The International Seismological Summary.

1951 April, May, June.

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

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The second quarter for 1951 contains 214 epicentres, 150 of which are repetitions from previously adopted epicentres.

Cases of abnormal focal depth are noted below :—

April	2d. 0h.	13·0°N.	90·0°W.	Base of Superficial Layers.
	2d. 22h.	6·2S.	149·1E.	Base of Superficial Layers.
	3d. 4h.	Undetermined shock		Suggested Deep.
	4d. 15h.	35·8N.	142·0E.	0·005
	4d. 17h.	Undetermined shock		Very Deep.
	4d. 18h.	37·7N.	141·8E.	0·010
	5d. 3h.	37·4N.	20·0E.	Suggested Deep.
	5d. 9h.	36·7N.	142·5E.	0·005
	6d. 22h.	46·6N.	142·4E.	0·040
	11d. 7h.	33·8S.	70·5W.	Base of Superficial Layers.
	13d. 16h.	35·5N.	140·4E.	Base of Superficial Layers.
	14d. 0h.	23·3S.	66·4W.	0·030
	15d. 12h.	17·8S.	178·8W.	0·070
	16d. 19h.	31·2N.	138·0E.	0·070
	20d. 19h.	36·2N.	140·0E.	0·005
	20d. 21h.	17·0S.	177·0W.	0·010
	23d. 6h.	37·9S.	177·8E.	0·010
	23d. 13h.	21·0S.	67·5W.	0·040
	24d. 10h.	17·8S.	178·8W.	0·070

April	25d. 18h.	30·8N.	130·7E.	0·020
	26d. 6h.	37·6N.	71·6E.	0·025
	26d. 10h.	34·8N.	137·0E.	Suggested Deep.
	29d. 10h.	21·5S.	179·0W.	0·090
	29d. 19h.	1·0N.	123·3E.	Suggested Deep.
	30d. 13h.	43·0N.	144·2E.	0·010
May	1d. 6h.	36·9N.	141·3E.	0·005
	1d. 19h.	36·7N.	70·5E.	0·020
	2d. 19h.	17·1N.	93·4W.	0·030
	3d. 4h.	15·4N.	61·2W.	0·020
	4d. 11h.	44·4N.	142·2E.	0·030
	5d. 3h.	6·5S.	145·8E.	0·005
	6d. 23h. (3m.)	13·0N.	87·8W.	0·010
	6d. 23h. (8m.)	13·0N.	87·8W.	0·010
	8d. 7h.	18·5S.	178·0W.	0·080
	8d. 20h.	8·3S.	79·8W.	0·005
	9d. 6h.	36·9N.	70·8E.	0·015
	9d. 22h.	38·2N.	142·0E.	Base of Superficial Layers.
	10d. 21h.	34·0S.	72·0W.	Base of Superficial Layers.
	11d. 2h.	13·0N.	87·8W.	0·010
	13d. 10h.	19·4N.	75·8W.	0·010
	14d. 6h.	37·1N.	71·2E.	0·010
	14d. 13h.	9·0N.	86·1W.	0·010
	15d. 5h.	21·2S.	69·7W.	0·010
	15d. 9h.	18·3N.	145·2E.	0·025
	16d. 0h.	15·3S.	172·5W.	0·010
	16d. 13h.	15·0S.	69·5W.	0·025
	19d. 7h.	35·5S.	179·6E.	0·005
	21d. 8h.	6·2S.	154·8E.	0·020
	22d. 4h.	23·2S.	177·4W.	0·010
	24d. 15h. (11m.)	41·3N.	143·1E.	0·005
	24d. 15h. (31m.)	37·6N.	71·6E.	0·010
	25d. 21h.	17·8S.	178·8W.	0·060
	28d. 17h.	23·7S.	68·1W.	0·020
	28d. 19h.	19·0S.	169·5E.	0·030
	29d. 1h.	31·2N.	138·0E.	0·050
	30d. 0h.	52·3N.	177·3W.	0·015
	31d. 20h.	18·6N.	121·2E.	0·010

June	1d. 20h. (2m.)	53·1°N.	172·5°W.	0·005
	1d. 20h. (4m.)	53·1N.	172·5W.	0·005
	5d. 1h.	9·0N.	86·1W.	0·005
	5d. 16h.	29·8N.	131·2E.	0·005
	6d. 5h.	37·8N.	142·2E.	0·005
	6d. 10h.	40·9N.	142·7E.	Base of Superficial Layers.
	6d. 16h.	71·3N.	9·7W.	Suggested Deep.
	6d. 22h.	37·3N.	141·3E.	0·005
	8d. 22h.	Undetermined shock		Suggested Deep.
	9d. 3h.	21·5S.	179·0W.	0·090
	12d. 22h.	36·3N.	71·0E.	0·030
	13d. 1h.	18·5N.	63·0W.	Suggested Deep.
	17d. 21h.	36·1N.	141·2E.	Base of Superficial Layers.
	18d. 13h.	33·8S.	70·5W.	0·010
	18d. 17h.	11·0N.	84·0W.	0·010
	19d. 16h.	Undetermined shock		Very Deep.
	20d. 4h.	36·3N.	71·0E.	0·010
	20d. 16h.	40·2N.	142·2E.	Suggested Deep.
	22d. 8h.	38·1N.	141·4E.	0·005
	22d. 12h.	42·5N.	144·4E.	Base of Superficial Layers.
	23d. 1h.	37·3N.	141·3E.	Base of Superficial Layers.
	24d. 16h.	5·7S.	154·0E.	0·005
	25d. 3h.	56·2N.	155·3W.	0·005
	25d. 16h.	61·1N.	150·1W.	0·015
	27d. 18h.	37·1N.	141·8E.	0·005
	28d. 3h.	16·4S.	71·0W.	0·010
	28d. 5h.	35·9N.	140·3E.	0·005

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 administration.

KEW OBSERVATORY,
Richmond,
SURREY,

April, 1959.

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1951 APRIL, MAY, JUNE.

April 1d. 19h. 21m. 11s. Epicentre 40°·4N. 125°·1W. (as on 1951, Jan. 13d.).

Felt at Ferndale. Suggested epicentre 40°28′N. 125°18′W.

L. M. Murphy and W. K. Cloud.
United States Earthquakes, 1951, Serial No. 762, Washington, 1953, p.11.

$A = -·4391$, $B = -·6248$, $C = +·6456$; $\delta = -2$; $h = -2$;
$D = -·818$, $E = +·575$; $G = -·371$, $H = -·528$, $K = -·764$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Santa Clara		3·9	139	e 1 3	+ 1	i 2 19	S_g	—	—	—
Tinemaha		6·3	120	i 1 37	+ 1	—	—	—	—	—
Haiwee		7·0	125	i 1 47	+ 1	i 3 27	S*	—	—	—
Santa Barbara		7·3	143	e 1 51	+ 1	—	—	—	—	—
China Lake		7·5	125	i 1 51	− 2	i 3 36	S*	—	—	—
Seattle		7·5	14	e 1 57k?	+ 4	i 3 14	− 6	i 2 4	PP	i 4·6
Pasadena		8·4	136	e 2 2	− 4	i 3 34	− 9	i 2 4	P	e 4·3
Riverside	z.	8·9	133	e 2 10	− 2	—	—	—	—	—
Palomar	z.	9·6	134	e 2 23	− 2	—	—	—	—	—
St. Louis		26·9	83	e 5 42	− 3	e 10 15	− 5	e 10 43	?	—
Morgantown		34·3	76	i 6 50	0	—	—	—	—	—
Resolute Bay		37·1	13	e 7 12	− 2	e 15 43	SS	—	—	e 19·7

Seattle gives several other unidentified readings.
Long waves were also recorded at Palisades, Ottawa, Seven Falls, Saskatoon, Scoresby Sund, Paris, Rome, and Istanbul.

April 1d. 20h. 45m. 25s. Epicentre 42°·0S. 75°·0W.

Intensity IV in Chile between 41° and 42° South.
Suggested epicentre 42°·0S. 76°·5W. (U.S.C.G.S.).

F. Greve.
Boletin del año 1951, Instituto sismologico, Universidad de Chile, Santiago, p.13.

$A = +·1929$, $B = -·7200$, $C = -·6666$; $\delta = -3$; $h = -2$;
$D = -·966$, $E = -·259$; $G = -·173$, $H = +·644$, $K = -·745$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Santa Lucia	N.	9·2	23	e 2 21	+ 5	3 52	−11	4 23	SSS	—
La Plata		15·1	68	3 39	+ 3	6 37	+12	6 41	SS	8·0
La Paz		26·1	15	i 5 39	+ 2	i 10 7	0	11 9	SS	13·0
Huancayo		29·8	359	e 6 9	− 2	e 11 8	+ 1	e 7 12	PP	e 12·2
Bogota		46·4	1	i 8 30	0	i 16 14	+56	e 18 42	SS	—
Chinchina		46·7	0	i 8 28	− 4	e 14 49	−33	—	—	—
Grahamstown	z.	76·2	122	i 11 57	+ 5	—	—	—	—	—
Kimberley	z.	78·0	117	i 11 35	−27	—	—	—	—	—
Pietermaritzburg	z.	81·2	121	i 12 23	+ 4	—	—	—	—	—
Weston		84·1	3	e 12 32	− 2	—	—	—	—	—
Palomar		84·3	326	i 12 34a	− 1	—	—	—	—	—
Riverside	z.	85·0	325	i 12 37a	− 1	—	—	—	—	—
Pasadena	z.	85·5	325	i 12 39a	− 2	—	—	—	—	—
China Lake	z.	86·7	327	i 12 45a	− 2	—	—	—	—	—
Ottawa	z.	87·0	359	e 12 46	− 2	—	—	—	—	—
Tinemaha	z.	88·0	326	i 12 53a	0	—	—	—	—	—
Fresno	z.	88·4	325	e 12 53a	− 2	—	—	e 13 42	?	—
Branner	z.	90·0	324	e 13 2k	− 1	—	—	—	—	—
Berkeley	z.	90·4	324	e 13 3	− 1	—	—	e 13 16	?	—
Reno		90·8	327	e 13 5a	− 1	—	—	e 14 7	?	—
Mineral	z.	92·2	326	e 13 11a	− 2	—	—	e 13 25	?	—
Tamanrasset	z.	98·2	67	e 13 42	+ 2	—	—	e 17 45	PP	50·6
Rome		114·8	55	e 19 29	PP	e 28 3?	S	e 35 3	SS	—
Stuttgart		116·7	48	e 18 48	[+ 2]	e 35 5	SS	—	—	e 67·6
Istanbul		125·0	63	e 19 9	[+ 7]	—	—	—	—	e 66·6

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ksara	126·2	75	i 21 28	PP	e 32 52	PPS	—	—	—
Leninakan	135·0	70	e 19 35	[+14]	—	—	—	—	—
Borzhomi	135·1	68	e 19 27	[+ 5]	e 22 57	PKS	—	—	—
Tiflis	136·0	69	e 19 27	[+ 4]	e 22 59	PKS	—	—	—
Bombay	144·3	121	e 19 35?	[− 3]	—	—	—	—	—
Ashkabad	144·4	80	e 19 36	[− 2]	—	—	—	—	—
Poona	144·7	122	i 19 42	[+ 3]	—	—	—	—	—
Mary	146·8	82	i 19 46	[+ 4]	—	—	—	—	—
Sverdlovsk	148·2	47	e 19 46	[+ 1]	—	—	—	—	—
Manila	149·4	212	e 19 53?	[+ 7]	—	—	—	—	—
Samarkand	151·3	82	e 19 52	[+ 3]	—	—	—	—	—
Stalinabad	152·3	84	e 19 54	[+ 3]	—	—	—	—	—
Tashkent	153·4	79	i 19 54	[+ 2]	—	—	i 23 48	PP	—
Tchimkent	153·9	77	i 19 54	[+ 1]	i 23 51	PP	20 17	PKP_2	—
Fergana	155·0	82	e 19 58	[+ 3]	—	—	—	—	—
Andijan	155·6	82	e 19 59?	[+ 4]	e 24 26	PP	e 20 45	PKP_2	—
Naryn	158·4	81	i 20 4	[+ 5]	—	—	i 20 39	PKP_2	—
Rybach'e	158·6	80	i 20 2	[+ 3]	—	—	—	—	—
Almata	159·3	76	i 20 3	[+ 3]	e 24 29	PP	i 20 41	PKP_2	—
Almata II	159·7	76	i 20 3	[+ 3]	—	—	—	—	—
Przhevalsk	160·3	79	e 20 4	[+ 3]	—	—	—	—	—

Additional readings :—
La Paz iPPZ =6m.25s., i =10m.38s., iScS =16m.39s.
Tamanrasset ePPZ =17m.53s., eZ =20m.49s.
Long waves were also recorded at Punta Arenas, Almeria, Alicante, Granada, Pavia, Strasbourg, Clermont-Ferrand, Paris, and De Bilt.

April 1d. Readings also at 1h. (Bucharest, Istanbul, Nanking, and Zi-ka-wei), 2h. (Manila and near Istanbul), 3h. (near Akhalkalaki), 8h. (near Alicante (3), Apia, and Wellington), 9h. (Almata II, Frunse, Kulyab, Rybach'e, Tchimkent, near Andijan, Fergana, Murgab, Obi-garm, Tacubaya, near Copiapo, and near Malaga), 10h. (near Copiapo), 11h. (Huancayo, and near Bogota), 12h. (La Paz, Huancayo, Stuttgart, near Alicante, and near Copiapo), 14h. (Tortosa), 15h. (near Tananarive), 16h. (Bucharest, near Istanbul, and Sofia), 17h. (Santa Lucia, Copenhagen, and near Istanbul), 18h. (Chatra), 19h. (Bombay), 20h. (Apia, Borzhomi, and near Fort de France), 21h. (near Akahalkalaki, Gandzha, and Tsikhlis-Dzhvari), 22h. (near Kurmenty), 23h. (Antofagasta and Collmberg).

April 2d. 0h. 13m. 37s. Epicentre 13°·0N. 90°·0W. Focus at base of superficial layers.

A =0000, B = −·9747, C = +·2235 ; δ = −1 ; h = +6 ;
D = −1·000, E =000 ; G =000, H = −·224, K = −·975.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Oaxaca	7·7	302	e 1 58	+ 5	i 3 31	+11	—	—	—
Merida	7·9	3	i 2 5k	+10	i 3 41	+16	—	—	—
Vera Cruz	8·5	317	e 2 12	+ 8	i 3 56	+16	—	—	—
Puebla	9·9	308	e 2 31	+ 8	i 4 11	− 3	i 4 27	SS	—
Galerazamba	14·6	97	e 4 0	+34	e 6 48	SSS	—	—	—
Guadalajara	14·9	303	e 4 15	+45	—	—	—	—	e 7·2
Manzanillo	15·0	295	e 5 57	?	e 7 12	?	—	—	e 8·0
Chinchina	16·3	118	i 3 54	+ 6	i 7 9	SS	i 7 38	SSS	—
Bogota	17·8	116	i 4 14	+ 7	i 7 47	SS	e 4 24	pP	—
Chihuahua	21·6	319	e 4 55	+ 6	e 8 43	+ 2	—	—	—
Lubbock	23·2	336	5 2	− 3	9 33	sS	7 53	?	—
St. Louis	25·5	359	i 5 26	− 1	10 0	sS	i 10 44	SS	—
Florissant	25·7	359	e 5 28	− 1	10 40	SS	—	—	—
Fort de France	28·0	84	e 5 48	− 2	e 11 8	?	—	—	—
Morgantown	28·0	17	i 5 49	− 1	e 10 41	+11	—	—	—
Pittsburgh	28·7	16	—	—	e 10 25	−17	—	—	—
Huancayo	28·8	148	e 6 1	+ 4	e 10 53	+10	(e 12 3)	SS	e 12·0
Cleveland	29·3	13	i 6 0a	− 2	e 11 6	sS	e 7 3	PP	—
Pennsylvania	29·7	19	e 6 5	0	e 11 1	+ 3	e 7 5	PP	—
Fordham	31·1	25	e 6 20	+ 3	e 11 34	sS	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Buffalo		31·3	16	e 6 21	+ 2	i 11 29	+ 6	—	—	—
Palisades		31·3	25	i 6 19	0	e 11 28	+ 5	—	—	15·6
Palomar		31·8	315	i 6 23a	− 1	e 11 41	+11	—	—	—
Riverside	Z.	32·5	316	i 6 29a	− 1	—	—	—	—	—
Pasadena		33·1	316	i 6 34a	− 1	i 11 59	+ 8	1 7 56	pPP	e 14·4
Weston		33·5	26	i 6 37	− 1	e 12 8	+11	—	—	—
China Lake		33·7	319	i 6 39a	− 1	e 12 16	sS	i 13 10	ScP	—
Ottawa		34·5	18	6 46	− 1	12 7	− 5	—	—	15·2
Tinemaha		34·8	319	i 6 49a	− 1	—	—	—	—	—
Fresno		35·6	318	e 6 55a	− 1	e 13 50	sS	e 21 59	Q	e 23·8
La Paz		36·4	142	i 7 7a	+ 4	i 12 54	sS	i 8 29	PP	17·9
Shawinigan Falls	N.	36·5	21	7 2	− 2	—	—	—	—	22·6
Reno		37·3	322	e 8 11a	+60	—	—	e 9 21	?	20·1
Santa Clara		37·4	317	i 7 13	+ 1	e 13 10	sS	—	—	—
Seven Falls	E.	37·6	22	7 17	+ 4	13 2	+ 2	8 47	PP	20·1
Berkeley	Z.	37·9	317	i 7 16a	0	—	—	—	—	—
Halifax		38·8	31	9 10	pPP	13 36	sS	16 30	SSS	19·7
Mineral	Z.	38·9	321	e 7 23a	− 1	—	—	e 8 59	PP	24·3
Arcata		40·7	320	7 40	+ 1	13 55	+ 8	—	—	22·5
Saskatoon		41·3	345	—	—	e 17 16	sSSS	—	—	e 26·2
Seattle		43·8	330	e 8 3	− 1	e 14 38	+ 6	e 9 31	PP	e 21·4
Victoria		44·9	330	e 8 12	− 1	—	—	—	—	23·9
La Plata		56·5	148	9 47	+ 6	17 35	+ 7	10 5	pP	26·0
Resolute Bay		61·7	359	e 10 14	− 3	e 18 35	− 1	e 14 6	PPP	e 27·1
Scoresby Sund		70·6	20	e 11 11	− 3	20 23	− 1	25 17	sSS	34·4
Rathfarnham Castle		76·0	38	—	—	e 22 21?	PPS	e 25 7	—	e 38·4
Durham	E.	78·6	37	—	—	22 12	sS	—	—	—
Malaga		78·9	55	i 12 2	0	e 22 4	+ 8	—	—	e 41·3
Granada		79·4	54	e 12 2k	− 2	i 21 53	− 9	—	—	38·4
Kew		79·8	40	e 12 10	+ 4	e 23 10	SPP	e 30 32	SSS	36·4
Almeria		80·4	55	e 12 9	− 1	e 22 13	+ 1	15 13	PP	42·8
Alicante		81·7	53	12 18	+ 1	22 31	+ 6	15 24	PP	38·8
Paris		82·0	42	i 12 22	+ 4	e 22 46	+17	e 23 41	PPS	e 38·4
Tortosa		82·0	50	—	—	e 22 35	+ 6	—	—	e 41·4
Clermont-Ferrand		83·0	45	—	—	e 22 23?	−16	e 23 47	PS	e 44·4
De Bilt		83·0	38	e 12 23	0	e 22 53	+14	—	—	e 39·4
Strasbourg		85·4	41	e 12 35?	0	e 23 9	+ 7	e 24 10	PS	e 40·8
Copenhagen		86·3	34	e 12 49	+ 9	23 17	+ 6	24 17	PS	43·4
Stuttgart		86·3	41	e 12 38	− 2	e 23 13	+ 2	e 16 7	PP	42·4
Jena	E.	87·2	39	13 7	pP	—	—	e 13 24	?	—
Pavia		87·2	44	e 12 47a	+ 3	e 23 19	− 1	e 18 44	PPP	e 42·0
Collmberg	Z.	87·9	39	e 12 47	0	—	—	—	—	—
Prague		89·2	39	—	—	e 23 31	− 7	e 24 46	PS	e 44·4
Tamanrasset	Z.	90·0	67	e 12 58	+ 1	e 23 43	− 3	e 16 32	PP	41·4
Triest		90·2	43	—	—	i 23 38	[+13]	e 25 4	PS	e 46·9
Rome		90·5	47	e 13 1	+ 1	e 23 37	[+10]	e 16 31	PP	—
Helsinki		90·7	27	—	—	e 23 38	[+10]	—	—	—
Skalnate Pleso		93·0	38	e 17 2	PP	e 23 54	[+13]	e 24 4	SKKS	—
Pulkovo		93·2	26	25 49	PS	23 53	[+11]	e 30 39	SS	—
Taranto		94·4	47	—	—	23 57	[+ 8]	—	—	—
Moscow		98·8	27	—	—	24 26	[+14]	e 31 59	SS	—
Istanbul		102·2	42	18 36	PP	24 40	[+11]	e 27 21	PS	50·4
Sverdlovsk		106·3	16	18 36	PP	24 56	[+ 9]	27 56	PS	—
Helwan		109·2	52	—	—	e 25 13	[+13]	e 29 7	PPS	—
Ksara		110·6	46	e 19 11	PP	e 28 42	PS	—	—	—
Vladivostok		112·3	328	e 18 13	[−19]	e 25 25	[+13]	e 28 52	PS	—
Riverview	E.	121·0	239	e 30 15	PS	—	—	—	—	—
Tashkent		122·7	18	i 20 29	PP	i 26 0	[+10]	e 30 18	SKSP	—
Andijan		124·1	16	e 20 38	PP	e 25 46	[− 8]	e 30 22	SKSP	—
Fergana		124·3	16	e 20 41	PP	—	—	—	—	—
Stalinabad		125·0	20	e 21 4?	PP	e 26 12	[+15]	e 27 56	SKKS	—
Bombay		144·1	28	e 19 23?	[− 9]	—	—	—	—	—
Poona		144·9	26	e 19 35	[+ 1]	—	—	—	—	—

For Notes see next page.

NOTES TO APRIL 2d. 0h. 13m. 37s.

Additional readings :—
Puebla i =2m.38s.
Bogota iPP =4m.35s., iSKKS?EN =21m.19s.
St. Louis iS? =10m.13s.
Florissant e =7m.56s., iS? =10m.13s.
Cleveland ePN =6m.5s.
Pennsylvania eEN =6m.54s., eN =10m.45s.. eE =11m.35s.
China Lake eScSEN =17m.11s.
La Paz iPPP =8m.49s., iPcP =9m.31s., iSS? =15m.44s.
Seven Falls SSE =15m.47s., ScSE =17m.32s.
Seattle e =8m.33s., 8m.57s., 9m.5s., and 10m.31s.
La Plata SE =17m.41s., SKS?N =20m.29s., SS?E =20m.59s., N =25m.29s.
Resolute Bay eN =14m.11s.
Scoresby Sund e =13m.45s. and 22m.53s.
Rathfarnham Castle eEN =30m.33s.
Granada PcP =12m.56s., ScS =23m.20s., SS =26m.37s.
Kew ePSZ =24m.5s.
Almeria SS =27m.29s.
Alicante PPP =17m.20s., PS =23m.24s., SS =27m.48s., SSS =31m.28s.
Paris iPPP =17m.34s., eSS =28m.22s.
Strasbourg e =12m.40s., eSSS =32m.23s.
Stuttgart ePPS =24m.28s., ePKKP? =30m.23s.
Tamanrasset eZ =18m.1s., ePPPZ =18m.35s.
Rome eSSE =30m.18s.
Skalnate Pleso eN =19m.13s., eS?N =24m.28s., ePSE =25m.42s., e =27m.33s., eSS = 30m.29s.
Istanbul eZ =19m.8s., eN =25m.48s.
Tashkent eSKKS =27m.34s.
Andijan eSKKS =27m.18s.
Long waves were also recorded at Santa Lucia, Aberdeen, Upsala, Ivigtut, and Christchurch.

April 2d. 14h. 42m. 21s. Epicentre 34°·0N. 38°·0W.

Strasbourg gives epicentre as adopted.

$A = +\cdot6547$, $B = -\cdot5115$, $C = +\cdot5566$; $\delta = +7$; $h = 0$;
$D = -\cdot616$, $E = -\cdot788$; $G = +\cdot439$, $H = -\cdot343$, $K = -\cdot831$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Paris		33·4	51	e 6 39	− 3	—	—	—	—	15·6
Strasbourg		36·8	52	e 7 8	− 3	—	—	—	—	—
Scoresby Sund		37·6	351	e 7 25	+ 7	—	—	e 7 46	?	17·6
Stuttgart		37·7	52	e 7 19	0	e 13 18	+ 8	e 13 59	?	e 18·6
Tamanrasset	z.	39·6	94	i 7 35k	0	—	—	e 9 12	PP	21·6
Istanbul	z.	52·5	62	e 9 19	+ 2	—	—	—	—	—
Helwan	z.	58·0	74	9 54	− 3	—	—	e 10 4	P	—
Ksara		60·0	68	i 10 10	− 1	e 17 18	−65	e 10 57	PcP	—
China Lake	z.	63·5	298	e 10 36	+ 2	—	—	—	—	—
Tinemaha	z.	63·5	299	e 10 36	+ 2	—	—	—	—	—
Reno	z.	63·6	302	e 11 29	+54	—	—	—	—	—
Palomar	z.	64·0	294	e 10 42	+ 4	—	—	—	—	—
Riverside	z.	64·1	295	e 10 32	− 6	—	—	—	—	—
Mineral	z.	64·5	303	e 10 42k	+ 1	—	—	—	—	—
Pasadena	z.	64·6	295	e 10 42	+ 1	—	—	—	—	—
Fresno	z.	64·7	299	e 10 46	+ 4	—	—	—	—	—

Additional readings :—
Tamanrasset iZ =7m.49s. and 8m.22s.
Long waves were also recorded at Palisades, Tortosa, and De Bilt.

April 2d. 17h. 56m. 52s. Epicentre 38°·6N. 70°·5E. (as on 1950, November 21d.).

A = +·2615, B = +·7386, C = +·6213 ; δ = −7 ; h = −1 ;
D = +·943, E = −·334 ; G = +·207, H = +·586, K = −·784.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Obi-garm	0·6	279	i −0 52?	?	e −0 44?	?	—	—	—
Kulyab	0·9	219	i 0 20	0	i 0 34	0	—	—	—
Khorog	1·4	142	0 30	+ 3	0 52	+ 6	—	—	—
Stalinabad	1·4	268	i 0 24	− 3	i 0 42	− 4	—	—	—
Fergana	2·0	29	e 0 41	P_g	i 1 12	S_g	—	—	—
Andijan	2·6	34	0 50	P*	i 1 27	S_g	—	—	—
Lunacharskoe	2·9	342	0 54	P*	i 1 33	S*	—	—	—
Samarkand	2·9	291	e 0 49	+ 1	—	—	—	—	—
Tashkent	2·9	341	i 0 49	+ 1	i 1 26?	+ 2	—	—	—
Tchimkent	3·8	352	i 1 2	+ 1	i 1 44	− 3	—	—	—
Naryn	5·1	54	e 1 36	P*	—	—	—	—	—
Frunse	5·3	35	i 1 29	P*	—	—	—	—	—
Mary	6·9	264	1 40	− 5	2 58	− 7	—	—	—
New Delhi	11·4	149	e 2 50	+ 3	e 4 49	− 7	3 4	PPP	—

New Delhi gives SSSE = 5m.10s., S*E = 5m.32s.
Long waves were recorded at Bombay.

April 2d. 22h. 9m. 35s. Epicentre 6°·2S. 149°·1E. Focus at Base of Superficial Layers. (as on 1942, March 4d.).

A = −·8531, B = +·5106, C = −·1073 ; δ = +1 ; h = +7 ;
D = +·514, E = +·858 ; G = +·091, H = −·055, K = −·994.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Guam		19·5	347	4 27	0	—	—	—	—	—
Brisbane		21·5	170	i 4 51 a	+ 3	i 8 47	+ 8	i 5 16	PP	i 10·9
Riverview		27·6	176	5 48 a	+ 2	i 10 26	+ 2	i 6 36	PP	e 13·1
Manila		34·7	307	e 6 53	+ 4	—	—	e 8 3	PP	—
Apia		39·2	104	e 7 27?	0	—	—	—	—	—
Perth		40·3	226	e 7 35	− 1	i 13 45	+ 4	—	—	i 19·6
Bandong		41·2	267	e 7 51	pP	i 13 57	+ 3	—	—	—
Kaimata	N.E.	41·2	154	e 7 46	+ 3	e 13 54	0	—	—	—
Tuai	N.	41·2	145	e 7 45	+ 2	e 12 25	?	—	—	—
Wellington		41·8	151	i 7 47	− 1	i 14 1	− 2	i 8 15	pP	19·4
Owase		41·9	346	7 49	0	—	—	—	—	—
Djakarta		42·0	268	e 7 56	+ 6	i 14 11	+ 5	—	—	—
Misima		42·2	349	e 7 47	− 4	—	—	i 10 50	?	—
Christchurch		42·5	154	i 7 55	+ 1	i 14 15	+ 2	i 8 18	pP	e 20·7
Hunatu		42·6	349	i 7 55	0	14 14	− 1	—	—	—
Kumamoto		42·6	338	e 7 57	+ 2	14 51	+36	—	—	—
Ooita		42·6	339	e 7 53	− 2	i 14 52	+37	e 18 6	SSS	—
Osaka		42·6	344	e 7 40	−15	—	—	—	—	—
Tokyo		42·6	350	e 8 2	pP	e 14 23	+ 8	e 13 53	PcS	—
Nagoya		42·7	346	e 7 38	−17	—	—	—	—	—
Takamatsu		42·7	343	e 7 57	+ 2	e 14 49	+33	—	—	—
Gihu		43·0	346	e 7 57	− 1	—	—	—	—	—
Hikone		43·0	346	7 58	0	—	—	—	—	—
Kumagaya		43·1	349	e 8 2	+ 3	—	—	—	—	—
Utunomiya		43·4	350	e 8 0	− 1	e 14 23	− 4	—	—	—
Matumoto	E.	43·5	348	e 8 3	+ 1	—	—	—	—	—
Oiwake		43·5	348	8 5	+ 3	—	—	—	—	—
Onahama	E.	43·6	352	e 7 43	−20	—	—	—	—	—
Matusiro		43·7	348	8 4	0	13 59	−32	(17 37)	SS	17·6
Nagano	N.	43·9	348	e 8 6	+ 1	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Shirakawa		43·9	351	e 8 5	0	—	—	—	—	—
Kanazawa		44·1	346	e 8 4	− 3	—	—	—	—	—
Toyama		44·1	347	e 8 10	+ 3	e 14 37	0	—	—	—
Inawasiro		44·3	351	i 8 14	+ 6	—	—	—	—	—
Hukusima		44·5	351	8 11	+ 1	e 14 35	− 7	—	—	—
Sendai		44·9	352	8 13	0	e 14 52	+ 4	—	—	—
Mizusawa	N.	45·7	352	e 8 20	0	e 13 52	PcS	—	—	—
Miyako		46·1	353	i 8 22	− 1	—	—	—	—	—
Akita		46·4	351	e 8 26	+ 1	e 15 9	− 1	—	—	—
Aomori		47·4	352	8 34	+ 1	—	—	—	—	—
Nanking		47·8	325	i 8 36 a	0	i 15 22	− 8	i 8 55	pP	20·1
Urakawa		48·5	355	i 8 43	+ 1	e 15 38	− 1	e 10 30	PP	e 21·9
Mori	N.	48·7	352	e 8 45	+ 2	—	—	—	—	—
Obihiro		49·2	355	e 8 50	+ 3	—	—	—	—	—
Sapporo		49·5	353	8 49	0	e 15 50	− 3	e 9 10	pP	—
Vladivostok		50·8	344	i 9 4	+ 5	i 16 21	+10	i 9 23	pP	—
Petropavlovsk		59·7	7	i 10 1	− 3	—	—	i 10 21	pP	—
Chatra		68·3	302	e 10 58	− 2	—	—	e 39 11	P′P′	—
Kabansk		68·4	333	10 59	− 1	19 56	− 2	—	—	—
Irkutsk		69·6	332	11 6	− 2	20 9	− 3	11 24	pP	—
New Delhi		77·3	301	e 11 50	− 3	i 21 31	− 8	—	—	—
Poona		78·1	290	e 11 56	− 1	21 50	+ 2	14 54	PP	39·0
Bombay		79·1	290	e 12 3	0	i 21 52	− 6	—	—	—
Almata II		81·1	315	12 13	0	—	—	—	—	—
Almata		81·4	315	12 14	− 1	22 18	− 4	—	—	—
Naryn		81·6	312	i 12 13	− 3	22 13	−11	e 12 35	pP	—
Rybach'e		81·8	314	e 12 17	0	e 22 23	− 3	—	—	—
Krasnogorka		82·7	314	—	—	e 22 28	− 8	—	—	—
Frunse		83·0	314	i 12 22	− 1	—	—	—	—	—
Andijan		84·1	312	12 28	− 1	i 22 43	− 7	e 12 48	pP	—
Fergana		84·4	311	e 12 29	− 1	e 22 45	− 8	—	—	—
Kulyab		85·4	308	e 12 37	+ 2	e 22 59	− 3	—	—	—
Obi-garm		85·6	309	e 12 30	− 6	e 22 47	[− 9]	—	—	—
Stalinabad		86·3	309	i 12 39	− 1	i 23 1	[+ 1]	12 59	pP	—
Tashkent		86·4	312	i 12 38	− 2	i 22 53	[− 8]	—	—	—
Tchimkent		86·4	313	12 38	− 2	23 4	[+ 3]	—	—	—
Samarkand		87·9	309	—	—	e 23 9	[− 1]	—	—	—
Mary		91·6	307	13 3	− 2	—	—	—	—	—
Berkeley		92·7	53	e 13 9	− 1	—	—	e 14 16	?	e 43·3
Victoria	z.	92·9	42	e 13 9	− 2	—	—	—	—	—
Mineral	z.	93·4	51	e 13 12k	− 1	—	—	i 13 19	pP	—
Sverdlovsk		94·3	326	i 13 13	− 4	23 38	[−10]	i 17 5	PP	—
Fresno	z.	94·6	54	e 13 18k	− 1	—	—	e 13 57	?	—
Reno		94·8	51	e 13 17	− 3	e 24 26	− 2	e 13 37	pP	—
Pasadena		95·7	56	i 13 23k	− 1	e 39 49	Q	i 14 0	pP	e 44·0
Tinemaha	z.	95·8	54	i 13 24k	0	—	—	e 30 15	PKKP	—
China Lake		96·3	55	i 13 25k	− 1	e 24 40	− 0	e 23 58	SKS	—
Riverside	z.	96·4	56	i 13 27k	0	—	—	i 14 4	pP	—
Palomar		96·7	57	i 13 29	+ 1	i 24 2	[+ 1]	i 24 39	S	—
Resolute Bay		102·7	15	(e 13 57)	+ 2	(e 24 37)	[+ 6]	(e 13 37)	?	—
Moscow		107·2	326	e 18 37	PP	—	—	e 20 56	PPP	—
Pulkovo		109·6	332	e 19 1	PP	28 23	PS	34 37	SS	—
Yalta		112·0	315	e 19 5	PP	—	—	—	—	—
Ksara		112·7	303	19 24	PP	e 36 9	?	—	—	—
Grahamstown	z.	112·9	231	i 18 35	[+ 2]	—	—	—	—	—
Upsala		115·1	335	—	—	e 39 50	SSS	—	—	e 59·4
Scoresby Sund		115·5	357	e 19 31	PP	e 29 21	PS	—	—	56·4
Istanbul		116·5	313	e 18 37	[− 4]	e 29 26	PS	e 19 14	pPKP	e 46·4
Helwan	z.	117·1	300	—	—	e 29 14	SP	e 33 9	?	—
St. Louis		117·6	49	e 18 54	pPKP	—	—	—	—	—
Skalnate Pleso		119·4	324	e 20 43	pPP	e 26 25	SKKS	e 31 9	PPS	—
Copenhagen		119·9	334	20 19	PP	36 55	PSS	—	—	55·4
Potsdam		121·6	330	i 20 43	pPP	—	—	—	—	e 60·4
Collmberg	z.	122·2	329	e 18 53	[+ 2]	e 32 13	PPS	e 28 50	PKKP	—
Prague		122·2	328	e 20 46	pPP	e 26 11	eSKS	e 37 31	SSP	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Cleveland	z.	123·0	44	i 18 49k	[− 4]	—	—	—	—	—
Jena		123·2	329	e 19 29?	[+36]	—	—	e 20 36	PP	—
Witteveen	z.	124·3	334	e 19 0	[+ 4]	—	—	—	—	—
Triest		124·9	323	—	?	e 31 49	PPS	e 42 44	Q	e 52·6
Ottawa		125·0	37	18 57	[0]	—	—	—	—	58·4
De Bilt		125·5	334	e 20 48	PP	e 37 25	SS	—	—	e 65·4
Stuttgart		125·7	328	e 19 0k	[+ 2]	e 22 28	PKS	e 20 53	PP	68·4
Taranto		125·8	316	e 17 45	?	—	—	—	—	—
Strasbourg		126·6	329	e 19 0	[0]	e 32 43	PPS	e 21 3	PP	61·4
Padova		126·7	324	e 18 47	[−13]	—	—	e 16 38	?	—
Rome		127·7	319	e 18 55?	[− 7]	e 22 13	SKP	e 38 10?	SS	—
Pavia		127·9	325	e 21 6	PP	e 32 59	PPS	—	—	—
Kew		128·2	336	e 21 42	?	e 22 16	SKP	—	—	e 60·4
Besançon		128·3	329	e 19 4	[+ 1]	i 22 16	SKP	e 20 59	PP	—
Rathfarnham Castle		128·9	342	i 18 9	?	e 31 22	PS	e 22 18	SKP	e 60·4
Paris		129·0	332	e 19 8	[+ 3]	i 22 24	PKS	i 21 7	PP	e 60·4
Huancayo		132·2	113	i 19 16	[+ 5]	i 22 45	PKS	e 21 38	PP	e 54·8
Chinchina		135·8	88	e 19 19	[+ 1]	e 22 51	PKS	—	—	—
Algiers Univ.	z.	136·6	319	e 19 20	[+ 1]	i 22 44	SKP	—	—	—
La Paz		136·8	122	e 19 16s	[− 3]	40 13	SS	22 7	PP	64·7
Bogota		137·0	90	i 19 22	[+ 2]	i 22 52	PKS	—	—	—
Granada		140·4	325	e 19 55	[+29]	30 9	SKKS	39 52	SS	72·3
Tamanrasset	z.	141·2	300	e 19 24	[− 3]	i 22 57	PKS	e 34 34	PPS	61·4
Fort de France		149·1	72	i 19 39	[− 2]	—	—	e 23 22	PP	—

Additional readings and notes :—
Riverview iNZ =6m.16s., iZ =7m.1s., iN =11m.6s., iSSE =11m.55s., iEZ =12m.27s., iN =12m.50s.
Wellington iPPZ =9m.40s., iPPP =9m.56s., iSSS =17m.26s.
Christchurch eZ =9m.4s., PPZ =9m.38s., SS =17m.35s., eQEN =17m.55s.
Nanking iZ =9m.22s., iPcP =9m 56s , iPP =10m 43s , eN =14m 47s , iEZ =15m 35s , isS? =15m.48s., SS =18m.57s.
Urakawa ePPP? =11m.15s.
Vladivostok isS =16m.56s.
Poona PPPE =16m.42s., eSE =21m.41s., ScSE =21m.58s., PSE =22m.25s., PPSE =22m.46s., SSE =26m.27s., SSSE =29m.46s., QE =32m.44s.
Stalinabad sS =23m.43s.
Sverdlovsk SS =30m.47s.
Reno eZ =25m.12s.
China Lake eZ =14m.8s., ePKKPZ =30m.13s.
Resolute Bay eSEN =(24m.10s.) ; readings have been reduced by 3 minutes.
Pulkovo pPS =28m.43s.
Istanbul ePPEZ =19m.56s., eZ =29m.16s., eSSZ =33m.6s.
Skalnate Pleso eN =21m.13s. and 28m.30s., e =39m.49s.
Prague e =20m.58s., epPP? =21m.17s., e =22m.37s., 23m.40s., and 25m.9s., ePS =30m.57s., eSSS =42m.13s.
Jena ePKP?E =19m.32s.?, eE =20m.1s., eN =20m.7s.
Stuttgart ePKKP? =28m.36s., eSS =37m.55s., eSSS =42m.31s., eQ =61·4m.
Strasbourg e =19m.36s. and 20m.7s., eSS? =38m.49s., SSS =43m.25s.
Rome ePPZ =20m.31s.
Besançon e =20m.8s.
Rathfarnham Castle e =39m.50s.
Paris e =19m.28s., i =21m.14s., iPPP =24m.22s., iPcP,PKP =32m.5s., ePPS? =33m.24s., eScS,PKP? =34m.24s., e =35m.24s., eSS =38m.34s., eSSS =43m.24s., e =44m.34s. and 53m.10s.
Huancayo e =22m.38s., i =23m.4s., e =34m.27s., eSS? =39m.37s.
Algiers Univ. eZ =19m.49s. and 31m.5s.
La Paz iPKP =19m.23s., iZ =19m.43s., iPKS =23m.17s., PS =32m.46s., SSS =45m.5s.
Tamanrasset iZ =19m.30s., eZ =20m.1s., 21m.12s., and 24m.51s., ePPPZ =26m.5s., eZ =30m.49s., ePKKSZ =31m.27s.
Long waves were also recorded at Alicante, Almeria, and Clermont-Ferrand.

April 2d. Readings also at 0h. (Collmberg and near Istanbul), 1h. (Bombay, Tamanrasset, Bogota, Reno, Chinchina, Pasadena, Riverside, Palomar, China Lake, and Tinemaha), 5h. (Apia), 6h. (Samarkand, Tashkent, near Obi-garm, Stalinabad, Khorog, Fergana, and Tchimkent), 7h. (Tananarive), 8h. (Stuttgart), 10h. (Stalinabad, Fergana, Samarkand, Andijan, Tchimkent, near Kulyab, Obi-garm, and Khorog), 11h. (Tacubaya, Mount Wilson, Riverside, Palomar, China Lake, and Tinemaha), 13h. (Apia), 14h. (Apia, Malaga, Almata, Naryn, near Kurmenty, Przhevalsk, Chilisk, Almata II and Ili), 17h. (Santa Lucia, Huancayo, Pasadena, Riverside, China Lake, Tinemaha, near Almata, Almata II, Ili, and Kurmenty), 18h. (Chinchina, Bogota, Tacubaya, Huancayo, La Paz, Ottawa, Pasadena, Riverside, China Lake, Tinemaha, and Fort de France), 19h. (near Manila), 21h. (Chatra), 22h. (Helwan).

April 3d. 3h. 13m. 19s. Epicentre 17°·2S. 174°·4W. (as on 1949, December 6d.).

$A = -\cdot 9513$, $B = -\cdot 0933$, $C = -\cdot 2939$; $\delta = +5$; $h = +5$;
$D = -\cdot 098$, $E = +\cdot 995$; $G = +\cdot 292$, $H = +\cdot 029$, $K = -\cdot 956$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Apia		4·2	37	1 6	− 1	1 42	−15	—	—
Tuai	N.	22·8	198	e 8 41?	?	—	—	—	—
Wellington		25·7	200	e 5 34	− 1	e 10 1	0	—	—
Kaimata	N.E.	28·0	203	e 5 59	+ 4	e 10 53	+15	—	—
Berkeley	Z.	73·5	42	e 11 47	PcP	—	—	—	—
Pasadena	Z.	73·9	47	e 11 38	− 1	—	—	—	—
Fresno	Z.	74·4	43	e 11 41 a	− 1	—	—	—	—
Palomar	Z.	74·4	48	e 11 41	− 1	—	—	—	—
Riverside	Z.	74·4	47	e 11 41	− 1	—	—	—	—
China Lake	Z.	75·3	45	e 11 46	− 1	—	—	—	—
Mineral	Z.	75·4	40	i 11 47 k	0	—	—	i 11 59	PcP
Tinemaha	Z.	75·6	44	e 11 49	+ 1	—	—	—	—
Reno	Z.	76·0	42	e 11 51 a	0	—	—	—	—
Victoria	Z.	79·6	32	e 12 11	+ 1	—	—	—	—
Collmberg	Z.	145·5	353	e 19 46	[+ 6]	—	—	—	—
Prague		146·5	348	e 19 50	[+ 8]	—	—	e 19 59	PKP_2
Stuttgart	Z.	148·4	355	e 19 54	[+ 9]	—	—	—	—
Strasbourg		148·6	357	e 19 56 k	[+11]	—	—	e 20 9	PKP_2
Istanbul	Z.	148·8	325	e 20 1	PKP_2	—	—	—	—
Besançon		150·0	0	e 20 0	[+13]	—	—	e 20 7	PKP_2
Tamanrasset	Z.	174·4	—	e 20 7	[− 4]	—	—	—	—

Additional readings :—
Mineral iZ = 12m.10s.
Prague e = 20m 30s and 20m 56s.
Besançon e = 20m.18s.

April 3d. 4h.

Intensity IV in Chile between 25° and 26° South. Depth suggested 100km.
Strasbourg gives epicentre 25°·25S. 69°·50W.

F. Greve,
Boletin del año 1951, Instituto Sismologico, Universidad de Chile, Santiago, p. 13.

Antofagasta iPE = 39m.21s., iE = 39m.38s., iLE = 39m.41s.
Copiapo iPN = 39m.27s., iN = 39m.41s., iLN = 39m.58s.
La Paz eP = 41m.16s., iS = 42m.50s., L = 43m.22s.
Santa Lucia eN = 42m.38s.
Riverside ePZ = 50m.27s., iZ = 50m.40s., eZ = 50m.53s.
Mount Wilson ePZ = 50m.31s., iZ = 50m.44s.
China Lake ePZ = 50m.35s., iZ = 50m.49s., eZ = 51m.3s.
Palomar eZ = 50m.36s., eZ = 50m.45s.
Tinemaha ePZ = 50m.42s., eZ = 50m.56s.
Mineral ePZ = 51m.6s. a.
Reno ePZ = 51m.12s. k.
Tamanrasset ePZ = 51m.38s., eZ = 51m.58s., Z = 55m.25s.

April 3d 19h 26m. 15s. (I)
23h. 13m. 38s. (II)
Epicentre 39°·2N. 70°·7E. (as on 1950, March 5d.).

$A = +·2568$, $B = +·7334$, $C = +·6295$; $\delta = +9$; $h = -2$;
$D = +·944$, $E = -·331$; $G = +·208$, $H = +·594$, $K = -·777$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
I Obi-garm	0·9	237	i 0 15	P_g	i 0 27	S_g	—	—	—
II	0·9	237	i 0 16?	P_g	i 0 29?	S_g	—	—	—
I Fergana	1·4	31	i 0 25	− 2	e 0 44	S_g	—	—	—
II	1·4	31	e 0 26	− 1	e 0 44	S_g	—	—	—
I Kulyab	1·5	209	i 0 27	− 1	0 47	− 2	—	—	—
II	1·5	209	e 0 31	P_g	e 0 55	S_g	—	—	—
I Stalinabad	1·6	247	i 0 32	P_g	i 0 56	S_g	—	—	—
II	1·6	247	i 0 37	P_g	i 1 2	S_g	—	—	—
I Khorog	1·9	158	i 0 32	− 2	i 1 1	+ 2	—	—	—
II	1·9	158	e 0 35?	+ 1	1 4?	S_g	—	—	—
I Andijan	2·0	39	i 0 37	+ 2	i 1 3	+ 1	—	—	—
II	2·0	39	0 38?	+ 3	i 1 5	S_g	—	—	—
I Tashkent	2·4	333	e 0 44	+ 3	e 1 20?	S_g	—	—	—
I Murgab	2·7	108	i 0 46	+ 1	i 1 21	+ 2	—	—	—
I Samarkand	2·9	279	e 0 56?	P_g	i 1 38?	S_g	—	—	—
II	2·9	279	—	—	e 1 43?	S_g	—	—	—
I Tchimkent	3·1	345	0 53	+ 2	i 1 47	S_g	—	—	—
II	3·1	345	0 55?	P*	e 1 46	S_g	—	—	—
I Naryn	4·6	60	i 1 12	0	—	—	—	—	—
II	4·6	60	—	—	e 2 28	S_g	—	—	—
I Frunse	4·7	38	i 1 16	+ 2	i 2 29	S*	—	—	—
I Krasnogorka	5·2	38	i 1 20	− 1	—	—	—	—	—
I Rybach'e	5·2	50	e 1 22	+ 1	i 3 5	S_g	—	—	—
I Almata	6·2	47	e 1 33	− 2	2 45	− 3	—	—	—
I Almata II	6·4	49	i 1 38	0	—	—	—	—	—
I Kurmenty	6·9	54	i 1 43	− 2	—	—	—	—	—
I Kizyl-Arvat	11·2	274	—	—	6 12	S_g	—	—	—
I New Delhi	11·9	151	e 2 48	− 6	e 5 0	− 9	5 23	SS	4·9

I New Delhi also gives S*E = 5m.44s.

April 3d. Readings also at 0h. (near Bandong), 2h. (Frunse, Almata, Almata II, Rybach'e, Ili, Krasnogorka, near Obi-garm, Fergana, Kulyab, Stalinabad, Khorog, Andijan, Lunacharskoe, Tashkent, Tchimkent, Samarkand, and Tacubaya), 3h. (Pretoria, and near Klyuchi), 4h. (Tamanrasset), 5h. (Bogota, La Paz, near Huancayo, Tacubaya, Mineral, Reno, China Lake, Mount Wilson, Riverside, Palomar, Tinemaha, Apia, Ksara, near Bandong, and Djakarta), 6h. (Grahamstown, Pietermaritzburg, Pretoria, Kimberley, and Tacubaya), 7h. (Tananarive, Jena, Collmberg, and near Stuttgart), 9h. (China Lake and Riverside), 10h. (Apia and near Manila), 11h. and 12h. (Apia), 13h. (Apia and Collmberg), 14h. (Apia, La Paz, Naryn, Almata, Almata II, Ili, near Fergana, Tchimkent, Andijan, Tashkent, Frunse, Krasnogorka, Obi-garm, and Rybach'e), 15h. (Obi-garm (2), Tchimkent, Frunse, Naryn, Samarkand, Mary, near Kulyab, Khorog, Fergana, Andijan, Tashkent, and Murgab), 16h. (near Obi-garm (2)), 17h. (near Huancayo), 18h. (near Gandzha), 21h. (Copiapo, Huancayo, and near La Paz) 22h. (Bogota, Chinchina, Palomar, Pasadena, Riverside, China Lake, Tinemaha, Victoria, Tamanrasset, near Gori, and near Grozny).

April 4d. 1h. 10m. 19s. Epicentre 36°·7N. 22°·5E. (as on 1947, July 21d.).

Intensity IV at Magoula Leonidion (Laconia), and Charokopion (Messina). Epicentre 37°N. 22°·6E.

A. Galanopoulos.
Seismological Institute Bulletin for 1951, Athens, 1952, p. 15.

$A = +·7425$, $B = +·3076$, $C = +·5951$; $\delta = +7$; $h = 0$;
$D = +·383$, $E = -·924$; $G = +·550$, $H = +·228$, $K = -·804$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Athens		1·6	40	0 29	− 1	i 0 47	− 4	—	—	—
Taranto		5·6	314	1 23	− 4	2 26	− 7	—	—	—
Messina		5·7	287	i 1 24 a	− 4	i 2 31	− 4	—	—	—
Istanbul		6·7	48	e 1 39	− 3	e 3 6	+ 6	e 3 26	S*	e 4·0
Ksara		11·3	101	e 3 50	+64	—	—	—	—	—
Prague		14·5	340	—	—	e 6 25	+14	—	—	e 7·1
Stuttgart		15·5	325	e 3 43	+ 1	—	—	—	—	e 9·2
Collmberg	z.	16·1	338	e 3 51	+ 2	—	—	e 4 13	PPP	—
Strasbourg		16·1	322	e 3 54?	+ 5	—	—	—	—	—
Besançon		16·2	316	e 3 53	+ 3	—	—	e 4 27	PPP	—
Paris		19·0	315	e 4 27	+ 1	—	—	i 4 30	?	—
Tamanrasset	z.	20·2	232	e 4 40	+ 1	e 5 54	?	e 5 10	PPP	e 10·2
Granada		20·8	280	i 4 5k	−40	—	—	—	—	—

Additional readings :—
Messina $iP^*Z = 1m.27s.$, $i = 1m.30s.$, 1m.41s., and 2m.42s.
Istanbul $esSS_gE = 3m.38s.$, $esSSS_gE = 3m.48s.$
Long waves were also recorded at Pavia, Rome, and Potsdam.

April 4d. 15h. 20m. 51s. Epicentre 35°·8N. 142°·0E. Depth of focus 0·005.
(as on 1949, Feb. 26d.).

Intensity II-III at Shirakawa, Kannomineyama, and Aso. Epicentre 36°·0N. 142°·0E. Depth of focus 50km.

Seismo. Bull. Cent. Met. Obs., Japan, for 1951, Tokyo, 1951, p.84, with macroseismic chart.

$A = -·6406$, $B = +·5005$, $C = +·5823$; $\delta = -6$; $h = 0$;
$D = +·616$, $E = +·788$; $G = -·459$, $H = +·358$, $K = -·813$.

		△	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Tyosi		0·9	266	0 14	− 4	0 22	− 9
Mito		1·4	295	0 19	− 5	0 32	−11
Onahama		1·5	322	0 17k	− 9	0 37	− 8
Tukubasan		1·6	285	0 19	− 8	—	—
Tokyo		1·8	266	0 27	− 3	0 48	− 4
Utunomiya		1·9	294	0 24	− 7	0 45	− 9
Yokohama		1·9	259	0 32	+ 1	—	—
Mera		2·0	244	0 38	+ 6	—	—
Kumagaya		2·1	279	0 32	− 2	—	—
Hukusima		2·3	328	0 33	− 4	—	—
Inawashiro		2·3	320	0 35	− 2	1 2	− 2
Maebasi		2·4	284	0 36	− 2	1 1	− 6
Sendai		2·6	340	0 40	− 1	1 8	− 4
Isinomaki		2·7	348	0 50	+ 8	—	—
Kohu		2·8	267	0 48	+ 4	1 13	− 4
Oiwake		2·8	281	0 41	− 3	1 22	+ 5
Matusiro		3·1	284	1 0	+12	—	—
Shizuoka		3·1	254	0 45	− 3	—	—
Nagano		3·2	286	0 48	− 1	1 33	+ 6
Matumoto		3·3	278	0 53	+ 2	—	—
Takada		3·3	293	0 48	− 3	—	—
Iida		3·4	267	0 52	0	—	—
Mizusawa	E.	3·4	348	1 30	S	(1 30)	− 2
Miyako		3·8	0	1 9	+11	1 56	+14
Morioka		3·9	351	0 58	− 1	—	—

Continued on next page.

	△	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Toyama	4·0	284	1 11	+10	2 7	+20
Nagoya	4·1	261	1 4	+ 2	—	—
Hikone	4·7	265	1 38	?	—	—
Tsuruga	4·8	270	1 14	+ 2	—	—
Aomori	5·1	350	2 2	S	(2 2)	−12
Osaka	5·4	260	1 29	+ 9	—	—
Urakawa	6·4	5	1 31	− 3	2 44	− 2

Additional readings :—
Mizusawa SE =1m.45s.
Aomori S =2m.46s.

April 4d. 17h. Undetermined shock. South Pacific, very deep.

Apia P =16m.42s., S =18m.43s.
Brisbane iPZ =18m.42s. a.
Auckland eSN =19m.55s.
Tuai eN =20m.0s.
Kaimata eNE =21m.0s.
New Plymouth eE =21m.0s.
Wellington e =21m.0s.
Riverview eE =23m.17s., iE =26m.14s.
Lick iPZ =25m.25s. k.
Pasadena iPZ =25m.26s.
Riverside iPZ =25m.28s. k.
Fresno ePZ =25m.29s. a.
Palomar iPZ =25m.29s. k.
Mineral ePZ =25m.33s. k, eZ =26m.9s.
China Lake iPZ =25m.34s. k, epPZ =27m.45s.
Tinemaha iPZ =25m.34s. k, epPZ =27m.45s.
Reno ePZ =25m.37s. a, eZ =25m.58s.
Victoria eZ =25m.52s.
Collmberg eZ =32m.50s. and 32m.58s.
Stuttgart ePKPZ =32m.50s., ePKP$_2$?Z =32m.59s., eZ =33m.11s.
Jena ePKP?EN =32m.54s., eEN =33m.1s., eN =33m.4s.
Prague ePKP =32m.54s., ePKP$_2$ =33m.10s., e =33m.22s. and 34m.8s.
Strasbourg ePKP =33m.0s., ePKP$_2$? =33m.14s.
Tamanrasset ePKPZ =33m.12s.
Paris ePKP? =33m.17s.
Besançon ePKP$_2$ =33m.32s.

April 4d. 18h. 55m. 55s. Epicentre 37°·7N. 141°·8E. Depth of focus 0·010.
(as on 1950, July 12d.).

Intensity VI at Onikohe ; V at Sendai, Inawashiro, Kogota, Onagawa, Matsukura ; IV at Hukusima, Yamagata, Onahama, Miyako, Utunomiya, Hurukawa, Watari, Toyama, Senamaya, and Sakari. Epicentre 37°·9N. 142°·0E. Depth 70km.

Seismo. Bull. Cent. Met. Obs., Japan, April, 1951, Tokyo, 1951, p.85, with macroseismic chart.

$A = -·6234$, $B = +·4905$, $C = +·6090$; $\delta = +10$: $h = -1$;
$D = +·618$, $E = +·786$; $G = -·479$, $H = +·377$, $K = -·793$.

	△	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Isinomaki	0·8	333	0 15	− 3	0 25	− 7
Sendai	0·9	309	0 17 a	− 2	0 29	− 5
Hukusima	1·1	273	0 19 a	− 3	0 34	− 4
Onahama	1·1	223	0 23	+ 1	0 39	+ 1
Inawashiro	1·3	264	0 24 a	0	0 42	0
Yamagata	1·3	296	0 21	− 3	0 37	− 5
Mizusawa	1·5	343	0 23	− 4	0 39	− 8
Mito	1·7	219	0 31	+ 2	0 54	+ 3
Miyako	1·9	4	0 26	− 6	0 46	− 9
Utunomiya	1·9	233	0 34	+ 2	0 57	+ 2

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Morioka		2·0	347	0 27 a	− 6	0 47	−10
Tukubasan		2·0	322	0 33	0	0 59	+ 2
Niigata		2·2	276	0 43	+ 7	1 4	+ 2
Akita		2·4	326	0 37	− 1	1 3	− 4
Kumagaya		2·5	231	0 41 a	+ 1	1 12	+ 2
Maebasi		2·6	239	0 43 a	+ 2	1 14	+ 2
Tokyo		2·6	219	0 43	+ 2	1 15	+ 3
Aikawa		2·8	276	0 42	− 2	1 5	−12
Hatinohe		2·8	356	0 40	− 4	1 8	− 9
Titibu		2·8	232	0 45	+ 1	1 19	+ 2
Yokohama		2·8	217	0 49	+ 5	1 24	+ 7
Oiwake		2·9	242	0 51	+ 6	1 32	+13
Takada		2·9	258	0 48	+ 3	1 23	+ 4
Nagano		3·0	247	0 50	+ 3	1 25	+ 3
Matusiro		3·1	248	0 50	+ 2	1 26	+ 2
Aomori		3·2	346	0 53	+ 3	1 23	− 4
Mera		3·2	210	0 57	+ 7	1 39	+12
Hunatu		3·3	228	0 54	+ 3	1 31	+ 2
Kohu		3·3	231	0 56	+ 5	1 36	+ 7
Matumoto		3·4	245	0 55	+ 3	1 38	+ 6
Misima		3·5	223	0 54	0	1 36	+ 2
Osima		3·5	214	0 59	+ 5	—	—
Toyama		3·8	256	0 59	+ 1	1 58	+16
Shizuoka		3·9	226	1 2	+ 3	1 46	+ 2
Wazima		3·9	267	1 0 a	+ 1	—	—
Kanazawa		4·3	255	1 7	+ 2	—	—
Mori		4·5	348	1 4	− 3	1 50	− 9
Urakawa		4·5	9	0 57	−10	1 49	−10
Nagoya		4·7	237	1 15	+ 5	2 22	+18
Tsuruga		5·0	247	1 17 k	+ 3	2 14	+ 3
Hikone		5·1	243	1 18	+ 2	2 14	0
Kameyama		5·2	238	1 29	+12	2 35	+19
Tu		5·2	237	1 28	+11	2 39	+23
Sapporo		5·3	356	1 25	+ 7	2 42	+24
Kyoto		5·6	243	1 20	− 2	2 43	+17
Owase		5·8	233	1 25	0	—	—
Kobe		6·2	243	1 42	+12	—	—
Sumoto		6·5	241	1 58	+23	—	—
Kôti		7·9	241	2 15	+21	4 3	+41
Vladivostok		9·3	308	i 2 10	− 3	e 3 56	0
Ooita		9·4	245	2 19	+ 5	5 17	?
Kumamoto		10·3	245	2 31	+ 5	—	—
Petropavlovsk		19·3	32	e 4 17	− 3	e 7 55	+ 7
Resolute Bay	z.	61·9	15	e 10 8	− 4	—	—
Reno	z.	72·8	53	e 11 9 a	−11	—	—
Fresno	z.	74·4	55	e 11 27 a	− 2	—	—
Tinemaha	z.	75·1	54	i 11 34	+ 1	—	—
China Lake	z.	76·3	55	i 11 40 k	0	—	—
Pasadena	z.	77·0	56	i 11 42	− 2	—	—
Riverside	z.	77·6	56	e 11 45	− 2	—	—
Palomar	z.	78·3	57	i 11 50	− 1	—	—
Stuttgart	z.	84·2	331	e 12 19	− 3	—	—

April 4d. Readings also at 0h. (near Huancayo), 1h. (Tortosa, Frunse, Samarkand, Tashkent, near Andijan, Fergana, Khorog, Kulyab, Obi-garm, Stalinabad, and Tchimkent), 2h. (Riverside, China Lake, Oaxaca, Puebla, Vera Cruz, near Tacubaya, and near Mizusawa), 6h. (near Malaga, near Sotchi, and near Fort de France), 8h. (Brisbane, Kaimata, Christchurch, Wellington, near Apia, Prague, and near Collmberg (2)), 9h. (near Akhalkalaki, Gandzha, and Tsikhlis-Dzhvari), 10h. (Mineral, Petropavlovsk, Vladivostok, Irkutsk, Kabansk, and Sverdlovsk), 11h. (Ksara and Zi-ka-wei), 12h. (Erevan and Grahamstown), 13h. (Andijan, Ashkabad, Fergana, Samarkand, near Khorog, Kulyab, Obi-garm, and Stalinabad), 14h. (near Collmberg), 15h. (Rybach'e, near Almata II, Ili, and Kurmenty), 17h. (near Alicante), 18h. (Grahamstown, Puebla, and Tacubaya), 19h. (Palomar, Riverside, China Lake, Tinemaha, Manzanillo, Puebla, Vera Cruz, and near Tacubaya), 20h. (Tacubaya), 22h. (near Akhalkalaki, Gandzha, and Tsikhlis-Dzhvari).

April 5d. 3h. 15m. 22s. Epicentre 37°·4N. 20°·0E. (as on 1947, Sept. 19d.).

Intensity IV at Astakos (Acarnania); III at Pyrgos and Ithaca.
Epicentre suggested 37°·5N. 20°·2E., with depth 100km.

A. Galanopoulos.
Seismological Institute Bulletin, 1951, Athens, 1952, p.15.

$A = +\cdot7484$, $B = +\cdot2724$, $C = +\cdot6048$; $\delta = +9$; $\lambda = -1$;
$D = +\cdot342$, $E = -\cdot940$; $G = +\cdot568$, $H = +\cdot207$, $K = -\cdot796$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Athens		3·0	79	0 51	+ 1	e 1 27	0	—	—	i 1·7
Messina		3·6	284	i 1 1	+ 3	i 1 43	+ 1	i 1 25	P_g	—
Taranto		3·8	326	0 49	−12	e 1 45	S*	e 1 22	P_g	—
Sofia		5·9	25	i 1 29	− 2	i 2 31	− 9	i 1 59	P_g	—
Rome		7·3	310	e 1 24?	−26	i 3 16	+ 1	e 2 17	P_g	3·8
Belgrade		7·4	3	e 1 48k	− 4	e 3 12	− 6	e 2 22	P_g	i 4·0
Istanbul		7·9	60	i 1 59	0	e 3 35	+ 5	e 2 48	P_g	e 5·3
Bucharest		8·4	32	e 2 3	− 3	e 3 22	−21	—	—	i 4·2
Timisoara		8·4	6	e 2 43	P_g	e 4 30	S_g	—	—	—
Florence		9·2	316	e 2 24	+ 8	3 58	− 5	4 23	S*	—
Kalossa		9·2	355	e 2 35	+19	e 4 13	+10	—	—	5·6
Prato		9·3	316	e 2 27	+10	e 4 55	S_g	—	—	—
Padova		9·4	322	e 2 49?	P*	e 5 1	S_g	—	—	—
Triest		9·5	332	e 2 32	+12	i 3 59	−11	e 3 2	PPP	i 5·2
Bologna		9·7	320	e 2 52	+30	e 4 36	+21	—	—	e 5·7
Budapest		10·1	356	e 2 30	+ 1	e 4 14	−11	—	—	5·6
Ogyalla		10·5	353	e 3 53	?	e 4 26	− 9	—	—	—
Pavia		11·3	317	e 2 47	+ 1	e 4 31	−23	e 5 41	Q	e 6·2
Uzhgorod		11·3	8	e 2 47	+ 1	—	—	—	—	—
Kishinev		11·6	31	i 2 47	− 3	—	—	—	—	—
Skalnate Pleso		11·8	1	e 2 50	− 3	e 4 57	− 9	e 5 34	SS	e 5·9
Helwan		12·1	125	e 2 50	− 7	4 53	−21	5 36	S*	e 6·0
Chur		12·2	324	e 3 1	+ 3	e 5 4	−12	—	—	—
Lwow		12·8	12	i 3 4	− 2	e 5 27	− 3	—	—	—
Yalta		12·8	52	3 2	− 4	5 24	− 6	—	—	—
Zürich		13·1	323	e 3 16	+ 6	5 29	− 9	—	—	—
Prague		13·3	344	i 3 15	+ 2	e 5 48	+ 6	e 3 37	pP	e 6·8
Ksara		13·4	101	e 3 13	− 1	e 7 4	L	—	—	(e 7·1)
Basle		13·6	322	e 3 18	+ 1	e 6 1	+11	—	—	e 7·7
Neuchatel		13·6	319	e 3 34	PPP	—	—	—	—	e 8·5
Cheb		13·8	339	e 3 31	+12	e 6 11	+17	e 4 49	?	e 6·8
Stuttgart		13·8	329	e 3 21	+ 2	e 6 2	+ 8	e 3 32	PP	e 8·1
Besançon		14·3	318	e 3 33	+ 7	e 6 4	− 2	e 3 43	PP	—
Karlsruhe		14·3	328	e 3 32	+ 6	e 6 27	+21	—	—	e 7·6
Strasbourg		14·3	325	e 3 28	+ 2	e 6 8	+ 2	—	—	e 7·8
Sonneberg	E.	14·4	337	—	—	e 6 25	+16	—	—	e 7·5
Collmberg		14·8	343	e 3 32	0	e 7 46	L	e 3 40	PP	e 8·8
Jena		14·8	338	e 3 34?	+ 2	e 6 33	+15	—	—	e 8·0
Clermont-Ferrand		15·1	309	e 2 56	?	e 5 56	−29	e 3 14	P	e 8·2
Tortosa		15·5	289	e 3 42	0	i 6 54	+19	—	—	—
Potsdam		15·7	344	i 3 48	+ 4	e 6 19	−20	i 3 55	PP	9·0
Alicante		16·2	280	3 51	+ 1	7 3	+12	4 8	PP	e 8·0
Paris		17·1	317	i 4 13	+11	i 7 27	+15	i 7 46	SS	e 9·6
Almeria		17·9	275	i 4 13	+ 1	e 7 41	+11	4 31	PP	9·4
De Bilt		18·0	330	i 4 18	+ 5	e 7 43	+11	i 4 38	PP	e 9·6
Witteveen	z.	18·0	334	e 4 22	+ 9	—	—	—	—	—
Borzhomi		18·5	68	4 18	− 1	e 7 44?	0	—	—	—
Piatigorsk		18·7	62	4 19	− 3	7 41	− 7	—	—	—
Leninakan		18·8	72	e 4 20	− 3	—	—	—	—	—
Granada		18·8	277	i 4 24a	+ 1	i 8 22	SS	i 5 0	PP	14·1
Toledo		18·9	284	e 4 26	+ 2	e 7 40	−13	4 40	PP	10·1
Copenhagen		19·0	347	i 4 26a	0	i 7 58	+ 3	—	—	10·0
Tamanrasset	z.	19·2	225	i 4 30a	+ 2	e 8 16	+17	—	—	9·7
Malaga		19·5	276	i 4 32	+ 1	i 7 58	− 8	—	—	e 10·0
Tiflis		19·6	68	4 29	− 3	—	—	—	—	—

Continued on next page.

		△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	Supp. m. s.		L. m.
Kew		20·1	321	e 4 35	− 3	e 8 20	+ 1	e 9 22	SS	e 10·6
Grozny		20·5	65	e 4 42	0	e 8 30	+ 3	—	—	—
Kirovobad		20·7	71	i 4 41	− 3	—	—	—	—	—
Moscow		21·9	27	e 4 53	− 4	e 8 50	− 4	—	—	—
Upsala		22·5	356	i 5 2	0	i 9 2	− 3	i 5 29	PP	e 11·6
Lenkoran		22·7	75	5 0	− 4	—	—	—	—	—
Helsinki		23·0	5	e 5 5	− 2	e 9 10	− 4	e 9 14	PcP	e 12·9
Baku		23·4	73	e 5 12	+ 1	e 9 21	0	—	—	—
Pulkovo		23·4	13	e 5 8	− 3	i 9 16	− 5	—	—	—
Rathfarnham Castle		24·2	320	e 5 36?	+17	e 9 43	+ 8	e 5 51	PP	e 13·0
Aberdeen	E.	24·6	330	i 8 32	?	i 9 43	+ 1	i 10 44	SS	13·6
Kizyl-Arvat		28·4	74	e 5 56	− 2	—	—	—	—	—
Ashkabad		30·2	76	e 6 10	− 4	e 11 7	− 6	—	—	—
Sverdlovsk		33·1	41	i 6 36	− 4	i 11 50	− 9	—	—	—
Samarkand		36·5	71	e 7 5	− 4	—	—	—	—	—
Tashkent		37·9	68	i 7 16?	− 4	i 13 7?	− 6	—	—	—
Tchimkent		38·0	66	e 7 18	− 3	—	—	—	—	—
Stalinabad		38·1	72	e 7 20	− 2	e 13 8	− 8	—	—	—
Kulyab		39·0	73	e 7 34	+ 4	—	—	—	—	—
Scoresby Sund		39·8	339	e 7 44	+ 8	—	—	—	—	20·6
Andijan		40·3	68	7 37	− 3	e 13 40	− 9	—	—	—
Khorog		40·5	73	e 7 42	0	—	—	—	—	—
Frunse		41·5	64	e 7 47	− 3	—	—	—	—	—
Murgab		42·1	71	i 7 54	− 1	i 14 13	− 3	—	—	—
Almata		43·1	63	8 2	− 2	—	—	—	—	—
Almata II		43·4	63	i 8 3	− 3	—	—	—	—	—
Bombay		49·4	97	e 8 55	+ 2	e 16 0	0	10 50	PP	—
Irkutsk		58·3	46	e 9 56	− 3	—	—	—	—	—
Kabansk		59·7	46	10 6	− 3	e 18 9	−10	—	—	—
Pretoria	Z.	63·3	171	i 10 43	+10	—	—	—	—	—
Harvard		67·0	306	e 10 59	+ 2	—	—	—	—	—
Morgantown		73·9	307	e 11 42	+ 3	—	—	—	—	—
Vladivostok		78·8	44	e 12 2	− 4	—	—	—	—	—
La Paz		98·4	255	13 52	+11	25 10	+ 3	—	—	—

Additional readings :—
Messina eE = 4m.4s.
Rome iS?N = 2m.46s.
Belgrade eZ = 2m.6s., eP_gS_gNW = 2m.55s., $eP_gS_{g?}NE$ = 3m.40s., iS_gNE = 3m.56s.
Istanbul $esPP_g$ = 2m.38s., eE = 3m.56s., e = 4m.4s., $esSS_g$ = 4m.28s., e_gSSS_gN = 4m.35s.
Bucharest iS?N = 3m.26s.
Timisoara eE = 4m.9s., iSN = 4m.55s.
Kalossa eN = 3m.31s. and 4m.53s., eE = 5m.1s., eN = 5m.18s.
Triest $eS_gS_g?$ = 4m.58s.
Budapest ePE = 2m.44s., eE = 5m.0s., eN = 5m.10s., eE = 5m.16s., eN = 5m.22s.
Ogyalla eE = 4m.5s., e = 4m.15s., eS_gN = 5m.22s., eS_gE = 5m.27s.
Skalnate Pleso eN = 2m.54s., epPN = 3m.11s., e = 4m.1s., eSN = 4m.54s., eN = 5m.25s.
Helwan eZ = 3m.40s.
Prague e = 3m.21s., esP = 3m.46s., e = 4m.11s., 4m.49s., and 5m.27s., esS? = 6m.26s.
Stuttgart eSS = 6m.19s., e = 7m.11s.
Besançon e = 3m.54s., 4m.34s., and 4m.51s.
Strasbourg eP = 3m.32s., e = 3m.58s., 5m.1s., 5m.50s., and 6m.26s.
Collmberg eZ = 5m.47s.
Jena eEN = 3m.40s. and 3m.57s., eE = 4m.7s., eSN = 6m.36s.
Clermont-Ferrand e = 7m.20s.
Potsdam eSE = 6m.22s., iSSSEN = 6m.53s., iSSS?Z = 6m.59s.
Alicante SS = 7m.23s., SSS = 7m.37s., PcS = 12m.21s.
Paris iPcP = 8m.47s.
Granada PPP = 6m.11s., SS? = 11m.28s.
Toledo e = 8m.1s., SS = 8m.15s.
Kew eZ = 6m.50s.
Upsala iSE = 9m.6s., eN = 9m.17s., eSSE = 9m.42s.?.
Helsinki eZ = 5m.9s., eSSE = 9m.50s.
Rathfarnham Castle eSSEN = 10m.52s.
Bombay PPPEN = 11m.50s., ScSEN = 18m.45s.

