabad		83.5	308	12	45?	+14	23	1?	+ 9	—	—	—
College		85.0	24	e 12	38	0	i 23	4	- 3	e 16	24	PP e 35.1
Sverdlovsk		85.1	327	i 12	38	- 1	i 23	3	- 5	—	—	—
Kizyl-Arvat		85.3	309	i 12	42	+ 2	i 23	3	[ 0]	—	—	—
Sitka		89.7	33	e 12	56	- 5	e 23	48	- 4	i 24	36	PS e 36.4

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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.
Tananarive	90.2	251	13 16	+12	23 53	- 3	16 53	PP 40.7
Baku	90.3	310	e 13 5	+ 1	e 24 3	+ 6	e 16 45	PP —
Lenkoran	91.1	309	i 13 6	- 2	e 23 56?	- 8	—	—
Grozny	93.4	313	e 13 21	+ 3	—	—	—	—
Tiflis	94.2	312	e 13 21	- 1	e 23 55	[- 2]	e 17 7	PP —
Leninakan	94.9	311	e 13 22	- 3	—	—	—	—
Borzhomi	95.2	312	e 13 25	- 2	e 24 3	[+ 1]	—	—
Ferndale	E. 96.9	49	—	—	e 24 38	{+ 6}	—	e 47.2
Victoria	96.9	41	13 34	0	24 55	+ 1	31 37	SS —
Arcata	Z. 97.0	49	e 13 38 <sub>a</sub>	+ 3	e 24 50	- 5	e 17 32	PP e 47.6
Seattle	97.7	42	e 13 50 <sub>k</sub>	+12	e 24 41	{+ 3}	e 17 47	PP e 38.7
Ukiah	97.7	51	e 17 48	PP	e 25 15	+14	e 24 19	SKS e 40.1
Moscow	97.8	326	e 13 35	- 3	e 24 11	[- 5]	e 17 36	PP —
Sotchi	97.8	314	e 13 47	+ 9	—	—	—	—
Shasta Dam	98.3	49	i 13 42	+ 1	e 25 24	+18	e 17 54	PP —
Berkeley	98.6	52	i 13 42 <sub>a</sub>	0	e 24 23	[+ 3]	e 17 49	PP e 40.4
Mineral	Z. 98.9	49	e 13 46	+ 3	e 24 1	[- 21]	e 17 52	PP —
Santa Clara	98.9	52	e 13 47	+ 4	i 24 25	[+ 3]	e 17 52	PP e 47.1
Lick	99.1	52	e 13 46 <sub>a</sub>	+ 2	e 24 26	[+ 3]	e 17 50	PP e 41.3
Fresno	100.6	53	e 13 20 <sub>a</sub>	-31	e 24 34	[+ 4]	e 17 42	PP e 48.7
Pulkovo	100.9	331	e 13 52	0	e 24 22	[- 9]	e 18 0	PP —
Resolute Bay	Z. 101.2	12	e 13 57	+ 3	—	—	—	—
Ksara	101.6	303	e 13 57	+ 1	27 38	PS	18 11?	PP —
Yalta	101.7	315	e 13 56	0	e 24 34	[- 1]	18 4	PP —
Tinemaha	Z. 101.8	53	e 13 59	+ 3	—	—	—	—
Haiwee	Z. 102.2	53	e 13 58	0	—	—	—	—
Pasadena	102.2	55	e 13 59	+ 1	i 24 39	[+ 1]	e 18 27	PP e 41.4
Riverside	102.9	55	e 14 1	0	e 24 43	[+ 2]	—	—
Hungry Horse	103.1	40	i 14 7	+ 5	—	—	e 17 55	PKP —
Palomar	Z. 103.4	56	i 14 15	+11	—	—	i 18 25	PP —
Helsinki	103.4	332	—	—	e 24 40	[- 3]	e 33 5	SS 45.2
Butte	N. 104.6	42	—	—	e 25 54	- 5	e 32 43	SS e 42.6
Boulder City	104.7	53	e 14 10	+ 1	—	—	e 18 24	PP —
Overton	Z. 104.9	52	e 14 12	+ 2	—	—	e 18 29	PP e 55.8
Kishinev	104.9	319	e 18 32	PP	24 46	[- 4]	—	—
Pierce Ferry	105.3	53	e 14 15	P	e 25 0	[+ 8]	e 18 44	PP e 56.3
Bozeman	105.7	43	—	—	e 24 57	[+ 3]	e 26 12	S e 43.1
Helwan	E. 105.9	300	—	—	i 24 53	[- 2]	—	—
Istanbul	106.0	312	e 13 13	P	e 24 57	[+ 2]	—	—
Saskatoon	106.7	36	—	—	e 26 21	+ 5	—	—
Upsala	E. 106.9	333	e 18 26	[- 1]	e 24 52	[- 7]	e 20 47	PPP e 43.5
Lwow	107.2	322	14 18	P	24 58	[- 2]	e 18 44	PP —
Pretoria	Z. 107.3	243	e 18 20	[- 8]	—	—	—	—
Bucharest	107.4	316	e 18 50	PP	i 25 3	[+ 2]	—	46.2
Warsaw	108.2	325	e 18 17	[-12]	e 25 2	[- 3]	e 18 52	PP e 53.2
Tucson	108.6	56	e 14 26	P	e 26 2	{+ 7}	e 18 22	PKP e 44.8
Skalnate Pleso	109.8	322	e 19 9	PP	e 25 5	[- 6]	e 26 6	SKKS —
Timisoara	N. 110.3	318	19 14?	PP	—	—	—	—
Scoresby Sund	110.5	353	—	—	26 32	S	34 20	SS 48.2
Belgrade	111.1	317	e 19 17 <sub>a</sub>	PP	e 25 11	[- 6]	e 28 43	PS e 59.7
Budapest	111.1	321	e 19 47	PP	e 28 40	PS	e 34 31	SS 57.2
Copenhagen	111.3	331	e 18 58	[+22]	i 25 20	[+ 2]	i 28 41	PS 52.2
Kalossa	E. 111.5	320	e 19 40	PP	e 28 34	PS	—	—
Ogyalla	111.5	321	—	—	e 28 38	PS	e 30 33	PPS —
Rapid City	111.5	43	e 19 42	PP	e 28 51	PS	e 33 52	SS e 46.6
Bergen	111.8	337	—	—	26 24	{+ 6}	30 29	PPS 45.5
Potsdam	112.6	327	i 19 28	PP	e 25 19	[- 4]	i 21 46	PPP e 53.2
Prague	112.9	325	e 14 43	P	e 25 20	[- 4]	e 18 25	PKP e 54.2
Collmberg	113.1	326	e 18 40?	[+ 1]	e 26 26	{- 1}	e 19 59	PP e 55.2
Jena	114.1	326	e 18 53	[+12]	e 25 26	[- 3]	e 19 48	PP e 58.2

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	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Taranto	114.8	314	19 39	PP	e 38 49	SSS	—	—
Triest	115.2	321	e 19 39	PP	i 25 31	[- 2]	i 26 28	SKKS
Stuttgart	116.5	325	e 18 46	[ 0]	e 25 34	[- 4]	e 19 39	PP
Aberdeen	116.8	337	i 20 8	PP	i 25 3	[-36]	i 23 3	PPP
De Bilt	116.8	330	i 20 1	PP	e 29 32	PS	e 36 30	SS
Karlsruhe	116.8	326	e 18 35	[-12]	—	—	—	—
Messina	116.8	313	e 20 28	PP	—	—	—	—
Padova	116.9	320	e 19 57	PP	e 25 9	[-30]	e 28 10	S
Bologna	117.2	321	e 20 17	PP	e 25 45	[+ 5]	e 29 9	PS
Chur	117.2	323	e 20 9	PP	—	—	—	—
Florence Xim	117.3	320	—	—	i 25 44	[+ 4]	i 29 44	PS
Strasbourg	117.4	326	e 19 0	[+12]	e 25 42	[+ 1]	e 20 1	PP
Rome	117.6	317	e 19 52	PP	i 25 42	[ 0]	i 29 42	PS
Zürich	117.6	324	e 18 58	[+10]	—	—	e 20 8	PP
Basle	118.1	324	e 19 52	PP	e 27 45	?	e 20 17	PP
Durham	118.3	335	i 20 18	PP	i 30 4	PS	—	—
Neuchatel	118.7	324	e 18 56	[+ 6]	—	—	—	—
Kew	119.9	331	e 20 4	PP	i 30 0	PS	e 22 52	PPP
Paris	120.2	328	e 18 54	[+ 1]	i 25 48	[- 3]	i 20 21	PP
Ivigtut	120.8	3	—	—	36 54	SS	40 56	SSS
Tacubaya	121.1	68	e 22 13	?	e 25 49	[- 5]	e 22 33	PKS
Rathfarnham Castle	121.3	336	i 19 31	[+36]	e 30 19	PS	e 22 58	PPP
Clermont-Ferrand	121.6	325	e 32 27	PKKS	e 37 23	SS	e 40 54	SSS
St. Louis	122.6	44	e 19 5	[+ 7]	e 27 36	(+ 5)	i 20 41	PP
Chicago	122.8	39	—	—	e 28 29	S	e 36 57	SS
Vera Cruz	123.9	68	i 20 36	PP	e 25 50	[-13]	e 32 44	PPS
Tortosa	N. 126.0	321	—	—	38 25	SSP	—	—
Aliers Univ.	Z. 126.4	315	e 19 5	[ 0]	e 32 34	PPS	e 20 48	PP
Cleveland	126.8	37	—	—	e 29 34	?	e 37 55	SS
Ottawa	127.1	29	19 7	[+ 1]	i 38 17	SS	—	—
Alicante	128.0	319	19 38	[+30]	26 26	[+11]	21 36	PP
Seven Falls	E. 128.4	25	—	—	e 29 3	{+54}	i 38 23	SS
Toledo	129.3	323	e 19 11	[ 0]	26 7	[-11]	i 21 27	PP
Tamanrasset	Z. 130.0	298	i 19 16 <sub>a</sub>	[+ 4]	e 35 57	SKKS <sub>a</sub>	i 21 32	PP
Granada	130.7	320	i 19 23 <sub>k</sub>	[+10]	28 36	{+12}	i 21 28	PP
Washington	131.1	36	i 19 26	[+12]	—	—	e 21 54	PP
Columbia	131.3	44	e 22 47	PKS	e 38 50	SS	—	—
Malaga	Z. 131.5	320	i 19 16 <sub>k</sub>	[+ 1]	26 16	[- 8]	i 21 36	PP
Palisades	131.5	32	i 19 18	[+ 3]	i 39 9	SS	e 21 57	PP
Philadelphia	131.5	34	e 22 33	PKS	e 38 57	SS	e 34 17	PPS
Fordham	131.6	32	e 19 34	[+19]	e 23 1	SKP	e 21 56	PP
Harvard	131.6	29	e 19 18	[+ 3]	i 23 37	SKP	i 21 58	PP
Weston	131.8	29	e 19 17	[+ 1]	e 39 4	SS	e 22 6	PP
Lisbon	133.1	325	23 14	PKS	—	—	—	—
La Plata	E. 140.1	159	23 28	PP	29 20	{- 2}	41 38	SS
	N. 140.1	159	23 2	PP	29 26	{+ 4}	43 26	?
Bermuda	142.8	33	e 19 50	[+15]	33 16	SKSP	e 41 20	SS
Huancayo	143.6	114	e 19 39	[+ 2]	e 30 21	{+39}	i 23 20	PP
Galerzamba	145.4	73	i 19 52	[+12]	e 29 18	{-34}	i 23 38	PKS
Chinchina	145.8	82	e 19 43	[+ 2]	—	—	e 42 13	SS
Bogota	Z. 147.4	84	e 19 39	[- 4]	—	—	—	—
La Paz	147.9	126	e 19 45	[+ 1]	30 38	{+31}	23 24	PP
San Juan	150.9	54	i 19 56	[+ 7]	e 27 33	{+38}	e 30 24	SKKS
Fort de France	156.9	56	e 20 6	[+ 9]	e 31 0	{+ 4}	—	—

Additional readings :—

Brisbane iPPPN = 7m.17s., iSSN = 12m.37s.  
 Riverview eN = 12m.44s. and 13m.20s., iSSN = 14m.29s.  
 Koti PP = 8m.31s.  
 Hukuoka iZ = 7m.23s., iN = 7m.31s.  
 Perth i = 14m.42s., SS = 15m.16s.  
 Kobe eZ = 7m.15s.  
 Nanking i = 15m.11s., iSS? = 15m.37s.  
 Auckland i = 9m.44s., eSSSN = 19m.49s.  
 Apia e = 17m.14s.

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Wellington PP = 10m.57s., PPPZ = 11m.51s., iScPZ = 13m.4s., eSS = 18m.53s., eSSS = 20m.36s., Q = 23.0m.  
 Christchurch iP = 9m.9s., PP = 11m.0s.  
 Calcutta iPPPE = 12m.52s., iScSE = 19m.18s., iSSE = 21m.13s., eSSSE = 23m.10s.  
 Hyderabad SSN = 22m.47s.  
 New Delhi PcPSN = 15m.41s., PSN = 19m.44s., PPSN = 19m.55s., SKSN = 20m.34s., SSN = 23m.42s., QN = 27m.20s.  
 Honolulu i = 11m.2s.  
 Poona PPE = 13m.22s., PSE = 20m.2s., ScSE = 20m.26s., SSE = 23m.50s., SSSE = 26m.44s., QE = 28m.0s.  
 Bombay iSSE = 24m.37s., iSSN = 24m.41s., QE = 28m.16s.  
 College e = 15m.54s., eSS? = 28m.4s.  
 Sitka iS = 23m.54s., i = 24m.26s.  
 Tananarive PPP = 18m.56s., S = 24m.12s., PS = 25m.28s., SS = 30m.7s.  
 Arcata eZ = 26m.14s.  
 Seattle ePPP = 19m.30s., eSKS = 24m.19s., ePS = 25m.56s., ePPS = 26m.29s., eSS = 30m.27s., and many other e readings.  
 Ukiah eSS = 31m.37s.  
 Moscow ePPP = 19m.27s., eSKKS = 24m.29s., ePS = 26m.24s.  
 Shasta Dam e = 13m.50s., ePPP = 19m.52s., eSKS = 24m.19s.  
 Berkeley ePSEN = 25m.15s.  
 Santa Clara eE = 32m.9s. and 34m.37s.  
 Lick iZ = 13m.56s., eE = 18m.14s.  
 Fresno eSZ = 24m.40s.  
 Pulkovo ePPP = 20m.17s., eSKKS = 24m.45s., iPS = 26m.58s., iSS = 32m.11s.  
 Pasadena iZ = 14m.8s., ePSZ = 26m.57s., iZ = 27m.18s., eSSEN = 32m.44s.  
 Palomar iZ = 14m.42s.  
 Overton iZ = 14m.22s.  
 Bozeman ePS = 27m.55s., eSSS? = 38m.20s.  
 Helwan eE = 25m.14s. and 26m.41s.  
 Upsala eE = 18m.45s. and 19m.51s., E = 21m.35s., eN = 25m.34s., eS = 25m.46s., e = 27m.58s. and 28m.58s., eE = 29m.29s., eN = 29m.32s. and 34m.5s., eE = 35m.33s., eN = 36m.33s., e = 38m.14s.?  
 Lwow ePPP = 21m.3s., PS = 27m.56s.  
 Warsaw ePPE = 19m.3s., ePPPE = 21m.17s., ePPPZ = 21m.30s., eE = 23m.25s., eSKKSE = 26m.0s., eSE = 26m.35s., eSN = 26m.48s., ePSN = 27m.52s., ePSE = 28m.4s., ePSZ = 28m.7s., ePPSEN = 29m.6s., ePPSZ = 29m.19s., SSEN = 33m.54s., SSSN = 38m.4s.  
 Tucson iPP = 18m.56s., ePS = 28m.19s., ePPS = 29m.31s., eSS = 34m.7s.  
 Skalnate Pleso e = 19m.57s., ePS = 28m.19s., ePPS = 29m.20s., eSS = 34m.44s., e = 38m.8s.  
 Scoresby Sund 28m.31s., SSS = 38m.8s.  
 Belgrade e = 31m.44s. and 39m.48s.  
 Budapest eN = 19m.57s., 29m.7s., and 39m.27s.  
 Copenhagen i = 19m.19s., SS = 35m.2s.  
 Kalossa eN = 20m.4s.  
 Bergen eE = 28m.44s. and 32m.47s., SSEN = 35m.9s.?  
 Potsdam iPPPE = 21m.51s., ePPPN = 21m.54s., eSKKSE = 26m.16s., iSKKKSE = 26m.27s., ePS = 28m.50s., iPSN = 28m.53s.  
 Prague ePP = 19m.31s., ePPP = 21m.35s., eSKKS = 26m.29s., ePS = 28m.56s., eSKSP? = 29m.58s., eSS = 34m.50s., eSSS = 38m.56s., and other unidentified e readings.  
 Collmberg eZ = 18m.45s. and 19m.30s., eN = 28m.56s., eEZ = 29m.2s., ePKKPZ = 29m.44s., e = 30m.32s., eN = 32m.2s., eSSE = 35m.20s., eN = 35m.56s., eScSScSN = 39m.32s., eSSSN = 41m.14s.  
 Jena ePP?E = 19m.51s., eE = 20m.18s., eN = 20m.25s., ePPP?N = 22m.29s., eSKS?N = 25m.33s., ePS?EN = 29m.9s.  
 Trieste iSKP = 21m.1s., iPS = 29m.16s., iPPS = 30m.17s., eSS = 35m.32s.  
 Stuttgart ePP = 19m.55s., eZ = 20m.19s., ePPP = 22m.20s., eS? = 28m.14s., ePKKP = 29m.26s., ePPS = 31m.20s., eSS = 36m.14s.  
 Aberdeen ePSEN = 29m.46s., iSSEN = 36m.21s., eEN = 42m.14s.  
 Strasbourg ePPP = 22m.26s. and 22m.29s., eSKKS = 26m.53s., ePS = 29m.24s., ePPS = 30m.52s., eSS = 35m.58s., eSSS = 39m.47s. and 40m.9s.; and many other e readings.  
 Rome iSSN = 36m.42s.  
 Basle e = 21m.18s.  
 Kew e = 34m.10s. and 37m.0s., eEN = 49m.6s.  
 Paris e = 19m.4s., i = 20m.29s., iPPP = 22m.43s., i = 25m.31s. and 26m.56s., eSKKS = 27m.16s., iPS = 30m.12s., iPPS = 31m.25s., e = 35m.33s., eSSP = 37m.23s., Q = 56.2m.  
 Tacubaya e = 23m.52s., ePS = 30m.26s., eSS? = 37m.14s.  
 Clermont-Ferrand e = 33m.54s., 35m.4s., 39m.45s., 57m.18s., and 63m.9s.  
 St. Louis eS? = 28m.33s., iSS? = 37m.19s.  
 Vera Cruz iSKS = 25m.59s.  
 Algiers Univ. eZ = 19m.16s., 21m.31s., 22m.0s., and 22m.43s., ePPPZ = 23m.30s.  
 Cleveland eE = 37m.31s., eN = 40m.31s. and 41m.51s., eSSSE = 42m.38s., eN = 47m.40s.  
 Alicante PPP = 24m.18s., SS = 38m.30s., SSP = 39m.4s., SSS = 43m.16s., Q = 53m.0s.

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Toledo PKSEN = 22m.42s., PPPE = 24m.10s., SS? = 38m.37s., SSSN = 43m.40s.  
Tamanrasset iZ = 19m.26s. and 19m.38s., eZ = 20m.39s. and 21m.11s., iZ = 22m.17s.,  
iPKSZ = 22m.40s., iZ = 23m.2s., iPPPZ = 24m.18s., eZ = 26m.15s., ePSZ = 31m.27s.,  
eZ = 32m.37s.  
Granada SKP = 23m.8s., PPP = 24m.25s., S = 29m.50s., PS = 32m.42s., PPS = 35m.6s.,  
iSS = 39m.3s., SSS = 43m.42s.,  
Malaga PKSZ = 22m.38s., PPPZ = 24m.18s.  
Philadelphia i = 22m.49s., 23m.4s., and 41m.22s.  
Fordham iSS = 39m.11s.  
Harvard e = 22m.58s. and 25m.4s., eSKSP = 31m.33s., ePS = 31m.59s., e = 33m.2s.,  
ePPPS = 34m.42s., i = 36m.52s., eSS = 38m.38s., e = 40m.51s., eSeS, SeS = 41m.54s.,  
eSSS = 43m.22s., e = 46m.56s.  
La Plata PKPN = 23m.11s., PKPE = 23m.32s., SKKSN = 32m.38s., SKSPEN =  
36m.44s., SSE = 44m.2s., PSN = 45m.26s., PSSN = 45m.44s., and many other  
unidentified readings.  
Bermuda e = 30m.16s.  
Huancayo i = 20m.39s., iSKSP = 33m.23s., iSS = 42m.41s., eSSS = 47m.7s., i = 52m.51s.  
La Paz iPKPZ = 19m.49s., iZ = 20m.26s., i = 33m.14s., eSS = 42m.54s., SSP = 44m.34s.  
San Juan i = 20m.21s., eSS = 42m.54s.  
Long waves were also recorded at Jersey, Salt Lake City, Halifax, Edinburgh and  
Barcelona.

Sept. 19d. Readings also at 0h. (Tucson, Boulder City, College, Hungry Horse, Overton, Pierce Ferry, Shasta Dam, Samarkand, near Andijan, Kulyab, and Stalinabad), 1h. (near Tucson), 2h. (Apia, Auckland, Arapuni, Cobb River, Kaimata, Tuai, Palomar, Pasadena, Riverside, Tucson, Boulder City, Overton, Pierce Ferry, Lick, Shasta Dam, College, Collmberg, Tamanrasset, Samarkand, near Andijan, Fergana, Kulyab, Obi-garm, and Stalinabad), 3h. (Calcutta, Collmberg, Stuttgart, Tamanrasset and College), 5h. (Shasta Dam and near Prague), 6h. (Kulyab, near Obi-garm, near Andijan and near Istanbul), 7h. (Mary, near Ashkabad, Kizyl-Arvat and near Almata), 8h. (Istanbul and near Obi-garm), 9h. (near Almata), 10h. (near Almata and near Zürich), 12h. (near Borzhomi), 13h. (Mount Wilson, Palomar, Tinemaha, Tucson, Overton, Pierce Ferry, Collmberg and near Obi-garm), 14h. (near Overton), 15h. (Basle, Zürich and near Neuchatel), 17h. (near Ottawa), 19h. (La Paz (2)), 20h. (Brisbane and near Obi-garm), 21h. (Ottawa and College), 22h. (Copenhagen, Kulyab, near Almata, Andijan, Fergana, Frunse, Murgab, Naryn, Przhevalsk and Tchinkent), 23h. (New Delhi, Poona, Almata, Andijan (2), Fergana (2), Frunse, Kulyab, Obi-garm (2), Przhevalsk, Samarkand (2), Stalinabad, Collmberg, Stuttgart, Tchinkent, Tamanrasset, College and Hungry Horse).

Sept. 20d. 0h. New Britain region. U.S.C.G.S. suggests a depth of 500km.

Brisbane iPZ = 39m.19s.k, iZ = 39m.22s., iPcP? = 42m.51s.  
Riverview iS?N = 44m.35s.  
Lick ePZ = 46m.48s.k, epP?Z = 48m.39s.  
Pasadena iPZ = 47m.0s.k, ipPZ = 48m.51s.  
Tinemaha iPZ = 47m.0s., ipPZ = 48m.54s.  
Riverside iPZ = 47m.1s., ipPZ = 48m.53s.  
Palomar iPZ = 47m.5s., ipPZ = 48m.56s.  
College eP = 47m.59s., i = 48m.3s.  
Overton iPZ = 48m.34s.  
Berkeley epP?Z = 48m.36s.k.  
Shasta Dam eP = 48m.39s.  
Victoria eZ = 48m.40s.  
Mineral epP?Z = 48m.42s.  
Seattle i = 48m.46s.  
Boulder City eP = 49m.5s.  
Pierce Ferry iP = 49m.8s., i = 49m.12s.  
Hungry Horse iP = 49m.9s.  
Tucson eP = 49m.17s., e = 49m.20s.  
Palisades iPKP = 52m.53s.  
Collmberg eZ = 52m.54s. and 54m.57s.  
Harvard iPKP = 52m.55s.?  
Weston iPKP = 52m.56s.  
Stuttgart ePKPZ = 53m.1s., ePP?Z = 55m.4s.  
Algiers Univ. PKPZ = 53m.21s., epPKPZ = 55m.26s., ePPZ = 56m.12s.  
Tamanrasset ePKPZ = 53m.37s., epPKPZ = 55m.27s., ipPKPZ = 55m.31s., iPPZ =  
56m.31s., ePPP?Z = 59m.57s.



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Sept. 20d. 3h. 4m. 15s. Epicentre 15°·0N. 93°·8W. Depth of focus 0·020.  
(as on 1937, Sept. 9d.).

A = -·0640, B = -·9643, C = +·2572;  $\delta = +12$ ;  $h = +6$ ;  
D = -·998, E = +·066; G = -·017, H = -·257, K = -·966.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Oaxaca	3·5	305	1 11	+16	—	—	—	1·8
Puebla	5·8	314	1 27	+ 2	(2 19)	-12	—	2·3
Tacubaya	6·8	311	1 40	+ 2	2 36	-19	—	—
Merida	7·1	34	e 1 43	+ 1	i 2 42	-20	—	—
Tucson	23·1	332	i 4 54	+ 2	e 8 53	+ 5	e 5 18	pP e 12·4
San Juan	26·7	79	e 5 40	+14	e 10 40	?	e 6 15	pP e 12·1
Pierce Ferry	27·7	323	i 5 36	+ 1	e 16 12	ScS	—	—
Palomar	z. 27·8	316	i 5 37k	+ 1	—	—	—	—
Washington	28·0	28	e 6 11	pP	—	—	—	—
Boulder City	28·1	322	i 5 39	0	e 12 20	ScP	i 6 16	pP e 21·6
Overton	z. 28·3	323	i 5 41	0	e 12 22	ScP	—	—
Riverside	z. 28·5	316	i 5 43k	+ 1	—	—	i 6 20	pP
Pasadena	z. 29·1	316	i 5 49	+ 1	—	—	i 6 26	pP
Haiwee	z. 30·1	319	e 5 57	0	—	—	—	—
Tinemaha	z. 30·9	320	i 6 5k	+ 1	—	—	e 6 38	pP
Lick	z. 33·2	317	e 6 25k	+ 1	—	—	—	—
Ottawa	z. 33·9	22	e 6 22	- 7	—	—	—	—
Mineral	z. 35·0	322	e 6 40	+ 1	—	—	—	—
Shasta Dam	35·7	322	i 6 43	- 2	—	—	i 9 59	pPcP
Hungry Horse	37·2	338	i 6 54	- 3	—	—	—	—
La Paz	40·3	138	e 7 21	- 2	—	—	—	—
Victoria	z. 41·3	330	e 7 30	- 1	—	—	—	—
College	61·6	337	i 10 1	- 2	—	—	e 12 15	PP
Algiers Univ.	z. 86·5	53	e 12 34	PcP	—	—	—	—
Collmberg	z. 88·6	37	e 12 3	-33	—	—	—	—
Tamanrasset	z. 92·6	65	e 12 29	-26	—	—	e 16 39	PP

Additional readings :—

Tucson e = 9m.18s., eScP = 12m.16s.

Tamanrasset eZ = 12m.45s.

Sept. 20d. 13h. 50m. 13s. Epicentre 56°·5S. 26°·3W. (as on 1943 Nov. 4d.).

Approximate.

A = +·4971, B = -·2457, C = -·8322;  $\delta = +3$ ;  $h = -8$ ;  
D = -·443, E = -·896; G = -·746, H = +·369, K = -·554.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.
	°	°	m. s.	s.	m. s.	s.	m. s.
Pretoria	z. 49·4	75	e 8 50	- 3	—	—	—
La Paz	z. 50·9	304	e 9 3	- 2	—	—	—
Tamanrasset	z. 83·4	30	e 12 35k	+ 5	—	—	e 15 46
Ksara	104·2	49	e 23 15	?	—	—	—
Tucson	113·4	293	i 18 40	[ 0]	—	—	—
Palomar	z. 117·4	289	i 18 48	[ 0]	—	—	—
Pierce Ferry	118·0	294	i 18 50	[ + 1]	—	—	—
Riverside	z. 118·1	289	i 18 49	[ 0]	—	—	—
Boulder City	118·4	293	i 18 50	[ 0]	—	—	—
Overton	z. 118·6	294	i 18 50	[ 0]	—	—	—
Pasadena	z. 118·7	289	i 18 50	[ 0]	—	—	—
Haiwee	z. 120·1	292	i 18 55	[ + 2]	—	—	—
Tinemaha	z. 120·9	292	i 18 56	[ + 2]	—	—	—
Lick	z. 122·9	288	e 18 59 <sub>a</sub>	[ + 1]	—	—	—
Berkeley	z. 123·7	288	i 19 1 <sub>a</sub>	[ + 1]	—	—	—
Mineral	z. 125·2	292	e 19 3	[ 0]	—	—	—
Shasta Dam	125·8	292	i 19 3	[ - 1]	—	—	—
Hungry Horse	127·2	303	i 19 6	[ - 1]	i 22 21	PKS	—
Seattle	130·7	297	i 19 16	[ + 3]	i 22 43	PKS	—
Victoria	z. 131·9	297	e 19 15	[ - 1]	e 22 38	PKS	—
College	151·2	311	e 19 45	[ - 4]	—	—	i 20 6

Additional readings :—

Tamanrasset iZ = 12m.45s., eZ = 12m.51s.

Shasta Dam i = 19m.10s. and 19m.18s.

Seattle e = 19m.31s., 19m.54s. and 22m.36s.

College iPKP = 19m.55s.

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Sept. 20d. Readings also at 0h. (Victoria, near Prague (2) and Collmberg), 2h. (Huancayo), 3h. (Djakarta, Bandung, Victoria, Hungry Horse, Overton, Pierce Ferry, Tucson, and San Juan), 4h. (Stuttgart, Zürich, Bologna, and near Rome), 5h. (Calcutta and near Athens), 7h. (near Pavia), 10h. (Andijan, near Kulyab, Murgab, Obi-garm and Fergana), 11h. (College and Overton), 12h. (College, Victoria, Hungry Horse, Shasta Dam, Lick, Haiwee, Pasadena, Palomar, Tinemaha, Boulder City, Overton, Pierce Ferry, Tucson, Pretoria, Collmberg, and near Algiers Univ.), 13h. (Victoria, Overton, Pierce Ferry and Tucson), 15h. (New Delhi, Tamanrasset, Almata, Frunse, Fergana, Andijan, Tashkent, and Samarkand), 16h. (Poona, Potsdam and College), 18h. (Tchimkent, near Andijan and Fergana), 19h. (near Alicante and Tortosa), 21h. (Tamanrasset), 22h. (Andijan, Tashkent, Poona, and College), 23h. (Kizyl-Arvat, near Ashkabad, Mary, Naryn, near Obi-garm, Stalin-abad, Kulyab, Fergana, Tashkent, Andijan and Murgab).

Sept. 21d. 15h. 57m. 21s. Epicentre 6°·8S. 127°·5E. (as on 1947, Nov. 10d.).

A = -·6045, B = +·7878, C = -·1176;  $\delta$  = -12;  $h$  = +7;  
D = +·793, E = +·609; G = +·072, H = -·093, K = -·993.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Bandong	19·7	270	—	—	8 9	- 1	—	—
Djakarta	20·5	271	5 39	?	—	—	—	—
Brisbane	z. 31·8	133	i 6 25k	- 3	i 13 39	SS	i 7 15	PP
Riverview	34·7	143	—	—	i 12 4	-20	e 14 32	SS
Vladivostok	49·9	5	—	—	e 16 2?	- 5	—	e 21·4
Murgab	67·0	317	10 58	+ 1	—	—	—	—
Almata	67·6	323	11 3	+ 2	—	—	—	—
Frunse	68·9	321	i 11 9	0	—	—	—	—
Andijan	69·2	318	e 11 12	+ 2	—	—	—	—
Fergana	69·4	318	e 11 14	+ 2	—	—	—	—
Garm	69·8	317	e 11 16	+ 2	—	—	—	—
Tashkent	71·5	318	e 11 25	+ 1	e 20 30	-13	—	—
Sverdlovsk	83·3	330	i 12 32	+ 2	e 22 37	-13	—	—
College	93·8	25	e 13 19	- 1	—	—	e 14 46	?
Boulder City	116·3	53	e 18 46	[ 0]	—	—	—	—
Overton	z. 116·5	52	i 18 46	[ 0]	—	—	—	—
Pierce Ferry	116·9	53	e 18 47	[ 0]	—	—	—	—
Algiers Univ.	z. 121·4	309	18 53	[- 2]	—	—	—	—
Tamanrasset	z. 122·0	293	18 57k	[ 0]	—	—	e 20 2	PP
Huancayo	150·6	130	i 19 49	[+ 1]	—	—	—	—

Additional readings :—

Brisbane eSE = 13m.44s.

Huancayo i = 19m.54s., eL = 21m.2s.

Long waves were also recorded at Nanking and Potsdam.

Sept. 21d. 22h. 51m. 1s. Epicentre 9°·2S. 66°·0E.

A = +·4016, B = +·9019, C = -·1587;  $\delta$  = -11;  $h$  = +7;  
D = +·914, E = -·407; G = -·065, H = -·145, K = -·987.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Tananarive	20·3	240	e 4 40	0	e 8 33	+10	i 5 8	PP
Colombo	E. 21·1	41	4 41	- 7	8 43	+ 4	—	—
Kodaikanal	E. 22·4	29	i 4 37	-25	i 8 44	-20	5 22	PP
Poona	E. 28·6	16	5 59	- 1	i 10 42	- 6	12 12	SS
Bombay	28·7	13	e 6 0	- 1	i 10 55	+ 5	7 13	PPP
Hyderabad	N. 29·2	24	e 6 3	- 2	i 10 53	- 5	12 24	SS
Calcutta	E. 38·4	34	i 7 36	+11	i 13 28	+ 8	e 16 17	SS
Pietermaritzburg	z. 39·0	234	i 7 30	0	—	—	—	—
New Delhi	N. 39·1	16	e 7 30	- 1	i 13 26	- 5	9 22	PPP
Pretoria	z. 39·5	241	i 7 33	- 1	—	—	e 9 9	PP
Djakarta	40·6	88	e 7 48	+ 5	—	—	—	—
Dehra Dun	N. 41·0	16	e 11 41	?	e 15 23	?	—	—
Bandong	41·3	90	e 7 23	-26	—	—	e 9 29	PP
Grahamstown	43·5	232	i 8 7	0	—	—	—	e 20·5
Mary	46·7	356	i 8 33	+ 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.
Kulyab	47.0	5	e 8	35	0	e 15	26	0	—	—	—
Ashkabad	47.4	353	8	39	+ 1	e 15	42	PS	—	—	—
Stalinabad	47.6	4	i 8	38	- 1	e 15	34	- 1	—	—	—
Obi-garm	47.8	5	i 8	41	0	—	—	—	e 11	33	PPP
Murgab	47.9	9	i 8	39	- 3	i 15	35	- 4	—	—	—
Fergana	49.6	7	e 8	53	- 2	e 16	0	- 3	e 10	16	PcP
Andijan	50.0	7	8	57	- 1	e 16	9	0	e 10	53	PP
Lenkoran	50.3	343	i 9	2?	+ 2	i 16	22	+ 9	i 20	6	SS
Tashkent	50.4	3	i 9	0	- 1	i 16	14	0	e 10	50	PP
Ksara	51.1	328	i 9	11k	+ 5	16	47	PPS	—	—	—
Helwan	N. 51.2	321	e 9	11	+ 4	16	29	+ 4	—	—	—
Naryn	51.2	9	e 9	6	- 1	e 16	22	- 3	—	—	—
Baku	51.5	345	i 9	14	+ 5	—	—	—	—	—	—
Frunse	52.4	8	i 9	16	0	e 16	42	0	e 20	32	SS
Przhevalsk	52.7	12	i 9	16?	- 2	e 16	48?	+ 2	—	—	—
Almata	53.2	10	i 9	20	- 2	16	52	0	—	—	—
Leninakan	53.8	339	e 9	32	+ 6	—	—	—	—	—	—
Tiflis	54.3	340	9	30	0	—	—	—	—	—	—
Bcrzhomi	54.9	339	9	34	- 1	—	—	—	—	—	—
Grozny	55.4	343	9	43	+ 5	—	—	—	—	—	—
Zugdidi	56.0	339	9	45	+ 2	17	37	+ 7	—	—	—
Sotchi	57.7	338	e 9	56	+ 1	17	59	+ 6	—	—	—
Istanbul	60.5	329	e 10	14	0	e 18	34	+ 5	—	—	—
Yalta	60.7	335	10	15	0	18	37	+ 5	10	55	PcP
Athens	61.3	323	e 10	20	0	—	—	—	—	—	—
Bucharest	64.4	330	i 10	42	+ 2	i 19	28	+ 10	—	—	—
Kishinev	65.0	334	i 10	43	- 1	19	27	+ 1	—	—	—
Nanking	65.0	48	10	41	- 3	e 19	18	- 8	i 20	35	ScS
Sverdlovsk	65.9	358	i 10	49	- 1	i 19	36	- 1	e 23	47	SS
Zi-ka-wei	z. 66.5	51	i 10	50	- 4	e 19	41	- 3	13	21	PP
Messina	66.6	320	e 10	56	+ 2	e 19	26	- 19	—	—	—
Tamanrasset	z. 67.2	300	11	1a	+ 3	e 19	59	+ 7	e 11	29	PcP
Belgrade	67.6	327	e 11	2a	+ 1	e 20	3	+ 6	e 15	42	PPP
Timisoara	67.8	329	e 11	5	+ 3	e 20	9	+ 9	—	—	e 42.4
Moscow	68.9	344	i 11	9	0	e 20	15	+ 2	e 13	41	PP
Lwow	69.2	333	i 11	11	+ 1	e 20	16	0	e 21	11	ScS
Irkutsk	69.5	24	11	11?	- 1	i 20	19?	- 1	e 13	46	PP
Rome	70.6	321	e 11	18	- 1	e 20	41	+ 8	e 24	59	SS
Skalnate Pleso	70.6	331	e 11	16	- 3	e 20	37	+ 4	e 11	35	PcP
Triest	71.9	325	e 11	29	+ 2	e 20	54	+ 6	—	—	—
Raciborzu	z. 72.2	330	e 11	29	0	—	—	—	—	—	—
Florence Xim	72.3	322	e 11	34	+ 5	e 21	29	ScS	—	—	—
Warsaw	72.3	333	e 11	31	+ 2	e 20	48	- 4	e 14	13	PP
Prague	74.1	329	e 11	39	- 1	e 21	10	- 2	e 16	19	PPP
Pulkovo	74.4	343	e 11	42	0	i 21	16	0	e 26	7	SS
Algiers Univ.	z. 74.6	312	e 11	43	0	—	—	—	e 11	59	PcP
Chur	75.0	324	e 11	45	0	—	—	—	—	—	—
Collmberg	75.6	329	e 11	48	0	e 21	41	+ 12	e 14	39	PP
Zürich	75.8	324	e 11	49	- 1	e 21	39	+ 8	e 14	5	PP
Jena	N. 76.1	328	e 11	49	- 2	e 21	36	+ 1	—	—	—
Potsdam	76.1	330	e 11	48?	- 3	i 21	40	+ 5	i 11	53	P
Stuttgart	76.2	326	e 11	51k	- 1	e 21	40	+ 4	e 16	25	PPP
Helsinki	76.4	341	e 11	53	0	e 21	39	+ 1	—	—	e 42.0
Basle	76.5	324	e 11	54	0	e 21	39	0	—	—	40.0
Strasbourg	76.9	325	i 11	57	+ 1	e 21	50	+ 7	e 14	36	PP
Alicante	77.8	313	e 12	1	0	22	9	+ 16	27	3	SS
Clermont-Ferrand	78.4	321	i 12	0	- 4	e 22	9	+ 9	e 21	37	? e 46.8
Copenhagen	78.4	333	i 12	5	+ 1	e 22	4	+ 4	—	—	41.0
Upsala	78.8	338	e 12	1?	- 5	e 22	1?	- 3	e 26	59?	SS
Vladivostok	79.2	43	e 17	4	PPP	i 22	2	- 6	—	—	e 35.0
Granada	79.7	311	i 12	15k	+ 4	i 22	33	+ 20	23	9	PS
De Bilt	80.1	328	e 12	19	+ 6	e 22	11	- 7	—	—	i 42.0
Malaga	z. 80.1	310	i 12	14a	+ 1	i 22	28	+ 10	15	40	PP
Paris	80.1	323	i 12	14	+ 1	—	—	—	e 15	21	PP
Toledo	z. 80.9	313	i 12	20	+ 3	—	—	—	—	—	47.0

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.	
Riverview		81.0	123	i 12 15 <sub>a</sub>	- 3	e 22 22	- 5	e 34 29	Q	e 36.8
Kew		82.9	325	e 12 19	- 9	e 22 49	+ 3	—	—	e 39.0
Durham		84.9	328	—	—	i 23 7	+ 1	i 23 17	ScS	—
Aberdeen		86.1	330	—	—	i 23 19	+ 1	—	—	e 47.2
Rathfarnham Castle		86.9	326	i 12 46	- 2	e 22 59	[-14]	—	—	e 47.0
Resolute Bay	E.	113.6	354	—	—	i 27 30	?	e 29 16	PS	—
College		119.6	16	e 18 38	[-14]	e 31 1	PPS	e 20 14	PP	e 56.6
La Paz		127.9	241	i 19 12	[+ 4]	28 21	{+15}	21 18	PP	—
Bermuda		129.0	305	—	—	e 22 40	PKS	—	—	e 68.2
Harvard		130.2	319	e 21 42	PP	e 22 38	PKS	e 31 36	SKSP	e 63.8
Palisades		132.5	318	i 19 17	[ 0]	i 22 45	PKS	e 21 53	PP	—
San Juan		132.7	287	e 19 21	[+ 4]	e 22 41	PKS	e 31 41	SKSP	e 74.4
Philadelphia		133.8	318	e 22 46	PKS	e 28 40	{- 4}	—	—	e 66.2
Washington		135.7	318	e 19 23	[ 0]	—	—	e 22 9	PP	e 53.4
Huancayo		136.2	242	e 19 25	[+ 1]	e 32 26	SKSP	—	—	e 62.0
Victoria	z.	140.0	9	e 19 22	[- 8]	—	—	—	—	—
Bogota		140.1	267	e 19 40	[+ 9]	e 23 6	PKS	—	—	58.0
Seattle		141.0	8	e 19 35	[+ 3]	—	—	e 22 33	PP	—
Chinchina		141.7	268	e 19 28	[- 5]	—	—	e 22 41	PP	e 60.0
Logan		147.5	357	i 19 45	[+ 2]	—	—	i 20 8	PKP <sub>2</sub>	—
Shasta Dam		147.7	11	e 19 43	[- 1]	—	—	i 19 47	PKP	—
Mineral	z.	148.2	11	e 19 45	[ 0]	—	—	e 23 16	PP	—
Salt Lake City		148.5	357	e 19 45	[ 0]	—	—	—	—	—
Berkeley		150.5	13	e 19 48 <sub>k</sub>	[ 0]	—	—	e 23 29	PP	—
Lick	z.	151.1	13	e 19 46 <sub>a</sub>	[- 3]	—	—	e 23 31	PP	—
Tinemaha	z.	152.0	7	e 19 52	[+ 2]	—	—	e 23 39	PP	—
Fresno	z.	152.1	9	e 19 51 <sub>a</sub>	[ 0]	—	—	e 23 38	PP	—
Overton	z.	152.8	1	e 19 53	[+ 1]	—	—	e 24 0	PP	—
Haiwee	z.	152.9	6	i 20 0	[+ 8]	—	—	—	—	—
Pierce Ferry		153.2	0	e 19 53	[+ 1]	—	—	e 23 49	PP	—
Boulder City		153.3	1	e 19 53	[+ 1]	—	—	e 23 51	PP	—
Pasadena	z.	154.9	7	i 19 54	[ 0]	—	—	—	—	—
Riverside	z.	155.1	7	i 19 55	[ 0]	—	—	e 22 52	PP	—
Palomar		155.8	5	i 19 57	[+ 1]	—	—	e 23 58	PP	—
Tucson		156.9	353	e 19 58	[+ 1]	e 34 10	SKSP	e 24 7	PP	e 86.0
Tacubaya		162.4	307	e 21 4	PKP <sub>2</sub>	—	—	e 32 46	?	—

Additional readings :—

Tananarive i=4m.47s. and 4m.53s., eSS = 8m.43s.  
 Kodaikanal SSE = 9m.44s., SSSE = 10m.6s.  
 Poona SSSE = 12m.27s.  
 Bombay QE = 11m.24s., QN = 11m.33s., SSE = 11m.39s., SSN = 11m.58s.  
 New Delhi PPN = 7m.59s.?, SSN = 16m.6s., SSSN = 16m.36s.  
 Pretoria eZ = 8m.3s.  
 Andijan ePPP = 11m.59s.  
 Frunse ePS = 16m.56s.  
 Yalta PP = 12m.35s.  
 Nanking iZ = 13m.12s., e = 23m.19s.  
 Sverdlovsk SSS = 26m.59s.  
 Tamanrasset iZ = 11m.58s., eZ = 13m.4s., ePPZ = 13m.34s., ePPPZ = 15m.11s.  
 Moscow eScS = 21m.13s.  
 Irkutsk eScS = 21m.10s., SS = 24m.41s., SSS = 27m.59s.  
 Skalnate Pleso ePE = 11m.20s.  
 Warsaw eZ = 11m.35s., 11m.48s., and 12m.23s., eN = 12m.37s., eEZ = 13m.1s., ePPE = 14m.32s., eSN = 20m.54s., PSE = 21m.14s., PSN = 21m.23s., PPSN = 21m.35s., PPSE = 21m.45s., eN = 23m.49s., eE = 24m.23s., eSSEN = 25m.37s., eSSSN = 27m.57s., eSSSE = 28m.3s.  
 Prague iP = 11m.46s., e = 12m.3s., eN = 12m.10s. and 12m.39s., e = 12m.56s., ePP = 13m.32s., eN = 14m.8s., e = 15m.25s. and 16m.27s.  
 Algiers Univ. eZ = 12m.5s., 13m.38s., and 14m.20s., ePPZ = 14m.33s., PPPZ = 16m.14s.  
 Collmberg ePZ = 12m.29s., eZ = 15m.10s., ePPPZ = 16m.31s.  
 Jena ePEN = 11m.53s., eN = 12m.23s., eE = 12m.28s., eN = 17m.14s., eS?E = 21m.40s.  
 Stuttgart eP<sub>c</sub>PZ = 12m.21s., eZ = 13m.39s.  
 Strasbourg i = 12m.49s., e = 13m.38s., 14m.9s., 16m.12s., 18m.12s., and 18m.30s.  
 Upsala eP<sub>c</sub>P? = 12m.11s., eN = 14m.14s., e = 15m.33s., eN = 26m.20s., eSSSN = 29m.59s.?  
 Granada P<sub>c</sub>P = 12m.36s., iPP = 15m.32s., SS = 27m.42s.  
 Malaga PPPZ = 17m.24s.  
 Paris i = 12m.18s., e = 15m.27s.  
 Toledo eZ = 13m.53s. and 15m.49s.

Continued on next page.

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Riverview iZ = 14m.23s., eN = 20m.56s.  
 Kew iZ = 13m.22s., eSSSN = 33m.12s.  
 Rathfarnham Castle iZ = 13m.13s., eEN = 17m.27s.  
 College ePKP = 18m.49s., eSS = 36m.59s.  
 La Paz iPKSZ = 22m.35s., iPPS? = 34m.4s., SS = 38m.37s., SSS = 43m.31s.  
 Huancayo ePP? = 23m.16s., e = 38m.41s., eSSS = 45m.59s.  
 Mineral eN = 20m.49s.  
 Berkeley eZ = 19m.53s., iZ = 20m.52s.  
 Tinemaha iZ = 19m.58s.  
 Palomar iZ = 20m.11s., and 20m.21s.  
 Long waves were also recorded at Christchurch and Scoresby Sund.

Sept. 21d. Readings also at 0h. (College), 1h. (Apia, College (2), Hungry Horse, Overton, Pierce Ferry (2), Palisades, Seven Falls, and near Malaga), 2h. (near Istanbul), 5h. (College), 6h. (near Algiers Univ.), 13h. (Kulyab, Stalinabad, near Garm, and Obi-garm), 14h. (Andijan, Tchimkent, near Kulyab, Obi-garm, Garm, Murgab, Fergana, near Granada, Malaga, Toledo, Alicante, and Tortosa), 15h. (near Garm and near Balboa Heights), 16h. (Brisbane, Calcutta, New Delhi, Poona, Bombay, Collmberg, and Stuttgart), 18h. (near Obi-garm), 20h. (Belgrade, Istanbul, Timisoara, Stuttgart, Zürich, Prague, Collmberg, near Taranto, and near Florence Xim), 22h. (Prague, Fergana, near Obi-garm, College, Hungry Horse, Santa Clara, Logan, Salt Lake City, Tucson, near Boulder City, Overton (2), Pierce Ferry (2), and near Victoria), 23h. (Tananarive and Tamanrasset).

Sept. 22d. 0h. Undetermined shock.

Calcutta eE = 19m.18s.  
 Almata P = 19m.26s., S = 23m.4s.  
 Frunse eP = 19m.39s., eS = 23m.29s.  
 Fergana eP = 19m.45s.  
 Andijan eP = 19m.45s., eS = 23m.48s.  
 Kulyab eP = 19m.53s., eS = 24m.8s.  
 Obi-garm iP = 19m.59s.  
 Stalinabad eP = 20m.1s.  
 Vladivostok eP = 20m.5s.  
 Samarkand eP = 20m.21s.  
 Stuttgart eZ = 25m.39s.  
 Pretoria eZ = 35m.52s.  
 Wellington eS? = 38m.0s., eL = 50m.

Sept. 22d. 1h. 36m. 42s. Epicentre 47°·7N. 153°·0E. Depth of focus 0·020.  
 (as on 1949, Sept. 8d.).

A = -·6019, B = +·3067, C = +·7374;  $\delta = +11$ ;  $h = -5$ ;  
 D = +·454, E = +·891; G = -·657, H = +·335, K = -·675.

	$\Delta$	Az.	P.	O - C.	S.	O - C.	Supp.	L.
	°	°	m. s.	m.	m. s.	s.	m. s.	m.
Vladivostok	15·5	260	e 3 34	+ 3	e 6 45	+27	—	—
College	35·5	39	i 6 40	- 3	—	—	i 7 29	pP
Resolute Bay	50·0	19	e 8 39	- 1	—	—	—	—
Przhevsk	51·0	294	i 8 49	+ 2	—	—	—	—
Frunse	53·1	296	e 9 4	+ 1	—	—	—	—
Naryn	53·1	295	e 9 3	0	—	—	—	—
Victoria	z. 53·1	56	e 9 1	- 2	—	—	—	—
Sverdlovsk	53·1	317	i 9 2	- 1	e 16 29	+10	—	—
Andijan	55·7	296	9 23	+ 1	—	—	—	—
Fergana	56·3	296	e 9 26	0	—	—	—	—
Tashkent	57·3	297	i 9 33	0	—	—	—	—
Hungry Horse	58·3	52	i 9 39	- 1	—	—	—	—
Mineral	z. 58·9	63	e 9 43	- 1	—	—	—	—
Kulyab	59·1	295	e 9 46	0	—	—	—	—
Stalinabad	59·3	296	e 9 45	- 2	—	—	—	—
Samarkand	59·7	297	e 9 51	+ 1	—	—	—	—
Berkeley	z. 60·0	66	e 9 51k	- 1	—	—	e 10 38	pP
Lick	z. 60·7	66	i 9 57a	0	—	—	e 10 41	pP
Moscow	63·6	326	e 10 15	- 1	—	—	—	—
Haiwee	z. 63·8	65	i 10 16	- 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.	
Pasadena	z.	64.9	66	i 10 24	0	—	—	i 11 5	pP	—
Riverside	z.	65.5	66	i 10 27	- 1	—	—	i 11 4	pP	—
Overton	z.	65.6	63	i 10 29	0	—	—	—	—	—
Boulder City		65.8	63	e 10 30	0	—	—	—	—	—
Ashkabad		65.9	301	e 10 34	+ 3	—	—	—	—	—
Pierce Ferry		66.2	62	i 10 32	- 1	e 19 12	+ 5	—	—	—
Palomar	z.	66.3	66	i 10 32	- 1	—	—	i 11 10	pP	—
Tucson		70.7	63	i 11 0	0	—	—	e 11 46	pP	—
Tiflis		70.7	312	i 11 0	0	—	—	—	—	—
Borzhomi		71.3	313	11 3	- 1	—	—	—	—	—
Zugdidi		71.5	314	11 10	+ 5	—	—	—	—	—
Copenhagen		71.8	339	i 11 6 <sup>a</sup>	- 1	—	—	—	—	—
Yalta		73.6	319	e 11 18	+ 1	—	—	—	—	—
Potsdam	z.	74.6	336	i 11 23 <sup>a</sup>	0	—	—	—	—	—
Brisbane	z.	74.8	180	i 12 3 <sup>a</sup>	pP	—	—	—	—	—
Raciborzu	z.	75.1	333	e 11 26	0	—	—	—	—	—
Collmberg	z.	75.6	336	11 28	- 1	—	—	—	—	—
Jena		76.3	335	e 11 33	0	—	—	e 11 56	pP	—
Prague		76.3	335	i 11 32	- 1	e 20 48	-15	i 12 3	pP	—
Budapest		77.1	330	11 38	+ 1	e 17 53	?	e 14 13	PP	—
Rathfarnham Castle		77.8	348	i 11 41	0	e 21 9	-10	i 12 1	pP	—
Kalossa	N.	77.9	330	e 11 37	- 5	—	—	e 14 15	PP	—
Ottawa	z.	77.9	34	e 11 40	- 2	—	—	—	—	—
Istanbul		78.6	320	e 11 46	+ 1	e 21 29	+ 2	—	—	—
Stuttgart	z.	78.9	337	i 11 47 <sup>a</sup>	0	—	—	—	—	—
Strasbourg		79.5	337	i 11 51 <sup>a</sup>	+ 1	—	—	i 12 14	pP	—
Zürich		80.4	337	i 11 55 <sup>a</sup>	0	—	—	—	—	—
Basle		80.5	337	e 11 56	0	e 17 39	PPP	—	—	—
Paris		80.5	341	i 11 56	0	—	—	e 12 30	pP	—
Chur		80.6	335	i 11 57	+ 1	—	—	—	—	—
Ksara		81.2	311	e 12 2	+ 3	—	—	e 14 48	PP	—
Harvard		81.9	32	i 12 2	- 1	—	—	—	—	—
Weston		82.1	32	i 12 11 <sup>?</sup>	+ 7	—	—	—	—	—
Palisades		82.4	34	i 12 5	0	—	—	—	—	—
Algiers Univ.	z.	91.7	336	e 12 50	0	—	—	—	—	—
Tamanrasset	z.	104.0	329	e 13 48	+ 2	—	—	e 18 4	PP	—
Pretoria	z.	131.8	277	e 18 57	[+ 3]	—	—	i 21 50	PP	—
La Paz		134.1	61	e 18 48	[-10]	—	—	—	—	78.3

Additional readings :—

Raciborzu eZ = 11m.36s.  
 Collmberg eZ = 11m.34s., 11m.43s., and 12m.28s.  
 Prague iE = 11m.36s., e = 11m.51s., eSP? = 12m.28s., e = 12m.39s., 12m.57s.?, and 14m.3s.,  
 ePP = 14m.21s., epPP = 14m.43s., e = 20m.28s.  
 Rathfarnham Castle eEN = 15m.35s. and 25m.38s.  
 Kalossa eE = 13m.11s., 14m.27s., and 17m.28s., eN = 17m.44s.  
 Stuttgart eZ = 11m.52s.  
 Strasbourg i = 11m.55s., isP = 12m.43s., i = 13m.7s.  
 Paris i = 12m.8s.  
 Weston i = 12m.21s.  
 Algiers Univ. eZ = 13m.1s.  
 Tamanrasset eZ = 13m.52s. and 17m.15s.

Sept. 22d. 3h. 32m. 9s. Epicentre 9°·2S. 66°·0E. (as on 21d.).

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.
Tananarive		20.3	240	e 4 47	+ 7	e 8 45	+22	—	e 9.9
Colombo	E.	21.1	41	4 48	0	8 41	+ 2	—	10.7
Kodaikanal	E.	22.4	29	i 5 8	+ 6	i 9 16	+12	5 53	PPP
Poona	E.	28.6	16	e 6 3	+ 3	10 54	+ 6	—	12.8
Bombay		28.7	13	e 6 3	+ 2	e 10 55	+ 5	—	—
Hyderabad	N.	29.2	24	e 6 8	+ 3	i 10 50	- 8	—	—
Calcutta	E.	38.4	34	—	—	e 13 23	+ 3	—	—
New Delhi	N.	39.1	16	e 7 30	- 1	e 13 30	- 1	8 2	PP
Pretoria	z.	39.5	241	i 7 35	+ 1	—	—	—	—
Dehra Dun	N.	41.0	16	e 15 9	S	(e 15 9)	+70	—	(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.
Bandong	41.3	90	12	18	?	—	—	—	—	—	—
Mary	46.7	356	e 8	33	+ 1	—	—	—	—	—	—
Kulyab	47.0	5	e 8	36	+ 1	—	—	—	—	—	—
Ashkabad	47.4	353	e 8	34	- 4	—	—	—	—	—	—
Stalinabad	47.6	4	e 8	38	- 1	—	—	—	—	—	—
Obi-garm	47.8	5	e 8	45	+ 4	—	—	—	—	—	—
Samarkand	48.6	1	e 8	52	+ 5	—	—	—	—	—	—
Fergana	49.6	7	8	52	- 3	—	—	—	—	—	—
Andijan	50.0	7	8	56	- 2	e 16	8	- 1	—	—	—
Tashkent	50.4	3	i 9	0	- 1	i 16	14	0	—	—	—
Ksara	51.1	328	i 9	11k	+ 5	16	53	+ 29	—	—	—
Naryn	51.2	9	e 9	6	- 1	—	—	—	—	—	—
Frunse	52.4	8	i 9	14	- 2	e 16	43	+ 1	—	—	—
Almata	53.2	10	9	20	- 2	16	53	+ 1	—	—	—
Tiflis	54.3	340	i 9	30	0	—	—	—	—	—	—
Borzhomi	54.9	339	e 9	36	+ 1	—	—	—	—	—	—
Zugdidi	56.0	339	e 9	42	- 1	—	—	—	—	—	—
Istanbul	60.5	329	e 10	14	- 0	—	—	—	—	—	—
Sverdlovsk	65.9	358	i 10	48	- 2	19	37	0	—	—	—
Tamanrasset	z. 67.2	300	i 11	1a	+ 3	e 13	2	PP	i 11	29	P <sub>c</sub> P 39.4
Moscow	68.9	344	e 11	10	+ 1	e 20	14	+ 1	—	—	—
Lwow	69.2	333	e 11	10	0	e 20	18	+ 2	13	42	PP
Irkutsk	69.5	24	e 11	10	- 2	e 20	19	- 1	—	—	—
Rome	70.6	321	e 11	21	+ 2	—	—	—	—	—	—
Warsaw	z. 72.3	333	e 11	31	+ 2	—	—	—	e 14	14	PP
Prague	74.1	329	e 11	39	- 1	—	—	—	—	—	—
Algiers Univ.	z. 74.6	312	e 11	42	- 1	—	—	—	—	—	—
Collmberg	z. 75.6	329	e 11	50	+ 2	—	—	—	—	—	—
Zürich	75.8	324	e 11	48	- 2	—	—	—	—	—	—
Potsdam	76.1	330	i 11	52k	+ 1	—	—	—	—	—	e 41.8
Stuttgart	76.2	326	e 11	52k	0	—	—	—	—	—	—
Strasbourg	76.9	325	e 11	56	0	—	—	—	—	—	—
Copenhagen	78.4	333	e 11	58	- 6	27	15	SS	—	—	44.8
Vladivostok	79.2	43	i 12	6	- 2	i 22	2	- 6	—	—	—
Granada	79.7	311	i 12	13a	+ 2	e 23	38	PPS	i 12	32	P <sub>c</sub> P i 42.2
Paris	80.1	323	e 12	15	+ 2	i 22	22	+ 4	—	—	—
College	119.6	16	e 20	2	PP	—	—	—	—	—	—
Palisades	132.5	318	e 22	48	PKS	—	—	—	—	—	e 75.8
Hungry Horse	141.0	0	e 19	35	[+ 3]	—	—	—	e 22	32	PP
Shasta Dam	147.7	11	i 19	47	[+ 3]	—	—	—	—	—	—
Mineral	z. 148.2	11	e 19	48	[+ 3]	—	—	—	—	—	—
Berkeley	z. 150.5	13	e 19	54k	[+ 6]	—	—	—	—	—	—
Lick	z. 151.1	13	e 19	56a	[+ 7]	—	—	—	—	—	—
Tinemaha	z. 152.0	7	i 19	58	[+ 8]	—	—	—	—	—	—
Fresno	z. 152.1	9	e 19	59	[+ 8]	e 23	39	PP	e 20	40	pP
Overton	z. 152.8	1	e 20	1	[+ 9]	—	—	—	e 23	47	PP
Haiwee	z. 152.9	6	e 20	1	[+ 9]	—	—	—	—	—	—
Pierce Ferry	153.2	0	i 20	1	[+ 9]	—	—	—	e 23	41	PKS
Boulder City	153.3	1	e 20	2	[+ 10]	—	—	—	—	—	—
Mount Wilson	z. 154.8	7	e 20	18	[+ 24]	—	—	—	—	—	—
Riverside	z. 155.1	7	e 19	57	[+ 2]	—	—	—	—	—	—
Tucson	156.9	353	e 20	0	[+ 3]	—	—	—	—	—	—

Additional readings and notes :—

- Kodaikanal SSE = 9m.56s.
- Dehra Dun gives S and L as P and S.
- Lwow eS<sub>c</sub>S = 20m.45s.
- Warsaw eZ = 13m.55s.
- Prague e = 11m.58s.
- Algiers Univ. eZ = 11m.59s. and 12m.58s.
- Strasbourg e = 12m.23s., i = 12m.35s., e? = 13m.35s.
- Granada iPP = 15m.21s.
- Berkeley e = 20m.3s.
- Pierce Ferry i = 23m.48s.
- Riverside eZ = 20m.5s.
- Long waves were also recorded at Alicante.

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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Sept. 22d. 7h. 52m. 4s. Epicentre 25°·5S. 114°·0W.

A = -·3676, B = -·8256, C = -·4281;  $\delta = +1$ ;  $h = +3$ ;  
D = -·914, E = +·407; G = +·174, H = +·391, K = -·904.