April 5d. 9h. 10m. 58s. Epicentre 36°·7N. 142°·5E. Depth of focus 0·005.
(as on 1945, Jan. 6d.).

Intensity II-III at Inawashiro. Epicentre 36°·7N. 142°·3E., suggested depth 40-60km.

Seismo. Bull. Cent. Met. Obs., Japan, 1951, Tokyo, 1951, p.95.

$A = -·6376$, $B = +·4893$, $C = +·5951$; $\delta = +9$; $h = 0$;
$D = +·609$, $E = +·793$; $G = -·472$, $H = +·362$, $K = -·804$.

	Δ	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Onahama	1·3	280	0 24 a	+ 1	0 38	− 2
Tyosi	1·6	234	0 27	0	0 44	− 3
Mito	1·7	259	0 26	− 2	0 45	− 5
Hukusima	1·9	303	0 30	− 1	0 49	− 5
Shirakawa	1·9	283	0 30	− 1	0 43	−11
Sendai	2·0	321	0 32	0	0 56	− 1
Tukubasan	2·0	256	0 28	− 4	—	—
Inawashiro	2·1	295	0 33	− 1	0 54	− 5
Utunomiya	2·1	266	0 33	− 1	0 57	− 2
Tokyo	2·4	245	0 39	+ 1	1 7	0
Kumagaya	2·6	258	0 44	+ 3	1 11	− 1
Yokohama	2·6	241	0 47	+ 6	—	—
Mizusawa	2·7	336	0 47	+ 5	e 1 15	+ 1
Maebasi	2·8	264	0 43	− 1	1 14	− 3
Mera	2·8	230	0 56	+12	—	—
Titibu	2·8	255	0 55	+11	—	—
Miyako	2·9	352	1 1	+16	1 31	+12
Hunatu	3·2	248	0 43	− 6	1 37	+10
Morioka	3·2	341	0 52	+ 3	1 29	+ 2
Oiwake	3·2	263	0 48	− 1	—	—
Misima	3·3	241	0 58	+ 7	1 35	+ 6
Kohu	3·4	253	0 54	+ 2	1 37	+ 5
Matusiro	3·4	269	0 54	+ 2	—	—
Nagano	3·4	269	0 52	0	1 47	+15
Akita	3·6	329	1 6	+11	—	—
Matumoto	3·7	264	0 52	− 4	—	—
Shizuoka	3·8	244	1 0	+ 2	1 47	+ 5
Iida	4·0	254	1 6	+ 5	—	—
Aomori	4·3	343	1 39	+34	—	—
Toyama	4·3	272	1 23	+18	—	—
Nagoya	4·7	253	1 16	+ 6	2 16	+12
Gihu	4·8	256	1 4	− 8	1 53	−14
Hikone	5·3	256	2 16	S	(2 16)	− 3
Tsuruga	5·3	261	1 32	+13	—	—

April 5d. Readings also at 0h. (La Paz, Pretoria, Tamanrasset, near Kulyab, Obi-garm and Stalinabad), 1h. (Santa Lucia), 3h. (Almata, Almata II, Fergana, Przhevalsk, Tchimkent, near Andijan, Khorog, Murgab, Naryn, Obi-garm, Clermont-Ferrand, near Collmberg, and Jena), 4h. (Haiwee, China Lake, Tinemaha, Paris, Strasbourg, Stuttgart, and near Malaga), 5h. (Apia, Stuttgart, and Angra do Heroismo), 7h. (Tananarive), 8h. (Ksara and Tacubaya), 9h. (Tacubaya), 10h. (Mount Wilson, Riverside, China Lake, Tinemaha, and Mineral), 12h. (Andijan, Almata II, Naryn, Stalinabad, Tashkent, Tchimkent, near Fergana, Khorog, Kulyab, and Murgab), 14h. (Ili, Frunse, Rybach'e, near Andijan (2), Fergana (2), Khorog, Kulyab (2), Lunacharskoe, Murgab, Naryn, Stalinabad (2), Tashkent, and Tchimkent), 15h. (near Apia), 16h. (Collmberg, Stuttgart (2), and near Apia), 17h. (near Victoria), 18h. (near Akhalkalaki, Gandzha, and Stepanavan), 19h. (near Akhalkalaki, Gandzha, and Stepanavan), 20h. (Leninakan, Tiflis, near Akhalkalaki, Gandzha, Stepanavan, Tsikhlis-Dzhvari, and near Antofagasta), 23h. (New Delhi, Poona, Ashkabad, Mary, near Andijan, Fergana, Khorog, Kulyab, Lunacharskoe, Murgab, Samarkand, Stalinabad, Tashkent, and Tchimkent).

April 6d. 1h. 20m. 55s. Epicentre 23°·5N. 128°·5E.

U.S.S.R. gives epicentre as adopted.

A = −·5715, B = +·7184, C = +·3965; δ = −8; h = +4;
D = +·783, E = +·623; G = −·247, H = +·310, K = −·918.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Zi-ka-wei	z.	9·9	322	2 6	−19	3 56	−24	(4 26)	SS	4·4
Vladivostok		19·8	9	e 4 15	−20	e 7 52	−21	—	—	—
Petropavlovsk		37·4	29	e 7 7	− 9	—	—	—	—	—
Przhevalsk		45·4	307	e 8 20	− 2	—	—	—	—	—
Almata II		46·2	309	e 8 26	− 2	—	—	—	—	—
Almata		46·6	309	e 8 29	− 3	—	—	—	—	—
Rybach'e		47·1	307	e 8 31	− 4	—	—	—	—	—
Frunse		48·2	308	e 8 43	− 1	—	—	—	—	—
Andijan		49·7	304	e 8 54	− 2	e 15 59	− 5	—	—	—
Fergana		50·2	304	e 8 56	− 4	—	—	—	—	—
Khorog		50·3	300	e 9 9	+ 9	—	—	—	—	—
Tashkent		52·1	305	i 9 12	− 2	—	—	—	—	—
Stalinabad		52·5	302	e 9 17	0	—	—	—	—	—
Samarkand		53·8	303	e 9 24	− 2	—	—	—	—	—
Mary		58·0	301	e 9 58?	+ 1	—	—	—	—	—
Sverdlovsk		58·6	324	i 9 54	− 7	17 50	− 14	—	—	—
Ashkabad		60·7	302	e 10 18	+ 3	—	—	—	—	—
Borzhomi		71·2	308	e 11 25	+ 2	—	—	—	—	—
Moscow		71·4	324	e 11 20	− 4	—	—	—	—	—
Resolute Bay	z.	78·2	11	e 11 58	− 5	—	—	e 12 10	PcP	—
Ksara		79·4	302	e 12 15	+ 6	e 22 35	+25	—	—	—
Istanbul	z.	81·6	311	e 12 24	+ 3	—	—	—	—	—
Uzhgorod		82·7	320	e 12 32	+ 5	—	—	—	—	—
Skalnate Pleso		83·7	321	e 14 26	?	—	—	e 15 46	PP	—
Potsdam		85·9	327	e 12 49	+ 6	—	—	—	—	e 46·1
Prague		86·4	324	e 12 44	− 1	—	—	—	—	—
Collmberg	z.	86·5	325	e 12 45	− 1	—	—	e 12 55	PcP	—
Jena		87·5	325	e 12 45?	− 6	—	—	e 12 48	P	—
Stuttgart		90·0	325	e 13 3	0	—	—	e 13 11	PcP	e 48·1
Rome		92·1	318	e 15 35	?	—	—	—	—	e 47·7
China Lake	z.	94·1	48	e 13 27	+ 5	—	—	—	—	—
Pasadena	z.	94·6	50	i 13 34	+10	—	—	—	—	—
Riverside	z.	95·2	50	e 13 37	+10	—	—	—	—	—
Tamanrasset	z.	108·0	305	e 18 23	[− 6]	—	—	e 18 52	?	—

Additional readings :—
Resolute Bay eZ = 12m.34s.
Skalnate Pleso e = 19m.19s., 22m.16s., and 22m.24s.
Prague e = 13m.1s., 13m.29s., and 14m.47s.
Long waves were also recorded at many other European stations.

April 6d. 20h. 29m. 53s. Epicentre 44°·5N. 28°·0W.

Strasbourg gives epicentre as adopted.

A = +·6318, B = −·3360, C = +·6985; δ = −3; h = −3;
D = −·469, E = −·883; G = +·617, H = −·328, K = −·716.

	△	Az.	P.	O−C.	P.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Malaga	19·5	105	i 4 33	+ 2	e 8 3	− 3	—	—	—
Kew	19·7	60	—	—	e 8 7	− 3	—	—	—
Granada	19·8	104	i 4 37a	+ 2	8 7	− 6	5 37	?	9·0
Almeria	20·8	103	e 4 48	+ 3	e 8 12	−21	5 12	PP	10·6
Tortosa	21·2	90	e 4 47	− 2	—	—	—	—	e 11·1

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Paris		21·3	67	i 4 51	+ 1	—	—	i 5 31	PPP	e 10·1
Alicante		21·5	97	e 5 4	+12	8 55	+ 8	5 52	PPP	e 10·8
Besançon		23·7	71	e 5 15	+ 1	—	—	—	—	—
Strasbourg		24·8	67	e 5 46?	+21	—	—	e 6 47	?	e 12·1
Stuttgart		25·7	67	e 5 31	− 2	—	—	e 7 16	?	e 13·2
Collmberg	Z.	28·0	62	e 5 56	+ 1	—	—	—	—	—
Seven Falls	E.	29·7	292	e 2 31	?	—	—	—	—	14·4
Tamanrasset	Z.	35·0	118	i 6 56a	0	—	—	e 8 26	PP	—
Reno	Z.	64·8	303	e 10 43k	0	—	—	e 11 9	?	—
Tinemaha	Z.	65·4	299	e 10 50	+ 3	—	—	—	—	—
China Lake	Z.	65·7	298	e 10 46	− 2	—	—	—	—	—
Fresno	Z.	66·5	301	e 10 51a	− 3	—	—	—	—	—
Palomar	Z.	66·8	296	e 10 53	− 3	—	—	—	—	—
Pasadena	Z.	67·1	297	e 10 55	− 2	—	—	—	—	—
La Paz		70·9	221	e 11 25	+ 4	—	—	—	—	

Additional readings :—
Paris i = 5m.1s. and 6m.35s.
Besançon e = 5m.32s. and 5m.55s.
Tamanrasset eZ = 8m.39s.
Long waves were also recorded at De Bilt, Potsdam, Rome, and Pavia.

April 6d. 22h. 54m. 8s. Epicentre 46°·6N. 142°·4E. Depth of focus 0·040.

Intensity II-III at Hatinohe and Kusiro. Epicentre as adopted. Depth 320km.

Seismological Bulletin of the Central Meteorological Observatory, Japan, for April, 1951, Tokyo, 1951, p.87, macroseismic chart p.87.

A = −·5463, B = +·4207, C = +·7243 ; δ = +4 ; h = −4 ;
D = +·610, E = +·792 ; G = −·574, H = +·442, K = −·689.

	△	Az.	P.	O−C.	S.	O−C.	Supp.	
	°	°	m. s.	s.	m. s.	s.	m. s.	
Yuzno-Sakhlinsk	0·4	32	i 0 51	+14	i 1 24	+18	—	—
Wakkanai	1·3	203	0 58	+17	1 34	+21	—	—
Abashiri	2·8	152	0 58	+ 5	1 43	+ 8	—	—
Sapporo	3·6	192	1 8a	+ 6	1 58	+ 8	—	—
Obihiro	3·7	171	1 6	+ 3	1 54	+ 2	—	—
Kusiro	3·9	158	1 7	+ 2	1 56	0	—	—
Nemuro	4·0	144	1 7	+ 1	1 54	− 4	—	—
Urakawa	4·5	176	1 14	+ 2	2 6	− 2	—	—
Mori	4·7	197	1 22	+ 8	2 27	+15	—	—
Aomori	5·9	192	1 30	+ 2	2 35	− 3	—	—
Hatinohe	6·1	186	1 32	+ 1	2 38	− 4	—	—
Miyako	7·0	183	1 40a	− 2	2 52	−10	—	—
Morioka	7·0	188	1 40a	− 2	2 56	− 6	—	—
Akita	7·1	194	1 44	+ 1	2 57	− 7	—	—
Mizusawa	7·5	187	1 45	− 3	3 6	− 7	1 48	P
Sakata	7·9	194	1 53	0	2 51	−31	—	—
Vladivostok	8·2	249	i 2 3	+ 6	i 3 36	+ 8	—	—
Sendai	8·4	188	1 59	0	3 26	− 7	—	—
Yamagata	8·5	191	1 56	− 4	3 29	− 6	—	—
Hukusima	9·0	190	2 5	− 2	3 41	− 5	—	—
Aikawa	9·1	201	2 7	− 1	3 45	− 3	—	—
Inawasiro	9·2	191	2 9	0	3 51	0	—	—
Shirakawa	9·6	190	2 13	− 1	—	—	—	—
Onahama	9·7	187	2 13	− 2	—	—	—	—
Takada	10·0	200	2 19	0	—	—	—	—
Wazima	10·1	206	2 23	+ 3	4 10	− 1	—	—
Utunomiya	10·2	191	2 22	0	4 12	− 1	—	—
Mito	10·3	188	2 25	+ 2	4 20	+ 5	—	—
Nagano	10·4	199	2 25	+ 1	4 17	− 1	—	—
Maebasi	10·5	195	2 24	− 1	3 30	−50	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Matusiro		10·5	198	2 26	+ 1	4 28	+ 8	—	—
Tukubasan		10·5	189	2 21	− 4	4 9	−11	—	—
Toyama		10·6	203	2 26 a	0	4 29	+ 7	—	—
Kumagaya		10·7	193	2 27	− 1	4 27	+ 3	—	—
Oiwake		10·7	197	2 29	+ 1	4 33	+ 9	—	—
Kanazawa		10·9	205	2 33	+ 3	4 31	+ 2	—	—
Matumoto		10·9	199	2 31	+ 1	4 28	− 1	—	—
Titibu		10·9	194	2 28	− 2	—	—	—	—
Tokyo		11·1	191	2 29	− 4	4 32	− 1	—	—
Kohu		11·3	196	2 37	+ 2	4 38	0	—	—
Yokohama		11·3	191	2 38	+ 3	—	—	—	—
Hunatu		11·4	195	2 34 a	− 2	4 36	− 4	—	—
Mera		11·8	190	2 40	− 1	—	—	—	—
Misima		11·8	194	2 36	− 5	—	—	—	—
Tsuruga		11·9	206	2 43	0	4 53	+ 2	—	—
Shizuoka		12·0	196	2 44	0	4 52	− 1	—	—
Nagoya		12·1	201	2 45	0	4 55	− 1	—	—
Hikone		12·2	204	2 48	+ 2	—	—	—	—
Petropavlovsk		12·3	52	e 2 49	+ 1	i 5 0	0	—	—
Kyoto		12·6	206	2 58	+ 7	5 11	+ 4	—	—
Owase		13·4	203	2 51	−10	—	—	—	—
Takamatsu		13·8	210	3 5	− 1	5 30	− 3	—	—
Hukuoka		15·9	219	3 30	0	6 23	+ 5	—	—
Nanking		23·2	241	e 4 44	+ 1	8 33	+ 2	i 10 16	SSS
Kabansk		23·8	296	4 50?	+ 1	e 8 36	− 5	—	—
Irkutsk		25·2	298	5 5	+ 4	9 5	+ 1	—	—
Ili		44·9	292	i 7 48	0	—	—	—	—
Almata		45·3	291	e 7 51	0	—	—	—	—
Rybach'e		46·2	291	e 7 59	+ 1	—	—	—	—
Sverdlovsk		48·8	314	e 8 19	+ 1	14 55	− 3	—	—
Murgab		49·7	286	e 8 28	+ 3	i 15 12	+ 1	—	—
Kulyab		52·7	288	e 8 48	+ 1	—	—	—	—
Stalinabad		53·0	290	i 8 49	0	i 15 54	− 2	—	—
Resolute Bay	z.	53·2	16	e 8 48	− 3	—	—	e 9 51	PcP
Victoria	z.	59·5	49	i 9 33	− 2	—	—	—	—
Mineral	z.	65·7	56	i 10 13 a	− 3	—	—	i 12 4	?
Berkeley	z.	66·9	58	e 10 21 a	− 2	—	—	—	—
Reno	z.	67·2	55	e 10 24 a	− 1	—	—	—	—
Lick	z.	67·6	58	i 10 25 a	− 3	—	—	—	—
Fresno	z.	69·1	57	e 10 34 a	− 3	—	—	—	—
Copenhagen		69·7	333	i 10 40 a	0	—	—	—	—
Tinemaha	z.	69·8	57	i 10 39 a	− 2	—	—	—	—
China Lake		71·1	57	i 10 46 a	− 3	i 19 34	− 7	—	—
Pasadena	z.	71·9	59	i 10 50 a	− 4	—	—	—	—
Riverside	z.	72·5	59	i 10 54 a	− 3	—	—	—	—
Collmberg	z.	73·2	329	i 11 1	0	—	—	—	—
Palomar	z.	73·2	59	i 10 58 a	− 3	—	—	—	—
Stuttgart	z.	76·7	330	e 11 20	− 1	—	—	—	—
Strasbourg		77·3	331	i 11 24	0	—	—	—	—
Paris		78·8	334	i 11 32	− 1	—	—	e 13 10	sP
Besançon		79·0	331	i 11 32	− 2	—	—	—	—
Ottawa	z.	82·4	26	11 48 a	− 3	—	—	—	—
Morgantown		86·2	31	i 12 9	− 1	—	—	—	—
Harvard		86·3	24	i 12 9	− 2	—	—	—	—
Weston		86·5	24	i 12 10	− 2	—	—	—	—
Palisades		87·0	27	i 12 13	− 1	—	—	—	—
Grahamstown	z.	130·3	262	i 21 27	SKP	—	—	—	—
La Paz		140·7	50	e 19 2	[+ 6]	—	—	—	—

April 6d. 23h. 53m. 0s. Epicentre 30°·5N. 97°·5E. (as on 1951, March 17d.).

A = −·1127, B = +·8557, C = +·5050 ; δ = −5 ; h = +2 ;
D = +·991, E = +·131 ; G = −·066, H = +·501, K = −·863.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Chatra		9·8	251	i 2 27	+ 3	i 5 22?	+65	2 40	PPP	5·2
Calcutta	N.	11·4	228	i 2 55	+ 8	i 5 0	+ 4	i 5 15	SS	—
New Delhi		17·8	269	e 4 7	− 4	e 7 23	− 5	4 22	PP	—
Nanking		18·3	79	4 19k	+ 2	e 7 44	+ 5	—	—	8·8
Przhevalsk		19·4	315	i 4 30	0	—	—	—	—	—
Naryn		20·5	309	i 4 41	− 1	e 8 26	− 1	—	—	—
Almata		20·8	315	i 4 43	− 2	i 8 33	0	—	—	—
Murgab		20·9	299	i 4 45	− 1	i 8 39	+ 4	—	—	—
Rybach'e		20·9	311	e 4 44	− 2	e 8 34	− 1	—	—	—
Ili		21·0	317	i 4 45	− 2	e 8 39	+ 2	—	—	—
Hyderabad	N.	21·7	237	i 4 56	+ 1	i 8 50	− 1	—	—	11·4
Frunse		22·1	310	i 5 1	+ 2	i 9 6	+ 8	—	—	—
Irkutsk		22·3	12	e 5 2	+ 1	—	—	—	—	—
Khorog		22·5	294	5 3	+ 1	—	—	—	—	—
Kabansk		22·6	14	5 6	+ 3	9 14	+ 7	—	—	—
Andijan		22·8	303	i 5 5	0	e 9 14	+ 3	—	—	—
Poona		24·6	246	i 5 23	0	i 9 50	+ 8	6 13	PPP	12·2
Stalinabad		24·9	298	i 5 26	0	—	—	—	—	—
Bombay		25·2	248	e 5 30	+ 1	i 10 0	+ 8	6 13	PP	—
Tashkent		25·2	304	i 5 29	0	—	—	—	—	—
Vladivostok		30·1	55	e 6 14	+ 1	i 11 11	− 1	—	—	—
Mary		30·2	294	e 6 14	0	—	—	—	—	—
Sverdlovsk		36·7	327	i 7 9	− 1	12 53	− 1	—	—	—
Baku		39·6	299	e 7 38	+ 3	—	—	—	—	—
Lenkoran		40·5	296	7 42	0	13 52	0	—	—	—
Kirovobad		42·3	300	7 56	− 1	i 14 18	− 1	—	—	—
Grozny		42·7	302	e 8 1	+ 1	—	—	—	—	—
Tiflis		43·4	301	e 8 6	0	—	—	—	—	—
Borzhomi		44·5	300	e 8 16	+ 1	—	—	—	—	—
Moscow		48·6	320	e 8 46	− 1	e 15 45	− 4	—	—	—
Petropavlovsk		49·2	43	8 30	−22	—	—	—	—	—
Ksara		51·6	291	i 9 10	0	19 12	ScS	—	—	—
Pulkovo		52·8	325	e 9 18	− 1	e 16 45	− 2	—	—	—
Lwow		57·1	313	i 9 49	− 1	e 17 46?	+ 1	—	—	—
Uzhgorod		58·4	312	9 58	− 2	—	—	—	—	—
Belgrade	z.	60·5	307	e 10 15	+ 1	—	—	e 11 28	?	—
Copenhagen		62·7	322	e 10 28	− 1	—	—	—	—	35·0
Prague		63·0	315	i 10 32	+ 1	—	—	—	—	—
Potsdam		63·2	318	e 10 32	0	—	—	—	—	e 32·0
Collmberg	z.	63·6	316	e 10 34	− 1	—	—	—	—	—
Jena		64·5	316	e 10 42	+ 1	—	—	e 11 48	?	—
Messina	z.	66·0	302	10 47	− 3	—	—	—	—	—
Stuttgart		66·7	314	e 10 53	− 2	—	—	—	—	e 37·0
Zürich		67·6	313	e 10 55	− 6	—	—	—	—	—
Strasbourg		67·7	314	e 11 2	+ 1	—	—	—	—	e 37·0
Besançon		69·3	314	e 11 9	− 2	—	—	e 11 46	PcP	—
Paris		70·8	317	e 11 15	− 5	—	—	i 11 44	PcP	e 43·0
Resolute Bay	z.	74·8	4	e 11 43	− 1	—	—	—	—	—
Algiers Univ.	z.	75·7	304	e 11 48	− 1	—	—	—	—	—
Tamanrasset	z.	80·4	291	i 12 15a	0	—	—	e 15 17	PP	—

Additional readings :—
Chatra PPPEZ =2m.47s.
Calcutta SSSN =5m.26s.
New Delhi PPPE =4m.31s.
Poona PPE =6m.5s., PcPE =8m.36s., QE =10m.46s., SSE =10m.56s., SSSE =11m.17s.
Prague e =10m.44s., 10m.56s., and 11m.24s.
Paris i =11m.21s., 12m.22s., 18m.55s., and 24m.20s.
Long waves were also recorded at Helsinki, Kew, De Bilt, Rome, Pavia, and Granada.

April 6d. Readings also at 4h. (near Apia), 5h. (Istanbul and near Manila), 7h. (near Alicante), 8h. (Apia, near Nanking, and Zi-ka-wei), 9h. (Mount Wilson, Riverside, Palomar, China Lake, and near Copiapo), 10h. (Ashkabad and Tamanrasset), 11h. (China Lake and Tacubaya), 13h. (Antofagasta, Copiapo, and near Ashkabad (2)), 14h. (Mount Wilson, Riverside, and China Lake), 16h. (Santa Lucia and near Alicante (2)), 17h. (Apia and near Kurmenty), 19h. (Alicante, Granada, Fergana, Stalinabad, near Andijan, Khorog, Kulyab, and Murgab), 20h. (Stuttgart), 23h. (Fergana, Murgab, Samarkand, near Khorog, Kulyab, and Stalinabad).

April 7d. 9h. 27m. 32s. Epicentre 10°·5S. 163°·0E. (as on 1949, January 21d.).

$A = -\cdot9405$, $B = +\cdot2875$, $C = -\cdot1811$; $\delta = -1$; $h = +6$;
$D = +\cdot292$, $E = +\cdot956$; $G = +\cdot173$, $H = -\cdot053$, $K = -\cdot984$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane		19·3	208	e 4 26	− 3	e 8 1	− 1	—	—	—
Riverview		25·6	203	i 5 32k	0	e 9 57	− 2	i 10 49	SS	e 12·7
Christchurch		33·9	168	6 16	−31	e 12 8	− 3	e 14 48	Q	e 17·0
Berkeley	z.	84·6	51	i 12 39a	+ 3	—	—	—	—	—
Lick	z.	84·9	51	i 12 40k	+ 2	—	—	—	—	—
Mineral	z.	85·8	48	i 12 44k	+ 2	—	—	—	—	—
Fresno	z.	86·2	53	e 12 46a	+ 2	—	—	e 16 48	PP	—
Pasadena		86·7	55	i 12 47	0	—	—	—	—	—
Reno	z.	86·9	50	e 12 51a	+ 3	—	—	—	—	—
Riverside	z.	87·3	55	i 12 50	0	—	—	—	—	—
Tinemaha	z.	87·4	52	i 12 52	+ 2	—	—	—	—	—
China Lake	z.	87·6	53	i 12 54	+ 3	—	—	—	—	—
Palomar		87·6	56	i 12 51	0	—	—	—	—	—
Tamanrasset	z.	155·3	303	i 19 59	[+ 4]	e 24 2	PP	e 20 30	PKP_2	—

Additional readings :—
Riverview iN = 10m.32s.
Lick iZ = 12m.43s.
Mineral iZ = 12m.56s.
Tamanrasset eZ = 24m.13s., ePPPZ = 27m.39s.
Long waves were also recorded at Wellington and Granada.

April 7d. 20h. 29m. 12s. Epicentre 25°·9N. 90°·5E.

Intensity VI at Shillong, Krishnagar, Berhampore, and Mohanbari ; V at Gauhati, Dhubri, and Chatra.

Seismo. Bull. Gov. of India, Met, Depart., April 1951, p. 2 and June 1951, p. 6.

$A = -\cdot0079$, $B = +\cdot9007$, $C = +\cdot4344$; $\delta = +3$; $h = +3$;
$D = +1\cdot000$, $E = +\cdot009$; $G = -\cdot004$, $H = +\cdot434$, $K = -\cdot901$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Chatra	E.	3·1	287	e 0 53	+ 2	(1 30)	+ 1	1 0	P_g	1·5
Calcutta	E.	3·9	211	e 1 4	+ 2	i 2 13	S_g	i 1 18	P_g	—
New Delhi	E.	12·2	286	e 2 53	− 5	i 5 13	− 3	3 1	PP	—
Hyderabad	N.	14·0	236	e 3 19	− 3	i 5 41	−18	—	—	7·1
Poona		17·1	249	e 4 0	− 2	i 7 14	+ 2	4 18	PP	8·0
Bombay		17·8	252	e 4 8	− 3	e 7 32	+ 4	—	—	8·4
Przhevalsk		19·3	331	4 34	+ 5	—	—	—	—	—
Khorog		19·8	310	e 4 36?	+ 1	—	—	—	—	—
Rybach'e		20·3	330	e 4 41	+ 1	e 8 25	+ 2	—	—	—
Almata II		20·4	332	i 4 42	+ 1	—	—	—	—	—
Almata		20·6	332	i 4 44	+ 1	i 8 36	+ 7	—	—	—
Andijan		21·1	318	e 4 49	+ 1	8 43	+ 4	—	—	—
Fergana		21·2	318	e 4 50	+ 1	e 8 44	+ 3	—	—	—
Kulyab		21·2	310	e 4 51	+ 2	—	—	—	—	—
Frunse		21·4	326	e 4 54?	+ 3	e 8 54?	+ 9	—	—	—
Stalinabad		22·2	311	e 5 1	+ 1	e 8 59	− 1	—	—	—
Tashkent		23·3	317	i 5 11	+ 1	i 9 23	+ 3	—	—	—
Tchimkent		23·7	319	i 5 15	+ 1	—	—	—	—	—
Nanking	z.	25·5	68	5 41a	+ 9	e 10 9	+12	—	—	—
Ashkabad		29·7	302	e 6 16	+ 6	—	—	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Sverdlovsk		37·6	333	7 18	0	—	—	—	—	—
Vladivostok		37·8	51	e 7 19	− 1	—	—	—	—	—
Grozny		40·2	308	e 7 43	+ 3	—	—	—	—	—
Tiflis		40·6	305	e 7 44	+ 1	—	—	—	—	—
Borzhomi		41·7	305	e 7 55	+ 3	—	—	—	—	—
Moscow		48·3	323	e 8 42	− 3	—	—	—	—	—
Yalta		48·6	307	e 8 48	+ 1	—	—	—	—	—
Collmberg	z.	62·6	317	e 10 27	− 1	—	—	—	—	c 43·3
Stuttgart	z.	65·4	314	e 10 45	− 2	—	—	e 10 51	P	—
Strasbourg		66·4	314	e 10 52	− 1	—	—	e 10 57	P	—
Tamanrasset	z.	76·1	289	e 11 51	0	—	—	i 11 57	PcP	—
Pretoria	z.	79·1	234	i 10 37	−91	—	—	—	—	—

Additional readings :—
Chatra PPPE = 1m.13s., P_gE = 1m.17s., iSE = 1m.41s., S_gE = 1m.59s.
Calcutta iP_gE = 1m.28s.
New Delhi PPPE = 3m.10s., iN = 4m.14s. and 5m.18s., SSSEN = 5m.40s.
Poona iZ = 6m.58s., SSE = 7m.37s., SSSE = 7m.48s., PcPE = 8m.30s., ScPE = 12m.1s.
Long waves were also recorded at Potsdam.

April 7d. Readings also at 0h. (Victoria), 2h. (Ashkabad, Andijan, near Khorog, Kulyab, Murgab, near Alicante (2), Almeria (2), Granada (2), Malaga (2), and Toledo (2)), 3h. (near Apia), 4h. (La Paz), 11h. (Guadalajara, near Puebla, and Tacubaya), 12h. (near Istanbul), 13h. (near Malaga), 15h. (Pretoria), 16h. (Ksara, Granada, near Alicante (2), Andijan, Stalinabad, near Khorog, Kulyab, and Murgab), 17h. (near Tsikhlis-Dzhvari), 19h. (New Delhi, Mary, Almata II, Fergana, Kizyl-Arvat, Krasnogorka, Lunacharskoe, Rybach'e, Tashkent, Tchimkent, near Andijan (2), Samarkand, Stalinabad (2), Khorog (2), and Kulyab (2)), 20h. (near Yalta), 21h. (near Manila), 22h. (Palomar, Pasadena, Riverside, China Lake, and Tinemaha), 23h. (Victoria and Pretoria).

April 8d. 20h. 53m. 8s. Epicentre 18°·5N. 70°·8E.

Felt at Poona, Bombay, Diu, and Surat. Epicentre 19°·2N. 70°·8E. (Poona).
Seismo. Bull. Gov. of India Met. Depart., April 1951, p. 3.

A = +·3121, B = +·8962, C = +·3154 ; δ = +6 ; h = +5 ;
D = +·944, E = −·329 ; G = +·104, H = +·298, K = −·949.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bombay		2·0	78	i 0 36	+ 1	1 6	+ 4	—	—	—
Poona		2·9	89	i 0 49	+ 1	i 1 25	+ 1	1 0	P_g	—
Hyderabad	N.	7·4	97	c 1 52	0	i 3 38	+20	—	—	—
Kodaikanal	E.	10·4	141	—	—	e 4 39	+ 7	—	—	—
New Delhi		11·6	29	c 2 39	−11	4 30	−31	2 48	PP	—
Colombo	E.	14·5	141	—	—	6 11	0	—	—	e 8·1
Calcutta	N.	16·9	74	e 4 1	+ 2	i 7 7	0	—	—	6·7
Chatra	Z.	17·2	57	e 3 52	−11	—	—	—	—	—
Khorog		18·9	4	e 4 22	− 2	e 7 51?	− 2	—	—	—
Murgab		20·0	8	i 4 39?	+ 2	i 8 14?	− 3	—	—	—
Stalinabad		20·1	357	e 4 37	− 1	c 8 15	− 4	—	—	—
Samarkand		21·4	352	e 4 52	+ 1	—	—	—	—	—
Fergana		21·8	4	e 4 54	− 2	—	—	—	—	—
Andijan		22·2	4	i 4 58	− 2	i 8 58	− 2	—	—	—
Tashkent		22·8	358	i 5 5	0	i 9 5	− 6	—	—	—
Naryn		23·3	12	i 5 9	− 1	c 9 19	− 1	—	—	—
Tchimkent		23·7	359	i 5 21	+ 7	—	—	—	—	—
Rybach'e		24·3	10	e 5 21	+ 1	—	—	—	—	—
Frunse		24·5	8	e 5 20	− 2	—	—	—	—	—
Almata		25·2	11	i 5 29	0	e 9 57	+ 5	—	—	—
Helwan	Z.	37·6	295	e 7 39	+21	—	—	e 8 59	PP	—
Sverdlovsk		39·0	352	e 7 31	+ 1	—	—	—	—	—
Collmberg	Z.	55·7	320	e 9 31	− 9	9 55	?	—	—	c 36·1
Tamanrasset	Z.	60·8	286	e 10 27	+11	—	—	e 10 35	?	—
Auckland	N.	111·9	123	(e 18 52)	[+15]	18 52	PKP	—	—	—

For Notes see next page.

NOTES TO APRIL 8d. 20h. 53m. 8s.

Additional readings :—
Poona P*E = 53s., PPE = 56s., PPPE = 1m.3s., QE = 1m.8s., S*E = 1m.31s., SSSE = 1m.35s., S_gS_gE = 1m.46s.
New Delhi N = 4m.43s.
Calcutta iN = 6m.49s.
Long waves were also recorded at Nanking.

April 8d. 21h. 38m. 5s. Epicentre 36°·6N. 36°·1E.

Destructive at Iskenderum (Alexandretta) with casualties.
Epicentres : 36°·6N. 36°·3E. (Istanbul).
36°·7N. 35°·9E. (Strasbourg).

Monthly Bulletin of Seismology, 1951, Istanbul, 1956.

A = +·6502, B = +·4741, C = +·5936 ; δ = −11 ; h = 0 ;
D = +·589, E = −·808 ; G = +·480, H = +·350, K = −·805.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ksara		2·8	184	i 0 49k	+ 2	1 25?	+ 3	—	—	—
Istanbul		7·1	311	e 1 49	+ 1	e 3 10	0	e 2 11	PP	—
Sotchi		7·5	21	e 1 55?	+ 2	i 3 38?	+18	—	—	—
Borzhomi		7·7	45	e 2 1	+ 5	e 3 51?	+26	—	—	—
Helwan		7·8	212	1 55	− 3	3 21	− 7	2 31	P_g	—
Yalta		8·0	350	2 0	0	e 3 37	+ 4	—	—	—
Theodosia		8·4	357	e 2 8	+ 2	3 59	+16	—	—	—
Kirovobad		9·0	60	2 18	+ 5	4 16	+18	—	—	—
Piatigorsk		9·4	33	2 22?	+ 4	4 19?	+12	—	—	—
Athens		9·9	282	2 28	+ 3	4 54	+34	5 2	?	i 5·3
Grozny		10·0	45	2 35	+ 8	i 4 46	+24	—	—	—
Lenkoran		10·3	74	2 35	+ 3	—	—	—	—	—
Bucharest	E.	10·9	319	i 2 42	+ 2	i 4 49	+ 5	—	—	i 5·9
Baku		11·4	67	e 2 52?	+ 5	e 5 15?	+19	—	—	—
Sofia		11·6	306	2 50	0	—	—	—	—	—
Kishinev		11·7	335	i 2 50	− 1	5 14	+10	—	—	—
Belgrade		14·4	310	i 3 27a	0	i 6 29	+20	—	—	e 7·6
Timisoara		14·4	314	i 3 31	+ 4	e 6 52	SS	—	—	e 7·5
Taranto		15·3	290	3 36	− 3	e 6 55	+25	—	—	—
Uzhgorod		15·7	324	i 3 44	0	e 6 43?	+ 4	—	—	—
Lwow		15·9	330	i 3 44	− 3	e 6 43	− 1	—	—	—
Kizyl-Arvat		16·1	75	i 3 51	+ 2	7 5	+16	—	—	—
Kalossa		16·2	313	3 51	+ 1	e 7 4	+13	4 8	PP	e 9·7
Messina		16·4	282	i 3 46a	− 7	i 6 59	+ 3	i 4 17	PP	e 9·8
Budapest	N.	16·6	316	i 3 57	+ 1	e 7 25	+25	—	—	9·6
Skalnate Pleso		17·1	324	e 4 3	+ 1	e 7 29	+17	e 4 21	pP	e 10·0
Ogyalla		17·4	316	4 8	+ 2	e 7 32	+13	e 4 25	pP	e 9·7
Vienna		18·6	316	i 4 20	− 1	e 8 36	PcP	i 4 39	PP	10·8
Raciborzu		18·7	323	i 4 20	− 2	e 8 7	+19	i 4 35	PP	e 10·9
Rome		19·0	294	i 4 21a	− 5	i 7 58	+ 3	i 4 37	pP	i 11·2
Triest		19·1	306	i 4 23	− 4	i 8 5	+ 8	i 4 40	PP	e 11·2
Moscow		19·2	4	e 4 26	− 2	i 8 9	+10	—	—	—
Padova		20·0	301	4 39	+ 2	e 8 8	− 9	4 57	PP	e 10·6
Florence		20·3	300	e 4 36	− 4	8 18	− 5	4 51	PP	—
Bologna		20·4	303	e 4 41	0	e 8 29	+ 4	i 5 3	PP	—
Prato		20·4	300	i 4 37	− 4	i 8 36	+11	—	—	—
Mary		20·6	78	i 4 45	+ 2	8 36	+ 7	—	—	—
Prague		20·6	319	i 4 42	− 1	e 8 34	+ 5	e 4 59	PP	e 11·4
Tunis		20·8	279	i 4 48	+ 3	e 8 39	+ 6	e 5 27	PP	—
Salo		21·2	304	e 4 47a	− 2	i 8 46	+ 5	i 5 14	PP	e 12·2
Pavia		22·0	303	e 4 56k	− 2	i 9 0	+ 4	e 6 56	PPP	i 13·2
Collmberg		22·1	319	i 4 56	− 3	e 7 57	−61	e 5 53	PP	e 11·9
Chur		22·2	305	e 4 57k	− 3	e 9 4	+ 4	e 6 47	?	—
Jena		22·6	317	e 5 2	− 1	e 9 11	+ 4	e 5 18	pP	e 12·9
Potsdam		22·6	322	i 5 3k	0	i 9 8	+ 1	i 5 43	PP	e 10·9

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Sonneberg	E.	22·6	316	e 5 2	− 1	e 9 9	+ 2	e 5 26	pP	e 12·6
Zürich		23·0	308	e 5 2	− 5	e 9 11	− 3	—	—	—
Stuttgart		23·1	312	i 5 5a	− 3	e 9 13	− 3	i 5 23	pP	e 12·4
Pulkovo		23·5	354	i 5 13	+ 1	i 9 26	+ 3	—	—	—
Karlsruhe		23·7	312	i 5 12	− 2	e 9 24	− 3	—	—	e 12·9
Basle		23·7	308	e 5 13	− 1	e 9 27	0	—	—	—
Strasbourg		23·9	311	i 5 14k	− 2	i 9 31	+ 1	e 5 47	PP	i 12·2
Neuchatel		24·0	307	e 5 14	− 3	e 9 36	+ 4	—	—	—
Samarkand		24·4	73	e 5 25	+ 4	—	—	—	—	—
Besançon		24·7	306	i 5 19	− 5	e 9 42	− 2	i 5 51	PP	—
Helsinki		24·7	347	e 5 24	0	e 9 44	0	e 5 41	pP	e 13·1
Copenhagen		24·9	328	i 5 26	0	i 9 51	+ 4	—	—	12·9
Stalinabad		25·9	74	i 5 40?	+ 5	i 10 10?	+ 6	—	—	—
Lunacharskoe		26·1	69	i 5 42	+ 5	—	—	—	—	—
Tashkent		26·1	69	i 5 40	+ 3	—	—	—	—	—
Sverdlovsk		26·1	30	i 5 37	0	10 10	+ 3	—	—	—
Upsala		26·2	338	e 5 36	− 2	e 10 10	+ 1	i 5 53	pP	e 12·0
Witteveen	Z.	26·2	319	i 5 39a	+ 1	—	—	—	—	—
Clermont-Ferrand		26·3	301	i 3 52	?	—	—	—	—	e 10·2
Algiers Univ.	Z.	26·4	281	i 5 38a	− 2	e 6 33	PP	i 5 56	pP	—
Tchimkent		26·4	67	i 5 41	+ 1	—	—	—	—	—
Barcelona		26·7	292	e 7 7	?	e 12 22	?	—	—	e 15·6
De Bilt		26·7	317	i 5 44a	+ 1	i 10 45	+28	—	—	e 14·6
Paris		27·3	308	i 5 46	− 2	e 10 34	+ 7	i 6 32	PP	e 13·9
Tortosa		28·0	290	i 5 51	− 4	i 10 21	−17	—	—	—
Fergana		28·1	70	e 5 58	+ 3	e 10 45	+ 5	—	—	—
Khorog		28·3	77	6 1	+ 4	10 51	+ 8	—	—	—
Andijan		28·5	70	6 2	+ 3	10 52	+ 6	—	—	—
Alicante		29·0	286	i 6 4	0	10 55	+ 1	i 6 54	PP	e 14·2
Kew		29·7	313	e 6 9	− 1	e 11 42	+36	i 7 22	PP	e 15·9
Tamanrasset	Z.	29·8	252	i 6 10a	− 1	e 11 8	+ 1	i 6 30	pP	e 12·3
Murgab		30·0	74	i 6 21	+ 9	11 17	+ 7	—	—	—
Almeria		30·8	283	i 6 16	− 4	i 11 22	− 1	7 14	PP	18·5
Naryn		31·2	67	i 6 26	+ 3	e 11 34	+ 5	—	—	—
Durham	E.	31·5	318	e 7 56	PP	i 11 40	+ 6	—	—	—
Toledo		31·5	289	i 6 23	− 3	e 11 30	− 4	i 6 40	pP	18·2
Granada		31·6	284	i 6 26k	0	i 12 16	SS	6 51	pP	i 17·6
Almata		31·8	64	6 32	+ 4	i 11 46	+ 8	—	—	—
Almata II		32·1	64	e 6 33	+ 2	—	—	—	—	—
Malaga		32·3	284	i 6 32	− 1	i 11 40	− 6	—	—	19·7
Aberdeen	E.	32·6	322	i 6 35	0	i 11 47	− 4	—	—	16·9
Rathfarnham Castle		33·7	315	i 6 42	− 3	e 11 13	−55	e 7 35	PP	e 15·9
Semipalatinsk		34·4	52	e 6 54	+ 3	—	—	—	—	—
New Delhi		35·3	90	7 4	+ 5	i 12 36	+ 3	8 19	PP	—
Lisbon		35·6	288	i 7 0k	− 1	12 36	− 2	12 31	S	18·9
Bombay		36·7	108	i 7 17	+ 7	i 13 6	+12	8 31	PP	17·5
Poona		37·7	107	i 7 27	+ 8	i 13 18	+ 8	7 55	PP	18·2
Hyderabad	N.	41·9	105	—	—	e 14 18	+ 5	—	—	—
Chatra	Z.	44·1	86	e 8 14	+ 2	—	—	e 8 55	PP	—
Scoresby Sund		45·4	337	i 8 23	+ 1	e 15 15	+11	e 10 10	PP	22·2
Kodaikanal	E.	45·6	114	i 8 30	+ 6	15 15	+ 9	10 15	PP	—
Irkutsk		49·3	49	8 53	0	15 57	− 2	—	—	—
Colombo	E.	49·6	116	9 4	+ 9	16 9	+ 6	—	—	30·2
Kabansk		50·8	49	i 9 6	+ 2	16 27	+ 7	—	—	—
Ivigtut		56·1	325	i 9 39	− 4	e 17 29	− 3	—	—	—
Pretoria	Z.	62·5	188	i 10 29	+ 1	—	—	—	—	—
Resolute Bay	Z.	64·4	348	i 10 39	− 1	—	—	e 13 0	PP	—
Pietermaritzburg	Z.	66·1	185	i 10 53	+ 2	—	—	—	—	—
Nanking		66·4	67	i 10 53k	0	i 19 47	+ 4	—	—	—
Vladivostok		69·8	51	i 11 13	− 1	e 20 23	0	—	—	—
Grahamstown	Z.	70·1	189	i 11 18	+ 2	—	—	—	—	—
Seven Falls	E.	74·1	318	11 39	− 1	—	—	—	—	36·1
Shawinigan Falls	N.	75·5	318	11 47	− 1	—	—	—	—	—
Harvard		77·3	314	e 11 58	0	—	—	—	—	46·1
Weston		77·3	314	i 11 57	− 1	—	—	—	—	—

Continued on next page.

		△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	Supp. m. s.		L. m.
Ottawa	z.	77·8	319	e 12 0	− 1	—	—	—	—	—
Palisades		79·7	314	i 12 9	− 2	—	—	—	—	—
Morgantown		84·0	316	i 12 32	− 1	—	—	e 13 48	?	—
Fort de France		87·0	286	i 12 42	− 6	e 23 26	−11	—	—	—
St. Louis		90·2	321	i 13 3	− 1	—	—	e 13 18	pP	—
Victoria	z.	93·3	346	e 13 17	− 1	—	—	—	—	—
Seattle		93·9	345	i 13 23 a	+ 2	—	—	i 13 27	pP	—
Mineral	z.	100·7	343	e 13 53 k	+ 1	—	—	i 17 54	PP	—
Reno	z.	101·1	341	e 13 53	0	—	—	e 18 2	PP	—
Tinemaha	z.	103·0	339	e 18 17	PP	—	—	e 30 20	PKKP	—
Bogota		103·2	286	e 17 28	PP	e 24 47	[+ 5]	—	—	e 50·9
China Lake	z.	103·9	338	e 14 6	0	e 18 11	PP	e 30 15	PKKP	—
Riverside	z.	105·5	338	e 18 34	PP	—	—	—	—	—
Pasadena	z.	105·6	338	i 18 35	PP	—	—	e 31 27	PKKP	e 59·2
Palomar	z.	106·0	336	i 18 39	PP	—	—	—	—	—
La Paz		110·9	265	e 13 21	PP	—	—	i 34 19	SS	—
Huancayo		114·3	273	—	—	e 27 33	{+58}	e 29 26	PS	e 58·1

Additional readings :—
Istanbul esPP$_g$NZ =2m.27s., esPPP$_g$EZ =2m.31s., eEZ =3m.15s., esP$_g$S$_g$N =3m.23s., eNZ =3m.37s., isSS$_g$Z =4m.16s.
Helwan P*N =2m.13s.
Bucharest eSN =4m.52s.
Sofia iEN =3m.14s. and 3m.25s.
Belgrade eNW =4m.47s.
Kalossa PPN =4m.13s., PPPN =4m.20s., iN =4m.33s., iE =4m.48s.
Messina iZ =3m.53s. and 6m.47s.
Budapest PE =4m.0s., eE =7m.8s., eN =8m.55s.
Skalnate Pleso esP =4m.36s., e =4m.47s., eN =5m.0s., eE =5m.5s., e =6m.11s., eN = 6m.55s., e =7m.13s., eSE =7m.32s., e =7m.46s., esS?N =8m.19s., e =8m.55s.
Ogyalla esP =4m.35s., e =4m.53s., 5m.6s., 5m.16s., and 5m.38s., eN =7m.9s., ePcP = 8m.11s., esS? =8m.27s., eE =9m.17s.
Raciborzu iPPE =4m.38s., ePPPEN =4m.48s., eN =5m.10s. and 7m.7s., eSSEN = 8m.30s., eSSSZ =8m.43s.
Rome iZ =4m.51s., eSSN =8m.34s.
Triest iPPP =5m.33s., iSSS =10m.50s.
Padova SS =8m.48s.
Florence i =4m.46s., iPPP? =5m.4s., i =8m.53s., SS =9m.0s., i =9m.22s.
Prague e =4m.53s., esP =5m.18s., iS =8m.37s., esS =9m.8s., e =9m.35s.
Tunis i =5m.46s., eSS? =8m.48s., e =9m.42s. and 9m.48s.
Salo eZ =4m.57s., iZ =5m.21s.
Collmberg eN =8m.4s.
Jena eN =5m.9s., ePP?E =5m.38s., eEN =6m.7s., eSN =9m.14s., eSS?N =9m.58s., eSS?E =10m.9s.
Potsdam iE =6m.49s., iSN =9m.11s., iSZ =9m.15s., iSSZ =9m.56s., isSN =10m.7s., iSSSE =10m.19s.
Sonneberg eSN =9m.12s., eE =10m.15s.
Stuttgart ePP? =5m.52s., e =7m.39s. and 8m.3s., eSS =9m.57s., e =10m.33s.
Strasbourg i =5m.37s., e =6m.41s., i =9m.36s., eSS =10m.8s., i =10m.44s.
Besançon i =5m.31s., 6m.28s., and 7m.29s., ePcP =9m.9s.
Helsinki eZ =10m.2s., esSE =10m.16s., eE =12m.7s.
Upsala iPN =5m.40s., iPPP? =6m.13s., iPPP?N =6m.23s., i =6m.53s., iN =7m.25s., iS =10m.14s., isSN =10m.28s., eSS?E =11m.31s., eSSS?E =11m.49s.
Clermont-Ferrand e =4m.15s., 8m.1s., 8m.25s., and 8m.55s.
Algiers Univ. eZ =6m.7s.
Paris i =5m.51s. and 6m.8s., iPPP? =6m.54s., i =8m.22s., iPcP =8m.53s., i =9m.31s. and 10m.52s., iSS =11m.54s., eSSS? =12m.24s., e =13m.4s. and 13m.40s., iScS? = 16m.35s.
Alicante i =6m.22s., PPP =7m.6s., PcP =9m.22s., SS =12m.24s., SSS =12m.36s., PcS =13m.18s.
Kew ePcPZ =8m.22s., eSS =13m.40s.
Tamanrasset esP?Z =6m.46s., esSZ =11m.38s.
Toledo e =11m.49s., SS? =12m.0s.
Granada sP =7m.8s., PcP =8m.56s., iSS =14m.9s., ScS =16m.32s.
Aberdeen eE =12m.49s., iE =15m.18s.
Rathfarnham Castle iZ =6m.51s., ePcP =9m.22s., eEN =12m.14s.
New Delhi SSN =15m.4s.
Bombay PPPEN =9m.16s.
Poona PPPE =8m.13s., ScPE =13m.0s., sSE =13m.56s., SSE =16m.3s., SSSE = 16m.44s., ScSE =17m.12s.
Scoresby Sund e =15m.50s., SS =18m.31s.
Resolute Bay eZ =11m.0s. and 11m.44s.
Huancayo eSS =35m.33s.
Long waves were also recorded at Edinburgh.

April 8d. Readings also at 1h. (Messina, Fergana, Samarkand, near Andijan, Khorog, Kulyab, and Stalinabad), 2h. (Palomar, Pasadena, China Lake, and Tinemaha), 3h. (Messina and near Athens), 4h. (Christchurch, Wellington, Brisbane, Riverview, Perth, Palomar, Pasadena, Riverside, China Lake, Tinemaha, Berkeley, Fresno, Reno, Mineral, Collmberg, Stuttgart, Tamanrasset (2), La Paz, and near Huancayo), 5h. (Andijan, Samarkand, Tchimkent, near Fergana, Khorog (2), Kulyab (2), Murgab (2), and Stalinabad (2)), 6h. (Bogota, Chinchina, Fort de France, Huancayo, La Paz, La Plata, China Lake, Mineral, Pretoria, Tamanrasset, and Ksara), 7h. (Harvard, La Plata, and Istanbul), 9h. (near Copiapo), 10h. (Djakarta and Tacubaya), 11h. (Apia and near Alicante), 13h. (Palomar, Pasadena, Riverside, China Lake, Tinemaha, and Fresno), 17h. (Granada, near Alicante, and Malaga), 18h. (Mineral and Tamanrasset), 19h. (near La Paz), 20h. (Manila), 21h. (near Zi-ka-wei, near Mizusawa, near Andijan, Fergana, Khorog, Kulyab, and Stalinabad), 22h. (Almata near Almata II, Ili, Krasnogorka, Naryn, and Rybach'e).

April 9d. 16h. 55m. 13s. Epicentre 23°·8N. 129°·0E.

$A = -\cdot5764$, $B = +\cdot7118$, $C = +\cdot4013$; $\delta = -6$; $h = +4$;
$D = +\cdot777$, $E = +\cdot629$; $G = -\cdot253$, $H = +\cdot312$, $K = -\cdot916$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Zi-ka-wei	Z.	10·0	319	e 2 13	−14	e 4 1	−21	—	—	i 5·0
Manila		11·9	221	e 4 15	?	—	—	—	—	—
Nanking	Z.	12·2	315	—	—	(e 5 11)	− 5	—	—	e 5·2
Kabansk		33·0	334	e 6 47	+ 8	—	—	—	—	—
Calcutta	E.	37·3	277	—	—	e 13 14	+10	—	—	e 25·2
Almata		46·7	309	e 8 35	+ 3	—	—	—	—	—
Ili		46·7	310	e 8 30	− 2	—	—	—	—	—
Naryn		47·2	306	e 8 35	− 1	—	—	—	—	—
Rybach'e		47·3	307	e 8 35	− 2	—	—	—	—	—
Andijan		49·9	304	e 8 57	0	e 16 8	+ 1	—	—	—
Fergana		50·4	304	e 9 0	− 1	—	—	—	—	—
Tchimkent		52·0	307	i 9 13	0	—	—	—	—	—
Tashkent		52·3	305	e 9 14	− 1	—	—	—	—	—
Stalinabad		52·7	302	i 9 18	0	e 16 45	− 1	—	—	—
Samarkand		54·1	303	e 9 29	0	—	—	—	—	—
Mary		58·2	301	i 10 1	+ 3	—	—	—	—	—
Sverdlovsk		58·6	324	i 9 58	− 3	17 56	− 8	—	—	—
Ashkabad		60·9	302	e 10 22	+ 5	—	—	—	—	—
Borzhomi		71·4	308	e 11 28	+ 4	—	—	—	—	—
Resolute Bay	Z.	77·8	11	e 12 1	0	—	—	—	—	—
Ksara		79·6	302	—	—	e 27 4	SS	—	—	—
Upsala	N.	79·8	332	—	—	e 21 26	−48	—	—	e 42·8
Istanbul	Z.	81·8	311	e 12 25	+ 3	—	—	—	—	—
Collmberg	Z.	86·5	325	e 12 50	+ 4	—	—	—	—	—
Stuttgart		90·0	325	e 13 17?	+14	—	—	—	—	e 47·8
Rome	N.	92·2	318	e 16 57?	PP	—	—	—	—	—
Tinemaha	Z.	92·5	48	e 13 25	+11	—	—	—	—	—
China Lake	Z.	93·6	48	e 13 32	+13	—	—	—	—	—
Mount Wilson	Z.	94·0	50	e 13 35	+14	—	—	—	—	—
Riverside	Z.	94·7	50	e 13 37	+13	—	—	—	—	—

No additional readings.
Long waves were also recorded at Bombay and other European stations.

April 9d. Readings also at 4h. (near Dzhergetal), 5h. (Copiapo and near Apia), 6h. (near Dzhergetal), 10h. (Apia), 12h. (Collmberg and Ashkabad), 15h. (near Dzhergetal), 18h. (near Akhalkalaki, Gandzha, and Tsikhlis-Dzhvari), 20h. (Palomar, Riverside, China Lake, Tinemaha, Lick, Reno, Mineral, and Palisades), 21h. (Colcutta), 22h. (Copiapo, La Paz, and Santa Lucia), 23h. (Zi-ka-wei, Nanking, Ksara, Collmberg, Copenhagen, Potsdam, Scoresby Sund (2), Santa Lucia, and near Santa Clara).

April 10d. 10h. 55m. 38s. Epicentre 15°·5S. 173°·0W. (as on 1950, Dec. 8d.).

Intensity IV at Apia.
Near Epicentre suggested in Three-monthly Seismo. Bull., Apia, second quarter, 1951, p.2.

$A = -·9569$, $B = -·1175$, $C = -·2656$; $\delta = +1$; $h = +6$;
$D = -·122$, $E = +·993$; $G = +·264$, $H = +·032$, $K = -·964$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		2·1	35	i 0 36	− 1	i 0 59	− 5	—	—	—
Auckland	N.	23·9	205	e 5 17	+ 1	—	—	—	—	—
Wellington		27·8	201	e 5 56	+ 3	—	—	—	—	e 13·9
Kaimata	N.E.	30·1	204	6 17	+ 4	—	—	—	—	—
Christchurch		30·5	201	e 6 20	+ 3	e 11 17	− 1	e 13 2	SS	15·0
Brisbane	Z.	33·7	244	i 6 42	− 3	—	—	i 8 4	PP	—
Riverview		37·1	234	i 7 13a	− 1	e 15 40	SS	i 8 35	PP	e 17·5
Berkeley		71·3	41	e 11 26k	+ 3	e 20 49	+ 8	e 14 3	PP	e 32·5
Lick	Z.	71·4	41	i 11 24a	0	—	—	e 14 4	PP	—
Pasadena		71·8	46	e 11 26	0	i 20 50	+ 4	i 14 5	PP	e 32·3
Fresno		72·2	43	e 11 28a	− 1	—	—	e 13 59	PP	—
Palomar		72·3	47	e 11 29	0	e 20 58	+ 6	i 11 33	P	—
Riverside		72·3	46	e 11 28	− 1	—	—	i 11 33	P	—
Petropavlovsk		72·6	348	e 11 30	− 1	e 20 53	− 3	—	—	—
China Lake		73·1	45	e 11 34	0	e 21 9	+ 8	i 11 38	P	—
Mineral	Z.	73·2	39	i 11 34a	− 1	—	—	i 14 19	PP	—
Tinemaha		73·4	43	i 11 40	+ 4	—	—	—	—	—
Reno	Z.	73·8	40	e 11 37k	− 1	—	—	—	—	—
Vladivostok		77·1	322	e 22 18	PS	i 21 42	− 4	i 22 4	ScS	—
Seattle		77·5	33	i 12 2a	+ 3	e 12 40	sP	i 12 28	pP	—
Victoria		77·5	32	12 0	+ 1	21 56	+ 6	—	—	—
Tacubaya		80·4	67	e 12 24	+ 9	e 22 34	sS	e 22 50	PS	—
Florissant		94·0	51	—	—	e 23 57	[+ 1]	—	—	—
St. Louis		94·0	51	e 13 23	+ 2	e 23 58	[+ 2]	e 30 50	SS	—
Huancayo		94·1	104	—	—	e 24 10	[+14]	e 24 50	sS	—
Kabansk		96·3	322	e 13 34	+ 2	e 24 49	0	—	—	—
Irkutsk		97·7	323	e 13 49	+11	e 24 11?	[− 4]	—	—	—
La Paz		99·3	110	e 13 46	+ 1	i 24 34	sS	—	—	—
Resolute Bay		101·7	15	e 14 1	+ 5	25 36	+ 1	e 27 10	PS	e 49·0
Palisades		106·8	51	e 18 40	PP	e 25 3	[+ 4]	e 34 7	SSP	e 51·2
Seven Falls	E.	109·4	45	28 31	PS	25 10	[0]	34 41	SS	50·6
Bombay		117·4	284	—	—	e 29 22	PS	—	—	—
Andijan		118·6	308	e 20 17	PP	—	—	—	—	—
Tashkent		120·8	310	e 20 27	PP	e 25 50	[− 2]	e 30 17	PS	—
Scoresby Sund		122·2	11	e 18 58	[+ 1]	e 26 1	[+ 4]	e 30 27	PS	57·2
Kimberley	Z.	132·8	202	i 19 21	[+ 4]	—	—	—	—	—
Helsinki	N.	133·5	349	e 23 5	PKS	—	—	—	—	—
Moscow		133·5	337	e 19 21	[+ 2]	e 22 48	PKS	—	—	—
Aberdeen	E.	137·8	7	e 20 26	[+60]	e 30 22	{+74}	e 25 12	PPP	e 69·9
Tiflis		138·3	317	e 22 22	PP	—	—	—	—	—
Copenhagen		139·7	356	e 19 54	[+24]	—	—	e 23 4	PKS	66·4
Rathfarnham Castle		140·9	12	e 22 25?	PP	—	—	—	—	e 63·4
Potsdam		142·9	355	e 22 49	PP	—	—	—	—	e 64·4
Lwow		143·1	341	e 19 37	[+ 1]	—	—	—	—	—
Yalta		143·1	327	e 19 43	[+ 7]	—	—	e 22 44	PP	—
Kew		143·7	7	e 23 3	PKS	—	—	e 24 33	?	e 64·4
Collmberg	Z.	144·0	354	e 19 38	[+ 1]	—	—	e 23 11	PP	—
Jena	E.	144·5	354	e 19 17	[−21]	—	—	e 19 42	PKP_2	—
Uzhgorod		144·6	344	19 38	[0]	—	—	—	—	—
Skalnate Pleso		144·7	346	e 21 29	?	e 26 52	[+ 6]	e 41 46	SS	—
Ogyalla		146·4	347	e 19 39	[− 3]	e 26 57	[+ 8]	e 41 46	SS	—
Karlsruhe	Z.	146·6	358	i 19 46	[+ 4]	—	—	i 19 58	PKP_2	—
Paris		146·6	6	i 19 47	[+ 5]	i 27 7	[+18]	e 26 40	PPP	e 70·4
Stuttgart		146·8	358	e 19 44	[+ 2]	e 29 52	SKKS	e 23 2	PP	e 70·4
Strasbourg		147·0	359	e 19 47k	[+ 4]	e 30 9	SKKS	e 23 30	PP	72·4

Continued on next page,

		△ °	Az. °	P. m.	P. s.	O−C. s.	S. m.	S. s.	O−C. s.	Supp. m.	Supp. s.	Supp.	L. m.
Timisoara		147·6	342	e 19	22?	[−22]	—		—	—		—	—
Basle		148·0	0	e 19	51	[+ 7]	—		—	—		—	—
Istanbul		148·1	328	e 19	48	[+ 4]	e 30	15	{+ 7}	e 23	5?	PP	e 72·4
Ksara		148·2	310	e 19	51 a	[+ 6]	33	39	PSKS	23	31	PP	—
Zürich		148·2	359	e 19	46	[+ 1]	—		—	e 23	2	PP	—
Besançon		148·3	2	e 19	52	[+ 7]	—		—	i 20	3	PKP_2	—
Neuchatel		148·6	0	e 19	50	[+ 5]	—		—	—		—	—
Chur		148·7	358	e 19	55	[+10]	—		—	—		—	—
Triest	z.	149·4	351	i 20	4	[+18]	—		—	i 20	7	PKP_2	—
Sofia	E.	149·5	336	e 20	4	[+17]	—		—	—		—	—
Padova		150·8	354	e 20	20	PKP_2	—		—	23	44	PP	—
Florence		151·6	354	e 20	2	[+12]	—		—	e 20	47	?	—
Rome		153·3	353	e 19	56	[+ 4]	e 43	58	SSP	e 23	44	PP	—
Helwan	z.	153·5	307	e 20	3	[+11]	—		—	e 23	50	PP	—
Toledo		153·9	21	e 19	7	[−46]	—		—	e 23	7	PP	—
Alicante		156·3	15	19	45	[−11]	27	20	[+19]	24	6	PP	e 73·6
Granada		156·4	23	i 20	28 k	PKP_2	44	34	SSP	i 24	14	PP	79·1
Almeria		157·1	20	20	24	[+27]	35	02	SKSP	24	38	PP	78·9
Algiers Univ.	z.	158·5	9	e 20	34	[+35]	—		—	—		—	—
Tamanrasset	z.	172·6	7	e 20	11	[0]	—		—	i 29	29	PPP	—

Additional readings :—
Riverview iPPP =8m.59s., iN =16m.4s.
Lick eZ =14m.11s.
Pasadena i =11m.30s.
Seattle e =12m.8s., iPcP =12m.16s., i =12m.34s., e =12m.58s. and 13m.9s.
St. Louis iP =13m.26s., e =13m.41s., iSKS =24m.1s., e =30m.1s.
Resolute Bay eEZ =18m.0s., eE =24m.29s.
Palisades eS =26m.23s., ePS =28m.6s.
Scoresby Sund e =20m.26s.
Aberdeen eE =47m.12s.
Collmberg eZ =19m.59s.
Jena eE =19m.29s., 20m.5s., and 20m.50s.
Skalnate Pleso ePKS =23m.26s., e =23m.53s., eN =25m.4s., eSKKS? =29m.28s., eSSSN =46m.46s.
Ogyalla e =20m.3s., ePP =22m.52s., e =28m.40s. and 34m.49s.
Paris iPKPZ =19m.58s., iPP =23m.8s., iPKS? =23m.20s., iSKKS =30m.6s., iPKKS? =32m.22s., iSKSP? =33m.24s., iPS? =34m.38s., eSPP? =35m.54s., SS =42m.20s., eSSP?(△ >180°) =53m.34s. and numerous unidentified i readings.
Stuttgart iPKPZ =19m.48s., ipPKP?Z =19m.48s., i =20m.4s., eZ =20m.8s. and 20m.28s., e =20m.52s., ePPP =26m.34s., eS =31m.34s., ePSKS =33m.22s., eSS? =43m.22s.
Strasbourg iPKPZ =20m.0s., i =20m.26s. and 21m.33s., SS =43m.16s.
Istanbul ePKPZ =19m.51s., ePKSE =23m.20s., eSSEN =42m.5s.
Besançon i =20m.11s., e =20m.26s., 20m.44s., 21m.20s., and 21m.45s.
Rome ePKP$_2$Z =20m.20s., ePPSN =37m.48s.
Helwan eZ =20m.14s. and 21m.16s.
Toledo i =20m.19s.
Alicante PKP$_2$ =20m.27s., PPS =37m.18s., SS =43m.46s., SSP =44m.34s., SSS =49m.48s., Q =64·6m.
Granada PKP$_2$ =21m.31s., SKSP =34m.40s.
Tamanrasset iZ =20m.14s., iPKP$_2$Z =21m.40s., eZ =21m.50s., iZ =24m.40s., iPPZ =25m.17s., eZ =25m.30s. and 29m.23s.
Long waves were also recorded at Pavia, Tortosa, Clermont-Ferrand, Upsala, De Bilt, Weston, Harvard, and Ottawa.

April 10d. Readings also at 0h. (De Bilt, Kew, Collmberg, Paris, Strasbourg, Stuttgart, Scoresby Sund, and Copiapo), 1h. (Potsdam), 3h. (Bombay, Kodaikanal, Collmberg, near Dzhergetal, and near Kiyuchi), 4h. (China Lake, Riverside, and Chatra), 5h. (near Naryn and near Dzhergetal), 6h. (near Copiapo), 7h. (China Lake and Tinemaha), 8h. (Rome), 9h. (near Apia), 10h. (Puebla, Tacubaya, and Vera Cruz), 11h. (Apia), 12h. (Apia and near Dzhergetal), 13h. (Collmberg and near Apia), 15h. (near Akhalkalaki and Dzhergetal (2)), 16h. (Copiapo and Santa Lucia), 18h. (Bombay, Tamanrasset, near Victoria (4), and near Dzhergetal), 19h. (Rome and near Dzhergetal), 20h. (Besançon, Collmberg, Strasbourg, near Ravensburg, Stuttgart, Basle, Chur, Zürich, near Copiapo, and near Victoria), 23h. (near Apia and near Dzhergetal).

April 11d. 7h. 45m. 18s. Epicentre 33°·8S. 70°·5W. Focus at base of superficial layers. (as on 1949, July 31d.).

A = +·2780, B = −·7850, C = −·5537 ; δ = +9 ; h = +1 ;
D = −·943, E = −·334 ; G = −·185, H = +·522, K = −·833.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Santa Lucia		0·4	334	i 0 4	− 5	(0 21)	+ 5	—	—	0·4
Copiapo	N.	6·4	1	e 1 33	− 1	e 2 49	+ 2	—	—	—
Antofagasta	E.	10·1	0	3 45	?	e 4 20	+ 1	e 4 25	?	—
La Paz		17·4	8	i 4 2a	0	i 7 32	SS	—	—	9·2
Punta Arenas	N.	19·3	181	e 11 6	?	e 12 21	PcS	—	—	—
Huancayo		22·1	348	e 4 56	+ 2	e 9 13	+23	i 5 38	PPP	—
Bogota		38·4	355	e 7 30	+10	e 13 15	+ 3	—	—	—
Chinchina		38·8	353	e 7 31	+ 8	e 16 37	SSS	e 9 6	PP	e 20·4
Morgantown		73·6	353	e 11 28	− 4	—	—	e 11 54	?	—
Harvard		75·9	0	i 11 45	0	—	—	—	—	—
Palomar	Z.	79·7	323	e 12 6	0	—	—	—	—	—
Pasadena	Z.	81·0	322	e 12 14	+ 1	—	—	—	—	—
China Lake	Z.	82·1	324	e 12 18	− 1	—	—	e 12 29	pP	—
Lick	Z.	85·3	322	e 12 35k	0	—	—	i 12 42	pP	—
Tamanrasset	Z.	91·6	64	e 13 1	− 4	—	—	e 16 52	PP	—
Ksara		120·2	68	e 20 42	PP	—	—	—	—	—

Additional readings :—
Copiapo N = 3m.32s. and 3m.43s.
Chinchina eSEN = 14m.6s.
Tamanrasset ePP?Z = 16m.30s., ePPZ = 16m.40s., ePPPZ = 18m.27s.
Long waves were also recorded at Paris, Pavia, Stuttgart, and Potsdam.

April 11d. 13h. 59m. 53s. Epicentre 4°·8N. 61°·6E. (as on 1950, May 3d.).

A = +·4740, B = +·8766, C = +·0831 ; δ = +1 ; h = +7 ;
D = +·880, E = −·476 ; G = +·040, H = +·073, K = −·997.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Kodaikanal	E.	16·6	68	e 4 2	+ 6	—	—	—	—	—
Bombay		17·8	37	i 4 5	− 6	e 7 21	− 7	4 29	PP	8·4
Poona		18·1	39	i 4 10	− 4	e 7 57	SS	4 35	PPP	8·3
Colombo	E.	18·3	82	3 13	−64	—	—	—	—	9·1
Calcutta	E.	31·3	53	8 57	?	i 11 47	+16	—	—	—
Stalinabad		34·2	10	e 6 47	− 2	—	—	—	—	—
Fergana		36·6	13	e 7 7	− 3	—	—	—	—	—
Tashkent		37·0	10	e 7 11	− 2	e 12 55	− 4	—	—	—
Ksara		37·5	323	e 6 12	−65	—	—	i 8 54	PP	19·7
Helwan	Z.	37·9	314	e 7 47	+27	—	—	e 9 2	PPP	—
Tchimkent		38·0	9	e 7 18	− 3	—	—	—	—	—
Kirovobad		38·3	342	e 7 26	+ 2	e 13 19	0	—	—	—
Frunse		39·6	15	e 7 34	− 1	—	—	—	—	—
Rybach'e		39·6	17	e 7 38	+ 3	—	—	—	—	—
Yalta		46·3	333	e 9 0	+31	—	—	—	—	—
Istanbul		46·4	325	e 8 25	− 5	e 15 13	− 5	e 10 19	PP	24·1
Sverdlovsk		51·9	359	e 9 39	+27	—	—	—	—	—
Tamanrasset	Z.	57·0	294	e 9 46	− 4	—	—	i 9 51	P	—
Irkutsk		59·0	29	e 10 7	+ 3	e 18 4	− 6	—	—	—
Kabansk		60·0	30	e 10 15	+ 4	—	—	—	—	—
Collmberg	Z.	61·4	328	e 10 18	− 2	—	—	—	—	—
Strasbourg		63·1	323	e 10 37?	+ 5	—	—	e 11 7	?	—
Besançon		63·6	322	e 10 39	+ 4	—	—	—	—	—
Paris		66·4	322	e 11 6	+13	—	—	—	—	—

Additional readings :—
Poona PPPE = 4m.46s., SSE = 8m.47s.
Helwan eZ = 11m.7s.
Istanbul eN = 18m.49s.
Tamanrasset iZ = 10m.47s., eZ = 11m.44s.
Long waves were also recorded at Christchurch and Wellington.