		$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.	
				m.	s.		m.	s.		m.	s.		
Huancayo		38·8	77	i 7	28	0	i 13	26	0	i 8	57	PP	i 16·4
La Paz		43·6	88	i 8	7k	- 1	i 14	37	- 1	9	58	PP	20·9
Tacubaya		46·9	20	e 8	32	- 2	i 9	27	?	—	—	—	e 22·2
Chinchina		48·0	57	i 8	45	+ 2	i 15	41	0	i 10	28	PP	i 23·1
La Plata	E.	48·8	115	i 8	47	- 2	15	55	+ 3	10	26	PP	23·8
Bogota	z.	49·0	58	i 8	50	0	e 16	1	+ 6	e 12	34	PPP	—
Apia		55·3	270	e 15	56	?	e 17	37	+16	—	—	—	e 23·9
Tucson		57·5	3	e 9	53	0	e 17	56	+ 6	e 12	31	PP	e 24·2
Palomar		58·6	357	i 10	1k	0	i 18	14	+10	e 39	35	P'P'	—
Riverside	z.	59·2	356	e 10	5	0	—	—	—	—	—	—	—
Pasadena		59·4	356	i 10	7k	+ 1	i 18	17	+ 2	i 12	11	PP	e 25·5
Lubbock		59·9	13	10	9	- 1	—	—	—	—	—	—	—
Wellington		60·0	235	i 10	14	+ 3	e 18	33	+10	12	26	PP	27·6
Auckland	N.	60·7	240	i 9	26	-49	—	—	—	—	—	—	—
Boulder City		61·1	0	e 10	20	+ 2	e 18	48	+11	—	—	—	—
Christchurch		61·2	232	i 10	24	+ 5	e 18	44	+ 6	e 12	56	PP	28·1
Pierce Ferry		61·3	1	i 10	20	0	e 18	49	+10	—	—	—	e 31·5
Haiwee	z.	61·4	357	e 10	21	+ 1	—	—	—	e 39	40	P'P'	—
Overton	z.	61·7	0	i 10	23	+ 1	—	—	—	i 11	23	P <sub>c</sub> P	e 32·4
Fresno	z.	62·1	355	e 10	16k	- 9	—	—	—	—	—	—	e 30·3
Tinemaha		62·4	357	i 10	27	0	—	—	—	i 39	38	P'P'	—
Lick		62·9	353	e 10	30a	0	e 18	16	-44	e 39	44	P'P'	—
Honolulu		63·0	314	e 10	35	+ 4	—	—	—	—	—	—	e 29·2
Santa Clara		63·0	353	i 10	35	+ 4	e 20	22	S <sub>c</sub> S	—	—	—	e 30·6
Berkeley		63·5	353	e 10	35k	+ 1	e 19	14	+ 7	e 11	14	P <sub>c</sub> P	e 28·8
San Juan		63·8	52	e 10	31	- 5	e 19	6	- 5	e 13	21	PP	e 26·3
Ukiah		64·9	352	—	—	—	e 20	42	S <sub>c</sub> S	—	—	—	e 27·8
Mineral	z.	65·9	354	e 10	51	+ 1	—	—	—	e 39	29	P'P'	—
Salt Lake City		66·0	2	e 10	52	+ 2	e 19	40	+ 2	e 13	42	PP	e 27·5
Shasta Dam		66·3	354	i 10	53	+ 1	e 19	38	- 4	e 13	41	PP	—
Logan		66·9	2	e 10	57	+ 1	e 19	56	+ 7	e 11	29	P <sub>c</sub> P	e 28·7
St. Louis		67·6	20	i 10	59	- 2	i 19	59	+ 2	i 20	44	PS	i 32·4
Florissant		67·7	20	e 11	1	0	i 20	1	+ 3	e 24	15	SS	—
Bozeman		70·9	3	e 11	19	- 2	e 20	37	+ 1	e 25	23	SS	e 31·2
Butte	N.	71·2	2	i 11	23	0	e 20	33	- 7	e 14	25	PP	e 33·7
Chicago		71·3	21	e 11	21	- 2	i 20	40	- 1	e 25	6	SS	e 32·2
Washington		72·8	29	e 11	31	- 1	e 21	2	+ 4	e 14	16	PP	e 31·3
Cleveland		73·1	25	i 11	33	- 1	e 21	3	+ 2	e 25	48	SS	—
Seattle		73·2	355	e 11	37	+ 2	e 21	8	+ 6	e 14	44	PP	e 35·9
Hungry Horse		73·5	0	e 11	35	- 1	e 21	14	+ 8	e 14	26	PP	—
Pennsylvania		74·0	28	i 11	38	- 1	i 21	11	0	e 25	27	SS	—
Victoria		74·2	354	i 11	39	- 1	i 21	17	+ 3	—	—	—	—
Bermuda		74·3	42	i 11	46	+ 5	e 21	23	+ 8	e 14	30	PP	e 34·5
Philadelphia		74·5	31	e 11	37	- 5	i 21	13	- 4	e 15	6	PP	e 32·0
Fordham		75·8	31	i 11	49	- 1	i 21	31	0	i 26	27	SS	33·6
Palisades		75·9	31	i 11	49k	- 1	i 21	30	- 2	i 14	44	PP	e 34·9
Saskatoon		77·6	5	11	59	- 1	21	56	+ 5	27	8	SS	—
Harvard		78·2	31	i 12	2	- 1	i 22	2	+ 5	e 14	56	PP	e 38·6
Weston		78·2	31	i 12	10?	+ 7	e 22	4	+ 7	e 27	4	SS	—
Ottawa		78·7	26	e 12	4	- 2	22	0	- 3	15	1	PP	—
Vermont		79·0	28	i 12	8	+ 1	i 22	12	+ 6	e 14	57	PP	e 32·5
Riverview		80·0	237	i 12	16k	+ 3	i 22	23	+ 6	i 12	29	pP	e 37·2
Brisbane	z.	81·1	244	e 12	21	+ 3	—	—	—	—	—	—	—
Seven Falls	E.	82·1	28	i 12	25	+ 1	i 22	38	0	i 23	28	PS	—
College		93·8	345	e 13	20	0	i 23	56	[+ 2]	—	—	—	e 42·6
Resolute Bay		100·7	5	13	52	0	i 25	35	+ 9	i 24	39	SKS	—
Scoresby Sund		114·5	21	—	—	—	29	20	PS	35	20	SS	55·9
Malaga	z.	119·9	60	e 18	54	[+ 2]	25	56	[+ 6]	20	18	PP	62·6
Rathfarnham Castle		120·5	40	i 18	55	[+ 1]	e 28	23	S	e 21	38	PP	e 49·1
Granada		120·6	60	17	57k	[-57]	27	27	{+ 9}	36	25	SS	i 56·2

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.	
Alicante	123.2	58	15	37	P	22	25	PKS	33	51	PPS	e 54.2
Kew	124.1	43	e 23	29	PPP	e 29	55	PKKP	e 38	7	SSP	e 52.9
Vladivostok	124.2	306	e 19	4	[+ 3]	e 26	3	[ - 0]	e 20	49	PP	—
Tamanrasset	z. 125.2	78	e 19	6	[+ 3]	—	—	—	e 20	53	PP	—
Paris	126.0	46	e 19	7	[+ 3]	e 38	43	PSS	e 37	22	SS	e 59.9
De Bilt	127.5	42	—	—	—	e 37	56?	SS	—	—	—	e 47.9
Bandong	128.3	237	24	23	PPP	—	—	—	—	—	—	—
Strasbourg	129.5	46	e 19	15	[+ 4]	e 22	26	PKS	e 21	17	PP	e 57.9
Stuttgart	130.4	45	e 19	13	[ - 0]	e 22	39	PKS	e 21	26	PP	e 61.9
Copenhagen	131.1	36	e 19	7	[ - 7]	22	31	PKS	—	—	—	—
Jena	N. 131.6	43	e 19	16?	[+ 1]	e 22	43	PKS	—	—	—	—
Potsdam	132.2	40	i 19	18 <sub>a</sub>	[+ 2]	i 22	46	PKS	—	—	—	62.9
Florence Xim.	132.3	52	e 19	21	[+ 5]	—	—	—	—	—	—	—
Upsala	132.3	30	e 21	38	PP	e 22	41	PKS	e 39	13	SS	e 61.9
Collmberg	132.4	42	e 19	17	[+ 1]	e 22	50	PKS	e 21	44	PP	—
Padova	132.7	51	e 16	34	?	i 22	49	PKS	e 18	51	PKP	—
Rome	133.3	55	i 19	21	[+ 3]	i 22	40	PKS	e 21	39	PP	—
Prague	133.6	43	e 19	23	[+ 4]	e 26	26	[ - 2]	e 21	45	PP	e 55.9
Triest	133.9	49	e 19	27	[+ 8]	e 26	10	[ - 19]	e 21	48	PP	—
Warsaw	137.0	38	e 19	28	[+ 3]	e 22	58	PKS	e 22	8	PP	e 63.9
Skalnate Pleso	137.5	43	e 19	27	[+ 1]	e 27	17	[+42]	—	—	—	—
Pulkovo	137.8	25	e 19	28	[+ 1]	e 23	0	PKS	e 22	15	PP	—
Belgrade	138.7	50	e 19	29 <sub>a</sub>	[+ 1]	e 23	7	PKS	e 22	28	PP	—
Irkutsk	140.7	322	e 19	27	[ - 5]	23	12	PKS	e 22	38	PP	—
Bucharest	N. 142.7	48	e 19	38	[+ 3]	—	—	—	—	—	—	—
Moscow	143.4	26	e 19	34	[ - 2]	—	—	—	e 22	46	PP	—
Istanbul	145.7	53	i 19	41	[+ 1]	—	—	—	e 23	0	PP	—
Yalta	148.0	45	19	46	[+ 2]	—	—	—	—	—	—	—
Sverdlovsk	148.5	5	i 19	48	[+ 3]	i 23	20	PKS	i 19	53	PKP <sub>2</sub>	—
Sotchi	152.0	43	20	0	[+10]	—	—	—	—	—	—	—
Ksara	152.6	65	19	53	[+ 2]	36	52	PPS	23	41	PP	—
Zugdidi	153.9	43	e 20	2	[+ 9]	—	—	—	—	—	—	—
Borzhomi	155.2	44	e 19	58	[+ 3]	—	—	—	—	—	—	—
Gori	155.6	42	e 20	2	[+ 7]	—	—	—	—	—	—	—
Leninakan	156.1	45	e 20	17	[+21]	—	—	—	—	—	—	—
Tiflis	156.1	42	e 19	58	[+ 2]	e 23	22	PKS	—	—	—	—
Baku	160.0	38	e 20	7	[+ 6]	—	—	—	—	—	—	—
Almata	160.1	337	i 20	3	[+ 2]	—	—	—	—	—	—	—
Przhevalsk	160.2	333	e 20	5	[+ 4]	—	—	—	—	—	—	—
Lenkoran	160.4	43	i 19	56?	[ - 5]	31	26	{+12}	i 28	24	PPP	—
Frunse	161.3	341	i 20	5	[+ 3]	—	—	—	—	—	—	—
Naryn	162.1	338	e 20	5	[+ 2]	—	—	—	—	—	—	—
Andijan	163.9	343	20	8	[+ 3]	—	—	—	e 20	49	PKP <sub>2</sub>	—
Tashkent	164.0	351	20	7	[+ 2]	e 27	35?	[+27]	i 24	49	PP	—
Fergana	164.4	343	20	8	[+ 3]	—	—	—	—	—	—	—
Obi-garm	166.5	348	i 20	7	[ - 0]	—	—	—	—	—	—	—
Kulyab	167.2	346	i 20	18	[+10]	—	—	—	—	—	—	—
Mary	167.4	15	e 20	23	[+15]	—	—	—	—	—	—	—
Bombay	170.9	225	e 25	22	PP	—	—	—	—	—	—	—

### Additional readings :—

Huancayo iPPP = 9m.26s.

La Paz iZ = 8m.21s., iPcP? = 10m.4s., iSS = 17m.56s., iScS = 18m.20s., iSSS = 18m.36s.

Chinchina i = 8m.56s.

La Plata E = 9m.26s., PPE = 10m.39s., PPPE = 11m.2s., SE = 15m.45s., SSSE = 19m.19s., QE = 21.7m.

Tucson ePPP = 13m.13s.

Palomar iZ = 10m.23s. and 10m.51s.

Pasadena iZ = 10m.31s. and 10m.44s., eZ = 10m.57s., iScSEN = 20m.2s.,

ePKPPKZ = 39m.41s.

Wellington ePPPZ = 13m.45s., eZ = 19m.2s., SSS = 23m.31s., Q = 27m.26s.

Christchurch SEN = 18m.51s., eSS = 22m.46s., eQN = 25m.26s.

Pierce Ferry ePKP,PKP = 39m.43s.

Overton ePKP,PKPZ = 39m.46s.

Lick iEZ = 10m.35s.

Berkeley eE = 19m.56s., eScS?E = 20m.32s., ePKPPKZ = 39m.37s.

Continued on next page.

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San Juan ePPP = 14m.28s., eSS = 23m.26s.  
 Salt Lake City eSS = 23m.44s.  
 Shasta Dam ePKP, PKP = 39m.17s.  
 Logan e = 23m.34s.  
 St. Louis ePP = 13m.27s., iSS = 24m.14s., iSSS? = 27m.59s.  
 Florissant e = 20m.55s.  
 Butte eSSN = 25m.31s.  
 Washington ePPP = 16m.4s.  
 Cleveland iSE = 21m.6s., eSSE = 25m.57s.  
 Seattle e = 11m.44s., 11m.59s., 12m.13s., 12m.51s., 13m.20s., 13m.34s., and 22m.16s.  
 Hungry Horse eScS = 21m.49s.  
 Pennsylvania iN = 13m.5s., eN = 13m.53s., iN = 29m.33s.  
 Bermuda iScS = 21m.56s., eSSS = 29m.36s.  
 Philadelphia iSS = 26m.8s., eSSS = 29m.12s.  
 Palisades eSS = 26m.32s.  
 Harvard e = 14m.23s.  
 Ottawa SKS = 22m.34s., SS = 26m.54s.  
 Vermont ePPP = 17m.5s.  
 Riverview iPPZ = 15m.21s., iSKSN = 22m.27s., iE = 22m.47s., ePSE = 23m.11s.,  
 ePPSZ = 23m.35s., eSSEZ = 27m.46s., iE = 28m.8s., eSSSE = 31m.7s.  
 Resolute Bay PSE = 27m.15s., PPSE = 27m.48s., SS = 32m.39s.,  
 Scoresby Sund 30m.28s.  
 Malaga iZ = 19m.44s.  
 Rathfarnham Castle eEN = 20m.14s. and 28m.46s.  
 Granada PP = 18m.45s., SKP = 20m.21s., PPS = 30m.15s.  
 Vladivostok eSKSP = 30m.55s., iPS = 31m.0s., eSS = 37m.53s.  
 Tamanrasset iZ = 19m.21s.  
 Strasbourg ePPS = 33m.7s. and 33m.13s., eSS = 38m.56s. and 39m.8s., eSSS =  
 43m.8s., e = 47m.12s. and 51m.17s.  
 Jena eN = 20m.31s.  
 Stuttgart eZ = 19m.16s., e = 31m.26s., ePPS = 33m.13s., eSS = 38m.56s.?  
 Upsala eN = 51m.55s.  
 Collmberg eN = 34m.38s., eSSEN = 39m.56s.?  
 Rome eSS = 39m.26s.  
 Prague eSKP = 22m.48s., e = 24m.2s., ePPP = 24m.44s., eSKKS = 28m.26s., eSKSP =  
 32m.11s., ePS = 32m.39s., ePPS = 34m.26s., eSS = 39m.15s., eSSS = 44m.50s.  
 Trieste eSKKS? = 28m.16s., iPS = 32m.8s., eSS = 39m.38s.  
 Warsaw eZ = 21m.24s., eSKPEN = 23m.1s., ePPPZ = 25m.17s., ePSE = 32m.19s.,  
 ePPSE = 34m.16s., ePPSN = 34m.19s., eSSEN = 40m.9s.  
 Skalnate Pleso e = 30m.59s. and 31m.6s.  
 Belgrade e = 28m.39s. and 37m.4s.  
 Irkutsk iPKP = 19m.35s.  
 Sverdlovsk SKSP = 30m.8s., ePS = 30m.52s.  
 Tashkent iSKKS = 31m.37s., iSKSP = 35m.52s.  
 Long waves were also recorded at Sitka, Aberdeen and Djakarta.

Sept. 22d. 23h. 53m. 32s. Epicentre 17°·6S. 177°·1W. Depth of focus 0·060.

A = -·9525, B = -·0483, C = -·3005;  $\delta$  = -11; h = +5;  
 D = -·051, E = +·999; G = +·300, H = +·015, K = -·954.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.	
	°	°	m. s.	s.	m. s.	s.	m. s.	m.	
Apia	6·4	54	1 34	- 4	i 2 48	- 7	e 14 19	ScS	—
Auckland	N. 20·5	200	i 4 13	+ 4	i 7 40	+ 11	i 8 8	PcP	—
Arapuni	21·4	196	e 4 19	+ 2	e 7 46	+ 2	—	—	—
Tuai	N. 21·7	193	i 4 17	- 3	7 44	- 6	i 14 49	ScS	—
New Plymouth	E. 22·7	198	4 35?	+ 6	8 13	+ 7	—	—	—
Wellington	24·6	195	i 4 43	- 3	i 8 31	- 6	10 33	sS	—
Kaimata	N.E. 26·7	200	e 5 3	- 2	i 9 7	- 3	e 15 3	—	—
Christchurch	27·3	197	i 5 9	- 2	i 9 13	- 7	6 18	pP	—
Brisbane	29·2	246	i 5 23k	- 4	i 9 48	- 2	—	—	—
Riverview	32·7	235	i 5 58k	+ 1	i 10 42	- 1	i 7 14	pP	—
Honolulu	43·0	27	e 7 21	- 1	e 13 19	+ 2	e 8 4	PcP	e 18·8
Guam	48·7	307	8 6	0	—	—	—	—	—
Yokohama	66·8	323	e 10 13	+ 3	—	—	—	—	—
Tokyo	66·9	323	e 10 11	0	18 31	+ 1	19 29	ScS	—
Shizuoka	67·2	322	10 14	+ 1	18 38	+ 4	13 19	sPP	e 26·2
Hunatu	67·4	322	10 13k	- 1	e 18 18	- 18	—	—	—
Kumagaya	67·5	323	i 10 14	- 1	e 18 36	- 1	—	—	—
Utunomiya	67·5	324	e 10 14	- 1	e 18 38	+ 1	—	—	—
Maebasi	67·8	323	i 10 17	0	e 18 43	+ 2	e 12 23	PP	—
Owasi	67·9	320	i 10 16	- 1	—	—	e 14 33	PPP	—

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.
Hokusima	68.0	326	10	18	0	e 19	45	+62	—	—	—
Nagoya	68.2	321	10	19	0	18	48	+ 3	—	—	—
Matsuro	68.4	323	i 10	22	+ 2	18	44	- 4	—	—	—
Gihu	68.5	321	10	17	- 4	e 18	48	- 1	—	—	e 31.5
Nagano	68.5	323	e 10	22	+ 1	e 18	54	+ 5	10	50	pP
Mizusawa	E. 68.6	327	10	21	- 1	17	48	-62	—	—	—
Osaka	68.8	320	10	24	+ 1	i 19	53	+61	e 11	0	pP
Kyoto	68.9	321	i 10	24	+ 1	e 18	58	+ 5	—	—	—
Kobe	69.0	320	e 10	24	0	e 19	53	+58	e 13	29	PP
Sumoto	69.0	319	10	24	0	e 18	56	+ 1	i 19	53	PS
Simidu	69.2	316	10	26	+ 1	19	1	+ 4	—	—	—
Kōti	69.3	317	i 10	26	0	e 19	52	+54	e 10	41	pP
Akita	z. 69.6	326	i 10	27	- 1	—	—	—	—	—	—
Miyazaki	69.7	315	10	28	0	i 19	7	+ 4	i 20	0	S <sub>c</sub> S
Matuyama	70.0	318	e 10	27	- 3	e 19	7	+ 1	i 19	54	S <sub>c</sub> S
Ocita	70.4	317	i 10	36	+ 4	i 19	16	+ 5	—	—	—
Kumamoto	70.7	316	e 10	35	+ 1	19	12	- 2	—	—	—
Hukuoka	71.4	316	10	38 <sub>a</sub>	0	19	25	+ 3	—	—	e 26.5
Sapporo	71.4	330	i 10	38	0	e 19	25	+ 3	i 11	50	pP
Bandong	73.9	269	i 10	52	- 1	i 19	49	- 1	—	—	e 29.9
Djakarta	74.9	269	i 10	58	0	i 19	58	- 3	—	—	—
Santa Clara	75.4	43	e 11	8	+ 7	i 20	14	+ 8	i 20	46	S <sub>c</sub> S
Berkeley	75.5	43	i 11	3 <sub>a</sub>	+ 1	e 20	12	+ 5	e 12	34	pP
Lick	75.6	43	i 11	2 <sub>k</sub>	0	e 20	12	+ 4	e 12	35	pP
Ukiah	75.6	41	e 11	10	+ 8	i 19	53	-15	e 12	36	pP
Ferndale	75.9	39	—	—	—	e 20	20	+ 9	e 23	8	sS
Pasadena	76.1	47	e 11	5	0	i 20	19	+ 5	i 12	37	pP
Arcata	76.2	39	e 13	12 <sub>k</sub>	pP	e 22	22	sS	e 14	34	PP
Fresno	76.4	44	e 11	8 <sub>k</sub>	+ 1	e 20	24	+ 7	e 12	42	pP
Vladivostok	76.4	325	i 11	5	- 2	i 20	21	+ 4	i 12	40	pP
Zi-ka-wei	z. 76.4	310	i 11	7	0	i 20	19	+ 2	i 12	38	pP
Palomar	76.6	48	i 11	7	- 1	i 20	16	- 3	i 12	38	pP
Riverside	76.6	47	e 11	7	- 1	i 20	26	+ 7	i 12	41	pP
Shasta Dam	77.1	39	i 11	10	0	e 20	24	0	i 12	43	pP
Haiwee	z. 77.3	45	i 11	12	0	e 20	34	+ 8	i 12	46	pP
Mineral	77.4	40	e 11	12	0	e 20	32	+ 5	e 12	45	pP
Tinemaha	77.6	45	i 11	14	+ 1	i 20	38	+ 9	i 12	54	pP
Nanking	78.8	309	11	17 <sub>k</sub>	- 3	i 20	45	+ 3	i 12	40	pP
Boulder City	79.4	47	i 11	23	0	e 20	54	+ 6	i 11	30	P <sub>c</sub> P
Overton	z. 79.9	46	i 11	26	+ 1	e 21	5	+12	i 12	54	pP
Pierce Ferry	80.0	47	i 11	27	+ 1	e 21	1	+ 7	i 13	2	pP
Tucson	80.5	51	i 11	30	+ 1	i 21	9	+10	i 12	59	pP
Seattle	81.3	34	i 11	35 <sub>a</sub>	+ 2	e 21	16	+ 8	i 12	37	pP
Victoria	81.3	33	e 11	33 <sub>a</sub>	0	21	17	+ 9	13	7	pP
Sitka	82.1	22	i 14	0	?	i 21	16	0	i 14	56	PP
Salt Lake City	83.8	44	i 11	49	+ 4	i 21	38	+ 6	e 13	20	pP
Logan	84.3	43	e 11	48	0	e 21	39	+ 2	e 13	22	pP
Tacubaya	84.9	68	i 11	58 <sub>k</sub>	+ 7	e 21	44	+ 1	i 21	55	SKS
College	85.2	12	e 11	49	- 3	e 21	33	[- 2]	i 13	46	pP
Puebla	85.6	68	e 12	0	+ 6	e 21	48	- 2	i 13	42	pP
Butte	N. 86.0	39	e 11	59	+ 3	e 21	50	- 4	e 24	44	sS
Hungry Horse	86.3	37	e 11	57	0	e 21	45	[+ 3]	e 16	50	PP
Bozeman	86.7	40	e 12	2	+ 3	i 21	58	- 2	i 22	48	PS
Saskatoon	92.3	35	—	—	—	22	22	[+ 4]	22	54	SKKS
Irkutsk	97.0	323	i 12	47	0	23	36?	+ 6	16	28?	PP
Huancayo	97.3	105	i 12	49	+ 1	i 23	22	-10	i 14	29	pP
Florissant	98.3	52	e 12	55	+ 2	i 22	51	[+ 1]	e 14	30	pP
St. Louis	98.4	52	e 12	55	+ 2	i 22	55	[+ 5]	i 14	30	pP
Calcutta	E. 100.6	291	i 17	23	PP	i 23	4	[+ 3]	i 25	53	PS
Chicago	101.1	49	—	—	—	e 23	5	[+ 2]	i 24	14	pS
La Plata	102.2	133	17	31	PP	e 23	11	[+ 3]	24	28	S
La Paz	102.3	111	i 13	18 <sub>a</sub>	+ 7	i 23	18	[+ 9]	i 14	50	pP
Chinchina	102.4	88	e 13	16	+ 5	i 23	16	[+ 7]	i 14	52	pP
Bogota	103.8	89	e 17	42	PP	i 23	18	[+ 2]	e 24	7	SKKS
Colombo	E. 104.4	273	17	43	PP	23	20	[+ 2]	—	—	27.5

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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.
Galerazamba	104.4	83	e 17 52	PP	e 23 31?	[+13]	e 32 22 SS	—
Columbia	104.5	58	—	—	e 23 22	[+3]	e 23 55 SKKS	—
Resolute Bay	104.8	16	13 20	- 2	24 40	+ 5	17 31 PP	—
Cleveland	E. 105.5	51	e 17 51	PP	e 23 30	[+7]	e 19 15 pPP	—
Pittsburgh	N.W. 106.5	52	—	—	e 23 41	[+13]	e 24 31 S	—
Kodaikanal	E. 107.6	276	e 17 59	PP	i 23 21	[-11]	20 36 PPP	27.4
Pennsylvania	N. 108.2	52	—	—	i 25 10	S	e 27 36 sS	—
Hyderabad	N. 108.5	283	—	—	23 38	[+2]	—	—
Washington	108.5	54	e 18 17	PP	e 27 31	sS	e 19 40 pPP	e 58.7
Philadelphia	110.1	53	e 18 22	PP	i 23 45	[+2]	e 21 3 PPP	e 46.8
Ottawa	110.2	47	17 45	[+2]	23 46	[+3]	18 30 PP	—
Fordham	111.2	52	e 18 33	PP	e 23 52	[+5]	i 25 43 S	48.8
Palisades	111.2	52	e 13 46	P	i 23 53	[+6]	i 18 35 PP	e 57.3
New Delhi	N. 111.7	295	e 18 37	PP	i 23 48	[-1]	—	—
Przhevalsk	112.3	309	17 52	[+5]	—	—	—	—
Harvard	113.0	51	i 18 46	PP	e 24 37	SKKS	i 20 12 pPP	54.1
Poona	E. 113.0	283	18 50	PP	24 44	SKKS	21 3 PPP	—
Weston	113.2	51	i 18 42?	PP	i 25 50	S	i 27 50 SP	—
Almata	113.4	311	e 17 42?	[-8]	i 23 58	[+2]	i 18 47 PP	—
Seven Falls	E. 113.7	45	e 18 53	PP	i 24 4	[+7]	i 27 54 SP	—
Bombay	114.0	283	e 18 29	PP	i 28 5	SP	i 21 21 PPP	—
Naryn	114.0	308	e 17 57	[+6]	e 24 0	[+2]	i 18 48 PP	—
San Juan	114.7	77	e 18 55	PP	i 24 8	[+7]	e 21 28 pPP	e 49.3
Frunse	115.1	310	e 17 40	[-12]	i 24 6?	[+4]	i 18 49 PP	—
Andijan	116.7	307	17 58	[+3]	24 12?	[+4]	i 18 49 PP	—
Fergana	117.2	307	17 58	[+2]	e 24 12	[+2]	e 25 32 SKKS	—
Bermuda	117.9	62	e 19 29	PP	e 24 28	[+15]	e 28 52 PS	e 55.8
Fort de France	118.7	83	e 18 6	[+7]	e 24 21	[+6]	e 29 1 PS	—
Kulyab	118.7	304	e 18 3	[+4]	i 24 22	[+7]	e 19 27 PP	—
Obi-garm	118.8	305	18 4	[+5]	—	—	—	—
Tashkent	119.0	308	i 18 2	[+2]	i 24 21	[+5]	i 19 28 PP	—
Stalinabad	119.5	305	i 18 2	[+1]	e 24 18	[0]	—	—
Samarkand	120.9	306	e 18 7	[+3]	i 25 54	SKKS	e 19 41 PP	—
Sverdlovsk	122.1	327	e 14 39	P	i 24 32	[+6]	i 18 8 PKP	—
Ivigtut	123.6	27	—	—	27 26	?	36 13 SS	—
Grahamstown	124.6	205	i 18 14	[+3]	—	—	e 19 56 pPKP	—
Mary	125.0	305	e 18 13	[+1]	—	—	—	—
Scoresby Sund	125.0	10	20 7	PP	i 24 41	[+6]	27 32 sSKS	—
Pietermaritzburg	z. 126.1	211	e 18 17	[+3]	—	—	i 20 20 pPKP	—
Pretoria	z. 130.4	212	e 18 25	[+3]	e 20 7	pPKP	e 20 46 PP	—
Pulkovo	133.4	342	i 18 29	[+1]	25 3	[+6]	e 20 59 PP	—
Baku	133.7	310	e 18 33	[+5]	—	—	i 21 3 PP	—
Moscow	133.7	334	e 18 28	[0]	e 25 1	[+3]	e 20 2 pPKP	—
Helsinki	134.6	345	18 30?	[0]	i 25 6	[+7]	e 20 17 pPKP	49.5
Lenkoran	134.9	308	i 18 28	[-3]	22 56	PKS	21 10 PP	—
Upsala	136.5	350	i 21 18 <sup>a</sup>	PP	i 25 9	[+6]	i 22 4 PKS	—
Tiflis	136.9	314	i 18 38	[+3]	—	—	i 21 28 PP	—
Bergen	137.2	358	21 34	PP	33 38	PPS	38 57 SS	—
Piatigorsk	137.2	317	e 21 34	PP	27 39	SKKS	e 22 7 PKS	—
Gori	137.3	315	e 18 36	[+1]	—	—	21 31 PP	—
Erevan	137.7	311	e 18 44	[+8]	—	—	—	—
Borzhomei	137.9	315	e 18 30?	[-6]	i 27 46	SKKS	i 21 42 PP	—
Leninakan	137.9	313	e 18 43	[+7]	—	—	21 37 PP	—
Abastumanj	138.3	315	i 18 32	[-4]	—	—	—	—
Zugdidi	138.6	316	i 18 44	[+7]	i 27 51	SKKS	i 21 40 PP	—
Sotchi	139.6	318	e 18 34	[-5]	—	—	e 21 26 PP	—
Aberdeen	140.3	4	e 21 43	PP	i 28 33	SKKS	i 24 48 PPP	—
Copenhagen	141.3	352	i 18 39	[-3]	i 24 48	[-22]	i 21 45 PP	—
Edinburgh	E. 141.5	6	—	—	i 39 40	SS	—	—
Theodosia	141.5	323	e 18 42	[-1]	—	—	21 46 PP	—
Yalta	142.5	323	18 42	[-3]	28 12?	SKS	20 18 pPKP	—
Warsaw	142.6	342	e 18 42 <sup>k</sup>	[-3]	e 24 44	[-28]	18 50 PKP <sub>2</sub>	—
Lwow	143.6	337	i 18 45	[-2]	i 28 17	SKKS	i 20 37 pPKP	—
Kishinev	143.7	331	i 18 46	[-1]	—	—	21 50 PP	—
Rathfarnham Castle	143.7	9	i 18 43	[-4]	e 40 8	SS	i 20 32 pPKP	—

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	$\Delta$	Az.	P.	O - C.	S.	O - C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Potsdam	144.4	351	e 18 47	[- 1]	i 25 15	[ 0]	e 21 8 sPKP	—
Raciborzu	145.3	344	e 18 51	[+ 1]	—	—	—	—
Collnberg	145.4	350	i 18 50k	[ 0]	e 28 4	SKKS	e 20 51 pPKP	e 51.5
De Bilt	145.5	357	i 18 51	[+ 1]	e 40 28	SS	e 21 13 pPKP	—
Skalnate Pleso	145.5	340	e 18 50	[ 0]	e 31 55	SKSP	e 20 48 pPKP	—
Jena	146.0	350	e 18 54	[+ 3]	e 29 50	SKKS	e 20 38 pPKP	—
Kew	146.1	4	i 18 55k	[+ 4]	e 36 39	SS	i 21 14 PP	e 71.5
Prague	146.3	347	i 18 50	[- 1]	e 27 51	SKKS	e 20 30 pPKP	e 53.5
Ksara	146.4	306	18 54	[+ 3]	34 44	PPS	20 34 pPKP	—
Bucharest	146.9	329	e 18 58	[+ 6]	e 28 36	SKKS	—	41.5
Ogyalla	147.3	341	i 19 0	[+ 7]	e 27 58	SKKS	e 20 44 pPKP	—
Budapest	147.4	340	e 18 55	[+ 2]	e 28 37	SKKS	e 22 28 PP	e 41.5
Vienna	147.5	343	e 18 57	[+ 4]	e 28 54	SKKS	e 20 21 pPKP	—
Istanbul	147.6	323	i 18 53	[ 0]	e 27 8	?	—	—
Timisoara	N. 148.0	335	e 19 3	[+ 9]	e 28 36	SKKS	—	—
Jersey	E. 148.2	7	e 19 2	[+ 8]	e 28 30	SKKS	e 41 8 SS	57.5
Kalossa	N. 148.2	340	e 18 59	[+ 5]	e 25 26	[+ 6]	e 22 34 PP	—
Karlsruhe	148.4	354	i 18 57	[+ 3]	—	—	—	—
Stuttgart	148.5	353	e 18 55	[+ 1]	e 28 33	SKKS	e 20 38 pPKP	e 52.5
Strasbourg	148.8	354	e 18 56a	[+ 1]	i 28 49	SKKS	e 20 42 pPKP	56.5
Paris	148.9	2	e 18 57	[+ 2]	i 25 21	[ 0]	i 20 41 pPKP	—
Belgrade	149.1	335	e 18 57k	[+ 2]	i 28 49	SKKS	i 20 47 pPKP	e 54.9
Basle	149.9	354	e 18 58	[+ 1]	—	—	e 20 43 pPKP	—
Zürich	149.9	354	e 18 56a	[- 1]	e 28 51	SKKS	e 20 41 pPKP	—
Chur	150.3	351	e 19 0	[+ 3]	—	—	e 20 44 pPKP	—
Neuchatel	150.5	355	e 19 1	[+ 4]	—	—	—	—
Triest	150.6	345	i 18 57	[ 0]	i 28 54	SKKS	i 20 46 pPKP	—
Helwan	151.3	301	e 19 8	[+ 9]	—	—	e 22 48 PKS	—
Salo	z. 151.4	350	i 19 9a	[+10]	—	—	—	—
Clermont-Ferrand	151.9	0	i 19 6	[+ 6]	i 31 22	SKSP	i 25 53 PPP	—
Pavia	152.0	352	e 19 4a	[+ 4]	e 29 5	SKKS	e 21 7 pPKP	—
Padova	152.1	347	e 19 7	[+ 7]	25 27	[+ 2]	22 53 PP	—
Bologna	152.3	348	e 19 12	[+12]	—	—	—	—
Athens	152.7	323	e 19 1	[+ 1]	—	—	e 19 11 ?	—
Prato	152.9	347	e 19 4	[+ 3]	—	—	i 19 8 ?	—
Florence, Xim.	153.0	347	i 19 6	[+ 5]	e 25 13	[-13]	—	—
Rome	154.4	344	e 19 2	[- 1]	i 25 19	[- 9]	i 21 6 pPKP	—
Rocca di Papa	154.5	344	e 19 6	[+ 3]	e 29 14	SKKS	—	—
Lisbon	z. 156.5	24	20 9k	PKP <sub>2</sub>	—	—	20 40 pPKP	—
Messina	156.7	335	e 19 13	[+ 7]	e 29 24	SKKS	e 23 32 PKS	—
Tortosa	156.8	4	i 19 27	[+21]	i 25 58	[+28]	23 1 PP	—
Toledo	z. 157.0	14	i 19 9	[+ 3]	i 19 41	PKP <sub>2</sub>	i 23 23 PP	—
Alicante	159.1	8	18 45	[-24]	43 11	SS	23 21 PP	e 69.6
Granada	159.6	15	19 55a	PKP <sub>2</sub>	29 20	SKKS	21 35 pPKP	i 84.1
Malaga	z. 159.9	17	i 19 11a	[+ 1]	23 7	PKS	i 19 55 PKP <sub>2</sub>	43.1
Algiers Univ.	z. 160.9	0	i 19 58a	PKP <sub>2</sub>	e 22 0	PKS	e 23 38 PP	—
Tamanrasset	z. 174.3	—	i 19 22a	[+ 2]	e 22 19	PKS	e 21 8 pPKP	—

Additional readings and notes :—

Auckland iS<sub>c</sub>SN = 14m.50s.  
 Wellington iP<sub>c</sub>S = 11m.37s., iS<sub>c</sub>S = 14m.59s., esS<sub>c</sub>S = 18m.5s.  
 Christchurch sP = 7m.4s., P<sub>c</sub>PNZ = 8m.17s., SS = 11m.23s., eNZ = 13m.8s. and 14m.38s.,  
 iS<sub>c</sub>SE = 15m.14s., iP<sub>c</sub>SZ = 17m.36s., sS<sub>c</sub>SEN = 18m.10s.  
 Brisbane ePEN = 5m.28s.  
 Riverview iPPZ = 7m.26s., iZ = 8m.0s., iE = 10m.53s., iN = 10m.56s., iE = 11m.14s. and  
 11m.58s., iN = 13m.4s. and 13m.32s., iS<sub>c</sub>SEN = 15m.43s., iEN = 18m.45s.  
 Honolulu eSS = 16m.44s.  
 Tokyo eE = 11m.10s., e = 14m.18s. and 20m.53s.  
 Shizuoka ePPP = 14m.4s., S<sub>c</sub>S = 19m.40s.  
 Mizusawa SN = 17m.26s.  
 Kôti e = 18m.2s.  
 Sapporo esS = 20m.12s., eS<sub>c</sub>S = 21m.3s.  
 Santa Clara e = 12m.34s.  
 Berkeley eEN = 11m.8s. and 20m.46s., esSEN = 22m.52s.  
 Lick ePPZ = 14m.5s., eZ = 15m.18s. and 20m.42s., eSPEN = 20m.46s., esSEN =  
 22m.54s.  
 Ukiah iSP = 20m.42s., esS = 22m.53s.

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Pasadena iNZ = 11m.8s., iPPZ = 14m.4s., iE = 20m.43s., iSPEN = 21m.10s., isS = 22m.50s., iSSZ = 25m.46s.  
Arcata eZ = 15m.44s.  
Fresno eE = 22m.18s.  
Vladivostok iPP = 14m.18s., iPPP = 16m.3s., iSKS = 20m.42s., isS = 23m.2s.  
Zi-ka-wei iZ = 13m.21s.  
Palomar iE = 20m.39s., ePKP,PKPZ = 38m.26s.  
Riverside iPP = 14m.11s., eZ = 20m.53s.  
Shasta Dam iPcP = 11m.17s., eScS? = 20m.47s., ePKP,PKP = 38m.16s.  
Mineral eEN = 11m.19s.  
Nanking iP = 11m.21s., i = 11m.35s., iPP? = 13m.57s., e = 16m.50s., iZ = 19m.44s., i = 23m.16s.  
Boulder City i = 12m.57s., ePKP,PKP = 38m.19s.  
Overton iPP?Z = 14m.16s., ePKP,PKPZ = 38m.7s.  
Pierce Ferry i = 12m.38s., esP = 14m.8s., ePKP,PKP = 38m.19s.  
Tucson iPcP = 11m.45s., ePP = 14m.41s., esS? = 23m.54s., e = 24m.38s., ePKKP? = 30m.10s., ePKP,PKP = 38m.16s., eSKP,PKP = 41m.5s.  
Seattle iPP = 14m.14s., es = 21m.35s., ePS = 22m.23s., ePPS = 22m.33s., and other unidentified readings.  
Victoria sS = 23m.51s.  
Sitka isS = 24m.6s.  
Salt Lake City iP = 11m.52s., esP = 14m.22s., iSP = 22m.38s., esS = 24m.24s., eSS = 27m.8s.  
Logan iP = 11m.55s., ePP = 15m.10s., esS = 24m.28s.  
Tacubaya i = 22m.10s.  
College e = 14m.58s. and 16m.5s., is = 21m.45s., ePS = 22m.22s., isS? = 24m.28s., eSS? = 27m.8s., eSSS? = 30m.56s.  
Puebla ePcP = 12m.5s., iPP = 15m.31s., is = 22m.3s.  
Butte iN = 22m.0s., iSSN = 27m.47s., eN = 34m.24s.  
Hungry Horse es? = 22m.34s., iPKKP = 29m.50s., iPKP,PKP = 37m.57s.  
Bozeman esS = 24m.54s., eSS = 27m.54s., eSSS = 30m.16s., esSS = 30m.33s., e = 34m.44s.  
Saskatoon PPS = 25m.43s.  
Irkutsk iSKS = 22m.46s.  
Huancayo iPP = 16m.57s., e = 18m.52s., iSKKS? = 23m.0s., i = 25m.12s., ePS = 25m.28s., e = 26m.12s. and 26m.40s., eSS = 30m.34s.  
Florissant e = 15m.55s., ePKP? = 17m.1s., e = 21m.59s., iSKKS = 23m.28s., is = 23m.55s., i = 25m.13s., iSS = 30m.37s.  
St. Louis iP = 13m.2s., iPKP? = 17m.3s., is = 23m.53s., iSS = 30m.44s., and other unidentified readings.  
Chicago ePS = 26m.35s., iSS = 30m.49s.  
La Plata 19m.40s., iSE = 23m.14s., 23m.58s., N = 24m.58s., 26m.4s., N = 26m.50s., N = 27m.4s., E = 33m.4s.  
La Paz iPP = 17m.36s., iPPP = 19m.43s., iSKKS = 23m.45s., iZ = 26m.8s., iPS = 27m.11s., SS? = 31m.44s., e = 37m.36s.  
Chinchina iPP = 17m.33s., iPPEN = 26m.8s., ePPS?EN = 29m.54s.  
Bogota ePPSEN = 28m.32s.  
Columbia es? = 24m.50s., e = 27m.36s., eSS = 32m.8s.  
Resolute Bay i = 23m.23s., SKS = 24m.11s., PS = 26m.23s., PPS = 27m.0s., iE = 29m.4s.  
Cleveland iPPZ = 17m.56s., eE = 20m.7s. and 21m.23s., eSKKSE = 24m.19s., eSN = 24m.50s., iSE = 24m.53s., esSKSE = 26m.26s., eE = 26m.46s., esSKKSN = 27m.16s., eE = 27m.23s., esSN = 27m.43s., iN = 32m.23s.  
Pittsburgh iNW = 25m.6s., 32m.39s., and 35m.10s.  
Pennsylvania iSSN = 32m.54s., eN = 34m.48s., isSSN = 35m.27s., eSSSN = 36m.54s.  
Philadelphia i = 24m.53s., is? = 25m.33s., e = 27m.29s., ePS? = 27m.51s., ePPS = 29m.37s., isPS? = 30m.55s., eSS = 32m.57s., esSS = 35m.45s., iSSS = 37m.26s.  
Ottawa SKKS = 24m.51s., is = 25m.32s., PS = 27m.36s., SS = 33m.24s.  
Fordham i = 27m.46s., iSS = 33m.39s.  
Palisades iSKKS = 24m.57s., is = 25m.42s., iSP = 27m.32s., iPS = 28m.16s., eSS = 33m.28s.  
New Delhi eN = 19m.23s., iN = 24m.52s.  
Harvard e = 20m.2s., ePPP = 21m.28s., iSP = 28m.0s., eSPP = 28m.48s., ePPS = 30m.3s., iSPS or isSP = 30m.47s., e = 31m.26s., eSS = 34m.3s., esSS = 36m.30s., eSSS = 37m.55s.  
Poona PSE = 24m.51s., PPSE = 25m.6s., SSE = 27m.48s., QE = 28m.3s., SSSE = 28m.38s.  
Almata SKKS = 25m.6s.  
Seven Falls iE = 25m.13s.  
Bombay iE = 24m.1s.  
San Juan iSKKS = 25m.15s., e = 33m.28s., eSSS = 38m.51s.  
Frunse iSKKS = 25m.19s., eSKSP = 27m.58s.  
Andijan SKKS = 25m.29s., eSKSP = 28m.23s.  
Fergana eSKSP = 38m.27s.  
Bermuda e = 25m.53s., i = 26m.49s., iSS = 35m.15s., esSS = 37m.46s., e = 41m.37s.  
Tashkent SKKS = 25m.46s?, eSKSP = 28m.46s.  
Sverdlovsk ePP = 19m.28s., ipPKP = 19m.46s., ipPP = 21m.6s., iSKKS = 26m.3s., iSKSP = 29m.4s., iPPS = 31m.2s., eSS = 35m.36s.  
Ivigtut 38m.52s.  
Scoresby Sund 21m.37s.; SP = 22m.18s.; 25m.23s., SS = 36m.26s., sSS = 39m.7s.

*Continued on next page.*



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Pulkovo iPKS = 21m.58s., ePPP = 23m.42s., SKKS = 27m.10s., iSKSP = 30m.10s.  
 Moscow iPP = 21m.1s., i = 21m.22s., ePKS = 21m.56s., iPPP = 24m.24s.?, iSKKS = 27m.13s., iSS = 38m.10s.  
 Helsinki esPKP = 21m.6s., iPP = 21m.24s., iPKS = 22m.2s., epPP = 22m.56s., esPP = 23m.55s., ePPP = 24m.21s., ipPPP = 25m.52s., eSKKS = 27m.19s., ePPS = 33m.9s., eSS = 38m.24s., esSS = 41m.7s., eSSS = 43m.25s.  
 Upsala iSKP? = 21m.30s.?, eN = 23m.51s., isPKS = 24m.21s., epSKS = 27m.30s.?, eE = 28m.57s., eN = 30m.19s., ePSP = 33m.30s.?, eSS = 38m.46s., esSS?N = 41m.28s.?  
 Bergen eN = 23m.9s., eE = 41m.37s.  
 Aberdeen iEN = 23m.21s., iPPSN = 34m.6s., iN = 36m.11s., iEN = 39m.33s., iSSEN = 42m.14s., eSSSE = 47m.13s.  
 Copenhagen i = 18m.45s.; also 27m.13s., 38m.35s., 39m.51s., and 42m.22s.  
 Yalta PP = 21m.47s., SKSP = 31m.9s.  
 Warsaw iPKP?EN = 18m.45s., PKP<sub>2</sub>?N = 19m.5s., e = 19m.31s., epPKP?Z = 20m.46s., eSKPZ = 21m.27s., iZ = 21m.47s., sPKP?NZ = 21m.55s., ePPEZ = 22m.6s., epPP = 24m.13s., esPPZ = 25m.8s., esPPE = 25m.25s., sPKSE = 25m.53s., eSKKSEN = 28m.12s., esSKSNZ = 28m.54s., eSKKPZ = 30m.30s., eSKSP = 31m.14s., ePSKSN = 33m.20s., eSPPN = 33m.52s., e = 36m.36s., SSEN = 40m.6s.  
 Lwow iPP = 21m.43s.?, iSKSP = 31m.36s.  
 Rathfarnham Castle iZ = 18m.59s., 19m.6s., and 19m.49s., eEN = 21m.36s., ePPEN = 22m.5s., ePPP?EN = 25m.24s., eEN = 32m.26s., eSPPEN = 34m.2s., eSSSEN = 46m.28s.?  
 Potsdam iPKPE = 18m.52s., iZ = 21m.50s., iSKPN = 21m.59s., iPPE = 22m.11s., iZ = 23m.35s., ipPKSZ = 24m.17s., isPKSZ = 24m.57s., epSKSE = 27m.28s., ipSKSZ = 27m.31s., iSKSP?N = 31m.19s., iPSKSN = 32m.19s., iSPPN = 34m.13s., iPPSN = 35m.16s., iSSE = 40m.20s., iE = 41m.50s., isSSE = 43m.2s., isSSN = 43m.5s., iE = 45m.53s.  
 Raciborzu eZ = 18m.54s. and 20m.18s., eE = 20m.41s., eZ = 20m.46s.  
 Collmberg iPKP<sub>2</sub>Z = 18m.53s., iZ = 19m.0s., eN = 20m.14s., isPKPZ = 21m.55s., iZ = 22m.12s., ePPZ = 22m.33s., eN = 22m.40s., eZ = 22m.44s., and 23m.52s., eEN = 28m.28s., eSKKP?Z = 29m.49s., ePSKSN = 32m.28s.?, eSPPN = 34m.28s.?, eSSEN = 40m.28s., esSSE = 43m.10s.  
 De Bilt esSS = 43m.8s., eSSS = 46m.28s., esSSS = 48m.48s.  
 Skalnate Pleso ePKP<sub>1</sub> = 19m.6s., eE = 19m.28s., esPKP<sub>2</sub> = 21m.47s., e = 22m.18s., ePP = 22m.34s., e = 27m.28s., eSPP = 34m.39s., e = 39m.54s., eSS = 40m.40s., esSS = 43m.40s.  
 Jena iEN = 19m.13s., iE = 19m.22s., and 19m.41s., eN = 20m.15s., epPKP?E = 20m.42s., ePP?E = 22m.0s., ePP?N = 22m.11s.,  
 Kew ePPP = 24m.47s., eEN = 43m.20s., eSSS = 46m.13s., e = 60m.33s., and 63m.19s.  
 Prague ePKP<sub>1</sub> = 19m.9s., esPKP = 21m.14s., eSKP = 22m.0s., ePP = 22m.24s., epPP = 23m.59s., esPP = 24m.43s., eSKSP = 31m.58s., ePSKS = 32m.38s., eSS = 40m.37s., esSS = 43m.12s., eSSS = 46m.4s., and many other e readings.  
 Ogyalla ePKP<sub>2</sub> = 19m.21s., epPKP<sub>1</sub> = 20m.57s., esPKP<sub>2</sub> = 21m.40s., e = 21m.44s., ePP = 22m.41s., esPP = 25m.2s., ePPP = 26m.10s., eSS = 41m.10s.  
 Budapest eE = 21m.37s. and 22m.48s., eN = 23m.38s. and 25m.22s., eE = 25m.37s., eN = 31m.38s.  
 Vienna esPKP = 21m.2s., ePP = 22m.12s., ePKS = 22m.56s., ePPP = 25m.35s.  
 Jersey eE = 20m.59s., eSPP?E = 34m.21s., eE = 43m.48s.  
 Kalossa iPE = 19m.2s., eE = 20m.12s., iN = 20m.19s., eE = 22m.52s., eN = 28m.44s., eE = 29m.8s.  
 Karlsruhe i = 19m.0s., e = 20m.1s.  
 Stuttgart iPKP = 18m.58s., iPKPZ = 19m.2s., iPKP = 19m.6s., eZ = 19m.33s. and 19m.52s., epPKP = 20m.44s., isPKPZ = 21m.22s., e = 21m.46s., eSKP = 22m.30s., ePPP = 25m.48s., ePSKS = 32m.46s., ePPS = 35m.1s., eSS = 40m.58s., e = 42m.22s., and 43m.38s., eSSS = 46m.28s.  
 Strasbourg isPKP = 21m.24s., iPP = 22m.31s., epPP = 24m.7s., esPP = 24m.44s., ePPP = 26m.4s., epPPP = 28m.6s., eSKSP = 31m.46s., ePSKS = 32m.28s., eSPP = 34m.22s., eSS = 40m.57s., esSS = 43m.55s., eSSS = 46m.55s., esSSS = 49m.33s., and other unidentified phases.  
 Paris i = 19m.4s., isPKP = 21m.24s., iPP = 22m.39s., ipPP = 24m.27s., isPP = 24m.49s., ePPP = 26m.6s., iSKKS = 28m.0s., i = 33m.4s., iSPP = 35m.0s., isPS = 36m.1s., eSS = 41m.7s., esSS = 43m.58s., eSSS = 46m.50s. and 47m.5s.  
 Belgrade i = 19m.3s., e = 31m.49s., 35m.4s., and 48m.16s.  
 Basle iPKP = 19m.7s., e = 21m.43s.  
 Zürich iPKP = 19m.5s.  
 Neuchatel iPKP = 19m.7s.  
 Trieste iPKP<sub>2</sub>Z = 19m.14s., ipPKP<sub>2</sub>Z = 21m.3s., iSKPZ = 22m.6s., iPPZ = 22m.42s., epPPZ = 24m.24s., iPPPZ = 26m.20s., isSKKS = 31m.55s., iPSKS = 32m.57s., iSKKS<sub>2</sub> = 33m.44s., iPSKS<sub>2</sub>? = 37m.17s., iSS = 41m.30s., isSS = 44m.18s.  
 Salo iZ = 19m.14s.  
 Clermont-Ferrand ipPPP = 27m.20s., eSS = 41m.52s., eSSS = 47m.52s., esSSS = 50m.4s. and other unidentified i readings.  
 Pavia iZ = 19m.11s., e = 21m.52s.  
 Padova SKKS = 29m.1s.  
 Athens readings given as for local shock.  
 Rome iPKP<sub>2</sub>Z = 19m.31s., ePP = 22m.49s., eSKKS = 29m.3s., ePPS? = 35m.37s.  
 Messina e = 19m.44s.  
 Tortosa PPEN = 27m.3s.

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Alicante PKP<sub>2</sub> = 19m.25s., SSP = 43m.55s., SSS = 49m.17s., Q = 63m.33s.  
 Granada PKP<sub>2</sub> = 20m.13s., sPKP = 22m.38s., iPP = 24m.17s., pPP = 26m.16s., sPP = 27m.11s., SKSP = 33m.37s., pPPS = 38m.14s., iSS = 43m.8s., sSS = 46m.8s.  
 Malaga iPPZ = 23m.29s., iPPPZ = 27m.21s.  
 Algiers Univ. eZ = 20m.20s.  
 Tamanrasset iPKP<sub>2</sub>Z = 20m.56s., esPKPZ = 21m.51s., epPKP<sub>2</sub>Z = 22m.40s., esPKP<sub>2</sub>Z = 23m.27s., iPPZ = 24m.44s., iZ = 24m.51s., eZ = 25m.42s., epPPZ = 26m.24s., eZ = 27m.12s. and 28m.5s., ePPPZ = 28m.27s. and 28m.39s.  
 Long waves were also recorded at Tananarive.

Sept. 22d. Readings also at 0h. (near Boulder City, Overton (2), and Pierce Ferry), 1h. (near Overton and Pierce Ferry), 2h. (near Florence Xim.), 4h. (Haiwee, Palomar, Pasadena, Riverside, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Lick, Mineral, Shasta Dam, College, Philadelphia, Kew, and Collmberg), 7h. (Calcutta), 8h. (Tucson, Pierce Ferry, Mineral, Shasta Dam, Hungry Horse, College, Resolute Bay, and near Borzhomi), 9h. (Calcutta), 10h. (near Garm and Obi-garm), 11h. (Brisbane), 12h. (Pierce Ferry, Shasta Dam, Pretoria, Collmberg, Stuttgart, Stalinabad, Tashkent, near Almata, Andijan, Fergana, Frunse, Garm, Kulyab, Murgab, Naryn, Obi-garm, Przhevalsk, Samarkand, and Tchimkent), 13h. (Brisbane, College, Collmberg, Calcutta, Almata, Fergana, Frunse, Kulyab, Murgab, Naryn, Przhevalsk, Samarkand, Stalinabad, Sverdlovsk, Irkutsk, and near Obi-garm), 14h. (Stuttgart, near Garm (2) and Obi-garm), 15h. (Huancayo, La Paz, Overton, Pierce Ferry, Lick, Shasta Dam, Hungry Horse, and near Borzhomi), 16h. (near Borzhomi), 17h. (near Garm and near Ashkabad), 18h. (La Paz, Riverside, Tinemaha, Tucson, Boulder City, Overton (2), Pierce Ferry, Shasta Dam, Hungry Horse, near Istanbul and near Garm), 19h. (near Garm), 20h. (Kaimata, New Plymouth, Tuai, Overton, and Pierce Ferry), 23h. (La Paz, La Plata, Boulder City, Overton, Pierce Ferry, Borzhomi, Tiflis, and near Garm).

Sept. 23d. 6h. 23m. 40s. Epicentre 34°·8N. 25°·6E. (as on 1948, March 6d.).

Intensity VIII at Hierapetra and Myrtos; VII at Kritsas; VI at Malles; V at Fourni Vassiliki; IV at Ampelouzos, Episcopi, and Heraklion. Suggested epicentre 34°·9N. 25°·7E.

A. Galanopoulos.

Seismological Institute Bulletin, 1950, Athens, 1951, p.21, with macroseismic chart separate from the text.

A = +·7422, B = +·3556, C = +·5681;  $\delta$  = +5; h = 0;  
 D = +·432, E = -·902; G = +·512, H = +·245, K = -·823.

	$\Delta$	Az.	P.	O - C.	S.	O - C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Athens	3·5	335	i 0 58	+ 1	e 1 40	0	—	—
Istanbul	6·8	23	i 1 42	- 2	e 3 10	+ 7	—	—
Helwan	6·9	134	1 41	- 4	2 56	- 9	—	—
Sofia	8·1	348	i 2 3	+ 1	i 3 37	+ 2	e 4 5	S*
Ksara	8·6	94	e 2 4	- 5	4 36?	S <sub>g</sub>	—	—
Messina	8·8	296	e 2 12	+ 1	i 3 52	- 1	—	e 4·5
Bucharest	9·6	2	e 2 27	+ 6	i 4 16	+ 4	i 5 23	S <sub>g</sub>
Belgrade	10·8	340	e 2 39 <sup>k</sup>	0	e 4 52	+10	i 6 3	S <sub>g</sub>
Timisoara	11·4	344	e 2 50	+ 3	e 5 21	S*	e 5 52?	S <sub>g</sub>
Yalta	11·7	32	2 50	- 1	—	—	—	—
Rome	12·5	308	e 3 2	0	e 5 32	+ 9	—	—
Kishinev	12·5	10	3 6	+ 4	5 22	- 1	—	—
Kalossa	12·7	340	e 3 8	+ 3	—	—	—	e 8·0
Budapest	13·6	341	3 19	+ 2	e 7 6	?	—	7·6
Sotchi	14·0	47	e 3 20	- 2	—	—	—	—
Triest	14·1	324	e 3 21	- 2	e 5 51	-11	e 3 30	PP
Ogyalla	14·2	339	e 3 40	+16	—	—	—	e 7·0
Florence, Xim.	14·3	313	i 3 27	+ 1	i 5 42	-24	—	—
Padova	14·3	316	e 3 45	+19	7 1	L	—	(7·0)
Prato	14·4	47	e 3 28	+ 1	—	—	e 3 36	pP
Bologna	14·6	316	e 3 40	+10	—	—	—	e 7·9
Skalnate Pleso	14·9	346	e 3 40	+ 6	e 6 39	SS	—	—
Zugdidi	14·9	54	3 35	+ 1	—	—	—	—
Lwow	15·1	356	i 3 40	+ 4	i 6 26	+ 1	—	—
Abastumanj	15·2	58	3 36	- 2	—	—	—	—

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		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.	s.	m.
Borzhomi		15.6	58	3 42	- 1	—	—	—	—	—
Leninakan		15.6	62	3 47?	+ 4	—	—	—	—	—
Erevan		15.9	65	e 3 46	- 1	—	—	—	—	—
Raci borzu		16.2	343	e 3 51	+ 1	—	—	e 4 3	PP	—
Pavia		16.3	315	e 3 54a	+ 2	e 7 10	+17	—	—	e 13.8
Tiflis		16.6	60	e 3 28?	-28	—	—	—	—	—
Chur		17.1	320	e 4 3	+ 1	e 7 13	+ 1	—	—	—
Prague		17.3	336	e 4 2	- 2	e 7 18	+ 2	i 4 16	PP	e 8.8
Warsaw		17.7	351	e 4 11	+ 1	e 7 31	+ 5	e 4 36	PPP	e 9.3
Grozny		17.8	55	e 4 39	PPP	e 7 28	0	—	—	—
Zürich		17.9	321	e 4 11a	- 1	e 7 35	+ 5	—	—	—
Algiers Univ.	z.	18.4	283	i 4 19k	+ 1	—	—	i 4 29	PP	—
Basle		18.5	321	e 4 19	0	e 7 52	+ 8	—	—	e 10.2
Stuttgart		18.5	325	e 4 19a	0	e 7 48	+ 4	e 4 48	PPP	e 10.2
Neuchatel		18.6	319	e 4 20	- 1	—	—	—	—	—
Collmberg		18.8	335	e 4 22	- 1	e 7 52	+ 2	e 5 1	PPP	e 10.3
Karlsruhe		19.0	325	4 20?	- 6	e 8 3	+ 8	—	—	e 10.3
Lenkoran		19.0	70	i 4 30	+ 4	—	—	—	—	—
Jena		19.1	335	e 4 25	- 2	e 8 1	+ 4	e 4 50	PP	—
Shemakla		19.1	63	—	—	e 9 2	SSS	—	—	—
Strasbourg		19.1	323	i 4 26	- 1	i 8 4	+ 7	i 4 37	PP	e 10.3
Potsdam		19.7	338	e 4 35	+ 1	i 8 13	+ 3	i 8 56	PcP	e 10.3
Baku		20.0	65	e 4 36	- 1	e 8 20	+ 3	—	—	—
Clermont-Ferrand		20.3	310	i 4 40	0	i 8 41	+18	i 4 55	PP	e 14.0
Tortosa		20.7	295	4 44	0	8 37	+ 6	5 3	PP	e 12.3
Alicante		21.2	289	4 49	0	8 37	- 4	4 57	pP	e 10.6
Tamanrasset	z.	21.2	242	i 4 53k	+ 4	—	—	i 5 18	PP	—
Paris		22.1	317	i 4 58	- 1	e 9 0	+ 2	i 5 23	PP	e 12.3
Moscow		22.5	17	e 5 0	- 2	e 8 57	- 8	—	—	—
De Bilt		22.6	327	—	—	e 9 13	+ 6	—	—	e 11.3
Copenhagen		22.8	342	i 5 5	0	i 9 11	0	—	—	11.8
Granada		23.7	286	i 5 13k	- 1	i 9 30	+ 3	6 7	PP	—
Malaga	z.	24.4	284	i 5 22k	+ 1	9 44	+ 5	10 10	SS	11.7
Jersey	E.	24.9	315	e 5 24	- 2	—	—	e 9 10	PcP	11.3
Kew		25.0	320	i 5 39	+12	i 10 4	+15	—	—	e 13.3
Pulkovo		25.2	6	e 5 27	- 2	i 9 44	- 8	—	—	—
Helsingfors		25.4	359	—	—	e 9 56	0	—	—	13.3
Upsala		25.6	352	e 5 37	+ 5	e 9 54	- 5	e 11 4	SS	e 14.3
Ashkabad		26.5	73	5 41	0	—	—	—	—	—
Aberdeen		29.1	329	—	—	i 11 31	+35	—	—	i 16.8
Rathfarnham Castle		29.1	320	i 6 3	- 1	e 10 58	+ 2	i 6 48	PP	e 13.8
Mary		29.3	73	e 6 26	+20	—	—	—	—	—
Sverdlovsk		32.3	37	i 6 30	- 3	i 11 40	- 6	—	—	—
Samarkand		33.1	69	e 6 38	- 2	—	—	—	—	—
Stalinabad		34.6	70	e 6 59	+ 6	—	—	—	—	—
Tashkent		34.7	65	e 6 51	- 3	e 12 18	- 6	—	—	—
Obi-garm		35.3	69	e 6 56	- 3	—	—	—	—	—
Kulyab		35.5	71	e 7 0	0	—	—	—	—	—
Fergana		36.7	67	e 7 7	- 3	e 12 51	- 3	—	—	—
Andijan		37.1	67	e 7 13	- 1	e 12 57	- 4	—	—	—
Frunse		38.5	63	i 7 24	- 2	e 13 16	- 6	—	—	—
Naryn		39.7	65	i 7 34	- 2	—	—	—	—	—
Almata		40.2	61	i 7 38	- 2	e 13 42	- 6	—	—	—
Przhevsk		41.4	62	i 7 51	+ 1	—	—	—	—	—
Irkutsk		56.8	46	—	—	e 17 37?	- 4	—	—	—
Pretoria	z.	60.3	177	i 10 13	0	—	—	—	—	—
Resolute Bay	z.	64.1	346	i 10 33	- 5	—	—	—	—	—
Pietermaritzburg	z.	64.2	175	e 10 43	+ 4	—	—	—	—	—
Harvard		72.1	310	i 11 28	0	—	—	—	—	—
Weston		72.1	310	i 11 18?	-10	—	—	—	—	—

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.
College	80.5	358	e 12 13	- 2	—	—	—	—
San Juan	81.1	286	e 12 21	+ 3	—	—	—	—
Hungry Horse	89.7	334	i 13 1	0	—	—	i 13 15	P
Victoria	z. 92.6	340	e 13 13	- 2	—	—	—	—
Mineral	z. 99.3	335	e 13 45	0	—	—	—	—
Shasta Dam	99.3	336	e 13 31	-14	—	—	—	—
Overton	z. 99.9	328	i 13 59	+11	—	—	i 17 37	PP
Pierce Ferry	100.0	328	e 13 50	+ 2	—	—	e 17 52	PP
Tucson	101.8	323	e 13 52	- 4	—	—	e 18 4	PP
Mount Wilson	z. 103.4	329	e 18 19	PP	—	—	—	—

Additional readings :—

Sofia e = 2m.14s.  
 Messina iS = 2m.24s., i = 3m.49s.  
 Belgrade e = 2m.55s.  
 Timisoara ePE = 2m.53s.?  
 Kalossa eE = 3m.16s. and 3m.53s.  
 Trieste iP<sub>g</sub>P<sub>g</sub>P<sub>g</sub>Z = 4m.30s.  
 Ogyalla eP?E = 3m.46s., eE = 4m.32s.  
 Skalnate Pleso e = 4m.29s. and 4m.41s.  
 Raciborzu ePE = 3m.57s.  
 Prague iP = 4m.5s., e = 4m.34s., 5m.0s., and 5m.20s., iS = 7m.22s., eSS = 7m.39s., eSS = 7m.49s.  
 Warsaw ePPPZ = 4m.40s., eE = 5m.25s., eZ = 5m.31s., eSSSEN = 7m.56s., eE = 8m.24s., eNZ = 8m.32s.  
 Algiers Univ. iPPPZ = 4m.42s., eZ = 5m.12s.  
 Basle i = 4m.22s.  
 Stuttgart eZ = 5m.1s., e = 9m.40s.  
 Collmberg eZ = 5m.23s., eE = 8m.2s.  
 Jena eE = 7m.12s., eSEN = 8m.10s.  
 Strasbourg iPPP = 5m.0s., e = 5m.53s., iP<sub>c</sub>P? = 9m.6s.  
 Potsdam iN = 6m.0s., iSEZ = 8m.16s.  
 Tortosa SSS?N = 9m.36s.  
 Alicante PPP = 5m.32s., SSS = 9m.41s., S<sub>c</sub>S = 16m.3s.  
 Tamanrasset ePPPZ = 5m.27s.  
 Paris i = 5m.0s. and 5m.9s., iPPP = 5m.33s., iSS = 9m.26s.  
 Granada P<sub>c</sub>P = 7m.58s., SS = 10m.31s.  
 Malaga iZ = 8m.18s.  
 Upsala eE = 5m.50s., eSE = 9m.57s., eE = 12m.44s.  
 Aberdeen iN = 12m.1s.  
 Rathfarnham Castle e = 7m.47s., and 13m.0s.  
 Overton iZ = 18m.19s.  
 Long waves were also recorded at Bergen and Scoresby Sund.