April 11d. Readings also at 0h. (near Grozny), 1h. (Potsdam and near Apia), 4h. (Rome, Nanking, Puebla, and near Tacubaya), 5h. (Kew, Paris, Copenhagen, De Bilt, Stuttgart, Potsdam, Pavia, Strasbourg, near Seattle, and Victoria), 9h. (Apia and Tamanrasset), 11h. (Stuttgart and Santa Lucia), 12h. (Manila, Samarkand, Fergana, Lunacharskoe, near Kulyab, Murgab, Obi-garm (2), Stalinabad (2), Khorog (2), and Dzhergetal (2)), 13h. (near Copiapo), 14h. (near Apia), 16h. (Apia (2) and Rome), 18h. (Antofagasta, Copiapo, and La Paz), 19h. (Lick, Reno, Pasadena, Riverside, China Lake, Tinemaha, Tamanrasset, and Rome), 20h. (Ksara, Tamanrasset, Stuttgart, Paris, Kew, De Bilt, La Paz, Huancayo, Bogota, Chinchina, and Galerazamba), 21h. (Fresno, Reno, near Palomar, Pasadena, and near Frunse), 22h. (Victoria, Seattle, Berkeley, Lick, Fresno, near Riverside, Palomar, Pasadena, La Jolla, and near Dzhergetal (2)), 23h. (Palisades, Tacubaya, near Gandzha, Akhalkalaki, and Tsikhlis-Dzhvari).

April 12d. 11h. 6m. 39s. Epicentre 6°·2N. 117°·0E.

$A = -\cdot4514$, $B = +\cdot8858$, $C = +\cdot1073$; $\delta = -8$; $h = +7$;
$D = +\cdot891$, $E = +\cdot454$; $G = -\cdot049$, $H = +\cdot096$, $K = -\cdot994$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Manila		9·2	25	e 2 19	+ 3	e 4 9	+ 6	i 2 41	P*	—
Bandong		16·0	216	e 3 56	PP	i 8 4	L	—	—	(i 8·1)
Djakarta		16·0	220	e 4 3	PP	i 7 30	SSS	—	—	—
Zi-ka-wei	z.	25·2	9	e 5 24	− 5	10 55	SS	—	—	—
Nanking		25·8	2	e 5 36	+ 2	(e 9 57)	− 5	e 9 3	PcP	e 10·0
Calcutta	E.	32·1	304	e 7 47	PPP	i 11 41	− 2	—	—	—
Colombo	E.	36·9	274	(7 11)	− 1	7 11	P	3 21	?	21·4
Kodaikanal	E.	39·3	280	e 7 30	− 2	—	—	—	—	—
Poona		43·8	291	e 8 7	− 2	e 14 37	− 3	9 51	PP	—
Bombay		44·8	291	—	—	e 14 52	− 3	—	—	—
Kabansk		46·5	352	e 8 26	− 5	e 15 1	−18	—	—	—
Almata II		50·8	324	e 9 2	− 2	—	—	—	—	—
Andijan		52·6	318	e 9 19	+ 1	e 16 44	0	—	—	—
Stalinabad		54·1	315	e 9 33	+ 4	—	—	—	—	—
Tashkent		54·9	318	e 9 29?	− 6	e 17 8?	− 8	—	—	—
Sverdlovsk		66·9	331	e 10 56	0	19 41	− 8	—	—	—
Ksara		79·2	303	e 15 55	?	e 26 58	SS	—	—	—
Istanbul		84·4	311	e 12 33	− 3	e 22 57	− 4	e 28 21?	SS	e 39·4
Tamanrasset	z.	107·1	296	e 18 53	PP	—	—	—	—	—

Poona gives also PPPE = 10m.29s., ScPE = 13m.38s., PSE = 14m.45s., PPSE = 14m.53s.
Long waves were also recorded at Paris.

April 12d. Readings also at 0h. (Tacubaya, near Granada, and near Dzhergetal), 1h. (Copiapo), 3h. (Tacubaya, Pasadena, Riverside, Palomar, and China Lake), 4h. (Tamanrasset (2), Victoria, Seattle, Palisades, Chinchina, Bogota, Berkeley, Lick (2), Fresno (2), Mineral (2), Reno, Pasadena, Riverside, near Palomar, and near Reykjavik (2)), 5h. (Brisbane (2), Mount Wilson, Riverside, China Lake, Lick (3), Fresno (2), Mineral (3), and Reno), 6h. (Huancayo, Palisades, Seattle, Berkeley, Lick, Fresno, Mineral, Reno, La Jolla, near Palomar, Riverside, Pasadena, and near Reykjavik), 7h. (Apia, Bucharest, and near Sofia), 8h. (Huancayo, near Ashkabad, and near Dzhergetal), 10h. (Santa Lucia), 11h. (near Apia and near Dzhergetal), 12h. (La Paz, La Plata, Santa Lucia, and near Copiapo), 13h. (Copiapo (2) and Santa Lucia), 14h. (Stuttgart, and near Dzhergetal), 15h. (Puebla, near Tacubaya, near Neuchatel, Basle, Zürich, and Stuttgart), 16h. (Alicante), 17h. (Stuttgart, near Neuchatel, Basle, and Zürich ; intensity IV at Montana), 18h. (near Apia and near Dzhergetal), 19h. (Mizusawa), 20h. (Oaxaca, Puebla, near Tacubaya, and near Akhalkalaki), 21h. (Oaxaca (2), Vera Cruz (2), near Puebla (2), and Tacubaya (2)).

April 13d. 10h. 14m. 40s. Epicentre 10°·0S. 119°·0E.

Strasbourg and U.S.C.G.S. give epicentre as adopted.

$A = -·4775$, $B = +·8615$, $C = -·1725$; $\delta = -6$; $h = +7$;
$D = +·875$, $E = +·485$; $G = +·084$, $H = -·151$, $K = -·985$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bandong		11·7	285	e 2 53	+ 2	e 5 19	SS	—	—	—
Djakarta		12·6	286	e 3 5	+ 2	i 5 38	SS	—	—	—
Perth		22·0	187	i 5 0	+ 2	i 8 50	− 6	5 25	PP	i 11·1
Manila		24·5	5	i 5 23	+ 1	i 9 3	−37	e 5 58	PP	—
Guam		34·6	48	8 22	PPP	—	—	—	—	—
Brisbane	z.	36·5	123	i 7 3	− 6	e 12 45	− 6	—	—	—
Riverview		37·8	134	i 7 19k	− 1	i 13 9	− 2	i 8 48	PP	e 19·8
Zi-ka-wei	z.	41·0	4	i 7 45	− 1	14 5	+ 6	9 21	PP	17·4
Nanking		41·8	0	i 7 53a	0	i 14 6	− 5	i 9 36	PP	e 17·6
Colombo	E.	42·4	292	7 56	− 2	14 16	− 4	—	—	24·2
Calcutta	E.	44·1	318	e 8 14	+ 2	i 14 41	− 4	i 18 6	SS	20·6
Kodaikanal	E.	45·9	296	i 8 26	0	15 11	0	18 26	SS	21·4
Chatra		47·9	322	e 8 38?	− 4	e 15 38	− 1	10 28	PP	19·9
Hyderabad	N.	48·5	305	e 8 43	− 3	i 15 35	−13	—	—	22·8
Poona		52·8	303	i 9 17	− 2	16 47	0	14 22	ScP	25·0
Bombay		53·8	303	i 9 24	− 2	i 16 54	− 7	11 28	PP	25·0
Vladivostok		54·2	13	i 9 26	− 3	i 17 1	− 5	—	—	—
New Delhi		55·7	316	e 9 36	− 4	i 17 10	−16	11 39	PP	—
Kaimata	N.E.	55·9	135	e 10 20?	?	—	—	—	—	—
Cobb River	E.	56·4	133	e 9 49	+ 4	e 17 32	− 4	—	—	—
Auckland	N.	56·8	128	10 5?	+17	17 40?	− 1	19 35?	ScS	28·3?
New Plymouth	E.	56·8	130	e 9 59	+11	—	—	—	—	—
Christchurch		57·1	136	9 47	− 3	17 39	− 6	e 14 40	PcS	e 27·3
Wellington		57·9	133	e 9 53	− 3	e 17 44	−11	i 10 32	pP	e 29·7
Terre Adelie		58·7	169	i 10 0	− 2	e 17 56	−10	—	—	—
Kabansk		62·7	353	10 27	− 2	18 53	− 4	—	—	—
Irkutsk		63·3	351	10 30	− 3	19 1	− 3	—	—	—
Naryn		64·7	326	i 10 37	− 5	e 19 12	−10	—	—	—
Khorog		64·8	320	e 10 41	− 2	—	—	—	—	—
Almata II		65·2	328	10 43	− 2	—	—	—	—	—
Rybach'e		65·3	327	i 10 43	− 3	19 26	− 3	—	—	—
Almata		65·4	328	i 10 44	− 3	19 26	− 4	—	—	—
Dzhergetal		66·1	322	i 10 45	− 6	i 19 30	− 9	—	—	—
Andijan		66·3	324	i 10 50	− 2	e 19 37	− 5	—	—	—
Fergana		66·4	324	—	—	e 19 37	− 6	—	—	—
Frunse		66·4	327	i 10 50	− 3	i 19 38	− 5	—	—	—
Stalinabad		67·2	320	i 10 56	− 2	i 19 46	− 6	—	—	—
Lunacharskoe		68·5	322	e 11 8	+ 2	—	—	—	—	—
Tashkent		68·5	322	i 11 3	− 3	i 20 1	− 7	—	—	—
Tchimkent		68·9	323	i 11 6	− 3	i 20 8	− 5	—	—	—
Samarkand		69·0	320	11 10?	+ 1	20 10?	− 4	—	—	—
Semipalatinsk		69·0	335	e 11 7	− 2	—	—	—	—	—
Tananarive		69·4	254	—	—	e 20 18	0	25 1	SS	34·2
Mary		71·4	316	i 11 22	− 2	—	—	—	—	—
Petropavlovsk		71·4	24	e 11 20	− 4	—	—	—	—	—
Ashkabad		74·0	315	i 11 38?	− 1	i 21 9?	− 2	—	—	—
Klyuchi		74·6	23	e 11 51	+ 8	—	—	—	—	—
Baku		81·0	314	i 12 19	+ 1	—	—	—	—	—
Lenkoran		81·2	312	10 4?	?	22 10?	−19	—	—	—
Shemakha		82·0	313	12 24?	+ 1	22 30?	− 7	—	—	—
Sverdlovsk		82·0	332	i 12 21	− 2	22 28	− 9	—	—	—
Kirovobad		83·6	313	i 12 31	0	i 22 50	− 3	—	—	—
Makhach-Kala		83·6	311	e 12 38	+ 7	—	—	—	—	—
Erevan		84·8	312	e 12 39	+ 2	—	—	—	—	—
Grozny		84·9	316	e 12 39	+ 1	—	—	—	—	—
Tiflis		85·0	314	12 38	0	—	—	—	—	—
Leninakan		85·4	313	e 12 42	+ 2	—	—	—	—	—
Borzhomi		86·1	314	e 12 45	+ 1	e 23 11	− 7	—	—	—
Grahamstown	z.	86·6	237	i 13 17	+31	—	—	—	—	—
Sotchi		89·2	315	e 13 3	+ 4	e 23 45	− 2	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ksara		89·8	306	i 13 2a	0	23 53?	0	—	—	—
Helwan	N.	92·8	300	—	—	e 23 50	[+ 1]	e 24 14	S	—
Moscow		93·4	326	e 13 32?	+14	—	—	—	—	—
Istanbul		96·4	311	e 13 29	− 3	e 24 44	− 6	e 24 6	SKS	e 47·3
Collmberg	Z.	107·7	321	18 55	PP	—	—	—	—	—
Jena	N.	108·7	320	18 53	PP	—	—	e 19 22	?	—
Stuttgart		110·5	319	18 48	[+14]	e 28 32	PS	e 19 26	PP	e 62·8
Resolute Bay		112·6	9	e 19 26	PP	e 29 2	PS	e 30 32	PPS	—
Scoresby Sund		114·8	347	e 18 54	[+11]	—	—	e 19 43	PP	61·3
Tamanrasset	Z.	115·4	290	e 18 46	[+ 2]	e 29 28	PS	e 19 47	PP	—
Victoria	Z.	115·6	41	e 29 56	PS	—	—	—	—	—
Berkeley		118·7	52	e 20 5	PP	e 29 57	PS	e 36 15	SS	—
Mineral	Z.	118·7	50	e 18 50k	[0]	—	—	e 20 7	PP	—
Lick	Z.	119·3	52	e 20 10	PP	—	—	—	—	—
Reno	Z.	120·3	50	e 19 6	[+13]	—	—	e 20 17	PP	—
Fresno	Z.	120·9	53	e 20 24s	PP	—	—	—	—	—
Pasadena		122·6	56	e 18 59	[+ 1]	e 20 35	PP	i 19 10	PKP_2	e 55·3
China Lake	Z.	122·8	54	e 19 1	[+ 3]	i 20 41	PP	i 19 10	PKP_2	—
Riverside	Z.	123·3	56	e 19 0	[+ 1]	—	—	—	—	—
Tacubaya		142·0	71	19 51	[+17]	—	—	—	—	—
Ottawa		142·5	17	19 42	[+ 7]	32 53	SKSP	—	—	78·3
Cleveland		143·8	27	i 19 34k	[− 3]	—	—	e 22 20	PP	—
Pennsylvania		145·9	23	i 19 39	[− 2]	e 29 56	{+ 1}	23 28	PP	—
Morgantown		146·0	27	i 19 41	[0]	—	—	e 20 57	?	—
Harvard		146·3	13	i 19 42	[+ 1]	—	—	i 23 2	PP	e 81·2
Weston		146·5	13	i 19 44	[+ 2]	—	—	—	—	—
Palisades		147·1	17	i 19 45	[+ 2]	—	—	i 19 59	pPKP	—
La Paz		152·7	166	e 20 8	[+17]	44 8	SS	i 20 30	PKP_2	—
Huancayo		153·9	148	e 20 6	[+13]	—	—	—	—	—
Chinchina		164·7	108	i 20 6	[0]	—	—	e 25 1	PP	e 84·0
Bogota		166·0	111	e 20 21	[+14]	31 34	{− 9}	e 25 9	PP	—

Additional readings :—
Perth e =5m.40s.
Manila eSS? =10m.11s.
Riverview iEZ =7m.34s., iZ =9m.1s., iSSZ =15m.50s., iSSSE =16m.21s.
Nanking i =8m.1s., 8m.22s., 8m.41s., and 8m.58s., PcS?Z =13m.16s.
Calcutta PcSE =13m.29s.
Chatra PcSN =13m.35s.
Poona eSEN =16m.31s., PSEN =16m.39s.
Bombay QE =22m.38s.
New Delhi PPSN =17m.25s.
Christchurch esP?Z =11m.10s., eSS =21m.20s., eSSSZ =25m.10s.
Wellington PcP?Z =11m.11s., iPPP?Z =13m.43s., PcS? =14m.9s., eSSS =24m.3s.
Tananarive e =21m.50s.
Helwan iN =24m.36s.
Istanbul ePPE =17m.22s., ePPPE =19m.26s., ePSE =26m.22s., ePPSE =26m.46s.
Stuttgart eZ =19m.4s., eSSS? =40m.2s.
Tamanrasset ePPPZ =22m.13s., eZ =24m.1s.
Berkeley eSKSN =28m.5s., eZ =30m.11s.
Reno eE =19m.28s.
Pennsylvania eN =20m.47s. and 25m.20s.
Harvard e =21m.14s.
La Paz PP =23m.13s., PPS =37m.20s.
Long waves were also recorded at Paris, Strasbourg, Kew, De Bilt, Potsdam, Prague, and Skalnate Pleso.

April 13d. 16h. U.S.S.R. gives epicentre as 39°·7N. 73°·0E.
Andijan iP_g =18m.29s., S_g =18m.44s.
Fergana eP_g =18m.31s., eS_g =18m.48s.
Dzhergetal eP_g =18m.41s., eS_g =19m.1s.
Murgab eP_g =18m.44s., S* =19m.4s.
Naryn eP =19m.1s., eS =19m.34s.
Khorog P =19m.5s., S* =19m.40s.
Obi-garm eP* =19m.3s., eS_g =19m.46s.
Tchimkent eP =19m.7s.
Frunse eP =19m.8s., iS =19m.50s.
Almata II iP =19m.23s., iS_g =20m.35s.
Ili P =19m.30s., S* =20m.46s.
Lunacharskoe iS =19m.51s.
Stalinabad iS* =20m.6s.

April 13d. 16h. 28m. 45s. Epicentre 35°·5N. 140°·4E. Focus at base of superficial layers.
(as on 1951, March 9d.).

Intensity IV at Tokyo, Nishiikuta, Makabe, and Shimozuma ; II-III at Kasama. Epicentre 35°·4N. 140°·1E. Depth 60km.
Seismological Bulletin of the Cent. Met. Obs., Japan, for April, 1951, Tokyo, 1951, p. 88. macroseismic chart p. 88.

A = −·6287, B = +·5201, C = +·5781 ; δ = −3 ; h = 0 ;
D = +·637, E = +·771 ; G = −·445, H = +·368, K = −·816.

	△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.
Tyosi	0·4	58	0 16	+ 7	0 26	+10
Tokyo	0·6	289	0 13	+ 1	0 21	0
Mera	0·7	219	0 17	+ 4	0 28	+ 5
Tukubasan	0·8	341	0 15	0	0 24	− 2
Mito	0·9	3	0 17	+ 1	0 30	+ 2
Kumagaya	1·0	309	0 18k	0	0 30	− 1
Osima	1·1	229	0 17	− 2	0 31	− 2
Utunomiya	1·1	338	0 18k	− 1	0 31	− 2
Misima	1·2	252	0 19	− 1	0 31	− 5
Titibu	1·2	294	0 19	− 1	0 32	− 4
Hunatu	1·3	270	0 20k	− 2	0 34	− 4
Maebasi	1·3	313	0 22k	0	0 38	0
Kohu	1·5	275	0 26	+ 2	0 40	− 4
Onahama	1·5	16	0 35	+11	0 45	+ 1
Oiwake	1·7	299	0 25	− 3	0 47	− 2
Shizuoka	1·7	252	0 28	0	0 47	− 2
Omaesaki	2·0	243	0 44	+12	0 58	+ 2
Iida	2·1	270	0 34	+ 1	—	—
Inawasiro	2·1	354	0 33	0	1 3	+ 4
Matumoto	2·1	290	0 33	0	0 57	− 2
Nagano	2·2	203	0 32	− 3	0 56	− 5
Hukusima	2·3	1	0 37	+ 1	1 4	0
Takada	2·4	313	0 43	+ 5	1 20	+14
Nagoya	2·8	263	0 46	+ 3	1 22	+ 6
Sendai	2·8	8	0 51	+ 8	1 17	+ 1
Hikone	3·4	269	0 59	+ 7	—	—
Tsuruga	3·5	274	1 3	+10	—	—
Morioka	4·2	6	1 3	0	1 50	− 2

April 13d. Readings also at 1h. (China Lake, Tinemaha), Copiapo, and near Antofagasta, 2h. (near Gori), 3h. (near Dzhergetal), 4h. (Tamanrasset, Strasbourg, and near Obi-garm), 6h. (near Copiapo, near Dzhergetal, and near Shemakla), 8h. (Apia, Auckland, Kaimata, New Plymouth, Tuai, Wellington, Pasadena, Riverside, Tinemaha, Palomar, China Lake, Lick, Fresno, Mineral, Arcata, Reno, Tamanrasset, Collmberg, Stuttgart, near Neuchatel, near Obi-garm, and Dzhergetal), 9h. (Auckland), 11h. (near Belgrade), 12h. (Weston, Palisades, Morgantown, near Adak, and near Istanbul), 13h. (Raciborzu, Scoresby Sund (2), Resolute Bay, Pasadena, Riverside, Palomar, China Lake, Tinemaha, Berkeley, Lick, Fresno, Mineral, Arcata, and Reno), 14h. (Grahamstown, Pietermaritzburg, Pretoria, Tamanrasset (2), and near Seattle), 15h. (Alicante, Collmberg, Stuttgart, Victoria, Berkeley, Lick, Mineral, Palomar, China Lake, and Tinemaha), 17h. (near Dzhergetal (2)), 18h. (near Malaga), 19h. (Collmberg (3)), 20h. (near Santa Lucia), 22h. (near Reykjavik (2)), 23h. (Victoria).

April 14d. 0h. 45m. 29s. Epicentre 23°·3S. 66°·4W. Depth of focus 0·030.
(as on 1951, March 14d.).

A = +·3681, B = −·8425, C = −·3933 ; δ = −1 ; h = +4 ;
D = −·916, E = −·400 ; G = −·157, H = +·360, K = −·919.

		△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	Supp. m. s.		L. m.
Antofagasta	E.	3·7	264	i 0 43	−17	i 1 16	−10	—	—	—
Copiapo	N.	5·4	220	1 0	−21	1 53	−30	—	—	—
La Paz		6·9	346	i 1 43k	+ 3	i 3 3	+ 5	—	—	3·5
Santa Lucia		10·8	200	e 2 6	−24	3 31	−57	2 56	?	—
Buenos Aires		13·2	150	i 2 44	−16	4 49	−33	(5 20)	S	5·3

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
La Plata	Z.	13·7	150	2 53	−13	5 19	−15	—	—	6·2
Huancayo		14·1	321	i 3 10	− 1	—	—	—	—	—
Bogota		28·7	343	i 5 39	+ 1	i 10 18	+ 8	i 6 19	pP	—
Chinchina		29·5	341	i 5 45	− 1	i 10 25	+ 3	i 10 46	sS	—
Punta Arenas	N.	30·0	184	—	—	e 11 58	SS	—	—	—
Galerazamba		35·0	345	i 6 32	− 1	i 11 56	+ 8	i 12 25	sS	—
Fort de France		38·1	9	i 7 1	+ 2	i 12 41	+ 6	—	—	—
Oaxaca		49·9	322	e 8 35	+ 2	—	—	—	—	—
Vera Cruz		51·3	324	e 8 48	+ 5	e 15 44	+ 1	e 9 24	pP	—
Puebla		52·3	321	e 8 52	+ 2	e 16 4	+ 7	e 17 22	sS	—
Tacubaya		53·2	320	i 8 58a	+ 1	e 16 12	+ 3	—	—	—
Guadalajara		56·6	318	—	—	e 17 1	+ 7	—	—	—
Morgantown		63·9	348	i 10 11	0	—	—	i 10 56	pP	—
City College, N.Y.		64·2	355	i 10 12	− 1	—	—	e 10 58	pP	—
Fordham		64·2	355	i 10 13	0	i 18 39	+ 8	i 10 59	pP	—
Cincinnati		64·4	345	i 10 13	− 1	i 18 37	+ 4	i 10 57	pP	—
Palisades		64·4	355	i 10 15	+ 1	i 18 40	+ 7	e 10 58	pP	—
Pennsylvania		64·7	351	i 10 14	− 2	i 18 45	+ 8	i 11 21	pP	—
Pittsburgh		64·7	349	i 10 14	− 2	i 18 42	+ 5	i 11 0	pP	—
St. Louis		65·5	339	i 10 20	− 1	i 18 51	+ 4	i 11 6	pP	—
Weston		65·5	357	i 10 22	+ 1	e 18 47	0	e 11 7	pP	—
Harvard		65·6	357	i 10 23	+ 1	i 18 57	+ 9	i 11 7	pP	e 27·5
Florissant		65·7	339	i 10 21	− 1	i 18 52	+ 3	i 11 6	pP	—
Cleveland		66·0	348	e 10 23	− 1	i 18 57	+ 4	i 11 8	pP	—
Halifax		67·7	3	11 23	pP	19 18	+ 5	e 20 16	PS	—
Ottawa		68·9	353	i 10 43	+ 1	i 19 36	+ 9	11 28	pP	27·5
Shawinigan Falls	N.	69·8	356	10 50	+ 2	19 46	+ 8	i 11 37	pP	—
Palomar		74·1	318	i 11 13k	0	i 20 33	+ 7	—	—	—
Pasadena		74·8	318	i 11 20k	+ 3	i 20 47	+13	i 12 9	pP	e 29·5
Riverside		74·8	318	i 11 17k	0	i 20 41	+ 7	—	—	—
China Lake		76·2	320	i 11 24k	− 1	i 20 55	+ 6	i 12 1	pP	—
Tinemaha		77·4	320	i 11 32k	0	i 21 9	+ 7	i 29 5	PKKP	—
Fresno		78·1	319	i 11 34k	− 2	e 21 14	+ 4	e 22 5	pS	—
Lick		79·6	318	i 11 43k	− 1	e 21 32	+ 7	—	—	—
Santa Clara		79·8	318	i 11 44	− 1	i 21 34	+ 7	i 12 36	pP	e 27·8
Grahamstown	Z.	79·9	121	i 12 15	+30	—	—	—	—	—
Reno		79·9	321	e 11 46k	+ 1	e 21 32	+ 4	e 14 51	PP	—
Berkeley		80·3	318	i 11 47k	0	e 21 37	+ 4	i 12 42	pP	—
Mineral		81·5	321	i 11 52k	− 2	e 21 51	+ 6	—	—	—
Saskatoon		82·9	336	e 12 2	+ 1	i 22 8	+ 9	—	—	—
Arcata		83·3	319	e 12 2k	− 1	e 22 12	+ 9	—	—	—
Malaga		83·5	46	i 12 8	+ 4	i 22 18	+13	15 12	PP	39·3
Tamanrasset	Z.	83·6	61	i 12 7k	+ 3	i 22 13	+ 7	i 12 53	pP	—
Pretoria	Z.	84·0	115	i 12 6	0	—	—	—	—	—
Granada		84·3	46	i 12 8k	0	i 22 20	+ 7	12 55	pP	38·0
Pietermaritzburg	Z.	84·3	119	i 12 9	+ 1	—	—	—	—	—
Almeria		84·9	47	i 12 4	− 7	i 22 18	− 1	15 24	PP	39·0
Ivigtut		85·5	9	12 14	0	i 22 33	+ 9	i 13 3	pP	—
Toledo		85·6	43	i 12 16	+ 2	i 22 29	+ 4	i 13 7	pP	—
Seattle		86·6	326	e 12 20k	+ 1	e 22 29	[+ 8]	i 13 13	pP	—
Alicante		87·0	45	12 26	+ 5	22 33	[+ 9]	23 53	PS	e 38·2
Terre Adélie		87·8	191	i 12 20	− 5	—	—	—	—	—
Victoria		87·8	326	e 12 24	− 1	22 38	[+ 9]	—	—	—
Tortosa		89·0	44	e 12 37	+ 7	i 22 48	[+11]	—	—	—
Barcelona		90·4	44	—	—	i 22 54	[+ 9]	i 23 20	S	—
Rathfarnham Castle		92·3	31	i 12 47	+ 1	e 23 9	[+14]	i 13 45	pP	e 43·5
Clermont-Ferrand		93·2	41	i 12 53	+ 3	i 23 16	[+15]	i 13 41	pP	e 39·9
Tunis		93·6	51	—	—	c 23 14	[+10]	e 23 57	S	—
Reykjavik	Z.	93·8	18	i 12 56a	+ 3	—	—	i 13 44	pP	—
Kew		94·2	35	i 12 56	+ 2	i 23 14	[+ 7]	i 13 43	pP	e 44·5
Christchurch		94·3	218	i 12 52	− 3	23 9	[+ 2]	i 16 39	PP	e 42·5
Wellington	Z.	94·3	221	i 12 50	− 5	—	—	i 16 38	PP	—
Paris		94·4	38	i 12 57	+ 2	i 23 11	[+ 3]	i 13 48	pP	—
Besançon		95·6	40	e 13 4	+ 3	e 14 9	sP	e 13 50	pP	—
Pavia		96·3	43	e 13 9a	+ 5	i 23 29	[+12]	e 13 58	pP	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Aberdeen	E.	96·5	29	—	—	i 23 24	[+ 5]	i 24 37	S	—
Basle		96·7	41	e 13 10	+ 4	e 23 30	[+10]	e 14 19	pP	—
Auckland	N.	96·9	225	e 12 26	−41	—	—	e 17 17	PP	—
Prato		97·3	45	e 13 33	+24	e 23 37	[+14]	—	—	—
Strasbourg		97·3	40	e 13 12a	+ 3	i 23 33	[+10]	e 13 58	pP	—
Zürich		97·3	41	e 13 10a	+ 1	e 23 31	[+ 8]	e 13 58	pP	—
Rome		97·4	46	e 13 6	− 3	i 23 33	[+ 9]	i 13 58	pP	—
De Bilt		97·5	36	e 13 59	pP	i 23 34	[+10]	i 24 22	S	—
Chur		97·6	42	e 13 13	+ 3	e 23 30	[+ 5]	—	—	—
Bologna		97·7	44	e 17 11	PP	i 23 34	[+ 9]	e 24 17	S	—
Salo		97·7	43	e 13 13	+ 3	i 23 27	[+ 2]	e 25 56	PS	—
Karlsruhe		97·9	40	e 13 13	+ 2	i 23 36	[+10]	e 14 2	pP	—
Messina	E.	98·1	52	—	—	e 23 35	[+ 8]	e 24 24	S	—
Padova		98·1	45	e 13 45	?	23 42	[+15]	24 12	S	—
Stuttgart		98·3	41	e 13 14	+ 1	i 23 38	[+10]	e 14 3	pP	e 39·5
Scoresby Sund		98·6	13	i 13 16a	+ 2	i 23 38	[+ 9]	e 14 4	pP	—
Witteveen	Z.	98·6	35	i 13 17a	+ 3	—	—	i 14 5	pP	—
Resolute Bay		99·5	352	i 13 19	0	e 23 37	[+ 4]	e 14 5	pP	—
Triest		99·8	44	e 14 12	pP	i 23 41?	[+ 6]	e 17 23	PP	—
Sonneberg		100·1	40	—	—	e 23 46	[+10]	e 24 49	S	—
Taranto		100·2	50	13 35	+13	23 40	[+ 3]	17 10	PP	—
Jena		100·6	39	e 13 26	+ 2	e 23 48	[+ 9]	e 14 15	pP	—
Cheb		100·7	39	e 16 1	?	e 23 53	[+14]	e 24 51	S	—
Collmberg	Z.	101·5	39	e 13 31	+ 3	e 17 36	PP	e 14 19	pP	—
Prague		101·9	40	e 13 32	+ 3	23 57	[+12]	e 14 17	pP	e 42·0
Potsdam		102·0	37	i 14 21	pP	i 23 55	[+ 9]	i 15 2	S	e 41·5
Copenhagen		102·9	34	26 43	SP	24 1	[+11]	25 13	S	53·5
Tananarive		103·1	117	28 13	PPS	e 24 2	[+11]	25 21	S	—
Ogyalla		103·4	43	e 26 48	SP	e 25 1	+ 1	e 24 2	SKS	—
Kalossa		103·5	45	—	—	i 24 3	[+10]	—	—	—
Belgrade		103·9	47	e 16 36a	?	i 24 4	[+10]	i 24 47	SKKS	—
Budapest		103·9	44	—	—	i 24 2	[+ 8]	—	—	—
Timisoara	N.	104·7	46	—	—	e 24 7	[+ 9]	—	—	—
Skalnate Pleso		105·2	43	e 15 31	sP	24 11	[+10]	e 24 56	SKKS	—
Upsala	E.	106·9	31	—	—	i 24 18	[+10]	e 27 19	pS	—
Helwan	N.	107·6	64	e 18 25	PP	e 24 19	[+ 8]	e 25 51	S	—
Lwow		107·7	43	—	—	i 24 19	[+ 7]	—	—	—
Istanbul		108·9	52	e 18 33	PP	e 25 25	S	e 26 1	SKKS	e 62·5
Helsinki		110·6	31	e 27 54	SP	e 25 40	S	e 26 12	S	—
Ksara		112·4	61	i 19 0	PP	i 28 26	PS	i 20 0	pPP	—
Riverview		112·9	213	14 15	P	e 24 27	[− 6]	i 18 55	PP	—
Pulkovo		113·2	33	—	—	24 40	[+ 6]	25 49	SKKS	—
Yalta		113·3	50	e 19 15	PP	e 24 41	[+ 7]	e 25 50	SKKS	—
Moscow		116·8	37	—	—	i 24 54	[+ 7]	e 26 6?	SKKS	—
Sotchi		117·1	51	—	—	e 24 56	[+ 7]	—	—	—
Borzhomi		119·6	53	e 18 28	[+ 5]	i 25 8	[+11]	i 26 34	SKKS	—
Piatigorsk		119·6	51	—	—	e 25 1	[+ 4]	e 26 25	SKKS	—
Tiflis		120·6	53	e 18 29	[+ 4]	e 25 9	[+ 8]	e 26 43	SKKS	—
Nakhichevan		120·9	57	20 17	PP	i 25 12	[+10]	i 29 38	SKSP	—
Grozny		121·5	52	e 18 30	[+ 3]	i 25 12	[+ 8]	—	—	—
Kirovobad		121·7	55	i 29 36	SKSP	i 25 8	[+ 3]	i 26 46	SKKS	—
Makhach-Kala		122·7	52	e 20 19	PP	i 26 57	SKKS	i 29 52	SKSP	—
Shemakha		123·4	53	18 29?	[− 2]	—	—	i 20 25	PP	—
Lenkoran		123·5	57	18 33	[+ 2]	30 31	PS	19 23	pPKP	—
Baku		124·4	55	e 18 42	[+ 9]	e 25 31	[+18]	e 20 26	PP	—
Sverdlovsk		129·3	34	i 18 42	[0]	25 36	[+ 9]	e 19 36?	pPKP	—
Mary		133·7	59	i 18 52	[+ 2]	21 24	PP	e 19 42	pPKP	—
Petropavlovsk		134·9	324	e 18 53	[0]	—	—	i 21 32	PP	—
Samarkand		137·5	56	e 18 51	[− 6]	—	—	—	—	—
Tashkent		139·0	53	i 19 2	[+ 2]	i 28 30	SKKS	i 19 48	pPKP	—
Stalinabad		139·1	57	i 19 3	[+ 3]	28 29	SKKS	i 19 53	pPKP	—
Dzhergetal		140·8	54	e 19 2	[− 1]	—	—	—	—	—
Fergana		141·0	53	e 19 7	[+ 3]	25 1	[−48]	e 19 57	pPKP	—
Andijan		141·3	53	i 19 5	[+ 1]	29 11	SKKS	i 19 51?	pPKP	—
Bombay		141·8	88	e 19 4	[− 1]	41 42	PSS	22 29	PP	—

Continued on next page.

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Frunse		142·3	48	i 19 5	[− 1]	28 49	SKKS	i 19 55 pPKP	—
Poona		142·7	90	19 6	[− 1]	27 53	SKKS	22 45 PKS	—
Murgab		143·1	56	i 19 11	[+ 4]	i 28 57	SKKS	i 20 1 pPKP	—
Kodaikanal	E.	143·2	103	e 19 7	[0]	—	—	— —	—
Rybach'e		143·5	49	i 19 10	[+ 2]	i 29 1	SKKS	e 20 1 pPKP	—
Colombo	E.	143·7	111	19 6	[− 2]	29 1	SKKS	(40 31?) SS	40·5
Ili		143·7	45	i 19 10	[+ 2]	—	—	— —	—
Almata		143·8	46	19 11	[+ 2]	29 5	SKKS	i 20 1 pPKP	—
Naryn		143·8	50	i 19 9	[0]	i 29 1	SKKS	i 19 59 pPKP	—
Almata II		144·1	46	i 19 11	[+ 2]	—	—	— —	—
Kurmenty		144·8	46	i 19 12	[+ 1]	—	—	— —	—
Przhevalsk		145·1	47	i 19 14	[+ 3]	—	—	— —	—
Hyderabad		146·6	93	e 19 15	[+ 1]	i 29 12	SKKS	i 20 3 pPKP	—
Yuzno-Sakhlinsk		146·8	324	19 17	[+ 3]	—	—	— —	—
New Delhi	N.	146·9	73	e 19 18	[+ 4]	i 29 12	SKKS	i 20 10 pPKP	—
Djakarta		150·0	166	i 19 19	[0]	i 22 49	PKS	— —	—
Irkutsk		150·2	11	19 20	[+ 1]	29 35	SKKS	20 12 pPKP	—
Kabansk		150·8	8	19 21	[+ 1]	—	—	— —	—
Vladivostok		155·1	326	i 19 25	[− 1]	i 44 26	PSS	i 20 19 pPKP	—
Chatra	N.	155·8	73	e 19 30	[+ 3]	—	—	— —	—
Calcutta	E.	156·7	86	e 19 33	[+ 5]	—	—	— —	—
Zi-ka-wei	Z.	169·5	320	i 19 41	[+ 1]	i 20 56	sPKP	i 20 32 pPKP	—
Nanking		170·1	333	i 19 41	[+ 1]	i 20 54	sPKP	i 20 34 pPKP	—

Additional readings :—
La Paz iPP =1m.55s., iSS =3m.19s.
Bogota isS =11m.27s.
Chinchina iPP =6m.27s., iSS?EN =12m.53s.
Tacubaya e =14m.6s. and 16m.26s.
Fordham iScS? =19m.38s.
Cincinnati iPcP =10m.46s., iSS =19m.49s.
Palisades ePS =19m.48s.
Pennsylvania iPcP?N =11m.0s., eScSN =19m.35s., iE =19m.51s., eSSN =23m.19s., eSSS?E =26m.13s., eE =28m.6s., ePKKP?E =28m.55s., iE =30m.41s.
Pittsburgh i =20m.24s.
St. Louis i =10m.31s., e =13m.30s. and 14m.56s., i =19m.3s., iScS? =19m.59s., i =21m.27s. and 24m.15s.
Harvard eScS =19m.56s., isPS =21m.33s.
Florissant e =13m.27s., i =19m.6s., iScS? =19m.59s., isS =20m.18s., i =21m.30s., e =24m.33s.
Cleveland iPSEN =20m.1s., isSE =20m.47s., iE =21m.32s.
Pasadena isPZ =12m.29s., ePPZ =14m.9s., ePKP,PKPZ =38m.40s., eSKP,PKPZ =41m.58s. and other unidentified i readings.
China Lake iZ =11m.42s., isPZ =12m.20s., iPKKPZ =28m.58s., ePKP,PKPZ =38m.40s., eSKP,PKPZ =41m.56s., iZ =42m.59s.
Fresno eE =14m.16s., eZ =16m.54s.
Lick iZ =11m.52s. and 13m.1s.
Santa Clara isSE =22m.35s.
Reno eZ =13m.7s., eSEN =21m.35s., ePKP,PKPNZ =38m.29s.
Berkeley ePPZ =14m.53s., ipSE =22m.31s., isSN =23m.9s., iZ =24m.6s., eE =25m.0s. isPSEN =26m.47s., iE =28m.33s.
Mineral iZ =12m.2s., 12m.56s., and 13m.49s.
Malaga PPP =17m.8s., PS =23m.16s.
Tamanrasset ePPZ =15m.21s., epPPZ =16m.7s., ePPPZ =17m.8s., eZ =21m.6s. and 21m.26s., ePSZ =23m.45s., ePKP,PKPZ =38m.10s., eZ =38m.22s., eSKP,PKPZ =41m.25s.
Granada pPP =16m.3s., sS =22m.57s., PS =23m.39s., SS =26m.51s.
Almeria SS =28m.24s.
Ivigtut i =22m.21s., 23m.28s., ePS =24m.8s., SS =28m.13s.
Toledo pS =23m.25s., SS =28m.14s., SSS =31m.55s.
Seattle isP =13m.35s., ePP =15m.59s., ipPP =16m.56s., eS =22m.41s., eSP =23m.51s., esS =24m.10s. and many other unidentified readings.
Alicante PPP =16m.47s., ScS =23m.17s., PPS =24m.36s., SS =27m.29s., SSS =30m.11s., Q =33·5m.
Barcelona i =24m.26s.
Rathfarnham Castle ePPEN =15m.41s., eSKKS =23m.20s.
Clermont-Ferrand iS =23m.57s., isS =25m.42s., iPPS =26m.7s., i =26m.41s., iSS =29m.58s., eSSP? =30m.31s., e =31m.1s., eSSS =33m.18s.
Tunis e =24m.16s., ePS =25m.17s.
Reyjavik iZ =13m.4s.
Kew eS? =23m.50s., eSP =25m.14s.

Continued on next page.

Christchurch eZ =14m.4s. and 21m.21s., ePS =24m.33s., eEN =26m.5s., eSSEN = 30m.1s., eZ =31m.11s., eSSS?Z =33m.26s.
Paris isP =14m.13s., iPP =16m.44s., iSKKS =23m.26s., iS =23m.51s., iSP =25m.7s., iPS =25m.29s., iPPS =26m.37s., iSS =30m.29s. and other unidentified readings.
Besançon e =14m.39s., 14m.50s., and 15m.56s., ePP =17m.0s., e =17m.25s. and 18m.1s.
Pavia e =17m.5s., eS =24m.16s., i =24m.51s.
Aberdeen iE =25m.37s., iPPSE =26m.37s., iE =30m.28s., 40m.12s., and 49m.27s.
Strasbourg esP =14m.23s., ePP =17m.7s., epPP =17m.52s., iS =24m.24s., eSP = 25m.45s., eSPP =26m.41s., eSS =31m.31s., eSSS =35m.13s., and other unidentified e readings.
Zürich ePP =17m.6s., eS =24m.21s.
Rome ePPZ =17m.8s., iSEN =24m.26s., iPSEN =25m.54s., eSSEN =31m.22s.
De Bilt e =39m.31s.?.
Bologna e =18m.33s., ePS =25m.26s.
Salo eE =13m.16s., iEN =22m.36s.
Karlsruhe ePPZ =17m.13s., eSEN =24m.47s.
Padova PP =17m.45s., S =24m.36s.
Stuttgart ePP =17m.11s., e =23m.17s. and 24m.8s., eSKKS? =24m.28s., eS? =25m.7s., ePS? =25m.53s., ePPS? =27m.15s., e =27m.49s., 28m.38s., and 30m.36s., eSS = 31m.38s.
Scoresby Sund iS =24m.30s., e =25m.1s., SS =31m.13s.
Resolute Bay eZ =13m.25s., ePP =17m.28s., eSEN =24m.35s., eEN =26m.0s.
Triest iS =24m.41s.?, ePS =25m.45s., ePPS =27m.9s.
Sonneberg eSKSN =23m.49s.
Taranto SS? =32m.10s.
Jena eN =15m.6s.?, ePPN =17m.18s., eSKSEN =23m.51s., eN =24m.6s., eS?E = 24m.49s., eS?N =24m.53s.
Cheb eSP? =26m.18s., e =31m.19s.
Prague e =18m.13s., eSKKSN =24m.27s., eSKKSE =24m.34s., eSE =25m.0s., eSN = 25m.3s., esSKS? =25m.31s., eSP =26m.31s., ePS =26m.59s., esSP =27m.39s., ePPS =28m.3s., e =29m.19s., eSS =32m.3s., esSS =33m.36s., e =37m.5s. and 38m.59s.
Potsdam iSKSN =23m.58s., iSKKSE =24m.36s., iSE =25m.4s., isS =26m.34s.
Ogyalla esSKS? =25m.42s., ePS =27m.13s., eSPP =27m.49s., e =28m.7s., 28m.45s., 30m.17s., 33m.16s., and 36m.1s.
Belgrade ePPZ =18m.37s., eNW =36m.14s.
Skalnate Pleso eS =25m.36s., epS =26m.42s., esS =27m.12s., ePPS =28m.11s., eE = 29m.52s., eSSSN =37m.37s.
Upsala iE =25m.7s., eE =28m.27s., eN =32m.49s.
Helwan eN =23m.59s., iN =25m.13s.
Istanbul ePPE =19m.18s., ePPPE =21m.25s., eEN =24m.26s., eE =27m.53s., ePSE = 28m.43s., ePPSE =29m.40s.?, eE =30m.19s. and 32m.10s., eSSE =33m.55s., eSSSE =38m.44s.
Riverview eSE =26m.7s., iPSNZ =28m.30s., iPSE =28m.34s., iE =28m.43s., iPPSE = 29m.34s.
Yalta eSS =34m.43s.
Moscow eSS =35m.24s.
Lenkoran iPP =20m.21s.
Baku epPP =21m.14s.
Sverdlovsk ePP =20m.54s., iSKKS =27m.35s., SKSP =30m.44s., SS =38m.5s.
Tashkent iPP =21m.53s., ePPP =25m.0s.
Stalinabad PKS =22m.33s., SS =39m.59s.
Fergana ePP =22m.10s., eS =23m.35s., SKKS =26m.25s.
Andijan iPP =22m.11s.
Bombay PPPEN =25m.55s.
Frunse iSS =40m.45s.
Poona iE =22m.24s., PKSE =23m.9s., iE =23m.39s., PPPE =26m.17s., SSE = 39m.45s.
Murgab PP =22m.23s., SS =36m.47s.
Almata iPP =22m.27s.
Naryn PP =22m.24s., SS =40m.11s.
New Delhi iN =23m.40s., eN =27m.48s., iN =31m.6s., eN =32m.58s. and 37m.37s.
Irkutsk eSS =42m.1s.
Vladivostok iPP =24m.40s., iSSS =50m.29s.
Zi-ka-wei iPPZ =24m.44s.
Nanking iPP =24m.48s., i =25m.37s., PP?Z =26m.1s.

April 14d. 4h. 10m. 3s. Epicentre 39°·0N. 71°·8E. (as on 1951, March 9d.).

$A = +·2434$, $B = +·7402$, $C = +·6268$; $\delta = +2$; $h = -1$;
$D = +·950$, $E = -·312$; $G = +·196$, $H = +·595$, $K = -·779$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Dzhergetal		0·5	296	i 0 11	− 3	—	—	—	—	—
Fergana		1·4	359	i 0 26	− 1	e 0 43	− 3	—	—	—
Khorog		1·5	186	0 33	+ 5	—	—	—	—	—
Andijan		1·8	14	i 0 35	+ 3	i 1 0	+ 4	—	—	—
Murgab		1·8	111	i 0 38	+ 6	—	—	—	—	—
Stalinabad		2·4	259	i 0 43	+ 2	e 1 7	− 5	—	—	—
Lunacharskoe		3·0	321	e 0 57	P_g	e 1 37?	S_g	—	—	—
Tashkent		3·0	320	0 58	P_g	1 31	S*	—	—	—
Tchimkent		3·7	333	i 1 0	0	—	—	—	—	—
Samarkand		3·8	281	i 1 2	+ 1	1 44	− 3	—	—	—
Naryn		4·0	51	1 8	P*	—	—	—	—	—
Frunse		4·4	28	i 1 15	P*	—	—	—	—	—
Rybach'e		4·7	42	i 1 19	P*	—	—	—	—	—
Almata		5·7	41	i 1 33	+ 5	i 2 41	+ 6	—	—	—
Almata II		6·0	43	i 1 37	+ 5	—	—	—	—	—
Przhevalsk		6·1	53	i 1 37	+ 3	—	—	—	—	—
Ili		6·3	37	i 1 39	+ 3	—	—	—	—	—
Kurmenty		6·3	48	i 1 40	+ 4	—	—	—	—	—
Ashkabad		10·6	269	2 35	− 1	4 32	− 5	—	—	—
New Delhi		11·3	155	i 2 46a	0	i 4 57	+ 3	2 53	PP	5·4
Semipalatinsk		12·9	25	e 3 7	0	—	—	—	—	—
Baku		16·9	281	i 4 1	+ 2	—	—	—	—	—
Chatra		17·7	127	e 4 9	− 1	i 7 25	− 1	7 57	SSS	—
Lenkoran		17·9	277	4 8	− 4	—	—	—	—	—
Shemakla		17·9	283	4 38?	+26	—	—	—	—	—
Makhach-Kala		18·7	290	i 4 21	− 1	7 51	+ 3	—	—	—
Sverdlovsk		19·3	341	i 4 26	− 3	i 7 59	− 3	—	—	—
Kirovobad		19·6	284	i 4 31?	− 1	—	—	—	—	—
Grozny		20·0	291	i 4 38	+ 1	i 8 17?	0	—	—	—
Bombay		20·1	177	e 4 39	+ 1	i 8 26	+ 7	5 4	PPP	10·0
Nakhichevan		20·5	279	i 4 31	−11	—	—	—	—	—
Poona		20·5	175	i 4 43	+ 1	i 8 27	0	5 3	PP	9·6
Tiflis		20·7	286	e 4 42	− 2	—	—	—	—	—
Gori		21·2	287	4 55?	+ 6	—	—	—	—	—
Leninakan		21·5	285	e 4 54?	+ 2	—	—	—	—	—
Calcutta	E.	21·6	135	i 5 0a	+ 6	i 9 0	+11	i 5 25	PP	10·4
Akhalkalaki		21·7	288	4 55	0	—	—	—	—	—
Tsikhlis-Dzhvari		21·8	288	4 55?	− 1	—	—	—	—	—
Hyderabad		22·3	164	i 5 0	− 1	i 9 8	+ 6	—	—	11·7
Irkutsk		26·1	48	5 38	+ 1	e 9 58	− 9	—	—	—
Kabansk		27·4	50	e 5 50	+ 1	e 10 27	− 1	—	—	—
Moscow		28·2	318	e 5 59	+ 3	e 10 42	+ 1	—	—	—
Yalta		28·4	293	5 57?	− 1	—	—	—	—	—
Ksara		29·2	271	i 6 6	+ 1	11 42	+44	—	—	—
Kishinev		32·1	301	6 30?	− 1	—	—	—	—	—
Istanbul		32·5	288	i 6 33	− 1	e 11 50	+ 1	e 7 33	PP	e 18·0
Colombo	E.	32·8	166	5 34	−64	—	—	—	—	16·0
Pulkovo		33·3	322	6 40	− 1	—	—	—	—	—
Helwan	N.	34·4	267	e 6 51	0	12 23	+ 4	—	—	—
Lwow		35·2	304	e 6 58?	0	—	—	—	—	—
Helsinki	N.	36·0	323	—	—	e 17 29	ScS	—	—	e 19·2
Uzhgorod		36·4	303	7 8	0	12 47	− 3	—	—	—
Skalnate Pleso		37·7	304	e 7 19	0	e 17 27	ScS	e 8 46	PP	e 19·2
Belgrade		38·1	296	e 7 23	+ 1	e 17 35	ScS	e 8 50	PP	e 26·6
Nanking		38·5	85	i 7 32a	+ 6	i 13 27	+ 5	—	—	—
Budapest		38·7	300	7 26	− 1	e 13 35	+10	i 8 49	PP	e 24·5
Kalossa		38·9	300	e 7 47	+18	e 13 31	+ 3	e 9 28	PPP	—
Raciborzu		39·0	306	e 7 30	0	e 13 25	− 4	e 9 5	PP	e 20·2
Ogyalla		39·2	302	e 8 46	PP	e 16 39	SSS	e 8 55?	PP	—
Upsala		39·5	320	i 8 56	PP	e 13 34	− 3	e 17 29	ScS	i 18·4

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Vienna		40·4	303	i 7 42	+ 1	—	—	e 9 22	PP	—
Zi-ka-wei	z.	40·9	85	e 7 48	+ 2	i 17 8	SS	—	—	—
Prague		41·4	306	i 7 49	− 1	e 14 10	+ 5	e 9 36	PP	e 22·0
Taranto		41·4	291	8 6	+16	15 16	+71	9 36	PP	e 19·6
Potsdam		42·0	309	i 7 55a	+ 1	i 17 16	SS	9 32	PP	24·0
Copenhagen		42·1	314	9 34	PP	—	—	—	—	21·0
Collmberg		42·2	307	e 7 49	− 7	e 17 42	SS	e 9 38	PP	e 25·0
Triest		42·6	299	i 7 47	−12	i 14 22	− 1	i 9 36	PP	—
Cheb		42·7	306	e 10 13	PPP	e 18 15	ScS	e 11 25	?	e 20·2
Jena		43·1	306	e 8 3	− 1	e 14 26	− 4	e 9 53	PP	—
Messina		43·4	288	i 8 6a	0	—	—	i 9 12	?	—
Padova		44·2	298	e 8 12	0	15 24	+38	—	—	—
Rome		44·5	294	i 8 12	− 3	e 15 25	+34	i 9 57	PP	—
Bologna	z.	44·6	298	e 8 17a	+ 1	—	—	—	—	—
Vladivostok		44·7	65	—	—	e 14 54	0	—	—	—
Florence		44·8	297	e 8 17	0	—	—	e 10 30	PPP	—
Prato		44·9	297	e 8 20	+ 2	e 17 57	SS	—	—	—
Stuttgart		45·0	305	e 8 17	− 2	e 15 0	+ 2	e 10 7	PP	e 26·0
Chur		45·2	301	e 8 19	− 1	—	—	—	—	—
Karlsruhe		45·4	306	i 8 23	+ 1	e 15 18	+14	e 10 14	PP	e 26·0
Zürich		45·7	303	e 8 23a	− 1	e 15 29	+21	e 10 12	PP	—
Witteveen	z.	45·8	311	e 8 24	− 1	—	—	—	—	—
Pavia		45·9	300	e 8 26	0	—	—	e 10 55	PPP	e 28·0
Strasbourg		46·0	305	i 8 25a	− 2	e 15 24?	+12	e 10 19	PP	e 24·0
Basle		46·3	303	e 8 28	− 1	—	—	—	—	—
De Bilt		46·8	309	e 8 33	0	e 15 25	+ 1	e 10 25	PP	e 25·0
Besançon		47·4	303	e 8 37	− 1	—	—	e 10 21	PP	—
Paris		49·3	306	i 8 51	− 2	i 16 0	+ 1	e 10 42	PP	e 24·0
Clermont-Ferrand		49·8	302	i 8 55	− 1	—	—	—	—	e 31·6
Aberdeen	E.	50·0	317	—	—	i 17 10	?	i 20 10	SS	i 27·0
Kew		50·3	310	i 8 58k	− 2	e 16 12	− 1	e 19 57	SS	e 25·0
Rathfarnham Castle		53·3	313	e 9 28	+ 5	e 17 11	+17	e 11 24	PP	e 27·0
Tortosa		53·3	297	e 9 24	+ 1	—	—	—	—	—
Alicante		55·0	294	9 38	+ 3	e 18 26	+69	25 58	Q	e 30·4
Scoresby Sund		55·0	336	i 9 35a	0	—	—	—	—	27·0
Toledo		56·8	297	i 9 47	− 1	—	—	—	—	—
Almeria		57·0	293	i 9 39	−11	17 41	− 2	11 49	PP	37·0
Reykjavik	z.	57·2	329	i 9 51k	0	—	—	—	—	—
Tamanrasset	z.	57·9	275	i 9 55k	− 1	e 17 54	− 1	e 18 18	PPS	—
Malaga		58·5	294	i 10 2	+ 2	—	—	13 12	PPP	37·9
Resolute Bay		66·2	357	i 10 49	− 3	e 19 34	− 6	e 15 12	PPP	e 36·2
Pretoria	z.	76·2	219	i 11 53	+ 1	—	—	—	—	—
Pietermaritzburg	z.	78·4	216	i 12 5	+ 1	—	—	—	—	—
Grahamstown	z.	83·3	217	i 12 31	+ 1	—	—	—	—	—
Ottawa		91·0	338	13 8	+ 1	e 23 23	[−16]	—	—	45·5
Victoria		91·8	10	13 11	0	23 44	[+ 1]	—	—	57·2
Harvard		92·3	333	e 13 14	+ 1	—	—	—	—	e 53·0
Seattle		92·8	10	i 13 18a	+ 2	—	—	—	—	e 55·0
Palisades		94·4	334	—	—	e 24 0	[+ 2]	e 25 58	PS	—
Mineral	z.	100·1	11	e 13 50a	+ 1	—	—	e 17 43	PP	—
Reno	z.	101·1	9	e 13 53k	0	—	—	e 22 53	?	—
Berkeley	z.	102·4	11	—	—	e 22 5	PKS	—	—	—
Tinemaha	z.	103·7	8	e 14 8	+ 3	—	—	—	—	—
China Lake	z.	105·0	8	e 14 12	+ 1	—	—	e 18 25	PP	—
Palomar	z.	107·6	7	e 14 33	P	—	—	e 18 57	PP	—
La Paz		138·5	292	e 22 19	PP	—	—	—	—	—

Additional readings :—
New Delhi PPPN =3m.1s., SSSEN =5m.20s.
Chatra SSN =7m.37s.
Poona iPE =4m.49s., PPPE =5m.12s., QE =8m.37s., SSE =8m.57s., SSSE =9m.15s., ScPE =11m.49s., ScSE =15m.3s.
Calcutta iSSE =9m.35s.
Istanbul eE =7m.45s., ePPPZ =7m.53s., eSSN =13m.43s., eSSSEN =14m.7s., eScSE = 17m.3s.
Skalnate Pleso eE =8m.21s., ePPPE =9m.11s., e =15m.17s., eSS =15m.57s., eSSSN = 16m.31s., e =17m.57s.
Belgrade eNE =8m.55s. and 26m.10s.
Budapest e =18m.38s.

Continued on next page.

Kalossa eE =9m.33s.
Raciborzu ePPPZ =9m.22s., eN =9m.58s. and 11m.4s., e =11m.25s., eN =13m.7s., eSSN =16m.17s., eE =16m.27s., eN =17m.56s., e =18m.46s.
Ogyalla ePPP =9m.22s., ePcP =9m.45s., eN =10m.17s., eE =14m.24s.
Upsala ePPP?N =9m.27s., iSSN =16m.14s.
Vienna ePPP =10m.9s.
Prague e =7m.52s. and 8m.39s., ePPP? =10m.23s., eS?N =13m.45s., eSS =17m.7s. and 17m.23s., eScS =17m.58s., iScS =18m.10s., eSSS? =18m.21s., e =19m.2s. and 20m.24s.
Potsdam iPPE =9m.38s., iN =17m.8s., iSSZ =17m.25s.
Collmberg iZ =7m.56s., eZ =9m.25s., ePPPZ =10m.20s., eZ =16m.7s.
Triest iSS =17m.36s.
Jena eN =8m.12s., 8m.20s., 8m.28s., 9m.7s., and 9m.32s., ePPP?E =10m.11s., eN =14m.37s.
Rome eSSE =18m.2s.
Stuttgart eZ =8m.48s., eSS =18m.25s., eSSS =19m.31s., e =21m.42s. and 22m.11s.
Karlsruhe iZ =8m.27s.
Strasbourg e =8m.32s., i =9m.31s., e =10m.46s., ePPP =11m.4s., e =12m.4s., 12m.30s., 13m.22s., and 18m.38s.
De Bilt eSS =19m.7s.
Besançon e =8m.52s., 9m.28s., 10m.33s., and 10m.55s., ePPP =11m.27s.
Paris ePPP =11m.51s., iSS =19m.39s., i =19m.55s.
Kew iZ =9m.20s.
Rathfarnham Castle eZ =9m.58s.
Alicante PcP =10m.14s., PP =12m.11s., PPP =13m.40s., PcS =14m.14s., PS =18m.48s., SSS =25m.28s.
Almeria PcP =10m.34s., PPP =12m.57s., ScS =18m.32s., SS =21m.28s., SSS =23m.39s.
Tamanrasset ePKP,PKPZ =39m.49s.
Malaga PcS =15m.44s., i =20m.12s.
Resolute Bay eEZ =11m.19s., eSSE =24m.9s.
Seattle i =13m.26s., 13m.34s., and 13m.38s., e =14m.22s. and 14m.41s.
Mineral eZ =18m.13s.
Reno eZ =23m.37s.
Long waves were also recorded at Kodaikanal, Bergen, Edinburgh, Ivigtut, Weston, and Pasadena.

April 14d. 4h. 52m. 19s. Epicentre 39°·0N. 71°·8E. (as at 4h. 10m)

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Dzhergetal		0·5	296	i 0 10	− 4	—	—	—	—	—
Fergana		1·4	359	e 0 27	0	e 0 44	− 2	—	—	—
Khorog		1·5	186	0 33	P_g	0 54	S_g	—	—	—
Andijan		1·8	14	i 0 36	P_g	i 1 0	S_g	—	—	—
Stalinabad		2·4	259	i 0 43	+ 2	—	—	—	—	—
Lunacharskoe		3·0	321	i 0 52	+ 2	i 1 29	+ 2	—	—	—
Tashkent		3·0	320	i 0 52	+ 2	i 1 32?	S*	—	—	—
Tchimkent		3·7	333	i 1 2	+ 2	1 55	S*	—	—	—
Samarkand		3·8	281	1 5	P*	1 47	0	—	—	—
Frunse		4·4	28	i 1 15	P*	i 2 7	+ 5	—	—	—
Rybach'e		4·7	42	e 1 23	P*	—	—	—	—	—
Krasnogorka		5·0	30	—	—	e 2 22	+ 4	—	—	—
Almata		5·7	41	i 1 33	+ 5	i 2 43	+ 8	—	—	—
Almata II		6·0	43	i 1 36	+ 4	—	—	—	—	—
Przhevalsk		6·1	53	i 1 38	+ 4	—	—	—	—	—
Ili		6·3	37	i 1 38	+ 2	—	—	—	—	—
Chilisk		6·7	45	i 1 47	+ 5	—	—	—	—	—
Mary		7·9	263	e 1 57	− 2	—	—	—	—	—
New Delhi		11·3	155	e 2 48	+ 2	e 4 57	+ 3	2 57	PP	—
Makhach-Kala		18·7	290	e 4 22	0	—	—	—	—	—
Sverdlovsk		19·3	341	i 4 26	− 3	—	—	—	—	—
Kirovobad		19·6	284	e 4 32	0	—	—	—	—	—
Nakhichevan		20·5	279	e 4 57	PP	e 8 36	+ 9	—	—	—
Calcutta	E.	21·6	135	—	—	i 9 0	+11	—	—	i 12·4
Borzhomi		21·8	288	e 4 57	+ 1	—	—	—	—	—
Kabansk		27·4	50	e 5 49	0	—	—	—	—	—
Collmberg	z.	42·2	307	e 7 55	− 1	—	—	—	—	—
Stuttgart	z.	45·0	305	e 8 17	− 2	—	—	e 10 0	PP	—
Strasbourg		46·0	305	i 8 26k	− 1	—	—	—	—	—
Besançon		47·4	303	e 8 37	− 1	—	—	—	—	—
Tamanrasset	z.	57·9	275	i 9 55k	− 1	—	—	—	—	—
Pietermaritzburg	z.	78·4	216	i 12 5	+ 1	—	—	—	—	—

New Delhi gives also PPPEN =3m.4s.
Long waves were also recorded at Potsdam, Paris, and Kew.

April 14d. 12h. 45m. 5s. Epicentre 39°·0N. 71°·8E. (as at 4h. 52m.).

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Dzhergetal		0·5	296	i 0 10	− 4	—	—	—	—	—
Fergana		1·4	359	e 0 25	− 2	e 0 43	S_g	—	—	—
Khorog		1·5	186	0 33	P_g	0 54	S_g	—	—	—
Andijan		1·8	14	i 0 36	P_g	i 1 2	S_g	—	—	—
Murgab		1·8	111	i 0 39	P_g	—	—	—	—	—
Stalinabad		2·4	259	i 0 46	P*	i 1 18	S_g	—	—	—
Lunacharskoe		3·0	321	i 0 51	+ 1	1 31	S*	—	—	—
Tashkent		3·0	320	i 0 53	P*	e 1 32?	S*	—	—	—
Samarkand		3·8	281	1 1	0	1 54	S*	—	—	—
Naryn		4·0	51	e 1 7	+ 3	—	—	—	—	—
Frunse		4·4	28	i 1 13	+ 3	—	—	—	—	—
Krasnogorka		5·0	30	i 1 19	+ 1	—	—	—	—	—
Almata		5·7	41	i 1 34	+ 6	—	—	—	—	—
Przhevalsk		6·1	53	i 1 37	+ 3	—	—	—	—	—
Ili		6·3	37	i 1 37	+ 1	—	—	—	—	—
Chilisk		6·7	45	i 1 44	+ 2	—	—	—	—	—
Mary		7·9	263	e 2 1	+ 2	—	—	—	—	—
Ashkabad		10·6	269	e 2 35	− 1	—	—	—	—	—
New Delhi		11·3	155	e 2 48	+ 2	e 4 55	+ 1	2 56	PP	—
Semipalatinsk		12·9	25	e 3 7	0	—	—	—	—	—
Shemakla		17·9	283	e 4 13	+ 1	—	—	—	—	—
Sverdlovsk		19·3	341	i 4 26	− 3	—	—	—	—	—
Grozny		20·0	291	e 4 38	+ 1	—	—	—	—	—
Bombay	N.	20·1	177	—	—	e 7 55	−24	—	—	e 12·4
Tiflis		20·7	286	4 42	− 2	—	—	—	—	—
Calcutta	E.	21·6	135	—	—	e 9 27	SS	—	—	i 12·4
Borzhomi		21·8	288	e 4 56	0	—	—	—	—	—
Kabansk		27·4	50	e 5 53	+ 4	—	—	—	—	—
Ksara		29·2	271	5 55?	−10	11 55?	SS	—	—	—
Collmberg	Z.	42·2	307	e 7 54	− 2	—	—	—	—	—
Stuttgart	Z.	45·0	305	e 8 18	− 1	—	—	—	—	—
Strasbourg		46·0	305	i 8 25k	− 2	—	—	—	—	—
Tamanrasset	Z.	57·9	275	i 9 54k	− 2	—	—	—	—	—

New Delhi gives also SSEN = 5m.6s.
Long waves were also recorded at Christchurch and Wellington.

April 14d. 13h. 32m. 58s. Epicentre 61°·2N. 136°·5E.