Sept. 23d. 18h. 38m. 44s. Epicentre 9°·7N. 125°·7E. (as on 1950, July 18d.).

Intensity IV at Surigao ; II at Hinatuan. Monthly Seismo. Bull., Manila, 1950.

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.
Zi-ka-wei	z. 21.8	350	i 4 56	0	i 8 58	+ 6	—	—
Nanking	23.1	344	i 5 8 <sub>a</sub>	0	i 9 22	+ 6	5 41	PP
Bandong	24.4	229	e 5 31	+10	e 10 4	+25	—	—
Djakarta	24.5	231	e 5 22	0	—	—	—	e 11.8
Vladivostok	33.7	8	e 6 42	- 3	—	—	—	—
Brisbane	z. 45.5	145	i 8 16	- 7	—	—	—	—
Irkutsk	45.9	342	e 8 26	0	e 15 9	- 2	—	—
Kodaikanal	E. 47.5	276	—	—	e 14 27	-67	—	—
Riverview	49.6	152	e 8 52	- 3	e 15 52	-11	e 16 3	PS
Poona	E. 50.9	286	9 7	+ 2	i 16 21	0	—	23.6
Bombay	51.9	286	e 9 16	+ 4	16 39	+ 4	—	—
Almata	53.9	318	e 9 28	+ 1	—	—	—	—
Naryn	53.9	316	e 9 30	+ 3	—	—	—	—
Frunse	55.4	316	e 9 34	- 4	e 17 23	+ 1	—	—
Andijan	56.2	313	e 9 45	+ 1	e 17 35	+ 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.
Stalinabad	58.3	310	e 9 59	0	—	—	—	—
Tashkent	58.6	313	e 10 2	+ 1	e 18 5	+ 1	—	—
Samarkand	59.9	310	e 10 13	+ 3	—	—	—	—
Sverdlovsk	68.4	328	11 4	- 2	20 4	- 3	—	—
Baku	73.0	310	e 11 41	+ 8	e 21 9	+ 9	—	—
Tiflis	76.8	311	i 11 56	+ 1	—	—	—	—
Borzhomei	77.9	311	e 12 0	- 1	—	—	—	—
College	79.8	25	e 12 6	- 6	—	—	—	—
Moscow	81.0	325	e 12 16	- 2	e 22 21	- 6	—	—
Ksara	84.5	303	i 12 39	+ 3	23 58?	+ 56	30 34	SSS
Upsala	90.6	331	—	—	e 23 51	- 9	—	e 49.3
Collmberg	z. 96.2	324	e 13 31	0	—	—	—	—
Stuttgart	99.5	324	e 13 46	0	e 25 22	+ 6	—	—
Shasta Dam	99.8	46	e 13 30	-17	—	—	—	—
Hungry Horse	101.9	36	e 13 53	- 4	—	—	e 17 42	PP
Kew	103.4	328	—	—	e 26 16?	+ 27	—	e 61.2
Overton	z. 107.2	48	i 18 41	PP	—	—	—	—
Pierce Ferry	107.7	48	e 14 21	- 1	—	—	e 18 1	PKP
Tucson	111.8	50	e 19 12	PP	—	—	—	—
San Juan	149.7	22	e 19 49	[+ 2]	—	—	—	—
Galerazamba	z. 150.9	45	i 19 54	[+ 5]	—	—	—	—

Additional readings :—

Nanking 6m.3s.

Riverview ePPS?N = 16m.8s., eE = 18m.54s. and 19m.26s., eN = 19m.47s., eZ = 19m.54s.

Poona PPSE = 17m.37s., SSE = 20m.47s., SSSE = 22m.37s.

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

Sept. 23d. Readings also at 0h. (Tamanrasset (2) and near Garm), 1h. (Tamanrasset, near Garm, and near Pierce Ferry), 2h. (Pretoria), 5h. (near Mizusawa), 6h. (College), 8h. (College and Prague), 9h. (Mount Wilson, Palomar, Riverside, Tinemaha, Tucson, Overton, Pierce Ferry, Lick, Mineral, Shasta Dam, Hungry Horse (2), and College), 10h. (Huancayo, Tucson, Hungry Horse, and College (2)), 11h. (College and near Garm), 12h. (near Boulder City, Overton (3), Pierce Ferry (2), and near College (2)), 13h. (Nanking and near Chinchina), 15h. (Stuttgart and near Overton), 16h. (Brisbane, College (2), near Ashkabad, and near Garm (2)), 17h. (Brisbane, Pretoria, Mount Wilson, Palomar, Riverside, Tinemaha, Tucson (2), Boulder City, Overton, Pierce Ferry (2), Shasta Dam, College (2), near Oaxaca, Puebla, Tacubaya, near Fort de France, and near Alicante (3)), 18h. (Brisbane, Nanking, Zi-ka-wei, Sverdlovsk, College, Granada, and near Garm (2)), 19h. (near Garm), 20h. (Apia, New Plymouth, Tuai, Haiwee, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Mineral, Shasta Dam, Hungry Horse, College (2), Andijan, Fergana, Collmberg, Paris, Prague, Strasbourg, and Stuttgart), 21h. Timisoara, near Andijan, Fergana, Kulyab, Murgab, Obi-garm, Stalinabad, and near Garm), 23h. (near Przhevalsk).

Sept. 24d. 22h. 13m. 22s. Epicentre 63°·4N. 147°·9W. (as on 1948, Feb. 14d.).

Felt at College.

L. M. Murphy and F. P. Ulrich.

United States Earthquakes, 1950, serial No. 755, Washington, 1952, p.17.

A = -·3813, B = -·2392, C = +·8929;  $\delta$  = -12;  $h$  = -10;

D = -·531, E = +·847; G = -·756, H = -·474, K = -·450.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
College	1.5	1	i 0 26	- 2	—	—	—	—
Victoria	z. 20.1	126	e 4 45	+ 7	—	—	—	—
Resolute Bay	21.1	36	4 45	- 3	—	—	i 8 52	P <sub>c</sub> P
Seattle	21.2	126	e 5 0	+11	—	—	e 5 23	PPP
Hungry Horse	23.9	112	i 5 16	0	e 9 35	+ 5	i 6 5	PPP
Shasta Dam	27.3	133	e 5 48	0	—	—	—	—
Mineral	z. 27.9	133	e 5 53	- 1	—	—	e 9 8	P <sub>c</sub> P
Berkeley	z. 29.9	135	e 6 13k	+ 1	—	—	—	—
Lick	z. 30.6	135	e 6 19k	+ 1	—	—	—	—
Tinemaha	z. 31.9	131	i 6 31	+ 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.
Haiwee	z.	32.9	131	e 6 41	+ 3	—	—	—	—
Overton	z.	33.7	127	e 6 46	+ 1	e 13 10	P <sub>c</sub> S	—	—
Boulder City		34.1	127	e 6 51	+ 3	—	—	e 9 26	P <sub>c</sub> P
Pierce Ferry		34.3	126	e 6 51	+ 1	—	—	—	—
Pasadena	z.	34.6	133	e 6 55	+ 2	—	—	—	—
Riverside	z.	35.0	133	i 6 56	0	—	—	i 9 27	P <sub>c</sub> P
Palomar		35.8	132	i 7 3	0	—	—	—	—
Lincoln	E.	37.3	103	—	—	e 13 35	P <sub>c</sub> S	—	e 19.6
Tucson		38.9	125	e 7 30	+ 1	—	—	i 7 33	P
Ottawa	z.	43.1	79	e 8 0	- 4	—	—	—	—
Collmberg	z.	64.7	14	e 10 38	- 4	—	—	e 11 12	P <sub>c</sub> P
Paris		65.7	22	e 10 52 <sub>k</sub>	+ 4	—	—	i 11 23	P <sub>c</sub> P
Stuttgart	z.	66.7	16	e 10 52	- 3	—	—	—	—
Triest		70.3	14	i 11 11 <sub>a</sub>	- 6	—	—	—	—
Istanbul		75.9	3	e 11 48	- 2	—	—	—	—
Malaga	z.	76.1	30	i 11 50 <sub>k</sub>	- 1	e 21 28	- 7	—	—
Tamanrasset	z.	91.6	25	e 13 8	- 2	—	—	—	—
Pretoria	z.	142.3	6	e 19 30	[ - 5 ]	—	—	—	—
Pietermaritzburg	z.	146.2	2	i 19 41	[ 0 ]	—	—	—	—
Grahamstown		149.7	10	e 19 50	[ + 3 ]	—	—	—	—

Additional readings :—

Seattle e = 5m.44s.  
Hungry Horse i = 5m.36s.  
Mineral eN = 8m.36s.  
Berkeley eZ = 6m.31s.

Long waves were also recorded at Saskatoon, Bozeman, Seven Falls, Harvard, and Palisades.

Sept. 24d. 22h. 56m. 38s. Epicentre 34°·5N. 60°·7E.

A = +·4042, B = +·7202, C = +·5638 ;  $\delta$  = -6 ; h = 0 ;  
D = +·872, E = -·489 ; G = +·276, H = +·492, K = -·826.

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Mary		3.2	16	i 0 55	+ 3	—	—	—	—
Ashkabad		3.9	332	i 0 48?	-14	—	—	—	—
Samarkand		7.2	42	i 1 51	+ 2	—	—	—	—
Stalinabad		7.7	56	i 1 57	+ 1	—	—	—	—
Kulyab		8.1	63	e 2 2	0	—	—	—	—
Obi-garm		8.4	57	i 1 48	-18	—	—	—	—
Garm		8.9	57	e 2 14	+ 2	—	—	—	—
Tashkent		9.6	42	i 2 23	+ 2	—	—	—	—
Lenkoran		10.4	297	2 48?	+14	—	—	—	—
Fergana		10.6	53	i 2 37	+ 1	e 4 38	+ 1	—	—
Andijan		11.2	52	2 50	+ 6	e 4 57	+ 5	—	—
Shemakla		11.4	306	—	—	4 54	- 2	—	—
Frunse		13.7	48	i 3 18	0	—	—	—	—
Naryn		13.9	56	e 3 17	- 4	—	—	—	—
Erevan		14.1	298	e 3 36?	PP	—	—	—	—
Tiflis		14.4	305	3 28	+ 1	i 6 22	SS	—	—
Grozny		14.6	312	e 3 32	+ 2	e 5 58	-15	—	—
Leninakan		14.8	300	e 3 24	- 8	—	—	—	—
Gori		15.0	305	—	—	e 6 34	SS	—	—
Dehra Dun	N.	15.2	101	e 2 52	-46	e 6 40	SS	e 12 10	P <sub>c</sub> S
New Delhi	N.	15.3	108	e 3 43	+ 4	e 6 46	SS	3 54	PP
Almata		15.4	50	i 3 40	0	—	—	—	—
Borzhomj		15.5	303	e 3 38	- 4	—	—	—	—
Abastumanj		15.8	302	e 3 50	+ 5	—	—	—	—
Zugdidi		16.8	304	4 0	+ 2	—	—	—	—
Bombay		18.9	143	i 4 29	+ 5	e 8 13	SS	—	—
Poona	z.	19.8	141	4 39	+ 4	8 29	+16	8 59	SSS
Ksara		20.5	274	i 4 40	- 2	8 36	+ 9	—	—
Theodosia		22.0	306	5 2?	+ 4	8 57?	+ 1	—	—
Sverdlovsk		22.3	359	i 5 0	- 1	e 9 3	+ 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.	
Yalta		22.7	304	5	2	- 2	9	12	+ 3	5	42	PP	—
Hyderabad	N.	23.3	134	5	12	+ 2	9	56	SS	—	—	—	—
Helwan		25.3	267	e 5	32	+ 2	i 10	4	+10	e 10	28	?	e 11.7
Istanbul		25.8	294	e 5	33	- 1	e 10	1	- 1	—	—	—	—
Moscow		26.5	331	e 5	39	- 2	e 10	12	- 2	—	—	—	—
Calcutta	E.	27.0	109	e 5	42	- 3	e 10	34	+12	e 12	10	SSS	—
Kishinev		27.0	309	5	43	- 2	10	25	+ 3	—	—	—	—
Bucharest		28.3	302	e 6	2	+ 5	i 11	47	SS	i 12	29	SSS	i 14.3
Kodaikanal	E.	28.6	144	e 5	59	- 1	e 11	19	+31	—	—	—	—
Athens		29.9	287	e 6	9	- 3	—	—	—	—	—	—	—
Lwow		30.9	311	i 6	17	- 3	i 13	0	SS	e 17	0	ScS	—
Timisoara		31.9	303	6	22?	- 7	—	—	—	—	—	—	—
Pulkovo		32.1	332	e 6	31	0	e 11	41	- 2	—	—	—	—
Belgrade		32.4	301	—	—	—	e 11	44	- 4	e 13	48	SS	e 16.8
Skalnate Pleso		33.1	310	e 6	43	+ 3	e 14	12	SSS	e 7	43	PP	e 15.2
Warsaw		33.3	315	e 6	43	+ 2	e 12	3	+ 1	e 17	1	ScS	e 20.4
Kalossa		33.5	305	e 6	45	+ 2	e 14	43	SSS	e 7	18	?	—
Budapest		33.6	306	e 6	59	+15	e 14	17	SS	—	—	—	e 17.4
Ogyalla		34.2	307	e 8	9	PP	e 14	34	SSS	—	—	—	—
Helsinki		34.6	330	—	—	—	e 14	10	SS	e 14	59	SSS	20.4
Taranto		34.7	293	e 8	10	PP	e 15	10	SSS	—	—	—	—
Irkutsk		35.7	46	7	5	+ 3	e 12	39?	0	—	—	—	—
Messina		36.3	290	e 7	10	+ 3	e 12	48	0	—	—	—	—
Prague		37.0	310	e 7	8	- 5	e 13	0	+ 1	e 8	51	PP	e 21.9
Triest		37.1	303	i 7	11 <sub>a</sub>	- 3	e 12	57	- 4	i 9	38	P <sub>c</sub> P	—
Upsala		37.7	326	e 8	53	PP	e 15	59	SS	e 17	33	ScS	e 20.1
Collmberg		38.0	311	e 7	20	- 1	—	—	—	e 9	3	PP	e 25.4
Potsdam		38.1	314	i 7	22 <sub>k</sub>	0	i 13	18	+ 2	e 17	38	ScS	e 23.4
Rome		38.2	297	i 7	22 <sub>k</sub>	- 1	e 13	6	-11	e 8	56	PP	e 19.4
Padova		38.5	301	e 7	27	+ 1	13	14	- 8	e 8	22	?	—
Florence, Xim.		38.9	299	e 7	30	+ 1	e 13	6	-22	—	—	—	—
Jena	E.	38.9	310	e 7	27	- 2	—	—	—	e 9	5	PP	—
Copenhagen		39.1	319	i 7	29	- 2	i 13	31	0	18	36	Q	20.4
Prato		39.1	299	i 7	29	- 2	i 13	29	- 2	—	—	—	—
Chur		40.0	304	e 7	35	- 3	—	—	—	—	—	—	—
Stuttgart		40.3	308	i 7	38 <sub>a</sub>	- 2	e 13	40	- 9	e 16	34	SS	e 26.4
Zürich		40.7	306	e 7	39	- 5	e 17	44	SSS	—	—	—	—
Strasbourg		41.2	308	i 7	45 <sub>a</sub>	- 3	e 14	2	0	e 9	40	PP	e 25.4
Bergen	N.	43.8	325	—	—	—	e 15	7	+27	—	—	—	e 20.9
Paris		44.7	308	i 8	14	- 2	i 14	58	+ 4	—	—	—	e 27.4
Kew		46.3	311	e 8	19	-10	e 15	15	- 1	—	—	—	e 28.4
Aberdeen	N.	47.3	320	—	—	—	i 15	28	- 3	e 23	47	Q	i 28.5
Tortosa		47.3	297	i 8	38	+ 1	15	28	- 3	10	14	P <sub>c</sub> P	—
Nanking		48.1	76	8	46 <sub>a</sub>	+ 3	—	—	—	—	—	—	e 25.3
Tamanrasset	z.	49.3	272	e 8	51	- 2	i 15	37	-22	e 10	44	PP	—
Rathfarnham Castle		49.9	314	e 8	18	-39	e 15	42	-27	—	—	—	e 26.4
Zi-ka-wel	z.	50.5	76	i 9	6	+ 4	—	—	—	i 11	9	PP	—
Granada		51.3	293	i 9	10 <sub>a</sub>	+ 2	i 16	31	+ 5	11	10	PP	i 29.8
Malaga	z.	52.1	293	i 9	11 <sub>k</sub>	- 3	i 16	27	-11	i 18	15	?	32.7
Vladivostok		54.6	58	i 9	38	+ 6	—	—	—	8	48	?	—
Scoresby Sund		55.5	337	—	—	—	e 17	31	+ 7	23	46	Q	28.4
Pretoria	z.	67.4	212	i 10	59	0	—	—	—	—	—	—	—
Pietermaritzburg	z.	69.9	208	e 11	15	0	—	—	—	—	—	—	—
Grahamstown		74.7	209	e 11	43	0	—	—	—	—	—	—	—
College		78.5	13	e 12	4	0	—	—	—	e 15	9	PP	—
Hungry Horse		97.4	357	e 13	37	0	i 23	45	[-29]	i 17	37	PP	—
Shasta Dam		105.1	3	i 23	45	?	—	—	—	—	—	—	—
Overton	z.	109.2	356	e 18	31	[ 0]	—	—	—	i 18	56	PP	—
Pierce Ferry		109.6	355	e 16	6	P	—	—	—	—	—	—	—
Tucson		113.1	352	e 19	35	PP	—	—	—	—	—	—	—
La Paz		131.0	279	21	38	PP	—	—	—	—	—	—	—

For Notes see 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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NOTES TO SEPTEMBER 24d. 22h. 56m. 38s.

Additional readings and note :—

New Delhi SSN = 7m.6s.  
 Yalta PPP = 5m.54s., P<sub>c</sub>P = 8m.47s.  
 Calcutta eP<sub>c</sub>PE = 8m.30s.  
 Skalnate Pleso e = 8m.9s.  
 Warsaw e = 8m.41s., eE = 9m.24s., eN = 10m.49s., eZ = 11m.18s., eP<sub>c</sub>S = 12m.23s., eEZ = 14m.3s., eSS = 14m.44s., e = 15m.53s.  
 Ogyalla eN = 10m.7s., e = 13m.28s.  
 Helsinki eZ = 15m.17s.  
 Prague eP = 7m.13s., eN = 7m.39s., eE = 7m.52s., e = 9m.52s., eSS = 15m.36s., e = 15m.55s.  
 Upsala e = 14m.52s.  
 Potsdam eSSSE = 16m.46s., eSSS?Z = 16m.57s., eE = 17m.27s.  
 Rome ePP = 8m.32s., eSS? = 16m.3s.  
 Jena eE = 7m.55s.  
 Stuttgart iP = 7m.42s.  
 Strasbourg e = 8m.8s., 16m.58s., and 17m.26s.  
 Tortosa iE = 14m.57s., SS?E = 18m.46s., SSS?E = 20m.8s.  
 Tamanrasset eZ = 10m.52s., ePPPZ = 11m.48s.  
 Granada SSS = 20m.10s.  
 Vladivostok readings given as P and P<sub>c</sub>P.  
 Long waves were also recorded at De Bilt, Clermont-Ferrand, and Alicante.

Sept. 24d. Readings also at 0h. (near Garm), 1h. (Seattle, near Victoria, and near Garm), 2h. (Overton and Pierce Ferry), 3h. (Prague), 4h. (near Overton), 5h. (near Kulyab), 7h. (Messina, Pasadena, Riverside, Palomar, Haiwee, Tinemaha, Tucson, Overton, Hungry Horse, near Shasta Dam, and near Alicante (2)), 8h. (Brisbane, Sverdlovsk, College, and Overton), 10h. (near Alicante and near Garm), 12h. (Stalinabad, near Kulyab, Andijan, near Garm, and near Istanbul), 13h. (near Zugdidi), 14h. (Ashkabad), 15h. (near Obi-garm, Garm (2)), Stalinabad, and near Trieste), 16h. (Hungry Horse, Garm, Kulyab, Stalinabad, Fergana, near Obi-garm, Andijan, near Sofla, and near Prague), 17h. (near Przhevalsk, and near Istanbul), 17h. (New Delhi, Mary, Naryn (2), Frunse (2), Przhevalsk (2), Almata (2), near Kulyab (2), Obi-garm (2), Stalinabad (2), Garm (2), Fergana (2), Samarkand (2), Andijan (2), and Tashkent (2)), 19h. (near Mizusawa and near Frunse), 20h. (Ashkabad and Pierce Ferry), 21h. (Overton, and Pierce Ferry), 22h. (near Overton and near Trieste).

Sept. 25d. 12h. 25m. 28s. Epicentre 24°·0N. 93°·0E. (as on 1949, July 15d.).

Approximate.

A = -·0479, B = +·9133, C = +·4045; δ = +3; h = +4;  
 D = +·999, E = +·052; G = -·021, H = +·404, K = -·915.

	Δ	Az.	P.	O - C.	S.	O - C.
	°	°	m. s.	s.	m. s.	s.
Murgab	21·7	316	e 4 55	0	—	—
Naryn	22·4	326	e 4 55	- 7	—	—
Almata	23·3	330	i 5 3	- 7	—	—
Andijan	24·0	318	e 5 19	+ 2	e 9 36	+ 4
Fergana	24·2	318	e 5 19	0	e 9 36	+ 1
Frunse	24·2	325	i 5 13	- 6	e 9 28	- 7
Kulyab	24·2	311	5 25	+ 6	9 48	+13
Obi-garm	24·6	312	e 5 26	+ 3	—	—
Tashkent	26·3	317	e 5 42	+ 3	e 10 19?	+ 8
Samarkand	26·9	311	e 5 53	+ 8	—	—
Sverdlovsk	40·3	333	7 34	- 6	—	—
Collmberg	z. 65·5	317	e 10 51	+ 4	—	—
Stuttgart	z. 68·4	316	e 11 11	+ 5	—	—
College	79·9	22	i 12 3	- 9	—	—
Pretoria	z. 79·9	236	e 12 1?	-11	—	—

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Sept. 25d. 17h. 58m. 2s. Epicentre 32°·6N. 75°·9E. (as on 1950, Aug. 12d.).

$\Delta = +.2056$ ,  $B = +.8187$ ,  $C = +.5362$ ;  $\delta = +5$ ;  $h = +1$ ;  
 $D = +.970$ ,  $E = -.244$ ;  $G = +.131$ ,  $H = +.520$ ,  $K = -.844$ .

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
New Delhi	4.1	164	e 1 4	- 1	i 2 3	+ 8	1 25	1.8
Murgab	6.0	345	e 1 30	- 2	i 3 5	S*	—	—
Kulyab	7.3	318	e 1 52	+ 2	e 3 6	- 9	—	—
Obi-garm	7.9	322	e 2 2?	+ 3	e 3 32?	+ 2	—	—
Stalinabad	8.3	318	i 2 5	+ 1	i 3 34	- 6	—	—
Fergana	8.4	338	e 2 11	+ 5	—	—	—	—
Andijan	8.6	342	e 2 7	- 2	3 39	- 9	—	—
Naryn	8.8	1	e 2 6	- 5	e 3 36	-17	—	—
Frunse	10.3	355	e 2 28	- 4	—	—	—	—
Almata	10.7	4	e 2 39	+ 1	—	—	—	—
Tchimkent	10.9	334	e 2 37	- 3	—	—	—	—
Mary	12.5	297	e 3 8	+ 6	—	—	—	—
Bombay	13.9	192	e 6 11	S	(e 6 11)	+14	—	(7.1)
Poona	14.1	188	i 3 17	- 6	5 54	- 8	5 58?	6.5
Ashkabad	15.3	295	e 3 43	+ 4	—	—	—	—
Kodaikanal	E. 22.3	177	e 6 28	?	—	—	—	—
Sverdlovsk	26.4	341	e 5 35	- 5	—	—	—	—

Additional readings and note :—

The Indian readings appear to have been given one hour too early, and the corresponding correction has been applied to times of all stations in this group.

New Delhi PPE = 1m.11s., P\*E = 1m.15s., SSE = 2m.14s.

Bombay records S as P and L as S.

Poona SSSE = 6m.26s.

Long waves were recorded at Hyderabad.

Sept. 25d. 18h. 9m. 27s. Epicentre 32°·5S. 71°·3W. (as on 1937, Dec. 17d.).

Intensity V-VI between South Latitudes 32° and 33°.

F. Greve.

Boletín del año, 1950. Instituto Sismológico, Santiago, Chile, 1951, p.9.

$A = +.2709$ ,  $B = -.8004$ ,  $C = -.5347$ ;  $\delta = -7$ ;  $h = +1$ ;  
 $D = -.947$ ,  $E = -.321$ ;  $G = -.171$ ,  $H = +.506$ ,  $K = -.845$ .

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
La Plata	E. 11.4	106	2 45	- 2	5 3	+ 7	—	5.6
	N. 11.4	106	2 52	+ 5	4 57	+ 1	—	5.5
La Paz	16.2	12	i 3 53	+ 3	i 7 5	+14	4 6	9.6
Huancayo	20.7	350	i 4 45	+ 1	e 8 41	+10	e 5 39	—
Tucson	74.4	326	i 11 40	- 2	—	—	—	—
Ottawa	z. 77.6	357	e 11 59	- 1	—	—	—	—
Palomar	z. 78.3	323	i 12 4 <sub>a</sub>	+ 1	—	—	—	—
Grahamstown	78.7	122	i 12 7	+ 1	—	—	—	—
Pierce Ferry	79.1	327	i 12 7	- 1	—	—	—	—
Riverside	z. 79.1	323	i 12 7 <sub>a</sub>	- 1	—	—	—	—
Boulder City	79.4	326	e 12 9	0	—	—	—	—
Overton	z. 79.6	327	i 12 11	+ 1	—	—	—	—
Pasadena	79.6	323	i 12 9 <sub>a</sub>	- 1	—	—	—	—
Haiwee	z. 81.1	324	i 12 18	0	—	—	—	—
Tinemaha	z. 81.9	325	i 12 23	0	—	—	—	—
Pietermaritzburg	z. 83.5	121	e 12 31	0	—	—	—	—
Lick	z. 83.9	323	e 12 33 <sub>a</sub>	0	—	—	—	—
Pretoria	z. 83.9	117	i 12 34	+ 1	—	—	—	—
Mineral	z. 86.1	324	e 12 43	- 1	—	—	—	—
Shasta Dam	86.8	324	i 12 46	- 1	—	—	—	—
Hungry Horse	89.1	334	i 12 57	- 1	—	—	—	—
Tamanrasset	z. 91.6	64	i 13 11 <sub>a</sub>	+ 1	—	—	e 16 50	PP

Additional readings :—

La Plata E = 3m.57s.

La Paz iSS = 7m.23s., P<sub>c</sub>P = 8m.33s.

Palomar iZ = 12m.18s.

Tamanrasset iZ = 13m.24s.

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Sept. 25d. 23h. 16m. 0s. Epicentre 9°·7N. 125°·7E. (as on 23d.).

Intensity III at Surigao ; II at Hinatuan.

Monthly Seismo. Bull., Manila, 1950. Epicentre 9°·8N. 126°·8E.

	$\Delta$	Az.	P.		O-C.	S.		O-C.		Supp.		L.
	°	°	m.	s.	s.	m.	s.	s.	m.	s.		m.
Manila	6·7	317	i 2	5	P <sub>g</sub>	i 3	28	S*	—	—	—	—
Guam	19·0	76	4	15	-11	—	—	—	—	—	—	—
Zi-ka-wei	z. 21·8	350	i 4	54	- 2	i 8	57	+ 5	i 5	49	PP	e 9·8
Nanking	23·1	344	i 5	2 <sub>a</sub>	- 6	i 9	29	+13	i 5	58	PP	—
Bandong	24·4	229	e 5	25	+ 4	i 9	55	+16	—	—	—	—
Djakarta	24·5	231	i 5	26	+ 4	i 9	53	+13	—	—	—	—
Vladivostok	33·7	8	i 6	42	- 3	i 12	3	- 5	e 13	48	SS	—
Colombo	E. 45·4	270	8	22	0	17	28	?	—	—	—	26·0
Brisbane	z. 45·5	145	i 8	18	- 5	—	—	—	—	—	—	—
Irkutsk	45·9	342	e 8	33	+ 7	e 15	9	- 2	—	—	—	—
Hyderabad	N. 46·5	285	—	—	—	e 15	21	+ 2	—	—	—	—
Kodaikanal	E. 47·5	276	(e 8	16)	-22	—	—	—	—	—	—	—
Riverview	49·6	152	i 8	59 <sub>a</sub>	+ 4	i 16	12	+ 9	e 19	19	SS	—
Bombay	51·9	286	e 9	14	+ 2	e 16	37	+ 2	—	—	—	—
Frunse	55·4	316	e 9	38	0	e 17	24	+ 2	—	—	—	—
Andijan	56·2	313	e 9	45	+ 1	—	—	—	—	—	—	—
Fergana	56·5	313	e 9	55?	+ 9	—	—	—	—	—	—	—
Kulyab	57·4	309	e 10	9?	+16	—	—	—	—	—	—	—
Stalinabad	58·3	310	i 9	58	- 1	—	—	—	—	—	—	—
Tashkent	58·6	313	i 10	0	- 1	i 18	4?	0	—	—	—	—
Mary	63·4	307	i 10	33	- 1	—	—	—	—	—	—	—
Ashkabad	66·3	307	10	50	- 2	—	—	—	—	—	—	—
Wellington	67·9	142	—	—	—	e 19	45	-16	e 26	25	SSS	e 38·0
Christchurch	68·0	145	e 20	0	S	(e 20	0)	- 2	—	—	—	e 40·0
Sverdlovsk	68·4	328	11	3	- 3	e 20	1	- 6	—	—	—	—
Lenkoran	73·8	308	—	—	—	i 21	49	PS	—	—	—	—
Tiflis	76·8	311	11	55	0	e 21	43	+ 1	—	—	—	—
Borzhom	77·9	311	e 12	0	- 1	—	—	—	—	—	—	—
Zugdidi	79·0	311	e 12	18?	+11	—	—	—	—	—	—	—
College	79·8	25	e 12	7	- 5	e 22	10	- 4	—	—	—	e 33·4
Moscow	81·0	325	e 12	21	+ 3	e 22	25	- 2	—	—	—	—
Pulkovo	84·4	329	e 12	33	- 3	e 22	54	- 7	—	—	—	—
Yalta	84·4	314	12	34	- 2	23	55	PS	—	—	—	—
Ksara	84·5	303	i 12	37 <sub>a</sub>	+ 1	23	29?	+27	25	0?	?	—
Sitka	86·8	33	(e 13	17)	+30	e 13	17	P	—	—	—	e 36·1
Helsinki	87·0	331	—	—	—	e 23	19	[+ 5]	—	—	—	47·0
Kishinev	87·6	318	12	50	- 1	e 23	24	- 8	—	—	—	—
Istanbul	88·7	312	i 12	54	- 3	e 23	44	+ 1	—	—	—	—
Bucharest	90·1	315	e 12	54	- 9	23	32	[- 1]	—	—	—	—
Lwow	90·1	321	e 13	1	- 2	i 23	53	- 2	—	—	—	—
Warsaw	91·2	324	e 13	24	+16	e 23	43	[+ 3]	e 24	14	S	e 49·0
Resolute Bay	z. 92·2	10	e 13	15	+ 2	—	—	—	—	—	—	—
Potsdam	95·8	325	e 13	29	0	—	—	—	—	—	—	e 50·0
Collmberg	96·2	324	e 13	30	- 1	—	—	—	—	—	—	e 52·0
Scoresby Sund	97·0	350	—	—	—	24	24	[+12]	31	36	SS	54·0
Jena	97·2	324	13	37?	+ 1	—	—	—	—	—	—	—
Stuttgart	99·5	324	e 13	45	- 1	e 25	24	+ 8	—	—	—	e 52·0
Shasta Dam	99·8	46	i 13	44	- 3	—	—	—	i 17	2	PP	—
De Bilt	100·2	328	—	—	—	e 27	0?	PS	—	—	—	e 49·0
Rome	100·3	316	e 13	41	- 9	e 25	14	- 9	e 17	53	PP	e 51·0
Florence Xim	100·4	318	—	—	—	e 24	29	[ 0]	e 34	38	SSP	—
Strasbourg	100·5	323	—	—	—	e 26	50	PS	—	—	—	e 51·0
Hungry Horse	101·9	36	i 13	56	- 1	—	—	—	—	—	—	—
Paris	103·4	325	—	—	—	e 27	19	PS	e 30	30	PKKP	e 58·0
Rathfarnham Castle	105·2	333	—	—	—	e 26	57	+53	e 27	59	PS	e 53·0
Overton	z. 107·4	48	e 14	21	P	—	—	—	e 18	48	PP	—
Pierce Ferry	107·7	48	e 14	22	P	—	—	—	—	—	—	—
Alicante	110·7	317	14	40	P	—	—	—	—	—	—	e 49·1
Tucson	111·8	50	e 18	22	[-15]	—	—	—	e 19	12	PP	—
Tamanrasset	z. 113·1	300	e 18	41	[+ 2]	e 29	35	PS	i 19	31	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.	
Granada	113.4	318	18	9 <sub>a</sub>	[-31]	26	32	{+ 3}	30	50	PPS	i 61.6
Harvard	125.7	15	i 19	1	[- 3]	—	—	—	e 20	52	PP	e 71.5
Weston	125.9	15	e 19	3	[- 1]	—	—	—	—	—	—	—
Palisades	126.4	18	e 19	4	[- 1]	e 37	33	SS	e 20	57	PP	e 52.1
San Juan	149.7	22	e 19	51	[+ 4]	—	—	—	—	—	—	—
Galerazamba	150.9	45	i 19	53	[+ 4]	26	27	[-28]	—	—	—	—
Chinchina	154.2	54	e 19	55	[+ 2]	e 24	0	SKP	e 44	0	PSKP	—
Bogota	155.7	54	e 20	14	[+19]	e 25	29	SKP	—	—	—	—
La Paz	164.9	118	i 20	8	[+ 2]	31	36	{- 1}	24	52	PP	78.5

Additional readings and notes :—

Zi-ka-wei iZ = 9m.4s.

Nanking i = 6m.33s.

Kodaikanal readings have been increased by 10m.

Christchurch ePPE = 22m.40s., eS = 28m.45s., eSSZ = 32m.30s., eQEN = 34m.25s., eSSSZ = 35m.0s., record wrongly interpreted.

Warsaw eSKKS = 24m.1s., eN = 24m.6s., ePS = 25m.24s., ePPS = 25m.58s.

Jena eN = 13m.49s.

Rome eSSZE = 32m.53s.

Rathfarnham Castle eZ = 32m.29s.

Granada SS = 35m.29s.

La Paz iPKP,Z = 21m.4s., iPPZ = 25m.10s., PPS = 38m.12s., SS = 46m.0s.

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

Sept. 25d. Readings also at 1h. (College), 2h. (Manila, Guam, Brisbane, Bandung, Djakarta, Palisades, Tucson, Overton, College, near Collmberg, Prague and near Tacubaya), 3h. (Tucson, Overton, Pierce Ferry (2), Shasta Dam, Hungry Horse, College, Potsdam, Rome, Kodaikanal, Andijan and near Mary), 4h. (Tacubaya, Granada, Kizyl-Arvat, Sverdlovsk, near Ashkabad and Mary), 5h. (Mizusawa and near Andijan), 6h. (near Garm, near Istanbul and near Mizusawa), 8h. (Bogota, Huancayo, and College), 10h. (Bucharest), 11h. (Tacubaya and near Alicante), 12h. (College and Pierce Ferry), 13h. (near Santa Clara (2)), 15h. (Overton and Pierce Ferry), 17h. (College and near Huancayo), 18h. (Bogota, near Garm and near Huancayo), 19h. (Santa Clara and near Ottawa), 21h. (near Garm), 22h. (New Delhi), 23h. (Almata, Frunse, Kodaikanal, College (2), and near Garm).

Sept. 26d. 19h. 6m. 0s. Epicentre 22°·5N. 122°·5E. (as on 1950 March 22d.).

A = -·4969, B = +·7800, C = +·3805;  $\delta$  = +9;  $h$  = +4;

D = +·843, E = +·537; G = -·204, H = +·321, K = -·925.

	$\Delta$	Az.	P.		O-C.	S.		O-C.	Supp.		L.
	°	°	m.	s.	s.	m.	s.	s.	m.	s.	m.
Vladivostok	22.0	19	i 4	49	- 9	i 8	35	-21	—	—	—
Calcutta	E. 31.5	277	—	—	—	e 13	17	SS	—	—	e 18.5
Irkutsk	32.9	338	e 6	30	- 8	—	—	—	—	—	—
Przhevalsk	41.6	311	e 7	52	+ 1	—	—	—	—	—	—
Almata	42.9	311	e 8	2	0	—	—	—	—	—	—
Naryn	43.2	308	i 8	7	+ 3	—	—	—	—	—	—
Murgab	44.3	303	8	15	+ 2	—	—	—	—	—	—
Frunse	44.5	308	i 8	16	+ 1	—	—	—	—	—	—
Poona	Z. 45.6	275	(i 8	33)	+ 9	—	—	—	(e 12	37)	?
Andijan	45.8	305	e 8	25	0	e 15	11?	+ 2	—	—	—
Fergana	46.1	305	e 8	29	+ 1	—	—	—	—	—	—
Garm	47.1	303	e 8	37	+ 2	—	—	—	—	—	—
Kulyab	47.5	302	e 8	40	+ 2	—	—	—	—	—	—
Tashkent	48.1	306	e 8	46	+ 3	—	—	—	—	—	—
Sverdlovsk	56.1	325	9	37	- 6	e 17	21	-11	—	—	—
Moscow	68.9	323	e 11	2	- 7	—	—	—	—	—	—
Ksara	75.1	301	e 11	52	+ 6	—	—	—	—	—	—
Stuttgart	87.5	323	e 16	11	PP	—	—	—	—	—	e 46.0
Shasta Dam	92.9	44	e 13	18	+ 2	—	—	—	—	—	—
Hungry Horse	93.3	34	i 13	19	+ 1	—	—	—	—	—	—
Chinchina	147.5	35	e 19	49	[+ 6]	—	—	—	—	—	—
Bogota	148.6	33	e 19	57	[+12]	—	—	—	—	—	—

Poona readings have been reduced by 30m.

Long waves were also recorded at Bombay, New Delhi and other European stations.



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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Sept. 26d. Readings also at 0h. (Mount Wilson, Riverside, Tucson, Pierce Ferry, College, near Leninakan and Garm), 1h. (near Garm (2) ), 2h. (Nanking, College, and near Garm), 3h. (Istanbul, Potsdam, Andijan, Fergana, Garm, Murgab, Stalinabad, near Kulyab and Obi-garm), 4h. (near Tacubaya), 5h. (Ksara, Tamanrasset, Grahamstown, Pietermaritzburg, and Pretoria), 6h. (Guam, Mount Wilson, Palomar, Riverside, Tucson, Overton, Pierce Ferry, Shasta Dam, Hungry Horse, College (2), near Huancayo and La Paz), 7h. (College and Ashkabad), 8h. (Collmberg, Ravensburg, near Stuttgart, Basle, Neuchatel, and Zürich), 9h. (Collmberg and near Stuttgart), 11h. (near Garm), 12h. (Hungry Horse (2), College, Nanking, and near Przhevalsk), 14h. (College, Calcutta (2), Poona, Nanking, Zi-ka-wei, Andijan, Fergana, Kulyab, Naryn, Obi-garm, Potsdam, and near Garm (2) ), 15h. (Kew, Paris, De Bilt, and near Garm (2) ), 16h. (Pierce Ferry and near Overton), 17h. (Ashkabad, La Paz, Pierce Ferry, Hungry Horse and College), 18h. (Ashkabad), 19h. (Nanking, Zi-ka-wei, and Andijan), 20h. (Bogota, Chinchina, Huancayo, La Paz, Honolulu, Pierce Ferry, College, Ashkabad, Fergana, near Andijan, Garm (2) and Stalinabad), 21h. (Nanking, Copenhagen, Potsdam, Paris, and near Garm), 22h. (Overton, Pierce Ferry, Shasta Dam, Collmberg, and near Garm), 23h. (Poona, Calcutta, and near Garm).

Sept. 27d. 3h. 36m. 54s. Epicentre 19°·6N. 109°·3W.

A = -·3116, B = -·8898, C = +·3334;  $\delta = -1$ ;  $h = +5$ ;  
D = -·944, E = +·331; G = -·110, H = -·315, K = -·943.

	$\Delta$	Az.	P.		O-C.		S.		O-C.		Supp.		L. m.	
			m.	s.	s.	m.	s.	m.	s.					
Guadalajara	5·7	78	1	24	-	4	—	—	—	—	—	—	2·5	
Tacubaya	9·5	90	2	23	+	3	—	—	—	—	—	—	4·6	
Puebla	10·5	91	e 2	33	-	2	—	—	—	—	—	—	4·9	
Tucson	12·7	351	e 3	2	-	3	e 5	20	-	8	—	—	e 6·1	
Palomar	z. 15·3	335	e 3	37	-	2	—	—	—	—	—	—	—	
Riverside	z. 16·0	335	e 3	50	+	2	—	—	—	—	—	—	—	
Pasadena	z. 16·5	333	e 3	55	+	1	—	—	—	—	—	—	e 7·0	
Boulder City	17·0	345	e 4	0	-	1	—	—	—	—	—	—	e 11·6	
Pierce Ferry	17·0	348	e 3	59	-	2	—	—	—	—	—	—	—	
Overton	z. 17·4	347	1	4	6	0	—	—	—	—	—	—	e 12·2	
Haiwee	18·2	338	e 4	14	-	2	—	—	—	—	—	—	—	
Tinemaha	19·1	338	e 4	24	-	3	—	—	—	—	—	—	—	
Fresno	19·4	335	e 4	32	+	2	—	—	—	—	—	—	e 11·0	
Lick	z. 20·7	332	e 4	42k	-	2	e 8	28	-	3	e 5	33	PP	—
Santa Clara	20·8	332	e 5	9	+24		1	8	55	+22	—	—	—	e 11·4
Salt Lake City	21·2	356	e 4	50	+	1	e 8	54	+13		e 4	56	PP	e 10·9
Berkeley	21·4	332	e 4	50a	-	1	e 8	57	+12		e 5	17	PP	e 11·4
Logan	22·2	356	e 5	4	+	4	e 9	10	+10		e 5	45	PP	e 11·1
Mineral	z. 23·2	336	e 5	7	-	2	—	—	—	—	—	—	—	e 12·7
Shasta Dam	23·8	336	e 5	13	-	2	—	—	—	—	—	—	—	—
Swan Island	24·1	90	i 5	15	-	3	1	9	41	+ 7	—	—	—	i 19·8
Rapid City	E. 24·9	11	e 5	36	+10		e 9	38	- 9		—	—	—	e 11·8
St. Louis	25·3	35	e 5	26	-	4	e 9	46	- 8		e 5	38	pP	—
Bozeman	26·1	358	e 5	46	+	9	e 10	11	+ 4		—	—	—	e 14·3
Butte	N. 26·5	356	e 5	46	+	5	e 10	10	- 4		—	—	—	e 13·4
Miami	27·4	91	i 6	27	PP		—	—	—	—	—	—	—	—
Chicago	28·8	34	—	—	—	—	e 10	37	-14		—	—	—	e 12·2
Hungry Horse	28·9	354	e 6	3	0		—	—	—	—	—	—	—	—
Seattle	29·9	344	—	—	—	—	(e 11	36)	+27		—	—	—	e 11·6
Victoria	31·0	343	—	—	—	—	e 11	36	+10		—	—	—	—
Cleveland	32·1	40	e 6	36k	+	5	e 11	40	- 3		e 13	59	SS	—
Guantanamo Bay	32·2	83	e 6	48	+16		i 11	36	- 9		—	—	—	i 14·9
Saskatoon	32·5	3	—	—	—	—	e 14	37	SS		—	—	—	—
Washington	33·8	47	e 6	57	+11		—	—	—	—	—	—	—	e 19·8
Galerazamba	33·9	98	e 6	53	+	6	e 12	18	+ 7		—	—	—	e 16·1
Pennsylvania	N. 34·1	44	i 6	58	+10		i 12	16	+ 2		—	—	—	e 13·9
Philadelphia	35·6	47	e 9	23?	PcP		e 13	30?	PcS		—	—	—	e 15·7
Chinchina	35·9	108	e 12	23	S		(e 12	23)	-19		e 15	6	?	—
Palisades	36·9	46	e 7	19	+	7	e 12	51	- 7		e 8	22	PP	e 25·4
Bogota	37·4	108	e 7	18	+	2	i 13	3	- 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.
Ottawa	37.8	39	e 7 20	0	13 6	- 5	—	—
Harvard	39.1	45	e 7 39	+ 8	—	—	—	e 29.5
Weston	39.2	45	e 7 31	0	e 13 26	- 6	e 16 12	SS
San Juan	40.8	83	e 7 40	- 5	e 13 52	- 4	e 9 15	PP
Seven Falls	E. 41.6	39	—	—	e 17 7	SSP	—	—
Bermuda	41.8	62	e 9 30	PP	e 14 15	+ 4	—	e 19.5
Sitka	42.1	340	—	—	e 14 16	0	—	e 21.1
Huancayo	45.9	129	e 8 26	0	e 15 12	+ 1	—	e 18.7
College	51.9	341	e 9 16	+ 4	e 19 22	ScS	e 20 40	SS
La Paz	54.1	128	9 28	- 1	i 17 8	+ 3	i 23 6	Q
Resolute Bay	55.7	5	—	—	i 17 21	- 5	—	—
Kew	86.1	36	—	—	e 23 16	- 2	—	e 33.1
Alicante	91.9	48	13 10	- 1	23 32	[-12]	16 44	PP
Istanbul	108.3	32	e 17 0	PP	—	—	—	e 44.5
Ksara	117.4	32	—	—	e 32 40	?	e 43 16	?

Additional readings :—

Palomar eZ = 3m.41s.

Pierce Ferry i = 5m.25s., e = 6m.27s.

Berkeley eSN = 9m.7s., eSSE = 9m.54s., eNZ = 10m.36s.

St. Louis ePP = 6m.10s., e = 7m.28s., iS = 9m.53s., isS = 10m.7s.

Cleveland iPZ = 6m.43s.

Palisades ePcP = 9m.42s., eSS = 25m.33s.

Alicante PPP = 18m.42s., PS = 24m.56s.

Long waves were also recorded at Oaxaca, La Plata, Scoresby Sund, Columbia, Halifax, and other European stations.

Sept. 27d. 8h. 23m. 57s. Epicentre 18°·8S. 175°·0E.

A = -·9437, B = +·0826, C = -·3203 ;  $\delta$  = -2 ;  $h$  = +5 ;  
D = +·087, E = +·996 ; G = +·319, H = -·028, K = -·947.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Apia	13.6	71	e 3 18	+ 1	(e 5 39)	-11	—	e 5.6
Auckland	N. 18.0	180	i 4 14	+ 1	e 8 16	SSS	—	e 10.3
Arapuni	19.2	181	e 4 30	+ 2	e 8 21	SS	—	—
Tuai	N. 20.0	177	e 4 33	- 4	e 8 19	+ 2	—	—
New Plymouth	E. 20.2	182	e 4 38	- 1	e 8 16	- 5	—	—
Brisbane	E. 22.0	234	i 4 57 <sub>a</sub>	- 1	i 9 8	+12	—	—
Wellington	22.4	182	i 5 3	+ 1	i 9 1	- 3	i 5 42	PP
Kaimata	23.9	187	e 5 14	- 2	—	—	—	—
Christchurch	24.9	185	5 23	- 3	i 9 33	-14	e 10 33	Q
Riverview	26.0	231	i 5 35	- 1	i 10 11	+ 5	i 11 8	SS
Vladivostok	73.2	329	i 11 29	+ 4	i 21 17	+15	—	—
Berkeley	81.5	46	i 12 21 <sub>k</sub>	0	—	—	e 35 21	Q
Lick	z. 81.7	46	e 12 22 <sub>k</sub>	0	—	—	—	—
Pasadena	82.5	50	i 12 25 <sub>k</sub>	- 1	—	—	—	—
Fresno	z. 82.6	48	e 12 27 <sub>k</sub>	+ 1	—	—	—	—
Shasta Dam	82.9	43	i 12 28	0	—	—	—	—
Riverside	z. 83.0	50	i 12 28 <sub>k</sub>	0	—	—	—	—
Palomar	z. 83.1	52	i 12 29 <sub>k</sub>	0	—	—	—	—
Mineral	z. 83.3	44	e 12 29	- 1	—	—	—	—
Haiwee	83.6	49	i 12 32 <sub>k</sub>	+ 1	—	—	—	—
Tinemaha	83.9	48	i 12 33 <sub>k</sub>	0	—	—	—	—
Boulder City	85.8	50	i 12 43	+ 1	—	—	—	—
Overton	z. 86.3	50	i 12 46	+ 1	—	—	—	—
Pierce Ferry	86.5	50	i 12 46	0	—	—	e 16 7	PP
Victoria	z. 86.5	37	i 12 47 <sub>a</sub>	+ 1	—	—	—	—
Seattle	86.7	38	e 12 49	+ 2	—	—	e 14 18	pP
Tucson	87.2	55	i 12 50	+ 1	—	—	—	—
College	88.1	15	e 12 52	- 2	e 23 37	0	—	e 41.6
Logan	90.4	46	i 13 5	+ 1	—	—	e 16 38	PP
Hungry Horse	91.9	39	e 13 10	- 1	—	—	e 31 28	PKKP

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.
Bogota	z.	111.3	92	i 26 1	S	i 36 13	?	—	—
Andijan		111.5	307	e 19 6	PP	—	—	—	—
Fergana		111.8	307	e 19 6	PP	—	—	—	—
Tashkent		113.8	308	i 19 37	PP	e 29 27	PS	—	—
Stalinabad		114.0	305	i 19 35	PP	—	—	—	—
Samarkand		115.5	306	e 19 43	PP	—	—	—	—
Ottawa	z.	116.6	48	i 18 45	[- 1]	—	—	—	—
Sverdlovsk		118.8	325	e 18 50	[ 0]	—	—	—	—
San Juan		122.3	79	e 20 32	PP	—	—	—	—
Moscow		131.2	329	e 21 27	PP	—	—	—	—
Yalta		138.5	317	e 21 30	PP	—	—	—	—
Ksara		140.7	310	e 19 29	[- 3]	—	—	e 22 41	PP
Istanbul		143.4	316	i 19 33	[- 3]	e 26 37	[- 7]	—	—
Bucharest	N.	143.6	322	e 19 33	[- 4]	—	—	—	—
Potsdam		143.6	343	i 19 35k	[- 2]	—	—	e 20 21	PKP <sub>1</sub>
Raciborz	E.	143.7	336	e 19 38	[+ 1]	—	—	—	—
Collmberg		144.6	342	i 19 39k	[+ 1]	e 29 45	{- 3}	e 20 41	PKP <sub>2</sub>
Prague		145.1	338	i 19 42	[+ 3]	—	—	e 22 39	PP
Helwan	z.	145.2	296	i 19 41k	[+ 1]	—	—	e 20 9	PKP <sub>3</sub>
Jena	E.	145.3	341	e 19 34?	[- 6]	—	—	e 22 10	PP
Rathfarnham Castle		145.6	2	i 19 43	[+ 3]	e 26 29	[- 19]	e 22 37	PP
De Bilt		145.8	349	i 19 44	[+ 3]	—	—	—	—
Kew		147.2	355	i 19 48	[+ 5]	—	—	e 20 15	PKP <sub>2</sub>
Stuttgart		148.0	343	e 19 44k	[ 0]	e 44 27	?	e 20 33	PKP <sub>2</sub>
Athens		148.5	313	e 19 49	[+ 4]	—	—	—	—
Strasbourg		148.5	344	e 19 45	[ 0]	e 27 40	PS	—	—
Zürich		149.4	343	e 19 45k	[- 1]	—	—	—	—
Basle		149.5	343	e 19 47	[ 0]	—	—	—	—
Paris		149.5	352	e 19 48	[+ 1]	—	—	e 22 7	PKS
Chur		149.6	340	e 19 52k	[+ 5]	—	—	—	e 78.0
Rome		152.6	332	e 22 1	PKS	—	—	e 24 6	PP
Alicante		160.1	350	20 13	[+ 12]	—	—	—	e 72.0
Algiers Univ.	z.	160.7	340	e 20 2	[ 0]	—	—	e 20 46	PKP <sub>2</sub>
Malaga	z.	162.1	358	i 20 5k	[+ 2]	—	—	i 20 53	PKP <sub>2</sub>
Tamanrasset	z.	169.4	294	i 20 11a	[+ 2]	—	—	i 21 25	PKP <sub>2</sub>

Additional readings :—

Wellington iSS = 9m.43s.  
 Christchurch iNZ = 5m.37s.  
 Riverview iSN = 10m.15s., eQN = 11.2m.  
 Lick eZ = 12m.37s. and 13m.12s.  
 Seattle e = 12m.57s., 13m.33s., and 14m.0s.  
 Logan i = 13m.28s.  
 Bucharest eEN = 19m.38s.  
 Prague ePKP<sub>2</sub> = 19m.49s., e = 20m.3s., eE = 20m.17s., e = 20m.26s., 20m.41s., 21m.38s., and 24m.33s.  
 Helwan eZ = 23m.35s.  
 Jena eE = 19m.42s. and 20m.14s.  
 Rathfarnham Castle iZ = 20m.6s.  
 Stuttgart iPKPZ = 19m.49s., e = 22m.9s., ePPP = 27m.21s.  
 Strasbourg i = 20m.49s., e = 21m.22s. and 25m.11s.  
 Zürich i = 19m.49s.  
 Basle i = 19m.53s., e = 21m.53s.  
 Paris i = 19m.53s., 19m.58s., and 20m.11s., e = 20m.26s.  
 Malaga iPPZ = 24m.35s.  
 Tamanrasset eZ = 21m.19s. and 24m.19s., ePP = 25m.14s.  
 Long waves were also recorded at Harvard.

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Sept. 27d. Readings also at 0h. (Mount Wilson, Palomar, Tucson, Pierce Ferry, near Tananarive, near Mizusawa, and near Garm (2)), 1h. (Ashkabad and Nanking), 2h. (Collmberg), 3h. (Florence Xim, Haiwee, Palomar, Pasadena, Riverside, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Hungry Horse, and Seattle), 4h. (Helsinki and near Garm), 5h. (Upsala and near College), 6h. (Apia, Mount Wilson, Palomar, Riverside, Tinemaha, Tucson, Overton, Pierce Ferry, and College (2)), 7h. (near Garm and near Huancayo), 8h. (Mount Wilson, Palomar, Riverside, Tinemaha, Tucson, Nanking, Apia, La Paz, and near Garm), 9h. (College and Tucson), 10h. (College, Vladivostok, Nanking, New Delhi, Bombay, Poona, Stuttgart, near Borzhomi, and near Garm), 11h. (College, Nanking, De Bilt, Potsdam, Paris, and near Garm (3)), 12h. (Hungry Horse, College, Zi-ka-wei, Nanking, Paris, near Garm, and near Rome), 13h. (De Bilt, Potsdam, Upsala, Kew, Paris, and Strasbourg), 14h. (near Trieste), 15h. (College, Durham, and Nanking), 16h. (Pasadena, Riverside, Boulder City, Overton, Pierce Ferry, College, Nanking, Frunse, Kulyab, Mary, Obi-garm, near Samarkand, Stalinabad, Tashkent, Tchimkent, and near La Paz), 17h. (Potsdam, Strasbourg, Vladivostok, Zi-ka-wei, Nanking, Hungry Horse, Ashkabad, and near Garm), 18h. (Pierce Ferry, and near Garm), 19h. (near Tuai and Wellington), 20h. (near Garm), 21h. (Andijan, near Garm, Kulyab, Obi-garm, Samarkand, and Stalinabad), 22h. (Nanking (2), Mount Wilson, Riverside, Tucson, Boulder City, Pierce Ferry, College, Merida, near Oaxaca, Puebla, and Tacubaya), 23h. (Apia).

Sept. 28d. 3h. 29m. 35s. Epicentre 22°·9N. 121°·5E. (as on 1949, Nov. 11d.).

$$A = -.4818, B = +.7862, C = +.3869; \quad \delta = -7; \quad h = +4;$$

$$D = +.853, E = +.522; \quad G = -.202, H = +.330, K = -.922.$$

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Zi-ka-wei	z.	8·3	356	e 1 57	- 7	i 3 49	+ 9	—	—
Nanking		9·4	346	2 18	0	i 4 2	- 5	i 2 27	PP
Ooita		13·6	39	e 3 48	+31	—	—	—	—
Osaka		17·0	43	e 4 17	PP	—	—	—	—
Owase		17·0	45	e 4 16	PP	—	—	e 5 4	?
Kameyama		17·7	44	4 20	PP	7 50	SS	—	—
Gihu		18·2	45	e 4 25	PP	7 57	SS	—	—
Nagoya		18·2	45	e 4 27	PP	7 57	SS	—	—
Toyama		19·3	42	e 4 33	+ 4	—	—	—	—
Matumoto		19·5	44	e 4 35	+ 4	e 8 18	+12	—	—
Hunatu		19·6	46	4 33	+ 1	8 9	+ 1	—	—
Matusiro		19·9	42	e 4 34	- 2	8 18	+ 3	—	—
Nagano	E.	19·9	42	e 4 39	+ 3	e 8 25	+10	—	—
Utunomiya		20·1	45	e 4 46	+ 8	e 8 31	+12	—	—
Maebasi		20·3	43	e 4 47	+ 7	e 8 43	+20	—	—
Kumagaya		20·4	44	e 4 52	+11	e 8 31	+ 6	—	—
Tokyo		20·4	46	4 55	+14	8 19	- 6	8 50	SS
Vladivostok		21·9	22	e 4 53	- 4	—	—	—	—
Sendai		22·6	43	e 5 4	+ 1	e 9 3	- 4	—	—
Mizusawa	E.	23·3	42	5 11	+ 1	e 9 11	- 9	—	—
Miyako		24·1	42	e 5 12	- 6	e 9 28	- 6	—	—
Calcutta	E.	30·6	276	e 6 19	+ 1	i 11 23	+ 3	e 7 26	PP
Irkutsk		32·2	340	e 6 29	- 3	—	—	—	—
Djakarta		32·3	208	i 6 38	+ 5	e 11 53	+ 7	—	—
Bandong		32·6	207	e 6 34	- 1	i 11 52	+ 1	—	—
New Delhi		40·1	288	e 7 41	+ 2	e 13 41	- 5	9 12	PP
Hyderabad	N.	40·7	271	—	—	13 58	+ 3	—	—
Przhevalsk		40·7	311	e 7 49	+ 5	—	—	—	—
Almata		41·9	311	i 7 55	+ 1	—	—	—	—
Naryn		42·2	308	i 7 56	0	i 14 17	0	—	—
Colombo	E.	43·1	254	8 3	- 1	13 55	-35	—	—
Frunse		43·5	308	i 8 8	+ 1	i 14 35	- 1	—	—
Kodaikanal	E.	43·9	261	e 8 6	- 4	—	—	—	—
Poona	E.	44·6	273	i 8 18	+ 2	i 14 55	+ 3	9 48	P <sub>c</sub> P
Andijan		44·8	305	e 8 18	+ 1	14 53	- 2	—	—
Fergana		45·2	305	i 8 20	0	14 57	- 4	—	—
Bombay		45·5	274	e 8 27	+ 4	e 18 32	SS	—	—
Kulyab		46·5	302	e 8 32	+ 1	e 15 17	- 2	—	—
Obi-garm		46·6	303	i 8 34	+ 2	i 15 20	- 1	—	—
Tchimkent		47·0	307	e 8 35	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.	s.	m.	
Tashkent		47.2	306	18	38			+ 2	15	26	- 3				
Stalinabad		47.3	302	18	37			0	e 15	27	- 4				
Samarkand		48.8	303	18	50			+ 1							
Mary		52.7	302	19	20			+ 2	16	50	+ 4				
Sverdlovsk		55.2	324	19	35			- 2	i 17	14	- 6				
Ashkabad		55.5	301	19	40			+ 1	i 17	27	+ 3				
Brisbane	z.	58.6	147	110	3 <sub>a</sub>			+ 2							
Baku		61.8	305	e 10	25			+ 2							
Lenkoran		62.9	303	10	33			+ 3	19	2	+ 2				
Riverview		63.1	152	110	34 <sub>a</sub>			+ 2						e 32.3	
Tiflis		65.5	307	110	47			0	i 19	31 <sub>?</sub>	- 1				
Borzhom		66.5	307	110	48			- 6							
Zugdidi		67.5	308	111	1			+ 1							
Moscow		68.0	323	e 11	2			- 1	e 19	55	- 7				
College		69.8	27	e 11	12			- 2	i 20	15	- 8	e 13	48	PP	e 36.6
Pulkovo		71.1	328	111	21			- 1	e 20	33	- 5				
Yalta		72.2	312	11	29			0	20	49	- 2				
Helsinki		73.6	330	e 11	34			- 3	e 20	54	- 13	e 25	48	SS	33.4
Honolulu		73.8	73	e 11	36			- 2							
Ksara		74.2	300	111	41 <sub>a</sub>			+ 1	22	21 <sub>?</sub>	PPS				
Kishinev		75.4	315	11	46			- 1	21	19	- 8				
Istanbul		77.1	310	111	55			- 2	e 21	39	- 7				
Upsala	N.	77.2	330						e 24	1	?			e 38.4	
Lwow		77.5	319	111	58			- 1	e 21	42 <sub>?</sub>	- 8				
Bucharest		78.0	313	e 12	2			0							
Warsaw		78.3	323	e 12	1			- 2	e 22	7	+ 8	e 22	24	ScS	e 40.4
Helwan		79.1	297	i 12	8 <sub>a</sub>			0	e 22	4	- 3	e 15	30	PP	
Resolute Bay		79.9	9	12	11			- 1	22	13	- 3	23	33	PPS	
Raciborz	z.	80.8	321	e 12	17			0							
Potsdam		82.7	325	112	26 <sub>a</sub>			- 1	i 22	41	- 3	e 15	43	PP	e 45.4
Prague		83.0	322	112	28 <sub>k</sub>			0	e 22	25	- 22	e 12	42	PcP	
Collberg		83.3	323	112	29 <sub>a</sub>			- 1				e 15	40	PP	e 45.4
Jena		84.2	323	e 12	34			0				e 15	46	PP	
Triest		84.5	318	e 12	42			+ 6	e 23	5	+ 3	e 23	48	PS	e 41.4
Stuttgart		86.6	322	112	45 <sub>a</sub>			- 1	e 23	16	[+ 5]	e 16	8	PP	e 46.4
De Bilt		87.0	327	e 12	49			+ 1							e 45.4
Karlsruhe		87.0	323	e 12	46			- 2							
Aberdeen		87.3	333						e 25	5	PPS				e 45.4
Strasbourg		87.6	323	112	51			0	e 23	21	[+ 3]	e 23	25	SKKS	e 42.4
Zürich		87.7	322	e 12	51 <sub>a</sub>			- 1				e 16	13	PP	
Florence, Xim.		88.0	318	e 13	5			PcP	i 23	33	- 3				
Rome		88.1	315	e 12	53 <sub>a</sub>			- 1	e 23	39	(+ 1)	e 16	38	PP	
Basle		88.2	321	e 12	54 <sub>a</sub>			0				e 22	12	?	
Victoria	z.	88.4	37	112	54 <sub>a</sub>			- 1							
Seattle		89.4	38	113	1			+ 1				i 13	28	pP	
Kew		90.1	328	e 16	37			PP							e 40.4
Paris		90.3	325	113	4			0				i 16	39	PP	e 48.4
Rathfarnham Castle		91.7	332	e 18	0			?				e 18	59	PPP	e 43.4
Shasta Dam		93.3	43	113	22			+ 4				e 16	59	PP	
Hungry Horse		93.4	34	113	17			- 1				e 16	53	PP	
Mineral	z.	94.0	43	e 13	21			0				e 17	2	PP	
Lick	z.	95.6	46	e 13	29			+ 1				e 17	10	PP	
Tinemaha	z.	98.0	44	e 13	39			0							
Alicante		98.3	318	13	26			- 15							e 42.3
Haiwee	z.	98.7	44	e 13	43			+ 1							
Pasadena	z.	99.8	47	e 13	47			0				e 17	30	PP	
Riverside	z.	100.4	47	e 13	48			- 2				e 17	52	PP	
Boulder City		100.9	44	e 13	53			+ 1				e 17	40	PP	
Palomar		101.1	47	e 18	0			PP							
Pierce Ferry		101.3	43	e 13	54			0				i 18	1	PP	

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	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Pretoria	z. 102.4	248	i 14 1	+ 2	—	—	—	—
Tamanrasset	z. 102.9	303	e 14 3	+ 2	—	—	e 18 18	PP
Tucson	105.8	44	e 18 16	PP	—	—	—	—
Ottawa	z. 110.3	12	e 19 5	PP	—	—	—	—
St. Louis	111.9	26	i 19 20	PP	e 29 0	PS	e 34 57	SS
Weston	114.0	10	e 18 41	[ 0]	—	—	e 19 39	PP
Palisades	114.8	12	—	—	e 40 27	SSS	—	—
Chinchina	147.6	32	i 19 43	[- 1]	—	—	—	—
Bogota	148.7	31	e 19 48	[+ 3]	—	—	i 19 51	PKP,
Huancayo	160.7	59	e 20 5	[+ 3]	—	—	e 24 28	PP
La Paz	168.9	56	i 20 11	[+ 2]	i 32 13	{+15}	i 25 11	PP

Additional readings :—

Nanking iE = 2m.51s.