A = −·3513, B = +·3334, C = +·8749; δ = +2; h = −9;
D = +·688, E = +·725; G = −·635, H = +·602, K = −·484.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Petropavlovsk	14·4	114	i 3 39?	+12	e 5 47?	−22	—	—	—
Wakkanai	16·1	167	e 3 52	+ 3	e 6 59	+10	e 4 30	PPP	8·1
Abashiri	17·8	160	4 20	+ 9	7 44	+16	9 44	Q	11·2
Valdivostok	18·3	190	i 4 18	+ 1	i 7 28	−11	—	—	—
Sapporo	18·4	168	i 4 21	+ 3	i 7 48	+ 7	i 4 24	P	9·4
Kabansk	18·7	256	4 23	+ 1	7 55	+ 7	—	—	—
Nemuro	18·7	159	e 4 21	− 1	e 7 54	+ 6	—	—	e 9·2
Obihiro	18·7	164	e 4 36	PP	e 9 22	L	—	—	(e 9·4)
Kusiro	18·8	162	e 4 24	+ 1	i 7 59	+ 9	—	—	i 10·6
Muroran	19·1	168	4 30	+ 3	—	—	—	—	—
Mori	19·3	168	e 4 28	− 1	8 17	SS	—	—	10·4
Urakawa	19·4	165	e 4 32	+ 2	e 8 7	+ 3	e 5 15	PPP	e 10·5
Irkutsk	19·6	259	i 4 33	+ 1	i 8 13	+ 5	—	—	—
Aomori	20·6	171	4 41	− 2	i 8 44	+15	—	—	—
Akita	21·6	171	4 55	+ 1	8 54	+ 5	—	—	e 11·2

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Morioka		21·7	170	e 4 52	− 3	e 8 50	− 1	—	—	e 11·2
Miyako		21·9	168	e 4 51	− 6	e 8 49	− 5	—	—	—
Mizusawa		22·3	170	5 1	0	9 4	+ 2	—	—	e 11·9
Isinomaki		23·0	169	e 4 56	−11	—	—	—	—	—
Sendai		23·1	170	e 5 8	0	e 9 17	+ 1	e 11 22	Q	e 12·7
Yamagata		23·1	171	e 5 10	+ 2	e 8 25	−51	—	—	e 11·8
Aikawa		23·2	177	e 5 7	− 2	i 9 20	+ 2	—	—	—
Niigata		23·3	176	5 17	+ 7	9 31	+11	—	—	12·6
Hukusima		23·6	171	5 12	− 1	9 32	+ 7	—	—	i 12·1
Inawasiro		23·8	171	e 5 20	+ 5	i 9 36	+ 8	—	—	e 13·0
Wazima		23·8	178	5 21	+ 6	9 38	+10	e 11 48	Q	e 13·3
Shirakawa		24·2	171	e 5 20	+ 1	e 9 44	+ 9	—	—	—
Onahama		24·4	169	e 5 29	+ 8	9 46	+ 7	—	—	13·4
Toyama		24·5	178	e 5 23	+ 1	9 50	+10	—	—	13·3
Nagano	E.	24·6	177	e 5 17	− 6	e 9 43	+ 1	e 8 5	?	e14·5
Kanazawa		24·7	179	e 5 29	+ 5	i 9 53	+ 9	—	—	e 12·4
Matusiro		24·7	177	e 5 26	+ 2	9 42	− 2	12 41	Q	13·6
Utunomiya		24·8	175	e 5 25	0	e 9 54	+ 8	—	—	14·3
Maebasi		24·9	176	i 5 25	− 1	e 9 58	+11	—	—	e 13·1
Oiwake		24·9	176	e 5 30	+ 4	e 9 55	+ 8	—	—	—
Matumoto		25·0	177	e 5 30	+ 3	e 10 2	+13	—	—	e 15·8
Mito	N.	25·0	173	e 5 29	+ 2	e 9 55	+ 6	—	—	—
Takayama		25·1	177	e 5 26	− 2	e 9 59	+ 8	—	—	—
Tukubasan		25·1	173	e 5 31	+ 3	e 9 57	+ 6	—	—	—
Hukui		25·2	179	e 5 30	+ 1	—	—	—	—	—
Titibu		25·3	175	e 5 31	+ 1	e 10 6	+12	—	—	—
Tokyo		25·6	173	e 5 33	+ 1	e 10 2	+ 3	e 6 49	PPP	13·5
Tsuruga		25·6	179	e 5 34	+ 2	10 10	+11	11 33	Q	13·3
Toyooka		25·7	181	5 34	+ 1	10 18	+17	—	—	—
Hikone		25·8	179	e 5 39	+ 5	e 10 16	+14	—	—	e 15·2
Hunatu		25·8	175	5 36	+ 2	10 12	+10	—	—	12·7
Matsue		25·9	187	e 5 33	− 2	e 10 17	+13	—	—	e 13·5
Yokohama		25·9	174	5 49	+14	i 10 54	SS	—	—	12·7
Yonago		25·9	187	e 5 36	+ 1	e 10 3	− 1	—	—	—
Nagoya		26·0	178	5 38	+ 2	10 20	+14	—	—	13·0
Misima		26·1	175	e 5 33	− 4	10 20	+13	11 40	SSS	12·0
Kyoto		26·2	180	e 5 50	+12	e 10 21	+12	—	—	e 13·3
Shizuoka		26·3	176	5 43	+ 4	10 11	0	—	—	12·8
Kameyama		26·4	178	e 5 42	+ 2	e 10 27	+15	—	—	13·8
Mera		26·4	174	e 5 45	+ 5	10 23	+11	—	—	—
Hamada		26·5	188	e 5 42	+ 1	e 9 36	−38	—	—	—
Kobe		26·5	181	e 5 44	+ 3	e 10 20	+ 6	e 14 13	Q	e 16·3
Tu		26·5	178	e 6 1	+20	e 10 24	+10	—	—	12·7
Omaesaki		26·6	175	e 5 58	+16	e 10 36	+20	—	—	14·3
Osaka		26·6	181	e 5 37	− 5	e 10 16	0	—	—	12·3
Mitchell Field		26·9	88	i 5 45	0	i 10 35	+15	—	—	—
Sumoto		26·9	182	i 5 46	+ 1	i 10 34	+14	—	—	14·5
Takamatsu		26·9	183	e 5 49	+ 4	i 10 36	+16	—	—	e 13·7
Hirosima		27·0	187	e 5 44	− 1	i 10 28	+ 6	—	—	e 14·8
Owase		27·1	178	5 46	0	10 24	0	13 25	Q	14·5
Matuyama		27·5	186	i 5 50	0	i 10 31	+ 1	—	—	—
Siomisaki		27·8	180	e 5 58	+ 5	i 10 39	+ 4	—	—	—
Hukuoka		27·9	190	e 5 55	+ 1	e 10 41	+ 4	—	—	e 14·7
Muroto		28·0	185	e 5 59	+ 4	e 10 55	+17	—	—	e 14·6
Ooita		28·2	188	e 5 59	+ 3	e 10 58	+17	—	—	e 14·2
Saga		28·2	191	5 59	+ 3	11 2	+21	—	—	—
Kumamoto		28·6	189	e 6 2	+ 2	11 6	+18	—	—	16·4
Nagasaki		28·8	191	e 6 9	+ 7	e 12 1	SS	—	—	e 17·4
Unzendake		28·8	191	e 6 0	− 2	—	—	—	—	—
Nanking		31·4	211	6 24	− 1	i 11 30	− 2	i 7 18	PP	i 14·4

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Zi-ka-wei		31·6	206	6 25	− 1	e 11 33	− 2	i 11 40	S	14·1
Semipalatinsk		32·4	278	e 6 37	+ 3	—	—	—	—	—
Sverdlovsk		37·3	299	i 7 16	0	i 12 58	− 6	—	—	—
Przhevalsk		38·9	269	i 7 31	+ 2	—	—	—	—	—
Almata		39·0	272	i 7 31	+ 1	e 13 28	− 1	—	—	—
Rybach'e		40·1	272	i 7 44	+ 5	13 49	+ 3	—	—	—
Resolute Bay		40·3	20	i 7 39	− 1	e 13 43	− 6	e 9 22	PP	e 21·0
Frunse		40·5	273	e 7 44	+ 2	i 13 52	0	—	—	—
Naryn		40·9	271	e 7 46	0	e 13 59	+ 1	—	—	—
Andijan		43·2	273	8 7	+ 3	e 14 30	− 2	—	—	—
Fergana		43·7	273	e 8 11	+ 3	e 14 41	+ 2	—	—	—
Lunacharskoe		44·2	276	i 8 20?	+ 8	i 14 47?	+ 1	—	—	—
Tashkent		44·2	276	e 8 13	+ 1	e 14 44	− 2	—	—	—
Murgab		44·3	269	e 8 17	+ 4	—	—	—	—	—
Dzhergetal		44·9	273	i 8 23?	+ 5	i 14 51?	− 5	—	—	—
Samarkand		46·6	277	8 25	− 7	—	—	—	—	—
Stalinabad		46·6	274	8 32	0	i 15 20	− 1	—	—	—
Pulkovo		46·7	319	e 8 31	− 1	i 15 19	− 3	—	—	—
Moscow		47·2	312	e 8 37	+ 1	e 15 27	− 2	—	—	—
Chatra		47·6	247	i 8 40	+ 1	e 15 40	+ 5	18 32	ScS	22·7
Scoresby Sund		47·7	351	i 8 40	0	i 15 36	0	18 40	ScS	21·0
Manila		47·9	200	e 8 41	− 1	i 16 56	?	e 10 58	PP	i 27·3
Helsinki		48·0	323	—	—	e 15 42	+ 1	e 19 7	SS	—
Upsala		50·4	326	e 9 0	− 1	e 16 13	− 1	e 18 56	ScS	e 23·0
New Delhi		50·7	289	e 9 3	0	i 16 16	− 2	18 52	ScS	—
Calcutta	E.	50·8	244	e 9 3	− 1	i 16 23	+ 3	18 45	ScS	23·6
Ashkabad		52·1	282	9 15	+ 1	16 40?	+ 2	—	—	—
Makhach-Kala		53·1	294	e 9 26	+ 5	—	—	—	—	—
Victoria		53·3	55	9 21	− 2	16 50	− 4	—	—	29·6
Grozny		53·6	296	e 9 30	+ 5	e 16 58	0	—	—	—
Korror		53·8	183	11 49	PP	—	—	—	—	—
Baku		54·1	291	e 9 37	+ 8	e 17 9	+ 4	—	—	—
Seattle		54·5	55	i 9 33a	+ 1	e 17 16	+ 6	e 10 32	PcP	e 27·0
Tiflis		55·3	295	9 38	0	—	—	—	—	—
Copenhagen		55·4	326	e 9 39	+ 1	e 17 23	+ 1	21 8	SS	—
Kirovobad		55·4	293	9 35?	− 3	17 18?	− 4	—	—	—
Borzhomi		55·8	297	e 9 45?	+ 4	e 17 28?	0	—	—	—
Lenkoran		55·9	296	9 42	0	17 30	+ 1	—	—	—
Sotchi		56·0	301	e 9 44	+ 1	e 17 32	+ 2	—	—	—
Saskatoon		56·4	42	—	—	i 17 39	+ 3	—	—	27·6
Theodosia		56·6	305	e 9 47	0	e 17 37	− 1	—	—	—
Lwow		56·9	315	e 9 51	+ 2	i 17 41	− 1	—	—	—
Yalta		57·5	305	9 56	+ 3	17 50	0	—	—	—
Aberdeen	E.	57·6	335	—	—	i 18 16	PPS	i 21 48	SS	32·6
Ivigtut		57·9	4	e 9 52	− 4	e 17 51	− 4	22 1	SS	27·0
Potsdam		58·1	324	e 10 2	+ 4	i 18 4	+ 6	i 24 10	SSS	29·0
Uzhgorod		58·5	316	e 10 8	+ 8	i 18 5	+ 2	—	—	—
Raciborzu		58·6	319	e 10 3	+ 2	—	—	e 12 4	PP	—
Skalnate Pleso		58·7	317	e 10 5	+ 3	e 18 5	− 1	e 18 22	PS	e 29·5
Edinburgh	E.	59·0	336	—	—	e 24 2	SSS	—	—	—
Collmberg		59·1	323	i 10 6	+ 2	e 18 16	+ 5	e 12 32	PP	e 30·0
Witteveen	Z.	59·5	328	e 10 10	+ 3	—	—	—	—	—
Durham		59·7	334	—	—	i 18 21	+ 2	—	—	—
Hyderabad	N.	59·7	250	e 10 12	+ 3	i 18 15	− 4	—	—	26·9
Prague		59·8	322	i 10 11a	+ 2	e 18 23	+ 3	e 12 27	PP	e 29·0
Jena		59·9	323	e 10 10	0	e 18 21	0	e 12 30	PP	e 29·0
Cheb		60·4	323	e 11 6	PcP	e 18 27	− 1	e 12 42	PP	—
Ogyalla		60·5	318	e 11 33	?	e 18 33	+ 4	e 12 39	PP	—
Sonneberg	E.	60·5	324	—	—	e 18 31	+ 2	e 25 24	SSS	e 28·9
Budapest		60·6	317	10 24	+ 9	i 18 35	+ 5	e 13 45	PPP	e 27·0

Continued on next page,

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
De Bilt		60·6	329	—	—	i 18 32	+ 2	i 22 27	SS	e 28·0
Bucharest		60·7	311	—	—	e 18 32	0	—	—	29·0
Mineral		60·7	60	10 5a	−10	—	—	i 12 35	PP	e 34·6
Poona		60·8	256	e 10 15	− 1	e 18 31	− 2	14 6	PPP	28·8
Bombay	N.	61·0	257	e 10 19	+ 1	e 18 35	0	22 23	SS	28·5
Timisoara		61·3	314	e 10 2?	−18	e 18 44	+ 5	e 22 56	SS	e 30·6
Kalossa		61·4	317	e 10 33	+13	e 20 22	ScS	e 12 55	PP	e 32·0
Rathfarnham Castle		62·1	336	e 10 26?	+ 1	e 18 44	− 5	—	—	e 26·0
Reno		62·2	58	e 10 25a	− 1	e 18 57	+ 6	—	—	e 31·6
Belgrade		62·4	314	e 10 34a	+ 7	e 18 58	+ 5	e 25 51	SSS	e 32·8
Istanbul		62·4	306	e 10 30	+ 3	e 18 55	+ 2	e 12 47	PP	e 29·7
Karlsruhe		62·5	325	e 10 30	+ 2	e 18 48	− 6	e 12 45	PP	e 31·0
Kew		62·5	332	e 10 27	− 1	e 18 58	+ 4	e 20 24	ScS	e 27·0
Stuttgart		62·5	324	e 10 27	− 1	e 18 52	− 2	e 12 32	PP	e 32·0
Berkeley		62·6	62	i 10 28a	0	e 18 46	−10	e 22 34	SS	e 28·6
Strasbourg		63·1	325	i 10 34k	+ 2	e 19 3	+ 1	e 12 50	PP	29·0
Santa Clara		63·2	62	e 10 50	+18	e 19 11	+ 8	—	—	e 32·2
Sofia		63·2	311	e 10 36	+ 4	19 9	+ 6	20 26	ScS	26·2
Lick	Z.	63·3	62	i 10 32a	− 1	e 18 3	−61	i 12 44	PP	—
Triest		63·9	319	i 10 38	+ 1	i 19 11?	− 1	i 12 56	PP	e 33·1
Zürich		63·9	324	e 10 36k	− 1	e 19 10	− 2	—	—	—
Basle		64·1	324	e 10 40	+ 2	—	—	—	—	—
Chur		64·1	323	e 10 37	− 1	e 19 18	+ 4	—	—	e 28·9
Fresno	Z.	64·6	60	e 10 41	0	e 20 39	ScS	e 15 22	PcS	—
Neuchatel		64·7	325	e 10 43	+ 1	e 19 28	+ 6	—	—	—
Paris		64·8	329	i 10 40	− 3	i 19 20	− 3	i 13 2	PP	29·0
Salo		65·0	322	e 10 46	+ 2	e 19 23	− 3	e 12 50	PP	e 36·4
Tinemaha		65·0	59	i 10 45a	+ 1	—	—	—	—	—
Padova		65·5	321	e 11 5	PcP	19 55	PS	—	—	31·1
Bologna		65·7	321	e 11 5k	+17	e 19 38	+ 4	e 24 11	SS	e 35·3
Pavia		65·7	323	e 10 52	+ 4	i 19 36	+ 2	e 13 24	PP	e 32·0
Ksara		65·8	297	i 10 54	+ 5	i 19 44	+ 9	—	—	—
China Lake		66·3	59	i 10 52a	0	i 19 45	+ 3	i 10 57	P	—
Prato		66·3	320	e 11 56	+64	i 19 46	+ 4	—	—	—
Florence		66·4	320	e 10 55	+ 2	19 44	+ 1	e 11 55	?	e 30·1
Kodaikanal	E.	66·4	248	e 10 35	−18	i 19 41	− 2	—	—	28·6
Clermont-Ferrand		66·9	327	i 10 59	+ 3	e 19 49	0	i 11 13	PcP	e 27·6
Athens		67·2	308	—	—	e 19 42?	−10	—	—	—
Taranto		67·3	315	e 12 59	PP	19 49	− 5	—	—	31·2
Pasadena		67·5	60	i 10 59a	− 1	i 19 57	+ 1	i 39 21	P′P′	e 28·0
Rome		67·7	319	e 11 3	+ 2	i 19 59	+ 1	e 13 27	PP	e 30·6
Riverside	Z.	68·0	60	i 11 2a	− 1	—	—	—	—	—
Palomar		68·7	60	i 11 7a	0	i 20 14	+ 4	e 39 17	P′P′	—
Ottawa		70·6	24	11 17	− 2	20 27	− 6	24 42	SS	33·8
Djakarta		71·0	212	—	—	e 20 35	− 2	—	—	—
Helwan	N.	71·1	298	e 11 26	+ 4	20 34	− 4	14 2	PP	—
Barcelona		71·2	327	—	—	i 20 47	+ 7	—	—	e 33·1
Tortosa		72·2	327	e 11 55	PcP	i 20 56	+ 5	—	—	—
Cleveland		73·1	30	i 11 32k	− 2	e 21 0	− 1	e 21 45	PPS	—
Tunis		73·1	317	—	—	e 29 32	SSS	—	—	—
Florissant		73·3	37	e 11 34	− 1	e 20 58	− 6	e 29 3	SSS	—
Halifax		73·3	15	—	—	e 21 5	+ 1	e 29 2?	SSS	33·0
St. Louis		73·5	37	e 11 33	− 3	i 21 0	− 6	i 29 8	SSS	—
Harvard		74·2	22	i 11 41	+ 1	e 21 12	− 2	e 25 48	SS	—
Toledo		74·3	330	e 11 43	+ 2	i 21 22	+ 7	29 41	SSS	36·9
Weston		74·3	22	i 11 40	− 1	e 21 10	− 5	—	—	—
Alicante		74·8	327	11 43	− 1	i 21 23	+ 3	29 42	SSS	e 36·3
Palisades		75·2	24	i 11 45	− 1	e 21 13	−12	e 14 25	PP	e 35·7
Fordham		75·3	24	e 11 44	− 3	e 21 20	− 6	—	—	41·0
Lisbon		76·6	334	—	—	31 38	SSS	—	—	40·5
Almeria		76·7	328	e 12 2?	+ 7	21 24	−17	14 30	PP	39·2
Granada		76·7	329	i 12 0a	+ 5	i 21 42	+ 1	30 39	SSS	i 38·8
Malaga		77·4	329	i 12 2	+ 4	i 21 48	− 1	15 0	PP	40·3
Tamanrasset	Z.	87·5	316	e 12 51	0	—	—	i 16 0	PP	—
Tacubaya		88·5	51	e 13 3	+ 7	—	—	—	—	e 47·3

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane		89·4	165	e 13 2	+ 2	—	—	i 21 42	?	—
Riverview		95·4	168	e 13 34	+ 6	e 24 47	+ 5	e 31 6	SS	e 43·7
Fort de France		103·0	17	—	—	e 27 21	PS	—	—	—
Tananarive		105·9	260	—	—	e 33 35	SS	e 37 9	SSS	e 52·1
Christchurch		108·4	153	—	—	e 38 2	SSS	e 44 12	Q	e 52·0
Pretoria	z.	121·0	273	e 18 58	[+ 3]	—	—	—	—	—
Huancayo		125·7	39	e 19 9	[+ 5]	e 32 38	PPS	e 37 39	SS	e 54·4
La Paz		132·0	32	e 21 42	PP	i 31 32	PS	i 39 22	SS	63·6

Additional readings :—
Mizusawa PN =5m.4s., SN =9m.9s.
Sendai iN =9m.23s., eSS? =10m.54s.
Misima PP =6m.53s., PPP =6m.59s.
Nanking iPPPZ =7m.36s., iZ =7m.42s.
Resolute Bay eZ =9m.49s.
Chatra QN =20m.24s.
Scoresby Sund 19m.20s.
Upsala eN =9m.46s., 10m.33s., and 11m.37s., eSS =19m.46s., eE =20m.17s., eN = 20m.20s., iN =20m.23s.
New Delhi iPSN =16m.23s., SSN =19m.45s., iN =20m.16s.
Calcutta iSSE =19m.58s.
Seattle isP =9m.54s., epPcP? =10m.49s., ePP =11m.40s., ePPP =12m.49s., ePS = 17m.27s., eSS =21m.1s., eSSS =23m.14s., and other unidentified readings.
Copenhagen i =9m.42s.
Aberdeen iE =24m.19s., eE =26m.9s.
Racibozu eE =10m.7s. and 10m.35s.
Skalnate Pleso e =10m.12s., eSN =18m.8s., eSS =22m.8s., e =23m.2s., eSSS =24m.2s.
Collmberg eZ =16m.24s., eE =26m.36s., eN =28m.45s.
Prague ePcP? =10m.43s., e =11m.49s., ePPP =13m.44s., e =14m.50s., ePS =18m.59s., eSS =22m.38s., e =24m.14s., eSSS =24m.44s.
Jena eN =10m.19s., eE =10m.29s. and 13m.7s., ePPP?E =13m.43s., eE =19m.22s., eSSS?N =24m.38s. and 24m.50s., eE =25m.26s. and 27m.54s.
Cheb e =11m.32s. and 12m.20s., eS =18m.36s., eSS =22m.50s.
Ogyalla eN =17m.53s., 18m.11s., and 18m.41s., ePSE =18m.57s., eSS =22m.27s., e =23m.56s.
Sonneberg eSN =18m.35s., eE =24m.5s., eEN =27m.29s.
Budapest ePPSN =19m.17s., SKSN =20m.10s., eSSN =23m.25s., SSSE =24m.39s., SSSN =25m.2s.?
Mineral iZ =10m.29s. and 11m.6s., eZ =14m.26s.
Poona PSE =18m.49s., PPSE =18m.58s., ScSE =20m.6s., SSE =22m.40s., SSSE = 25m.9s., QE =25m.34s.
Timisoara eS?E =18m.48s.
Kalossa eN =10m.44s., eQN =27·0m.
Belgrade eNW =15m.55s., 25m.5s., and 27m.14s.
Istanbul ePPPN =14m.14s., ePcSN =15m.4s., ePSE =19m.15s., eSSN =22m.44s., eN =23m.56s., eSSSE =25m.37s., eN =26m.0s.
Stuttgart ePcP?Z =10m.46s., ePPP? =14m.44s., eScS =20m.22s., eSS =22m.40s., eSSS =25m.44s.
Berkeley iE =19m.0s., eEN =26m.12s., eZ =27m.2s.
Strasbourg i =10m.40s., e =10m.46s. and 11m.29s., iS =19m.11s., eScS =20m.32s., eSS =23m.5s., eSSS =25m.14s.
Sofia SSEN =23m.18s.
Triest iZ =10m.51s., iSS =23m.20s., iSSS =25m.25s.
Paris i =10m.49s., 10m.52s., and 12m.22s., iScS =20m.36s., i =22m.14s., iSS =23m.30s., iSSS =25m.50s.
Bologna e =14m.27s.
Pavia e =26m.20s.
Clermont-Ferrand i =12m.16s. and 12m.23s.
Pasadena iPPZ =14m.1s.
Rome eSSE =24m.17s., eSSSE =26m.39s.
Helwan PPPN =15m.44s., PSN =21m.8s., SSN =25m.14s.
Cleveland eSEN =20m.55s.
St. Louis ePPP =16m.9s.
Harvard ePKKP =29m.46s.
Toledo ePP =14m.34s., ePPP =16m.20s., SS =26m.11s., Q =33m.22s.
Alicante PP =14m.30s., PPP =16m.24s., ScS =21m.52s., PS =22m.8s., SS =26m.32s., Q =31m.32s.
Almeria SS =26m.24s.
Granada PcP =12m.9s., iPP =15m.2s., PPP =16m.20s., PPS =24m.9s., iSS =26m.36s.
Malaga PPP =16m.46s., PS =22m.40s.
Tamanrasset iPPPZ =17m.58s., eZ =20m.29s.
Riverview iE =29m.46s., eQ =39·9m.
Huancayo e =28m.30s. and 48m.27s.
La Paz i =34m.31s.
Long waves were also recorded at Bergen, Collmberg, Messina, Galerazamba, and La Plata.

April 14d. 23h. 40m. 52s. Epicentre 28°·1N. 93°·7E.

Intensity VI at Mohanbari and Tezpur ; V at Gauhati ; and as strong at Jorhat, Shillong, and Dibrugarh.
Epicentre 29°·0N. 94°·0E. (Poona).

Seismological Bulletin, Government of India, Meteorological Department, April, 1951, p. 9.

$A = -\cdot0570$, $B = +\cdot8816$, $C = +\cdot4686$; $\delta = +5$; $h = +2$;
$D = +\cdot998$, $E = +\cdot065$; $G = -\cdot030$, $H = +\cdot468$, $K = -\cdot883$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Chatra	E.	5·9	259	1 36	+ 5	(2 41)	+ 1	3 15	S_g	2·7
Calcutta	E.	7·4	222	1 43	− 9	i 3 14	− 4	i 2 26	P_g	—
New Delhi		14·5	276	e 3 18	−10	e 6 4	− 7	3 28	PP	6·7
Hyderabad		17·6	236	i 4 9	+ 1	i 7 36	+13	—	—	9·0
Przhevalsk		19·0	324	i 4 25	− 1	8 2	+ 7	—	—	—
Naryn		19·7	319	e 4 42?	+ 8	e 8 15?	+ 5	—	—	—
Almata		20·0	324	i 4 40	+ 3	i 8 31	+14	—	—	—
Rybach'e		20·2	319	i 4 40	+ 1	8 24	+ 3	—	—	—
Poona		20·5	246	e 4 42	0	i 8 36	+ 9	5 6	PP	10·0
Khorog		20·7	302	4 45	+ 1	8 38	+ 7	—	—	—
Ili		21·0	326	i 4 41?	− 6	e 8 40?	+ 3	—	—	—
Bombay		21·2	248	i 4 53	+ 4	i 8 49	+ 8	9 19	SS	10·1
Frunse		21·4	318	4 53	+ 2	—	—	—	—	—
Andijan		21·6	311	i 4 53	− 1	i 8 53	+ 4	—	—	—
Fergana		21·8	311	e 4 55	− 1	e 8 58	+ 6	—	—	—
Nanking		22·1	72	i 4 56a	− 3	i 8 57	− 1	i 5 14	PP	i 10·3
Obi-garm		22·6	305	i 5 16	+13	i 9 25	+18	—	—	—
Stalinabad		23·2	305	e 5 8	− 1	i 9 14	− 4	—	—	—
Kodaikanal	E.	23·4	224	i 5 22k	+11	i 9 36	+15	—	—	11·4
Lunacharskoe		23·9	310	i 5 18	+ 2	i 9 34	+ 4	—	—	—
Tashkent		23·9	310	i 5 17	+ 1	i 9 31	0	—	—	—
Zi-ka-wei	Z.	24·3	74	i 5 19	− 1	e 9 47	+10	—	—	—
Colombo	E.	24·8	214	5 27	+ 2	9 54	+ 8	—	—	17·1
Irkutsk		25·4	14	5 31	0	e 9 55	− 1	—	—	—
Kabansk		25·8	17	e 5 34	0	10 5	+ 3	—	—	—
Mary		28·3	298	5 59	+ 2	—	—	—	—	—
Manila		28·7	111	e 6 9	+ 8	i 10 39?	−11	—	—	i 12·2
Ashkabad		31·1	298	e 6 22	0	11 28	0	—	—	—
Vladivostok		34·2	53	e 6 44	− 5	e 12 4	−12	—	—	—
Djakarta		36·4	156	e 6 56	−12	e 12 36	−14	—	—	—
Sverdlovsk		37·0	330	e 7 12	− 1	12 58	− 1	—	—	—
Baku		37·9	301	e 7 28	+ 8	e 13 19	+ 6	—	—	—
Lenkoran		38·6	298	i 7 28	+ 2	13 26	+ 3	—	—	—
Shemakha		38·8	301	6 55?	−33	i 12 52?	−34	—	—	—
Kirovobad		40·6	301	7 42	− 1	i 13 54	0	—	—	—
Grozny		41·2	305	e 7 50	+ 2	14 2	0	—	—	—
Tiflis		41·8	302	e 7 49	− 4	—	—	—	—	—
Erevan		42·0	300	e 8 6	+12	—	—	—	—	—
Leninakan		42·5	301	e 8 4	+ 5	—	—	—	—	—
Borzhomi		42·9	303	e 8 3?	+ 1	i 14 31?	+ 4	—	—	—
Korror		43·7	110	15 37	?	—	—	—	—	—
Sotchi		45·6	305	e 8 25	+ 1	e 15 7	+ 1	—	—	—
Moscow		48·3	321	e 8 43	− 2	e 15 41	− 4	—	—	—
Ksara		49·4	291	i 8 57	+ 4	i 16 6	+ 6	—	—	—
Yalta		49·6	306	8 55	0	16 1	− 2	—	—	—
Pulkovo		52·8	325	i 9 18	− 1	i 16 42	− 5	—	—	—
Kishinev		53·2	311	9 20	− 2	16 49	− 3	—	—	—
Petropavlovsk		53·2	42	i 9 19	− 3	e 16 48	− 4	—	—	—
Istanbul		53·6	302	e 9 26	+ 1	e 16 58	0	e 11 29	PP	e 29·1
Helwan	N.	54·0	287	—	—	i 17 0	− 3	e 19 16	ScS	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Helsinki		55·5	326	e 9 38	− 1	e 17 23	− 1	—	—	e 24·2
Lwow		56·2	313	e 9 44	0	i 17 32	− 1	—	—	—
Uzhgorod		57·5	312	9 54	+ 1	i 17 51	+ 1	—	—	—
Skalnate Pleso		58·8	313	e 12 54	PP	e 22 30	SS	e 25 8	SSS	—
Upsala		59·2	325	e 10 3	− 2	e 18 11?	− 1	e 19 52	ScS	e 31·1
Belgrade		59·3	307	e 10 6a	0	e 18 15	+ 1	e 26 25	Q	e 38·4
Budapest		59·8	311	e 10 11	+ 2	e 18 18	− 2	—	—	35·1
Ogyalla		60·3	312	e 15 38	?	—	—	—	—	—
Prague		62·3	315	e 10 25	− 1	e 18 54	+ 2	e 14 14	PPP	e 33·1
Copenhagen		62·5	316	e 10 28	0	e 18 53	− 1	20 20	ScS	31·1
Taranto		62·5	303	10 22	− 6	18 52	− 2	—	—	—
Potsdam		62·7	317	i 10 30a	+ 1	i 18 55	− 2	i 23 3	SS	e 32·1
Collmberg		63·0	316	e 10 28	− 3	—	—	e 12 28	PP	e 40·1
Triest		63·8	310	i 10 33	− 3	i 19 5	− 6	i 11 10	PcP	—
Jena		63·9	316	e 10 35	− 2	e 19 18?	+ 6	e 13 12	PP	—
Messina		64·4	301	e 10 39	− 1	e 19 16	− 2	i 10 51	?	—
Padova		65·3	309	e 10 59	+13	e 19 37	+ 8	13 25	PP	—
Rome		65·6	306	e 10 31	−17	e 19 43	+10	e 13 13	PP	—
Bologna		65·7	310	e 10 50	+ 2	e 20 19	PPS	e 13 14	PP	—
Florence		66·0	308	e 10 51	+ 1	—	—	—	—	—
Salo	N.	66·0	310	e 10 53	+ 3	e 19 36	− 2	—	—	—
Stuttgart		66·0	314	e 10 47a	− 3	e 19 36	− 2	e 13 11	PP	e 35·1
Karlsruhe		66·4	315	e 10 53	0	e 19 42	− 1	e 11 27	PcP	e 36·1
Zürich		66·7	313	e 10 51	− 4	e 19 47	+ 1	e 13 54	PP	—
Strasbourg		66·9	314	e 10 54k	− 2	e 19 47	− 2	e 11 24	PcP	e 35·1
Pavia		67·0	310	e 10 58	+ 1	e 19 52	+ 2	e 20 28	PPS	—
Basle		67·3	313	e 10 53	− 6	e 19 52	− 2	—	—	—
De Bilt		67·9	318	i 11 3	+ 1	e 19 54	− 7	e 21 3	ScS	e 35·1
Aberdeen	E.	69·9	325	—	—	i 20 27	+ 3	i 25 5	SS	e 38·1
Paris		70·2	315	i 11 14	− 3	i 20 28	0	i 11 54	pP	e 35·1
Durham		70·4	322	—	—	i 20 30	0	i 21 22	ScS	—
Clermont-Ferrand		70·8	312	i 11 20	0	i 20 33	− 2	i 11 40	PcP	e 39·1
Kew		70·9	318	i 11 18k	− 3	e 20 31	− 5	e 21 27	ScS	e 37·1
Scoresby Sund		71·8	342	e 11 23	− 3	i 20 46	0	i 21 29	ScS	38·1
Rathfarnham Castle		73·6	322	i 11 33	− 4	e 21 2	− 5	e 12 34	?	e 39·1
Tortosa		74·5	307	i 11 41	− 1	i 21 13	− 4	—	—	—
Alicante		76·2	306	11 42	−10	21 38	+ 2	14 40	PP	e 36·7
Resolute Bay		77·3	3	e 11 54	− 4	e 21 44	− 4	—	—	e 43·1
Toledo		78·0	308	i 12 0	− 2	—	—	e 14 58	PP	—
Tamanrasset	Z.	78·1	289	e 12 0	− 2	—	—	e 14 46	PP	—
Almeria		78·2	305	11 59	− 4	21 59	+ 2	15 1	PP	38·8
Granada		78·9	306	i 12 8a	+ 1	i 22 12	+ 7	15 1	PP	i 39·5
Brisbane	Z.	79·3	128	i 12 9	0	—	—	—	—	—
Malaga		79·7	306	i 12 10	− 1	i 22 10	− 3	e 15 26	PP	48·3
Riverview		82·2	135	i 12 26a	+ 2	i 22 44	+ 5	—	—	e 39·7
Pietermaritzburg	Z.	83·4	230	i 12 38	PcP	—	—	—	—	—
Victoria		96·8	24	13 37	+ 3	24 14	[+ 3]	—	—	48·6
Seattle		97·9	24	—	—	e 24 19	[+ 3]	e 25 4	S	e 53·1
Seven Falls	E.	103·8	349	—	—	e 24 45	[0]	—	—	53·9
Mineral	Z.	104·4	27	e 14 22	+14	—	—	e 18 10	PP	—
Ottawa		106·2	352	24 50	SKS	(24 50)	[− 6]	—	—	54·1
Harvard		108·4	348	e 28 16	PS	e 29 25	PPS	e 34 18	SS	e 59·6
Tinemaha	Z.	108·6	26	e 19 3	PP	—	—	—	—	—
Palisades		110·3	350	e 19 7	PP	e 25 12	[− 1]	e 48 31	Q	e 60·6
Cleveland	N.	110·6	356	—	—	e 25 13	[− 2]	—	—	61·0
Pennsylvania	N.	111·0	353	i 19 43	PP	e 25 16	[0]	i 28 37	PS	—
Mount Wilson	Z.	111·1	27	e 19 49	PP	—	—	—	—	—
Riverside	Z.	111·6	27	e 19 42	PP	—	—	—	—	—
Palomar	Z.	112·4	27	e 19 24	PP	—	—	—	—	—
Bogota		145·4	338	i 19 42	[+ 2]	—	—	—	—	79·1
Chinchina		145·6	340	e 19 39	[− 1]	—	—	e 23 2	PP	—
La Paz		159·6	300	e 20 16	[+16]	31 18	{+ 8}	24 26	PP	—
Huancayo		161·0	325	e 20 11	[+ 9]	e 34 31	SKSP	e 25 44	?	e 81·2

For Notes see next page.

NOTES TO APRIL 14d. 23h. 40m. 52s.

Additional readings :—
Chatra P*E =1m.52s., P_gE =2m.8s., iSEN =3m.3s.
Calcuta iP*E =2m.4s., iS_gE =4m.7s.
New Delhi PPEN =3m.37s., iN =5m.57s., SSE =6m.21s.
Poona PPPE =5m.20s., QE =8m.50s., SSE =9m.14s., SSSE =9m.27s.
Bombay SSE =9m.31s.
Nanking iSN =8m.51s., SS =9m.25s.
Istanbul eEN =19m.16s., eSSEN =20m.52s.
Skalnate Pleso eN =14m.16s., e =17m.8s. and 21m.28s.
Upsala eSSSN =24m.32s., eN =29m.8s.
Budapest eN =10m.38s.
Prague ePP =13m.4s., e =13m.29s., 14m.56s., and 20m.15s., eSS =22m.38s., eSSS =25m.41s.
Potsdam iZ =10m.54s. and 11m.39s.
Collmberg eZ =10m.31s.
Triest eS_cS =20m.29s., eSS =23m.27s., eSSS =26m.32s.
Jena eP_cP?E =11m.0s., eS?N =19m.21s.
Rome iE =10m.44s., eSSEN =23m.34s.
Stuttgart iPZ =10m.52s., eP_cP =11m.24s., eS_cS =20m.46s., eSS =23m.50s., e =27m.26s. and 29m.50s.
Strasbourg e =11m.33s. and 12m.15s., ePPP =15m.12s., e =20m.52s., eSS =24m.17s., e =25m.53s., eSSS =27m.36s.
Pavia eSSS =27m.48s.
Aberdeen iE =21m.23s., eSSSE =28m.12s.
Paris i =11m.17s., iP_cP =11m.38s., i =11m.51s., isP =12m.15s., iPP =13m.55s., iPPP =15m.28s., i =20m.38s., eSS =25m.26s., iSSS =28m.36s.
Clermont-Ferrand i =11m.46s. and 21m.35s.
Kew iZ =11m.50s., eSSSEN =28m.19s.
Scoresby Sund 25m.25s.
Alicante PPP =16m.28s., S_cS =21m.58s., PS =22m.16s., PPS =22m.30s., SS =26m.26s., SSS =29m.46s., Q =31m.38s.
Tamanrasset iZ =12m.3s., ePPPZ =16m.28s.
Almeria SS =27m.19s.
Granada P_cP =12m.34s., PS =22m.36s., iSS =27m.23s.
Malaga PPP =17m.54s.
Mineral iZ =19m.0s.
Pennsylvania iPS?N =28m.57s., iPPS?N =29m.48s.
Bogota iPP =19m.55s., iS? =21m.57s., e =41m.8s.
La Paz SS =44m.36s.
Long waves were also recorded at Bergen, Edinburgh, Ivigtut, Pasadena, Weston, and Galcrazamba.

April 14d. Many more aftershocks of the Turkestan earthquake at 4h. were recorded at neighbouring stations. The times of the first recorded phase of each are given below.

Dzhergetal.

h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
4	31	47	6	41	13	11	23	31	17	37	52
4	33	43	6	47	26	11	33	30	17	40	1
4	48	0	6	49	45	11	41	25	17	43	22?
4	59	1	6	59	16	11	51	31	17	53	32
5	3	15	7	2	2	11	57	46	18	1	36
5	13	58	7	5	24	12	1	21	18	2	36
5	19	3	7	15	9	12	3	50	18	20	12
5	25	52	7	20	2	13	13	6	19	6	13
5	33	16	7	33	38	13	37	51	19	21	23
5	42	27	7	36	56	14	43	56	20	17	17
5	53	23	7	56	17	14	46	18	20	25	35
5	59	28	7	59	23	14	53	2	20	45	34
6	4	23	9	18	10	15	21	28	21	56	35
6	6	41	9	26	52	15	35	8	22	7	40
6	8	11	9	44	31	16	1	6	22	12	45
6	14	57	10	26	0	16	14	37	22	55	10
6	15	37	10	32	13	16	26	16	23	23	29
6	16	35	10	49	32	16	33	27	23	32	25
6	24	45	11	12	22	17	14	9	23	44	20
6	30	29	11	12	39	17	29	25	23	55	47

Fergana.

h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
4	59	18	6	16	52	11	12	55	17	54	7
5	19	20	6	25	1	11	51	45	22	12	59
5	26	9	6	50	1	12	4	6	23	56	3
5	53	39	7	33	54	15	35	23			
5	59	45	10	49	48	17	29	58			

Continued on next page.

Khorog.

h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
4	59	23	5	59	51	7	34	2	17	43	1
5	19	27	6	16	59	10	49	54	22	13	8
5	26	15	6	25	8	12	4	13			
5	53	47	6	50	10	15	35	31			

Obi-garm.

h.	m.	s.	h.	m.	s.	h.	m.	s.
17	29	56	17	43	23	22	13	18

Andijan.

h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
4	59	27	6	17	1	11	13	5	17	54	17
5	19	30	6	25	11	11	51	56	22	13	10
5	26	18	6	50	12	12	2	54			
5	53	49	7	34	4	12	4	16			
5	59	53	10	49	58	17	29	52			

Murgab.

h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
4	59	28?	5	59	56	6	50	17	11	13	42
5	26	26	6	17	4?	7	34	5	11	51	59
5	53	53	6	25	15	10	49	59	12	4	53

Stalinabad.

h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
5	19	38	6	17	42	12	4	57	23	56	22
5	26	27	6	25	21	15	35	44			
5	53	58	10	50	5	17	54	26			
6	0	3	11	52	9	22	13	21			

Lunacharskoe.

h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
5	54	11?	6	17	54	10	50	18	17	54	37
6	0	12	6	50	31	11	52	17			

Tashkent.

h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
5	54	8	6	25	30	10	50	16?	15	35	53
6	0	12	6	50	28	11	52	14?	17	54	38
6	17	18	7	34	22	12	4	35			

Tchimkent.

h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
5	20	47	6	50	37?	11	14	32	15	35	58
5	54	15	7	34	29	11	52	27	17	54	41
6	0	24	10	50	22	12	4	45	23	56	40

Samarkand.

h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
5	55	10	7	35	25	10	50	27	15	36	6
6	0	22									

Naryn.

h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
5	27	56	6	18	26	10	51	24	22	13	50
5	32	25	6	26	33	11	52	27			
5	55	16	6	50	46?	12	4	44			
6	1	9	7	35	44	17	54	47			

Frunse.

h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
6	50	49	11	53	28	15	36	11	17	54	56
10	50	36									

Rybach'e.

h.	m.	s.	h.	m.	s.
10	52	46	17	56	25

Krasnogorka.

h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
5	33	31?	6	50	55	15	36	26	23	57	57
6	0	40	11	52	41	17	55	58			

Almata.

h.	m.	s.	h.	m.	s.	h.	m.	s.
6	0	51	6	51	10	15	36	53

Continued on next page.

Almata II.

h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
5	27	20	5	54	30	15	36	34	23	57	14
5	34	7	6	18	3						

Przhevalsk.

h.	m.	s.
6	0	57

Ili.

h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
5	32	56	6	0	57	15	36	35	23	57	15

Kurmenty.

h.	m.	s.	h.	m.	s.
5	32	46	23	57	17

Chilisk.

h.	m.	s.
5	32	52

April 14d. Readings also at 0h. (near Reykjavik), 1h. (Collmberg, Stuttgart, Tamanrasset, and Dzhergetal (2)), 5h. (Apia, Brisbane, Riverview, Christchurch, Wellington, Huancayo, La Paz, Mineral, Palomar, China Lake, and Tinemaha, several shocks), 6h. (Mount Wilson, Palomar, China Lake, Tinemaha, Collmberg, Stuttgart, and Tamanrasset (2)), 7h. (Santa Lucia), 8h. (Palomar, China Lake, and Pretoria), 9h. (near Tananarive), 10h. (near Akhalkalaki, Gandzha, and Tsikhlis-Dzhvari), 11h. (Brisbane), 12h. (Palomar, China Lake, Tamanrasset, Brisbane, and Makhach-Kala), 13h. (near Scoresby Sund), 14h. (Sutttgart, Yuzno-Sakhlinsk, and near Copiapo), 15h. (Christchurch and Stuttgart), 16h. (Istanbul), 17h. (near Alicante), 20h. (Victoria, Ksara, and near Manila), 21h. (near Tacubaya).

April 15d. 12h. 39m. 23s. Epicentre 17°·8S. 178°·8W. Depth of focus 0·070.
(as on 1951, Feb. 19d.).

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

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Apia		7·9	60	1 57	+ 1	i 3 29	+ 1	—	—
Brisbane	z.	27·7	245	e 5 14	+ 4	—	—	—	—
Pasadena	z.	77·4	48	i 11 3	− 3	—	—	—	—
Palomar	z.	77·9	50	i 11 4k	− 5	—	—	—	—
Riverside	z.	77·9	48	i 11 6	− 3	—	—	—	—
China Lake	z.	78·7	47	i 11 11k	− 2	—	—	—	—
Tinemaha	z.	78·9	45	i 11 13	− 1	—	—	—	—
Reno		79·2	43	e 11 13k	− 3	e 20 29	− 6	—	—
Victoria		82·4	35	e 11 29	− 3	—	—	i 11 37	P
Rathfarnham C.	z.	144·1	7	i 18 37	[− 4]	—	—	e 24 12	?
Ksara		145·1	303	i 18 44	[+ 2]	e 30 2	PKKS	—	—
Jena		145·9	348	e 18 46	[+ 2]	—	—	e 18 57	PKP_2
Prague		146·1	345	e 18 45	[+ 1]	—	—	e 18 58	PKP_2
Stuttgart	z.	148·4	352	e 18 46	[− 1]	—	—	e 18 56	PKP_2
Strasbourg		148·8	352	i 18 52a	[+ 4]	—	—	—	—
Paris		149·0	358	i 18 53	[+ 5]	—	—	i 18 59	PKP_2
Tamanarsset	z.	173·6	—	e 19 12	[− 1]	e 21 49	sPKP	i 20 47	pPKP

Additional readings :—
Prague $ePKP_2$ = 19m.7s., e = 19m.42s., 20m.10s., and 22m.12s., ePP = 24m.24s.?, ePPP = 26m.9s.
Stuttgart iPKPZ = 18m.51s.

April 15d. Readings also at 0h. (near Dzhergetal (3)), 1h. (La Paz, Khorog, near Andijan, Fergana, Obi-garm, and Dzhergetal (5)), 2h. (near Athens, near Shemakla, and near Dzhergetal), 3h. (near Dzhergetal and near Reykjavik (2)), 4h. (Calcutta (2) and near Dzhergetal (2)), 5h. (Lick, Mineral (2), Reno, Pasadena, Mount Wilson, Riverside (2), Palomar (2), China Lake (2), Palisades, Puebla, Tacubaya, Vera Cruz, Santa Lucia, Copiapo (2), Bombay, Nanking, Ksara, Collmberg, Stuttgart (2), Andijan, Frunse, Rybach'e, Dzhergetal (2), near Fergana, Khorog, Obi-garm, Stalinabad, Tashkent, and Tchimkent, several shocks), 6h. (Apia, Grahamstown, Victoria, and near Dzhergetal (3)), 7h. (Santa Lucia, near Dzhergetal, and near Alicante (2)), 8h. (Clermont-Ferrand, Ksara, and near Dzhergetal), 9h. (Reno, Fresno, near Ashkabad, and near Dzhergetal (3)), 10h. (near Dzhergetal (2), and near Ashkabad), 11h. (Stuttgart, near Mizusawa, and near Dzhergetal (2)), 14h. (near Dzhergetal), 15h. (Fergana, Khorog, Stalinabad, near Akhalkalaki, near Murgab, Andijan, Obi-garm, and Dzhergetal (2)), 16h. (Apia, and near Dzhergetal (2)), 17h. (near New Delhi, near Khorog, Obi-garm, and Dzhergetal (5)), 18h. (Gori), 19h. (near Dzhergetal), 20h. (Pasadena, near Palomar, near Lunacharskoe, Tchimkent, Fergana, Stalinabad, Murgab, Andijan, Khorog, Obi-garm, and Dzhergetal (3)), 21h. (Dzhergetal), 22h. (Collmberg, China Lake, Mount Wilson, Palomar, and Tinemaha), 23h. (Andijan, Frunse, Naryn, near Dzhergetal, Khorog, Lunacharskoe, Murgab, Samarkand, Stalinabad, and Tashkent).

April 16d. 15h. 47m. 19s. Epicentre 50°·8N. 6°·9E. (as on 1951, March 14d.).

Felt near Euskirchen-Mechernich.
Stuttgart Monthly Seismo. Bull. Epicentre 50°36′·5N. 6°43′·2E.

A = +·6300, B = +·0762, C = +·7728 ; δ = −7 ; h = −6 ;
D = +·120, E = −·993 ; G = +·767, H = +·093, K = −·635.

		△	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Witteveen	Z.	2·0	356	e 0 46	P_g	—	—	—	—
Strasbourg		2·3	166	e 0 43	P*	i 1 7	− 2	i 1 20	S_g
Stuttgart	Z.	2·5	143	e 0 43?	P*	e 1 17	+ 3	e 0 49	P_g
Jena	E.	3·0	85	e 0 57	P_g	e 1 32	+ 5	i 1 40	S_g
Basle		3·3	172	e 1 3	P_g	e 1 43	S*	—	—
Paris		3·4	237	i 1 3	P*	e 1 38	+ 1	i 1 47	S*
Besançon		3·6	190	e 1 13	P_g	e 1 53	S*	e 2 25	?
Zürich		3·6	161	e 0 56	− 2	e 1 46	+ 4	—	—
Neuchatel		3·8	179	e 0 56	− 5	e 2 2	S_g	—	—
Collmberg		3·9	82	e 1 3?	+ 1	e 1 57	+ 7	e 1 18	P_g
Prague		4·9	95	—	—	e 2 33	S*	e 2 40	S_g

Additional readings :—
Stuttgart eZ = 46s., 57s., 1m.10s., and 1m.21s., eS_g?Z = 1m.24s., eZ = 1m.28s.
Jena eN = 1m.0s. and 1m.18s., eE = 1m.22s., eN = 1m.38s., iE = 1m.45s.
Paris e = 1m.41s
Collmberg eP*EZ = 1m.14s., eZ = 1m.48s., eS*?Z = 2m.4s., eEZ = 2m.11s., eS_gZ = 2m.24s.

April 16d. 19h. 52m. 57s. Epicentre 31°·2N. 138°·0E. Depth of focus 0·070.

Intensity IV at Tokyo, Tyosi, Mizukaido, Nikko; II-III at Torishima, Yokohama, Utunomiya, Shirakawa, Onahama, and Sapporo. Epicentre as adopted. Depth of focus 470km.

Seismo. Bull. Cent. Met. Obs., Japan, April, 1951, Tokyo, 1951, p.89, with macroseismic chart.

A = −·6368, B = +·5734, C = +·5155 ; δ = +4 ; h = +1 ;
D = +·669, E = +·743 ; G = −·383, H = +·345, K = −·857.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.	
	°	°	m. s.	s.	m. s.	s.	m. s.		m.	
Torisima	1·7	110	1 0	− 2	1 50	− 1	—	—	—	
Hatidyozima	2·5	39	0 52	−14	1 43	−16	—	—	—	
Siomisaki	2·9	320	1 9a	0	2 4	0	—	—	—	
Owase	3·2	332	1 12k	+ 1	2 10	+ 2	—	—	—	
Omaesaki	3·4	3	1 12k	− 1	2 15	+ 5	—	—	—	
Hamamatu	3·5	356	1 15	+ 2	2 16	+ 4	—	—	—	
Tu	3·7	341	1 16	+ 1	2 17	+ 3	—	—	—	
Kashiwara	3·8	331	1 17	+ 1	2 18	+ 2	—	—	—	
Shizuoka	3·8	5	1 13k	− 3	2 15	− 1	—	—	—	
Wakayama	3·8	323	1 28	+12	2 28?	+12	—	—	—	

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m.	s.	m.
Kameyama		3·9	341	1 18	+ 1	2 20	+ 3	—	—	—
Mera		4·0	22	1 16	− 2	2 16	− 3	—	—	—
Misima		4·0	11	1 22	+ 4	2 22	+ 3	—	—	—
Osaka		4·0	330	1 19	+ 1	2 22	+ 3	—	—	—
Nagoya		4·1	348	1 19k	+ 1	2 23	+ 3	—	—	—
Sumoto		4·1	321	1 19a	+ 1	2 19	− 1	—	—	—
Kobe		4·2	327	1 22	+ 3	2 24	+ 2	—	—	—
Kyoto		4·2	334	1 21	+ 2	2 25	+ 3	—	—	—
Gihu		4·3	346	1 23	+ 3	2 30	+ 6	—	—	—
Hikone		4·3	341	1 24k	+ 4	2 29	+ 5	—	—	—
Hunatu		4·3	8	1 21k	+ 1	2 26	+ 2	—	—	—
Iida		4·3	358	1 25	+ 5	2 27	+ 3	—	—	—
Kohu		4·4	6	1 24k	+ 3	2 29	+ 4	—	—	—
Yokohama		4·4	18	1 23k	+ 2	2 27	+ 2	—	—	—
Koti		4·5	303	1 21a	− 1	2 26	− 1	—	—	—
Simidu		4·6	292	1 29a	+ 6	2 36	+ 8	—	—	—
Tokyo		4·7	18	1 23k	− 1	2 28	− 2	—	—	—
Tsuruga		4·7	341	1 25	+ 1	2 32	+ 2	—	—	—
Titibu		4·9	10	1 25	− 1	2 31	− 2	—	—	—
Hukui		5·0	344	1 30	+ 4	2 44	+ 9	—	—	—
Matumoto		5·0	0	1 29	+ 3	2 38	+ 3	—	—	—
Takayama		5·0	353	1 37	+11	2 46	+11	—	—	—
Uwazima		5·0	295	1 26	0	—	—	—	—	—
Kumagaya		5·1	13	1 28	+ 1	2 37	0	—	—	—
Oiwake		5·1	5	1 30	+ 3	2 39	+ 2	—	—	—
Toyooka		5·1	329	1 31	+ 4	2 44	+ 7	—	—	—
Tyosi		5·1	27	1 28k	+ 1	2 36	− 1	—	—	—
Matuyama		5·2	302	1 31a	+ 3	2 40	+ 2	—	—	—
Maebasi		5·3	9	1 28k	− 1	2 40	0	—	—	—
Matusiro		5·3	2	1 29	0	2 41	+ 1	—	—	—
Tukubasan		5·3	19	1 29	0	2 39	− 1	—	—	—
Kanazawa		5·4	348	1 32	+ 2	2 46	+ 4	—	—	—
Nagano		5·4	2	1 30k	0	2 44	+ 2	—	—	—
Toyama		5·5	353	1 34k	+ 3	2 48	+ 4	—	—	—
Mito		5·6	21	1 32	0	2 43	− 2	—	—	—
Miyazaki		5·6	279	1 33	+ 1	2 47	+ 2	—	—	—
Utunomiya		5·6	16	1 30k	− 2	2 41	− 4	—	—	—
Ooita		5·7	292	1 33	0	2 48	+ 1	—	—	—
Hamada		6·2	308	1 37	− 1	2 56	0	—	—	—
Onahama		6·2	22	1 38	0	2 54	− 2	—	—	—
Shirakawa		6·2	17	1 37	− 1	2 55	− 1	—	—	—
Wazima		6·2	352	1 40	+ 2	2 59	+ 3	—	—	—
Kumamoto		6·4	286	1 39	− 1	2 57	− 3	—	—	—
Simonoseki		6·5	297	1 37	− 4	3 1	− 1	—	—	—
Yakusima		6·5	265	1 37	− 4	2 57	− 5	—	—	—
Inawashiro		6·6	15	1 45	+ 3	3 5	+ 1	—	—	—
Niigata		6·7	7	1 47	+ 4	3 9	+ 4	—	—	—
Unzendake		6·7	285	1 41	− 2	—	—	—	—	—
Aikawa		6·8	2	1 43	− 1	3 5	− 2	—	—	—
Hukusima		6·8	17	1 45k	+ 1	3 8	+ 1	—	—	—
Hukuoka		6·8	292	1 42k	− 2	3 7	0	—	—	—
Yamagata		7·3	15	1 51	+ 1	3 17	0	—	—	—
Sendai		7·4	18	1 51k	0	3 20	+ 2	—	—	—
Isinomaki		7·7	20	1 54	0	3 25	+ 1	—	—	—
Sakata		7·8	11	1 38	−17	3 9	−17	—	—	—
Tomie		8·0	283	1 59	+ 2	3 34	+ 4	—	—	—
Mizusawa	N.	8·3	18	2 2	+ 2	3 38	+ 2	—	—	—
Akita		8·7	11	2 8	+ 3	3 47	+ 3	—	—	—
Morioka		8·9	16	2 8	+ 1	3 48	0	—	—	—
Miyako		9·0	20	2 9k	+ 1	3 51	+ 2	—	—	—
Aomori		9·8	12	2 26	+10	4 13	+ 8	—	—	—
Hatinohe		9·8	16	2 17	+ 1	4 8	+ 3	—	—	—
Mori		11·1	10	2 33	+ 3	4 35	+ 4	—	—	—
Muroran		11·4	11	2 36	+ 3	4 41	+ 5	—	—	—
Urakawa		11·6	18	2 37	+ 1	4 50	+10	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Sapporo		12·1	12	2 43 a	+ 2	4 56	+ 6	—	—	—
Obihiro		12·4	18	2 49	+ 5	5 7	+11	—	—	—
Kusiro		12·8	22	2 44	− 4	4 56	− 8	—	—	—
Valdivostok		12·9	339	i 2 50	+ 1	i 5 8	+ 2	—	—	—
Nemuro		13·5	24	2 59	+ 3	5 25	+ 8	—	—	—
Abashiri		13·7	19	3 13	+15	5 31	+10	—	—	—
Zi-ka-wei	z.	14·2	274	2 54	− 9	i 5 24	− 6	—	—	—
Wakkanai		14·5	10	3 13	+ 7	5 49	+13	—	—	—
Yuzno-Saklinsk		16·1	12	i 3 27	+ 5	i 6 17	+11	—	—	—
Nanking		16·4	278	i 3 21	− 4	i 6 8	− 3	—	—	—
Manila		22·7	227	i 4 11	−14	i 5 11	pP	—	—	—
Petropavlovsk		26·5	27	i 5 2	+ 2	e 9 6	+ 6	e 6 15	pP	—
Klyuchi		29·7	26	e 5 28	+ 1	i 9 58	+ 9	—	—	—
Kabansk		31·0	321	5 39	0	i 10 11	+ 1	e 7 2	pP	—
Irkutsk		32·3	321	5 50	0	i 10 32	+ 2	e 7 15	pP	—
Uglegorsk		38·0	2	3 51	?	i 6 58	?	—	—	—
Calcutta	E.	44·8	272	i 7 32	0	—	—	i 8 57	pP	—
Djakarta		47·6	225	i 7 48	− 5	i 14 6	− 6	—	—	—
Przhevalsk		48·1	302	i 7 54?	− 3	—	—	—	—	—
Almata		49·1	303	i 8 3	− 1	i 14 31	− 2	i 17 1	ScS	—
Rybach'e		49·8	301	i 8 7	− 3	14 42	0	e 9 42	pP	—
Naryn		50·0	300	i 8 10	− 1	i 14 46	+ 1	—	—	—
Frunse		50·8	302	i 8 15	− 2	i 14 57	+ 1	i 17 14	ScS	—
New Delhi		52·2	284	e 8 23	− 4	i 15 9	− 6	15 27	PPS	—
Andijan		52·9	300	i 8 30	− 2	i 15 23	− 1	18 12	sS	—
Fergana		53·4	300	e 8 32	− 4	e 15 28	− 3	i 17 29	ScS	—
Dzhergetal		54·1	299	i 8 39	− 2	i 15 39	− 1	—	—	—
Tchimkent		54·6	303	i 8 44	0	i 15 46	− 1	—	—	—
Lunacharskoe		55·0	301	i 8 48	+ 1	i 15 51	− 1	—	—	—
Tashkent		55·0	301	i 8 44	− 3	i 15 47	− 5	i 17 40	ScS	—
Hyderabad	E.	55·4	271	—	—	e 15 53	− 4	—	—	—
Stalinabad		56·1	298	i 8 52	− 3	i 16 5	− 1	i 17 52	ScS	—
Samarkand		57·1	300	i 8 58	− 4	i 16 17	− 2	17 53	ScS	—
Sverdlovsk		57·8	321	e 9 3	− 3	i 16 27	− 1	e 10 37	pP	—
Poona		58·8	274	e 9 10	− 3	i 16 38	− 3	10 7	pP	—
Colombo	E.	59·3	259	9 12	− 4	16 42	− 5	—	—	—
Bombay		59·6	275	e 9 15	− 3	i 16 44	− 7	e 10 51	sP	—
Kodaikanal	E.	59·6	265	e 9 21	+ 3	—	—	—	—	—
Brisbane		60·1	164	e 9 22	0	i 16 53	− 4	i 11 3	sP	—
Mary		61·6	300	i 9 30	− 2	17 18	+ 2	—	—	—
Ashkabad		64·1	301	9 46	− 2	i 17 46	0	—	—	—
Apia		65·8	124	—	—	18 10	+ 3	—	—	—
Riverview		65·9	168	—	—	i 18 5	− 3	e 19 11	ScS	—
Resolute Bay		68·9	14	i 10 18	0	e 18 46	+ 3	e 11 54	sP	—
Baku		69·2	306	e 10 20	+ 1	i 18 50	+ 3	—	—	—
Shemakla		70·0	306	e 10 25	+ 1	i 18 55	− 1	—	—	—
Moscow		70·2	324	—	—	i 18 57	− 1	—	—	—
Lenkoran		70·7	304	10 28	0	19 4	0	—	—	—
Grozny		70·9	310	e 10 30	+ 1	i 19 5	− 1	—	—	—
Kirovobad		71·5	307	i 10 23	−10	i 19 13	0	i 19 51	ScS	—
Tiflis		72·2	309	e 10 36	− 1	i 19 20	0	e 12 18	pP	—
Victoria	z.	72·5	44	e 10 41	+ 2	—	—	—	—	—
Nakhichevan		72·9	306	e 8 50	?	i 15 55	?	—	—	—
Seattle		73·6	44	i 10 48 a	+ 3	i 11 11	PcP	i 12 29	pP	—
Arcata		75·7	51	e 10 59 a	+ 2	—	—	e 12 45	pP	—
Upsala		76·9	334	—	—	i 20 5?	− 7	—	—	—
Mineral	z.	77·6	50	i 11 8 a	+ 1	—	—	i 14 16	PP	—
Scoresby Sund		77·6	354	i 11 8	+ 1	i 20 26	+ 7	e 12 54	pP	—
Berkeley		78·4	53	i 11 13 a	+ 2	e 20 43	+16	i 12 52	pP	—
Tuai	N.	78·6	149	e 11 3	− 9	—	—	e 30 9	Q	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Cobb River	E.	78·8	153	e 11 11	− 3	—	—	c 20 28	ScS	—
Santa Clara		78·9	53	e 11 16	+ 2	i 11 27	?	—	—	—
Lick	Z.	79·1	53	i 11 17 a	+ 2	i 14 19	PP	i 12 59	pP	—
Reno		79·2	50	i 11 7 a	− 9	e 20 45	+10	e 14 25	PP	—
Kaimata	N.E.	79·5	155	e 11 21	+ 4	—	—	20 34	ScS	—
Wellington		79·7	153	e 11 14	− 4	—	—	i 20 34	ScS	—
Lwow		80·4	323	e 11 21	− 1	e 20 43	− 5	e 23 49	sS	—
Fresno		80·7	52	i 11 24 a	+ 1	e 20 54	+ 3	e 13 35	sP	—
Ksara		82·2	305	i 11 31	0	21 6	0	i 13 12	pP	—
China Lake		82·7	52	i 11 34 a	0	i 21 12	+ 1	i 14 53	PP	—
Istanbul		82·7	314	—	—	e 21 8	− 3	c 24 12	sS	e 48·0
Skalnate Pleso		82·7	325	—	—	e 21 9	− 2	c 23 3	pS	—
Raciborzu		83·1	326	e 11 33	− 3	e 21 13	− 2	e 13 21	pP	—
Pasadena		83·2	54	i 11 37 a	+ 1	i 21 13	− 3	c 13 22	pP	—
Potsdam	E.	83·9	330	—	—	i 21 19	− 3	—	—	—
Riverside		83·9	54	i 11 40	0	—	—	i 15 2	PP	—
Palomar		84·6	54	i 11 43 a	0	i 21 26	− 3	i 13 36	pP	—
Collmberg		84·7	329	c 11 42	− 2	e 21 29	− 1	e 13 28	pP	—
Prague		84·9	328	e 11 48	+ 4	e 21 34	+ 2	e 13 39	pP	—
Sofia		85·1	318	—	—	e 21 24	[+ 2]	e 21 36	S	—
Belgrade		85·4	320	c 13 42	pP	e 21 39	+ 2	e 24 41	sS	—
Jena		85·6	329	e 13 39	pP	e 21 37	− 2	c 14 6	?	—
Triest		88·3	325	c 13 26	pP	e 24 54	sSKS	e 14 17	sP	—
Taranto		90·1	319	—	—	e 22 15	− 5	—	—	—
Rome	N.	91·6	322	—	—	e 22 28	− 5	e 29 18	SS	—
Harvard		101·8	22	e 17 11	PKP	—	—	—	—	—
Tacubaya		105·6	55	e 14 57	pP	—	—	e 17 55	PP	—
Tamanrasset	Z.	109·6	314	e 17 37	[+ 2]	e 26 51	SP	i 18 13	PP	—
Fort de France		130·8	25	e 18 16	[0]	—	—	e 20 58	PP	—
Chinchina		131·8	47	e 15 3	P	e 21 16	PP	c 18 32	PKP	—
Huancayo		143·8	65	i 18 42	[+ 1]	—	—	c 21 37	PP	—
La Paz		152·1	63	i 18 58 a	[+ 5]	25 19	[+ 6]	22 47	PP	—

Additional readings :—
Nanking i =3m.33s., 4m.5s., 5m.8s., 5m.21s., and 7m.58s.
Petropavlovsk esS =11m.28s.
Kabansk esS =12m.46s., ScS =15m.16s.
Irkutsk esS =13m.3s.
Rybach'e iScS =17m.2s.
New Delhi iEN =17m.19s., eN =17m.57s., and 18m.48s., iN =20m.33s. and 21m.42s.
Sverdlovsk iScS =18m.2s., sS =19m.15s., SS =20m.25s.
Poona sPE =10m.44s., PPE =11m.3s., PPPE =12m.0s., ScPE =13m.37s., PSE = 16m.45s., PPSE =16m.55s., sSE =18m.10s., SSE =19m.57s., SSSE =22m.1s.
Bombay PPEN =11m.12s., isSEN =18m.19s.
Brisbane iSKSE =18m.26s., isSE =19m.44s.
Riverview iE =19m.14s., isS?E =21m.0s., iSS?E =22m.23s.
Resolute Bay eZ =10m.25s., eEN =19m.30s.
Seattle esP =13m.23s.
Mineral iZ =11m.25s.
Berkeley ePPZ =14m.16s.
Lick iZ =11m.56s.
Reno eZ =11m.55s.
Fresno eZ =23m.39s.
China Lake eSKP,PKP?Z =40m.35s.
Istanbul eN =26m.29s.
Skalnate Pleso eSS =26m.33s., eSSS =30m.21s.
Raciborzu eE =21m.16s., eEN =21m.26s., eZ =21m.30s., eN =21m.58s., eE =22m.3s.
Pasadena iZ =13m.28s., iPPZ =14m.56s., eE =21m.46s., eSPZ =22m.30s., iE =23m.18s., eSKP,PKP?Z =40m.29s.
Potsdam iN =21m.22s., iE =22m.30s.
Riverside iZ =11m.51s. and 12m.0s.
Palomar iZ =11m.59s., iPP =15m.6s., eSKP,PKP?Z =40m.21s.
Prague esP =14m.19s., ePP =14m.58s., eSP =22m.8s. and 22m.23s., esS =24m.33s., eSS =27m.16s.
Belgrade eNE =18m.33s. and 41m.58s.
Triest ePPP? =17m.47s.
Rome eN =25m.33s.
Tamanrasset epPPZ =19m.56s., iPSZ =28m.43s., iZ =28m.57s., eZ =30m.57s. and 31m.41s.
La Paz iPKP,?Z =19m.16s., iSKKS =28m.54s., PPS =36m.15s., SS =41m.43s.

April 16d. 20h. 32m. 42s. Epicentre 51°·1N. 156°·5E. (as on 1950, January 31d.).

$A = -·5782$, $B = +·2514$, $C = +·7762$; $\delta = 0$; $h = -6$;
$D = +·399$, $E = +·917$; $G = -·712$, $H = +·310$, $K = -·631$.

		△	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Victoria	z.	49·3	60	e 8 53	0	—	—
Mineral	z.	55·4	67	i 9 38a	0	—	—
Reno	z.	56·9	67	e 9 52k	+ 3	—	—
Lick	z.	57·3	70	e 9 51a	− 1	—	—
Scoresby Sund		58·7	359	e 10 2	0	—	—
Fresno	z.	58·8	69	e 10 2a	0	—	—
Tinemaha	z.	59·5	68	i 10 9	+ 2	—	—
China Lake		60·7	68	i 10 15	0	e 18 23	− 9
Pasadena	z.	61·6	70	i 10 20	− 2	—	—
Riverside	z.	62·1	70	i 10 24	− 1	—	—
Palomar		62·9	70	i 10 30	0	—	—
Collmberg	z.	73·4	337	e 11 37	+ 1	—	—
Harvard		77·8	34	i 12 1	0	—	—
Weston		78·0	34	i 12 2	0	—	—
Brisbane	z.	78·3	182	e 22 22	S	(e 22 22)	+18
Tamanrasset	z.	102·1	333	e 37 31	SSS	—	—

Additional readings :—
Mineral iZ = 9m.54s.
Lick iZ = 10m.1s.
Harvard e = 12m.26s.

April 16d. Readings also at 0h., 1h., and 3h. (near Dzhergetal), 4h. (near Antofagasta), 5h. (Manila, Perth, Brisbane, Christchurch, Wellington, Copiapo, China Lake (2), Tinemaha, near Dzhergetal (2), and near Tacubaya), 6h. (Tacubaya, and near Dzhergetal (2)), 7h. (Brisbane, Santa Lucia, Mount Wilson, Palomar, China Lake, and near Dzhergetal (3)), 8h. (China Lake), 10h. (Seven Falls and near Basle), 11h. (near Copiapo (2), near Dzhergetal (2), and near Apia), 12h. (Manila, Pretoria, Mineral, near Dzhergetal, and near Antofagasta), 13h. (Dzhergetal), 14h. (Stuttgart and near Dzhergetal), 15h. (Mineral, Collmberg, and near Dzhergetal (2)), 16h. (Pavia, La Paz, near Mizusawa, near Dzhergetal, near Oaxaca, Puebla, Tacubaya, and Vera Cruz), 17h. (Pavia), 18h. (Harvard and near Dzhergetal (2)), 19h. (near Apia and near Dzhergetal), 20h. (Fresno, Lick, Reno, Mineral, Bogota, Istanbul, Jena, near Collmerg, and near Kurmenty), 21h. (Palomar, Pasadena, Riverside, China Lake (2), Wellington, and near Dzhergetal), 22h. (Christchurch and near Dzhergetal), 23h. (Collmberg and Manila).

April 17d. 11h. 0m. 24s. Epicentre 2°·2N. 126°·0E. (as on 1949, April 1d.).

$A = -·5874$, $B = +·8084$, $C = +·0382$; $\delta = +1$; $h = +7$;
$D = +·809$, $E = +·588$; $G = -·022$, $H = +·031$, $K = -·999$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Manila		13·2	338	e 3 1	−10	—	—	e 3 23	PP
Brisbane	z.	39·3	140	e 7 26	− 6	—	—	—	—
Vladivostok		41·1	7	e 7 46	− 1	i 13 57	− 4	—	—
Kabansk		52·2	346	e 9 15	0	e 16 36	− 4	—	—
Irkutsk		53·1	344	e 9 23	+ 2	e 16 50?	− 1	—	—
Almata II		59·4	322	i 10 7	+ 1	—	—	—	—
Andijan		61·6	316	e 10 23	+ 1	e 18 44	+ 1	—	—
Fergana		61·9	316	e 10 22	− 2	—	—	—	—
Stalinabad		63·4	313	e 10 33	− 1	—	—	—	—
Tchimkent		64·2	317	i 10 37	− 2	—	—	—	—
Sverdlovsk		74·9	329	11 44	0	21 16	− 6	—	—
Baku		78·0	311	—	—	e 22 0	+ 5	—	—
Borzhomi		83·0	312	e 12 31	+ 3	—	—	—	—
Ksara		88·9	303	e 13 2	+ 4	e 23 8	[−18]	—	—
Mineral	z.	105·5	48	e 14 19k	+ 6	—	—	e 18 28	PP

April 17d. Readings at 1h. (Tamanrasset, Huancayo, Chinchina, near Bogota, and near La Paz), 2h. (near Ksara and near Dzhegetal (2)), 3h. (Ksara and near Dzhergetal), 5h. (Santa Lucia, Stuttgart, Basle, and near Zürich), 6h. (near Krasnogorka), 8h. (near Athens), 12h. (Brisbane), 13h. (Copiapo), 15h. (Apia and near Akhalkalaki), 16h. (Puebla, Vera Cruz, and Tacubaya), 17h. (near Istanbul), 18h. (Brisbane, Puebla, near Tacubaya, Ksara, and near Istanbul), 21h. (Stuttgart and near Beigrade), 22h. (Bucharest and near Victoria), 23h. (Stuttgart, Santa Lucia, near Kurmenty, and near Victoria (5).

April 18d. Readings at 0h. (Pretoria), 1h. (Christchurch, Tuai, Wellington, Puebla, near Tacubaya, and near Dzhergetal), 2h. (Ksara, Almata II, Khorog, Stalinabad, near Andijan, Fergana, Tchimkent, and Dzhergetal), 3h. (Reykjavik), 4h. (Ksara, Oaxaca, near Puebla, Tacubaya, Vera Cruz, Fergana, Stalinabad, Tashkent, near Andijan, Dzhergetal (2), Khorog, Tchimkent, near Bandong, Djakata, and near Manila (2)), 5h. (near Dzhergetal), 6h. (Copiapo), 7h. (near Dzhergetal), 8h. (Stuttgart), 9h. (Scoresby Sund, near Grozny, and near Dzhergetal), 10h. (Brisbane, near Dzhergetal, and near Istanbul), 11h. (Collmberg), 12h. (Apia, Ashkabad, Baku, Kirovobad, Lenkoran, Mary, Andijan, Tashkent, Poona, Bombay, Helwan, Ksara, Tamanrasset, Mineral, Mount Wilson, Riverside, Palomar, and China Lake; several shocks), 13h. (Ksara), 15h. (Santa Lucia, Tacubaya, and near Dzhergetal (2)), 16h. (near Ebingen, Stuttgart, Zürich, and Basle), 17h. (near Ottawa and near Dzhergetal), 18h. (near Dzhergetal), 19h. (Istanbul and near Dzhergetal (2)), 21h. Dzhergetal), 22h. (Collmberg and near Dzhergetal (2)), 23h. (Ashkabad and near Klyuchi).

April 19d. Readings at 0h. (Santa Lucia), 1h. (near Mizusawa), 3h. (Ksara and near Dzhergetal), 4h. (near Dzhergetal and near Messina), 5h. (Tacubaya, Ksara, Tamanrasset, Victoria, and near Messina), 6h. (Tacubaya, Manila, and near Copiapo), 7h. (Lunacharskoe, Naryn, near Andijan, Dzhergetal, Fergana, Khorog, Obi-garm, Stalinabad, Tashkent, Tchimkent, and near Istanbul), 9h. (near Andijan (2), Dzhergetal (2), Fergana, Khorog (2), and Obi-garm (2)), 13h. (Brisbane, Ksara, near Collmberg, Prague, and Jena), 14h. (Lick, Ebingen, Stuttgart, and near Santa Lucia), 15h. (Mount Wilson, Riverside, Palomar, China Lake, Tinemaha, Copiapo, near Tacubaya, Alicante, and Granada), 16h. (near Santa Lucia), 17h. (Nanking), 18h. (Antofagasta), 19h. (Pasadena, Riverside, Palomar, China Lake, Stuttgart, and near Kurmenty), 20h. (Brisbane, Manila, and near Istanbul), 21h. (Copiapo, Santa Lucia, Tamanrasset, Kurmenty, Stalinabad, near Andijan, Dzhergetal, Fergana, Khorog, Murgab, Naryn, and Obi-garm), 23h. (Grahamstown, Kimberley, Pietermaritzburg, Pretoria, Chatra, and near Dzhergetal).

April 20d. 2h. 43m. 20s. (I)
2h. 52m. 51s. (II)
4h. 15m. 2s. (III)
Epicentre 39°·2N. 23°·6E.

I Intensity IV at Atalanti and Argalasti; III at Martinon.
II Intensity IV at Kymi, Atalanti, and Argalasti; III at Martinon.
III Intensity IV at Kymi, Atalanti, Argalasti, and Livanates; III at Martinon.
Strasbourg gives epicentre as adopted.

A. Galanopoulos, Seismological Institute Bulletin, 1951, Athens, 1952, p. 16.

$A = +\cdot7120$, $B = +\cdot3111$, $C = +\cdot6295$; $\delta = 0$; $h = -2$;
$D = +\cdot400$, $E = -916$; $G = +\cdot577$, $H = +\cdot252$, $K = -\cdot777$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
I	Athens	1·2	155	i 0 22 a	− 2	i 0 38	− 3	—	—	—
II		1·2	155	i 0 27	P_g	i 0 43	S_g	—	—	—
III		1·2	155	e 0 26	P_g	i 0 43	S_g	—	—	—
I	Sofia	3·5	357	e 0 57	0	1 41	+ 1	i 1 56	S_g	—
II		3·5	357	e 1 1	+ 4	1 49	S*	2 0	S_g	—
III		3·5	357	1 0	+ 3	1 37	− 3	1 57	S_g	—
I	Istanbul	4·6	64	e 1 11	− 1	e 2 32	S_g	—	—	—
II		4·6	64	e 1 13	+ 1	e 2 34	S_g	—	—	—
III		4·6	64	e 1 13	+ 1	e 2 34	S_g	—	—	—
I	Taranto	5·1	287	1 42	P_g	e 2 20	0	e 2 40	S*	—
III		5·1	287	1 15	− 5	2 18	− 2	e 2 23	S	—
I	Bucharest	5·5	19	e 1 52	P_g	i 3 6	S_g	—	—	—
III		5·5	19	e 1 32	+ 7	i 3 1	S_g	e 1 38	P*	—
III	Belgrade	6·1	338	e 2 0 a	P_g	3 39	?	—	—	—
I	Messina	6·4	262	i 1 44 k	+ 6	i 1 57	−56	i 1 48	P*	—
II		6·4	262	—	—	e 2 49	− 4	e 3 7	S*	—
III		6·4	262	e 1 38	0	i 2 57	+ 4	i 2 11	P_g	—

Continued on next page.

			△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
			°	°	m. s.	s.	m. s.	s.	m. s.		m.
I	Timisoara	E.	6·8	346	—	—	e 3 30	S*	—	—	—
III			6·8	346	e 2 17?	P_g	e 2 51	−12	e 3 34	S*	—
I	Rome	E.	8·9	291	—	—	e 5 11	?	—	—	—
III			8·9	291	e 4 7	?	e 4 21	S*	—	—	—
I	Triest		9·7	315	e 3 31	?	e 5 19	S_g	e 4 38	S*	—
II			9·7	315	—	—	e 5 16	S_g	e 5 45	S_gS_g	—
III			9·7	315	e 3 5	?	e 5 17	S_g	e 4 25	S	—
III	Florence		10·3	300	—	—	e 4 26	− 4	—	—	e 5·5
III	Prato		10·5	301	—	—	e 4 22	−13	—	—	e 6·4
III	Ksara		11·3	115	3 52	?	—	—	—	—	e 6·7
III	Pavia		12·3	304	4 56	?	e 5 35	SS	—	—	—
III	Prague		12·7	332	e 4 5	+60	—	—	e 6 40	Q	e 7·4
III	Zürich		13·7	312	e 3 22	+ 4	e 5 56	+ 4	—	—	e 7·6
III	Stuttgart		14·1	317	e 3 23	0	—	—	—	—	e 8·0
III	Collmberg	Z.	14·2	332	e 3 34	PP	—	—	—	—	—
III	Jena		14·5	328	e 3 38	PP	—	—	e 4 0	PPP	e 8·4
III	Strasbourg		14·8	315	e 3 28	− 4	—	—	e 3 48	PPP	e 7·5
III	Besançon		15·2	308	e 3 52	PP	—	—	—	—	—
III	Algiers Univ.	Z.	16·4	268	e 3 51	− 2	—	—	—	—	—
III	Clermont-Ferrand		16·5	300	3 10	−44	—	—	—	—	—
III	Paris		17·9	309	i 4 28	PP	i 7 50	SS	i 4 42	PPP	e 9·6
III	Kew		20·7	314	—	—	e 8 41	+10	—	—	e 11·0
I	Tamanrasset	Z.	22·5	229	i 5 0k	− 2	—	—	—	—	—
II		Z.	22·5	229	e 5 3	+ 1	—	—	—	—	—
III		Z.	22·5	229	e 5 3	+ 1	—	—	i 5 21	PP	e 11·0

Additional readings :—
Sofia I S_gEN = 2m.6s., II eP_gEN = 1m.19s., III eEN = 1m.8s.
Bucharest I eN = 2m.56s. and 3m.9s., III iSE = 3m.12s.
Belgrade III eP_gZ = 2m.19s., eNW = 4m.5s. and 4m.26s.
Messina II eZ = 3m.1s.
Timisoara I eN = 3m.33s.?, eEN = 3m.58s., III ePPE = 2m.31s., eN = 3m.51s., iSN = 4m.7s., iS*?N = 4m.40s.
Rome III eN = 5m.11s., iE = 5m.37s.
Triest III $eP_gP_gP_g$? = 3m.41s., eS_gS_g? = 5m.5s.
Jena III eN = 4m.25s.
Long waves were also recorded for I and II at Pavia, and for III at Skalnate Pleso, Potsdam, De Bilt, and Tortosa.

April 20d. 19h. 47m. 41s. Epicentre 36°·2N. 140°·0E. Depth of focus 0·005.
(as on 1940, Sept. 17d.).

Intensity IV at Mito, Nikko, Kannomineyama, Katakura, Makabe, Koga; II-III at Utunomiya, Titibu, and Awao.
Epicentre 36°·4N. 140°·1E. Depth 55km.
See Seismological Bulletin of the Central Meteorological Observatory, Japan, for April, 1951, Tokyo, 1951, p.91. Macroseismic chart p.91.

A = −·6196, B = +·5199, C = +·5880; δ = −6; h = 0;
D = +·643, E = +·766; G = −·450, H = +·378, K = −·809.

	△	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Tukubasan	0·1	—	0 9	− 1	0 17	− 1
Mito	0·4	64	0 13	+ 1	0 23	+ 1
Utunomiya	0·4	343	0 9	− 3	0 17	− 5
Kumagaya	0·5	264	0 11k	− 2	0 20	− 3
Tokyo	0·5	200	0 14	+ 1	0 24	+ 1
Maebasi	0·8	285	0 13a	− 4	0 23	− 6
Yokohama	0·8	200	—	—	0 30	+ 1
Shirakawa	0·9	11	—	—	0 31	0
Onahama	1·0	45	0 26	+ 7	0 36	+ 3
Hunatu	1·2	235	0 21	− 1	0 38	0
Oiwake	1·2	277	0 14	− 8	0 32	− 6
Kohu	1·3	244	0 24	+ 1	0 40	0
Inawasiro	1·4	4	0 26	+ 2	0 43	0
Misima	1·4	218	0 30	+ 6	0 47	+ 4
Hukusima	1·6	14	0 28	+ 1	0 50	+ 3

April 20d. 21h. 3m. 51s. Epicentre 17°·0S. 177°·0W. Depth of focus 0·010.
(as on 1949, March 30d.).

U.S.C.G.S. gives epicentre as adopted, depth 100km.

$A = -\cdot9556$, $B = -\cdot0501$, $C = -\cdot2906$; $\delta = +13$; $h = +5$;
$D = -\cdot052$, $E = +\cdot999$; $G = +\cdot290$, $H = +\cdot015$, $K = -\cdot957$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Apia		6·0	60	i 1 49	+21	i 2 58	+22	—	—
Brisbane		29·6	244	e 5 59	+ 1	e 10 29	−16	—	—
Riverview		33·1	233	i 7 54	PP	i 11 18	?	i 8 0	PPP
Lick	z.	75·0	42	i 11 34k	+ 2	—	—	i 11 43	pP
Berkeley	z.	75·0	42	e 11 31	− 1	—	—	—	—
Pasadena		75·6	47	i 11 36k	0	—	—	—	—
Fresno	z.	75·9	44	e 11 39k	+ 1	—	—	—	—
Palomar		76·1	48	i 11 39k	0	—	—	—	—
Riverside	z.	76·1	48	i 11 38k	− 1	—	—	—	—
Mineral	z.	76·8	40	e 11 43k	0	—	—	—	—
China Lake	z.	76·9	46	i 11 43k	0	—	—	—	—
Tinemaha		77·1	44	i 11 45k	+ 1	—	—	—	—
Reno	z.	77·5	43	e 11 48k	+ 1	—	—	—	—
Victoria	z.	80·8	33	e 12 5	+ 1	—	—	—	—
Scoresby Sund		124·4	11	e 18 45	[− 3]	—	—	—	—
Rathfarnham Castle		143·1	8	i 19 17	[− 6]	—	—	e 34 44	PcSP'
Potsdam	z.	143·8	351	i 19 21	[− 3]	—	—	—	—
Witteveen	z.	144·1	355	i 19 24k	[0]	—	—	—	—
Collmberg	z.	144·9	348	e 19 24	[− 2]	—	—	e 20 47	?
De Bilt		144·9	357	i 19 27	[+ 1]	—	—	—	—
Jena		145·5	351	e 19 29	[+ 2]	—	—	e 19 45	pPKP
Prague		145·8	348	i 19 27	[0]	e 20 1	sPKP	e 19 51	pPKP
Ksara		146·1	306	i 19 29k	[+ 1]	36 17	?	23 0	PP
Karlsruhe	z.	147·8	352	e 19 27	[− 4]	—	—	i 19 33	PKP_2
Stuttgart	z.	147·9	353	e 19 28	[− 3]	i 19 33	PKP_2	e 19 55	pPKP
Paris		148·3	2	i 19 34	[+ 3]	i 22 56	PP	i 19 39	pPKP
Strasbourg		148·3	354	i 19 35k	[+ 4]	—	—	e 19 55	pPKP
Belgrade		148·6	336	e 19 35k	[+ 3]	—	—	—	—
Basle		149·3	355	e 19 37	[+ 4]	—	—	—	—
Zürich		149·4	354	e 19 36k	[+ 3]	—	—	—	—
Besançon		149·7	355	e 19 38	[+ 4]	e 20 19	sPKP	e 19 47	PKP_2
Chur		149·8	353	e 19 33	[− 1]	—	—	e 19 37	PKP_2
Tamaurasset	z.	173·8	338	i 19 50a	[− 7]	e 25 22	PP	e 21 42	PKP_2

Additional readings :—
Rathfarnham Castle iZ = 20m.25s., eEN = 24m.21s.
Jena eEN = 20m.23s., eN = 20m.43s.
Prague $iPKP_2$ = 19m.36s., $epPKP_2$ = 20m.5s., $esPKP_2$ = 20m.15s., e = 20m.27s., 20m.57s., and 21m.16s.
Strasbourg e = 19m.40s.
Belgrade e = 25m.18s. and 30m.11s.
Tamaurasset eZ = 23m.34s.

April 20d. 22h. 48m. 22s. Epicentre 40°·8N. 77°·7E. (U.S.S.R.).

A = +·1617, B = +·7418, C = +·6509 ; δ = +8 ; h = −2 ;
D = +·977, E = −·213 ; G = +·139, H = +·636, K = −·759.

	△	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Naryn	1·4	296	e 0 26	− 1	e 0 46	0
Przhevalsk	1·8	17	i 0 29	− 3	0 55	− 1
Rybach'e	2·1	323	i 0 36	− 1	i 1 4	0
Kurmenty	2·3	11	i 0 39	− 1	—	—
Almata	2·5	347	i 0 45	+ 2	i 1 19	+ 5
Almata II	2·5	354	i 0 42	− 1	e 1 16	+ 2
Chilisk	2·8	11	i 0 45	− 2	—	—
Frunse	3·1	312	—	—	i 1 39	S_g
Krasnogorka	3·1	322	i 0 54	+ 3	i 1 35	S*
Ili	3·2	352	i 0 51	− 1	i 1 33	+ 1
Murgab	3·8	231	e 1 3	+ 2	—	—
Andijan	4·0	271	—	—	i 2 10	S_g
Fergana	4·5	267	e 1 14	+ 3	—	—
Dzhergetal	5·2	254	e 1 27	+ 6	—	—
Khorog	5·8	237	e 1 32	+ 3	—	—
Tchimkent	6·3	286	—	—	i 3 19	S*
Lunacharskoe	6·4	277	—	—	i 3 41	S_g

April 20d. 22h. 54m. 33s. Epicentre 10°·5N. 62°·6W. (as on 1949, Aug. 21d.).

A = +·4526, B = −·8732, C = +·1811 ; δ = +12 ; h = +6 ;
D = −·888, E = −·460 ; G = +·083, H = −·161, K = −·984.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Fort de France		4·4	19	i 1 13	+ 3	i 1 58	− 4	1 21	P*	e 4·7
Bogota		12·8	244	i 3 12	PP	e 5 47	SS	—	—	—
Chinchina		14·0	248	i 3 43	PPP	e 6 25	SSS	—	—	—
Huancayo		25·7	209	e 4 57	−36	—	—	e 5 38	P	—
La Paz	z.	27·4	191	e 5 53	+ 3	—	—	—	—	—
Harvard		32·8	348	i 7 48	PP	—	—	—	—	—
St. Louis		37·4	324	i 7 16	0	e 13 19	+14	—	—	—
Santa Lucia		44·4	189	—	—	—	—	i 21 23	Q	i 21·6
Palomar	z.	54·6	304	i 9 32	0	—	—	e 9 53	?	—
Riverside	z.	55·1	305	e 9 58	+22	—	—	—	—	—
China Lake	z.	55·6	307	e 10 38	PcP	—	—	—	—	—
Tinemaha	z.	56·5	308	e 10 10	+24	—	—	—	—	—
Lick	z.	59·2	308	i 10 0k	− 5	i 10 21	?	i 10 28	?	—
Mineral	z.	59·7	311	i 10 7k	− 2	—	—	i 10 31	?	—
Scoresby Sund		65·1	13	e 10 43	− 2	—	—	—	—	—
Tamanrasset	z.	65·9	70	i 10 50k	0	—	—	i 11 10	?	—
Stuttgart	z.	70·2	42	e 11 14	− 3	—	—	e 11 36	PcP	—
Collmberg	z.	72·9	40	e 11 30	− 3	—	—	—	—	—

Fort de France also gives P_g = 1m.32s., iS* = 2m.8s., S_g = 2m.19s.

April 20d. Readings also at 0h. (Lick, Mineral, Reno, Pasadena, Riverside, China Lake, Tinemaha, Palomar, Tamanrasset, Stuttgart, Paris, Brisbane, Fergana, Tashkent, Tchimkent, Valdivostok, Kabansk, and near Dzhergetal), 1h. (Puebla and near Tacubaya), 2h. (Paris, Rome, near Messina (2), and near Copiapo), 3h. (Brisbane, Copenhagen, near Puebla, Oaxaca, Tacubaya, and Vera Cruz), 4h. (near Messina (2)), 5h. (Apia, Pasadena, Riverside, Palomar, China Lake, Tinemaha, Lick, Fresno, Mineral, Reno, and near Copiapo), 6h. (Tamanrasset and Brisbane), 7h. (Antofagasta, Tacubaya, and Pretoria), 8h. (Grahamstown, Ksara, Helwan, Tamanrasset, Tacubaya, and Nanking), 9h. (near Kabansk and near Dzhergetal), 11h. (near Apia (2)), 12h. (Apia), 14h. (near Manila), 15h. (near Mizusawa), 16h. (near Dzhergetal and near Messina), 17h. (near Messina (2)), 19h. (Ksara, Florence, near Rocca-di-Papa, Rome, and near Victoria), 20h. (Mineral, Mount Wilson, Palomar, China Lake, Tinemaha, and near Adak), 21h. (near Dzhergetal), 23h. (La Paz).

April 21d. 17h. 0m. 40s. Epicentre 7°·28. 154°·6E. (as on 1950, Jan. 15d.).

$A = -·8963$, $B = +·4256$, $C = -·1245$; $\delta = -1$; $h = +7$;
$D = +·429$, $E = +·903$; $G = +·112$, $H = -·053$, $K = -·992$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Brisbane		20·2	184	e 4 42	+ 3	e 8 25	+ 4	—	—
Riverview		26·7	186	i 5 42a	− 1	e 10 17	0	i 10 32	?
Apia		33·7	103	6 40	− 5	—	—	—	—
Manila		39·3	304	e 7 27	− 5	—	—	—	—
Berkeley	z.	89·0	52	e 12 58	0	—	—	e 13 28	?
Lick	z.	89·4	52	i 13 1k	+ 1	—	—	—	—
Mineral		89·9	50	e 13 2a	0	—	—	e 13 16	?
Victoria	z.	90·1	41	i 28 3	?	—	—	—	—
Fresno	z.	90·8	53	e 13 6a	0	—	—	e 14 58	?
Reno		91·2	50	e 13 9a	+ 1	—	—	e 13 36	?
Pasadena		91·7	56	i 13 11a	+ 1	—	—	—	—
Tinemaha	z.	92·0	53	i 13 13	+ 1	—	—	—	—
China Lake	z.	92·4	54	i 13 14a	0	—	—	—	—
Riverside	z.	92·4	56	i 13 13a	− 1	—	—	—	—
Palomar	z.	92·7	57	i 13 16k	+ 1	—	—	—	—
Ksara		117·8	303	e 20 13	PP	e 29 5	PS	—	—
Harvard		126·3	41	i 19 7	[+ 2]	—	—	—	—
Stuttgart	z.	129·3	331	e 19 15	[+ 4]	—	—	e 19 26	pPKP
La Paz		131·6	119	e 19 24	[+ 9]	—	—	—	—
Malaga		144·9	329	i 19 38	[− 1]	—	—	e 22 52	PP
Tamanrasset	z.	146·5	301	i 19 47k	[+ 5]	—	—	—	—

Tamanrasset gives also iZ = 19m.51s., eZ = 20m.2s.
Long waves were also recorded at Wellington.

April 21d. Readings also at 1h. (Jena, Stuttgart, Messina, Prague, Taranto, Triest, near Belgrade, near Kurmenty, and near Copiapo), 2h. (Apia, Pretoria, Almata II, Stalinabad, near Dzhergetal, Fergana, Khorog, and Obi-garm), 4h. (near Almata), 6h. (Palomar, China Lake, and Tinemaha), 10h. (Borzhomi, Gori, Leninakan, near Akhalkalaki, Gandzha, Stepanavan, Tiflis, Tsikhlis-Dzhvari, and near Dzhergetal), 11h. (near Apia, near Akhalkalaki, Gandzha, and Stepanavan), 12h. (Naryn, Samarkand, near Dzhergetal (2), Fergana, Khorog, Kulyab, Murgab, Obi-garm, Stalinabad, and Tchimkent), 13h. (Antofagasta, Copiapo, and near Dzhergetal (2)), 14h. (Stuttgart, near Athens, and near Apia), 17h. (near Alicante (3)), 18h. (Bogota, La Paz, and Apia), 23h. (Kew).

April 22d. 3h. 37m. 40s. Epicentre 28°·7N. 94°·2E. (as on 1951, March 12d.).

Intensity VI at Mohanbari. Epicentre 28°·7N. 94°·4E. (Poona).
Seismo. Bull., Government of India, Met. Depart., June, 1951, p. 6.

$A = -·0643$, $B = +·8762$, $C = +·4777$; $\delta = +6$; $h = +2$;
$D = +·997$, $E = +·073$; $G = -·035$, $H = +·476$, $K = -·879$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Chatra	6·5	255	e 1 45	+ 6	i 3 7	+12	1 53	PP	3·3
Calcutta	8·1	222	e 1 56	− 6	i 3 24	− 9	i 4 9	S*	—
New Delhi	14·9	274	e 3 34	0	i 6 18	− 2	6 33	SS	—
Hyderabad	18·3	236	i 4 18	+ 1	i 7 51	SS	—	—	9·9
Kurmenty	19·2	322	i 4 28	0	—	—	—	—	—
Murgab	19·4	305	4 31	+ 1	8 9	+ 5	—	—	—
Naryn	19·5	316	i 4 33	+ 2	i 8 13	+ 7	—	—	—
Almata II	19·9	322	i 4 36	0	—	—	—	—	—
Almata	20·1	322	i 4 38	0	i 8 23	+ 4	—	—	—
Rybach'e	20·1	320	i 4 38	0	i 8 20	+ 1	—	—	—
Khorog	20·8	300	4 47	+ 2	i 8 40	+ 3	—	—	—
Frunse	21·2	316	i 4 52	+ 3	i 8 47	+ 6	—	—	—
Poona	21·2	246	i 4 52	+ 3	i 8 47	+ 6	5 14	PP	10·2
Andijan	21·5	309	i 4 55	+ 3	8 49	+ 2	—	—	—
Nanking	21·5	74	e 4 37k	−15	i 8 23	−24	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bombay		21·8	248	e 4 59	+ 3	e 8 59	+ 7	5 45	PPP	10·6
Fergana		21·8	309	e 4 56	0	e 8 55	+ 3	—	—	—
Kulyab		22·3	300	i 5 3	+ 2	i 9 9	+ 7	—	—	—
Obi-garm		22·6	304	i 5 3	0	i 9 11	+ 4	—	—	—
Stalinabad		23·3	303	i 5 12	+ 2	i 9 24	+ 4	—	—	—
Zi-ka-wei	Z.	23·7	76	5 9	− 5	e 9 23	− 4	—	—	—
Lunacharskoe		23·9	308	i 5 19	+ 3	—	—	—	—	—
Tashkent		23·9	308	i 5 18	+ 2	—	—	—	—	—
Kodaikanal	E.	24·1	225	e 5 24k	+ 6	i 9 45	+11	—	—	11·6
Tchimkent		24·1	311	i 5 20	+ 2	i 9 41	+ 7	—	—	—
Irkutsk		24·7	13	i 5 23	− 1	—	—	—	—	—
Samarkand		24·9	303	e 5 18	− 8	—	—	—	—	—
Kabansk		25·1	16	i 5 26	− 2	e 9 49?	− 2	—	—	—
Mary		28·4	297	i 6 1	+ 3	10 48	+ 3	—	—	—
Djakarta		36·7	158	—	—	e 14 0	ScP	—	—	—
Sverdlovsk		36·7	330	i 7 13	+ 3	i 12 52	− 2	—	—	—
Bandong		37·7	157	8 43	PP	—	—	—	—	—
Tiflis		41·9	302	e 7 54	0	e 14 15	+ 2	—	—	—
Borzhomi		42·9	302	e 8 5	+ 3	—	—	—	—	—
Moscow		48·1	321	i 8 44	+ 1	i 15 40	− 2	—	—	—
Ksara		49·5	291	e 8 57a	+ 3	16 8	+ 6	—	—	—
Pulkovo		52·6	325	i 9 16	− 2	16 40	− 4	—	—	—
Istanbul		53·7	302	e 9 25	− 1	e 16 57	− 2	e 11 29	PP	e 31·3
Helwan	N.	54·2	288	—	—	i 17 6	0	e 19 14	ScS	—
Belgrade		59·3	307	e 10 4	− 2	e 20 56	?	e 12 53	PP	e 39·2
Raciborzu		59·8	314	e 10 13	+ 4	—	—	e 13 19	PPP	—
Ogyalla	E.	60·2	312	e 13 1	PPP	e 24 38	SSS	e 20 38	ScS	—
Prague		62·2	315	i 10 25	− 1	e 20 25?	ScS	e 12 34	PP	—
Copenhagen		62·3	322	e 10 26a	0	—	—	—	—	34·3
Potsdam		62·6	318	i 10 28k	0	—	—	—	—	e 34·3
Taranto		62·6	303	e 10 29	+ 1	—	—	—	—	—
Jena		63·8	316	e 10 35	− 1	—	—	e 10 48	pP	—
Rome		65·6	306	e 10 45a	− 3	e 19 32	− 1	e 13 13	PP	—
Stuttgart		65·9	314	i 10 48a	− 2	e 19 39	+ 2	e 13 12	PP	e 37·3
Chur		66·2	311	e 10 49	− 3	—	—	—	—	—
Karlsruhe	Z.	66·3	314	e 10 50	− 2	—	—	e 10 59	pP	—
Witteveen	Z.	66·3	319	i 10 52k	0	—	—	—	—	—
Zürich		66·7	313	e 10 54a	− 1	—	—	—	—	—
Strasbourg		66·8	314	i 10 55a	− 1	e 19 45?	− 3	e 13 11	PP	38·3
Pavia		67·0	311	e 10 49	− 8	—	—	—	—	e 37·3
Basle		67·3	313	e 10 58	− 1	—	—	e 11 23	PcP	—
Besançon		68·4	313	e 11 4	− 2	—	—	e 11 30	PcP	—
Paris		70·1	316	i 11 15	− 1	i 20 36	+ 9	i 13 51	PP	e 37·3
Clermont-Ferrand		70·8	312	i 11 20	0	—	—	i 12 1	PcP	e 43·3
Kew		70·8	319	i 11 21k	+ 1	e 20 40	+ 5	e 34 26	Q	e 39·3
Scoresby Sund		71·4	342	e 11 22	− 2	20 50	+ 8	—	—	40·3
Rathfarnham Castle		73·4	322	i 11 48	pP	—	—	e 40 30	Q	e 43·3
Algiers Univ.	Z.	74·3	303	e 11 39	− 2	—	—	—	—	—
Resolute Bay	Z.	76·7	2	e 11 50	− 5	—	—	—	—	—
Toledo		78·0	308	i 12 2	0	—	—	i 12 8	PcP	50·2
Tamanrasset	Z.	78·3	290	i 12 4k	+ 1	—	—	i 15 2	PP	—
Almeria		78·3	305	i 12 8	+ 5	22 42	PS	—	—	42·6
Granada		78·9	306	i 12 15a	+ 8	e 22 51	PS	—	—	41·9
Pietermaritzburg	Z.	84·1	231	e 12 36	+ 2	—	—	—	—	—
Mineral	Z.	103·7	27	e 17 49k	PP?	—	—	e 18 18	PP	—
Reno	Z.	105·1	26	e 18 15	PP	—	—	—	—	—
Fresno	Z.	107·5	28	e 17 59	PP	—	—	—	—	—
China Lake	Z.	109·2	27	e 18 34	[+ 3]	—	—	e 18 53	PP	—
Mount Wilson	Z.	110·4	28	e 18 59	PP	—	—	—	—	—
Riverside	Z.	110·9	28	e 19 8	PP	—	—	—	—	—
Bogota		145·0	338	i 19 37	[− 2]	—	—	—	—	—
La Paz	Z,	159·7	304	e 20 3	[+ 3]	—	—	—	—	—

For Notes see next page,

NOTES TO APRIL 22d. 3h. 37m. 40s.

Additional readings :—
Chatra PPPEN =1m.58s., P*EN =2m.1s., P_gEN =2m.18s., QEN =2m.55s., SSSEN = 3m.30s.
New Delhi QEN =6m.11s.
Poona iE =5m.2s., PPPE =5m.24s., PcPE =8m.41s., iE =8m.55s., QE =9m.5s., SSE = 9m.31s., SSSE =9m.44s., ScPE =11m.52s., ScSE =15m.13s.
Bombay QEN =9m.37s.
Istanbul ePPPE =12m.39s., ePSN =17m.10s., eScSEN =19m.8s.
Raciborzu iE =10m.36s., eE =11m.24s.
Ogyalla e =24m.9s.
Prague e =10m.42s., i =10m.58s., e =11m.23s. and 12m.11s., ePPP? =13m.47s.
Rome eE =11m.50s., eSSEN =23m.50s.
Stuttgart e =10m.58s., eZ =13m.22s., ePPP =15m.2s.
Strasbourg ePcP =11m.22s., eSS? =24m.48s.
Besançon e =11m.48s. and 12m.38s.
Paris i =11m.22s., iPcP =11m.36s., i =13m.43s., iPPP =15m.45s., eSSS =28m.34s.
Toledo i =13m.23s., e =27m.54s.
Tamanrasset ePcPZ =12m.15s., ePPP?Z =16m.31s.
Long waves were also recorded at Aberdeen, Upsala, De Bilt, Alicante, and Ivigtut.

April 22d. 6h. 32m. 41s. Epicentre 34°·8N. 52°·1E. (as on 1945, May 11d.).

A = +·5055, B = +·6494, C = +·5681 ; δ = −1 ; h =0 ;
D = +·789, E = −·614 ; G = +·349, H = +·449, K = −·823.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Lenkoran	4·8	327	1 13	− 2	2 4	− 8	—	—	—
Ashkabad	5·9	56	1 33	+ 2	2 40	0	—	—	—
Shemakla	6·4	336	1 47?	P*	i 2 58?	+ 5	—	—	—
Nakhichevan	6·9	311	e 1 56?	P*	i 3 12?	+ 7	—	—	—
Kirovobad	7·5	324	i 1 47	− 6	i 3 7	−13	—	—	—
Erevan	8·1	314	e 2 7	+ 5	—	—	—	—	—
Mary	8·4	68	i 2 4	− 2	e 3 39	− 4	—	—	—
Leninakan	8·9	315	e 2 24?	+12	—	—	—	—	—
Tiflis	9·0	322	e 2 12	− 1	—	—	—	—	—
Borzhomi	9·8	318	e 2 24	0	—	—	—	—	—
Grozny	9·8	332	e 2 25	+ 1	i 4 14	− 3	—	—	—
Ksara	13·4	270	e 3 26	PP	—	—	—	—	7·3
Stalinabad	13·9	70	e 2 23	−58	—	—	—	—	—
Obi-garm	14·6	70	i 3 30	0	—	—	—	—	—
Lunacharskoe	15·0	59	e 3 38	+ 3	—	—	—	—	—
Tashkent	15·0	59	e 3 33	− 2	—	—	—	—	—
Tchimkent	15·6	56	i 3 38	− 5	—	—	—	—	—
Khorog	16·0	75	e 3 49	+ 1	—	—	—	—	—
Fergana	16·6	65	3 55	− 1	—	—	—	—	—
Andijan	17·1	63	4 1	− 1	—	—	—	—	—
Murgab	17·9	70	i 4 15	+ 3	—	—	—	—	—
Istanbul	19·2	297	e 4 31	+ 3	e 8 6	+ 7	e 4 58	PPP	e 10·7
Frunse	19·3	59	e 4 47?	PP	i 8 21?	SS	—	—	—
Naryn	19·9	62	i 4 35	− 1	e 8 15	0	—	—	—
Rybach'e	20·2	59	e 4 40	+ 1	—	—	—	—	—
Almata	21·0	58	—	—	e 8 46	+ 9	—	—	—
Sverdlovsk	22·8	13	5 1	− 4	9 4	− 7	—	—	—
Moscow	23·2	340	5 8	− 1	—	—	—	—	—
Stuttgart	z. 34·4	308	e 6 51	0	—	—	—	—	—
Tamanrasset	z. 42·2	267	e 8 4	+ 8	—	—	—	—	—
Scoresby Sund	52·3	337	e 9 18	+ 3	—	—	—	—	—

Istanbul gives also eSSN =8m.34s.

April 22d. 12h. 36m. 16s. Epicentre 75°·8N. 73°·0W.

$A = +·0722$, $B = -·2361$, $C = +·9691$; $\delta = +11$; $h = -13$;
$D = -·956$, $E = -·292$; $G = +·283$, $H = -·927$, $K = -·247$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Resolute Bay	Z.	5·7	269	e 1 23	− 5	e 2 35	0	2 3	P_g	—
Scoresby Sund		15·2	84	3 33	− 5	e 6 20	− 8	—	—	7·0
Ivigtut		17·0	136	—	—	e 7 28	+18	—	—	8·8
Reykjavik	Z.	20·1	97	i 4 39	+ 1	—	—	i 5 0	PP	—
Saskatoon		25·9	229	—	—	i 10 59	SS	—	—	e 12·9
Seven Falls	E.	28·8	178	6 31	+29	14 38	L	—	—	(14·6)
Shawinigan Falls	N.	29·3	180	e 5 54	−12	—	—	—	—	e 15·9
Ottawa		30·5	184	e 6 16	− 1	e 11 22	+ 4	—	—	16·2
Aberdeen	E.	31·1	85	i 9 2	PcP	i 12 3	+35	—	—	i 13·8
Harvard		33·4	179	i 6 42	0	—	—	—	—	e 16·5
Weston		33·5	179	i 6 43	0	—	—	—	—	—
Victoria	Z.	34·1	247	6 47	− 1	—	—	e 15 46	Q	17·9
Palisades		34·9	182	i 7 2	+ 7	—	—	e 18 8	Q	e 21·5
Copenhagen		35·9	74	i 7 3	− 1	—	—	—	—	16·7
Kew		36·7	88	e 12 20	S	(e 12 20)	−34	—	—	e 18·7
Witteveen	Z.	37·2	81	e 7 17	+ 2	—	—	—	—	—
Florissant		37·9	203	e 7 21	+ 1	—	—	—	—	e 19·3
St. Louis		38·1	203	i 7 22	0	e 15 54	SS	i 7 28	P	e 19·0
Paris		39·8	88	e 7 35	− 1	e 13 55	PS	i 8 59	PP	e 19·2
Collmberg	Z.	40·1	77	e 7 39	0	—	—	—	—	—
Strasbourg		41·3	83	e 7 49	0	—	—	—	—	—
Mineral	Z.	41·4	241	e 7 50a	0	—	—	i 9 11	PP	e 21·4
Arcata		41·5	244	e 8 52	+62	—	—	—	—	e 21·7
Stuttgart		41·5	81	e 7 50	0	—	—	e 20 32	Q	21·7
Prague		41·6	76	e 7 50	− 1	e 13 56	−12	e 9 8	PP	—
Reno		41·8	238	e 7 53k	0	—	—	e 9 0	PP	e 22·3
Tinemaha	Z.	43·9	236	i 8 5	− 5	—	—	—	—	—
Berkeley		44·0	241	i 8 12	+ 1	—	—	e 10 3	PP	e 23·0
Lick		44·3	241	i 8 15a	+ 2	—	—	i 10 7	PP	e 24·0
Lubbock		44·4	216	—	—	e 19 16	SSS	—	—	23·6
Fresno	Z.	44·5	238	e 8 16a	+ 1	—	—	—	—	e 23·8
Pavia		44·8	83	e 8 46	+29	—	—	—	—	—
China Lake	Z.	45·0	235	i 8 19a	0	—	—	—	—	—
Pasadena		46·7	234	i 8 33a	+ 1	—	—	—	—	e 23·7
Riverside	Z.	46·7	234	e 8 31a	− 1	—	—	—	—	—
Palomar	Z.	47·2	233	i 8 37a	+ 1	—	—	—	—	—
Rome		48·8	82	e 8 40	− 9	e 16 9?	+17	e 10 34	PP	—
Almeria		49·9	98	e 9 24	+27	—	—	—	—	30·4
Irkutsk		52·2	4	e 8 49?	−26	e 16 44?	+ 5	—	—	—
Kabansk		52·4	2	9 16	0	e 16 52?	+10	—	—	—
Tiflis		56·3	54	e 9 40	− 5	—	—	—	—	—
Almata		59·6	26	e 10 9	+ 1	—	—	—	—	—
Almata II		59·7	26	i 10 8	− 1	—	—	—	—	—
Frunse		59·7	28	e 10 10	+ 1	e 18 33	+14	—	—	—
Tchimkent		59·7	32	e 10 7	− 2	—	—	—	—	—
Andijan		61·6	30	e 10 23	+ 1	—	—	—	—	—
Ksara		61·9	65	e 11 34	+70	—	—	—	—	—
Obi-garm		63·3	33	i 10 30	− 3	—	—	—	—	—
Tamanrasset	Z.	65·3	95	e 10 40?	− 6	—	—	e 11 18	PcP	—

Additional readings :—
Resolute Bay eZ = 1m.31s., 2m.17s., and 2m.24s., eE = 2m.48s.
Reykjavik iZ = 5m.32s.
Victoria eZ = 16m.59s.
Paris i = 7m.44s.
Strasbourg e = 7m.55s. and 8m.26s.
Prague e = 8m.17s., ePPP = 9m.37s.
Lick iZ = 8m.32s.
Fresno eZ = 8m.28s. and 9m.9s.
Rome eSSN = 19m.30s.
Ksara e = 2m.18s.
Long waves were also recorded at Pittsburgh, Seattle, and other European stations.

April 22d. Readings also at 0h. (near Ashkabad), 2h. (Apia, Wellington, Lick, and Mineral), 3h. (Ksara and near Messina), 5h. (Bandong and Chatra), 6h. (Djakarta, Harvard, Rome, and near Manila), 7h. (near Kabansk and near Tacubaya), 8h. (Resolute Bay, near Kabansk and near Alicante (2)), 9h. (Ksara, Santa Lucia, and near Alicante (3)), 10h. (Scoresby Sund, near Kabansk, and near Alicante (2)), 11h. (near Alicante (2)), 12h. (Ottawa and Tamanrasset), 14h. (Tamanrasset), 15h. (near Klyuchi), 17h. (Palomar, Pasadena, Riverside, China Lake, Tinemaha, Fresno, Berkeley, Lick, Reno, Mineral, Collmberg, Raciborzu, Granada, and near Klyuchi), 19h. (near Obi-garm), 21h. (Kew, Chatra, Almata, Ili, Kulyab, Kurmenty, Murgab, Obi-garm, near Almata II, Andijan, Fergana, Frunse, Krasnogorka, and Naryn), 22h. (La Paz, Akhalkalaki (2), Almata, Fergana, Krasnogorka, near Almata II, Kurmenty, Naryn, Rybach'e, Puebla, near Tacubaya, near Apia (2)), 23h. (Ili, Kurmenty, near Almata II, Naryn, and Rybach'e).

April 23d. 0h. 52m. 23s. Epicentre 19°·2N. 155°·5W. (as on 1941, Sept. 25d.).

Intensity VII near Kilauea, Caldera, felt in the whole island of Hawaii and particularly in the Islands of Maiu and Oahu, slight damage, in the Volcanological Observatory of Hawaii, slight landslides at Kilauea, Caldera, and Hilo, and several rock falls north of Hilo on the Hamakua coast.

G. A. Macdonald and C. K. Wentworth.
Hawaiian Volcanoes during 1951, a contribution to general geology, Geological Survey, Bulletin 996-D, Washington, 1954, pp.141, 174, 181-185.

$A = -\cdot8600$, $B = -\cdot3919$, $C = +\cdot3269$; $\delta = +5$; $h = +5$;
$D = -\cdot415$, $E = +\cdot910$; $G = -\cdot297$, $H = -\cdot136$, $K = -\cdot945$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Hawaii		0·3	43	0 8	− 3	—	—	—	—	—
Arcata		34·4	43	e 6 51a	0	e 17 13	ScS	—	—	—
Berkeley		34·4	51	i 6 50k	− 1	i 12 25	+ 6	i 9 26	PcP	e 14·3
Santa Clara		34·4	51	e 6 49	− 2	e 12 29	+10	—	—	e 15·3
Fresno		35·8	52	e 7 1k	− 2	e 12 28	−13	e 8 26	PP	e 16·9
Mineral	z.	35·9	46	7 3a	− 1	—	—	i 8 22	PP	e 18·4
Pasadena		36·3	58	i 7 6k	− 1	i 8 23	PP	i 9 31	PcP	e 15·1
Mitchell Field		36·6	340	i 7 15	+ 5	—	—	—	—	—
Reno	z.	36·8	48	e 7 11a	0	e 13 4	+ 8	—	—	—
Riverside		36·9	58	i 7 11k	− 1	—	—	i 9 34	PcP	—
Tinemaha		37·1	54	i 7 13	− 1	—	—	—	—	—
China Lake		37·2	54	i 7 13k	− 2	—	—	i 9 32	PcP	—
Palomar		37·2	59	i 7 13k	− 2	—	—	i 8 34	PP	—
Victoria		39·0	34	7 31	+ 1	13 33	+ 4	9 3	PP	—
Seattle		39·1	36	i 7 33a	+ 2	e 13 40	+ 9	e 9 39	PcP	e 18·1
Petropavlovsk		48·9	326	e 8 42	− 8	15 58	+ 5	—	—	—
Lubbock		49·6	61	8 54	− 1	16 3	0	—	—	—
Saskatoon		50·2	37	—	—	16 7	− 4	—	—	25·1
Tacubaya		52·9	79	e 9 23	+ 3	—	—	—	—	—
Puebla		53·9	79	e 9 31	+ 4	—	—	—	—	—
Florissant		59·1	56	e 10 3	− 1	e 18 7	− 4	e 18 37	PPS	—
St. Louis		59·1	56	e 10 3	− 1	18 9	− 2	18 42	PPS	e 27·6
Resolute Bay		64·0	14	e 10 34	− 4	e 19 11	− 2	e 11 10	PcP	e 36·1
Vladivostok		64·6	310	i 10 41	0	e 19 26	+ 5	—	—	—
Cleveland		65·7	52	i 10 46k	− 2	e 19 31	− 3	i 10 51	P	—
Buffalo		67·5	50	e 11 4	+ 4	e 19 55	− 1	—	—	—
Brisbane	z.	68·1	229	e 11 7	+ 3	—	—	—	—	—
Ottawa	z.	69·5	48	e 11 9	− 3	—	—	—	—	—
Palisades		71·4	52	i 11 22	− 2	e 20 43	+ 1	e 11 28	P	—
Fordham		71·5	52	i 11 24	0	—	—	—	—	34·3
Seven Falls	E.	72·6	45	11 30	− 1	20 52	− 4	—	—	36·0
Harvard		72·9	50	e 11 29	− 4	—	—	—	—	e 39·0
Riverview		73·2	224	i 11 42k	+ 7	e 21 41	PS	—	—	—
Manila		79·3	282	e 12 10	+ 1	—	—	—	—	—
Kabansk		79·8	321	12 12	0	e 22 19	+ 5	—	—	—
Bogota		80·4	88	i 12 17	+ 2	1 22 21	0	—	—	—
Irkutsk		81·1	322	12 19	+ 1	—	—	—	—	—
Huancayo		84·8	105	e 12 29	− 8	—	—	e 12 41	PcP	—
Scoresby Sund		84·9	15	e 12 37a	− 1	e 22 55	[− 5]	i 12 42	PcP	40·6
La Paz		92·9	106	i 13 21	+ 5	23 53	[+ 3]	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Sverdlovsk		98·4	341	e 13 41	0	24 29	[+10]	17 41	PP	—
Rathfarnham C.	z.	103·1	17	i 17 39	?	e 26 25	?	e 18 0	?	—
Tchimkent		106·0	327	e 14 15	0	—	—	—	—	—
Kew		106·4	14	e 17 57	?	e 25 29	{−11}	27 21	S	e 49·6
Collmberg	z.	109·1	7	e 18 59	PP	—	—	—	—	—
Granada		118·0	25	18 23k	[−26]	e 36 19	SS	20 4	PP	65·7
Ksara		126·2	348	i 13 48	?	—	—	i 20 59	PP	—
Tamanrasset	z.	134·3	25	i 19 22k	[+ 2]	e 22 53	PKS	i 21 49	PP	—

Additional readings :—
Arcata eZ = 6m.57s., eE = 15m.37s.
Berkeley iZ = 6m.56s., eSZ = 12m.10s.
Fresno eZ = 16m.19s.
Mineral iZ = 7m.8s., 7m.18s., and 7m.31s.
Reno eNZ = 7m.28s. and 8m.9s.
Seattle ePP = 8m.56s., ePPP = 9m.17s., eSSS = 16m.37s., and other unidentified readings.
Florissant eSS = 22m.11s.
St. Louis i = 10m.8s., ePP? = 11m.58s., eSS = 22m.13s.
Resolute Bay eE = 12m.48s., 14m.25s., 20m.37s., and 23m.35s.
La Paz iZ = 15m.15s. and 15m.49s.
Tamanrasset iZ = 20m.25s., ePPP?Z = 24m.32s.
Long waves were also recorded at Rome, Alicante, and Almeria.

April 23d. 6h. 50m. 23s. Epicentre 37°·9S. 177°·8E. **Depth of focus 0·010.**
(as on 1950, March 13d.).

Felt throughout the Koromandel Peninsula and in the region of East Cape as far as Cook Strait, maximum intensity VII. Epicentre 37°·8S. 178°·2E.

R. C. Hayes.
Earthquake origins in New Zealand during the year 1951, New Zealand Journal of Science and Technology, Sec. B, Vol. 34, No. 4, Jan., 1953, p.254.

$A = -\cdot7905$, $B = +\cdot0304$, $C = -\cdot6117$; $\delta = -1$; $h = -1$;
$D = +\cdot038$, $E = +\cdot999$; $G = +\cdot611$, $H = -\cdot023$, $K = -\cdot791$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tuai	N.	1·0	210	i 0 23	+ 3	i 0 37	+ 1	—	—	—
Auckland	N.	2·6	293	i 0 37	− 4	i 1 6	− 6	—	—	—
New Plymouth	E.	3·1	248	i 0 50	+ 2	i 1 25	+ 1	—	—	—
Wellington		4·1	214	i 1 1	− 1	i 1 36	−13	—	—	—
Cobb River	E.	5·1	229	i 1 14	− 2	—	—	—	—	—
Kaimata	N.E.	6·7	225	i 1 40?	+ 3	—	—	—	—	—
Christchurch		6·9	214	1 37	− 3	—	—	—	—	—
Riverview		21·9	273	i 4 51a	+ 5	e 8 48	+11	i 5 12	pP	e 10·7
Brisbane		23·2	290	i 5 1a	+ 2	e 9 36	sS	i 5 53	PP	—
Apia		25·7	26	e 5 22	− 1	10 2	sS	i 6 18	PP	—
Terre Adelie		35·5	205	i 6 54	+ 5	i 12 31	+14	i 13 5	PcS	17·6
Bandoug		70·1	278	e 11 9	+ 5	e 20 18	+12	—	—	—
Djakarta		71·2	278	i 11 7	− 3	i 20 19	+ 1	—	—	—
Manila		74·6	303	e 11 29	− 1	e 20 9	−47	e 12 36	sP	—
Zi-ka-wei	z.	86·5	314	12 31	− 2	24 0	SP	13 4	pP	—
Nanking		88·7	313	i 12 42	− 2	i 23 23	+ 3	i 13 15	pP	—
Vladivostok		90·8	329	e 12 52	− 2	e 23 13	[− 2]	i 16 25	PP	—
La Plata	E.	91·0	138	23 13	SKS	23 49	+ 8	(24 37)	PS	24·6
Pasadena		93·1	48	e 13 3	− 1	i 24 9	+ 9	i 13 39	pP	e 42·1
Palomar		93·3	50	i 13 5	0	i 24 5	+ 4	i 13 39	pP	—
Lick	z.	93·4	44	i 13 5a	− 1	—	—	i 13 40	pP	—
Berkeley		93·5	44	e 13 6	0	e 23 32	[+ 2]	e 13 36	pP	—
Riverside	z.	93·5	48	e 13 6	0	—	—	i 13 39	pP	—
Fresno		94·0	46	e 13 7a	− 1	e 24 10	+ 3	e 13 40	pP	—
China Lake	z.	94·6	47	i 13 11	0	—	—	i 13 45	pP	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tinemaha	z.	95·1	47	e 13 13	0	—	—	—	—	—
Huancayo		95·6	110	—	—	e 23 56	[+15]	e 25 37	SP	e 40·8
Mineral	z.	95·6	43	i 13 15k	− 1	—	—	—	—	—
La Paz		97·9	118	e 13 27	+ 1	i 24 39	− 1	e 13 51	pP	46·6
Victoria	z.	100·6	36	13 48	+10	—	—	—	—	—
Chinchina		106·1	97	—	—	i 24 50	[+18]	—	—	—
Saskatoon		111·1	40	—	—	28 31	PS	—	—	41·7
Bombay		113·0	278	e 17 37?	[−49]	e 28 58	PS	—	—	—
Almata II		121·5	304	e 18 41	[− 1]	—	—	—	—	—
Almata		121·8	304	e 20 51	pPP	i 29 46	sSP	i 23 44	sPPP	—
Rybach'e		122·0	302	e 18 43	[0]	—	—	e 20 33	PP	—
Frunse		123·2	302	e 18 45	[0]	—	—	—	—	—
Resolute Bay		125·4	19	e 18 47	[− 3]	e 23 0	SPP	e 19 22	pP′	—
Palisades		126·0	63	i 18 52	[+ 1]	e 27 35	SKKS	—	—	e 59·7
Ottawa	z.	126·3	57	i 18 51	[0]	—	—	—	—	—
Tashkent		126·3	298	e 18 52	[+ 1]	e 38 40	PSS	e 30 55	PcS,P′	—
Harvard		128·2	62	i 18 56	[+ 1]	e 32 9	PPS	—	—	e 60·5
Weston		128·3	62	i 18 56	[+ 1]	i 22 9	SKP	i 19 33	pP′	—
Mary		130·3	291	e 19 33	pPKP	—	—	i 21 42	sPP	—
Seven Falls	E.	130·9	56	19 7	[+ 7]	i 22 15	SKP	e 23 3	?	—
Sverdlovsk		135·2	317	e 19 9	[+ 1]	e 39 25	SS	—	—	—
Baku		140·0	291	e 22 54	pPP	—	—	—	—	—
Scoresby Sund		146·7	11	i 19 25a	[+ 4]	—	—	—	—	—
Moscow		148·0	317	e 19 34	[+ 3]	—	—	—	—	—
Ksara		149·0	273	i 19 36	[+ 3]	—	—	22 54?	PP	—
Reykjavik	z.	151·2	19	i 18 35	[−61]	—	—	—	—	—
Helsinki		151·8	334	e 19 42	[+ 5]	e 20 27	sP′	e 20 17	pP′	—
Yalta		152·0	297	e 19 43	[+ 6]	—	—	—	—	—
Copenhagen		159·6	338	i 19 48	[+ 1]	—	—	i 20 24	pP′	—
Potsdam		162·0	332	e 20 46	PKP_2	—	—	—	—	e 81·6
Collmberg	z.	162·8	327	e 19 56	[+ 6]	—	—	e 20 39	PKP_2	—
Prague		163·0	323	e 19 57	[+ 7]	e 27 25	[+41]	i 20 39	PKP_2	—
Tamanrasset	z.	163·6	207	e 23 54	?	—	—	e 25 2	pPP	80·6
Jena		163·7	328	e 19 52?	[+ 1]	—	—	e 20 42	PKP_2	—
Taranto		164·7	286	20 43	PKP_2	27 11	[+26]	—	—	—
Kew		166·4	356	e 20 25	pP′	e 35 2	SKKS	e 29 5	PPP	e 79·6
Stuttgart		166·4	327	e 19 51	[− 3]	e 28 52	PPP	e 20 53	PKP_2	e 88·6
Karlsruhe	z.	166·5	329	e 19 53	[− 1]	—	—	e 20 52	PKP_2	—
Strasbourg		167·1	331	e 19 53	[− 1]	—	—	e 20 58	PKP_2	—
Zürich		167·6	326	e 19 52	[− 2]	—	—	i 21 0	PKP_2	—
Bologna		167·9	310	i 21 4k	PKP_2	—	—	e 25 23	PP	—
Basle		168·0	327	e 21 1	PKP_2	—	—	—	—	—
Rome		168·0	295	e 20 11?	[+16]	e 45 0	SS	e 24 49	PP	—
Paris		168·6	344	e 19 50	[− 5]	—	—	e 20 15	pPKP	e 90·6
Pavia		168·8	316	e 20 22	pP′	e 38 26?	SPP	e 32 54	?	—
Besançon		168·9	331	e 19 55	[0]	—	—	e 20 25	pP′	—
Algiers Univ.	z.	175·6	—	i 19 59k	[+ 1]	26 3	?	e 25 28	PP	—
Tortosa		176·5	—	e 20 30	pP′	—	—	i 32 55	?	—
Toledo		177·6	—	e 19 59	[0]	—	—	e 25 50	PP	—
Malaga		177·9	—	i 19 58	[− 1]	26 54	[+ 4]	i 21 46	PKP_2	—
Alicante		178·6	—	20 28	pP′	27 20	[+30]	21 50	PKP_2	77·1
Granada		178·7	—	i 20 1a	[+ 2]	i 32 31	SKKS	20 19	pP′	86·7
Almeria		178·9	—	e 19 58	[− 1]	48 15	SSP	e 25 47	PP	89·0

Additional readings :—
Riverview iEZ =5m.7s., iPPEZ =5m.24s., iN =8m.57s. and 9m.5s., isS?EZ =9m.22s., iZ =9m.45s., iE =10m.12s., iN =10m.18s.
Terre Adelie PP =7m.55s., ePP =18m.17s., iPPP =8m.31s., i =16m.59s. and 17m.35s.
Nanking eZ =13m.48s., iEN =23m.57s.
Vladivostok iP_cP =12m.56s.?.
Pasadena iZ =13m.27s., eSKSEN =23m.31s., iPSEN =24m.45s., eE =25m.22s.
Palomar iEZ =13m.19s., iZ =13m.26s., iSKSEN =23m.34s., iN =24m.10s., iSPEN = 24m.47s., iE =25m.21s.
Lick iZ =13m.27s. and 14m.23s.
Berkeley eSEN =24m.10s., eSSN =30m.55s.
Fresno eZ =16m.22s.
China Lake iZ =13m.34s.

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Huancayo eS =25m.19s., e =28m.53s., eSS? =31m.4s.
La Paz PPZ =17m.51s., iSKS =24m.4s., iPS? =27m.27s.?, SS =32m.13s.
Resolute Bay eZ =19m.43s.
Palisades e =28m.34s. and 53m.17s.
Tashkent ePP =21m.21s.
Harvard e =22m.7s., eS_cS,S_cS =40m.38s., eSSS =42m.18s.
Reykjavik iZ =19m.43s. and 20m.51s.
Helsinki eZ =21m.21s.
Prague e =20m.46s., 21m.8s., 21m.19s., 21m.50s., 22m.17s., 22m.29s., 25m.4s., 25m.52s., and 28m.25s.
Jena eEN =21m.17s., eE =21m.41s.
Kew eEN =35m.30s.
Stuttgart eZ =21m.29s., 21m.50s., and 22m.2s., e =25m.33s., 25m.53s., 50m.37s., and 58m.25s.
Strasbourg e =20m.4s., 20m.48s., 21m.33s., and 22m.4s.
Bologna e =30m.35s. and 33m.22s.
Rome iPSKSE =34m.44s., eN =48m.29s.?
Paris e =20m.30s., iPP =24m.56s., i =25m.22s. and 44m.31s.
Besançon e =20m.46s., $ePKP_2$ =20m.56s., e =21m.31s.
Toledo e =20m.36s.
Malaga iPP =25m.54s.
Alicante PP =25m.30s., PPP =29m.26s., PPS =39m.17s., SSP =47m.18s., Q =68m.47s.
Granada sPKP =20m.55s., PKP_2 =21m.55s., $pPKP_2$ =22m.28s., SKP =23m.0s., iPP =26m.4s., pPP =26m.37s. and 27m.19s., iSKS =28m.19s., PPP =29m.43s., SKSP =36m.31s., PPS =41m.49s., iSS =46m.43s., sSS =47m.44s., SSS =55m.1s.
Almeria PPP =29m.51s.
Long waves were also recorded at Clermont-Ferrand, Rathfarnham Castle, and Seattle.

April 23d. 11h. 57m. 37s. Epicentre 0°·2N. 125°·2E. (as on 1950, September 14d.).

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

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Manila		14·9	344	i 3 37	+ 3	e 6 6	−14	—	—
Bandong		18·9	249	i 4 26	+ 2	i 8 11	SS	—	—
Djakarta		19·4	251	i 4 24	− 6	i 8 8	+ 4	—	—
Brisbane	z.	38·4	138	e 6 26	−59	—	—	—	—
Riverview		41·7	147	i 7 50k	− 2	e 14 4	− 6	e 17 6	SS
Vladivostok		43·2	7	i 8 6	+ 2	—	—	—	—
New Delhi		53·8	306	e 9 26	0	—	—	i 9 36	P
Kabansk		54·0	347	9 28	0	—	—	—	—
Bombay		54·6	293	e 9 23?	− 9	e 17 28	+17	—	—
Irkutsk		54·8	345	e 9 30	− 4	—	—	—	—
Murgab		60·4	315	i 10 13	0	i 18 27	− 1	—	—
Naryn		60·4	318	i 10 15	+ 2	—	—	—	—
Almata II		60·5	322	e 10 13	− 1	—	—	—	—
Almata		60·7	322	i 10 17	+ 2	—	—	—	—
Rybach'e		60·9	320	e 10 18	+ 1	—	—	—	—
Ili		61·0	323	i 10 15	− 3	—	—	—	—
Khorog		61·7	313	e 10 24	+ 2	—	—	—	—
Frunse		62·0	320	e 10 25	+ 1	e 18 50	+ 2	—	—
Andijan		62·5	317	10 26	− 2	e 18 54	0	—	—
Fergana		62·8	317	e 10 28	− 2	—	—	—	—
Kulyab		63·2	313	i 10 33	+ 1	—	—	—	—
Obigarm		63·6	314	i 10 32	− 3	e 19 8	0	—	—
Stalinabad		64·2	314	e 10 37	− 2	e 19 16	0	—	—
Tashkent		64·9	317	i 10 42	− 1	e 19 23	− 1	—	—
Tchimkent		65·1	317	i 10 42	− 3	—	—	—	—
Mary		69·0	311	e 11 9	0	—	—	—	—
Ashkabad		71·8	310	e 11 25	− 1	—	—	—	—
Sverdlovsk		76·3	330	i 11 52	0	e 21 31	− 6	—	—
Lenkoran		79·3	309	i 12 9	0	—	—	—	—
Kirovobad		81·4	311	i 12 20	0	i 22 34	+ 3	—	—
Grozny		82·2	314	e 12 25	+ 1	e 22 39	0	—	—
Tiflis		82·7	312	i 12 27	0	—	—	—	—
Gori		83·2	312	e 12 37	+ 8	—	—	—	—
Leninakan		83·3	311	e 12 35	+ 5	—	—	—	—
Borzhomi		83·8	312	e 12 36	+ 4	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Sotchi		86·6	314	e 12 46	0	—	—	—	—
Moscow		88·5	326	e 12 54	− 2	e 23 34	− 7	—	—
Ksara		89·3	304	i 13 0a	+ 1	e 25 36	PPS	—	—
Yalta		90·6	315	e 13 4	− 1	—	—	—	—
Raciborzu		100·7	321	e 22 37	?	e 22 47	?	e 23 7?	?
Resolute Bay		101·5	10	e 13 55	0	e 28 24	PPS	e 18 12	PP
Prague		103·0	322	e 18 27	PP	—	—	e 20 41	PPP
Collmberg	Z.	103·6	323	e 14 4	0	—	—	—	—
Stuttgart	Z.	106·7	322	e 14 17	− 1	—	—	e 18 46	PP
China Lake	Z.	111·7	50	e 18 39	[+ 2]	—	—	e 29 40	PKKP
Pasadena	Z.	111·7	53	e 18 46	[+ 9]	—	—	—	—
Palomar	Z.	113·0	53	e 29 26	PKKP	—	—	—	—
Tamanrasset	Z.	117·1	296	e 18 48	[+ 1]	e 19 58	PP	e 22 40	PPP
Seven Falls	E.	130·8	14	e 22 40	PKS	—	—	—	—
Shawinigan Falls	N.	130·8	15	e 22 58	PKS	—	—	—	—
Morgantown		134·2	27	i 22 47	PKS	—	—	—	—
Palisades		135·5	20	i 22 51	PKS	—	—	—	—

Additional readings :—
Riverview iZ = 8m.13s., iEN = 17m.27s.
Resolute Bay eZ = 17m.36s., eE = 24m.57s., 29m.5s., and 30m.14s.
Stuttgart eZ = 18m.53s.
Long waves were recorded at De Bilt and Kew.

April 23d. 13h. 17m. 4s. Epicentre 21°·0S. 67°·5W. Depth of focus 0·040.
(as on 1950, December 4d.).

Intensity III at Moquegua. Depth 250km. ca.
E. Silgado, Datos Sismológicos del Perú, 1951, Boletin No. 8, Lima, Peru, 1953, p. 12.
U.S.C.G.S. suggests epicentre 20°·5S. 67°·0W.

A = +·3576, B = −·8633, C = −·3563 ; δ = +11 ; h = +4 ;
D = −·924, E = −·383 ; G = −·136, H = +·329, K = −·934.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Antofagasta	E.	3·8	225	1 15	+11	i 2 8	+14	i 4 3	?	—
La Paz		4·5	351	1 2a	−10	i 1 48	−20	i 1 8	?	—
Copiapo	N.	6·8	202	1 54	+15	i 3 9	+12	3 21	SSS	—
Huancayo		11·6	319	i 2 35	− 4	e 4 50	+ 6	—	—	—
Santa Lucia		12·7	190	e 3 24	+32	5 57	SSS	—	—	—
Buenos Aires		15·7	151	i 3 37	+ 9	6 0	−14	—	—	—
La Plata	Z.	16·2	151	3 43	+10	6 44	SS	—	—	—
Concepción		16·5	196	i 3 57	PP	7 8	SS	—	—	—
Bogota		26·3	346	i 5 9	− 2	i 9 16	− 6	i 6 4	pP	—
Chichina		27·0	343	i 5 15	− 3	i 10 56	sS	i 6 7	pP	—
Punta Arenas	N.	32·2	183	—	—	e 13 29	SSS	—	—	—
Galerazamba		32·5	346	e 5 10	−56	—	—	e 11 8	?	e 17·8
Fort de France		36·0	12	—	—	e 18 12	?	—	—	—
Oaxaca		47·4	322	8 16	+ 8	—	—	—	—	—
Puebla		49·9	321	e 8 32	+ 6	e 19 26	SS	e 20 13	sSS	e 20·7
Tacubaya		50·7	321	e 8 39	+ 7	e 18 5	ScS	—	—	—
Morgantown		61·4	349	i 9 45	− 3	e 14 17	ScP	—	—	—
Palisades		62·0	355	i 9 50	− 2	i 17 47	− 5	i 19 16	ScS	—
Florissant		63·2	340	e 9 58	− 2	e 17 59	− 8	i 19 28	sS	—
Harvard		63·3	358	e 9 56	− 4	—	—	e 11 6	pP	—
St. Louis		63·3	340	e 9 56	− 4	i 18 3	− 5	i 11 2	pP	—
Lubbock		63·4	329	9 59	− 2	—	—	—	—	—
Cleveland		63·5	349	i 9 59a	− 3	i 18 8	− 3	e 10 55	pP	—
Buffalo		64·5	352	—	—	i 18 17	− 6	e 19 59	sS	—
Ottawa		66·5	354	e 10 17	− 4	e 18 44	− 3	—	—	—
Palomar		71·7	318	e 10 54	+ 2	e 19 58	+10	i 11 55	pP	—
Riverside		72·4	318	e 10 59	+ 2	—	—	i 12 0	pP	—
Pasadena		73·0	318	e 11 2	+ 2	i 20 9	+ 7	i 12 3	pP	—
China Lake	Z.	73·8	320	e 11 6k	+ 1	i 11 11	P	i 12 8	pP	—
Tinemaha		75·0	320	e 11 13	+ 1	—	—	i 12 20	pP	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Fresno	z.	75·7	320	e 11 16k	0	e 20 39	+ 7	e 12 18	pP	—
Lick	z.	77·2	319	i 11 27k	+ 3	—	—	i 12 28	pP	—
Berkeley		77·9	319	e 11 30	+ 2	e 21 8	+12	e 12 31	pP	—
Mineral	z.	79·1	321	e 11 35	+ 1	—	—	i 12 38	pP	—
Saskatoon		80·4	337	—	—	21 20	− 2	e 23 8	PPS	—
Arcata	z.	80·9	320	e 11 44a	0	—	—	e 12 48	pP	—
Grahamstown	z.	82·0	122	i 11 54	+ 5	—	—	—	—	—
Malaga		82·7	47	i 11 50	− 3	i 21 44	− 1	i 14 50	PP	—
Tamanrasset	z.	83·4	62	i 11 55k	− 1	i 21 52	0	i 12 57	pP	—
Granada		83·5	47	i 11 57a	0	i 21 56	+ 3	12 35	pP	45·1
Almeria		84·1	47	i 12 2	+ 2	e 21 58	− 1	15 6	PP	45·4
Seattle		84·2	327	e 12 3	+ 3	i 22 5	+ 5	e 13 34	sP	—
Toledo		84·6	44	i 12 2	0	e 22 0	− 3	i 13 5	pP	—
Victoria		85·3	327	12 8	+ 2	22 15	+ 5	24 5	sS	—
Alicante		86·2	47	12 9	− 1	22 17	− 2	31 57	SSS	e 41·1
Pietermaritzburg	z.	86·4	120	i 12 20	+ 9	—	—	—	—	—
Algiers Univ.	z.	87·8	49	e 12 17	− 1	—	—	i 13 18	pP	—
Tortosa		88·1	45	12 33	+14	i 22 27	[+ 9]	—	—	—
Clermont-Ferrand		92·7	42	e 12 39	− 2	—	—	—	—	—
Paris		93·2	38	e 12 40	− 3	i 23 23	+ 1	e 13 43	pP	—
Besançon		94·6	41	e 12 48	− 1	—	—	e 13 4	P	—
Pavia		95·7	44	—	—	e 23 53	+10	e 22 47	SKS	e 50·2
Strasbourg		96·2	40	e 12 59	+ 2	—	—	e 13 20	P	—
Rome		96·6	48	i 12 58	0	i 23 14	[+ 8]	e 24 3	S	—
Scoresby Sund		96·6	14	e 12 56	− 2	—	—	e 14 3	pP	—
Resolute Bay		97·1	352	e 17 1	PP	e 23 44	−11	e 25 35	sS	—
Stuttgart	z.	97·2	40	12 59	− 2	e 13 2	P	e 14 1	pP	—
Jena	E.	99·4	39	13 11	0	—	—	e 14 11	pP	—
Collmberg	z.	100·4	39	e 13 19	+ 3	e 18 12	?	e 14 19	pP	—
Prague		100·8	40	e 19 52	PPP	—	—	—	—	—
Ksara		112·2	61	e 18 53	PP	i 29 49	PPS	19 44	pPP	—
Bombay		142·7	86	e 22 56?	PP	—	—	—	—	—
New Delhi	E.	147·2	70	e 19 15	[+ 8]	—	—	i 19 19	PKP	—

Additional readings :—
Bogota isS =10m.49s., iScP?EN =13m.46s., iScS?EN =47m.38s.
Chinchina ePcSEN =11m.56s.
Palisades i =21m.4s.
Florissant esS =19m.23s., i =21m.18s.
St. Louis eS =17m.56s., isS =19m.26s, e =21m.12s.
Cleveland esPN =11m.9s., eSEN =18m.3s., eE =19m.32s. and 21m.21s.
Buffalo e =21m.29s.
Palomar iZ =10m.57s., iSEN =20m.38s.
Pasadena i =11m.5s., eZ =11m.20s., ipSEN =20m.46s., esSEN =21m.50s.
Fresno eZ =13m.12s., ePP?Z =14m.0s.
Berkeley esSZ =22m.49s.
Malaga PPP =16m.42s.
Tamanrasset iZ =11m.59s. and 12m.45s., ePPZ =15m.16s., ePPPZ =17m.15s., eZ = 22m.26s., eP′P′Z =38m.16s., eSKP,P′Z =41m.34s.
Granada PcP =15m.14s., pPP =15m.50s., PS =22m.56s., SS =27m.38s., SSS =31m.42s.
Almeria SS =27m.26s.
Seattle eP? =12m.6s., eS? =23m.6s., esS? =23m.36s., and other unidentified readings.
Toledo i =12m.6s., e =23m.18s. and 24m.33s.
Alicante PPP =19m.47s., ScS =23m.37s., PS =24m.16s., Q =35m.59s.
Algiers University eZ =12m.20s., iZ =12m.44s.
Paris i =12m.43s. and 13m.47s., iSKS =22m.53s., iSP =24m.31s., i =24m.49s., iPS = 25m.5s., iPPS =25m.25s., e =31m.5s., eSSS? =32m.47s.
Rome ePPZ =17m.20s.

April 23d. Readings also at 0h. (Apia), 2h. (Chatra), 3h. (Raciborzu), 4h. (Mizusawa and near Kabansk), 5h. (Aberdeen and Ksara), 6h. (Brisbane and Pretoria), 7h. (Lick, Mineral, and near Dzhergetal), 8h. (China Lake, Fresno, Mineral (2), Chatra (2), and near Kabansk), 9h. (near Bogota), 10h. (Santa Lucia and near Ashkabad), 11h. (Puebla, Tacubaya, and near Manila), 12h. (Lick, Fresno, Mineral, Pasadena, Palomar, China Lake, and Tinemaha), 13h. (near Akhalkalaki and near Dzhergetal), 14h. (near Athens), 15h. (Apia and near Dzhergetal), 16h. (near Dzhergetal), 17h. (Apia and Ksara), 18h. (near Gandzha and near Dzhergetal), 19h. (Murgab, near Dzhergetal, Khorog, and Obi-garm), 20h. (Gandzha, near Kurmenty, near Dzhergetal, and near Alicante), 21h. (Copiapo and near La Paz), 22h. (Tamanrasset), 23h. (Almata II, Naryn, Kulyab, near Andijan, Dzhergetal, Fergana, Murgab, and near Malaga).

April 24d. 10h. 13m. 44s. Epicentre 17°·8S. 178°·8W. Depth of focus 0·070. (as on 15d.).

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

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Apia		7·9	60	1 56	0	e 3 24?	− 4	—	—
Brisbane	z.	27·7	245	i 5 10k	0	—	—	—	—
Lick	z.	76·8	43	e 11 1a	− 2	—	—	—	—
Pasadena	z.	77·4	48	i 11 4	− 2	—	—	—	—
Riverside	z.	77·9	48	i 11 7	− 2	—	—	—	—
Mineral	z.	78·6	42	i 11 11k	− 1	—	—	—	—
China Lake	z.	78·7	47	i 11 12	− 1	—	—	e 13 8	pP
Tinemaha	z.	78·9	45	i 11 15	+ 1	—	—	—	—
Reno	z.	79·2	43	e 11 14	− 2	—	—	—	—
Victoria	z.	82·4	35	i 11 29	− 3	—	—	—	—
Collmberg	z.	145·3	349	i 18 40	[− 3]	—	—	—	—
Stuttgart	z.	148·4	352	e 18 50	[+ 3]	—	—	—	—
Strasbourg		148·8	352	18 51	[+ 3]	—	—	—	—
Paris		149·0	358	e 18 51	[+ 3]	—	—	—	—

Strasbourg gives also e = 18m.57s.

April 24d. Readings also at 0h. (Tamanrasset, near Kurmenty, and near Manila), 1h. (Santa Lucia (2) and near Dzhergetal), 2h. (Apia), 3h. (Victoria, Tamanrasset (2), Messina, and near Athens), 4h. (Prague and near Dzhergetal), 5h. (Apia, Brisbane (2), Antofagasta, Copiapo, Tamanrasset, near La Paz, near Dzhergetal, and near Kabansk), 6h. (Brisbane and Mizusawa), 8h. (Ksara and Strasbourg), 9h. (Antofagasta, Apia, near Akhalkalaki, Gandzha, and Stephanavan), 10h. (Almata II, Kulyab, Kurmenty, Obi-garm, near Andijan, Dzhergetal, Fergana, Murgab, Naryn, near Puebla, and Tacubaya), 11h. (near Dzhergetal), 12h. (Tamanrasset and near Algiers Univ.), 13h. (near Apia, and near Manila), 15h. (near Gandzha), 16h. (near Manila), 18h. (near Dzhergetal (3)), 19h. (Jena, Chatra, near Calcutta, near Dzhergetal, and near Gandzha), 20h. (near Dzhergetal), 21h. (Andijan, Almata II, Fergana, Lunacharskoe, Naryn, Rybach'e, Stalinabad, Tchimkent, near Dzhergetal, Khorog, Kulyab, Murgab, and Obi-garm), 23h. (Brisbane, Kew, and near Gandzha).

April 25d. 18h. 30m. 1s. Epicentre 30°·8N. 130°·7E. Depth of focus 0·020.

Intensity IV at Nishidake ; II-III at Yakusima, Miyazaki, Uwazima, and Simidu. Epicentre as adopted, depth of focus 130km.

Seismo. Bull. Cent. Met. Obs., Japan, for April, 1951, Tokyo, 1951, p.92, with macroseismic chart.

A = −·5611, B = +·6524, C = +·5095 ; δ = +5 ; h = +2 ;
D = +·758, E = +·652 ; G = −·332, H = +·386, K = −·860.

	Δ	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Yakusima	0·4	206	0 24	+ 2	0 41	+ 1
Miyazaki	1·3	29	0 27	− 2	0 48	− 3
Kumamoto	2·0	0	0 33	− 3	0 57	− 7
Nagasaki	2·0	340	0 32a	− 4	0 55	− 9
Unzendake	2·0	349	0 31	− 5	—	—
Tomie	2·4	318	0 42	+ 1	1 9	− 3
Saga	2·5	352	0 42a	0	1 10	− 4
Ooita	2·6	18	0 38	− 5	1 8	− 9
Hukuoka	2·8	355	0 41a	− 5	1 11	−10
Uwazima	2·9	33	0 46	− 1	1 15	− 8
Simonoseki	3·2	4	0 45	− 6	1 19	−11
Matuyama	3·5	29	0 49a	− 6	1 27	−10
Kôti	3·6	41	0 54a	− 2	1 32	− 7
Muroto	3·8	49	0 57k	− 2	1 40	− 4
Hirosima	3·9	22	0 42	−18	1 22	−24

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Hamada		4·2	15	0 59	− 5	1 46	− 7
Takamatu		4·5	38	1 6a	− 2	1 53	− 7
Sumoto		5·0	44	1 13a	− 1	2 6	− 6
Wakayama		5·1	46	1 15	− 1	2 8	− 6
Osaka		5·6	45	1 22	0	2 22	− 4
Kashiwara		5·7	48	1 30	+ 6	2 23	− 5
Owase		5·7	54	1 23	− 1	2 25	− 3
Toyooka		5·9	35	1 23	− 3	2 24	− 9
Kyoto		6·0	44	1 22	− 6	2 31	− 5
Kameyama		6·3	49	1 33	+ 1	2 39	− 4
Tu		6·3	50	1 35	+ 3	2 41	− 2
Hikone		6·4	45	1 36	+ 3	2 44	− 1
Tsuruga		6·6	41	1 34	− 2	2 46	− 4
Gihu		6·8	46	1 50	+12	2 52	− 3
Nagoya		6·8	49	1 38	0	2 53	− 2
Hukui		7·0	40	1 41	0	—	—
Shizuoka		7·7	55	1 49	− 1	3 29	+13
Toyama		8·0	41	2 3	+ 9	3 21	− 3
Matumoto		8·1	46	2 4	+ 8	3 26	0
Kohu		8·2	51	2 2	+ 5	3 32	+ 4
Misima		8·2	56	2 4	+ 7	3 46	+18
Wazima		8·3	36	2 0	+ 2	3 28	− 3
Nagano		8·5	45	2 9	+ 8	—	—
Oiwake		8·6	48	2 10	+ 8	3 45	+ 7
Maebasi		8·9	49	2 13	+ 7	3 48	+ 3
Kumagaya		9·0	51	2 32	+24	3 48	+ 1
Tokyo		9·0	55	2 27	+19	4 8	+21
Utunomiya		9·6	50	2 20	+ 5	4 18	+17
Nanking		10·3	282	e 2 33	+ 9	i 4 12	− 6
Manila		18·4	213	e 4 8	+ 3	—	—
Scoresby Sund		77·1	352	i 11 34a	− 3	—	—
Copenhagen		79·1	330	i 11 45	− 3	—	—
Collmberg	z.	81·6	326	i 11 59	− 2	e 12 43	pP
Jena		82·5	326	e 12 3	− 3	e 12 39	pP
Witteveen	z.	83·5	330	12 10k	− 1	—	—
Stuttgart	z.	85·2	326	e 12 17a	− 2	e 12 55	pP
Strasbourg		86·0	327	i 12 21	− 2	—	—
Tinemaha	z.	86·6	49	e 13 7	pP	—	—
China Lake	z.	87·8	49	e 13 11	pP	—	—
Paris		88·3	329	i 12 28	− 6	i 12 31	P

April 25d. Readings also at 2h. (Apia, Mount Wilson, Palomar, Riverside, China Lake, Tinemaha, Lick, Fresno, Mineral, Collmberg, Jena, Stuttgart, and near Dzhergetal), 4h. (near Mizusawa), 5h. (Pasadena, Riverside, China Lake, Mineral, Reno, Huancayo, Collmberg, Stuttgart, and Dzhetgeral), 6h. (Bogota and La Paz), 8h. (Brisbane, and near Kurmenty), 9h. (Huancayo, Naryn, Tashkent, Tchimkent, near Andijan, Dzhergetal (2), Fergana, Khorog, Kulyab, Murgab, Obi-garm, and Stalinabad), 10h. (Lick and Mineral), 12h. (Lunacharskoe, Tashkent, near Andijan (2), Dzhergetal (3), Fergana (2), Khorog (2), Murgab, Obi-garm (3), Samarkand, Stalinabad (2), and near Sofia), 13h. (La Paz), 14h. (near Obi-garm), 15h. (Palomar, Pasadena, Riverside, China Lake, Tinemaha, Fresno, Berkeley, Lick, Reno, and Mineral), 18h. (near Dzhergetal and near Shemakla), 19h. (near Kurmenty), 21h. (near Dzhergetal), 22h. (Fergana, near Dzhergetal, Khorog, Kulyab, Obi-garm, and Stalinabad), 23h. (Mount Wilson, Riverside, China Lake, Tinemaha, Lick, Mineral, Scoresby Sund, Copenhagem, Collmberg, Jena, Stuttgart, Tamanrasset, and near Athens).