Calcutta eSSE = 13m.15s.

New Delhi PPPEN = 9m.41s., PPSSEN = 14m.3s., SSEN = 16m.28s., SSSSEN = 16m.53s.

Poona iE = 8m.30s., PPE = 10m.14s., S<sub>c</sub>PE = 13m.44s., SSE = 17m.55s.

College iP = 11m.25s., i = 20m.38s., ePKP, PKP = 39m.11s.

Helsinki eZ = 11m.44s.

Warsaw e = 22m.34s., ePS? = 22m.57s.,

Resolute Bay SKS = 22m.28s.

Prague e = 12m.56s., eN = 13m.15s., e = 13m.37s., eN = 14m.25s., e = 14m.53s.

Jena eE = 13m.5s., eN = 13m.10s., ePP?E = 15m.32s.

Triest ePPS = 24m.39s., eSS = 28m.50s.

Strasbourg e = 13m.1s., 13m.33s., and 15m.21s.

Rome eSS = 29m.29s.

Seattle i = 13m.11s., 13m.21s., and 14m.16s.

Hungry Horse ePKKP = 30m.25s.

Tamanrasset eZ = 17m.16s., ePPPZ = 20m.30s.

Huancayo i = 20m.47s.

Long waves were also recorded at Bergen, Copenhagen, and Malaga.

Sept. 28d. 11h. 3m. 19s. Epicentre 37°·5N. 118°·5W. (as on 1949, Dec. 9d.).

A = -·3795, B = -·6989, C = +·6062;  $\delta = -4$ ;  $h = -1$ ;

D = -·879, E = +·477; G = -·289, H = -·533, K = -·795.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Tinemaha	0.5	155	i 0 10k	- 4	i 0 16	- 7	—	—
Haiwee	1.4	163	i 0 27k	0	i 0 45	- 1	—	—
Santa Clara	2.7	267	e 1 10	P <sub>g</sub>	i 1 36	S <sub>g</sub>	—	—
Boulder City	3.3	117	e 1 0	+ 7	i 1 44	S*	—	—
Pasadena	3.4	175	e 0 55	0	i 1 46	S*	i 1 2	P*
Pierce Ferry	3.9	110	i 1 1	- 1	i 2 1	S*	i 1 12	P*
Shasta Dam	4.4	318	i 1 23	P <sub>g</sub>	e 2 16	S*	—	—
Tucson	8.2	128	i 2 2	- 1	—	—	—	e 4.4

September 28d. 21h. 47m. 3s. Epicentre 54°·5N. 134°·5W.

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

A = -·4088, B = -·4160, C = +·8123;  $\delta = 0$ ;  $h = -7$ ;

D = -·713, E = +·701; G = -·569, H = -·579, K = -·583.

	$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Sitka	2.6	350	i 0 42	- 2	i 1 13	- 4	—	e 1.4
Victoria	9.1	127	e 2 12	- 2	e 4 2	+ 2	—	—
Seattle	10.3	127	i 2 24	- 8	i 4 43	+ 4	—	e 5.2
College	12.4	333	i 2 59	- 2	e 4 57	- 24	—	i 6.6
Hungry Horse	14.1	107	i 3 18	- 5	—	—	e 5 36	? e 7.0
Shasta Dam	16.0	145	i 3 50	+ 2	—	—	—	—
Butte	N. 16.3	112	e 3 59	+ 7	—	—	—	e 8.2
Mineral	Z. 16.6	143	e 3 54	- 2	—	—	—	—
Bozeman	17.4	111	e 4 5	- 1	—	—	—	e 9.0
Reno	18.0	140	e 4 15	+ 2	e 7 49	SS	—	—

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		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Berkeley	z.	18.6	148	i 4 19 <sub>a</sub>	- 2	—	—	—	—
Lick	z.	19.3	148	e 4 26 <sub>k</sub>	- 3	—	—	—	—
Logan		19.7	120	e 4 33	- 1	—	—	—	e 8.8
Fresno		20.5	143	e 4 36 <sub>a</sub>	- 6	—	—	—	—
Tinemaha	z.	20.7	141	i 4 42	- 2	—	—	14 57	PP
Haiwee	z.	21.6	141	i 5 2	+ 8	—	—	—	—
Overton	z.	22.7	134	e 5 3	- 1	—	—	—	e 13.6
Rapid City	E.	22.7	104	e 5 4	0	e 9 13	+ 4	—	e 11.7
Boulder City		23.0	135	e 5 10	+ 3	—	—	—	—
Pierce Ferry		23.2	133	i 5 8	- 1	—	—	—	—
Pasadena	z.	23.4	143	i 5 8	- 3	—	—	—	—
Riverside	z.	23.8	143	i 5 12	- 3	—	—	—	—
Palomar		24.5	142	i 5 20	- 2	—	—	—	—
Resolute Bay		25.5	24	5 38	+ 6	10 6	+ 9	—	13.4
Tucson		27.9	133	e 5 50	- 4	—	—	15 56	P
Cleveland	z.	36.9	88	i 7 14 <sub>a</sub>	+ 2	—	—	—	—
Palisades		41.6	83	—	—	—	—	e 19 51	Q i 21.6
Harvard		42.0	79	—	—	—	—	e 19 49	Q e 21.5
Collmberg	z.	71.1	21	e 11 26	+ 4	—	—	e 12 43	f
Pretoria	z.	148.6	29	e 18 49	[-56]	—	—	—	—

Additional readings:—

Victoria i = 2m.17s., e = 3m.45s., i = 4m.35s. and 4m.47s.

Seattle i = 2m.37s., 3m.28s., and 3m.45s.

Tinemaha iZ = 4m.47s.

Overton iZ = 5m.9s.

Pierce Ferry i = 5m.14s.

Pasadena iZ = 5m.14s. and 5m.22s.

Long waves were also recorded at several other North American stations.

Sept. 28d. 23h. Adriatic Sea.

Bologna e = 37m.21s. and 37m.46s.

Prato iP<sub>g</sub> = 37m.26s., iS<sub>g</sub> = 37m.44s.

Florence Xim. iP<sub>g</sub> = 37m.26s., iS<sub>g</sub> = 37m.45s.

Triest eP<sub>g</sub> = 37m.35s., eP<sub>g</sub>P<sub>g</sub> = 37m.40s., iS<sub>g</sub> = 37m.53s.

Padova iP<sub>g</sub> = 37m.35s., S<sub>g</sub>? = 37m.51s.

Rome eP<sub>g</sub> = 37m.41s., eS<sub>g</sub>? = 38m.18s.

Zürich eP<sub>g</sub>? = 38m.18s., eS<sub>g</sub>? = 39m.28s.

Basle eP<sub>g</sub>? = 38m.21s., e = 39m.55s.

Stuttgart eP<sub>g</sub>Z = 38m.43s.?, eZ = 38m.56s., 39m.20s., 39m.24s., 40m.6s., and 40m.10s.

Collmberg eZ = 38m.48s.?, 39m.22s., 40m.10s., and 41m.6s.

Strasbourg e? = 39m.6s., e = 39m.30s., eS<sub>g</sub>? = 39m.56s.

Jena eP<sub>g</sub>N = 39m.9s.?, eS<sub>g</sub>?N = 39m.50s., eS<sub>g</sub>N = 40m.30s., eE = 40m.53s., eN = 41m.5s.,

eE = 41m.41s.

Prague eS = 39m.37s., eS\* = 39m.55s., eS<sub>g</sub> = 40m.8s., e = 40m.13s., 40m.20s., and 40m.24s.

Tamanrasset ePZ = 42m.2s.

Sept. 28d. Readings also at 0h. (Pierce Ferry, College (2), Collmberg, and Stuttgart), 1h. (La Paz and near Shemakla), 2h. (Mizusawa, Calcutta, near Ashkabad, and near Irkutsk), 3h. (Tucson, Pierce Ferry, College, near Bogota, Chinchina, near Apia, and near Andijan), 4h. (College (2) and Collmberg), 5h. (Mount Wilson, Riverside, Tinemaha, Tucson, Hungry Horse, Pierce Ferry, College (2), and near Apia), 6h. (Collmberg, Paris, Strasbourg, Stuttgart, Tamanrasset, Nanking, near Bogota, and Chinchina), 8h. (Hungry Horse, Nanking, near Prague, and near Garm), 10h. (College and near Seven Falls), 11h. (Nanking (2) and La Paz), 12h. (Theodosia), 13h. (Brisbane, Garm, Nanking, Haiwee, Palomar, Pasadena, Riverside, Tinemaha, Boulder City, Mineral, Pierce Ferry, Shasta Dam, Hungry Horse, College, Collmberg, and near Garm), 14h. (Nanking, Weston, Edinburgh, Theodosia (2), and near Andijan), 15h. (Andijan, Kulyab, Stalinabad, near Garm (4), and Obi-garm), 16h. (Boulder City, Nanking, Zi-ka-wei, Calcutta, and Rome), 17h. (College, Strasbourg, and near Garm (2)), 19h. (Calcutta, New Delhi, Poona, Pretoria, Tortosa, and College), 21h. (Nanking and Zi-ka-wei), 22h. (College and near Garm), 23h. (near Huancayo).

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Sept. 29d. 1h. 44m. 5s. Epicentre 40°·0N. 54°·6E. (as on 1947, June 23d.).

A = +·4450, B = +·6262, C = +·6402;  $\delta = +1$ ;  $h = -2$ ;  
D = +·815, E = -·579; G = +·371, H = +·522, K = -·768.

	$\Delta$ °	Az. °	P.		O-C.	S.		O-C.
			m.	s.	s.	m.	s.	s.
Kizyl-Arvat	1·6	127	e 0	22?	- 8	0	37?	-14
Ashkabad	3·6	124	0	53	- 5	1	23	-19
Baku	3·6	278	e 1	26	P <sub>g</sub>	e 2	21	S <sub>g</sub>
Lenkoran	4·6	256	1	44	P <sub>g</sub>	—	—	—
Mary	6·2	111	e 1	37	+ 2	—	—	—
Grozny	7·4	299	e 2	0	+ 8.	3	32	S*
Leninakan	8·3	279	—	—	—	4	10	S*
Samarkand	9·5	88	e 2	23	+ 3	—	—	—
Stalinabad	11·1	93	e 2	38	- 5	i 4	34	-15
Tashkent	11·2	78	—	—	—	e 4	36?	-16
Tchimkent	11·5	74	e 2	44	- 4	e 4	44	-15
Kulyab	12·0	95	—	—	—	e 4	55	-16
Garm	12·2	90	e 2	55	- 3	—	—	—
Fergana	13·2	83	e 3	4	- 7	—	—	—
Andijan	13·6	81	e 3	10	- 7	i 5	30?	-20
Frunse	15·3	73	e 3	39	0	—	—	—
Ksara	16·2	253	e 3	52	+ 2	i 7	6	+15
Naryn	16·3	78	e 3	53	+ 1	—	—	—
Sverdlovsk	17·3	11	i 4	7	+ 3	7	9	- 7
Istanbul	19·3	282	e 4	32	+ 3	—	—	—
Collmberg	z.	30·8	305	e 6	21	+ 1	—	—
Stuttgart	z.	33·2	301	e 6	41	+ 1	—	—
College		74·0	11	e 11	39	0	—	—
Hungry Horse		91·5	353	e 13	10	0	—	—

Stuttgart gives also eZ = 6m.59s.

Sept. 29d. 6h. 32m. 13s. Epicentre 18°·9N. 107°·0W. (as on 1949, May 10d.).

A = -·2768, B = -·9054, C = +·3220;  $\delta = +5$ ;  $h = +5$ ;  
D = -·956, E = +·292; G = -·094, H = -·308, K = -·947.

	$\Delta$ °	Az. °	P.		O-C.	S.		O-C.	Supp.		L.	
			m.	s.	s.	m.	s.	s.	m.	s.	m.	
Manzanillo	2·5	87	i 0	43 <sub>a</sub>	0	i 1	18	+ 4	—	—	—	
Guadalajara	3·9	60	i 1	0 <sub>a</sub>	- 2	—	—	—	—	—	i 2·0	
Tacubaya	7·4	85	i 1	54 <sub>a</sub>	+ 2	—	—	—	—	—	3·8	
Puebla	8·3	88	e 2	7	+ 3	i 3	35	- 5	—	—	—	
Chihuahua	9·7	5	i 2	19 <sub>k</sub>	- 3	i 4	15	0	—	—	—	
Oaxaca	9·9	99	e 2	25	0	4	33	+13	—	—	—	
Tucson	13·7	346	i 3	19	+ 1	i 6	6	+14	e 4	6	PP	i 6·8
Lubbock	15·3	16	3	42	+ 3	8	16	L	—	—	—	(8·3)
Merida	16·5	80	e 3	47	- 7	i 6	50	- 8	i 4	0	PP	—
Palomar	16·9	330	i 3	59 <sub>k</sub>	0	—	—	—	—	—	—	—
Riverside	17·7	331	i 4	8 <sub>k</sub>	- 2	—	—	—	—	—	—	—
Pasadena	18·2	331	i 4	14 <sub>k</sub>	- 2	—	—	—	i 4	39	PP	e 7·1
Pierce Ferry	18·2	342	i 4	16	0	i 7	31	- 6	—	—	—	i 10·2
Boulder City	18·4	340	e 4	17	- 1	e 7	30	-11	i 4	59	PP	—
Overton	z.	18·7	341	i 4	22	0	—	—	—	—	—	—
Haiwee	19·7	334	i 4	32	- 2	—	—	—	—	—	—	—
Tinemaha	20·6	334	i 4	41 <sub>k</sub>	- 2	—	—	—	—	—	—	—
Fresno	21·0	331	i 4	45 <sub>k</sub>	- 2	e 8	22	-15	e 5	32	PP	e 10·1
Milton	21·5	50	i 4	58	+ 6	—	—	—	—	—	—	—
Swan Island	22·0	89	i 5	0	+ 2	—	—	—	—	—	—	—
Salt Lake City	22·2	352	i 4	57	- 3	i 9	12	+12	e 5	29	PP	e 10·8
Lick	22·4	329	e 4	59 <sub>k</sub>	- 3	e 9	29	+25	e 6	19	PP	—
Santa Clara	22·6	329	e 5	2	- 1	i 9	29	+22	—	—	—	i 11·8
Berkeley	23·1	329	e 5	6 <sub>k</sub>	- 2	e 9	30	+14	e 10	46	SS	e 13·2
Logan	23·1	353	i 5	10	+ 2	—	—	—	i 6	7	PP	i 10·5

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		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.	
		°	°	m. s.	s.	m. s.	s.	m. s.	m.	
Reno		23.3	334	i 5 11k	+ 1	e 9 47	+27	e 9 53	SS	e 11.8
Lincoln	E.	23.6	21	e 5 16	+ 3	e 9 27	+ 2	—	—	e 11.7
Florissant		24.5	33	i 5 23	+ 1	e 9 47	+ 7	—	—	—
St. Louis		24.5	33	i 5 22	0	i 9 55	+15	i 5 28	pP	—
Ukiah		24.6	329	i 5 26	+ 3	e 9 44	+ 2	e 6 20	PP	e 11.0
Mineral		24.8	333	e 5 22	- 3	e 10 2	+16	e 6 13	PP	e 12.5
Rapid City	E.	25.3	7	e 5 23	- 7	i 10 1	+ 7	e 6 26	PP	e 12.3
Shasta Dam		25.4	332	i 5 28	- 3	e 9 30	-26	e 5 58	PP	—
Miami		25.6	68	i 5 38	+ 6	i 10 10	+11	—	—	—
Ferndale		26.2	330	e 5 43	+ 5	e 9 35	-34	e 11 53	Q	e 14.0
Bozeman		26.9	355	e 5 45	0	i 10 26	+ 6	e 6 42	PP	i 12.0
Butte	N.	27.4	354	e 5 48	- 1	i 10 31	+ 3	e 6 48	PP	e 13.8
Columbia		27.6	51	e 5 53	+ 2	i 10 40	+ 8	e 6 44	PP	e 13.2
Chicago		28.2	31	e 6 1	+ 5	i 10 42	+ 1	e 7 2	PP	i 11.7
Balboa Heights		28.4	106	i 5 57	- 1	—	—	—	—	—
Hungry Horse		29.9	351	i 6 10	- 2	e 11 37	+28	—	—	—
Guantanamo Bay		30.1	82	i 6 12	- 1	—	—	—	—	—
Cleveland		31.3	38	i 6 24	0	i 11 37	+ 6	—	—	e 16.4
Seattle		31.3	340	e 6 22	- 2	i 11 43	+12	i 6 52	PP	—
Pittsburgh		31.6	41	e 6 31	+ 5	i 11 39	+ 4	i 8 0	PPP	—
Victoria		32.4	340	i 6 31k	- 3	11 43	- 5	7 24	PP	—
Washington		32.7	45	i 6 36	0	—	—	—	—	i 15.0
Pennsylvania		33.1	42	i 6 39	- 1	i 12 4	+ 5	i 7 42	PP	—
Saskatoon		33.2	0	6 41	+ 1	12 1	+ 1	8 2	PP	e 17.0
Chinchina		33.6	109	i 6 46	+ 2	i 12 18	+12	i 7 42	PP	—
Buffalo		33.7	38	i 5 43	-62	e 11 4?	-64	6 42	PP	—
Philadelphia		34.5	46	e 6 53?	+ 1	i 12 7?	-13	—	—	i 14.3
Bogota		35.1	109	i 7 3	+ 6	i 12 41	+11	i 15 23	SS	—
Fordham		35.8	44	i 7 2	- 1	i 12 49	+ 8	i 8 11	PP	18.2
Pallsades		35.8	44	i 7 3a	0	e 12 46	+ 5	i 7 11	pP	e 17.6
Ottawa		37.0	36	e 7 12	- 1	12 51	- 8	e 8 39	PP	—
Vermont		38.0	40	e 7 28	+ 7	i 13 26	+12	i 8 48	PP	i 15.8
Harvard		38.1	44	i 7 22	0	i 13 23	+ 7	i 8 51	PP	i 19.3
Weston		38.2	44	i 7 24	+ 1	i 13 24	+ 7	i 8 55	PP	—
San Juan		38.7	83	i 7 27	0	i 13 25	0	e 8 59	PP	e 16.4
Roosevelt Roads		39.1	83	(i 7 32)	+ 1	—	—	—	—	—
Shawinigan Falls	N.	39.4	38	7 38	+ 5	13 32	- 3	9 2	PP	—
Bermuda		40.0	62	i 7 45	+ 7	i 14 1	+17	9 22	PP	e 17.3
Seven Falls	E.	40.8	38	7 46	+ 1	14 3	+ 7	9 26	PP	—
Huancayo		43.8	131	i 8 12	+ 3	i 14 45	+ 5	i 9 57	PP	e 19.9
Sitka		43.9	338	e 8 3	- 7	i 14 43	+ 1	i 10 27	PPP	e 19.9
Fort de France		44.0	88	i 8 11	0	i 14 47	+ 4	—	—	—
Halifax		44.2	44	8 19	+ 7	14 47	+ 1	9 9	PP	—
Honolulu		47.6	282	e 8 38	- 1	e 15 41	+ 6	e 18 37	SS	e 19.8
La Paz		52.0	129	i 9 17a	+ 4	i 16 37	+ 1	i 11 15	PP	25.2
College		53.3	340	i 9 17	- 6	e 16 41	-13	e 11 22	PP	e 23.4
Resolute Bay		56.2	4	9 43	- 1	17 35	+ 2	10 59	PcP	—
Ivigut		58.7	29	i 10 8	+ 6	e 18 13	+ 7	13 33	PPP	28.8
Santiago		62.5	146	i 10 32	+ 4	i 17 4	?	—	—	—
Scoresby Sund		70.7	20	i 11 22	+ 2	i 20 38	+ 4	—	—	33.8
La Plata	E.	71.0	138	i 11 23	+ 1	20 34	- 3	12 17	PcP	34.4
	N.	71.0	138	i 11 21	- 1	20 31	- 6	12 28	PcP	31.1
Reykjavik	N.	71.0	27	—	—	e 28 58	SSS	—	—	e 35.9
Apia		71.6	248	—	—	e 20 47?	+ 3	—	—	e 31.8
Rathfarnham Castle		81.3	36	i 12 27	+ 7	e 22 37	+ 7	e 23 17	PS	e 38.8
Edinburgh	E.	82.0	33	—	—	e 22 52	+15	—	—	—
Aberdeen	N.	82.1	32	—	—	i 22 37	- 1	i 26 43	SS	39.0
Durham		83.3	34	i 12 39	+ 9	i 22 58	+ 8	—	—	—
Bergen		84.2	27	—	—	23 8	+ 9	23 43	PS	34.8
Lisbon		84.3	51	12 37k	+ 2	23 4	+ 4	28 42	SS	40.9
Jersey	E.	85.2	39	—	—	e 23 21	+12	—	—	e 39.8
Kew		85.3	36	i 12 44k	+ 4	e 23 7	- 3	e 29 47	SS	e 34.8
Toledo		87.6	48	e 12 56	+ 5	i 23 32	0	i 16 36	PP	39.6
De Bilt		88.1	34	i 12 58k	+ 4	i 23 34	- 3	i 13 24	pP	e 41.8
Paris		88.1	38	e 12 56	+ 2	e 23 23	[+ 2]	e 16 34	PP	e 38.8

Continued on next page.

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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.	
Malaga	z. 88.5	51	i 13	4 <sub>a</sub>	+ 8	i 23	50	[+26]	16	26	PP	i 42.1
Granada	88.9	51	i 14	39 <sub>k</sub>	?	24	39	PS	30	7	SS	i 46.4
Upsala	89.6	24	—	—	—	e 23	47?	- 4	e 29	47?	SS	e 35.8
Clermont-Ferrand	89.8	41	i 16	49	PP	e 24	5	+12	e 30	17	SS	—
Copenhagen	89.9	29	—	—	—	i 24	0	+ 6	i 29	30	SS	—
Tortosa	90.4	46	e 13	16	+12	i 23	39	[+ 4]	16	51	PP	e 42.8
Alicante	90.7	49	e 13	21	+15	i 24	15	+14	13	31	pP	e 42.7
Barcelona	91.2	45	—	—	—	e 24	44	+39	—	—	—	e 43.6
Strasbourg	91.3	37	e 13	15	+ 6	i 24	19	+13	i 16	53	PP	e 38.3
Karlsruhe	91.4	36	e 13	8	- 1	—	—	—	—	—	—	e 43.8
Neuchatel	91.6	38	e 13	13	+ 3	—	—	—	—	—	—	—
Basle	91.7	37	e 13	11	+ 1	e 25	7	PS	e 16	50	PP	—
Stuttgart	92.0	36	e 13	15	+ 3	e 23	55	{- 1}	e 16	57	PP	e 40.8
Potsdam	92.1	31	i 16	57	PP	i 25	30	PS	e 30	23	SS	40.8
Jena	E. 92.1	33	e 13	12?	0	e 25	27	PS	e 16	32?	PP	—
Chur	92.2	38	e 13	16	+ 3	—	—	—	—	—	—	—
Helsinki	92.2	22	—	—	—	i 24	5	{+ 7}	i 24	27	S	37.8
Zürich	92.4	37	e 13	17	+ 3	e 23	38	{- 9}	e 16	57	PP	—
Collmberg	92.7	33	e 13	19	+ 4	e 24	29	+11	e 17	2	PP	e 38.8
Cheb	E. 93.0	33	e 17	2	PP	e 23	40	{-10}	e 19	44	PPP	—
Wellington	93.8	228	e 13	35	+15	i 24	38	+10	17	17	PP	41.8
Algiers Univ.	z. 93.9	48	e 17	6	PP	—	—	—	—	—	—	—
Pavia	93.9	39	e 13	27 <sub>a</sub>	+ 6	e 26	53	PPS	e 18	11	PP	—
Prague	94.1	33	e 13	2?	-20	e 24	21	-10	e 17	19	PP	e 47.8
Pulkovo	94.3	19	e 17	18	PP	e 24	0	{+ 3}	e 19	30	PPP	—
Prato	94.7	39	e 13	35	+11	i 25	34	PS	—	—	—	—
Bologna	95.5	39	13	45	+17	e 24	32	-10	e 27	25	?	—
Florence, Xim.	95.7	39	e 13	36	+ 7	e 24	10	{+ 5}	—	—	—	—
Padova	95.9	39	e 13	43	+13	24	17	{- 7}	17	31	PP	—
Warsaw	96.0	29	e 17	40	PP	e 24	8	{+ 1}	e 19	43	PPP	e 45.8
Christchurch	96.1	226	e 14	17	+46	24	58	+10	e 17	32	PP	43.3
Triest	96.3	36	i 13	36	+ 4	e 25	0	+11	i 17	27	PP	e 43.8
Ogyalla	97.4	33	e 18	12	PP	e 24	17	{+ 3}	e 20	5	PPP	e 48.3
Skalnate Pleso	97.6	31	e 16	59	?	e 26	31	PS	—	—	—	—
Rome	97.7	41	e 13	39	+ 1	i 25	6	+ 5	17	35	PP	—
Vladivostok	98.0	320	i 13	40	+ 1	i 24	17	{ 0}	i 17	47	PP	—
Moscow	99.8	18	e 18	5	PP	e 24	45	{- 8}	—	—	—	—
Timisoara	100.4	34	—	—	—	24	47?	{-10}	—	—	—	—
Belgrade	100.6	35	e 13	54	+ 3	e 24	51	{- 7}	e 18	5	PP	e 50.7
Taranto	101.4	40	13	41	-14	23	41	{-53}	—	—	—	—
Tamanrasset	z. 102.2	60	14	2 <sub>a</sub>	+ 4	e 30	12	PKKP	i 18	17	PP	—
Kishinev	103.3	29	e 18	21	PP	—	—	—	—	—	—	—
Sofia	103.5	34	e 17	24	PP	—	—	—	—	—	—	—
Bucharest	103.8	31	—	—	—	e 24	53	{+ 8}	e 29	17	PPS	—
Sverdlovsk	103.9	6	i 18	21	PP	i 25	53	0	e 24	6?	SKS	—
Irkutsk	104.1	340	e 13	41	-26	e 24	47	{+ 1}	18	27	PP	—
Brisbane	107.1	247	—	—	—	28	17	PS	34	7	SS	50.3
Yalta	107.6	28	18	52	PP	21	48	PKS	20	48?	PPP	—
Istanbul	107.7	32	e 18	41	[+12]	e 28	16	PS	—	—	—	—
Riverview	109.9	239	i 19	7	PP	e 25	30	{+18}	i 27	3	S	e 50.3
Sotchi	110.9	25	e 19	1?	PP	—	—	—	—	—	—	—
Grozny	113.2	21	—	—	—	e 29	45?	PS	—	—	—	—
Tiflis	114.3	22	e 19	17?	PP	—	—	—	—	—	—	—
Helwan	117.1	40	e 18	56	[+ 9]	e 25	59	{+19}	e 28	47	PS	—
Almata	118.0	356	e 20	6	PP	—	—	—	—	—	—	—
Lenkoran	118.3	21	20	18	PP	—	—	—	—	—	—	—
Frunse	118.5	358	e 20	4	PP	e 26	52	{-11}	e 30	0	PS	—
Naryn	119.9	357	e 20	22	PP	e 26	58	{-15}	—	—	—	—
Tashkent	120.0	2	e 20	33	PP	e 25	53	{+ 3}	e 27	10	SKS	—
Andijan	120.6	0	e 20	21	PP	e 30	27?	PS	e 37	12	SS	—
Fergana	121.0	1	19	1?	[+ 6]	—	—	—	20	29	PP	—
Ashkabad	121.8	13	e 20	23?	PP	—	—	—	—	—	—	—
Garm	122.4	2	e 18	58	[+ 1]	—	—	—	—	—	—	—
Stalinabad	122.7	3	i 20	32	PP	—	—	—	—	—	—	—
Kulyab	123.4	3	e 20	52	PP	—	—	—	—	—	—	—

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	$\Delta$	Az.	P.	O - C.	S.	O - C.	Supp.	L.	
	°	°	m. s.	s.	m. s.	s.	m. s.	m.	
New Delhi	N. 132.6	354	e 19 37	[+20]	26 53	[+27]	22 47	PKS	—
Pretoria	N. 138.2	107	e 19 23	[-4]	—	—	—	—	—
Bombay	142.4	359	e 19 38	[+3]	e 41 28	SS	23 6	PP	—
Poona	N. 142.8	357	19 37	[+2]	29 17	{-21}	24 7	PKS	65.8
Hyderabad	N. 143.5	350	e 19 37	[0]	—	—	—	—	—
Bandong	144.3	284	e 19 14	[-24]	e 24 33	?	e 22 39	PP	—
Djakarta	144.7	286	i 19 39	[0]	e 23 9	PP	—	—	—
Kodaikanal	E. 150.7	351	e 19 17	[-31]	—	—	—	—	—
Colombo	E. 153.5	345	e 21 47?	?	—	—	—	—	70.8
Tananarive	155.9	93	20 28	[+32]	44 17	SS	24 8	PP	81.3

Additional readings :

Fresno iZ = 5m.41s. and 7m.4s., eN = 9m.53s.  
Salt Lake City e = 6m.9s.  
Lick eN = 7m.11s.  
Lincoln eE = 7m.27s., iSE = 9m.37s.  
St. Louis isS = 10m.9s., iSS = 10m.54s.  
Ukiah iS = 9m.48s.  
Rapid City e = 7m.17s.  
Bozeman ePPP? = 7m.17s.  
Butte eS?N = 10m.8s.  
Columbia e = 11m.27s.  
Chicago ePPP = 7m.30s., i = 11m.10s.  
Cleveland iP = 6m.29s., iE = 11m.9s. and 11m.46s.  
Seattle i = 7m.18s., eP<sub>c</sub>S = 12m.17s., e = 14m.24s., eS<sub>c</sub>S = 16m.47s.  
Pennsylvania iPPPZ = 8m.7s., iP<sub>c</sub>P?Z = 9m.14s., and other unidentified i readings.  
Saskatoon PPP = 8m.25s., SS = 14m.17s., e = 14m.32s.  
Chinchina iSS = 14m.22s.  
Buffalo ePPP = 7m.4s., eSS = 13m.3s.  
Philadelphia iP = 6m.57s.?, i = 8m.1s.? and 12m.43s.?  
Palisades i = 7m.25s., iPP = 8m.25s., eSS = 14m.54s., iS<sub>c</sub>S = 17m.1s.  
Ottawa i = 7m.17s. and 13m.3s., SS = 15m.17s.  
Vermont e = 10m.33s. and 15m.13s.  
San Juan i = 7m.32s., e = 10m.15s., eSS? = 16m.15s.  
Roosevelt Roads reading has been increased by 5m.  
Seven Falls SSE = 16m.55s.  
Huancayo i = 10m.19s., iQ = 18m.11s.  
Sitka i = 10m.57s. and 15m.25s., iS<sub>c</sub>S = 18m.9s.  
Halifax SS = 18m.19s.  
La Paz iZ = 9m.43s., iSS = 20m.35s., iSSS = 22m.1s., Q = 24m.19s.  
College i = 10m.40s., ePPP = 12m.32s., iS = 16m.55s., eSS = 20m.19s.  
Resolute Bay PPP = 13m.6s., PS = 18m.7s., e = 18m.52s., eE = 19m.58s., iSS = 21m.22s.  
Ivigtut 24m.0s.  
La Plata PZ = 11m.26s., PPN = 12m.59s., PP?E = 13m.23s., PPPE = 15m.41s., SSE = 24m.41s., QE = 31.0m.  
Rathfarnham Castle iZ = 13m.50s. and 16m.57s., eEN = 33m.27s.  
Aberdeen iN = 23m.50s. and 25m.43s., iSSSN = 34m.4s.  
Bergen SSN = 28m.31s.  
Lisbon PEZ = 12m.42s., 12m.47s., and 13m.9s., SEN = 13m.11s., SE = 23m.29s., Q = 39.6m.  
Kew iZ = 13m.14s. and 14m.10s.  
Toledo iSKSE = 23m.26s., PS = 24m.48s.  
De Bilt isS = 23m.51s., ePS = 24m.45s., eSS = 29m.37s., e = 36m.17s.  
Paris eSKKS = 23m.35s., iS = 23m.44s., iPS = 25m.2s., iSS = 29m.37s., eQ = 36m.11s., and other unidentified phases.  
Malaga PPPZ = 18m.28s.  
Granada SKKS = 24m.9s., PS = 25m.12s., PPS = 25m.54s., SSS = 33m.57s.  
Upsala eS?N = 24m.21s., eN = 26m.11s.  
Tortosa P<sub>c</sub>PEN = 13m.23s., PSN = 24m.37s., SSSN = 33m.6s.  
Alicante PP = 17m.3s., PPP = 18m.53s., PS = 25m.21s., SS = 30m.9s., Q = 38m.13s.  
Strasbourg e = 13m.41s., 14m.0s., and 17m.57s., ePPP = 19m.7s., eSKS = 23m.48s., e = 25m.0s., iPS = 25m.21s., ePPS = 26m.8s., i = 27m.5s., eSS = 30m.20s., eSSS = 33m.15s., e = 34m.13s. and 37m.7s., i = 37m.16s.  
Basle e = 13m.57s.  
Stuttgart e = 13m.44s. and 18m.11s., ePS = 25m.27s., eSS = 30m.23s., eSSS = 34m.47s.  
Potsdam iNZ = 17m.33s., iE = 18m.15s., iPSZ = 25m.38s., iSSN = 30m.27s.  
Jena eE = 18m.59s., ePS?N = 25m.31s.  
Helsinki eSS = 31m.6s.  
Collmberg eZ = 18m.19s., ePSEN = 25m.29s., eSSN = 30m.41s., eSSSE = 34m.23s., eN = 35m.29s.  
Cheb eE = 23m.2s., eSKKSE = 24m.26s., eSSE = 30m.35s., eSSS?E = 34m.23s.  
Wellington SKS = 23m.58s., ePS = 25m.35s., eSS = 30m.47s., Q = 38.3m.  
Algiers eZ = 17m.14s.  
Pavia eZ = 15m.32s., e = 22m.9s.  
Prague ePPP = 18m.7s., eSKS = 22m.59s., eSS = 30m.47s.  
Padova SKKS = 24m.54s.