April 26d. 6h. 46m. 5s. Epicentre 37°·6N. 71°·6E. Depth of focus 0·025.
(as on 1950, Nov. 22d.).

A = +·2507, B = +·7537, C = +·6076; δ = +9; h = −1;
D = +·949, E = −·316; G = +·192, H = +·577, K = −·794.

		Δ	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Khorog		0·1	180	0 20	− 5	0 37	− 7
Kulyab		1·5	282	i 0 31	− 2	0 57	− 2
Dzhergetal		1·6	349	0 37?	+ 3	1 3?	+ 2
Obi-garm		1·9	306	i 0 35	− 2	i 1 5	− 1
Murgab		2·0	67	i 0 35	− 3	i 1 3	− 5
Stalinabad		2·4	293	i 0 41	− 2	i 1 15	− 1
Fergana		2·8	3	e 0 48	+ 1	e 1 26	+ 2
Andijan		3·2	11	—	—	i 1 38	+ 5
Samarkand		4·1	302	e 0 58?	− 5	1 50?	− 3
Tashkent		4·1	336	—	—	i 1 57?	+ 4
Tchimkent		4·9	343	i 1 17	+ 3	e 2 16	+ 5
Naryn		5·1	41	e 1 13	− 3	—	—
Frunse		5·8	23	e 1 27	+ 2	e 2 33	+ 1
Rybach'e		5·9	34	i 1 28	+ 1	—	—
Krasnogorka		6·2	25	e 1 31	0	—	—
Almata		7·0	35	e 1 42	+ 1	—	—
New Delhi	E.	10·1	151	e 2 11	−10	i 3 47	−25

April 26d. 10h. 57m. 26s. Epicentre 34°·8N. 137°·0E. (as on 1949, Jan. 20d.).

Intensity IV at Nagoya, Tu, Gamagori, Utsumi, Okasaki, Kamezaki, Koromo, Shiroko; II-III at Kameyama, Kashiwara, Taguchi, Obara, and Matsusaka.

Epicentre 34°·9N. 137°·1E. Depth 20km.

Seismo Bull. Cent. Met. Obs., Japan, for April, 1951, Tokyo, 1951, p.93, with macroseismic chart.

A = −·6019, B = +·5612, C = +·5681; δ = −3; h = 0;
D = +·682, E = +·731; G = −·415, H = +·387, K = −·823.

	Δ	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Kameyama	0·4	277	0 10	− 3	0 16	− 5
Nagoya	0·4	356	0 7	− 6	0 12	− 9
Tu	0·4	261	0 11	− 2	0 17	− 4
Hamamatu	0·6	98	0 9	− 6	0 18	− 8
Hikone	0·8	307	0 16	− 2	0 26	− 5
Iida	1·0	44	0 24	+ 3	—	—
Kashiwara	1·0	254	0 22	+ 1	0 33	− 3
Omaesaki	1·0	101	0 23	+ 2	0 34	− 2
Owase	1·0	222	0 20	− 1	0 33	− 3
Kyoto	1·1	282	0 21	− 1	0 35	− 4
Tsuruga	1·1	318	0 24	+ 2	0 37	− 2
Osaka	1·2	263	0 24	0	0 40	− 1
Shizuoka	1·2	82	0 23	− 1	0 40	− 1
Kobe	1·5	266	0 28	0	0 51	+ 2
Kohu	1·5	57	0 31	+ 3	0 50	+ 1
Hunatu	1·6	64	0 32	+ 2	0 56	+ 5
Matumoto	1·6	29	0 34	+ 4	0 53	+ 2
Wakayama	1·6	249	0 31	+ 1	0 52	+ 1
Sumoto	1·8	256	0 33	+ 1	0 56	0
Oiwake	2·0	39	0 41	+ 6	1 7	+ 5
Nagano	2·1	28	0 41	+ 4	—	—
Kumagaya	2·3	55	0 46	+ 6	1 14	+ 5
Maebasi	2·3	46	0 42	+ 2	—	—
Yokohama	2·3	74	0 43	+ 3	—	—
Tokyo	2·4	66	0 44	+ 3	1 16	+ 4
Takamatu	2·5	259	1 14	S	(1 14)	0
Wazima	2·6	358	0 47	+ 3	1 25	+ 8
Utunomiya	2·9	53	0 52	+ 4	—	—
Mito	3·2	61	1 12	P_g	—	—

April 26d. 17h. 57m. 29s. Epicentre 53°·4N. 158°·1E.

A = −·5556, B = +·2233, C = +·8009; δ = 0; h = −7;
D = +·373, E = +·928; G = −·743, H = +·299, K = −·599.

		△	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Resolute Bay	z.	43·5	22	e 8 7	0	e 9 53	PP
Mineral	z.	53·6	70	i 9 24k	− 1	—	—
Berkeley	z.	54·9	72	e 9 34	− 1	i 9 46	?
Reno		55·1	69	e 9 37k	+ 1	—	—
Lick	z.	55·6	72	e 9 41k	+ 1	—	—
Tinemaha	z.	57·8	70	i 9 56	+ 1	i 10 34	PcP
China Lake	z.	59·0	70	i 10 4	0	—	—
Pasadena		59·9	72	i 10 10	0	i 10 48	PcP
Riverside	z.	60·4	72	i 10 13	0	i 10 22	?
Palomar	z.	61·2	72	i 10 20	+ 1	—	—
Copenhagen		67·7	341	i 11 1	0	—	—
Collmberg	z.	71·6	338	i 11 25	0	—	—
Jena		72·3	339	e 11 30?	+ 1	e 11 35	P
Stuttgart	z.	74·9	340	e 11 44	0	—	—
Strasbourg		75·3	341	i 11 47a	0	—	—
Paris		76·1	345	i 11 47a	− 4	—	—
Besançon		77·0	342	e 11 55	− 1	—	—
Clermont-Ferrand		78·9	343	i 12 7	0	i 12 19	PcP
Tamanrasset	z.	100·5	333	e 13 40	−11	—	—
Pretoria	z.	133·8	286	e 22 34	PKS	—	—
Grahamstown	z.	140·4	281	e 19 26	[− 5]	—	—

Additional readings :—
Mineral iZ = 9m.29s. and 9m.35s.
Lick iZ = 9m.49s. and 10m.21s.
China Lake iZ = 10m.15s. and 10m.41s.
Collmberg eZ = 12m.9s.
Stuttgart eP?Z = 10m.55s.?
Clermont-Ferrand e = 12m.48s.

April 26d. Readings also at 0h. (Collmberg, Stuttgart, Bombay, Poona, near New Delhi, and near Tananarive), 1h. (Brisbane (2), Gandzha, near Akhalkalaki, Tsikhlis-Dzhvari, and Stepanavan), 2h. (China Lake, Tinemaha, Mineral, and near Ashkabad), 3h. (Brisbane and Manila), 5h. (Fergana, Kulyab, Naryn, Stalinabad, Tchimkent, near Andijan, Dzhergetal, Khorog, Murgab, Obi-garm, and Rybach'e), 6h. (near Dzhergetal), 7h. (Apia and near Dzhergetal), 10h. (Apia and near Dzhergetal), 12h. (Apia, Borzhomi, Leninakan, Tiflis, near Akhalkalaki, Gandzha, Tsikhlis-Dzhvari, and Stepanavan), 13h. (Stuttgart), 14h. (Apia (2)), 15h. (near Prague), 16h. (Apia, Zürich, near Neuchatel, near Reykjavik, near Dzhergetal, and near Shemakla), 17h. (Copiapo, Concepción, Santa Lucia, and near Dzhergetal), 18h. (near Stuttgart and Zürich), 19h. (Pretoria, Copenhagen, and near Dzhergetal), 20h. (Ksara, Tamanrasset (2), Stuttgart, Palisades, Weston, Mount Wilson, China Lake, Tinemaha, Lick, Mineral, and near Fort de France), 21h. (Paris and near Dzhergetal), 22h. (Ashkabad, La Paz, and near Dzhergetal), 23h. (Apia).

April 27d. Readings at 2h. (Apia), 3h. (near Dzhergetal, near Athens, and near Malaga), 5h. (Apia, near Athens (2), and near Dzhergetal (2)), 6h. (Apia and Stuttgart), 7h. (Obi-garm, near Dzhergetal, Samarkand, Stalinabad, and near Apia), 8h. (Apia), 11h. (Apia, Santa Lucia, and near Santa Clara (2)), 14h. (Apia and Upsala), 15h. (New Delhi, Andijan, Ili, Lunacharskoe, Mary, Naryn, Rybach'e, Tashkent, near Dzhergetal, Khorog, Kulyab, Murgab, Obi-garm, Samarkand, and Stalinabad), 17h. (near Dzhergetal), 18h. (Andijan, Kulyab, Lunacharskoe, near Dzhergetal, Fergana, Khorog, Samarkand, Obi-garm, Stalinabad, and near Palisades), 19h. (near Dzhergetal), 20h. (Borzhomi, Erevan, Grozny, Gandzha (3), Kirovobad, near Akhalkalaki, Leninakan, Stepanavan, Tiflis, Tsikhlis-Dzhvari, near Dzhergetal, Istanbul, Stuttgart, Collmberg, Messina, Pavia, Tamanrasset, Antofagasta, and near Athens), 21h. (Apia and Gandzha), 22h. (China Lake).

April 28d. 21h. 19m. 41s. Epicentre 5°·6S. 150°·5E. (as on 1946, September 12d.).

A = −·8663, B = +·4901, C = −·0969; δ = +6; h = +7;
D = +·492, E = +·870; G = +·084, H = −·048, K = −·995.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane		21·9	174	e 4 54	− 3	e 8 59	+ 5	—	—	e 11·0
Riverview	E.	28·1	179	—	—	e 10 41	+ 1	e 11 52	SS	e 14·1
Manila		35·5	305	e 7 6	+ 6	—	—	—	—	—
Nanking		48·1	323	e 8 49	+ 6	(e 16 0)	+18	—	—	e 16·0
Vladivostok		51·3	344	e 9 6	− 2	e 16 38	+12	—	—	—
Kabansk		68·5	333	e 11 6	0	—	—	—	—	—
Almata II		81·7	315	i 12 24	+ 2	—	—	—	—	—
Andijan		84·7	311	i 12 40	+ 3	23 12	+ 8	—	—	—
Fergana		85·1	311	e 12 41	+ 2	—	—	—	—	—
Tchimkent		87·0	313	i 12 48	0	—	—	—	—	—
Tashkent		87·1	312	e 12 51	+ 2	e 23 44	+16	—	—	—
Mineral	z.	92·0	50	e 13 5k	− 7	—	—	—	—	—
Reno	z.	93·3	51	e 13 12a	− 6	—	—	—	—	—
Pasadena		94·2	56	i 13 16	− 6	—	—	i 15 14	?	e 43·3
Tinemaha	z.	94·3	53	e 13 19	− 4	—	—	e 15 15	?	—
Sverdlovsk		94·6	326	—	—	26 10	PS	—	—	—
China Lake	z.	94·8	55	i 13 17	− 8	—	—	i 15 16	?	—
Riverside	z.	94·9	56	i 13 19	− 6	—	—	i 15 17	?	—
Collmberg	z.	122·4	330	e 18 57	[0]	—	—	e 20 56	?	—
Stuttgart		125·9	329	e 19 3	[− 1]	e 43 19	SSS	e 21 2	PP	73·3
Harvard		127·7	38	i 19 4	[− 4]	—	—	—	—	e 69·2
Paris		129·1	333	—	—	e 44 55	?	i 45 13	?	69·3
La Paz	z.	135·9	120	19 21	[− 2]	—	—	—	—	—
Tamanrasset	z.	142·1	301	i 19 32k	[− 2]	—	—	e 21 32	?	—

Additional readings :—
Riverview eZ = 11m.5s.
China Lake iZ = 13m.30s.
Stuttgart ePKPZ = 19m.12s., eQ = 67m.19s.
Tamanrasset eZ = 20m.37s., ePP?Z = 23m.12s.
Long waves were also recorded at Berkeley, Palisades, Wellington, Granada, Ksara, Istanbul, Potsdam, Rome, Pavia, Messina, De Bilt, and Kew.

April 28d. Readings also at 0h. (Gandzha), 1h. (near Santa Lucia), 4h. (Raciborzu, near Istanbul and near Dzhergetal), 5h. (Collmberg, Stuttgart, Zürich, near Dzhergetal, and near Gandzha), 6h. (near Manila), 7h. (Chatra, Stuttgart, and La Paz), 8h. (Copenhagen, Potsdam, Collmberg, Stuttgart, Ksara, Tamanrasset, China Lake, Bombay, and Nanking), 9h. (Chatra and Tamanrasset), 11h. (Prague), 12h. (near Dzhergetal (2)), 13h. (Alicante and Granada), 14h. (Mount Wilson, Riverside, Palomar, China Lake, and Pretoria), 15h. (near Klyuchi), 16h. (near Alicante (3)), 17h. (Mount Wilson and China Lake), 18h. (Apia), 19h. (near Dzhergetal), 20h. (near Ashkabad and near Klyuchi), 21h. (Brisbane), 22h. (Christchurch, Wellington, Tamanrasset, Triest, Stuttgart, and near Athens), 23h. (near Apia).

April 29d. 7h. 35m. 42s. Epicentre 80°·0N. 125°·0E. (as on 1951, January 9d.).

A = −·1003, B = +·1432, C = +·9846; δ = 0; h = −14;
D = +·819, E = +·574; G = −·565, H = +·807, K = −·175.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Resolute Bay	24·0	25	e 5 17	0	e 9 33	+ 1	e 10 19	SS	e 12·1
Scoresby Sund	28·6	339	e 6 4	+ 4	e 10 45	− 3	—	—	13·3
Irkutsk	28·7	207	e 6 3	+ 2	e 10 59	+ 9	—	—	—
Kabansk	28·7	204	e 6 6	+ 5	e 11 1	+11	—	—	—
Sverdlovsk	30·2	261	6 13	− 1	11 16	+ 3	—	—	—
Pulkovo	32·6	292	e 6 32	− 3	—	—	—	—	—
Helsinki	33·1	297	e 6 36	− 4	e 11 51	− 8	—	—	e 17·3
Upsala	34·5	303	—	—	e 12 13	− 7	e 15 4	SSS	e 19·3
Moscow	35·3	283	e 6 56	− 3	—	—	—	—	—
Vladivostok	37·1	171	e 7 22	+ 8	—	—	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ivigtut		39·0	355	—	—	e 13 23	− 6	—	—	19·3
Copenhagen		39·3	305	i 7 29	− 3	e 13 26	− 8	—	—	20·3
Almata		40·5	237	e 7 46	+ 4	—	—	—	—	—
Frunse		41·5	240	7 53	+ 3	e 14 14	+ 7	—	—	—
Rybach'e		41·7	238	e 7 55	+ 3	—	—	—	—	—
Potsdam		42·5	304	i 7 57a	− 2	e 14 19	− 3	—	—	e 22·3
Collmberg	Z.	43·5	303	e 8 6	− 1	—	—	e 9 55	PcP	—
De Bilt		43·8	310	i 8 8	− 1	—	—	—	—	e 24·3
Tashkent		43·8	245	i 8 13?	+ 4	—	—	—	—	—
Andijan		43·9	242	i 8 1?	− 9	e 14 25?	−17	—	—	—
Jena	N.	44·1	304	e 8 8	− 4	—	—	—	—	—
Fergana		44·3	242	i 8 16?	+ 3	—	—	—	—	—
Prague		44·5	302	e 8 15	0	e 14 49	− 2	e 9 58	PP	e 23·3
Skalnate Pleso		44·5	296	e 10 2	PP	e 14 43	− 8	—	—	—
Uzhgorod		44·7	294	e 8 19	+ 3	e 14 54	0	—	—	—
Obi-garm		46·3	244	i 9 6?	+37	e 15 56?	+40	—	—	—
Karlsruhe	Z.	46·4	306	e 8 28	− 2	—	—	—	—	—
Stalinabad		46·6	245	8 32	0	15 26	+ 5	—	—	—
Stuttgart		46·6	305	e 8 28	− 4	e 15 18	− 3	e 18 38	SS	e 25·3
Yalta		46·7	281	8 31	− 1	e 15 21	− 1	—	—	—
Strasbourg		46·9	307	e 8 32	− 2	—	—	—	—	—
Paris		47·4	312	i 8 27	−11	e 15 26	− 6	i 10 18	PP	e 23·3
Tiflis		47·5	270	e 8 37	− 1	—	—	—	—	—
Borzhomi		47·7	272	e 8 42	+ 2	—	—	—	—	—
Shemakla		47·9	267	e 8 24?	−18	—	—	—	—	—
Nanking		48·1	187	—	—	e 15 51	+ 9	e 19 45	SSS	—
Kirovobad		48·2	269	8 44	0	15 46	+ 3	—	—	—
Ashkabad		48·9	255	e 8 59	+ 9	—	—	—	—	—
Pavia		50·0	305	—	—	e 15 40	−29	e 20 0	SS	e 29·7
Istanbul	E.	50·9	286	—	—	e 16 14	− 7	e 19 56?	SS	e 25·3
Rome		52·8	301	i 9 12	− 7	e 16 39	− 8	e 11 10?	PP	—
Seven Falls	E.	52·8	14	—	—	e 20 46	SS	—	—	—
Ottawa		54·3	18	i 9 30	0	17 9	+ 2	—	—	—
Mineral	Z.	54·4	60	e 9 24k	− 7	—	—	e 11 52	PP	—
Reno	Z.	55·5	58	e 9 44k	+ 5	—	—	—	—	—
Ksara		56·8	277	i 9 50	+ 2	e 19 22	ScS	—	—	—
Cleveland		57·8	24	i 9 56k	+ 1	e 17 10	−44	—	—	—
Alicante		58·1	312	9 57	− 1	17 59	+ 1	19 37	ScS	e 28·8
Fresno	Z.	58·2	59	e 9 56	− 2	—	—	—	—	—
Tinemaha	Z.	58·2	57	e 9 58	0	—	—	—	—	—
Palisades		58·8	17	i 10 1	− 1	e 24 33	SSS	—	—	—
China Lake	Z.	59·5	57	e 10 10	+ 3	—	—	—	—	—
Granada		59·6	35	10 7	− 1	19 17	+60	—	—	34·3
Almeria		59·8	313	e 10 1	− 8	—	—	—	—	35·6
Morgantown		59·8	23	i 10 9	0	—	—	e 11 56	?	—
Florissant		59·9	32	e 10 8	− 2	e 18 16	− 5	—	—	—
St. Louis		60·0	32	e 10 8	− 3	e 18 17	− 6	e 22 4	SS	—
Tamanrasset	Z.	72·6	303	i 11 25	− 6	—	—	e 14 5	PP	—

Additional readings :—
Resolute Bay eEZ =5m.43s., eE =6m.15s. and 11m.3s.
Prague e =8m.28s., 8m.35s., and 9m.0s., ePPP =10m.28s., e =17m.1s., eSS =17m.56s.
Stuttgart e =21m.18s.
Paris eSS =18m.52s., eSSS =18m.58s.
Rome eSSEN =20m.50s.
Mineral iZ =9m.41s.
Alicante PcS =14m.33s., SS =21m.54s.
St. Louis e =20m.3s. and 24m.58s.
Tamanrasset iZ =11m.30s.
Long waves were also recorded at Bombay, Kew, Clermont-Ferrand, and Harvard.

April 29d. 10h. 14m. 13s. Epicentre 21°·5S. 179°·0W. Depth of focus 0·090.
(as on 1951, March 13d.).

$A = -·9311$, $B = -·0163$, $C = -·3644$; $\delta = 0$; $h = +4$;
$D = -·017$, $E = +1·000$; $G = +·364$, $H = +·006$, $K = -·931$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Apia		10·3	44	e 2 24	+ 2	i 4 9	− 7	—	—
Wellington		20·4	194	i 3 53	− 5	i 7 0	−10	—	—
Cobb River	E.	20·7	198	i 3 58	− 3	e 7 5	−10	—	—
Kaimata	N.E.	22·5	199	e 4 21	+ 3	e 7 29	−15	—	—
Christchurch		23·0	195	—	—	e 7 43	− 9	—	—
Brisbane	z.	26·1	252	i 4 48k	− 1	—	—	—	—
Riverview		29·0	238	i 5 9a	− 5	i 9 24	− 2	i 6 54	pP
Pasadena	z.	80·0	47	i 11 10	+ 1	—	—	—	—
Fresno	z.	80·5	45	e 11 13k	+ 2	—	—	e 13 23	pP
Riverside	z.	80·5	47	i 11 11	0	—	—	—	—
China Lake	z.	81·4	46	i 11 17	+ 1	—	—	e 13 31	pP
Mineral	z.	81·5	41	i 11 17k	+ 1	—	—	e 13 22	pP
Tinemaha	z.	81·7	45	i 11 18	+ 1	—	—	—	—
Reno	z.	82·1	42	e 11 21a	+ 2	—	—	e 13 25	pP
Copenhagen		144·8	349	i 18 30	[0]	—	—	—	—
Ksara		146·9	298	i 18 38	[+ 5]	21 49	SKP	20 52	pPKP
Potsdam	z.	147·8	347	e 18 38	[+ 4]	—	—	e 20 55	pPKP
Collmberg	z.	148·8	345	e 18 41	[+ 5]	—	—	e 20 59	pPKP
Jena	N.	149·5	345	e 18 36?	[0]	—	—	—	—
Prague		149·6	343	e 18 45	[+ 8]	—	—	e 20 57	pPKP
Stuttgart	z.	152·0	348	e 18 41	[+ 1]	—	—	e 21 2	pPKP
Strasbourg		152·4	349	e 18 49	[+ 8]	—	—	e 19 3	PKP_2
Paris		152·7	357	i 18 57	[+16]	—	—	e 20 45	pPKP
Besançon		154·0	352	e 18 51	[+ 8]	—	—	e 19 8	PKP_2
Tamanrasset	z.	175·7	—	e 19 2	[+ 1]	e 24 38	PP	i 21 26	pPKP

Additional readings :—
Riverview iS_cSE =14m.48s.
Mineral eZ =12m.19s.
Jena eEN =18m.43s., eE =19m.13s., eN =19m.33s., eE =20m.3s.
Prague e =19m.9s., 19m.21s., 19m.42s., 20m.24s., and 21m.12s.
Stuttgart eZ =18m.48s. and 19m.0s.
Tamanrasset eZ =20m.31s., $iPKP_2Z$ =20m.45s., isPPZ =27m.47s., eZ =30m.33s.

April 29d. 19h. 35m. 2s. Epicentre 1°·0N. 123°·3E. (as on 1942, April, 28d.).

The U.S.S.R. network bulletin suggests a depth of 220km.

$A = -·5489$, $B = +·8357$, $C = +·0173$; $\delta = -2$; $h = +7$;
$D = +·836$, $E = +·549$; $G = -·009$, $H = +·014$, $K = -1·000$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Korror		12·8	60	3 6	0	—	—	—	—	—
Manila		13·7	351	i 3 31	+13	i 4 31	?	—	—	e 6·2
Bandong		17·5	243	e 4 30	PPP	e 8 6	SSS	—	—	—
Djakarta		17·9	246	e 4 3	− 9	i 7 17	−13	—	—	—
Nanking		31·2	353	i 6 27	+ 4	e 11 3	−26	—	—	—
Brisbane	z.	40·2	136	i 7 35k	− 5	—	—	e 9 8	PP	—
Vladivostok		42·6	10	i 7 55	− 4	i 13 57	−26	—	—	—
Riverview		43·4	145	i 8 4k	− 2	i 17 41	SS	i 9 47	PP	—
Poona		51·5	293	i 9 16	+ 7	e 15 27	−62	11 11	PP	—
Bombay		52·6	293	e 9 24	+ 6	e 18 5	?	—	—	—
Kabansk		52·8	348	9 17	− 2	e 16 27	−20	—	—	—
Irkutsk		53·5	345	9 22	− 2	e 16 37	−20	—	—	—
Kurmenty		58·0	323	i 9 58	+ 1	—	—	—	—	—
Chilisk		58·2	324	e 10 6	+ 8	—	—	—	—	—
Murgab		58·5	316	i 10 5	+ 5	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Almata		58·6	323	i 10 5	+ 4	—	—	—	—	—
Naryn		58·6	320	i 10 5	+ 4	—	—	—	—	—
Almata II		58·7	323	i 10 3	+ 1	—	—	—	—	—
Rybach'e		59·1	322	i 10 7	+ 3	—	—	—	—	—
Ili		59·2	324	i 10 5	0	—	—	—	—	—
Khorog		59·8	314	10 14?	+ 5	—	—	—	—	—
Frunse		60·2	321	i 10 14	+ 2	i 18 14	−11	i 19 42	sS	—
Andijan		60·7	317	i 10 17	+ 2	18 20	−12	e 11 5	pP	—
Fergana		60·9	317	e 10 17	0	e 18 22	−12	—	—	—
Kulyab		61·3	314	e 10 21	+ 1	—	—	—	—	—
Stalinabad		62·9	315	i 10 29	− 1	e 18 39	−21	i 11 17	pP	—
Lunacharskoe		63·0	317	i 10 36	+ 5	—	—	—	—	—
Tashkent		63·0	317	i 10 33	+ 2	i 18 46	−15	i 11 19?	pP	—
Tchimkent		63·2	318	i 11 33	+61	—	—	—	—	—
Mary		67·0	311	e 11 1	+ 4	—	—	—	—	—
Terre Adélie		68·9	172	i 11 7	− 2	e 19 54	−19	—	—	—
Ashkabad		69·8	311	e 11 18	+ 4	—	—	—	—	—
Sverdlovsk		74·5	329	i 11 40	− 2	20 54	−23	—	—	—
Baku		76·7	311	e 11 59	+ 4	—	—	—	—	—
Shemakla		77·7	312	12 4	+ 4	—	—	—	—	—
Makhach-Kala		78·9	314	—	—	e 21 55	−10	—	—	—
Kirovobad		79·5	311	12 11	+ 1	i 21 59	−12	—	—	—
Grozny		80·3	314	e 12 17	+ 3	—	—	—	—	—
Tiflis		80·8	312	e 12 17	0	—	—	—	—	—
Borzhomi		81·8	312	e 12 25	+ 3	—	—	—	—	—
Moscow		86·8	326	i 12 45	− 2	i 23 3	−22	13 38	pP	—
Ksara		87·3	303	12 54	+ 4	24 28?	+59	13 48	pP	—
Yalta		88·7	314	e 12 55	− 2	—	—	—	—	—
Pulkovo		90·7	330	e 13 3	− 3	e 23 13	[−24]	e 23 37	S	—
Lwow		95·2	320	e 17 21	PP	e 23 41	[−21]	—	—	—
Copenhagen		100·8	328	—	—	e 24 8	[−23]	e 25 46	S	—
Prague		101·3	322	e 18 2	PP	—	—	—	—	—
Collmberg	z.	101·8	323	e 13 56	0	—	—	e 18 12	PP	—
Stuttgart		104·9	322	e 14 9	− 1	e 25 58	− 3	e 18 14	PKP	—
Strasbourg		105·9	322	e 18 44k	PP	—	—	—	—	—
Paris		109·0	324	e 18 46	[+15]	—	—	i 18 58	PP	—
Clermont-Ferrand		109·9	320	17 58?	[−35]	—	—	—	—	—
Tamanrasset	z.	115·1	296	e 18 43	[0]	e 29 20	PS	i 19 51	PP	—
Ottawa	z.	130·8	18	—	—	i 22 11	PKS	—	—	—
Morgantown		134·3	25	i 22 25	PP	—	—	e 23 23	PKS	—
Harvard		134·7	15	i 22 25	PP	—	—	—	—	—
Palisades		135·4	18	i 22 27	PP	—	—	—	—	—

Additional readings :—
Poona P_cPE =10m.11s., PPPE =12m.5s., iE =12m.41s. and 16m.51s.
Andijan isS =19m.45s.
Moscow sS =24m.37s.
Prague e =18m.58s. and 19m.36s.
Stuttgart ePPZ =18m.36s., eZ =19m.19s., eSKS =24m.28s.
Tamanrasset eZ =20m.25s., ePPPZ =22m.24s.

April 29d. 21h. 59m. 28s. Epicentre 80°·0N. 125°·0E. (as at 7h.).

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Resolute Bay		24·0	25	e 5 19	+ 2	e 9 39	+ 7	e 10 36	SSS	e 13·1
Scoresby Sund		28·6	339	e 5 56	− 4	—	—	—	—	13·5
Copenhagen		39·3	305	—	—	e 13 38	+ 4	17 57	ScS	22·5
Potsdam		42·5	304	e 7 54	− 5	—	—	e 9 38	PP	e 24·5
Collmberg	Z.	43·5	303	e 8 5	− 2	—	—	—	—	—
De Bilt		43·8	310	e 8 12	+ 3	—	—	—	—	e 25·5
Prague		44·5	302	e 8 16	+ 1	—	—	e 9 57	PP	—
Kew		45·2	314	e 10 32	PPP	—	—	—	—	—
Stuttgart		46·6	305	e 8 29	− 3	—	—	e 10 15	PP	e 24·3
Strasbourg		46·9	307	e 8 34	0	—	—	e 9 19	?	—
Istanbul	E.	50·9	286	—	—	e 19 56	SS	—	—	e 25·8
Ksara		56·8	277	e 9 55	+ 7	e 19 6	ScS	—	—	—
St. Louis		60·0	32	e 10 11	0	e 18 31	+ 8	—	—	—
Tamanrasset	Z.	72·6	303	e 11 26	− 5	—	—	—	—	—

Additional readings :—
Resolute Bay eZ =6m.37s.
Prague e =8m.40s.
St. Louis e =10m.29s. and 16m.5s.
Long waves were also recorded at Paris, Pavia, and Granada.

April 29d. Readings also at 0h. (near Dzhergetal (2)), 5h. (Aberdeen), 6h. (Strasbourg), 7h. (Copiapo), 11h. (Brisbane, Tamanrasset, and near Dzhergetal), 12h. (Tamanrasset), 13h. (Fergana, Tchimkent, Samarkand, Almata II, near Khorog, Kulyab, Obi-garm, Stalinabad, Dzhergetal, and Murgab), 15h. (Dzhergetal, Vera Cruz, near Oaxaca, Tacubaya, and near Gandzha), 17h. (near Kurmenty), 18h. (Brisbane, Collmberg, Nanking, near Manila, and near Dzhergetal), 19h. (Kew, Puebla, near Manzanillo, Guadalajara, and Tacubaya), 21h. (Mineral and near Dzhergetal), 22h. (near Manila, near Dzhergetal, Khorog, Obi-garm, Andijan, and Kulyab), 23h. (Tamanrasset, Stuttgart, Timisoara, near Sofia, Istanbul, and Athens).

April 30d. 13h. 55m. 56s. Epicentre 43°·0N. 144°·2E. Depth of focus 0·010.

Intensity V at Onnebira, Tsurui, Honbetsu ; IV at Kusiro, Obihiro, Akubetsu, Shibecha, Otsu ; II-III at Nemuro. Epicentre as adopted. Depth 60km.

Seismo. Bull. Cent. Met. Obs., Japan, for 1951, Tokyo, 1951, p.94, with macroseismic chart.

$A = -\cdot5950$, $B = +\cdot4291$, $C = +\cdot6795$; $\delta = -13$; $h = -3$;
$D = +\cdot585$, $E = +\cdot811$; $G = -\cdot551$, $H = +\cdot397$, $K = -\cdot734$.

	△	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Kusiro	0·1	96	0 11a	− 3	0 19	− 5
Obihiro	0·7	264	0 15	− 3	0 24	− 7
Abashiri	1·0	3	0 23	+ 3	0 34	− 2
Nemuro	1·1	72	0 23	+ 1	0 36	− 2
Urakawa	1·3	231	0 20	− 4	0 38	− 4
Sapporo	2·1	272	0 33	− 1	0 57	− 3
Mori	2·8	251	0 43	− 1	1 17	0
Hatinohe	3·2	219	0 40	−10	1 13	−14
Aomori	3·4	231	0 49	− 3	1 23	− 9
Miyako	3·8	207	1 24	S	(1 24)	−18
Morioka	4·0	216	0 54	− 6	1 32	−14
Mizusawa E.	4·5	212	1 46	+39	1 55	− 4
Sendai	5·4	209	1 19	− 1	2 31	+10
Hukusima	6·0	210	1 9	−19	2 20	−16
Onahama	6·6	204	2 39	S	(2 39)	−11
Shirakawa	6·6	209	2 34	S	(2 34)	−16
Utunomiya	7·3	209	2 50	S	(2 50)	−18
Tukubasan	7·5	206	2 55	S	(2 55)	−17
Maebasi	7·7	213	3 8	S	(3 8)	− 9
Kumagaya	7·8	210	3 6	S	(3 6)	−14
Tokyo	8·1	207	3 11	?	—	—

The more distant of the above stations would appear to record one minute late.

April 30d. 15h. 28m. 4s. Epicentre 8°·3S. 154°·0E.

$A = -·8895$, $B = +·4338$, $C = -·1434$; $\delta = -4$; $h = +7$;
$D = +·438$, $E = +·899$; $G = +·129$, $H = -·063$, $K = -·990$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane		19·1	181	i 4 25a	− 2	i 8 4	+ 7	i 4 39	PP	—
Riverview		25·6	185	i 5 30a	− 2	i 10 2	+ 3	i 6 14	PP	e 12·3
Apia		34·0	102	6 52	+ 4	i 12 16	+ 3	—	—	15·3
Auckland	N.	34·2	148	e 6 48	− 1	e 12 11	− 5	—	—	14·9
New Plymouth	E.	35·5	151	—	—	(e 11 56)	−40	—	—	e 11·9
Cobb River	E.	36·6	155	e 7 9	− 1	e 12 44	− 9	—	—	—
Tuai	N.	36·8	149	e 8 36	PP	—	—	—	—	—
Kaimata	N.E.	37·4	158	e 7 14	− 2	—	—	e 8 2	PP	—
Wellington		37·7	153	i 7 16	− 3	e 12 50	−20	7 56	PP	17·9
Christchurch		38·7	158	7 24	− 3	e 13 14	−11	8 7	PP	18·4
Manila		39·9	305	e 6 37	−60	e 11 36	?	—	—	—
Perth		42·5	231	e 8 16	+17	i 14 31	+ 9	16 58	SS	i 20·0
Shizuoka		45·5	343	e 8 23	0	e 15 3	− 2	—	—	e 20·0
Tokyo		45·8	344	e 8 22	− 3	15 8	− 1	e 10 14	PP	—
Hunatu		45·9	343	8 24	− 2	e 15 0	−11	—	—	e 21·0
Bandong		46·0	269	e 8 25	− 2	i 15 16	+ 4	—	—	—
Kameyama		46·0	341	e 8 28	+ 1	e 15 19	+ 7	—	—	—
Koti		46·0	336	e 8 26	− 1	e 15 8	− 4	—	—	—
Sumoto		46·1	338	i 8 27	− 1	i 15 12	− 2	—	—	20·2
Iida		46·2	343	e 8 28	0	e 15 18	+ 3	—	—	—
Osaka		46·2	339	e 8 27	− 1	e 15 12	− 3	—	—	—
Kobe	Z.	46·3	339	e 8 28	− 1	e 15 20	+ 4	e 9 52	PP	e 22·4
Kumagaya		46·3	345	e 8 31	+ 2	e 15 19	+ 3	—	—	—
Gihu		46·4	342	e 8 24	− 6	e 15 16	− 2	—	—	—
Takamatu		46·4	338	e 8 32	+ 2	e 15 23	+ 5	—	—	—
Kumamoto		46·5	334	e 8 34	+ 3	15 27	+ 8	—	—	—
Ooita		46·5	334	e 8 54	+23	e 15 41	+22	—	—	—
Maebasi		46·6	344	e 8 35	+ 3	e 14 59	−22	e 12 1	PPP	—
Utunomiya		46·6	345	e 8 31	− 1	e 15 18	− 3	—	—	—
Oiwake		46·7	344	8 32	0	e 14 49	−33	—	—	—
Djakarta		46·8	270	i 8 30	− 3	i 15 25	+ 1	—	—	—
Matusiro		47·0	344	8 35	0	i 15 20	− 6	e 10 45	PP	24·0
Nagano	E.	47·1	344	e 8 32	− 3	e 15 30	+ 2	e 9 38	PcP	—
Saga		47·1	333	e 8 51	+16	e 15 33	+ 5	—	—	—
Hukuoka		47·3	333	e 8 36	− 1	15 32	+ 1	—	—	22·0
Kanazawa		47·5	341	e 8 43	+ 5	e 15 33	− 1	—	—	—
Toyama		47·5	342	e 8 39	+ 1	e 15 44	+10	—	—	—
Hamada		47·7	336	e 8 40	0	e 15 39	+ 3	—	—	—
Sendai		47·9	347	e 9 11	+29	e 16 23	+44	—	—	e 20·6
Morioka		49·2	348	e 8 50	− 2	e 15 57	− 1	—	—	—
Zi-ka-wei	Z.	50·1	324	e 8 58	− 1	16 4	− 6	i 16 19	PS	—
Urakawa		51·2	350	e 9 6	− 1	e 16 11	−14	—	—	e 24·4
Nanking		52·3	322	e 9 18	+ 3	i 16 47	+ 7	10 29	PcP	22·8
Sapporo		52·4	349	e 9 15	− 1	e 16 53	+11	—	—	e 24·5
Vladivostok		55·0	341	i 9 33	− 2	i 17 14	− 3	—	—	—
Terre Adélie		59·1	185	i 10 6	+ 2	i 18 8	− 3	i 10 20	pP	28·4
Petropavlovsk		61·3	4	i 10 19	− 1	18 42	+ 3	—	—	—
Mitchell Field		65·1	20	i 10 39	− 6	—	—	—	—	—
Calcutta	E.	71·2	297	e 11 29	+ 6	i 20 42	+ 2	i 22 22	?	—
Kabansk		72·5	332	11 30	0	20 56	+ 2	—	—	—
Irkutsk		73·7	331	11 35	− 3	—	—	—	—	—
Colombo	E.	75·4	279	11 52	+ 5	21 32	+ 5	—	—	39·8
Kodaikanal	E.	78·4	283	i 12 6k	+ 2	22 18	+18	—	—	—
New Delhi		82·5	300	e 12 28	+ 2	i 22 38	− 4	15 37	PP	37·7
Poona		83·4	290	i 12 32	+ 2	e 22 47	− 4	12 36	PcP	—
Bombay		84·4	290	e 12 37	+ 1	i 22 59	− 2	15 48	PP	38·4
Almata II		86·0	314	e 12 47	+ 4	—	—	—	—	—
Almata		86·3	314	i 12 46	+ 1	i 23 23	+ 3	—	—	—
Ili		86·4	315	e 12 50	+ 5	—	—	—	—	—
Naryu		86·6	313	e 12 48	+ 2	23 26	+ 3	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Rybach'e		86·8	313	—	—	e 23 30	+ 5	—	—	—
Murgab		87·4	309	e 12 53	+ 3	—	—	i 18 25	PPP	—
Frunse		87·9	313	i 12 54	+ 1	i 23 41	+ 6	—	—	—
Khorog		89·0	308	e 13 12	+14	23 49	+ 4	—	—	—
Andijan		89·1	311	13 0	+ 2	i 23 51	+ 5	—	—	—
Berkeley		90·1	52	i 13 6k	+ 3	e 23 42	[+ 9]	—	—	e 36·9
Lick	z.	90·5	52	i 13 6a	+ 1	—	—	i 13 22	PcP	—
Mineral	z.	91·1	50	e 13 8a	0	—	—	i 16 43	PP	—
Stalinabad		91·4	309	e 13 10	+ 1	i 24 10	+ 3	—	—	—
Tashkent		91·5	311	i 13 12	+ 2	i 24 5?	− 3	i 25 27	PS	—
Seattle		91·8	42	e 13 12	+ 1	e 23 51	[+ 8]	e 13 15	PcP	e 41·9
Fresno	z.	91·9	53	e 13 10a	− 1	—	—	e 16 16	PP	—
Reno		92·3	51	e 13 13k	0	—	—	e 16 39	PP	—
Pasadena		92·8	56	i 13 18	+ 2	i 24 19	0	i 13 34	PcP	e 37·1
Tinemaha	z.	93·1	54	i 13 20	+ 3	—	—	—	—	—
Riverside	z.	93·4	56	i 13 19	+ 1	—	—	—	—	—
China Lake	z.	93·5	55	i 13 17	− 2	—	—	i 13 27	PcP	—
Sverdlovsk		98·7	326	e 13 42	0	25 7	− 3	—	—	—
Ashkabad		99·5	307	e 17 56	PP	25 25	+ 9	—	—	—
Saskatoon		102·3	38	—	—	e 24 41	[+ 3]	e 32 48	SS	—
Tananarive		102·7	249	—	—	e 24 47	[+ 7]	27 23	PS	48·9
Resolute Bay		103·5	14	e 14 2	− 2	e 24 43	[− 1]	e 18 12	PP	e 37·5
Baku		106·1	310	e 18 41	PP	—	—	—	—	—
Lenkoran		107·0	308	18 52	PP	—	—	—	—	—
Makhach-Kala		107·7	312	—	—	e 26 1	{+12}	—	—	—
Tiflis		109·8	311	e 18 30	[− 3]	—	—	—	—	—
Vera Cruz		111·4	72	—	—	e 29 23	PPS	—	—	e 54·1
Pulkovo		113·7	332	e 19 32	PP	e 28 50	PS	—	—	—
Florissant		115·1	51	—	—	e 25 37	[+ 5]	e 26 56	SKKS	—
St. Louis		115·2	51	e 19 39	PP	e 25 32	[− 1]	e 26 46	SKKS	—
Helsinki		115·8	335	—	—	e 25 37	[+ 2]	e 27 30	SKKS	e 52·9
Yalta		116·9	316	e 19 59	PP	—	—	—	—	—
Scoresby Sund		117·8	358	e 18 47	[− 1]	e 25 47	[+ 5]	i 20 5	PP	54·9
Ksara		117·9	304	i 20 10k	PP	—	—	22 37	PPP	—
Upsala		119·0	336	e 19 15	[+24]	e 25 49	[+ 3]	e 20 11	PP	e 47·9
Cleveland		121·0	46	e 20 20	PP	e 25 54	[+ 1]	e 27 22	SKKS	50·5
Lwow		121·4	324	e 20 31	PP	—	—	—	—	—
Istanbul		121·5	314	e 20 24	PP	e 26 3	[+ 8]	e 22 42?	PPP	e 55·2
Helwan	N.	122·3	300	i 28 32	?	e 31 8	PPS	i 37 29	SS	—
Bucharest		122·4	318	e 20 8	PP	—	—	—	—	58·9
Morgantown		122·7	48	e 19 3	[+ 5]	—	—	i 20 14	PP	—
Uzhgorod		123·0	324	—	—	i 26 50	[+50]	—	—	—
Ottawa		123·5	40	i 19 26	[+26]	26 5	[+ 4]	e 30 23	PS	—
Copenhagen		123·9	335	e 20 21	PP	27 44	{+ 4}	30 20	PS	67·9
Pennsylvania	N.	123·9	45	i 20 47	PP	e 26 3	[0]	i 30 38	PS	—
Skalnate Pleso		123·9	326	e 22 56	PPP	e 26 14	[+11]	e 28 24	?	56·9
Budapest		125·4	324	e 20 56?	PP	e 29 46	?	e 30 16	PS	e 57·9
Ogyalla		125·7	325	e 21 22	PP	e 27 28	{−24}	e 37 2	SS	—
Potsdam		125·7	332	e 19 2	[− 2]	e 25 49	[−19]	i 20 54	PP	e 58·9
Seven Falls	E.	125·7	36	20 58	PP	26 12	[+ 4]	27 52	SKKS	—
Belgrade		125·9	321	e 19 30a	[+26]	e 28 10	{+17}	e 21 16	PP	e 62·9
Huancayo		126·3	112	e 19 12	[+ 7]	e 22 28	PKS	e 21 4	PP	e 52·3
Collmberg		126·5	331	e 19 7	[+ 2]	—	—	e 21 6	PP	e 60·4
Prague		126·5	329	e 19 13	[+ 8]	e 26 24	[+14]	e 21 8	PP	e 53·9
Fordham		126·6	44	e 21 0	PP	e 26 22	[+11]	—	—	56·8
Palisades		126·6	44	i 20 55	PP	i 26 18	[+ 7]	e 27 56	SKKS	e 60·4
Jena		127·4	331	e 19 13	[+ 6]	e 38 16	SS	e 21 13	PP	—
Harvard		127·5	41	e 19 10	[+ 3]	e 22 32	PKS	e 21 2	PP	e 60·6
La Plata		127·5	148	23 26	PPP	26 14	[+ 1]	28 8	SKKS	62·8
Cheb		127·6	331	e 21 13	PP	e 33 5	PPS	e 38 25	SS	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Weston		127·7	41	e 19 9	[+ 1]	—	—	—	—	e 63·7
Aberdeen	E.	127·8	344	i 20 5	[+57]	i 33 8	PPS	i 21 12	PP	58·8
Witteveen	Z.	128·3	336	e 19 15	[+ 6]	—	—	—	—	—
De Bilt		129·4	336	e 19 20	[+ 9]	e 32 56	PPS	i 21 28	PP	e 56·9
Triest		129·5	325	e 19 10	[− 1]	e 41 5	PSS	e 22 54	PKS	—
Durham		129·7	342	e 21 26	PP	i 22 41	PKS	—	—	—
Stuttgart		130·0	331	e 19 14	[+ 2]	e 22 59	PKS	e 21 33	PP	e 57·9
Karlsruhe		130·2	331	e 19 20	[+ 8]	—	—	e 21 34	PP	e 61·9
Chinchina		130·6	89	—	—	e 22 47	PKS	e 25 8	PPP	—
Strasbourg		130·8	331	e 19 21	[+ 7]	e 28 14	{−11}	e 21 33	PP	e 59·9
Zürich		131·2	330	e 19 3	[−11]	e 22 43	PKS	e 21 21	PP	—
Salo	E.	131·3	327	e 20 11	[+57]	e 22 40	PKS	e 24 25	PPP	—
Galerazamba		131·4	82	i 22 18	?	i 28 48	{+20}	—	—	e 35·1
Bologna		131·6	325	e 19 17	[+ 2]	e 23 17	PKS	—	—	—
La Paz		131·6	121	e 19 24	[+ 9]	26 36	[+12]	21 41	PP	62·4
Kew		132·0	338	e 19 28	[+12]	i 22 46	PKS	i 21 46	PP	e 64·9
Bogota		132·1	91	i 19 38	[+22]	i 22 48	PKS	i 21 38	PP	—
Prato		132·1	324	i 19 0	[−16]	i 28 40	{+ 7}	—	—	—
Messina	E.	132·2	316	e 20 34	?	—	—	e 24 10	PPP	—
Pavia		132·3	327	e 18 59	[−17]	e 26 9	[−17]	e 22 39	PKS	e 64·9
Rathfarnham Castle		132·4	344	i 19 11	[− 6]	e 22 55	PKS	e 21 47	PP	e 65·9
Rome		132·4	321	e 19 16	[− 1]	e 26 12	[−14]	e 22 36	PKS	—
Besançon		132·6	331	e 19 24	[+ 7]	e 22 52	PKS	e 21 48	PP	—
Paris		133·0	335	e 19 12	[− 6]	i 26 6	[−21]	e 21 46	PP	—
Clermont-Ferrand		135·1	332	i 19 32	[+10]	e 39 36	SS	i 22 1	PP	e 58·9
Tortosa		140·0	328	e 16 25	?	—	—	—	—	e 67·9
Algiers Univ.	Z.	141·3	322	e 19 26	[− 7]	—	—	e 22 15	PP	—
Alicante		142·3	327	19 33	[− 2]	26 21	[−22]	22 53	PP	e 63·1
Toledo		142·9	332	e 19 40	[+ 4]	41 26	SS	e 22 49	PP	66·3
Almeria		144·4	327	i 19 34	[− 4]	41 34	SS	22 52	PP	72·6
Granada		144·8	329	19 48k	[+ 9]	26 36	[−11]	22 30	PP	i 71·4
Fort de France		145·0	76	e 19 34	[− 5]	—	—	—	—	—
Malaga		145·5	329	(i 19 42)	[+ 2]	i 26 20	[−28]	74 44	Q	84·0
Lisbon	Z.	146·1	336	20 20a	PKP_2	22 26	PP	—	—	68·9
Tamanrasset	Z.	146·5	300	e 19 43	[+ 1]	e 29 36	{−23}	e 23 12	PP	64·9

Additional readings :—
Brisbane iSSE = 8m.26s.
Riverview iP = 5m.33s., iZ = 5m.40s. and 5m.45s., iPPPN = 6m.27s., iN = 10m.14s., iZ = 10m.17s., iN = 10m.20s., iE = 10m.32s. and 10m.43s.
Wellington ePPZ = 8m.47s., ePPP = 8m.56s., i = 10m.59s., SS = 14m.48s., eSSS = 15m.32s., Q = 15·4m.
Christchurch esPZ = 8m.30s., ePP = 8m.59s., eN = 11m.13s., eS_cP?Z = 12m.14s., SS = 16m.11s.
Perth i = 10m.1s. and 10m.59s., SSS = 18m.1s.
Tokyo e = 10m.33s. and 10m.59s., SSE = 18m.9s., iE = 18m.24s.
Kobe eZ = 8m.38s., eN = 8m.41s.
Matusiro ePPP? = 11m.17s., Q = 22m.26s.
Sendai e = 9m.29s.
Nanking PP = 11m.14s., PPP = 12m.17s., iPS?Z = 16m.59s., S_cSEN = 19m.16s., SS = 20m.17s.
Terre Adélie iP_cP = 10m.54s., iPP = 12m.19s., ePPP = 13m.45s., iSP = 18m.15s., iS_cS = 19m.52s., iSS = 22m.1s., i = 25m.4s.
New Delhi PPSN = 23m.36s., iN = 25m.46s., SSN = 27m.57s., SSSN = 31m.6s., QN = 33m.29s.
Poona PPE = 15m.50s., PPPE = 17m.39s., SKSE = 22m.39s., S_cSE = 22m.54s., PSE = 24m.4s., SSE = 28m.17s., SSSE = 31m.46s.
Bombay iPSEN = 23m.41s., iPPSEN = 24m.13s., SSE = 28m.19s., SSN = 28m.37s., QE = 34·6m.
Tashkent eSS = 30m.31s., eSSS = 33m.44s.
Seattle e = 13m.23s., 13m.37s., and 14m.14s.
Fresno eZ = 13m.31s.
Reno eZ = 13m.28s. and 17m.20s.
Tananarive PPS = 28m.6s., SS = 32m.47s.
Resolute Bay eZ = 16m.50s., eE = 22m.42s., 27m.10s., and 28m.1s.
Florissant ePS = 29m.31s.
St. Louis iSKKS = 26m.56s., iPS = 29m.33s., iPPS = 30m.47s., eSS = 35m.37s., e = 36m.38s., eSSS? = 39m.33s., e = 40m.45s.
Helsinki eSKSPN = 29m.40s., eSSEN = 36m.0s.

Continued on next page.

Scoresby Sund SKKS =27m.8s., 28m.0s., 29m.46s., 34m.55s., and 36m.2s.
Upsala ePPN =20m.18s., ePKS?E =22m.40s., ePPS =30m.56s.?, eSSN =36m.19s., and other unidentified readings.
Cleveland ePSE =30m.11s., eE =34m.19s., eSSE =36m.49s.
Istanbul eN =28m.21s., ePSEN =30m.5s., eE =30m.37s., eSSN =36m.43s., eSSPEN = 37m.1s., eSSSN =41m.13s., eN =51m.13s.
Helwan eN =41m.56s.
Ottawa e =37m.26s., SS =40m.26s.
Copenhagen i =20m.46s., 32m.8s., and 37m.32s.
Pennsylvania iE =26m.8s.
Skalnate Pleso eN =29m.56s., e =31m.50s., and 43m.8s.
Budapest e =21m.56s.?, eE =25m.56s.?, eEN =36m.56s.?, EN =37m.56s., eE = 40m.56s.?.
Ogyalla eN =23m.2s., e =23m.50s., eN =25m.27s., eSKSP?N =31m.30s., eN =33m.14s.
Potsdam ePPN =20m.59s., ePPP?EZ =23m.14s., ePSE =30m.52s., iSSPN =37m.56s.
Seven Falls PPSE =32m.44s., SSE =37m.50s., SSSE =42m.44s.
Belgrade ePPSNW =32m.56s., eNW =37m.14s. and 41m.57s.
Huancayo e =32m.23s., eSS =38m.26s., eSSS =42m.32s.
Prague ePKS =22m.20s. and 22m.38s., ePPP? =24m.3s., eSKKS =27m.50s., ePS = 30m.56s., eSKSP =31m.25s., ePPS =32m.36s., eSS =38m.9s., eSSS =42m.48s. and numerous other e readings.
Palisades ePPS =32m.29s., eSS =37m.56s.
Jena ePP?Z =21m.29s., ePPP?E =23m.10s.?, and other unidentified e readings.
Harvard eSS =38m.14s., eQ =52m.32s.
La Plata SKSPE =31m.50s., PSN =31m.56s., SKKSE($\triangle > 180°$) =36m.8s., SSN = 38m.8s., SSE =38m.14s., SSSN =42m.26s., QN =53m.32s.
Cheb e =23m.20s., 27m.7s., 29m.16s., and 41m.23s., eSSS =43m.4s.
Aberdeen iPKSE =21m.58s., iPPPE =24m.30s., iE =28m.56s., 32m.18s., and 38m.2s., iSSE =39m.0s., eE =44m.35s.
De Bilt eSS =38m.32s.
Triest e =23m.25s., i =30m.15s.
Durham iN =22m.35s.
Stuttgart eZ =19m.25s. and 19m.54s., ePPP =24m.18s., ePSKS =31m.36s., eSS = 38m.44s., eSSS =43m.50s.
Karlsruhe eZ =21m.13s., ePPPEN =24m.16s.
Strasbourg e =20m.5s. and 21m.15s., ePP =21m.40s., e =21m.53s., eSKP =23m.5s., ePPP? =24m.13s., ePPP =24m.24s., e =29m.5s., ePPS =33m.13s., eSS =38m.51s., eSSP =39m.8s., eSSS =43m.32s.
Salo e?E =30m.40s.
Bologna e =23m.40s.
La Paz iPKS =22m.56s., i =23m.30s., iSS =39m.24s.
Kew iPPPZ =24m.38s., iSKSP =31m.56s., ePSEN =33m.6s., ePPSEN =34m.6s., eSSEN =39m.18s., eQEN =57·9m.
Bogota eEN =38m.13s.
Pavia e =23m.5s., ePPS =33m.19s., iSS =39m.29s., e =58m.19s.?.
Rathfarnham Castle eZ =19m.30s., ePPP =24m.28s., i =26m.45s., eSKSPEN =31m.55s., eEN =33m.16s. and 35m.47s., eSS?EN =40m.29s., eEN =42m.36s.
Rome eSKKSN =28m.38s., iSSE =39m.6s.
Paris iPKS =22m.40s., iSKP =22m.47s., iPPP =24m.13s., iSKKS =28m.34s., iSP = 31m.45s., iPPS =33m.24s., iScS,PKP =34m.25s., iSS =39m.2s., iSSP =39m.28s., iPKP,PKS =41m.18s., iSSS =43m.52s., and other unidentified i and e readings.
Clermont-Ferrand e =23m.52s. and 24m.11s.
Alicante PPP =25m.25s., PPS =34m.1s., SS =39m.39s., SSP =40m.17s., Q =56m.23s.
Toledo PPP =25m.58s.
Granada SKKS =29m.39s., PPS =34m.12s., SS =41m.45s.
Malaga i =25m.12s., PKP has been increased by 2 minutes.
Lisbon EZ =20m.41s., Z =24m.51s.
Tamanrasset iZ =20m.10s., eZ =21m.39s., 22m.55s., 24m.17s. and 28m.41s., eSSZ = 42m.26s., QZ =56·9m.
Long waves were also recorded at Bergen and Ivigtut.

April 30d. Readings also at 1h. (Tamanrasset, Timisoara, China Lake, Oaxaca, Vera Cruz, near Puebla, Tacubaya (2), near Athens, Istanbul, and Sofia), 2h. (near Dzhergetal), 3h. (near Copiapo, near Alicante, and Tortosa), 4h. (Tortosa, near Alicante, and near Dzhergetal), 5h. (Raciborzu and near Messina), 6h. (Mineral), 11h. (Tacubaya), 12h. (near Athens), 15h. (Paris, Christchurch, New Plymouth, Cobb River, Kaimata, near Tuai, and Wellington), 16h. (Collmberg, Stuttgart (2), Lisbon, Tamanrasset, Brisbane, and near Apia), 17h. (Stuttgart, Zürich, Tamanrasset, near Malaga, and Toledo), 21h. (near Dzhergetal (2)), 22h. (near Sotchi).

May 1d. 5h. 2m. 40s. Epicentre 50°·5S. 149°·0E.

Epicentre as given by U.S.C.G.S. and Gutenberg.

$A = -\cdot5474$, $B = +\cdot3289$, $C = -\cdot7695$; $\delta = -5$; $h = -6$;
$D = +\cdot515$, $E = +\cdot857$; $G = +\cdot660$, $H = -\cdot396$, $K = -\cdot639$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Riverview		16·7	5	i 3 54k	− 3	i 7 6	+ 3	i 4 9	PP	e 7·2
Terre Adélie		16·8	190	e 3 56	− 2	e 6 58	− 7	e 4 19	PPP	—
Kaimata	N.E.	17·3	70	e 4 4	0	e 7 40	SS	—	—	—
Christchurch		17·5	75	i 4 6	− 1	7 42	SS	—	—	e 9·0
Cobb River	E.	19·0	68	e 4 23	− 3	e 7 48	− 7	—	—	—
Wellington		20·1	71	i 4 35	− 3	e 8 20	+ 1	—	—	9·8
New Plymouth	E.	21·0	66	4 54	+ 7	—	—	—	—	10·0
Auckland	N.	23·0	62	i 5 10	+ 3	e 9 10?	− 4	—	—	—
Tuai	N.	23·0	69	e 5 7	0	—	—	—	—	e 11·9
Brisbane		23·2	8	i 5 7k	− 2	i 9 23	+ 5	i 10 22	SSS	—
Perth		30·7	294	i 6 35	+16	i 11 18	− 3	12 53	SS	—
Bandong		55·4	308	e 9 41	+ 3	i 17 29	+ 7	—	—	—
Djakarta		56·4	307	e 9 42	− 3	i 17 36	0	—	—	—
Manila		69·3	331	i 11 7	− 4	i 20 2	−15	i 13 39	PP	i 32·2
Colombo	E.	82·3	290	12 25	0	22 40	0	—	—	—
Grahamstown	Z.	82·3	225	i 12 21	− 4	—	—	—	—	—
Tananarive		82·7	249	e 12 28	+ 1	e 22 46	+ 2	23 35	PS	35·5
Pietermaritzburg	Z.	83·6	231	e 12 28	− 3	—	—	—	—	—
Kumamoto		84·5	345	e 12 41	+ 5	24 2	PS	(32 27)	SSS	32·4
Koti		84·8	347	e 11 44	−53	e 22 20	−45	e 28 59	SS	—
Ooita		84·8	346	e 12 58	+21	e 23 26	+21	—	—	—
Hukuoka		85·3	345	e 12 40	0	e 23 1	[− 2]	—	—	35·7
Sumoto		85·4	349	i 12 40	0	23 13	+ 2	—	—	36·2
Osaka		85·6	349	e 12 44	+ 3	e 23 19	+ 6	e 16 4	PP	e 42·3
Shizuoka		85·6	352	e 12 42	+ 1	e 23 6	[+ 1]	e 28 54	SS	—
Kobe		85·7	349	e 12 41	− 1	e 23 26	+12	e 24 31	PPS	39·3
Tokyo		86·2	352	e 12 43	− 1	23 4	[− 5]	23 30	S	44·6
Hamada		86·3	346	e 12 44	− 1	e 23 5	[− 4]	—	—	—
Kodaikanal	E.	86·4	290	e 12 45	0	—	—	—	—	—
Nanking		86·4	334	e 12 41k	− 4	i 23 11	[+ 1]	i 23 17	S	39·2
Kimberley	Z.	87·0	227	i 12 43	− 5	—	—	—	—	—
Maebasi		87·0	352	e 12 49	+ 1	e 23 17	[+ 3]	—	—	—
Matusiro		87·2	351	i 12 52	+ 3	e 23 33	+ 5	e 16 21	PP	e 51·3
Nagano	N.	87·3	351	e 12 48	− 2	e 23 24	− 5	e 16 22	PP	—
Toyama		87·4	351	e 12 31	−19	e 23 37	+ 7	e 16 8	PP	e 40·0
Pretoria	Z.	87·8	231	i 12 39	−13	—	—	—	—	—
Sendai		88·7	354	e 12 56	− 1	e 22 54	[−31]	e 29 11	SS	—
Santa Lucia	N.	89·4	147	e 13 8	+ 8	e 23 31	[+ 2]	33 20	SSS	—
Mizusawa		89·5	354	12 59	− 1	23 33	[+ 3]	e 13 7	PcP	—
Miyako		90·0	355	e 12 58	− 5	e 23 45	− 9	—	—	—
Calcutta	E.	90·2	306	e 13 26	+22	i 23 57	+ 1	16 45	PP	—
Hyderabad	E.	91·5	295	—	—	23 43	[+ 1]	—	—	—
La Plata		91·7	158	13 2	− 8	24 19	+ 9	25 14	PS	44·5
Buenos Aires		91·9	158	e 12 52	−19	25 42	PPS	—	—	—
Chatra		94·4	308	e 12 58	−25	e 23 52	[− 6]	e 13 21	P	—
Vladivostok		94·4	347	e 13 23	0	i 24 34	+ 1	i 26 0	PS	—
Copiapo	N.	95·0	145	e 26 0	PS	e 24 41	+ 3	e 23 55	SKS	44·8
Poona	E.	95·0	293	i 13 26	0	24 46	+ 8	23 53	SKS	—
Bombay		95·9	292	e 13 32	+ 2	i 24 50	+ 4	e 24 2	SKS	39·0
New Delhi	N.	101·0	302	e 13 49	− 4	i 25 29	0	i 24 26	SKS	—
La Paz		105·7	143	e 13 48	−25	i 24 52	[− 2]	i 28 50	PPS	50·5
Huancayo		106·7	134	e 18 39	PP	e 24 53	[− 5]	e 27 56	PS	e 41·6
Kabansk		108·3	334	e 14 28	+ 3	25 4	[− 1]	28 17	PS	—
Irkutsk		109·2	332	e 14 28	0	28 27	PS	19 2	PP	—
Murgab		110·3	306	—	—	26 4	{− 3}	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Naryn		111·5	310	i 19 25	PP	25 20	[+ 2]	26 18	SKKS	—
Rybach'e		112·3	310	e 18 19	[−19]	—	—	e 19 24	PP	—
Almata		112·4	312	e 14 49	P	25 23	[+ 1]	i 19 26	PP	—
Obi-garm		112·7	303	e 14 45	P	—	—	—	—	—
Andijan		112·8	306	e 18 41	[+ 2]	26 27	{+ 2}	e 29 5	PS	—
Fergana		112·9	306	e 14 44	P	e 28 49	PS	—	—	—
Stalinabad		113·1	303	i 29 0	PS	—	—	—	—	—
Frunse		113·3	310	i 19 35	PP	i 25 31	[+ 6]	e 29 10	PS	—
Tashkent		114·9	305	e 14 58	P	e 25 19	[−13]	i 18 45	PKP	—
Pasadena		117·1	69	i 18 47	[0]	i 35 44	SS	i 19 59	PP	e 47·3
Santa Clara		117·2	63	e 19 53	PP	e 36 42	SPS	—	—	e 66·0
Berkeley		117·3	63	i 18 47k	[0]	e 29 50	PS	e 20 0	PP	e 54·1
Lick	z.	117·3	63	e 18 45a	[− 2]	e 29 25	PS	e 20 0	PP	—
Riverside	z.	117·5	69	i 18 47	[− 1]	—	—	i 20 2	PP	—
Fresno	z.	118·0	65	e 19 41	[+52]	e 29 18	PS	e 20 1	PP	—
China Lake	z.	118·6	67	i 18 50	[0]	e 29 10	PKKP	i 20 12	PP	—
Tacubaya		118·6	94	e 20 29	PP	—	—	e 26 26	?	e 55·7
Tinemaha	z.	119·1	66	i 18 51	[0]	—	—	—	—	—
Mineral	z.	119·4	61	e 18 44k	[− 8]	i 29 55	PS	i 18 53	PKP	e 57·4
Reno		119·9	63	e 18 54k	[+ 1]	e 29 3	PKKP	e 20 19	PP	e 55·9
Chinchina		121·3	125	e 20 22	PP	e 37 4	SS	e 51 6	Q	57·8
Bogota		121·8	127	i 18 58	[+ 2]	e 32 42	PKKS	e 20 38	PP	50·3
Seattle		123·9	54	e 19 3	[+ 3]	e 22 37	PKS	e 20 47	PP	e 57·3
Lenkoran		124·6	291	19 4	[+ 2]	—	—	i 20 51	PP	—
Baku		125·0	293	e 19 5	[+ 3]	—	—	e 21 7	PP	—
Shemakla		125·9	293	i 19 9	[+ 5]	i 28 7	{+14}	i 20 55	PP	—
Nakichevan		126·9	289	e 19 5	[− 1]	—	—	—	—	—
Kirovobad		127·3	291	i 19 7	[0]	—	—	i 21 5	PP	—
Makhach-Kala		128·0	294	e 19 18	[+10]	26 10	[− 5]	—	—	—
Tiflis		128·9	291	e 19 10	[0]	i 22 32	PKS	—	—	—
Grozny		129·3	293	e 19 16	[+ 5]	—	—	e 21 38	PP	—
Sverdlovsk		129·3	315	i 21 22	PP	38 45	SS	43 33	SSS	—
Ksara		129·4	277	i 21 13	PP	22 35	PKS	34 11	ScS,P′	—
Helwan	N.	129·7	270	e 21 20	PP	e 31 38	PS	22 38	PKS	—
Piatigorsk		131·3	293	e 19 14	[0]	e 22 40	PKS	—	—	—
Saskatoon		134·7	57	e 22 54	PKS	e 44 59	SSS	e 40 4	SPS	e 63·8
Fort de France		136·8	136	e 19 23	[− 2]	—	—	—	—	—
Yalta		136·8	288	19 27	[+ 2]	e 40 6	SS	e 22 11	PP	—
St. Louis		137·2	82	e 19 22	[− 3]	i 22 59	SKP	e 22 11	PP	—
Florissant		137·7	82	e 27 47	PcP,P′	e 32 23	PS	—	—	—
Istanbul	E.	138·1	281	e 19 28	[+ 1]	e 26 41	[+ 5]	23 3	PKS	e 58·3
Moscow		140·0	305	e 19 28	[− 2]	26 21	[−18]	i 23 10	PKS	—
Tamanrasset	Z.	140·4	240	i 19 26a	[− 5]	e 23 20	PKS	e 25 40	PPP	55·7
Kishinev		141·3	289	19 26	[− 7]	—	—	e 22 38	PP	—
Cleveland		144·4	85	i 19 35a	[− 3]	e 29 46	{ 0}	e 33 6	PSKS	—
Morgantown		144·4	89	i 19 33	[− 5]	e 29 38	{− 8}	—	—	—
Resolute Bay		144·7	23	e 19 34	[− 5]	e 26 36	[−12]	e 23 23	PKS	—
Pulkovo		145·0	309	i 19 36	[− 3]	e 29 44	{− 6}	i 23 5	PP	—
Lwow		145·4	291	i 19 36	[− 4]	e 29 48	{− 4}	i 23 4	PP	—
Timisoara	E.	145·4	283	i 19 49	[+ 9]	—	—	—	—	—
Belgrade		145·5	281	e 19 35a	[− 5]	e 29 48	{− 5}	e 33 3	SKSP	e 83·0
Uzhgorod		146·0	289	i 19 44	[+ 3]	i 23 12	PP	26 6	PPP	—
Pennsylvania		146·3	88	i 19 41	[0]	—	—	e 21 0	?	—
Kalossa	E.	147·2	284	19 46	[+ 3]	—	—	—	—	—
Budapest		147·5	285	19 45	[+ 2]	e 42 20	SS	e 30 36	SKKKS	e 51·3
Skalnate Pleso		147·5	289	19 48	[+ 5]	e 23 41	PKS	e 23 13	PP	e 60·3
Helsinki		147·7	310	i 19 44	[0]	e 47 44	SSS	e 33 53	PS	e 65·3
Ogyalla		148·2	285	e 19 47	[+ 2]	e 26 35	[−16]	e 33 26	SKSP	e 59·8
Fordham		148·9	91	e 19 46	[0]	—	—	i 19 52	PKP$_2$	—
Palisades		149·0	91	i 19 43	[− 3]	i 23 18	PKS	i 19 50	PKP$_2$	e 69·8
Raciborzu		149·0	289	e 19 44	[− 2]	e 23 30	PP	e 19 51	PKP$_2$	—
Rome		149·1	271	i 19 46	[0]	30 12	{− 1}	20 46	pP′	e 61·8
Ottawa		150·0	82	i 19 46	[− 1]	e 30 20	{+ 2}	23 30	PP	—
Triest		150·1	279	i 19 54	[+ 6]	e 27 6	[+12]	i 48 24	SSS	e 73·4
Padova		150·7	276	19 55	[+ 7]	e 30 27	{+ 5}	20 8	PKP$_2$	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Prato		151·0	273	e 19 53	[+ 4]	—	—	i 23 37	PP	—
Bologna		151·1	275	e 19 52k	[+ 3]	e 38 3?	SKSP	e 20 32	pP′	—
Harvard		151·3	90	i 19 48	[− 1]	e 30 26	{0}	i 23 33	PP	e 71·3
Prague		151·3	287	e 19 50a	[+ 1]	e 26 52	[− 3]	e 30 20	SKKS	e 61·8
Upsala		151·3	308	e 19 56	[+ 7]	e 30 22?	{− 4}	e 33 44	SKSP	e 61·3
Weston		151·3	90	e 17 55	P	—	—	i 19 54	PKP	e 71·0
Algiers Univ.	z.	152·1	253	e 19 51	[0]	—	—	e 23 42	PP	—
Salo		152·1	277	e 19 58	[+ 7]	—	—	i 20 22	PKP_2	—
Shawinigan Falls	N.	152·3	81	e 19 55	[+ 4]	—	—	e 25 36	?	—
Cheb		152·6	287	e 19 55	[+ 4]	e 30 26	{− 7}	e 33 59	SKSP	e 62·3
Pavia		152·8	275	e 19 52	[0]	e 30 29	{− 5}	e 27 6	PPP	e 75·7
Potsdam		152·8	292	i 19 53	[+ 1]	i 26 54	[− 3]	i 23 43	PP	e 56·3
Chur		153·2	278	e 19 53	[+ 1]	e 20 1	PKP_2	e 23 43	PP	—
Jena		153·3	288	e 19 50	[− 2]	e 30 39	{+ 3}	i 23 51	PP	e 62·8
Copenhagen		153·7	299	i 19 55	[+ 2]	43 16	SS	23 50	PP	—
Seven Falls	E.	153·8	81	e 20 1	[+ 8]	23 27	PKS	43 23	SS	—
Zürich		154·0	279	e 19 52a	[− 1]	e 30 5	{−35}	e 23 48	PP	—
Stuttgart		154·1	282	e 19 50a	[− 3]	e 30 33	{− 8}	i 23 50	PP	106·3
Basle		154·7	279	e 20 4	[+10]	e 20 22	PKP_2	e 24 0	PP	—
Karlsruhe		154·7	283	e 19 54	[0]	e 30 34	{−10}	e 43 40	SS	e 64·3
Neuchatel		154·9	278	e 19 55	[+ 1]	—	—	—	—	—
Strasbourg		155·0	282	e 19 51	[− 3]	e 30 45	{− 1}	e 23 59	PP	e 64·3
Alicante		155·2	252	19 55	[0]	26 32	[−28]	24 3	PP	e 70·7
Almeria		155·4	247	i 19 51	[− 4]	26 53	[− 7]	i 24 1	PP	61·3
Averroes		155·6	237	e 19 50	[− 5]	—	—	—	—	—
Besançon		155·6	278	e 19 52	[− 3]	—	—	i 20 21	PKP_2	—
Tortosa		156·1	259	i 19 59	[+ 3]	—	—	—	—	e 59·3
Granada		156·3	247	i 19 47a	[− 9]	30 56	{+ 3}	20 12	pP′	i 68·9
Malaga		156·5	245	i 19 57	[0]	i 26 33	[−28]	32 53	PPP	85·0
Clermont-Ferrand		156·9	272	i 19 56	[− 1]	e 30 59	{+ 3}	24 5	PP	e 35·3
Halifax		157·4	92	e 29 39	?	e 26 31	[−31]	e 33 31	?	e 50·0
De Bilt		157·5	289	i 19 59	[+ 1]	e 30 52	{− 8}	e 24 3	PP	e 64·3
Paris		158·3	279	e 19 53	[− 6]	i 27 5	[+ 2]	i 24 16	PP	e 66·3
Toledo		158·4	251	e 19 59	[0]	31 1	{− 3}	e 24 20	PP	59·7
Scoresby Sund		159·5	352	e 19 59	[− 1]	31 14	{+ 4}	27 20	SKS	69·3
Kew		160·7	285	i 20 1	[0]	26 28	[−37]	i 24 28	PP	e 65·3
Durham		161·7	295	e 20 24	[+22]	i 44 55	SSP	—	—	—
Aberdeen	E.	161·8	303	i 20 19	[+16]	i 31 16	{− 6}	i 24 40	PP	65·5
Rathfarnham Castle		164·5	291	i 20 3	[− 2]	e 45 30	SS	i 24 52	PP	e 66·3
Ivigtut		165·6	36	24 48	PP	31 46	{+ 5}	35 48	ScS,P′	69·3

Additional readings :—
Riverview iN = 4m.1s., iZ = 4m.32s., iSSZ = 7m.23s., iSSN = 7m.27s., iE = 7m.38s., iSSSN = 7m.45s.
Terre Adélie iSS = 7m.12s., iSSS = 7m.33s.
Brisbane iZ = 5m.12s., iPPNZ = 5m.26s.
Perth i = 11m.25s. and 14m.28s.
Manila ePPP = 14m.59s.
Tananarive PcP = 12m.37s., PP = 15m.43s., eS = 22m.49s., SS = 28m.20s.
Kobe eN = 12m.51s., eNZ = 14m.23s.
Tokyo PPN = 16m.22s., iSSN = 28m.52s., iSSSN = 33m.8s., Q = 38m.55s.
Nanking iPP?NZ = 16m.15s., PPPZ = 18m.0s., iPS?Z = 24m.23s., eSS?EN = 28m.41s., iSSSEN = 32m.26s., iQ = 35m.49s.
Matusiro ePPP? = 18m.38s., e = 19m.37s.
Nagano eSSN = 28m.24s.
Santa Lucia eSSN = 29m.18s., N = 37m.20s.
Mizusawa SE = 23m.3s.
Calcutta SSE = 29m.35s.
La Plata PPE = 16m.15s., PPN = 16m.44s., SKKSEN = 23m.32s., PPSE = 25m.32s., PPSN = 25m.42s., E = 26m.38s., N = 27m.2s., SSN = 30m.14s., N = 30m.58s., SSSN = 33m.2s., N = 34m.14s., QE = 37m.50s., QN = 38m.38s.
Vladivostok PP = 17m.18s., eSKS = 23m.44s., iSKKS = 23m.28s., iSS = 30m.46s., iSSS = 34m.32s.
Copiapo e = 31m.14s.
Poona PSE = 26m.25s., PPSE = 26m.52s., SSE = 30m.55s., SSSE = 34m.22s.
Bombay PPEN = 17m.16s., SSEN = 30m.59s.
New Delhi eN = 18m.8s., iPSN = 27m.8s., iN = 30m.34s., iSSN = 32m.25s.
La Paz iPP = 18m.44s., iSKKS = 25m.36s., iPS = 27m.56s., iSS = 33m.44s., iSSS = 37m.36s., Q = 49m.20s.

Continued on next page.

Huancayo e =34m.20s., eSSS? =37m.49s.
Kabansk ePP =18m.58s., eS =26m.25s.
Irkutsk SS =33m.55s.
Naryn PKS =22m.29s., eS =27m.7s., PS =29m.3s.
Almata ePKP =18m.32s., SKKS =26m.25s., ePS =29m.1s.
Andijan ePP =19m.41s., eSS =35m.21s.
Tashkent iPP =19m.47s., iPPP =21m.59s., iPS =29m.6s., eSS =35m.13s.
Berkeley eZ =18m.52s., 19m.2s., and 21m.40s., eSSEN =36m.26s.
Fresno eZ =22m.22s. and 27m.51s.
China Lake iZ =20m.29s., eZ =32m.33s. and 33m.4s.
Mineral eZ =20m.16s., iS?Z =29m.8s.
Reno eN =29m.18s.
Seattle e =19m.32s. and 19m.38s., eSKSP =30m.34s., ePS =30m.56s., ePPS =32m.36s., e =38m.56s.
Sverdlovsk PPP =24m.20s., PS =31m.35s.
Yalta ePKS =22m.51s.
St. Louis e =21m.47s., 24m.21s., and 26m.50s., iPS? =32m.25s., iPPS =34m.40s.
Istanbul ePPE =22m.6s., eSKKSE =29m.8s., ePKKSE =31m.57s., ePSE =32m.35s., ePPSE =34m.22s., eSSE =40m.35s., eSSSE =45m.43s. and many unidentified eE readings.
Moscow PP =22m.28s.
Tamanrasset eZ =22m.5s., iPPZ =22m.30s., ePSZ =33m.6s.
Cleveland iPKPE =19m.39s., ePPE =22m.54s., ePSKSN =32m.55s., eE =34m.22s., iSSE =42m.0s., iSSSE =46m.23s.
Resolute Bay eZ =20m.1s., e =29m.31s. and 30m.56s.
Pulkovo ePPP =26m.5s.
Lwow SKSP =33m.15s.
Belgrade iZ =19m.42s., eNW =24m.9s.
Kalossa ePN =19m.51s., iE =20m.5s., eE =20m.31s. and 20m.48s., iN =20m.56s. and 21m.26s.
Budapest PN =19m.48s., eE =32m.10s., eN =33m.20s. and 41m.50s., iE =44m.33s.
Skalnate Pleso e =20m.42s., ePPP =26m.41s., e =27m.12s.?, eE =33m.49s., eSSE =41m.50s., eSSSN =47m.38s.
Helsinki iPKP$_2$?Z =19m.55s., iZ =20m.52s. and 21m.15s., ePPZ =22m.46s., eSSN =42m.30s.
Ogyalla ePKP$_2$ =20m.9s., ePP? =23m.32s., eSSS =47m.8s. and many unidentified e readings.
Raciborzu eE =20m.14s., eZ =20m.18s., eN =20m.31s., eE =20m.49s., eZ =21m.24s., eE =24m.32s., eN =24m.35s.
Rome iPPZ =23m.25s., PPP =26m.40s., PSKS =33m.46s., SS =42m.40s., SSS =57m.22s.
Ottawa PSEN =33m.50s., SSEN =43m.2s.
Triest iSKP =23m.30s., iPP =23m.42s., eSKS =30m.13s., iSKSP =33m.53s., iSS =42m.36s.
Padova ePP =23m.42s.
Harvard e =21m.45s., i =22m.32s., ePPP =26m.37s., e =32m.48s., eSSS =48m.26s.
Prague ePKP$_2$Z =20m.8s. and 20m.12s., ePP =23m.33s., ePPPE =27m.9s., eSKSP =34m.8s., ePS?E =34m.48s., ePPSE =36m.48s., eSS =42m.57s., eSSS =48m.47s. and many unidentified e readings.
Upsala ePKS =23m.32s., eSKS? =27m.31s., ePPS?E =36m.42s., eSS =42m.49s., eSKS,SKS?E =43m.58s., eSSSN =48m.22s.?, and other unidentified readings.
Algiers University ePKP$_2$Z =20m.10s., eZ =20m.27s., 21m.8s., and 24m.48s., ePPPZ =27m.9s.
Salo e =20m.5s., iZ =20m.10s., iE =21m.20s.
Cheb ePP =23m.45s., ePPP =26m.59s., eSSE =42m.4s., eSSSE =48m.26s. and other unidentified e readings.
Pavia ePSKS =34m.9s., eSS =43m.5s.
Potsdam ePKPEN =20m.4s., iZ =20m.46s., ePPN =23m.38s., iPPE =23m.54s., iZ =24m.57s., ePcP,PKPN =28m.14s., eSKKS?N =30m.14s., iSKSPZ =34m.2s., iPPSZ =36m.42s., ePPSN =36m.56s., iSSN =43m.17s., iSSSN =49m.7s.
Jena ePKP$_2$?N =20m.15s., ePKP$_2$?E =20m.18s., ePPN =23m.57s., eSS?N =43m.20s. and 43m.27s., eSS?E =43m.32s., and many unidentified e readings.
Copenhagen i =20m.2s., SSS =48m.20s.
Seven Falls eE =34m.6s. and 38m.45s.
Stuttgart iPKPZ =20m.0s., iPKP$_2$Z =20m.17s., ePKP$_2$ =20m.20s., iPP =24m.6s., ePSKS =34m.32s., ePPS =36m.50s., eSS =43m.20s. and 44m.37s., eSSS =49m.20s., eQ =64·3m., and other unidentified e readings.
Karlsruhe ePKP$_2$Z =20m.19s., eZ =20m.35s., 23m.47s., and 24m.2s., eE =32m.36s.
Strasbourg iPKP$_2$ =20m.21s., ePP =23m.53s., ePPP =27m.26s., eSS =43m.45s., eSSS =49m.39s. and many unidentified readings.
Alicante PKP$_2$ =20m.24s., PPP =27m.17s., PPS =35m.51s., SS =41m.59s., SSS =47m.47s., Q =62m.17s.
Almeria PKS =23m.21s., PPP =27m.37s., SS =43m.49s.
Besançon i =20m.7s., e =20m.39s., 21m.24s., and 21m.39s.
Granada PKP$_2$ =20m.26s., pPKP$_2$ =21m.5s., iPP =24m.11s., iSKS =26m.44s., PPP =27m.53s., PPS =37m.30s., iSS =43m.38s., SSS =49m.56s., Q =61m.8s.
Malaga Q =74m.27s.
Clermont-Ferrand iPKP$_2$ =20m.28s., e =24m.25s.
De Bilt iPKP$_2$ =20m.31s., eSS =44m.10s., eSSS =50m.20s.

Continued on next page.

Paris iPKP = 20m.0s., iPKP$_2$ = 20m.36s., iSKP = 23m.15s., iPKS = 23m.29s., iPP ($\triangle$ > 180°) = 27m.44s., iPKP,PcP = 30m.8s., iSKKS = 30m.56s., iScS,PKP = 35m.17s., iPKP,PKP? = 36m.48s., iPPS = 37m.40s., iSS = 44m.16s., iPSS = 45m.12s., iSSS = 50m.12s., iSSP ($\triangle$ > 180°) = 52m.24s., SSS ($\triangle$ > 180°) = 58m.31s., and many unidentified i readings.
Toledo iPKP$_2$ = 20m.36s., ePPP = 28m.1s., ePPS = 37m.41s., e = 39m.11s.
Scoresby Sund PPP = 28m.2s., SKSP = 34m.44s., PPS = 37m.50s., SS = 44m.26s., SSS = 51m.7s., SSSS = 55m.2s. and unidentified readings.
Kew iPKP$_2$EZ = 20m.8s., eSKKSEZ = 30m.22s., eSSEN = 44m.34s., ePSSEN = 45m.32s., eSSSEN = 50m.56s.
Durham iN = 20m.31s., iE = 20m.50s.
Aberdeen iE = 20m.53s. and 24m.59s., iPPPE = 27m.47s., iE = 35m.47s., iSSE = 44m.31s., iSSSE = 51m.37s.
Rathfarnham Castle eZ = 21m.0s., iZ = 23m.33s., ePPP = 28m.41s., e = 30m.47s., i = 33m.1s., eEN = 40m.47s.
Ivigtut ? = 34m.56s., iSS = 44m.56s.
Long waves were also recorded at Antofagasta and Barcelona.

May 1d. 6h. 13m. 26s. Epicentre 36°·9N. 141°·3E. Depth of focus 0·005. (as on 1951, February 21d.).

Intensity V at Nikko, Higasiwasuno, Zuiryn, and Kannomineyama; IV at Mito, Tukubasan, Ashino, Batto, Kasama, Otsu, Shimozuma, Hokota, etc.; II-III at Onahama Shirakawa, Utunomiya, Hukusima, etc. Epicentre 36°·8N. 141°·1E. Depth 55km.

Seismological Bulletin of the Cent. Met. Obs., Japan, for May, 1951, Tokyo, 1951, p. 109. Macroseismic chart p. 109.

$A = -\cdot6256$, $B = +\cdot5012$, $C = +\cdot5978$; $\delta = -6$; $h = -1$;
$D = +\cdot625$, $E = +\cdot780$; $G = -\cdot467$, $H = +\cdot374$, $K = -\cdot802$.

		$\triangle$ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.
Onahama		0·3	276	0 13k	+ 1	0 20	0
Mito		0·8	232	0 16a	− 1	0 24	− 5
Shirakawa		0·9	284	0 16	− 2	0 26	− 5
Hukusima		1·1	322	0 21	+ 1	0 34	− 2
Tukubasan		1·2	235	0 19	− 3	0 31	− 7
Utunomiya		1·2	253	0 19k	− 3	0 31	− 7
Inawasiro		1·2	305	0 21	− 1	0 34	− 4
Tyosi		1·2	197	0 24	+ 2	0 37	− 1
Sendai		1·4	347	0 27	+ 3	0 44	+ 1
Isinomaki		1·5	0	0 27	+ 1	0 49	+ 4
Yamagata		1·5	331	0 43	S	(0 43)	− 2
Kumagaya		1·7	244	0 26k	− 2	0 43	− 7
Tokyo		1·7	225	0 28	0	0 45	− 5
Maebasi		1·8	254	0 30k	0	0 48	− 4
Titibu		2·0	243	0 30	− 2	0 50	− 7
Yokohama		2·0	222	0 33	+ 1	0 55	− 2
Mizusawa	E.	2·2	357	e 0 45	+10	1 5	+ 3
Oiwake		2·3	256	0 35	− 2	0 59	− 5
Takada		2·4	275	0 38	0	—	—
Mera		2·4	216	0 39	+ 1	1 2	− 5
Hunatu		2·5	236	0 38	− 1	1 5	− 4
Matusiro		2·5	262	0 37	− 2	1 5	− 4
Nagano		2·5	265	0 40	+ 1	1 25	sS
Kohu		2·6	240	0 40	− 1	1 7	− 5
Misima		2·6	227	0 35	− 6	1 10	− 2
Matumoto		2·8	256	0 40	− 4	1 13	− 4
Miyako		2·8	11	0 46	+ 2	1 18	+ 1
Morioka		2·8	358	0 47	+ 3	1 17	0
Akita		3·0	342	1 10	?	—	—
Shizuoka		3·0	232	0 46	− 1	—	—
Toyama		3·3	268	0 55	+ 4	—	—
Omaesaki		3·4	228	1 24	+32	1 55	+23
Nagoya		3·9	244	1 3	+ 4	—	—
Gihu		4·0	250	1 5	+ 4	—	—
Kameyama		4·4	246	1 24	+18	—	—
Osaka		5·2	247	1 43	+26	—	—
Urakawa		5·4	12	1 19	− 1	2 24	+ 2

May 1d. 19h. 0m. 0s. Epicentre 36°·7N. 70°·5E. Depth of focus 0·020.
(as on 1951, February 7d.).

U.S.S.R. gives epicentre 36°·5N. 70°·4E. Depth 180km.

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

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
	°	°	m. s.	s.	m. s.	s.	m. s.	
Khorog	1·2	48	0 25	− 3	0 49	0	—	—
Kulyab	1·3	335	i 0 25	− 4	i 0 50	− 1	—	—
Obi-garm	2·1	342	i 0 38	+ 1	i 1 10	+ 4	—	—
Stalinabad	2·3	323	e 0 37	− 3	i 1 10	0	—	—
Dzhergetal	2·6	12	0 46	+ 3	1 23	+ 6	—	—
Murgab	3·2	59	e 0 54	+ 3	e 1 36	+ 6	—	—
Fergana	3·8	15	e 1 1	+ 2	e 1 49	+ 5	—	—
Samarkand	4·1	319	1 0	− 3	1 50	− 1	—	—
Andijan	4·3	20	1 0	− 5	2 2	+ 7	e 1 11	pP
Tchimkent	5·6	354	e 1 24?	+ 2	e 2 28?	+ 2	—	—
Naryn	6·4	41	—	—	i 2 49	+ 4	—	—
Frunse	6·9	26	—	—	e 3 8	+11	—	—
Rybach'e	7·2	35	—	—	e 3 11	+ 7	—	—
Almata	8·2	35	—	—	e 3 27	− 1	—	—
Almata II	8·4	37	e 2 2	+ 2	—	—	—	—

May 1d. Readings also at 2h. (near Athens), 5h. (near Antofagasta, Copiapo, near Dzhergetal, and near Athens), 7h. (near Antofagasta, Copiapo, and near Tananarive), 9h. (near La Paz and near Prague), 11h. (La Plata, La Paz, China Lake, Riverside, Mount Wilson, Tamanrasset, near Ksara, near Scoresby Sund (2), Almata, Almata II, Frunse, Ili, Krasnogorka, Kurmenty, Tashkent, near Andijan, Dzhergetal, Fergana, Khorog, Murgab, Naryn, Obi-garm, Rybach'e, and Stalinabad), 13h. (Tinemaha, China Lake, Riverside, Mount Wilson, Stuttgart, and near La Paz), 15h. (near Kurmenty), 20h. (near Apia, near Erevan, Gori, Kirovobad, Leninakan, Lenkoran, Nakichevan, Shemakla, and Tiflis), 21h. (Pretoria, Christchurch, Terre Adélie, near Dzhergetal, and near Mizusawa), 22h. (Wellington, Resolute Bay, La Plata, Pretoria, Tamanrasset, Ksara, Besançon, Rome, Malaga, and near Kurmenty), 23h. (Algiers University, De Bilt, Granada, Istanbul, Kew, Paris, Pavia, Potsdam, Stuttgart, Grozny, near Gori, Kirovobad, and Tiflis).

May 2d. 12h. 19m. 50s. Epicentre 39°·2N. 70°·7E. (as on 1951, April 3d.).

$A = +·2568$, $B = +·7334$, $C = +·6295$; $\delta = +9$; $h = -1$;
$D = +·944$, $E = -·331$; $G = +·208$, $H = +·594$, $K = -·777$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
	°	°	m. s.	s.	m. s.	s.	m. s.	
Dzhergetal	0·4	88	0 6	− 7	0 15	− 6	—	—
Obi-garm	0·9	237	i 0 10	−10	e 0 21	−13	—	—
Fergana	1·4	31	e 0 29	+ 2	0 51	+ 5	—	—
Stalinabad	1·6	247	i 0 23	− 7	i 0 45	− 6	—	—
Khorog	1·9	158	i 0 27	− 7	0 53	− 6	—	—
Andijan	2·0	39	i 0 38	+ 3	i 1 10	S_g	—	—
Tashkent	2·4	333	e 0 43	P*	1 19	S_g	—	—
Murgab	2·7	108	e 0 48?	+ 3	e 1 26?	S*	—	—
Samarkand	2·9	279	e 0 48	0	1 20	− 4	e 0 52	P*
Tchimkent	3·1	345	i 0 53	+ 2	i 1 31	+ 2	i 1 44	S_g
Naryn	4·6	60	e 1 10	− 2	e 2 20	S*	—	—
Frunse	4·7	38	e 1 16	+ 2	—	—	—	—
Krasnogorka	5·2	38	1 22	+ 1	—	—	—	—
Rybach'e	5·2	50	—	—	e 2 39	S*	—	—
Almata	6·2	47	e 1 35	0	e 3 19	S_g	—	—
Almata II	6·4	49	i 1 38	0	—	—	—	—
Mary	7·1	260	—	—	e 3 14	+ 4	—	—

Additional readings :—
Fergana $eP_g = 31s.$, $i = 58s.$
Tchimkent $i = 1m.38s.$

May 2d. 16h. 16m. 59s. Epicentre 42°·0S. 80°·1E.

$A = +·1282$, $B = +·7343$, $C = -·6666$; $\delta = -1$; $h = -2$;
$D = +·985$, $E = -·172$: $G = -·115$, $H = -·657$, $K = -·745$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Perth		30·1	82	i 10 13	?	i 11 14	+ 2	i 12 37	SS	—
Tananarive		35·9	300	e 10 2	?	e 12 45	+ 3	e 15 2	SS	—
Terre Adélie		41·1	147	e 7 58	+11	—	—	—	—	19·5
Bandong		42·6	42	e 7 57	− 2	i 14 24	+ 1	—	—	—
Grahamstown	Z.	42·7	264	i 7 57	− 3	—	—	—	—	—
Djakarta		42·8	40	e 8 2	+ 1	i 14 28	+ 2	—	—	—
Pretoria	Z.	45·3	274	i 8 28	+ 7	—	—	—	—	—
Kimberley	Z.	46·3	269	i 7 54	−35	—	—	—	—	—
Colombo	E.	48·7	359	e 9 35	+47	15 55	+ 5	—	—	23·5
Kodaikanal	E.	52·0	356	e 10 25	+72	e 16 45	+ 9	—	—	22·0
Riverview		55·2	106	e 9 38	+ 1	e 17 18	− 2	i 17 32	PS	e 26·4
Hyderabad	N.	59·2	358	e 10 34	+29	i 18 5	− 7	—	—	26·1
Brisbane		60·0	100	e 10 9	− 2	e 18 25	+ 2	—	—	e 27·4
Poona		60·5	353	e 10 11	− 3	i 18 28	− 1	18 35	PS	28·4
Bombay		61·0	352	e 10 19	+ 1	e 18 38	+ 3	e 12 31	PP	28·7
Christchurch		64·3	126	i 11 7	+28	19 29	+12	23 36	SS	e 31·5
Calcutta	E.	64·7	9	e 9 9	?	i 19 24	+ 2	e 14 25	PP	—
Wellington		66·9	124	—	—	e 27 31?	SSS	—	—	e 33·0
Chatra		68·8	7	e 11 6	− 2	—	—	—	—	—
New Delhi		70·3	357	e 11 13	− 4	20 25	− 4	20 50	PS	—
Kulyab		80·1	352	12 20	+ 7	—	—	—	—	—
Murgab		80·2	355	e 12 22	+ 8	22 51	ScS	—	—	—
Stalinabad		80·8	351	e 12 13?	− 4	e 22 26?	− 1	—	—	—
Obi-garm		80·9	352	e 12 19	+ 2	—	—	—	—	—
Guam		81·0	63	e 19 51	?	—	—	—	—	—
Mary		81·0	346	12 17	− 1	—	—	e 15 19	PP	—
Nanking		81·8	33	12 37	+15	22 34	− 1	i 23 21	PS	—
Ashkabad		82·0	343	12 23	0	i 22 46	ScS	—	—	—
Samarkand		82·2	349	e 12 35	+11	—	—	—	—	—
Zi-ka-wei	Z.	82·2	35	e 12 22	− 2	e 21 39	−60	—	—	—
Andijan		82·7	354	12 28	+ 1	i 22 39	− 5	—	—	—
Naryn		83·1	357	e 12 29	0	22 39	− 9	e 15 41	PP	—
Tashkent		83·5	352	e 12 32	+ 1	i 22 49	− 3	e 28 33	SS	—
Przhevalsk		84·1	359	e 12 31	− 3	—	—	—	—	—
Rybach'e		84·1	357	e 12 36	+ 2	—	—	e 17 58	PPP	—
Helwan	N.	84·5	319	—	—	i 23 7	+ 5	e 32 13	SSS	—
Frunse		84·6	356	e 12 36	0	e 23 25	ScS	e 28 51	SS	—
Almata		84·9	358	e 12 38	0	e 23 1	− 5	—	—	—
Almata II		84·9	358	e 12 35	− 3	—	—	—	—	—
Lenkoran		85·3	336	e 12 43	+ 3	—	—	12 47	PcP	—
Ksara		85·7	324	i 12 48a	+ 6	23 7	[+ 2]	—	—	—
Baku		86·4	337	e 12 56	+11	e 23 26	+ 5	—	—	—
Nakhichevan		86·8	334	e 12 57	+10	e 23 27	+ 2	—	—	—
Shemakla		87·0	336	i 12 56	+ 8	—	—	—	—	—
Kirovobad		87·8	335	—	—	i 23 34	0	—	—	—
Tiflis		89·2	334	e 13 4	+ 5	e 23 35	{− 1}	—	—	—
Makhach-Kala		89·5	337	—	—	e 23 51	+ 1	—	—	—
Gori		89·7	334	e 13 5	+ 4	—	—	—	—	—
Borzhomi		89·8	333	e 13 5	+ 3	—	—	—	—	—
Grozny		90·4	336	e 13 14	+10	e 24 0	+ 2	—	—	—
Tamanrasset	Z.	94·2	296	e 13 20	− 2	e 25 1?	+30	e 13 31	PcP	38·0
Istanbul	E.	94·7	323	e 22 43	?	i 23 49	[−10]	e 25 58	PS	e 38·0
Irkutsk		96·2	14	e 13 59?	+28	e 25 1	+13	e 20 8	PPP	—
Kabansk		96·5	16	e 13 33	+ 1	e 24 4	[− 5]	e 26 14	PS	—
Bucharest		98·7	324	—	—	e 25 43	+33	e 30 45	SS	53·0
Sverdlovsk		99·8	349	e 13 51	+ 4	24 13	[−13]	17 55	PP	—
Belgrade		101·5	321	e 16 43	?	e 26 0	+27	e 20 32	PPP	e 56·6
Rome		103·4	314	e 18 44	PP	e 22 48	?	—	—	—
Uzgorod		103·6	325	—	—	e 25 3	{−17}	—	—	—
Lwow		103·8	326	—	—	e 25 24	{+ 2}	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ogyalla		104·9	322	e 19 34	?	e 26 19	+18	e 24 19	SKS	—
Skalnate Pleso		104·9	324	e 16 25	?	e 24 51	[+ 1]	e 34 19	SS	—
Algiers Univ.	z.	105·3	305	23 1?	?	—	—	—	—	—
Triest		105·4	318	—	—	e 28 15	PS	e 33 20	SS	—
Pavia		107·4	316	—	—	e 26 26	+ 3	e 39 9	P'P'	e 53·4
Prague		108·2	322	e 19 6	PP	e 28 16	PS	e 33 55	SS	e 53·0
Alicante		108·4	305	20 26	PPP	26 50	S	30 10	PPS	e 52·7
Almeria		108·7	303	18 40	[+10]	34 26	SS	19 14	PP	54·8
Granada		109·6	302	18 37a	[+ 5]	35 18	SS	19 17	PP	51·5
Collmberg	z.	109·7	321	e 19 3	PP	—	—	e 21 32	PPP	—
Stuttgart	z.	109·8	318	e 19 26	PP	e 29 49	PPS	e 21 49	PPP	e 58·0
Malaga		109·9	302	e 20 3	PP	e 31 15	PPS	—	—	52·2
Jena	z.	110·1	321	e 19 35	PP	—	—	e 21 22	PPP	—
Strasbourg		110·4	317	e 19 12	PP	e 24 32	[−42]	e 21 39	PPP	59·0
Copenhagen		112·9	325	—	—	35 1	SS	—	—	49·0
Paris		113·2	315	e 15 16	P	i 25 53	[+28]	i 19 37	PP	57·0
Upsala	N.	113·7	330	—	—	e 35 19	SS	—	—	e 54·0
De Bilt		113·9	320	e 20 1	PP	e 35 21	SS	e 39 41	SSS	e 57·0
La Paz		114·8	214	—	—	25 41	[+10]	26 5	SKKS	45·0
Kew		116·3	317	e 20 49	PP	—	—	—	—	e 48·0
Rathfarnham Castle		120·3	316	e 20 52	PP	—	—	e 23 49	PPP	47·0
Scoresby Sund		132·9	333	e 22 56	PKS	—	—	e 39 25	SS	54·0
Galerazamba		142·1	222	—	—	e 25 47	[−56]	e 28 15	SKKS	—
Resolute Bay		147·1	358	e 19 41	[− 2]	—	—	e 23 24	PP	—
Tacubaya		157·5	182	e 21 0	?	—	—	—	—	—
Seven Falls	E.	158·7	294	—	—	e 43 49	SS	—	—	73·0
Weston		158·9	281	e 20 4	[+ 4]	—	—	—	—	e 73·7
Victoria		162·2	61	20 7	[+ 4]	—	—	—	—	—
Berkeley		162·4	98	e 20 27	[+24]	—	—	—	—	e 76·9
Lick	z.	162·6	98	e 20 18k	[+15]	—	—	i 21 3	PKP_2	—
Seattle		163·2	64	e 20 23	[+19]	—	—	e 21 38	PKP_2	e 83·0
Mineral	z.	163·6	89	e 20 13k	[+ 9]	—	—	e 21 9	PKP_2	—
Pasadena	z.	163·6	114	e 20 14	[+10]	—	—	—	—	e 75·8
Fresno	z.	163·8	102	e 20 19a	[+14]	—	—	e 21 7	PKP_2	—
Palomar	z.	164·1	118	e 20 10	[+ 5]	—	—	—	—	—
Riverside	z.	164·1	114	e 20 22	[+17]	—	—	e 21 26	PKP_2	—
Reno		164·7	93	e 20 21a	[+15]	e 29 51	PKKP	e 24 31	PP	—
China Lake	z.	164·9	108	e 20 11	[+ 5]	—	—	e 21 11	PKP_2	—

Additional readings :—
Tananarive e =12m.58s. and 15m.25s.
Riverview iE =17m.28s., eN =17m.43s., SSE =21m.6s.,
Poona PPSN =18m.43s., SSN =22m.30s., QN =25m.42s.
Bombay SSEN =22m.24s., QN =25m.23s.
Christchurch eQ =27m.1s.
Calcutta iE =21m.41s.
New Delhi iSSEN =25m.0s.
Naryn SS =28m.13s.
Istanbul iE =22m.49s., eE =30m.29s.
Irkutsk SS =31m.24s.
Sverdlovsk PS =26m.37s., SS =32m.12s., SSS =36m.4s.
Belgrade eNW =29m.36s.
Skalnate Pleso e =19m.16s., 27m.31s., and 30m.43s.
Prague eE =26m.24s., e =29m.37s., eE =39m.19s.
Alicante PPP =23m.16s., Q =45m.26s.
Almeria PPP =21m.26s.
Granada pPP =20m.1s., PPS =29m.51s., SSS =38m.18s.
Stuttgart eZ =20m.11s., e =31m.31s., eSS =34m.11s., eSSS =38m.1s., e =45m.1s.
Jena eZ =20m.31s. and 21m.41s.
Strasbourg e =19m.20s., 28m.50s., 29m.39s., 34m.20s., 38m.1s., and 45m.49s.
Paris ePP =19m.46s., e =20m.12s., i =20m.19s. and 20m.31s., iPPP =22m.13s., ePKS = 23m.5s., i =23m.44s. and 24m.55s., eS =27m.17s., ePS =29m.5s., ePPS =30m.14s., iSS =35m.5s., iSSS =39m.25s., Q =51·0m.
Upsala eN =44m.32s. and 49m.42s.
Resolute Bay eEZ =19m.55s., eZ =21m.52s.
Long waves were also recorded at Tortosa, Toledo, Clermont-Ferrand, Taranto, Aberdeen, Potsdam, Helsinki, Harvard, Saskatoon, and Santa Clara,

May 2d. 19h. 51m. 12s. Epicentre 17°·1N. 93°·4W. Depth of focus 0·030.
(as on 1941, June 27d.).

A = −·0567, B = −·9547, C = +·2922 ; δ = +5 ; h = +5 ;
D = −·998, E = +·059 : G = −·017, H = −·292, K = −·956.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Oaxaca		3·2	269	0 55	+ 1	—	—	—	—	1·7
Vera Cruz		3·3	309	0 53	− 2	—	—	—	—	1·6
Puebla		4·9	293	1 19	+ 5	2 18	+ 6	—	—	—
Merida		5·2	43	1 21	+ 3	2 22	+ 3	—	—	—
Tacubaya		5·9	293	1 32	+ 5	—	—	—	—	2·9
Galerazamba		18·7	107	i 3 35	−29	e 5 52	?	—	—	—
Palomar	z.	26·6	312	i 5 18	− 2	—	—	i 6 3	pP	—
Riverside	z.	27·3	313	i 5 24	− 2	—	—	—	—	—
China Lake	z.	28·4	316	i 5 34k	− 2	—	—	e 6 15	pP	—
Tinemaha	z.	29·7	318	i 5 46	− 1	—	—	—	—	—
Lick	z.	32·0	315	i 6 6k	− 1	—	—	i 6 52	pP	—
Reno	z.	32·0	320	e 6 7	0	—	—	—	—	—
Victoria		39·6	329	7 9	− 2	—	—	—	—	—

May 2d. Readings also at 0h. (near Kurmenty), 3h. (Istanbul), 4h. (Almata II, Tchimkent, near Andijan, Dzhergetal, Fergana, Khorog, Kulyab, Murgab, Naryn, and near Huancayo), 7h. (Palomar, Riverside, near Mizusawa, and near Dzhergetal), 8h. and 10h. (near Dzhergetal), 11h. (near Apia), 12h. (near Palomar), 14h. (near Shemakla), 15h. (Manila), 16h. (near Kurmenty), 17h. (near Alicante (2)), 18h. (near Obi-garm), 20h. (Palomar, Pasadena, Riverside, China Lake, Andijan, Obi-garm, Samarkand, near Dzhergetal, Khorog, and Kulyab), 21h. (near Tacubaya and near Copiapo), 23h. (Nanking, near Dzhergetal, Khorog, Kulyab, and Obi-garm).

May 3d. 4h. 8m. 51s. Epicentre 15°·4N. 61°·2W. Depth of focus 0·020.

Intensity Scale III-IV at Morne des Cadets. Epicentre 15°·1N. 61°·0W. Depth of focus 150km. (Strasbourg).

Seismo. Bull. de Morne des Cadets, 1951, May.

A = +·4647, B = −·8453, C = +·2639 ; δ = +12 ; h = +6 ;
D = −·876, E = −·482 ; G = +·127, H = −·231, K = −·965.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Fort de France		0·7	176	i 0 24?	0	i 1 2?	+20	—	—	—
Port au Prince		11·1	288	i 2 31	− 4	i 4 33	− 4	2 38	PP	e 5·0
Galerazamba		14·4	253	i 3 23	+ 6	i 6 9	+16	i 6 36	SS	—
Bogota		16·6	236	i 3 45	0	i 6 56	+13	i 8 6	SS	—
Chinchina		17·5	238	i 3 55	0	i 7 10	+ 7	i 7 42	SS	—
Miami		20·7	305	i 4 32	+ 3	e 9 2	PcP	—	—	—
City College, N.Y.		27·6	340	i 5 35	+ 1	—	—	—	—	—
Fordham		27·7	340	i 5 36	+ 1	e 10 10	+ 6	e 10 56	sS	—
Palisades		27·8	340	i 5 35	− 1	i 10 10	+ 4	i 6 21	PP	—
Weston		28·3	345	e 5 40	− 1	e 11 6	pS	e 6 9	pP	—
Harvard		28·4	345	i 5 42	0	e 11 10	pS	—	—	e 16·6
Morgantown		29·2	330	i 5 49	0	e 11 31	+63	—	—	—
Pennsylvania	E.	29·2	334	—	—	i 10 33	+ 5	i 11 35	sS	—
Huancayo		30·6	208	i 6 0	− 1	i 10 52	+ 2	e 6 54	pP	e 12·5
Cleveland		31·4	330	i 6 8a	0	e 11 7	+ 5	i 7 10	PP	—
Ottawa		32·3	341	i 6 17	+ 1	11 19	+ 3	—	—	e 18·3
La Paz		32·4	192	6 17	0	i 11 21	+ 3	13 17	SS	15·5
Seven Falls	E.	32·6	349	e 6 20	+ 2	e 11 25	+ 4	e 13 25	SS	—
St. Louis		34·5	319	i 6 34	− 1	e 11 54	+ 4	e 7 41	PP	—
Florissant		34·6	319	e 6 35	0	e 11 56	+ 4	e 7 46	PP	—
Tacubaya		36·4	282	e 6 57	+ 7	e 13 32	sS	—	—	—
Lubbock		40·9	304	7 29	+ 1	13 31	+ 4	—	—	—
Buenos Aires		49·8	177	—	—	e 14 51	−43	—	—	—
La Plata		50·1	177	15 21	?	16 3	?	19 51	SS	27·0
Palomar	Z.	53·2	301	i 9 5	+ 1	—	—	e 9 37	pP	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Riverside	z.	53·6	302	i 9 7	0	—	—	—	—	—
China Lake	z.	54·0	304	i 9 10 a	0	—	—	e 9 43	pP	—
Pasadena		54·3	302	i 9 12 a	0	—	—	—	—	—
Malaga		54·4	56	i 9 12	0	i 16 46	+ 9	i 10 24	PcP	26·0
Tinemaha	z.	54·7	305	i 9 15	0	—	—	—	—	—
Granada		55·1	56	e 9 24 a	+ 6	16 51	+ 5	—	—	25·9
Toledo		55·2	53	i 9 20	+ 2	e 16 48	+ 1	e 11 30	PP	—
Fresno		55·9	305	e 9 23 a	0	e 17 5	+ 9	e 11 32	PP	—
Almeria		56·0	56	9 38	+14	17 26	pS	11 50	PP	—
Reno		56·2	308	e 9 26 a	0	—	—	e 9 53	pP	—
Lick	z.	57·4	305	i 9 35 a	+ 1	—	—	i 10 31	PcP	—
Alicante		57·7	54	9 54	+18	17 30	+10	17 56	PS	e 27·6
Mineral	z.	57·7	309	e 9 35 a	− 1	—	—	i 9 58	pP	—
Berkeley	z.	57·9	305	i 9 38	+ 1	—	—	e 10 17	PcP	—
Seattle		59·4	317	e 9 48	0	—	—	e 10 3	pP	—
Arcata		59·6	309	e 9 50 a	+ 1	—	—	—	—	—
Scoresby Sund		60·0	14	i 9 53	+ 1	e 17 56	+ 6	e 18 48	sS	—
Victoria		60·3	318	9 52 a	− 2	—	—	—	—	—
Aberdeen	E.	60·6	33	—	—	i 17 59	+ 1	—	—	—
Paris		61·3	42	e 9 45	−16	e 18 40	sS	e 10 12	pP	e 28·2
Resolute Bay		62·1	351	e 10 7	+ 1	e 18 21	+ 5	e 10 40	pP	e 29·3
Tamanrasset	z.	63·0	72	i 10 14 a	+ 2	i 11 13	sP	i 10 49	pP	—
De Bilt		63·5	39	—	—	e 18 44	+10	—	—	e 31·2
Witteveen	z.	64·5	38	e 10 27	+ 5	—	—	i 11 21	sP	—
Strasbourg		64·7	43	—	—	e 18 55	+ 6	e 19 52	sS	e 31·2
Stuttgart		65·7	43	e 10 29	− 1	e 19 7	+ 6	e 11 2	PcP	e 33·2
Jena		67·3	41	e 10 41?	+ 1	—	—	e 11 19	pP	—
Padova		67·4	48	e 11 6	+26	e 20 9	?	—	—	—
Rome		67·8	51	e 10 42	− 1	i 19 32	+ 6	—	—	—
Collmberg	z.	68·3	41	e 14 36	?	—	—	e 15 17	PP	—
Potsdam		68·4	39	—	—	i 19 39	+ 6	—	—	e 31·2
Prague		69·1	42	e 10 53	+ 2	e 19 50	+ 9	e 11 27	pP	—
Ksara		87·2	57	e 15 24	PP	e 24 8	PS	—	—	—

Additional readings :—
Port au Prince SS = 4m.46s.
Bogota e = 7m.57s.
Chinchina iPcPEN = 8m.2s.
Palisades i = 11m.1s.
Cleveland eE = 12m.35s., eSSE = 12m.46s., eE = 13m.19s.
St. Louis iPP = 7m.46s., eSS = 14m.12s.
La Plata SPE = 16m.21s., QE = 24·0m.
China Lake eZ = 9m.23s.
Fresno eN = 9m.57s., eZ = 10m.6s.
Reno eZ = 14m.9s., eE = 14m.27s.
Lick iZ = 9m.40s.
Alicante ScS = 19m.18s., Q = 23m.32s.
Mineral iZ = 9m.45s.
Seattle e = 9m.53s. and 10m.38s.
Scoresby Sund e = 19m.34s. and 20m.33s.
Paris e = 9m.53s. and 10m.1s., i = 10m.33s. and 10m.47s.
Resolute Bay eE = 19m.46s. and 28m.34s.
Tamanrasset eZ = 10m.42s., ePPZ = 12m.37s.
Strasbourg e = 26m.33s.
Stuttgart eScS = 19m.59s., e = 26m.51s.
Jena eN = 10m.57s., eE = 11m.4s. and 11m.35s.
Prague e = 12m.25s., ePP = 13m.32s., epPP = 14m.6s., epS = 20m.31s.

May 3d. Readings also at 1h. (Jena, Prague, Strasbourg, Stuttgart, Witteveen, near Besançon, and Paris), 3h. (Stuttgart and near Dzhergetal), 5h. (Tacubaya, Lick, near Basle, and Zürich), 6h. (near Almata II, Chilisk, and Kurmenty), 7h. (Tacubaya, near Istanbul, and near Tananarive), 8h. (near Dzhergetal), 9h. (Palomar, Riverside, China Lake, and Ksara), 10h. (Rome, near Andijan, Dzhergetal (2), Khorog, Kulyab, Obi-garm, and Stalinabad), 11h. (near Antofagasta), 13h. (Santa Lucia, Dzhergetal, Fergana, Kurmenty, Rybach'e, near Andijan, Almata, Almata II, Chilisk, Frunse, Ili, Naryn, and Tchimkent), 14h. (near Antofagasta, near Manila, and near Dzhergetal), 15h. (Guadalajara, Tacubaya, and China Lake), 18h. (Andijan, Rybach'e, near Almata II, Ili, Chilisk, Frunse, Krasnogorka, and Kurmenty), 19h. (Huancayo and La Paz), 20h. (Bogota, Tamanrasset, Weston, Fergana, Khorog, Rybach'e, Samarkand, near Andijan, Kulyab, Murgab, Obi-garm, Stalinabad, and Tchimkent), 22h. (Oaxaca, Puebla, Tacubaya, Vera Cruz, and Palomar), 23h. (near Neuchatel and near Kirovobad).

May 4d. 11h. 53m. 13s. Epicentre 44°·4N. 142°·2E. Depth of focus 0·030.

Intensity V at Shiranuka Nobeji ; IV at Kusiro, Urakawa, Morioka, Hatinohe, Meguro, Erimomisaki, Horoman, Honbetsu, Otsu, Shichinohe, and Hukuoka. Epicentre as adopted. Depth 240km.

Seismo. Bull. Cent. Met. Obs., Japan, for 1951, Tokyo, 1951, p. 110, with macroseismic chart.

$A = -·5664$, $B = +·4393$, $C = +·6972$; $\delta = -12$; $h = -3$;
$D = +·613$, $E = +·790$; $G = -·551$, $H = +·427$, $K = -·717$.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Asahigawa	0·6	169	0 30	0	0 55	+ 1	—	—	—
Wakkanai	1·1	335	0 35	+ 2	1 3	+ 4	—	—	—
Abashiri	1·5	104	0 38	+ 2	1 9	+ 5	—	—	—
Sapporo	1·5	205	0 39a	+ 3	1 9	+ 5	—	—	—
Obihiro	1·6	154	0 39	+ 2	1 11	+ 5	—	—	—
Kusiro	2·1	132	0 41k	− 1	1 11	− 3	—	—	—
Muroran	2·2	203	0 46a	+ 3	1 21	+ 5	—	—	—
Urakawa	2·3	169	0 45	+ 1	1 21	+ 4	—	—	—
Mori	2·6	207	0 50a	+ 3	1 24	+ 1	—	—	—
Yuzno-Sakhlinsk	2·6	8	i 0 48	+ 1	i 1 25	+ 2	—	—	—
Nemuro	2·7	114	0 45	− 3	1 19	− 6	—	—	—
Aomori	3·7	197	1 0a	0	1 49	+ 3	—	—	—
Hatinohe	3·9	189	1 1a	− 1	1 46	− 4	—	—	—
Miyako	4·8	182	1 10	− 3	2 6	− 5	—	—	—
Morioka	4·8	190	1 13a	0	2 7	− 4	—	—	—
Akita	5·0	200	1 15a	− 1	2 14	0	—	—	—
Mizusawa	5·3	189	i 1 18	− 1	2 16	− 5	i 2 19	S	—
Sakata	5·8	199	1 27	+ 1	2 11	−21	—	—	—
Isinomaki	6·0	187	1 5	−23	2 9	−28	—	—	—
Sendai	6·2	190	1 30a	− 1	2 37	− 5	—	—	—
Yamagata	6·3	194	1 33	+ 1	2 41	− 3	—	—	—
Hukusima	6·8	192	1 37	− 1	2 55	− 1	—	—	—
Niigata	6·9	202	1 41	+ 1	3 1	+ 3	—	—	—
Aikawa	7·0	206	1 41	0	2 59	− 1	—	—	—
Inawashiro	7·0	194	1 42a	+ 1	3 0	0	—	—	—
Shirakawa	7·4	192	1 46a	0	3 7	− 2	—	—	—
Onahama	7·5	188	1 47a	0	3 4	− 8	—	—	—
Vladivostok	7·6	264	i 1 51	+ 2	e 3 19?	+ 5	—	—	—
Takada	7·9	204	1 51	− 2	3 23	+ 2	—	—	—
Utunomiya	8·0	193	1 53	− 1	3 21	− 2	—	—	—
Mito	8·1	190	1 59a	+ 4	3 25	− 1	—	—	—
Wazima	8·1	212	1 56a	+ 1	3 30	+ 4	—	—	—
Nagano	8·3	203	1 57	− 1	3 14	−16	—	—	—
Tukubasan	8·3	192	1 57	− 1	3 26	− 4	—	—	—
Maebasi	8·4	198	1 58	− 1	3 31	− 1	—	—	—
Matusiro	8·4	202	1 59a	0	3 35	+ 3	—	—	—
Kumagaya	8·5	196	1 59a	− 1	3 23	−12	—	—	—
Oiwake	8·5	200	2 1a	+ 1	3 38	+ 3	—	—	—
Toyama	8·6	208	2 5	+ 3	3 43	+ 6	—	—	—
Titibu	8·7	197	2 3	0	3 39	0	—	—	—
Tyosi	8·7	187	2 5	+ 2	3 34	− 5	—	—	—
Matumoto	8·8	203	2 4	0	3 47	+ 5	—	—	—
Kanazawa	8·9	210	2 6a	0	3 47	+ 3	—	—	—
Tokyo	8·9	193	2 3	− 3	3 39	− 5	—	—	—
Takayama	9·1	206	2 11	+ 3	—	—	—	—	—
Kohu	9·2	199	2 11	+ 2	3 48	− 3	—	—	—
Yokohama	9·2	193	2 10	+ 1	3 46	− 5	—	—	—
Hunatu	9·3	198	2 9a	− 2	3 48	− 5	—	—	—
Hukui	9·4	211	2 14	+ 2	4 1	+ 6	—	—	—
Iida	9·5	202	2 20	+ 7	4 11	+13	—	—	—
Mera	9·6	192	2 18	+ 3	3 59	− 1	—	—	—
Misima	9·6	196	2 12	− 3	3 58	− 2	—	—	—
Gihu	9·9	207	2 20	+ 2	4 9	+ 2	—	—	—
Shizuoka	9·9	199	2 16	− 2	4 2	− 5	—	—	—
Tsuruga	9·9	210	2 19a	+ 1	4 10	+ 3	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Nagoya		10·1	205	2 21	0	4 11	− 1	—	—	—
Hikone		10·2	209	2 25	+ 3	4 16	+ 2	—	—	—
Hamamatu		10·3	201	2 35?	+11	4 10	− 6	—	—	—
Omaesaki		10·3	199	2 23	− 1	4 15	− 1	—	—	—
Kameyama		10·5	207	2 26	0	4 19	− 2	—	—	—
Toyooka		10·5	215	2 27	+ 1	4 26	+ 5	—	—	—
Kyoto		10·6	210	2 25	− 2	4 8	−15	—	—	—
Tu		10·6	206	2 33	+ 6	4 46	+23	—	—	—
Osaka		11·0	210	2 34	+ 2	4 36	+ 4	—	—	—
Kobe		11·1	212	2 33	− 1	—	—	—	—	—
Matsue		11·3	221	2 23	−13	4 35	− 4	—	—	—
Owase		11·3	202	2 35	− 1	4 56	+17	—	—	—
Hatidyozima		11·4	190	2 35	− 3	4 34	− 8	—	—	—
Sumoto		11·5	212	2 38	− 1	—	—	—	—	—
Himeji		11·6	214	2 35	− 5	—	—	—	—	—
Takamatu		11·9	215	2 45	+ 1	—	—	—	—	—
Siomisaki		12·0	207	2 43	− 2	4 53	− 2	—	—	—
Hamada		12·3	223	2 48	− 1	5 7	+ 5	—	—	—
Hirosima		12·5	220	3 8	+17	—	—	—	—	—
Koti		12·7	215	2 59	+ 5	5 32	+21	—	—	—
Matuyama		12·8	218	2 56a	+ 1	5 14	+ 1	—	—	—
Simidu		13·6	215	3 4	− 1	5 47	+16	—	—	—
Ooita		13·9	220	3 30	+21	5 56	+18	—	—	—
Petropavlovsk		13·9	45	i 3 5	− 4	i 5 22	−16	—	—	—
Hukuoka		14·1	224	3 12a	+ 1	5 54	+12	—	—	—
Saga		14·5	224	3 19a	+ 3	—	—	—	—	—
Kumamoto		14·6	222	3 20	+ 3	6 1	+ 7	—	—	—
Nagasaki		15·1	224	3 27	+ 3	—	—	—	—	—
Klyuchi		16·7	38	e 3 44	+ 2	i 6 40	0	—	—	—
Yakusima		16·7	218	3 43	+ 1	6 44	+ 4	—	—	—
Zi-ka-wei	z.	21·0	237	i 4 29	+ 2	i 8 11	+ 9	i 5 8	pP	—
Nanking		22·1	244	i 4 37k	0	i 8 26	+ 4	i 5 17	pP	—
Kabansk		24·7	301	5 1	− 1	9 7	+ 2	5 44	pP	—
Irkutsk		26·2	302	e 5 14	− 2	i 9 29	− 1	5 59	pP	—
Semipalatinsk		41·3	302	e 7 25	0	e 13 21	− 1	—	—	—
Almata II		45·7	294	i 7 59	− 1	—	—	—	—	—
Almata		46·0	294	i 8 1	− 2	i 14 29	− 1	i 8 53	pP	—
Rybach'e		46·9	292	i 8 9	− 1	i 14 44	+ 2	e 16 10	sS	—
Chatra	N.	47·2	267	e 8 12	0	i 14 44	− 3	e 16 12	sS	—
Naryn		47·4	291	e 8 15	+ 1	e 14 53	+ 3	i 16 17	sS	—
Frunse		47·7	293	i 8 16	0	i 14 56	+ 2	i 9 6	pP	—
Andijan		50·1	292	i 8 34	0	i 15 30	+ 3	i 9 25	pP	—
Fergana		50·7	292	e 8 37	− 2	e 15 35	0	9 28	pP	—
Tchimkent		51·2	295	i 8 41	− 1	i 15 44	+ 2	—	—	—
Tashkent		51·9	294	e 8 48	0	i 15 53	+ 1	i 17 22	sS	—
Khorog		52·3	288	e 8 50	0	e 16 0	+ 3	—	—	—
Obi-garm		52·9	291	e 8 54	− 1	i 16 4	− 1	—	—	—
Kulyab		53·3	290	8 57	− 1	—	—	—	—	—
New Delhi		53·3	276	e 8 56	− 2	i 16 9	− 1	i 17 38	sS	—
Stalinabad		53·6	292	i 8 59	− 1	i 16 17	+ 3	—	—	—
Samarkand		54·2	294	9 5	+ 1	16 27?	+ 5	—	—	—
Resolute Bay		55·3	16	e 9 8	− 4	e 16 30	− 7	e 9 42	pP	e 21·4
Mary		58·7	294	9 35	− 1	17 23	+ 1	10 27	pP	—
Ashkabad		60·8	296	e 9 51	0	i 17 52	+ 4	—	—	—
Victoria		61·0	49	9 47	− 5	—	—	—	—	—
Moscow		61·8	322	i 9 54	− 3	i 17 56	− 5	10 48	pP	—
Poona		61·9	269	e 9 55	− 3	i 17 57	− 5	i 19 33	ScS	—
Seattle		62·1	50	e 9 58a	− 1	e 18 7	+ 2	e 10 54	pP	—
Pulkovo		62·2	328	e 9 55	− 5	i 18 1	− 5	e 10 51	pP	—
Bombay	E.	62·4	270	e 10 0	− 1	e 18 16	+ 8	i 19 42	ScS	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Helsinki		63·9	332	—	—	e 18 21	− 6	e 19 35	sS	—
Makhach-Kala		64·5	306	10 9	− 6	i 18 34	0	—	—	—
Baku		64·7	303	e 11 9	pP	e 18 38	+ 1	—	—	—
Scoresby Sund		64·9	355	10 14k	− 3	i 18 35	− 4	19 48	ScS	—
Grozny		65·3	307	i 10 19	− 1	e 18 45	+ 1	—	—	—
Kirovobad		66·6	304	i 10 26	− 2	i 19 0	0	—	—	—
Upsala		66·6	333	i 10 24	− 4	e 18 50?	−10	i 11 18	pP	e 27·8
Tiflis		66·9	307	e 10 29	− 1	i 19 5	+ 2	—	—	—
Mineral	z.	67·0	56	i 10 27a	− 4	—	—	i 11 22	pP	—
Gori		67·1	307	e 10 30	− 1	19 7	+ 1	—	—	—
Borzhomi		67·6	307	e 10 35	+ 1	i 19 16	+ 4	—	—	—
Sotchi		68·5	311	e 10 41	+ 1	e 19 23	+ 1	e 11 35	pP	—
Reno		68·6	55	e 10 39a	− 2	e 19 22	− 2	e 11 33	pP	—
Fresno		70·4	58	e 10 49a	− 3	e 19 45	0	e 13 10	PP	—
Yalta		70·9	314	10 52	− 2	19 49	− 1	e 11 46	pP	—
Tinemaha	z.	71·1	57	i 10 53	− 3	—	—	i 11 48	pP	—
Copenhagen		71·6	333	i 10 56	− 3	i 19 55	− 3	e 11 52	pP	—
Kishinev		71·7	319	10 57	− 2	19 55	− 5	e 11 52	pP	—
Lwow		71·8	323	e 10 57	− 3	i 19 57	− 4	i 11 53	pP	—
Brisbane	z.	72·2	170	i 10 59k	− 3	—	—	—	—	—
China Lake		72·4	57	i 11 0k	− 3	e 20 2	− 5	i 11 55	pP	—
Pasadena		73·1	59	i 11 5a	− 3	—	—	i 12 3	pP	—
Uzhgorod		73·5	324	e 11 12	+ 2	i 20 21	+ 1	—	—	—
Riverside	z.	73·7	59	i 11 8a	− 3	—	—	—	—	—
Raciborzu		74·0	327	e 11 14	+ 1	e 20 23?	− 2	e 14 53	PP	—
Potsdam		74·1	332	i 11 12	− 1	i 20 24	− 2	i 12 7	pP	—
Ivigtut		74·4	6	—	—	i 20 25	− 5	—	—	—
Aberdeen	E.	74·5	342	i 16 42	PPP	i 20 30	− 1	e 24 7	SS	—
Palomar		74·5	69	i 11 13a	− 3	e 20 29	− 2	e 21 4	ScS	—
Collmberg		75·0	330	i 11 15	− 3	e 20 33	− 3	e 12 14	pP	—
Prague		75·5	329	e 11 22	+ 1	e 20 39	− 3	e 12 15	pP	—
Jena		75·8	330	e 11 21	− 2	e 20 42	− 3	e 12 3	pP	—
Istanbul		75·9	315	e 11 29	+ 5	e 20 48	+ 2	e 12 19	pP	—
Witteveen	z.	75·9	335	i 11 24	0	—	—	e 12 19	pP	—
Cheb		76·3	330	e 11 26	0	e 20 46	− 4	e 14 5	PP	—
De Bilt		77·0	335	e 11 19	−11	i 20 55	− 3	e 12 17	pP	e 36·8
Belgrade	N.W.	77·2	322	e 11 35k	+ 4	e 21 22	+22	—	—	—
Ksara		77·4	305	i 12 28k	pP	i 21 3	+ 1	—	—	—
Riverview		78·3	173	i 11 36k	− 1	e 21 31	+19	i 12 33	pP	—
Stuttgart		78·5	331	e 11 35	− 3	e 21 10	− 4	i 12 30	pP	e 40·8
Karlsruhe	z.	78·6	332	e 11 35	− 3	—	—	—	—	—
Kew		79·2	337	i 11 36	− 6	i 21 20	− 1	i 15 34	PP	e 31·8
Strasbourg		79·2	332	e 12 34	pP	e 21 20	− 1	e 15 32	PP	—
Triest		79·4	327	e 11 44	+ 1	i 21 20	− 3	e 12 35	pP	—
Zürich		79·9	331	e 11 41	− 4	e 21 26	− 2	e 12 37	pP	—
Basle		80·1	331	e 11 44	− 2	e 21 32	+ 1	—	—	—
Paris		80·7	335	e 11 49	0	i 21 32	− 5	i 12 43	pP	47·8
Salo	z.	80·7	328	e 11 46k	− 3	—	—	e 12 40	pP	—
Besançon		80·9	332	e 11 49	− 1	—	—	e 12 42	pP	—
Padova		81·1	327	e 12 39	pP	e 22 21	SP	e 15 37	PP	—
Bologna		81·3	327	e 13 21	?	e 21 45	+ 2	e 22 11	PS	—
Pavia		81·5	329	i 12 49k	pP	i 21 45	0	—	—	e 43·2
Jersey	E.	81·7	338	14 42	?	e 21 47?	0	—	—	—
Florence		81·9	327	e 12 0	+ 4	e 21 48	− 1	e 13 9	pP	—
Helwan	N.	82·9	305	e 12 59	pP	i 21 57	− 2	e 23 38	sS	—
Rome		83·0	325	e 12 40	?	i 21 58	− 2	12 58	pP	—
Clermont-Ferrand		83·2	333	—	—	22 11	+ 9	—	—	—
Florissant		84·6	39	—	—	e 22 4	SKS	—	—	—
St. Louis		84·8	39	i 12 8	− 2	i 22 8	SKS	i 13 5	pP	—
Cleveland		85·9	31	e 12 13	− 3	i 22 13	[− 4]	i 13 11	pP	—
Morgantown		88·1	32	i 12 26	0	—	—	i 13 23	pP	—
Harvard		88·4	25	i 12 26	− 2	e 22 29	[− 4]	e 13 23	pP	e 51·1
Weston		88·5	25	e 12 26	− 2	e 22 32	[− 2]	i 13 24	pP	—
Palisades		89·0	27	i 12 28	− 2	i 22 35	[− 2]	i 13 24	pP	—
Wellington		90·2	157	e 12 33	− 3	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Toledo		90·8	335	i 12 39	0	e 22 48	[0]	e 13 49	pP	—
Alicante		91·0	332	13 8	+28	23 17	+ 2	16 24	PP	e 41·4
Algiers Univ.	z.	91·1	328	13 25	pP	—	—	17 8	PP	—
Almeria		93·0	332	13 3	+14	24 10	+37	16 42	PP	—
Granada		93·1	334	i 16 31a	PP	23 16	[+16]	17 28	pPP	—
Malaga		93·8	334	i 13 46	pP	e 24 30	pS	i 17 32	PP	48·4
Tamanrasset	z.	102·3	320	e 13 24	− 7	i 17 42	PP	e 14 27	pP	—
Huancayo		134·5	57	e 18 52	[0]	e 21 58	SKP	e 19 55	pPKP	—
La Paz		142·2	52	e 19 11	[+ 5]	—	—	22 19	PP	67·1

Additional readings :—
Zi-ka-wei iZ = 5m.46s.
Nanking iZ = 6m.3s., 6m.30s., 8m.53s., 9m.15s., and 10m.3s.
Kabansk sS = 10m.29s.
Irkutsk sS = 10m.51s.
Frunse esS = 16m.25s.
Andijan isS = 16m.58s.
Fergana esS = 17m.5s.
New Delhi eEN = 18m.16s., eSSEN = 19m.59s.
Resolute Bay eZ = 9m.57s., eE = 10m.27s., eZ = 10m.47s., eEZ = 12m.37s., eE = 17m.11s., 18m.4s., and 18m.34s.
Mary sS = 18m.59s.
Moscow sS = 19m.22s.
Poona SSE = 21m.10s.
Seattle e = 10m.15s. and 11m.10s., ePP = 12m.9s., e = 18m.37s.
Pulkovo isS = 19m.22s.
Scoresby Sund 20m.21s.
Upsala eE = 14m.29s., eN = 15m.27s., iSP = 19m.11s., isS? = 19m.55s.
Mineral iZ = 10m.32s.
Copenhagen 14m.22s., iScS = 20m.29s.
China Lake iEZ = 11m.6s., e = 11m.45s., eEN = 20m.43s.
Pasadena iZ = 11m.49s.
Raciborzu eN = 20m.45s.
Collmberg epPP = 14m.58s.
Prague eE = 12m.28s., esPZ = 12m.42s., ePPE = 14m.13s., epPPE = 14m.57s., eScS? = 21m.11s., epSE = 21m.37s., esS = 22m.1s., e = 23m.51s., eSS? = 25m.20s.
Jena ePE = 11m.24s., epP?N = 12m.8s., eN = 12m.19s., eE = 21m.8s.
Cheb eE = 22m.32s.
De Bilt epPP = 15m.16s., ePS = 21m.22s., esS = 21m.37s.
Riverview ePPSE = 22m.49s.
Stuttgart epPP = 15m.30s., e = 21m.35s., 23m.41s., and 32m.17s.
Kew iZ = 12m.36s.
Strasbourg e = 13m.4s., 17m.20s., 21m.14s., and 29m.47s.?
Triest ePS = 22m.0s., eSS = 22m.24s.
Zürich epPP = 15m.33s.
Paris ipP = 13m.10s., ipPP = 15m.46s., eS = 21m.36s., eSKS = 21m.45s., eSP = 22m.19s., eSPP = 22m.40s., esS = 23m.10s., eSS = 26m.54s., esSS = 28m.0s., and other unidentified readings.
Helwan eN = 23m.59s.
Rome iZ = 16m.8s., e = 22m.50s.
St. Louis ePPP = 17m.19s., e = 18m.17s., iPS = sS = 23m.56s.
Cleveland eSPN = 23m.17s.
Palisades iS = 22m.55s., iSP = 23m.56s.
Alicante SS = 28m.34s., SSS = 32m.8s., Q = 35m.56s.
Granada SS = 26m.59s.
Malaga PPP = 19m.30s.
Tamanrasset epPPZ = 18m.39s.
Long waves were also recorded at Tortosa.

May 4d. 19h. 27m. 15s. Epicentre 7°·1N. 34°·6W. (as on 1950, January 2d.).
$A = +·8169$, $B = -·5635$, $C = +·1228$; $\delta = -6$; $h = +7$:
$D = -·568$, $E = -·823$; $G = +·101$, $H = -·070$, $K = -·992$.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bogota	39·3	269	e 7 42	+10	e 13 26	− 8	—	—	—
Malaga	40·3	38	e 9 11	PP	e 13 51	+ 2	—	—	18·7
La Paz	40·6	234	i 7 49	+ 6	i 14 9	+15	—	—	17·4
Granada	41·1	38	i 7 54a	+ 7	13 59	− 2	9 59	PPP	21·4
Almeria	41·6	40	8 22	+31	14 52	+44	—	—	21·7

Continued on next page,

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tamanrasset	z.	41·6	63	e 7 47	− 4	e 9 23	PcP	e 9 10	PP	18·8
Alicante		43·8	39	9 7	PP	14 8	−32	9 56	PP	e 20·9
Huancayo		44·8	245	e 8 16	− 1	e 15 36	+41	—	—	e 18·4
Algiers Univ.	z.	45·2	44	8 10	−10	—	—	—	—	—
Weston		47·8	324	e 8 42	+ 1	—	—	—	—	—
Harvard		48·0	324	i 8 44	+ 1	—	—	—	—	e 22·4
Clermont-Ferrand		50·4	34	9 45?	?	e 16 13	− 1	—	—	e 24·4
Rathfarnham Castle		51·5	21	e 9 7?	− 2	e 16 46	+17	—	—	e 22·2
Paris		52·0	30	i 9 9	− 4	i 16 32	− 4	e 20 14	SS	e 22·8
Kew		52·5	26	e 9 12	− 5	e 16 45	+ 2	—	—	e 22·8
Pavia		53·6	37	—	—	e 21 40	SSS	—	—	—
Rome		54·1	42	e 9 26	− 3	e 17 4	− 1	e 11 12	PP	e 25·4
Strasbourg		54·6	33	e 9 29	− 3	e 17 8	− 3	e 17 13	S	e 25·2
De Bilt		55·5	28	—	—	e 17 30	+ 6	—	—	e 23·8
Stuttgart		55·5	34	e 9 35	− 4	e 17 25	+ 1	—	—	e 26·8
Triest		56·6	39	e 12 9	PP	—	—	—	—	—
Jena		58·0	33	e 9 52?	− 5	—	—	e 11 59	PP	—
Scoresby Sund		63·8	4	e 10 35	− 1	e 19 17	+ 6	—	—	27·4
Ksara		69·9	57	e 11 16	+ 1	e 21 12	+48	—	—	—
Palomar	z.	79·7	303	e 12 15	+ 4	—	—	e 12 22	PcP	—
Riverside	z.	80·1	304	e 12 16	+ 3	—	—	—	—	—
China Lake	z.	80·2	306	e 12 17	+ 3	—	—	i 12 23	PcP	—
Mount Wilson	z.	80·7	304	e 12 21	+ 5	—	—	—	—	—
Reno	z.	81·8	309	e 12 27	+ 5	—	—	—	—	—
Mineral	z.	83·2	310	e 12 37 a	+ 8	—	—	—	—	—

Additional readings :—
La Paz S =11m.12s.
Tamanrasset eZ =7m.52s., iPPPZ =9m.51s., eZ =10m.2s.
Alicante PPS =14m.26s., SS =17m.27s., Q =17m.52s., SSS =18m.20s.
Paris i =9m.41s., 10m.4s., and 10m.42s., e =16m.35s. and 16m.42s.
Jena eN =10m.55s.
Long waves were also recorded at La Plata, Ottawa, and other European stations.

May 4d. Readings also at 1h. (Zi-ka-wei, Obi-garm, near Andijan, Khorog, and Kulyab), 2h. (Paris, Strasbourg, and Potsdam), 3h. (near Tananarive), 7h. (near Andijan), 8h. (Erevan), 9h. (Guadalajara, Manzanillo, Tacubaya, Mount Wilson, Riverside, China Lake, and near Makhach-Kala), 10h. (Christchurch, Wellington, and Resolute Bay), 11h. (Oaxaca, Puebla, Tacubaya, and near Klyuchi), 12h. (near Tamanrasset), 13h. (Chilisk, Frunse, Rybach'e, near Almata, Almata II, Krasnogorka, and Kurmenty), 15h. (near Antofagasta), 17h. (Copiapo), 18h. (Brisbane), 19h. (Palomar, Pasadena, Riverside, China Lake, near Alicante, Almeria, Malaga, Granada, and Toledo), 21h. (Ksara, Kurmenty, La Paz, and near Apia), 22h. (Apia).

May 5d. 3h. 29m. 41s. Epicentre 6°·5S. 145°·8E. Depth of focus 0·005.
(as on 1946, Sept. 23d.).

A = −·8220, B = +·5586, C = −·1108 ; δ = −1 ; h = +7 ;
D = +·562, E = +·827 ; G = +·092, H = −·062, K = −·994.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane		22·1	163	i 4 58 a	+ 7	i 9 4	+19	e 5 21	pP	—
Riverview		27·7	171	—	—	e 10 25	+ 5	e 12 1	SSS	e 13·7
Vladivostok		50·9	348	i 8 55	− 2	i 16 1	− 6	—	—	—
Petropavlovsk		60·3	8	e 10 1	− 3	—	—	—	—	—
Kabansk		67·1	335	e 10 49	0	e 19 35	− 1	—	—	—
Almata II		79·0	317	e 12 0	+ 1	—	—	—	—	—
Almata		79·3	317	e 12 2	+ 2	—	—	—	—	—
Andijau		81·8	313	12 16	+ 3	e 22 25	+ 5	—	—	—
Kulyab		83·0	310	e 12 24	+ 4	—	—	—	—	—
Mineral	z.	96·1	51	i 13 21 a	− 1	—	—	i 13 31	?	—
Reno	z.	97·4	52	e 13 27 a	− 1	—	—	—	—	—
Mount Wilson	z.	98·7	57	i 13 33	0	—	—	—	—	—
China Lake	z.	99·1	55	i 13 33	− 2	—	—	—	—	—
Riverside	z.	99·2	57	i 13 33	− 3	—	—	—	—	—
Tamanrasset	z.	138·4	297	e 22 45	PKS	—	—	—	—	—
La Paz		139·4	125	e 19 39	[+19]	—	—	—	—	—

Brisbane gives also isSE =9m.40s., eSSE =9m.48s.

May 5d. Readings also at 2h. (Copiapo and near Kurmenty), 3h. (Copiapo and near Seattle), 4h. (Almata II, Kurmenty, Przhevalsk, near Naryn, Rybach'e, Frunse, Krasnogorka, Ili, Chilisk, Andijan, Almata, Mount Wilson, Riverside, China Lake, Lick, Reno, Puebla, and near Tacubaya), 6h. (near Kurmenty), 7h. (Zürich and near Klyuchi), 8h. (Mineral), 9h. (Apia and Lick), 10h. (Oaxaca, Puebla, and near Tacubaya), 12h. (Ashkabad, Kulyab, Stalinabad, near Andijan, Garm, Fergana, Obi-garm, Khorog, near Zürich, and Stuttgart), 13h. (La Plata), 14h. (Kulyab, Tchimkent, Samarkand, Almata II, near Khorog, Obi-garm, Garm, Stalinabad, Murgab, Fergana, and Andijan), 15h. (La Plata, and near Makhach-Kala), 20h. (Huancayo, La Paz, Galerzamba, near Bogota, Chinchina, and near Copiapo), 22h. (Rathfarnham Castle).

May 6d. 21h. 42m. 19s. Epicentre 10°·4N. 85°·7W. (as on 1950, Nov. 11d.).