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Warsaw eSKSN = 24m.14s., eSEN = 24m.49s., ePS = 26m.14s., eN = 26m.41s.,  
 ePPSEN = 27m.6s., eSSE = 31m.24s., eSSN = 31m.38s., eSSSE = 35m.30s.  
 Christchurch eSKSNZ = 24m.11s., iSKSE = 24m.17s., iPS = 26m.17s., PPSEN = 27m.22s.,  
 SS?EN = 30m.12s., eSSSEN = 34m.32s., eQN = 37m.57s.  
 Trieste eSKS = 24m.12s., iPS = 26m.4s., eSS = 32m.9s.  
 Ogyalla eN = 19m.11s., ePS?E = 25m.47s.  
 Rome SKS = 24m.11s., iPS = 26m.33s., e = 27m.27s., eSS = 31m.35s.  
 Vladivostok iPPP = 19m.6s.?, ePS = 26m.32s.  
 Belgrade e = 27m.8s. and 40m.2s.  
 Tamanrasset eZ = 17m.13s., ePPPZ = 20m.32s.  
 Sverdlovsk ePS = 27m.34s., iSS = 33m.11s.  
 Irkutsk ePS = 27m.47s., SS = 33m.47s.?  
 Riverview ePSEZ = 28m.34s., ePPS?E = 29m.46s., iSSE = 34m.43s., iE = 34m.58s.  
 Helwan eZ = 19m.38s., eN = 24m.47s.  
 New Delhi PKSN = 23m.28s., PKS<sub>2</sub>N = 23m.36s., iN = 25m.16s., PPPN = 25m.58s.,  
 SKKKS<sub>2</sub>N = 29m.58s., PKKPN = 31m.45s., SKSPN = 32m.50s., PSN = 33m.18s.,  
 PPSN = 35m.0s.  
 Bombay eEN = 25m.56s.  
 Poona PPPN = 25m.57s., SKKKS<sub>2</sub>N = 29m.57s., PSN = 33m.2s., SSPN = 41m.34s.,  
 QN = 58.8m.

Sept. 29d. 7h. 54m. 25s. Epicentre 18°·9N. 107°·0W. (as at 6h.).

	$\Delta$	Az.	P.	O - C.	S.	O - C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Manzanillo	2.5	87	e 0 45	+ 2	e 1 20	+ 6	—	—
Guadalajara	3.9	60	e 1 8	+ 6	—	—	—	e 2.1
Tacubaya	7.4	85	e 2 0	+ 8	e 3 37	+19	—	—
Puebla	8.3	88	e 2 9	+ 5	e 3 54	+14	—	e 4.3
Chinchina	9.7	5	e 2 27	+ 5	e 4 23	+ 8	—	—
Oaxaca	9.9	99	—	—	e 4 37	+15	—	e 5.4
Tucson	13.7	346	e 3 16	- 2	e 5 44	- 8	—	e 6.6
Merida	16.5	80	e 3 59	+ 5	7 15	+17	—	—
Palomar	16.9	330	i 3 55	- 4	—	—	—	—
Riverside	z. 17.7	331	i 4 5	- 5	—	—	—	—
Pasadena	18.2	331	i 4 10	- 6	—	—	—	e 8.0
Pierce Ferry	18.2	342	i 4 14	- 2	—	—	—	—
Boulder City	18.4	340	e 4 14	- 4	—	—	—	—
Overton	z. 18.7	341	i 4 22	0	—	—	—	—
Haiwee	z. 19.7	334	e 4 31	- 3	—	—	—	—
Tinemaha	20.6	334	e 4 39	- 4	—	—	—	—
Fresno	N. 21.0	331	e 4 39	- 8	—	—	—	—
Salt Lake City	22.2	352	e 4 57	- 3	e 9 17	+17	—	e 11.0
Lick	z. 22.4	329	e 5 1 <sub>a</sub>	- 1	—	—	—	—
Reno	23.3	334	e 5 10	0	—	—	—	e 11.2
Lincoln	E. 23.6	21	—	—	e 9 48	+23	—	e 11.4
St. Louis	24.5	33	i 5 28	+ 6	e 10 1	+21	—	—
Mineral	z. 24.8	333	e 5 21	- 4	—	—	—	—
Shasta Dam	25.4	332	e 5 33	+ 2	—	—	—	—
Butte	N. 27.4	354	e 6 42	PP	e 10 42	+14	—	e 15.6
Columbia	27.6	51	—	—	e 10 35	+ 3	—	e 13.8
Chicago	28.2	31	—	—	e 10 45	+ 4	—	e 12.9
Hungry Horse	29.9	351	e 6 19	+ 7	—	—	—	—
Cleveland	31.3	38	i 6 29 <sub>k</sub>	+ 5	e 11 47	+16	—	—
Seattle	31.3	340	e 5 58	-26	e 10 45	-46	—	—
Victoria	z. 32.4	340	e 6 41	+ 7	—	—	—	—
Palisades	35.8	44	e 7 9	+ 6	—	—	—	—
Ottawa	z. 37.0	36	e 7 15	+ 2	—	—	—	—
Vermont	38.0	40	—	—	e 13 36	+22	—	e 15.9
Harvard	38.1	44	e 7 25	+ 3	—	—	—	—
Weston	38.2	44	e 7 16	- 7	e 13 15	- 2	—	—
San Juan	38.7	83	e 7 28	+ 1	e 13 29	+ 4	—	e 17.8
La Paz	52.0	129	9 24	+11	i 16 45	+ 9	22 9	SSS 24.3
College	53.3	340	e 9 19	- 4	—	—	—	—

Additional readings :—

Fresno ePZ = 4m.43s., iN = 4m.53s., eN = 6m.17s.

Lick eZ = 5m.22s.

Cleveland eE = 13m.3s. and 14m.14s.

San Juan e = 7m.55s.

Long waves were also recorded at Wellington, Rapid City, Ivigtut, Collmberg, and Stuttgart.

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Sept. 29d. Readings also at 0h. (Guam, Pasadena, Riverside, Tinemaha, Tucson, Shasta Dam, Hungry Horse, and College), 1h. (Tamanrasset, Prague, and Taranto), 2h. (Apia, Nanking, Hungry Horse, and near Garm), 3h. (Naryn, Obi-garm, Samarkand, Tchimkent, near Andijan, Fergana, Garm (2), Kulyab, Murgab, Stalinabad, and Tashkent), 4h. (Frunse, Garm, Naryn, Samarkand, near Andijan, Fergana, Kulyab, Murgab, Obi-garm, Stalinabad, Tashkent, and near Victoria), 5h. (Tucson), 6h. (College, Ksara, and near Garm), 8h. (near Garm), 9h. (College and Nanking), 10h. (Bandong, Tucson, College, La Paz, and near Huancayo), 12h. (Calcutta and Stuttgart), 13h. (Nanking, College, Tortosa, and near Garm), 14h. (College, Nanking, Vladivostok, Zi-ka-wei, Calcutta, and near Garm), 15h. (Potsdam, Nanking (2), and near Apia), 16h. (College, Collmberg, and Raciborzu), 18h. (College, Pretoria, and near Mizusawa), 19h. (Bermuda, Mount Wilson, Tucson, Victoria, College, Andijan, Stalinabad, near Garm, Kulyab, and Obi-garm), 21h. (Salt Lake City, Tucson, and Nanking), 22h. (Hungry Horse, Nanking, Zi-ka-wei, Calcutta, Ksara, Vladivostok, Andijan, Tashkent, near Alicante, and near Borzhomi), 23h. (Alicante, Collmberg, De Bilt, Kew, Paris, Potsdam, Rome, Ksara, and near Andijan).

Sept. 30d. 7h. 28m. 55s. Epicentre  $28^{\circ}7'N$ .  $94^{\circ}2'E$ . (as on 3d.).

Felt at Shillong and Tezpur. See Seismo. Bull., Gov. India, Sept., 1950, pp.20 and 27.

$A = -0.0643$ ,  $B = +0.8762$ ,  $C = +0.4777$ ;  $\delta = +6$ ;  $h = +2$ ;  
 $D = +0.997$ ,  $E = +0.073$ ;  $G = -0.035$ ,  $H = +0.476$ ,  $K = -0.879$ .

		$\Delta$	Az.	P.	O-C.	S.	O-C.	Supp.	L.	
		$^{\circ}$	$^{\circ}$	m. s.	s.	m. s.	s.	m. s.	m.	
Calcutta	E.	8.1	222	i 2 9	+ 7	i 3 37	+ 2	i 4 27	S <sub>z</sub>	—
Dehra Dun	N.	14.1	281	e 4 35	+72	e 6 59	+57	—	—	—
New Delhi		14.9	274	e 3 29	- 5	i 6 12	- 8	3 43	PP	—
Hyderabad	N.	18.3	236	i 4 14	- 3	i 7 48	+ 9	—	—	9.5
Przhevalsk		18.8	322	i 4 25	+ 2	—	—	—	—	—
Murgab		19.4	305	i 4 31	+ 1	8 4	0	—	—	—
Naryn		19.5	316	i 4 34	+ 3	—	—	—	—	—
Almata		20.1	322	i 4 40	+ 2	i 8 27	+ 8	—	—	—
Frunse		21.2	316	i 4 52?	+ 3	i 8 49?	+ 8	—	—	—
Poona	E.	21.2	246	i 4 50	+ 1	i 8 38	- 3	9 16	SS	10.0
Nanking		21.5	74	i 4 49 <sub>a</sub>	- 3	8 43	- 4	i 9 31	Q	i 10.1
Bombay		21.8	248	i 4 56	0	i 8 56	+ 4	—	—	—
Fergana		21.8	309	i 4 57	+ 1	i 8 52	0	—	—	—
Garm		22.3	304	5 1	0	—	—	—	—	—
Kulyab		22.3	300	e 5 2	+ 1	e 9 1	- 1	—	—	—
Obi-garm		22.6	304	i 5 8	+ 5	—	—	—	—	—
Stalinabad		23.3	303	i 5 12	+ 2	i 9 18	- 2	—	—	—
Zi-ka-wei	Z.	23.7	76	i 5 11	- 3	i 9 27	0	10 27	Q	11.2
Tashkent		23.9	308	i 5 18	+ 2	—	—	—	—	—
Tchimkent		24.1	311	i 5 20	+ 2	—	—	—	—	—
Kodaikanal	E.	24.1	225	i 5 27	+ 9	9 45	+11	10 43	Q	12.0
Irkutsk		24.7	13	i 5 25	+ 1	—	—	—	—	—
Samarkand		24.9	303	i 5 27	+ 1	—	—	—	—	—
Colombo	E.	25.6	216	5 38	+ 6	10 4	+ 5	—	—	19.5
Manila		28.5	113	i 6 12	+22	10 36	-10	—	—	—
Ashkabad		31.2	297	i 6 25	+ 2	—	—	—	—	—
Unzendake		31.2	72	e 6 3	-20	e 11 23	- 6	—	—	—
Hukuoka		31.3	71	6 20 <sub>a</sub>	- 4	e 11 24	- 7	e13 10	SS	e 19.8
Vladivostok		33.5	54	i 6 39	- 4	i 11 57	- 8	—	—	—
Sumoto		35.0	69	i 6 52	- 4	i 12 21	- 7	i 17 12	Q	e 19.7
Owase		36.1	70	i 7 3	- 2	e 12 42	- 3	—	—	—
Kameyama		36.3	68	7 6	- 1	e 12 45	- 3	—	—	19.8
Gihu		36.5	67	e 7 18	+ 9	—	—	—	—	—
Nagoya		36.6	67	e 7 7	- 3	12 49	- 4	—	—	—
Matusiro		37.6	65	7 14	- 4	12 58	-10	—	—	e 15.6
Nagano	N.	37.6	65	e 7 15	- 3	—	—	—	—	—
Bandong		37.7	157	e 7 24	+ 5	e 13 21	+11	—	—	—
Baku		37.9	300	i 7 24	+ 4	—	—	—	—	—
Hunatu		38.1	66	7 20	- 2	13 9	- 7	—	—	e 20.3
Shemakla		38.9	300	7 32	+ 3	—	—	—	—	—

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.	
Tokyo	38.9	67	7	28	- 1	13	11	-17	13	45	Q	16.0
Sendai	39.7	63	7	33	- 3	13	31	- 9	—	—	—	e 20.0
Mizusawa	39.9	61	e 7	33	- 4	9	16	PP	—	—	—	—
Grozny	41.2	304	e 7	55	+ 7	—	—	—	—	—	—	—
Tiflis	41.9	302	i 7	55	+ 1	—	—	—	—	—	—	—
Erevan	42.1	299	e 7	59	+ 4	—	—	—	—	—	—	—
Leninakan	42.6	301	e 8	8?	+ 9	—	—	—	—	—	—	—
Borzhomei	42.9	302	i 8	4	+ 2	—	—	—	—	—	—	—
Zugdidi	44.0	304	8	15	+ 4	—	—	—	—	—	—	—
Sotchi	45.6	305	e 8	22	- 2	—	—	—	—	—	—	—
Moscow	48.1	321	i 8	43	0	i 15	40	- 2	—	—	—	—
Theodosia	48.7	306	e 8	45	- 3	—	—	—	—	—	—	—
Ksara	49.5	291	i 8	58	+ 4	i 16	8	+ 6	—	—	—	—
Yalta	49.6	305	8	55	0	16	2	- 1	—	—	—	—
Pulkovo	52.6	325	i 9	17	- 1	i 16	43	- 1	—	—	—	—
Kishinev	53.2	310	9	20	- 2	—	—	—	—	—	—	—
Helwan	54.2	288	i 9	29 <sub>a</sub>	0	i 17	5	- 1	10	20	P <sub>c</sub> P	—
Helsinki	55.3	326	i 9	38	0	i 17	18	- 3	i 10	45	P <sub>c</sub> P	30.1
Bucharest	55.4	307	e 9	42	+ 4	e 17	22	0	e 19	25	S <sub>c</sub> S	35.1
Warsaw	57.8	317	9	52	- 3	e 17	53	- 1	11	52	PP	e 31.1
Athens	58.4	299	i 9	57 <sub>a</sub>	- 3	—	—	—	—	—	—	—
Timisoara	58.6	309	10	5?	+ 4	—	—	—	—	—	—	—
Skalnate Pleso	58.7	313	e 10	23	+21	e 18	25	+19	e 12	20	PP	e 23.2
Upsala	59.0	326	—	—	—	e 18	5?	- 5	e 19	51	S <sub>c</sub> S	e 30.1
Belgrade	59.3	307	e 10	5 <sub>a</sub>	- 1	e 18	16	+ 2	e 13	53	PPP	e 35.8
Raciborzu	59.8	314	e 10	10	+ 1	—	—	—	—	—	—	—
Ogyalla	60.2	312	e 10	15	+ 3	e 18	26	+ 1	e 12	37	PP	—
Prague	62.2	315	i 10	25	- 1	e 18	46	- 5	e 10	34	pP	e 33.1
Copenhagen	62.3	322	i 10	26	0	e 19	5	+13	i 20	19	S <sub>c</sub> S	32.1
Potsdam	62.6	318	i 10	28 <sub>a</sub>	0	i 18	56?	0	e 12	41	PP	34.1
Taranto	62.6	303	10	27	- 1	e 20	7	S <sub>c</sub> S	e 25	5	SSS	—
Collmberg	62.9	316	i 10	30 <sub>a</sub>	0	e 18	59	- 1	e 20	29	S <sub>c</sub> S	e 37.1
Triest	63.7	310	i 10	35	- 1	i 19	7	- 3	i 12	57	PP	—
Jena	63.8	316	e 10	35	- 1	e 19	8	- 3	e 12	54	PP	—
Messina	64.5	302	e 10	39	- 2	—	—	—	e 13	4	PP	—
Bergen	65.0	328	e 9	46	-58	e 18	48	-38	—	—	—	e 30.5
Padova	65.3	309	e 10	49	+ 3	19	28	- 1	—	—	—	—
Tananarive	65.4	230	—	—	—	e 20	26	S <sub>c</sub> S	—	—	—	e 32.8
Rome	65.6	306	i 10	46 <sub>a</sub>	- 2	i 19	28	- 5	e 13	15	PP	—
Bologna	65.7	310	e 10	55	+ 7	e 19	59	PS	e 13	31	PP	—
Florence, Xim.	65.9	308	e 10	46	- 4	i 19	32	- 5	—	—	—	—
Stuttgart	65.9	314	i 10	49 <sub>a</sub>	- 1	e 19	35	- 2	e 13	14	PP	e 38.1
Chur	66.2	311	i 10	51	- 1	e 19	35	- 5	—	—	—	—
Karlsruhe	66.3	314	i 10	52	0	e 19	24	-18	—	—	—	e 41.1
Strasbourg	66.8	314	i 10	55	- 1	i 19	48	0	e 13	23	PP	—
Pavia	67.0	311	i 10	57 <sub>a</sub>	0	e 20	5?	+15	e 15	17	PPP	—
Basle	67.3	313	e 10	58	- 1	e 19	52	- 2	e 13	19	PP	—
De Bilt	67.3	319	i 11	0 <sub>a</sub>	+ 1	i 19	55	+ 1	e 20	59	PPS	—
Neuchatel	67.8	313	e 11	3	+ 1	e 20	10	+10	—	—	—	—
Aberdeen	69.6	325	—	—	—	e 20	15	- 6	e 28	47	Q	37.2
Durham	70.2	323	—	—	—	i 20	29	+ 1	i 21	35	PPS	—
Clermont-Ferrand	70.8	312	i 11	19	- 1	i 20	30	- 5	i 13	59	PP	—
Kew	70.8	319	i 11	20 <sub>a</sub>	0	e 20	33	- 2	e 15	49	PPP	e 36.1
Scoresby Sund	71.4	342	i 11	23	- 1	—	—	—	i 13	53	PP	—
Rathfarnham Castle	73.4	322	i 11	37	+ 1	—	—	—	—	—	—	e 51.1
Algiers Univ.	74.3	303	i 11	40 <sub>a</sub>	- 1	—	—	—	e 14	27	PP	—
Tortosa	74.5	308	i 11	42	0	21	17	0	11	56	P <sub>c</sub> P	e 43.1
College	75.2	23	i 11	43	- 3	e 21	21	- 4	i 14	31	PP	e 36.7
Alicante	76.2	306	11	48	- 4	i 21	38	+ 2	14	54	PP	e 37.0
Resolute Bay	76.7	2	11	54	- 1	21	38	- 3	14	48	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.	
Toledo		78.0	308	i 12 3	+ 1	i 21 54	- 1	i 15 4	PP	—
Tamanrasset	z.	78.3	290	i 12 4k	+ 1	e 22 3	+ 4	i 12 11	P <sub>c</sub> P	—
Brisbane		79.4	129	e 12 7	- 2	—	—	—	—	—
Malaga	z.	79.7	306	i 12 11k	0	i 22 15	+ 2	i 14 59	PP	47.3
Lisbon		82.0	309	i 12 24a	+ 1	22 31	- 6	—	—	34.2
Riverview		82.3	134	e 12 22	- 3	i 22 40	0	i 12 30	P <sub>c</sub> P	—
Pretoria	z.	83.4	236	i 12 31	+ 1	—	—	—	—	—
Pietermaritzburg	z.	84.1	231	e 12 31	- 3	—	—	—	—	—
Sitka		84.6	24	e 12 37	+ 1	e 22 59	- 4	e 28 29	SS	e 44.8
Ivigut		85.4	342	i 12 38	- 2	23 18	+ 7	28 30	SS	46.1
Victoria		96.1	24	e 13 30	- 1	e 24 50	+ 2	e 24 10	SKS	—
Seattle		97.2	24	i 13 37a	+ 1	e 25 7	+ 10	i 17 34	PP	e 54.1
Saskatoon		97.5	13	—	—	e 24 8	[- 6]	—	—	—
Hungry Horse		99.2	19	e 13 45	0	e 24 22	[- 1]	i 17 35	PP	—
Butte	n.	101.8	19	i 18 7	PP	e 24 37	[+ 1]	e 27 17	PS	e 55.7
Shasta Dam		103.1	27	e 14 1	- 1	e 30 3	PKKP	e 18 1	PP	—
Seven Falls	e.	103.3	350	e 18 15	PP	e 24 36	[- 7]	—	—	—
Mineral	z.	103.7	27	e 14 3	- 2	e 30 1	PKKP	e 16 52	PP	—
Halifax		104.3	343	—	—	e 24 38	[- 9]	—	—	—
Berkeley	z.	105.5	29	e 18 25	[+ 1]	—	—	—	—	—
Ottawa	z.	105.7	352	e 18 25	[ 0]	—	—	—	—	—
Logan		105.9	20	e 14 15	0	—	—	i 18 36	PP	—
Lick	z.	106.2	29	e 19 29a	PP	—	—	e 29 53	PKKP	—
Fresno	z.	107.5	28	e 18 3	[- 25]	—	—	e 18 39	PP	—
Tinemaha	z.	107.8	27	i 18 53	PP	—	—	i 29 48	PKKP	—
Harvard		107.9	348	e 17 44	?	e 28 6	PS	i 18 55	PP	e 56.8
Weston		108.0	348	e 18 40	PP	e 24 59	[- 5]	e 28 1	PS	—
Palisades		109.8	350	e 18 25	[- 8]	i 25 9	[- 3]	e 19 0	PP	—
Chicago		109.8	2	e 19 2	PP	e 25 0	[- 12]	e 26 2	SKKS	e 53.5
Overton	z.	109.8	24	e 19 4	PP	—	—	—	—	—
Boulder City		110.1	24	e 18 57	[+ 24]	—	—	e 19 7	PP	—
Pierce Ferry		110.3	24	e 18 22	[- 12]	e 29 42	PKKP	i 19 8	PP	—
Pennsylvania	n.	110.5	354	e 19 18	PP	i 25 15	[+ 1]	i 26 7	SKKS	—
Pasadena		110.6	28	e 18 8	?	i 29 41	PKKP	i 19 5	PP	e 61.1
Riverside	z.	110.9	28	e 18 32	[- 3]	i 29 39	PKKP	e 19 5	PP	—
Philadelphia		111.0	351	e 20 13?	PP	e 26 15?	{+ 3}	e 29 39?	PS	e 54.3
Palomar	z.	111.6	27	e 19 18	PP	—	—	—	—	—
Washington		112.3	352	e 19 13	PP	e 29 12	PS	—	—	e 66.4
Tucson		114.9	23	e 18 32	[- 11]	e 29 20	PS	e 19 36	PP	e 59.6
Bermuda		116.0	340	—	—	e 29 25	PS	—	—	e 59.7
San Juan		129.5	336	e 19 13	[+ 2]	e 22 32	PKS	e 21 42	PP	e 67.5
Bogota		145.0	338	i 18 40	[- 59]	(i 29 58)	{+ 8}	e 55 29	Q	—
Chinchina		145.1	341	i 19 35	[- 4]	e 26 23	[- 24]	e 22 56	PKS	—
La Plata		155.6	250	—	—	43 47	SS	53 5	?	76.6
La Paz		159.7	304	20 5	[+ 5]	31 25	{+ 15}	i 24 28	PP	86.1
Huancayo		160.8	328	e 20 6	[+ 4]	e 30 37	{- 40}	i 20 48	PKP <sub>1</sub>	e 79.3

Additional readings :—

Calcutta iS\*E = 4m.6s.  
 New Delhi PPPN = 3m.51s., QN = 6m.2s., SSN = 6m.20s., SSSN = 6m.38s.  
 Poona QE = 8m.53s., SSSE = 9m.30s.  
 Nanking iE = 5m.51s.  
 Zi-ka-wei iZ = 5m.19s.  
 Helwan PPZ = 11m.50s.  
 Helsinki iEZ = 9m.46s., iPP = 11m.49s., iPS = 17m.29s.  
 Bucharest eN = 9m.53s. and 18m.25s.  
 Warsaw e = 10m.5s., eZ = 10m.14s., e = 11m.5s., eNZ = 12m.34s., PPP = 13m.20s.,  
 P<sub>c</sub>SEZ = 14m.4s., ePSE = 18m.12s., S<sub>c</sub>S = 19m.52s., SS = 21m.53s.  
 Skalnaté Pleso e = 10m.41s., eSE = 18m.29s., eE = 19m.11s.  
 Upsala iS = 18m.16s., eSSN = 24m.29s., eN = 26m.51s.  
 Belgrade eS<sub>c</sub>S = 19m.55s.  
 Ogyalla e = 10m.22s., ePPP = 13m.29s., eSS = 22m.33s., eSSS = 24m.28s.  
 Prague e = 10m.38s., ePP = 12m.17s. and 12m.41s., eNZ = 14m.12s., e = 15m.40s. and  
 22m.17s., eSS = 23m.23s.  
 Copenhagen i = 10m.36s., 20m.34s.  
 Potsdam ePN = 10m.31s., iEZ = 10m.36s., ePPZ = 12m.47s., eZ = 18m.47s., iS<sub>c</sub>SE =  
 20m.14s., iSSE = 23m.11s., eSSZ = 25m.59s.

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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Collmberg iZ = 10m.37s., eE = 11m.27s., eZ = 11m.40s., eN = 13m.19s., eZ = 13m.23s.,  
eE = 14m.35s., eSSN = 23m.5s., eE = 23m.11s.  
Triest isS = 20m.30s., eSS = 23m.19s.  
Jena iZ = 10m.43s.  
Messina e = 10m.59s.  
Rome PS = 20m.10s., SS = 23m.50s., SSS = 26m.30s.  
Stuttgart i = 10m.58s., eSS = 23m.59s.  
Strasbourg i = 11m.4s., e = 11m.30s., ePPP = 15m.10s., e = 19m.41s., i = 20m.0s., eScS =  
20m.55s., e = 21m.5s., eSS = 24m.16s.  
Pavia iZ = 11m.5s., e = 12m.13s., and 17m.50s.  
Basle e = 11m.6s.  
Clermont-Ferrand i = 14m.36s.  
Kew iEZ = 15m.29s., eSKS?E = 21m.21s., eSSE = 24m.45s., eSSSEN = 28m.17s.  
Rathfarnham Castle iZ = 12m.21s.  
Algiers Univ. eZ = 11m.48s., 12m.37s., and 14m.7s.  
Tortosa PSEN = 21m.49s., SS?E = 26m.39s.  
College ePPP? = 16m.35s., i = 20m.28s., eSS = 25m.53s.  
Alicante PPP = 16m.32s., PS = 22m.8s., PPS = 22m.18s., SS = 26m.40s., SSS = 29m.30s.,  
Q = 31m.14s.  
Resolute Bay PPP = 16m.27s., PS = 22m.17s., SS = 26m.41s.  
Toledo iZ = 12m.9s., SS = 27m.3s.  
Tamanrasset eZ = 14m.55s., iPPZ = 15m.2s., iZ = 15m.11s., ePKP,PKPZ = 39m.5s.,  
eSKP,PKPZ = 42m.46s.  
Brisbane iEZ = 12m.16s.  
Malaga PPP?Z = 18m.3s.  
Riverview iZ = 12m.41s., iE = 22m.53s., eSSE = 28m.1s.  
Seattle e = 17m.12s., i = 18m.16s., eSKS = 24m.10s., eSS = 31m.55s.  
Hungry Horse ePKKP = 30m.8s.  
Mineral ePKPZ = 17m.20s.  
Harvard e = 19m.43s., ePKS = 20m.50s., iPPS = 29m.16s.  
Palisades i = 19m.15s., ePPP = 21m.24s., ePS = 28m.38s., i = 28m.46s., eSS = 34m.32s.  
Pennsylvania iN = 21m.26s., eN = 28m.33s., iPSN = 28m.51s., ePPSN = 29m.49s.  
Philadelphia eSS? = 36m.33s.?, eSSS = 39m.5s.?.  
Washington iPP = 19m.24s.  
San Juan eSS = 38m.40s.  
Bogota iPKP, = 18m.48s., SKKS has been increased by 10m.  
La Paz iPKP,Z = 20m.45s., iSKS? = 28m.41s., iSS = 44m.25s., SSS = 50m.17s.  
Huancayo e = 23m.12s. and 25m.5s., eSKSP? = 35m.11s., e = 37m.5s., eSS = 44m.40s.  
Long waves were also recorded at Bozeman and Salt Lake City.

Sept. 30d. Readings also at 0h. (Nanking), 1h. (near Garm), 2h. (Logan and near Victoria),  
3h. (near Garm, near Victoria (2), and near Przhivalsk), 4h. (College, Nanking,  
Frunse, Murgab, Naryn, Samarkand, near Fergana, Garm, Kulyab, Obi-garm,  
Stalinabad, and Tchinkent, Tiflis, near Borzhomi, Leninakan, and near Apia),  
5h. (Nanking, Vladivostok, College, and Hungry Horse), 6h. (De Bilt, Potsdam,  
Paris, Stuttgart, Tamanrasset, and near Yalta), 7h. (near Yalta), 8h. (Collmberg,  
Stuttgart, Brisbane (2), Bandung, Harvard, Weston, Ottawa, Washington, Tucson,  
Pierce Ferry, Shasta Dam, Hungry Horse, College (3), and San Juan), 9h. (near  
Victoria and near Yalta), 10h. (College), 12h. (Nanking), 14h. (Nanking and near  
Garm (2)), 15h. (College, near Ashkabad, and near Garm), 16h. (Grahamstown,  
near Pretoria, Fergana, Murgab, near Andijan, Garm, and Stalinabad), 17h.  
(Pietermaritzburg, near Andijan, Garm, and Stalinabad), 18h. (Nanking and near  
Garm (2)), 19h. (Nanking and near Garm), 20h. (near Garm (3)), 21h. (near Garm (5),  
near Tacubaya, and near Santa Clara), 23h. (Hungry Horse and near Garm).

The scanned images of the bulletins of the International Seismological Summary (ISS) have been obtained as part of a global earthquake relocation project (Villaseñor et al., 1997) initiated with funding from the US National Science Foundation through grant EAR-9725140 and collected by SGA [Storia Geofisica Ambiente](#) (Bologna) on behalf of the [Istituto Nazionale di Geofisica e Vulcanologia](#) (Rome), in the frame of [Euroseismos](#) project.

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/>

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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.

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