$A = +\cdot0738$, $B = -\cdot9810$, $C = +\cdot1794$; $\delta = -1$; $h = +6$;
$D = -\cdot997$, $E = -\cdot075$; $G = +\cdot013$, $H = -\cdot179$, $K = -\cdot984$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Galerazamba		10·3	87	i 3 33	+61	i 5 44	+74	i 4 1	?	6·7
Chinchina		11·3	118	e 2 51	+ 5	e 4 58	+ 4	e 2 55	PP	—
Bogota		12·9	116	i 3 9	+ 2	i 5 40	+ 7	—	—	6·3
Tacubaya		15·8	305	e 3 51	+ 6	e 6 52	+10	—	—	—
Miami		16·2	18	e 4 16	PPP	i 7 18	SSS	—	—	—
Fort de France		24·3	78	e 5 35	+15	—	—	—	—	—
Huancayo		24·6	157	e 5 20	− 3	e 9 51	+ 9	e 5 59	PP	e 13·3
St. Louis		28·4	353	e 5 56	− 2	e 10 52	+ 7	e 9 21	PcP	—
Morgantown		29·6	9	e 6 8	− 1	—	—	e 7 31	?	—
Cleveland		31·2	6	i 6 21k	− 2	e 13 58	SSS	—	—	—
La Paz		31·9	147	e 6 37	+ 8	e 11 53	+13	i 14 25	QQ	16·3
Palisades		32·2	19	e 6 34	+ 2	—	—	—	—	e 17·0
Harvard		34·3	20	e 6 49	− 1	—	—	—	—	e 17·4
Weston		34·3	20	e 6 49	− 1	—	—	—	—	e 19·2
Ottawa		35·9	12	i 7 2	− 2	e 13 1	+19	—	—	e 19·7
Palomar	Z.	36·6	315	i 7 12	+ 2	—	—	—	—	—
Riverside	Z.	37·3	314	i 7 18	+ 2	—	—	—	—	—
Pasadena	Z.	38·0	314	i 7 23	+ 2	—	—	—	—	—
China Lake	Z.	38·4	318	i 7 27	+ 2	—	—	i 7 35	?	—
Seven Falls	E.	38·7	17	e 9 17	PPP	e 19 17	SS	—	—	19·4
Tinemaha	Z.	39·6	318	i 7 36	+ 1	—	—	i 9 40	PcP	—
Fresno	Z.	40·4	317	e 7 41a	0	—	—	—	—	—
Reno	Z.	41·9	320	e 7 56a	+ 2	—	—	—	—	—
Lick	Z.	42·0	316	i 7 56a	+ 2	—	—	—	—	—
Berkeley	Z.	42·7	316	e 8 1	+ 1	—	—	e 8 11	?	—
Mineral	Z.	43·6	320	e 8 8k	0	e 9 55	PP	e 8 16	?	—
Granada		77·5	55	e 11 45a	−14	—	—	—	—	38·3
Alicante		79·9	53	12 8	− 4	22 4	−12	30 40	SSS	e 35·0
Paris		81·1	42	e 12 15	− 3	—	—	e 11 58	?	e 37·7
Tamanrasset	Z.	87·1	68	e 12 46	− 3	—	—	—	—	—
Cheb		87·2	39	—	—	e 24 5	PS	—	—	—

Additional readings :—
Chinchina ePPP = 3m.3s.
Huancayo e = 5m.26s. and 10m.35s.
St. Louis e = 6m.11s.
Fresno eEN = 7m.49s., eZ = 8m.17s.
Lick iZ = 8m.5s. and 8m.12s.
Alicante PPP = 16m.20s., S = 21m.11s., ScS = 21m.30s., SS = 25m.42s.
Paris e = 12m.2s. and 12m.21s.
Long waves were also recorded at La Plata, Scoresby Sund, and at several other European stations.

May 6d. 23h. 3m. 32s. (I) | Epicentre 13°·0N. 87°·8W. Depth of focus 0·010.
23h. 8m. 1s. (II) | (as on 1951, Jan. 19d.).

Destructive in El Salvador; complete destruction of Jucuapa, considerable damage at Chinameca and surrounding villages, more than 1000 dead, formation of crevasses and hot springs. Epicentre 13°·5N. 88°·4W., depth 100km. (Strasbourg).

H. Meyer-Abich.
Das Erdbeben von Jucuapa im El Salvador (Zentral Amerika), vom 6 und 7, Mai, 1951. Neues Jahrbuch, Geologie, Paläontologie, Abhandlungen, 1952, vol. 95, No. 3, pp.311-336, with isoseismic and geological maps.

$A = +·0374$, $B = -·9740$, $C = +·2235$; $\delta = +3$; $h = +6$;
$D = -·999$, $E = -·038$; $G = +·009$, $H = -·223$, $K = -·975$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
I	Merida	8·1	348	e 1 51	− 6	i 3 24	− 3	—	—	—
II		8·1	348	—	—	i 3 27	0	—	—	—
I	Oaxaca	9·5	296	e 2 9	− 7	i 3 56	− 5	—	—	—
II		9·5	296	—	—	i 4 56	?	—	—	—
I	Vera Cruz	10·1	309	—	—	e 4 23	+ 7	—	—	e 5·5
II		10·1	309	—	—	e 4 12	− 4	—	—	—
I	Puebla	11·6	302	e 2 38	− 6	e 4 45	− 7	—	—	e 5·7
II		11·6	302	—	—	e 4 52?	0	—	—	e 5·7
I	Galerazamba	12·5	99	i 3 12	+16	i 4 51	−22	e 8 40	PcP	e 6·0
I	Tacubaya	12·6	302	i 2 53	− 4	i 5 19	+ 4	i 5 30	SS	—
II		12·6	302	—	—	i 5 23	+ 8	i 5 42	SSS	—
I	Chinchina	14·4	122	i 3 36	pP	i 6 38	sS	—	—	—
II		14·4	122	i 3 34	pP	e 6 35	sS	—	—	—
I	Miami	14·7	28	i 3 24	0	—	—	e 4 22	sP	—
I	Bogota	15·9	120	i 3 46	+ 7	i 7 11	sS	i 4 9	pP	—
II		15·9	120	i 3 48	+ 9	i 7 16	sS	i 4 9	pP	—
I	Guadalajara	16·7	299	—	—	e 7 4	+14	—	—	—
II		16·7	299	e 3 43	− 6	—	—	—	—	—
I	Lubbock	24·2	332	4 59	− 9	—	—	—	—	—
II		24·2	332	e 5 1	− 7	—	—	—	—	—
I	St. Louis	25·6	4	e 5 19	− 3	e 9 33	− 7	e 5 50	pP	—
II		25·6	4	e 5 17	− 5	i 10 42	SS	i 5 54	pP	—
I	Fort de France	25·9	84	e 5 32	+ 7	e 10 32	sS	—	—	e 13·7
I	Morgantown	27·4	13	i 5 38	0	—	—	e 8 24	?	—
II		27·4	13	i 5 38	0	—	—	—	—	—
I	Huancayo	27·8	155	e 5 50	+ 8	e 10 49	sS	e 6 52	PPP	e 12·0
II		27·8	155	e 5 50	+ 8	—	—	—	—	—
I	Pittsburgh z.	28·2	13	e 5 15?	−31	—	—	—	—	—
II	z.	28·2	13	e 5 21?	−25	—	—	—	—	—
I	Cleveland	28·9	9	e 5 47a	− 5	e 10 37	+ 3	—	—	—
II	z.	28·9	9	i 5 50a	− 2	—	—	—	—	—
I	Pennsylvania E.	29·0	15	—	—	e 10 36	+ 1	—	—	—
I	City College, N.Y.	30·3	22	i 6 4	0	—	—	—	—	—
II		30·3	22	i 6 5	+ 1	i 11 15	+19	—	—	—
I	Fordham	30·3	22	e 6 4	0	e 11 2	+ 6	—	—	15·5
II		30·3	22	e 6 5	+ 1	—	—	e 6 15	?	—
I	Palisades	30·4	22	i 6 5	0	e 11 2	+5	—	—	e 15·3
II		30·4	22	i 6 6	+ 1	—	—	—	—	—
I	Harvard	32·6	23	i 6 23	− 1	—	—	e 14 15	Q	e 16·2
II		32·6	23	i 6 23	− 1	—	—	—	—	—
I	Weston	32·6	23	e 6 24	0	—	—	e 6 55	sP	—
II		32·6	23	e 6 23	− 1	—	—	e 6 53	sP	—
I	Palomar z.	33·3	313	e 6 26	− 4	—	—	i 6 45	pP	—
II	z.	33·3	313	e 6 27	− 3	—	—	i 6 47	pP	—
I	Ottawa	33·9	15	i 6 32	− 4	e 11 56	+ 4	—	—	—
II		33·9	15	i 6 32	− 4	e 12 7	+15	—	—	—
I	Riverside z.	34·0	314	e 6 31	− 5	—	—	—	—	—
II	z.	34·0	314	e 6 36	0	—	—	e 6 50	pP	—
I	Pasadena	34·7	314	e 6 40	− 2	i 11 34	−30	i 6 57	pP	e 15·5
II	z.	34·7	314	e 6 39	− 3	—	—	i 6 57	pP	—
I	China Lake z.	35·1	317	e 6 41	− 5	—	—	—	—	—
II	z.	35·1	317	e 6 41	− 5	—	—	i 6 45	P	—
I	La Paz	35·2	146	e 6 50	+ 3	i 12 36	+24	i 8 19	PP	17·7
I	Tinemaha z.	36·3	318	e 6 54	− 2	—	—	—	—	—
II	z.	36·3	318	e 6 54	− 2	—	—	—	—	—

Continued on next page.

			Δ	Az.	P.	O – C.	S.	O – C.	Supp.		L.
			°	°	m. s.	s.	m. s.	s.	m. s.		m.
I	Seven Falls	E.	36·9	19	e 7 4	+ 3	e 12 49	+11	e 15 34	SSS	19·2
II		E.	36·9	19	e 7 4	+ 3	e 12 43	+ 5	—	—	—
I	Fresno		37·1	316	e 7 4a	+ 1	e 12 48	+ 7	e 8 28	PP	—
II		Z.	37·1	316	e 7 0	− 3	—	—	—	—	—
I	Halifax		37·7	29	e 8 32	PP	e 12 56	+ 6	e 15 52	SSS	e 18·5
I	Reno	Z.	38·6	319	e 7 11a	− 4	—	—	e 8 49	PP	—
II		Z.	38·6	319	e 7 13	− 2	—	—	—	—	—
I	Lick		38·7	316	e 7 14k	− 2	—	—	i 7 57	pP	—
II		Z.	38·7	316	e 7 11a	− 5	—	—	i 7 16	P	—
I	Berkeley		39·4	316	e 7 24	+ 2	e 13 28	+12	i 21 52	?	e 19·5
II		Z.	39·4	316	e 7 20	− 2	e 13 35	+19	—	—	—
I	Mineral	Z.	40·2	319	e 7 25k	− 3	e 13 31	+ 3	e 9 4	PP	—
II		Z.	40·2	319	e 7 27a	− 1	—	—	—	—	—
I	Saskatoon		41·9	343	—	—	e 17 9	SS	—	—	—
II			41·9	343	9 23	PP	—	—	—	—	20·2
I	Arcata	Z.	42·1	318	e 7 45a	+ 1	—	—	—	—	—
II		Z.	42·1	318	e 7 40	− 4	—	—	—	—	—
I	Seattle		44·9	328	e 8 9k	+ 2	e 14 34	− 3	i 8 27	pP	—
II			44·9	328	i 8 7k	0	—	—	i 8 26	pP	e 21·0
II	Victoria		45·9	328	8 11	− 3	—	—	—	—	—
I	La Plata		55·4	150	9 28	+ 2	17 16	+14	11 40	PP	28·7
II		E.	55·4	150	9 11	−15	16 59	− 3	—	—	—
I	Resolute Bay		61·8	358	i 10 5	− 6	e 18 27	+ 2	e 12 24	PP	e 27·7
II			61·8	358	i 10 7	− 4	e 18 28	+ 3	e 11 5	PcP	—
I	Reykjavik	Z.	67·9	26	i 10 51	+ 1	—	—	—	—	—
II		Z.	67·9	26	i 10 50	0	—	—	—	—	—
I	Scoresby Sund		69·8	19	i 11 2a	0	i 20 11	+ 9	21 10	ScS	34·5
II			69·8	19	e 11 2	0	i 20 11	+ 9	21 11	ScS	—
I	Rathfarnham C.		74·6	38	e 11 25	− 5	—	—	—	—	e 35·5
II			74·6	38	i 11 34	+ 4	—	—	—	—	—
I	Aberdeen	E.	76·9	34	—	—	e 22 38	PPS	i 25 51	SS	e 36·8
II		E.	76·9	34	—	—	i 23 34	?	—	—	—
I	Toledo		77·0	52	e 11 44	0	e 21 34	+11	e 26 24	SS	35·8
I	Malaga		77·1	54	i 11 47	+ 3	e 21 25	+ 1	i 14 45	PP	35·8
II			77·1	54	i 11 46	+ 2	—	—	—	—	—
I	Durham		77·3	37	—	—	e 21 33	+ 7	i 29 35	SSS	—
I	Granada		77·7	54	i 12 14a	pP	22 1	+31	26 25	SS	i 36·4
I	Kew		78·4	40	i 11 51	− 1	—	—	—	—	e 31·5
II			78·4	40	i 11 53	+ 1	—	—	—	—	—
I	Almeria		78·6	55	e 12 7	+14	e 21 59	+19	15 5	PP	39·6
I	Alicante		80·0	53	12 10	+10	21 36	−19	15 5	PP	e 36·9
I	Tortosa		80·4	50	e 11 54	− 8	22 56	PS	—	—	—
I	Paris		80·5	42	e 12 5	+ 2	e 22 34	SP	e 12 30	pP	35·5
II			80·5	42	i 12 5	+ 2	e 23 5	PS	e 12 30	pP	—
I	Clermont-Ferrand		81·4	46	—	—	e 23 4	PS	e 27 46	SS	e 36·3
II	De Bilt		81·7	38	e 11 59	−10	e 22 59	PS	—	—	e 38·0
II	Witteveen	Z.	82·4	37	e 12 16k	+ 3	—	—	—	—	—
I	Besançon		83·1	43	e 12 20	+ 4	—	—	e 13 2	sP	—
II			83·1	43	e 12 20	+ 4	—	—	e 13 10	sP	—
I	Strasbourg		84·0	41	e 12 24	+ 3	e 22 48	+13	e 23 34	sS	38·5
II			84·0	41	e 12 21	0	—	—	e 12 51	pP	—
II	Basle		84·1	43	e 12 23	+ 2	e 22 41	+ 5	—	—	—
I	Zürich		84·8	43	e 12 27	+ 2	—	—	—	—	—
II			84·8	43	e 12 26	+ 1	—	—	—	—	—
I	Stuttgart		84·9	41	e 12 27	+ 2	e 23 40	PS	e 15 43	PP	e 40·5
II			84·9	41	e 12 27	+ 2	e 28 18	SS	e 15 44	PP	—
I	Copenhagen		85·1	34	e 12 32	+ 6	—	—	—	—	39·5
II			85·1	34	—	—	e 22 42	− 4	24 29	PPS	—
I	Pavia		85·7	45	—	—	e 23 58	PS	e 28 16	SS	—
II			85·7	45	e 18 2	PPP	e 31 26	SSS	—	—	—
I	Jena	E.	85·8	39	e 12 33	+ 3	—	—	—	—	—
II		E.	85·8	39	e 12 33	+ 3	—	—	e 15 56	PP	—
I	Potsdam		86·3	38	—	—	e 24 16	PS	—	—	e 38·5
II		Z.	86·3	38	e 12 37	+ 5	—	—	—	—	—
I	Upsala		86·4	29	—	—	e 24 11	PS	e 24 19	SPP	e 43·5
II			86·4	29	—	—	e 24 14	PS	—	—	—

Continued on next page.

			△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
			°	°	m. s.	s.	m. s.	s.	m. s.		m.
II	Cheb		86·6	39	e 13 8	pP	e 23 3	+ 2	e 16 4	PP	—
I	Collmberg	z.	86·6	39	e 12 34	0	—	—	e 21 55	?	—
II		z.	86·6	39	e 12 36	+ 2	—	—	e 16 0	PP	—
I	Padova		87·8	45	e 13 4	pP	e 24 30	PS	e 16 34	pPP	—
I	Prague		87·8	39	e 13 30	sP	—	—	e 16 48	sPP	—
II			87·8	39	e 12 40	+ 1	e 23 19	+ 7	e 13 17	pP	—
I	Tamanrasset	z.	88·0	67	e 12 44	+ 4	e 16 15	PP	e 13 21	pP	—
II		z.	88·0	67	i 12 46k	+ 6	e 16 15	PP	e 13 25	pP	e 44·9
I	Triest		88·7	44	e 12 50	+ 6	e 23 9	[+ 7]	e 13 32	pP	—
II			88·7	44	e 12 47	+ 3	e 23 30	+10	—	—	—
I	Rome		88·9	47	e 13 15?	pP	e 24 8	PS	e 29 38	SS	—
II			88·9	47	e 13 33	sP	29 19	SS	—	—	—
II	Budapest		91·6	41	e 13 42	sP	e 24 29	sS	—	—	e 53·0
I	Skalnate Pleso		91·7	38	—	—	e 22 16	?	e 26 8	?	—
II			91·7	38	—	—	e 23 24	[+ 5]	e 25 5	SP	—
I	Timosoara		94·6	42	—	—	e 25 28	SP	e 27 28	?	e 54·5
I	Istanbul	E.	100·8	44	—	—	e 24 59	− 6	e 32 24	SS	e 48·5
II		E.	100·8	44	—	—	e 25 20	+15	e 26 50	PS	—
I	Ksara		109·0	48	e 12 43	?	—	—	—	—	—
II			109·0	48	e 19 13	PP	—	—	—	—	—

Additional readings and note :—
Unidentified readings are referred to quake I unless distinguished by the recording station.
Oaxaca I i =4m.13s. and 4m.57s.
Puebla I e =4m.50s. and 5m.12s.
Galerazamba I eScPEN =11m.51s.
Bogota I isS =7m.32s.
St. Louis I e =5m.37s., isP? =6m.36s., i =6m.58s. and 9m.59s., isS =10m.31s., i =12m.50s., II i =9m.59s., 11m.19s., and 12m.51s.
Cleveland I iPZ =5m.50s., eE =11m.29s.
La Paz I iP =6m.56s., i =9m.12s. and 14m.52s., iSS =15m.30s., iSSS =16m.0s.
Fresno I eZ =21m.40s., II ePKP,PKP =36m.38s.
Reno I eZ =7m.19s., eN =21m.40s., eE =22m.28s.
Lick I iZ =7m.25s., eEN =21m.40s., eZ =22m.10s., II ePKP,PKPZ =36m.35s.
Mineral I iZ =7m.36s., eZ =27m.8s., II ePKP,PKPZ =36m.45s.
Seattle I isP =8m.36s., iPcS =13m.37s., ipS =14m.53s., esS =15m.5s., and other readings without given phase.
La Plata I PN =9m.52s., N =20m.28s.
Rathfarnham Castle e =18m.39s., 19m.19s., and 33m.0s.
Toledo I e =14m.43s. and 16m.18s.
Granada I PP =15m.27s.
Almeria I PPP =16m.57s., SS =26m.49s.
Alicante I PPS =22m.55s., SS =26m.48s., Q =33m.15s.
Paris I esP? =13m.49s., ePP =15m.18s., ePKS =19m.55s., e =20m.19s., ePS =23m.10s., e =25m.8s., eSS =27m.23s., e =28m.14s., i =29m.48s., iSSS =30m.58s., Q =33·5m. II ePP =15m.1s., eSKP =19m.19s., iPPS =23m.24s., eSS =27m.20s.
Besançon I e =12m.31s. and 12m.47s.
Strasbourg II esP? =13m.17s., ePP =15m.42s.
Stuttgart I eZ =12m.41s., e =25m.34s., 26m.9s., 29m.43s., and 36m.28s. II ePZ = 15m.51s.
Jena I eN =12m.37s., II ePN =12m.36s.
Upsala I eE =27m.31s.? and 33m.22s.
Cheb II esP =13m.26s., eN =13m.59s. and 15m.41s., epPP =16m.37s., e =18m.31s., eN = 20m.37s., e =20m.56s., eN =22m.23s. and 23m.31s., ePS =24m.26s., eE =24m.59s., e =28m.29s., eN =30m.41s.
Prague I eE =14m.51s. and 15m.7s., II esP =13m.28s., e =14m.20s., eE =14m.34s., e =15m.30s., ePP =16m.20s., esPP =17m.13s., esS =24m.21s., eSS =28m.29s.
Triest I esS? =24m.32s., ePS? =25m.7s., eSS =29m.53s., esSS =31m.1s.
Istanbul readings wrongly identified.
Long waves to one or the other of these shocks were also recorded at Santa Clara, Ivigtut, Karlsruhe, Bombay, Tananarive, Auckland, Christchurch, Tuai, and Wellington.

Aprul 6d. Readings also at 1h. (Gori, Borzhomi, Erevan, Makhach-Kala, near Tiflis, Leninakan, Kirovobad, Grozny, Almata II, Ili, Frunse, near Khorog, Murgab, Garm, Obi-garm, Kulyab, Fergana, Andijan, Stalinabad, Naryn, and Tchimkent), 2h. (near Antofagasta), 5h. (near Apia and near Mizusawa), 7h. (Brisbane and near Apia), 8h. (Wellington, Cobb River, Kaimata, near Alicante (3), near Frunse, and near Kurmenty), 10h. and 11h. (near Alicante), 14h. (Apia), 16h. (near Apia), 20h. (Copiapo and near Antofagasta), 22h. (Palomar, China Lake, Mary, Obi-garm, Tchimkent, Naryn, Frunse, Krasnogorka, Almata II, Przhevalsk, Ili, near Khorog, Andijan, Kulyab, Murgab, Stalinabad, Tashkent, Rybach'e, and Lunacharskoe), 23h. (Mount Wilson, Riverside, Palomar, China Lake, Tinemaha, Collmberg, Potsdam, Jena, Stuttgart, Tamanrasset, and Ksara).

May 7d. 20h. 22m. 21s. Epicentre 13°·0N. 87°·8W. (as on 6d.).

$A = +\cdot0374$, $B = -\cdot9740$, $C = +\cdot2235$; $\delta = +3$; $h = +6$;

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Merida		8·1	348	e 2 2	0	e 3 35	0	—	—	—
Oaxaca		9·5	296	—	—	e 4 11	+ 1	e 4 53	S*	—
Vera Cruz		10·1	309	e 2 27	− 2	4 19	− 6	e 4 39	SS	—
Puebla		11·6	302	e 2 50	0	e 4 57	− 4	i 5 16	SSS	—
Galerazamba		12·5	99	i 3 39	+37	e 6 32	+69	—	—	—
Tacubaya		12·6	302	e 3 4	+ 1	e 5 40	SS	e 5 52	sS	—
Chinchina		14·4	122	i 3 38	+11	e 7 38	L	e 12 33	PcS	(e 7·6)
Bogota		15·9	120	i 3 49	+ 2	—	—	—	—	—
Fort de France		25·9	84	—	—	e 10 33	+29	—	—	e 13·4
Morgantown		27·4	13	i 5 49	0	e 11 22	+54	—	—	—
Huancayo		27·8	155	e 6 6	+13	e 11 9	+34	—	—	e 12·2
Pittsburgh	N.W.	28·2	13	i 5 50	− 6	i 11 7	+26	—	—	—
Cleveland		28·9	9	i 6 2a	− 1	e 10 52	− 1	i 6 43	PP	—
Palisades		30·4	22	—	—	e 11 19	+ 3	—	—	e 15·4
Harvard		32·6	23	i 6 37	+ 2	—	—	—	—	e 16·6
Weston		32·6	23	i 6 37	+ 2	—	—	—	—	e 15·8
Palomar	Z.	33·3	313	e 6 39	− 2	—	—	—	—	—
Ottawa		33·9	15	i 6 46	− 1	e 11 43	−28	—	—	e 17·6
Riverside	Z.	34·0	314	e 6 45	− 3	—	—	—	—	—
Pasadena		34·7	314	e 6 51	− 3	—	—	—	—	(e 16·4)
China Lake	Z.	35·1	317	e 6 54	− 3	—	—	—	—	—
La Paz		35·2	146	7 5	+ 7	i 11 55	−36	e 8 31	PPP	18·0
Shawinigan Falls	N.	35·8	18	e 7 3	0	—	—	—	—	—
Tinemaha	Z.	36·3	318	e 7 5	− 2	—	—	—	—	—
Seven Falls	E.	36·9	19	—	—	e 13 8	+10	e 15 57	SSS	e 19·2
Fresno	Z.	37·1	316	e 7 15k	+ 1	—	—	e 8 40	PP	—
Lick	Z.	38·7	316	i 7 26a	− 1	—	—	i 8 12	pP	—
Mineral	Z.	40·2	319	i 7 40a	0	—	—	—	—	—
Saskatoon		41·9	343	—	—	e 16 52	SS	—	—	e 22·0
Arcata	Z.	42·1	318	e 7 57a	+ 2	—	—	—	—	—
Seattle		44·9	328	e 8 19	+ 1	e 17 49	SS	e 9 50	PP	e 25·6
Victoria		45·9	328	8 19	− 7	—	—	—	—	—
Resolute Bay		61·8	358	e 10 20	− 3	e 18 42	− 4	e 11 17	PcP	e 28·5
Reykjavik	Z.	67·9	26	i 11 3	+ 1	—	—	—	—	—
Scoresby Sund		69·8	19	i 11 14k	0	—	—	—	—	33·6
Rathfarnham C.	Z.	74·6	38	—	—	e 28 58	SSS	—	—	e 35·8
Aberdeen	E.	76·9	34	i 14 48	PP	i 28 59	SSS	—	—	38·9
Malaga		77·1	54	i 12 2	+ 5	e 21 40	− 6	i 15 0	PP	36·8
Kew		78·4	40	—	—	e 27 39?	SS	—	—	—
Alicante		80·0	53	12 27	PcP	21 49	−28	15 27	PP	e 38·4
Paris		80·5	42	i 12 16	+ 1	—	—	34 39?	Q	37·6
Besançon		83·1	43	e 12 31	+ 2	—	—	e 12 49	PcP	—
Strasbourg		84·0	41	e 12 34	+ 1	e 28 39	SS	e 14 44	?	39·6
Stuttgart		84·9	41	e 12 39	+ 1	—	—	e 16 2	PP	e 38·6
Jena		85·8	39	e 12 45?	+ 3	e 16 9?	PP	e 13 17	?	—
Cheb		86·6	39	e 13 43	+57	e 23 39	+16	—	—	—
Collmberg	Z.	86·6	39	e 12 48	+ 2	—	—	e 16 13	PP	—
Triest	Z.	88·7	44	e 12 55	− 2	—	—	—	—	—
Rome		88·9	47	e 13 22	+24	—	—	e 21 44	?	—
Helsinki	E.	89·7	28	—	—	e 25 4	PS	—	—	—

Additional readings and note :—
Cleveland eSN = 10m.55s.
Pasadena L reading has been reduced by 30m.
La Paz i = 16m.13s.
Seven Falls eScSE = 17m.22s.
Fresno eE = 7m.42s., eZ = 10m.39s.
Lick iZ = 7m.30s.
Seattle e = 8m.25s.
Resolute Bay eE = 22m.24s., 22m.51s., and 25m.29s.
Malaga PPP = 16m.52s.
Alicante PPP = 17m.24s., Q = 32m.29s.
Paris i = 12m.19s.
Stuttgart eZ = 12m.43s. and 14m.57s., ePPP? = 18m.3s.
Cheb e = 15m.49s., 17m.39s., 22m.23s., and 27m.10s.
Long waves were also recorded at Berkeley, Almeria, Granada, Clermont-Ferrand, De Bilt, Potsdam, and Istanbul.

May 7d. Readings also at 0h. (Copiapo), 1h. (Santa Lucia), 5h. (Tamanrasset), 6h. (Cobb River, Kaimata, Tuai, and Wellington), 10h. (China Lake, Mineral, and near Krasnogorka), 11h. (China Lake (2), Mineral, Santa Lucia, near Apia, near Bogota, and Chinchina), 12h. (Apia), 13h. (Basle, near Chur, and Zürich), 16h. (Przhevalsk, near Almata II, Chilisk, and Kurmenty), 17h. (Rocca di Papa, Rome, and Stuttgart), 18h. (Klyuchi and Rome), 19h. (Bombay, Calcutta, Chatra, Mount Wilson, Palomar, China Lake, Tinemaha, Berkeley, Lick, and Mineral), 20h. (Pavia), 21h. (Ksara).

May 8d. 7h. 43m. 13s. Epicentre 18°·5S. 178°·0W. Depth of focus 0·080.
(as on 1950, Aug. 8d.).

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

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tuai	N.	20·7	192	—	—	e 7 9	−11	—	—	—
Wellington		23·5	194	4 29	0	7 57	− 8	—	—	—
Cobb River	E.	23·9	198	e 4 33	0	e 8 5	− 7	—	—	—
Kaimata	N.E.	25·6	199	e 4 48	0	8 30	− 8	—	—	—
Brisbane	Z.	28·1	246	i 5 15a	+ 5	—	—	—	—	—
Lick	Z.	76·8	42	i 10 59k	+ 2	—	—	—	—	—
Mount Wilson	Z.	77·5	47	i 11 2	+ 1	—	—	—	—	—
Palomar	Z.	77·8	48	i 11 4	+ 1	—	—	—	—	—
Riverside	Z.	77·8	47	i 11 4	+ 1	—	—	—	—	—
China Lake		78·6	45	i 11 6	− 1	—	—	—	—	—
Mineral	Z.	78·6	41	e 10 58a	− 9	—	—	—	—	—
Chatra	N.	102·3	294	32 27	?	—	—	—	—	e 62·0
Upsala		137·2	349	54 32	?	—	—	—	—	e 72·8
Stuttgart	Z.	149·2	350	e 18 43	[+ 1]	—	—	e 18 49	PKP_2	—

Additional readings :—
Lick iZ = 11m.7s.
Mineral iZ = 11m.13s.
Upsala eE = 56m.50?, e = 59m.59s. and 63m.16s., eN = 68m.9s., e = 71m.47s.

May 8d. 19h. 9m. 29s. Epicentre 39°·5N. 21°·5E.

Intensity V at Karditsa, Hellinopyrgos, and Lipsos (Arta); IV at Astakos (Acarnania) and Leukas. Epicentre as suggested by Strasbourg.

A. Galanopoulos.
Seismo. Institute Bull., 1951, Athens, 1952, p.18.

A = +·7199, B = +·2836, C = +·6335; δ = +1; h = −1;
D = +·367, E = −·930; G = +·589, H = +·232, K = −·774.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Athens		2·3	132	i 0 34k	− 6	i 1 7	− 2	e 0 37	P	—
Taranto		3·4	289	0 54	− 1	1 53	S_g	—	—	—
Sofia		3·5	22	e 0 55	− 2	1 41	+ 1	2 7	S_g	—
Belgrade	Z.	5·4	352	e 1 27a	+ 3	e 2 23	− 5	e 1 55	P_g	—
Bucharest		6·0	33	e 1 33	+ 1	3 8	S*	i 3 27	S_g	—
Istanbul	N.	6·0	72	—	—	e 3 2	S*	—	—	3·7
Timisoara	E.	6·2	358	e 1 48	P*	e 3 28	S_g	—	—	—
Rome		7·2	292	e 2 59	?	e 3 29	S*	—	—	e 4·3
Kalossa	N.	7·3	346	e 3 59	S_g	—	—	—	—	e 4·7
Budapest		8·2	348	e 2 55	+52	e 3 57	S*	4 31	S_g	(e 5·6)
Triest		8·4	320	e 2 38	P*	e 3 57	+14	e 4 40	S_g	—
Padova		8·7	308	e 3 2	P_g	e 4 32	S*	—	—	5·5
Florence		8·8	303	2 35	P*	e 4 14	S*	—	—	—
Bologna		9·1	307	—	—	e 4 4	+ 4	—	—	e 5·7
Pavia		10·8	306	e 2 12	−27	e 4 33	− 9	—	—	e 5·7

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Prague		11·7	337	e 2 48	− 3	e 5 5	+ 1	—	—	e 6·5
Zürich		12·2	314	e 2 59	+ 1	e 5 5	−11	—	—	—
Cheb		12·4	331	e 3 5	+ 4	e 5 43	+22	—	—	—
Stuttgart		12·8	320	e 3 3	− 3	e 5 18	−12	—	—	e 7·2
Basle		12·9	313	e 3 6	− 1	e 5 37	+ 4	—	—	—
Ksara		12·9	112	e 1 47	?	—	—	—	—	e 9·8
Collmberg	Z.	13·2	336	e 3 7	− 4	e 6 46	SS	e 3 18	PP	e 7·9
Jena		13·4	332	e 3 15	+ 1	e 5 31	−14	—	—	e 6·0
Strasbourg		13·4	317	e 3 22	PP	e 5 46	+ 1	e 3 54	?	e 6·9
Besançon		13·7	310	e 3 24	+ 6	e 5 46	− 6	e 3 32	PP	e 7·0
Potsdam		14·1	338	e 3 29	+ 6	—	—	—	—	8·5
Paris		16·5	311	i 3 55	+ 1	e 7 11	+13	i 4 5	PP	—
Upsala	E.	20·5	354	—	—	e 8 17	−10	—	—	e 12·1
Tamanrasset	Z.	21·5	224	i 4 46k	− 6	—	—	e 5 28	PP	—

Additional readings :—
Sofia eEN = 1m.13s. and 1m.47s.
Belgrade eZ = 3m.3s., iS_gNW = 3m.7s.
Bucharest eE = 1m.41s.
Timisoara eS* = 4m.3s.?, eS_g = 4m.28s.?.
Budapest S* is given as ePN, L is given as S, the record being wrongly interpreted.
Prague e = 2m.51s. and 3m.12s., eSN = 4m.44s., eN = 4m.55s., eS = 6m.1s.?.
Zürich e = 5m.22s.
Cheb e = 3m.39s. and 4m.10s.
Stuttgart eZ = 3m.7s. and 6m.1s.
Jena eN = 3m.22s., eE = 3m.25s. and 3m.31s.
Besançon eSS? = 5m.59s., e = 6m.14s.
Paris i = 3m.59s., iPPP = 4m.17s., i = 4m.35s. and 4m.45s., e = 5m.34s., eScS = 8m.35s.
Tamanrasset iZ = 4m.50s.
Long waves were also recorded at Skalnate Pleso, Copenhagen, Kew, and De Bilt.

May 8d. 20h. 0m. 51s. Epicentre 8°·3S. 79°·8W. Depth of focus 0·005.
(as on 1948, Jan. 16d.).

Intensity IV-V at Chiclayo ; IV at Guadalupe, Pacasmayo, Casa Grande, Paijan, and Trujillo. Epicentre 7°·7S. 80°·0W. (U.S.C.G.S.). Pasadena suggests depth 40km.

E. Silgado.
Datos sismológicos del Perú, 1951, Boletín No. 8, Lima, Peru, 1953, p.13.

$A = +·1753$, $B = -·9740$, $C = -·1434$; $\delta = -3$; $h = +7$;
$D = -·984$, $E = -·177$; $G = -·025$, $H = +·141$, $K = -·990$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Huancayo		5·8	131	i 1 29	+ 4	i 2 44	+12	i 2 19	?	—
Chinchina		13·8	18	i 3 14	0	i 5 50	+ 4	e 3 44	PP	7·0
La Paz		14·0	127	i 3 20	+ 3	i 6 27	+36	i 3 36	pP	7·6
Bogota		14·1	24	e 3 17	− 1	i 6 20	+27	i 3 40	pP	—
Galerazamba		19·5	13	i 4 35	+11	e 7 52	− 4	i 4 57	pP	e 8·8
Copiapo	N.	21·0	156	e 4 40	0	e 8 31	+ 6	—	—	e 15·0
Fort de France		29·4	40	e 6 48	PP	—	—	—	—	—
Tacubaya		33·5	325	e 7 10	PP	—	—	—	—	—
Morgantown		47·7	0	i 8 29	− 3	—	—	e 10 26	PP	—
Palisades		49·4	6	i 8 45	0	—	—	—	—	—
Cleveland	Z.	49·6	358	i 8 44k	− 3	—	—	—	—	—
Weston		51·0	9	e 8 55	− 2	—	—	—	—	e 23·2
Harvard		51·1	9	i 8 57	− 1	—	—	—	—	e 25·6
Ottawa		53·6	4	e 9 16	− 1	—	—	—	—	—
Palomar	Z.	54·4	322	e 9 20	− 3	—	—	i 9 31	pP	—
Shawinigan Falls	N.	55·0	7	e 9 52	pP	—	—	—	—	—
Riverside	Z.	55·1	322	e 9 27	− 1	—	—	—	—	—
Mount Wilson	Z.	55·7	322	e 9 32	0	—	—	i 9 41	pP	—
Seven Falls	E.	55·8	8	e 9 48	+15	e 17 20	+ 7	—	—	e 23·6
China Lake	Z.	56·5	324	e 9 36	− 2	—	—	i 9 57	pP	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Lick	z.	59·9	322	e 10 0k	− 2	—	—	i 10 20	pP	—
Reno	z.	60·3	326	e 10 5k	+ 1	—	—	e 10 13	pP	—
Mineral	z.	61·9	325	e 10 19k	+ 4	—	—	e 10 51	pP	—
Seattle		67·2	331	e 11 5	+16	—	—	—	—	e 36·2
Victoria		68·2	331	10 55	− 1	—	—	—	—	—
Malaga		83·4	52	i 12 24	+ 2	e 22 52	+16	i 15 44	PP	24·1
Resolute Bay		83·4	356	e 12 20	− 2	e 22 37	+ 1	e 34 33	Q	e 37·8
Granada		84·1	52	12 42	PP	23 21	PS	—	—	43·0
Toledo		84·5	49	e 12 29	+ 2	e 22 44	− 3	12 39	PcP	—
Almeria		84·9	52	e 12 28	− 1	e 22 55	+ 4	15 47	PP	—
Alicante		86·8	51	12 43	+ 5	23 15	+ 6	29 13	SS	e 43·4
Tamanrasset	z.	88·9	67	i 12 49	+ 1	e 16 15	PP	e 13 0	pP	—
Paris		91·1	41	i 16 35	PP	—	—	i 16 46	?	e 44·2
Strasbourg		94·5	41	e 13 12	− 2	e 34 57	SSS	e 17 9	PP	e 44·2
Karlsruhe	z.	95·0	41	e 13 13	− 4	—	—	—	—	—
Pavia		95·1	45	e 21 22	?	—	—	—	—	—
Stuttgart		95·5	41	e 13 18	− 1	—	—	e 17 20	PP	e 52·2
Padova		97·0	45	e 13 52?	pP	—	—	e 17 43	PP	—
Rome		97·2	49	e 13 37?	+10	e 26 19	PS	e 16 6	PP	e 50·5
Collmberg	z.	98·2	40	e 13 31	0	—	—	—	—	—
Ksara		115·9	56	e 21 54	PPP	e 33 28	SS	—	—	—

Additional readings :—
La Paz iSS =7m.0s.
Bogota isSEN =6m.44s.
China Lake iZ =9m.46s.
Malaga ePPP =17m.48s.
Resolute Bay eZ =13m.32s. and 14m.39s., eE =26m.58s.
Toledo e =15m.13s., ePP? =15m.35s.
Almeria SS =28m.25s.
Alicante Q =35m.43s.
Stuttgart eQ =48·2m.
Long waves were also recorded at La Plata, Berkeley, Scoresby Sund, Bombay, and other European stations.

May 8d. Readings also at 2h. (Brisbane), 3h. (Stuttgart), 4h. (Mount Wilson, Riverside, and China Lake), 7h. (La Plata, near Santa Lucia, and near Andijan), 6h. (Mineral and Tamanrasset), 10h. (near Santa Lucia), 13h. (Istanbul, Ksara, Borzhomi, Gori, Kirovobad, Lenkoran, Piatigorsk, Tiflis, Yalta, near Leninakan, and Sotchi), 15h. (near Copiapo), 16h. (Tamarnasset), 18h. (near Dzhergetal (2)), 21h. (Copiapo, Puebla, near Oaxaca, Tacubaya, Vera Cruz, near Kurmenty, Frunse, Khorog, Krasnogorka, Kulyab, Stalinabad, near Almata II, Andijan, Dzhergetal, Fergana, Garm, Murgab, Naryn, and Obi-garm), 22h. (Copiapo, Rybach'e, Tchimkent, near Alicante, Almeria, Granada, Malaga, and Toledo), 23h. (near Bandong and Djakarta).

May 9d. 6h. 20m. 23s. Epicentre 36°·9N. 70°·8E. Depth of focus 0·015.
(as on 1951, Jan. 28d.).

$A = +·2636$, $B = +·7570$, $C = +·5978$; $\delta = -10$; $h = -1$;
$D = +·944$, $E = -·329$; $G = +·197$, $H = +·565$, $K = -·802$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
	°	°	m. s.	s.	m. s.	s.	m. s.	
Khorog	0·9	48	0 22	0	0 41	+ 2	—	—
Kulyab	1·3	321	i 0 27	+ 1	i 0 50	+ 4	—	—
Garm	2·1	350	i 0 37?	+ 1	i 1 7?	+ 4	—	—
Obi-garm	2·2	335	i 0 34	− 3	i 1 3	− 2	—	—
Dzhergetal	2·3	8	0 40	+ 2	1 13	+ 6	—	—
Stalinabad	2·3	316	i 0 39	+ 1	i 1 11	+ 4	—	—
Murgab	2·9	59	0 46	0	i 1 20	− 1	—	—
Fergana	3·6	12	e 0 55	− 1	e 1 33	− 5	e 1 42	SS
Andijan	4·0	17	e 1 2	+ 1	1 52	+ 5	—	—
Samarkand	4·1	314	e 1 7	+ 5	e 1 49	− 1	—	—
Tchimkent	5·5	351	i 1 20	− 1	—	—	—	—
Naryn	6·1	40	—	—	e 2 34	− 4	—	—
Frunse	6·6	25	—	—	e 2 53	+ 3	—	—
Mary	7·2	279	—	—	e 3 2	− 3	—	—
Almata	7·9	35	e 2 39	?	e 3 23	+ 1	—	—
Almata II	8·1	36	i 1 54	− 2	—	—	—	—
Ashkabad	9·9	280	—	—	e 4 13	+ 3	—	—

May 9d. 22h. 24m. 39s. Epicentre 38°·2N. 142°·0E. Focus at base of superficial layers.
(as on 1949, Nov. 13d.).

Intensity VII-VIII at Yoneyama; V at Onikobe, Yahagi, and Semmaya; IV at Isinomaki, Sendai, Miyako, Morioka, Mizusawa, Watari, Hurukawa, Kesennuma, etc.
Epicentre 38°·5N. 142°·0E. Depth 55km.

Seismological Bulletin of the Central Meteorological Observatory, Japan, for May, 1951, Tokyo, 1951, p.112, with macroseismic chart.

$A = -·6208$, $B = +·4850$, $C = +·6159$; $\delta = -5$; $h = -1$;
$D = +·616$, $E = +·788$; $G = -·485$, $H = +·379$, $K = -·788$.

	△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.
Isinomaki	0·6	294	0 9	− 3	0 18	− 3
Sendai	0·9	274	0 13a	− 3	0 25	− 3
Hukusima	1·3	250	0 21k	− 1	0 37	− 1
Mizusawa	1·3	324	0 11	−11	0 22	−16
Yamagata	1·3	272	0 19	− 3	0 33	− 5
Miyako	1·4	0	0 16	− 7	0 28	−13
Onahama	1·5	215	0 36	+12	0 49	+ 5
Inawasiro	1·6	247	0 12	−14	0 39	− 7
Morioka	1·6	337	0 18	− 8	0 33	−13
Shirakawa	1·8	249	0 30	+ 1	0 48	− 3
Akita	2·1	315	0 25	− 8	0 46	−13
Mito	2·2	214	0 37	+ 2	1 6	+ 5
Hatinohe	2·3	351	0 27	− 9	0 46	−18
Niigata	2·3	263	0 52	+16	1 12	+ 8
Utunomiya	2·4	226	0 40	+ 2	1 9	+ 3
Tukubasan	2·5	217	0 41	+ 2	1 11	+ 2
Aomori	2·8	340	0 39	− 4	1 6	−10
Kumagaya	2·9	225	0 47	+ 2	1 22	+ 3
Aikawa	3·0	266	0 40	− 6	1 12	−10
Maebasi	3·0	232	0 46k	0	1 23	+ 1
Takada	3·1	250	0 40	− 8	1 25	+ 1
Tokyo	3·1	216	0 40	− 8	1 28	+ 4
Nagano	3·4	245	0 52	0	1 45	+13
Oiwake	3·4	236	0 52	0	1 22	−10
Matumoto	3·7	238	0 57	+ 1	—	—
Kohu	3·8	228	1 1	+ 3	1 48	+ 6
Hunatu	3·8	224	0 58	0	1 45	+ 3
Misima	3·9	220	0 56	− 3	2 8	88
Urakawa	4·0	9	1 1	+ 1	1 37	−10
Toyama	4·1	250	1 8	+ 6	2 8	88
Wazima	4·1	260	0 58	− 4	—	—
Iida	4·3	232	1 7	+ 2	—	—
Shizuoka	4·4	223	1 17	+11	2 0	+ 3
Sapporo	4·9	354	1 18	+ 5	2 5	− 5
Nagoya	5·0	235	1 17	+ 2	2 14	+ 2
Gihu	5·1	238	1 19	+ 3	2 11	− 4
Hikone	5·4	239	1 24	+ 4	—	—
Tsuruga	5·4	244	1 19	− 1	—	—
Kameyama	5·6	235	0 37	−46	1 39	−48
Nemuro	5·8	27	2 13	+47	—	—
Osaka	6·3	238	1 36	+ 3	—	—

May 9d. Readings also at 1h. (near Malaga), 2h. (Copiapo, Malaga, and near Dzhergetal), 3h. (near Dzhergetal and Copiapo), 6h. (near Apia), 7h. (Copiapo), 8h. (near Andijan, Dzhergetal, Fergana, Garm, Kulyab, Khorog, Lunacharskoe, Obi-garm, Stalinabad, and Tchimkent), 10h. (Brisbane, Saskatoon, and Stuttgart), 11h. (Bandong, Djakarta, and near Athens), 13h. (Stuttgart, Murgab, Tchimkent, near Andijan, Dzhergetal (2), Fergana, Garm, Kulyab, Khorog, Naryn, and Obi-garm), 14h. (Alicante, Fergana, Kulyab, near Dzhergetal, Khorog, Murgab, and Obi-garm), 15h. (Lick, Mineral, Reno, Pasadena, Riverside, Palomar, China Lake, Victoria, Jena, Stuttgart, and near Neuchatel), 16h. (Paris and Tacubaya), 17h. (Stuttgart), 20h. (Tamanrasset, Paris, Potsdam, Tortosa, Toledo, Alicante, near Almeria, Granada, Malaga, and near Tananarive), 22h. (near Dzhergetal), 23h. (Apia).

May 10d. 9h. 18m. 30s. Epicentre 19°·9S. 33°·8E. (given by Johannesburg).

Intensity VI at Pery ; IV at Beira and Vila Monica ; III at Chemba, Vila Gouveia, etc.

Observaçoes macrossismicas, 1951, Anuario Sismologico de Portugal, No. 5, 1951, p.6.

$A = +\cdot7820$, $B = +\cdot5235$, $C = -\cdot3384$; $\delta = +9$; $h = +5$;
$D = +\cdot556$, $E = -\cdot831$; $G = -\cdot281$, $H = -\cdot188$, $K = -\cdot941$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Pretoria	Z.	7·8	220	i 2 20	P_g	—	—	—	—	—
Johannesburg		8·2	219	e 2 2	− 1	i 3 26	−12	i 4 6	S*	—
Pietermaritzburg	Z.	10·2	197	i 2 27	− 4	i 4 11	−16	—	—	—
Kimberley	Z.	12·0	221	i 2 46	− 9	i 4 43	−28	—	—	—
Tananarive		13·0	88	i 3 12	+ 3	i 5 30	− 5	i 3 23	PP	6·9
Grahamstown	Z.	14·8	204	i 3 31	− 1	e 5 53	−25	—	—	—
Helwan	N.	49·5	356	i 8 54	0	e 16 6	+ 4	e 10 35	PP	—
Tamanrasset	Z.	50·6	325	i 9 3a	+ 1	e 16 22	+ 5	e 10 57	PP	25·5
Kodaikanal	E.	52·4	58	e 9 17	+ 1	—	—	—	—	—
Colombo	E.	52·6	54	8 21	−57	16 51	+ 7	—	—	25·5
Ksara		53·5	1	i 9 27k	+ 3	17 10	+13	—	—	—
Bombay		54·3	47	e 9 31	+ 1	e 17 8	+ 1	11 36	PP	—
Poona	E.	54·8	48	9 35	+ 1	17 17	+ 3	—	—	—
Hyderabad	N.	57·4	52	e 9 54	+ 1	—	—	—	—	—
Athens		58·3	350	i 10 2	+ 3	—	—	—	—	—
Messina		60·3	343	e 10 3	−10	e 18 31	+ 5	i 10 24	?	30·4
Erevan		60·6	9	e 10 17	+ 2	—	—	—	—	—
Istanbul		60·8	356	i 10 19	+ 3	e 18 37	+ 4	e 12 35	PP	e 25·5
Leninakan		61·1	8	e 10 20	+ 2	—	—	—	—	—
Kirovobad		61·4	11	i 10 20	0	e 18 43	+ 3	i 12 51?	PP	—
Baku		61·8	13	e 10 25	+ 2	—	—	e 12 37	PP	—
Shemakla		61·8	12	i 10 23	0	—	—	—	—	—
Ashkabad		62·0	22	i 10 26	+ 2	i 18 58	+10	—	—	—
Taranto		62·0	345	10 20	− 4	e 17 20	?	—	—	—
Borzhomi		62·1	7	i 10 27	+ 2	—	—	—	—	—
Tiflis		62·1	8	e 10 26	+ 1	—	—	—	—	—
Gori		62·3	8	i 10 29	+ 3	—	—	—	—	—
Mary		63·0	25	i 10 32	+ 1	—	—	—	—	—
Sofia		63·0	351	10 32	+ 1	e 19 6	+ 5	—	—	—
Algiers Univ.	Z.	63·4	332	i 10 34k	0	e 19 27	+21	e 11 13	PcP	—
Sotchi		63·4	4	e 10 33	− 1	—	—	—	—	—
Makhach-Kala		63·8	10	i 10 36	0	e 19 11	0	i 13 12	PP	—
Grozny		63·9	9	10 37	0	—	—	—	—	—
Yalta		64·1	0	10 39	+ 1	e 19 14	0	e 11 15	PcP	—
Piatigorsk		64·2	7	i 10 41	+ 2	—	—	—	—	—
Bucharest		64·4	353	e 10 43	+ 3	e 19 24	+ 6	—	—	—
Rome		64·6	342	i 10 39	− 2	19 21	0	10 50	pP	31·4
Belgrade		65·6	349	e 10 48a	0	e 20 19	PS	e 14 4	PP	e 37·2
Almeria		66·0	329	i 10 47	− 3	19 45	+ 7	13 22	PP	36·3
Alicante		66·3	331	10 51	− 1	19 41	−1	12 57	PP	e 31·1
Timisoara		66·3	350	e 10 55?	+ 3	e 20 9	+27	i 10 58	P	—
Florence		66·6	342	e 10 58?	+ 4	—	—	e 12 16?	?	—
Stalinabad		66·8	29	e 11 36	PcP	—	—	—	—	—
Granada		66·8	328	10 57	+ 1	20 9	+21	—	—	—
Prato		66·8	342	e 10 56	0	i 20 18	+30	—	—	—
Malaga		66·9	327	i 10 53	− 3	i 19 51	+ 2	13 15	PP	35·2
Samarkand		66·9	26	10 56	0	—	—	—	—	—
Padova		67·1	343	e 11 0	+ 3	20 3	+12	13 36	PP	—
Bologna	Z.	67·3	343	e 10 59	0	—	—	—	—	—
Khorog		67·3	31	i 11 0	+ 1	—	—	—	—	—
Obi-garm		67·3	29	i 10 58	− 1	—	—	—	—	—
Kalossa		67·5	349	e 11 3	+ 3	e 20 15	+19	e 13 47	PP	—
Triest		67·7	345	i 11 1	0	e 20 1	+ 3	i 13 35	PP	e 36·7
Budapest		68·4	349	11 6	0	e 20 0	− 7	e 13 37	PP	e 38·0
Pavia		68·6	342	i 11 7k	0	i 20 25	+16	e 12 0	?	e 32·5

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ogyalla		68·9	349	e 11 10	+ 1	e 13 45	PP	e 15 16	PPP	—
Uzhgorod		69·0	352	11 16	+ 7	—	—	—	—	—
Toledo		69·2	329	i 11 12	+ 2	e 20 17	+ 1	i 13 55	PP	36·5
Lunacharskoe		69·3	27	11 18?	+ 7	—	—	—	—	—
Chatra	N.	69·5	50	e 11 10	− 2	e 20 15	− 5	—	—	—
Fergana		69·6	30	i 11 14	+ 1	—	—	—	—	—
Skalnate Pleso		69·8	350	e 11 15	+ 1	e 20 30	+ 7	e 24 54	SS	e 38·5
Chur		70·0	342	e 11 16k	+ 1	—	—	—	—	—
Lwow		70·0	353	i 11 14	− 1	e 20 25	− 1	e 13 50	PP	—
Tchimkent		70·2	27	11 16	− 1	—	—	e 15 34	PPP	—
Zürich		70·7	342	e 11 19k	− 1	e 20 34	0	e 13 37	PP	—
Lisbon		70·9	325	i 11 19k	− 2	20 40	+ 4	—	—	34·2
Neuchatel		70·9	341	e 11 21	0	—	—	—	—	—
Clermont-Ferrand		71·0	337	i 11 24k	+ 2	e 20 42	+ 5	—	—	e 39·2
Raciborzu		71·0	350	e 11 23	+ 1	e 20 53	+16	e 16 4	PPP	—
Basle		71·2	342	e 11 23k	0	e 20 52	+12	e 11 50	PcP	—
Besançon		71·4	340	e 11 25	+ 1	e 14 0	PP	e 11 56	PcP	—
Prague		71·7	347	i 11 26a	0	e 20 48	+ 3	e 14 6	PP	e 31·5
Stuttgart		71·8	343	11 26k	0	e 20 46	0	e 11 35	pP	38·5
Djakarta		72·0	90	i 11 29	+ 1	e 20 56	+ 7	—	—	—
Strasbourg		72·0	342	i 11 28k	0	e 20 50	+ 1	i 12 3	PcP	e 32·5
Cheb		72·2	346	11 29	0	e 21 10	PS	e 14 44	PP	—
Karlsruhe		72·2	342	i 11 31	+ 2	—	—	e 11 45	PcP	e 33·5
Bandong		72·5	91	—	—	e 20 56	+ 2	—	—	—
Naryn		72·5	32	11 33?	+ 3	—	—	e 16 3	PPP	—
Frunse		72·9	30	i 11 33	0	e 20 58	− 1	e 14 12	PP	—
Collmberg		73·2	347	i 11 33	− 2	—	—	e 14 10	PP	e 38·5
Jena		73·2	346	e 11 34	− 1	e 21 5	+ 3	e 14 24	PP	—
Rybach'e		73·3	31	i 11 36	+ 1	—	—	e 14 21	PP	—
Paris		73·9	339	i 11 39	0	i 21 14	+ 4	i 11 50	pP	e 35·3
Potsdam		74·2	347	i 11 40k	0	e 21 24	+10	i 11 52	pP	e 35·5
Almata I		74·3	31	i 11 42	+ 1	e 21 15	0	—	—	—
Przhevalsk		74·5	32	i 11 42	0	—	—	—	—	—
Ili		74·9	30	e 11 44	0	—	—	—	—	—
Moscow		75·4	2	11 48	+ 1	21 27	0	14 38	PP	—
Jersey	E.	75·8	337	e 10 33	−77	—	—	e 13 42	?	—
De Bilt		75·9	342	i 11 52a	+ 2	e 21 42	+10	e 30 10	SSS	e 35·5
Witteveen	Z.	76·2	343	i 11 53	+ 1	—	—	i 14 37	PP	—
Kew		77·1	339	i 11 57k	0	—	—	—	—	e 36·5
Copenhagen		77·4	348	e 11 59	+ 1	e 21 51	+ 2	26 42	SS	40·3
Terre Adélie		78·6	156	i 12 7	+ 2	—	—	—	—	42·0
Pulkovo		79·4	358	i 12 10	+ 1	e 22 10	0	e 15 4	PP	—
Sverdlovsk		79·7	15	i 11 42?	−29	22 27	PS	—	—	—
Helsinki		80·1	355	i 12 14k	+ 1	e 22 42	sS	e 12 55	pP	e 44·0
La Plata	E.	80·2	236	12 12	− 2	22 30	sS	31 6	SSS	38·3
Durham		80·3	340	i 12 7	− 7	i 22 28	+ 8	—	—	—
Upsala		80·6	352	i 12 16	0	e 22 20	− 3	e 15 20	PP	e 35·5
Rathfarnham Castle		80·7	337	i 12 17	+ 1	e 22 18	− 6	i 12 46	pP	e 39·0
Aberdeen	E.	82·5	341	—	—	i 23 0	+18	—	—	e 45·2
Bergen		83·3	346	e 12 42	+12	—	—	—	—	—
Irkutsk		94·2	35	e 13 23	+ 1	—	—	—	—	—
La Paz		95·2	250	i 13 32	+ 5	i 24 23	{+ 4}	17 13	PP	45·5
Kabansk		95·4	36	13 29	+ 1	e 24 39	− 3	e 17 16	PP	—
Scoresby Sund		98·1	343	17 42	PP	26 49	PS	27 48	PPS	47·0
Huancayo		103·4	252	—	—	e 26 7	+18	—	—	e 43·9
Bogota		108·4	268	—	—	e 27 1	?	—	—	e 50·5
Chinchina		109·9	268	e 28 46	PS	—	—	e 39 48	SSS	52·5
Seven Falls	E.	114·2	314	e 19 33	PP	26 51	{+17}	35 21	SS	55·5
Harvard		114·3	309	e 19 38	PP	e 29 15	PS	—	—	e 54·8
Palisades		116·0	307	i 19 50	PP	e 25 48	[+12]	e 29 38	PS	e 56·3
Ottawa		117·5	312	e 20 2	PP	—	—	—	—	—
Resolute Bay		118·9	347	e 18 53	[+ 2]	e 30 3	PS	e 31 23	PPS	—
Petropavlovsk		126·4	38	e 19 5	[0]	—	—	e 20 59	PP	—
Victoria		146·1	333	19 42	[+ 1]	—	—	—	—	—
Seattle		146·2	331	e 19 45k	[+ 4]	i 22 9	PKS	i 19 56	PKP_2	e 80·5

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Reno	z.	150·0	317	e 19 51a	[+ 4]	—	—	e 23 26	PP	—
Tinemaha		150·2	312	i 19 57	[+ 9]	—	—	—	—	—
China Lake		150·3	310	i 19 50k	[+ 2]	—	—	i 19 55	PKP_2	—
Mineral	z.	150·7	320	i 19 42k	[− 7]	e 33 39	SKSP	i 19 56	PKP_2	—
Palomar		150·7	304	i 19 57	[+ 8]	—	—	i 20 5	PKP_2	—
Riverside	z.	150·8	306	i 19 51	[+ 2]	—	—	—	—	—
Pasadena		151·4	306	i 19 53k	[+ 3]	—	—	i 20 2	PKP_2	e 81·7
Fresno		151·5	313	e 19 52k	[+ 2]	e 26 54	[− 2]	e 20 0	PKP_2	—
Arcata	z.	151·8	323	e 19 54a	[+ 4]	—	—	—	—	—
Lick	z.	152·4	316	e 19 54k	[+ 3]	—	—	i 20 1	PKP_2	—
Berkeley		152·6	316	e 19 55a	[+ 4]	e 23 5	PKS	e 23 41	PP	e 80·5

Additional readings :—
Tananarive e =3m.42s., i =5m.39s., iSS =5m.45s., iSSS =6m.0s.
Helwan eN =9m.5s., 14m.12s. and 20m.6s.
Tamanrasset iZ =9m.12s., ePPPZ =12m.2s., eZ =16m.5s., eSSZ =19m.51s., eSSSZ = 21m.31s., eZ =23m.47s.
Bombay S_cSEN =19m.18s., SSEN =20m.57s.
Istanbul iN =10m.28s., ePPPN =14m.3s., ePSE =18m.50s., ePPSN =18m.58s., eN = 20m.10s., eSSN =22m.47s.
Algiers Univ. eZ =10m.45s., ePPZ =13m.2s.
Yalta ePS =19m.37s., eS_cS =20m.26s.
Rome ePP =13m.10s.
Belgrade eZ =10m.58s.
Almeria PPP =14m.59s.
Alicante PPS =20m.17s., S_cS =20m.51s., SS =23m.48s., Q =26m.47s.
Malaga PPP =15m.15s.
Padova PS? =20m.32s.
Kalossa eEN =11m.11s., eE =11m.19s.
Triest i =11m.10s.
Budapest iN =11m.15s., eE =11m.21s., 14m.20s., and 20m.12s.
Ogyalla e =11m.59s. and 13m.4s.
Skalnate Pleso e =12m.38s., 15m.41s., 18m.57s., 21m.54s., and 25m.46s.
Raciborzu eE =11m.27s. and 11m.36s., eN =11m.54s. and 21m.19s., eE =21m.40s.
Besançon e =11m.36s., 12m.14s. and 13m.0s.
Prague iN =11m.32s., eZ =11m.35s., e =12m.4s., 12m.11s., and 13m.32s., ePPN =14m.9s. ePPP? =15m.7s., e =21m.50s., eSSS =28m.54s.
Stuttgart $ePcP$ =11m.52s., eZ =13m.20s., ePP =14m.15s., $ePcS$ =15m.45s., ePPP = 16m.0s., ePS =21m.17s., e =24m.36s., eSSS =28m.36s., eQ =34·5m.
Strasbourg i =11m.36s., 12m.7s., and 12m.37s., ePP =14m.1s., e =15m.31s. and 15m.36s., ePPP =15m.54s., ePPS =22m.42s., eSSS =28m.30s., eQ? =30·5m.
Cheb e =12m.32s., 13m.49s., 14m.4s., 15m.54s., 23m.7s., and 27m.6s., eSSS =29m.18s.
Frunse ePPP =15m.58s., eSS =26m.6s.
Jena eE =11m.40s., eN =11m.45s., epP?E =11m.51s., eN =12m.9s. and 14m.7s., ePS?E =21m.53s.
Rybach'e PcP =11m.48s., ePPP =16m.24s.?
Paris i =14m.13s., iPP =14m.19s., ipPP =14m.30s., e =15m.11s., iPPP =15m.57s., i =16m.15s., e =21m.23s., ePS =21m.50s., iPPS =23m.3s., iSS =26m.11s., i = 27m.37s., eSSS =29m.15s.
Potsdam iPEN =11m.44s.
Moscow PcP =11m.58s.
De Bilt iZ =12m.2s., ePP =14m.42s.
Pulkovo iPcP =12m.20s., eSS =27m.19s.
Helsinki iZ =12m.23s., ePPZ =15m.16s.
La Plata E =20m.18s.
Upsala iN =12m.20s., eN =14m.44s., ePPP?N =16m.56s., eE =19m.47s., eN =20m.4s. and 21m.2s., ePSN =23m.3s.
Rathfarnham Castle iZ =12m.24s., e =15m.7s., eEN =22m.50s. and 24m.58s.
Aberdeen iE =32m.43s., eE =38m.0s.
La Paz iSKS =24m.12s., iS =24m.55s., PS =25m.47s., SS =31m.43s.
Kabansk eSKS =23m.55s.
Scoresby Sund 24m.35s.
Seven Falls PSE =29m.23s.
Palisades e =27m.7s.
Resolute Bay eE =20m.12s., eLE =33·7m.
Seattle iPP =22m.17s., and many other i readings.
Reno eZ =20m.42s.
Fresno eE =22m.25s.
Arcata eE =20m.20s., eZ =22m.38s.
Berkeley iZ =20m.1s., eZ =22m.26s.
Long waves were also recorded at Averroes, Tortosa, Edinburgh, Ivigtut, Weston, Christchurch, and Wellington.

May 10d. 14h. 57m. 22s. Epicentre 27°·5N. 102°·0E.

A = −·1847, B = +·8689, C = +·4593; δ = +6; h = +3;
D = +·978, E = +·208; G = −·095, H = +·449, K = −·888.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Chatra		13·2	269	e 3 27	+16	—	—	—	—	e 7·3
Nanking		15·3	69	3 35	− 4	5 52	−38	—	—	i 6·7
Zi-ka-wei		17·3	73	4 5	+ 1	e 7 10	− 6	i 8 55	SSS	i 9·2
Przhevalsk		24·3	314	e 5 23	+ 3	—	—	—	—	—
Naryn		25·4	310	i 5 35	+ 4	e 10 4	+ 8	—	—	—
Almata		25·7	316	e 5 31	− 2	e 10 3	+ 2	—	—	—
Frunse		27·0	312	i 5 48	+ 3	e 10 28	+ 6	—	—	—
Andijan		27·7	306	e 5 54	− 2	10 41	+ 8	—	—	—
Bombay		28·1	258	e 10 30	S	(e 10 30)	−10	e 12 11	SSS	i 15·8
Obi-garm		29·1	301	i 6 9	+ 5	—	—	—	—	—
Ashkabad		37·9	298	e 7 26	+ 6	—	—	—	—	—
Sverdlovsk		41·4	327	7 49	− 1	13 56	− 9	—	—	—
Ksara		56·4	294	—	—	e 17 5	−31	e 23 50	SSS	—
Upsala		63·9	326	—	—	e 26 38	SSS	—	—	e 33·6
Prague		67·9	317	e 11 25	PcP	—	—	e 12 14	?	—
Stuttgart		71·6	316	e 11 27	+ 2	—	—	—	—	e 37·6
Tamanrasset	z.	85·2	293	e 12 48	pP	—	—	—	—	—

Additional readings :—
Prague e = 14m.57s.
Long waves were also recorded at Calcutta, Grahamstown, Pretoria, Resolute Bay, Scoresby Sund, and other European stations.

May 10d. 19h. 44m. 47s. Epicentre 51°·5N. 179°·5E. (as on 1950, July 19d.).

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

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Adak		2·4	81	i 0 47	+ 6	i 1 18	+ 6	—	—	—
Mitchell Field		2·5	80	i 0 46	+ 3	i 1 17	+ 3	—	—	—
Klyuchi		12·0	301	e 3 15	+20	e 5 47	+36	—	—	—
Petropavlovsk		12·8	285	e 3 9?	+ 3	e 5 46?	+16	—	—	—
Vladivostok		32·8	274	i 6 34	− 3	e 11 53	− 1	—	—	—
Victoria		36·0	72	7 4	− 1	—	—	—	—	—
Seattle		37·1	72	e 7 30	+16	e 10 7	pPcP	e 8 22	PP	e 36·2
Resolute Bay		40·1	25	e 7 40	+ 1	e 13 40	− 6	e 9 42	PcP	e 16·7
Mineral	z.	41·4	82	i 7 54k	+ 4	—	—	—	—	—
Berkeley		42·5	85	i 7 58a	− 1	e 14 14	− 8	e 15 13	?	e 20·3
Reno	z.	43·0	81	e 8 9a	+ 6	—	—	—	—	—
Lick	z.	43·2	85	i 8 3k	− 1	—	—	i 8 16	pP	—
Kabansk		43·3	302	8 7	+ 2	e 14 42?	+ 9	—	—	—
Irkutsk		44·4	303	e 8 14	0	—	—	—	—	—
Fresno		44·7	84	e 8 21k	+ 5	—	—	e 9 8	?	—
Tinemaha		45·5	83	i 8 23	0	—	—	i 8 36	pP	—
China Lake	z.	46·7	84	i 8 31	− 1	—	—	i 8 46	pP	—
Zi-ka-wei	z.	46·7	268	e 8 28	− 4	—	—	—	—	—
Pasadena	z.	47·4	86	e 8 36	− 2	—	—	i 8 49	pP	—
Nanking		47·8	271	e 7 48	−53	—	—	—	—	—
Riverside	z.	48·0	86	e 8 40	− 3	—	—	e 8 53	pP	—
Palomar	z.	48·7	86	i 8 47	− 1	—	—	i 9 0	pP	—
Sverdlovsk		60·9	327	i 10 17	0	18 38	+ 4	—	—	—
St. Louis		61·1	64	e 10 18	0	e 18 31	− 6	e 10 32	pP	—
Ili		63·7	308	i 10 34	− 2	—	—	—	—	—
Ottawa		63·8	50	e 11 54	?	e 19 23	+12	—	—	—
Przhevalsk		64·1	307	e 10 37	− 1	—	—	—	—	—
Almata		64·3	309	i 10 39	0	—	—	—	—	—
Seven Falls	E.	64·8	46	—	—	e 19 17	− 6	—	—	30·2
Rybach'e		65·3	308	e 10 46	0	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Frunse		65·7	310	i 10 49	+ 1	—	—	—	—	—
Naryn		66·1	308	e 10 52	+ 1	—	—	—	—	—
Pulkovo		66·3	344	e 11 16?	+24	20 5?	+23	—	—	—
Palisades		68·0	51	i 11 6	+ 3	—	—	—	—	e 37·7
Weston		68·2	49	e 11 2	− 2	—	—	—	—	—
Andijan		68·4	310	i 11 6	0	e 20 10	+ 3	—	—	—
Tchimkent		68·6	312	e 11 6	− 1	—	—	—	—	—
Tashkent		69·5	312	e 11 14	+ 2	e 20 23	+ 3	—	—	—
Dzhergetal		70·2	310	e 11 18	+ 1	—	—	—	—	—
Khorog		71·3	307	e 11 24	+ 1	—	—	—	—	—
Rathfarnham Castle		75·5	4	i 11 50	+ 2	e 14 7	PP	i 12 12	pP	—
Mary		75·9	313	i 11 50	0	—	—	—	—	—
Witteveen	z.	75·9	357	i 11 51	+ 1	—	—	—	—	—
Lwow		76·9	344	e 11 55	− 1	—	—	—	—	—
Collmberg	z.	76·9	352	e 11 56	0	—	—	—	—	—
Ashkabad		77·1	316	e 11 58	+ 1	—	—	—	—	—
Stuttgart	z.	79·8	354	e 12 11	− 1	—	—	—	—	—
Paris		80·0	359	e 12 13	0	—	—	—	—	e 41·2
Strasbourg		80·0	355	e 12 13	0	—	—	—	—	—
Besançon		81·5	356	e 12 20	− 1	—	—	—	—	—
Istanbul		84·3	339	e 23 2	S	(e 23 2)	+ 2	—	—	e 41·2
Pretoria	z.	146·3	308	i 19 42	[+ 1]	—	—	—	—	—
Pietermaritzburg	z.	148·3	301	e 19 48	[+ 3]	—	—	—	—	—

Additional readings :—
Resolute Bay eZ = 9m.56s.
China Lake iZ = 8m.40s.
Long waves were also recorded at Bombay, Scoresby Sund, Copenhagen, De Bilt, Potsdam, Malaga, Almeria, and Harvard.

May 10d. 20h. 28m. 10s. Epicentre 51°·5N. 179°·5E. (as at 19h.).

		△	Az.	P.	O−C.	S.	O−C.	Supp.		
		°	°	m. s.	s.	m. s.	s.	m. s.		
Mitchell Field		2·5	80	i 0 46	+ 3	i 1 18	+ 4	—	—	
Victoria		36·0	72	7 6	+ 1	—	—	—	—	
Reno	z.	43·0	81	e 8 3	0	—	—	—	—	
Lick	z.	43·2	85	e 8 2k	− 2	—	—	i 8 20	pP	
Fresno	z.	44·7	84	e 8 29a	+13	—	—	—	—	
Tinemaha	z.	45·5	83	i 8 24	+ 1	—	—	i 8 38	pP	
China Lake	z.	46·7	84	i 8 32	0	—	—	i 8 47	pP	
Pasadena	z.	47·4	86	i 8 51	pP	—	—	—	—	
Riverside	z.	48·0	86	i 8 56	pP	—	—	—	—	
Palomar	z.	48·7	86	i 8 48	pP	—	—	i 9 3	sP	
St. Louis		61·1	64	e 10 18	0	e 20 3	ScS	e 10 35	pP	
Paris		80·0	359	e 12 14	+ 1	—	—	—	—	

St. Louis gives also e = 16m.44s.

May 10d. 21h. 32m. 58s. Epicentre 34°·0S. 72°·0W. Focus at Base of Superficial Layers.

Given by Pasadena.

A = +·2567, B = −·7901, C = −·5566 ; δ = −4 ; h = 0 ;
D = −·951, E = −·309 ; G = −·172, H = +·529, K = −·831.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Santa Lucia	N.	1·2	62	i 0 24	+ 4	—	—	i 0 31	?	—
Santiago		1·3	63	i 0 24	+ 2	i 1 39	+61	—	—	—
Copiapo	N.	6·8	13	1 36	− 4	3 20	+23	—	—	3·5
Antofagasta	E.	10·4	8	e 2 47	+17	e 4 49	+23	—	—	5·2
Buenos Aires		11·2	97	i 2 40	− 1	4 58	+12	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
La Plata		11·6	98	i 2 43	− 3	4 56	0	—	—	5·6
La Paz		17·8	12	i 4 8a	+ 1	i 7 29	+ 7	i 4 31	PP	9·5
Punta Arenas	N.	19·2	177	e 7 55	S	(e 7 55)	+ 2	—	—	e 9·7
Huancayo		22·1	351	i 4 56	+ 2	i 9 11	+21	i 5 45	PP	—
Bogota		38·5	357	i 7 21	0	i 13 20	+ 6	i 22 37	?	—
Chinchina		38·9	355	i 7 28	+ 4	i 13 27	+ 7	i 7 41	pP	17·3
Galerazamba		44·6	356	—	—	e 13 2	PcS	—	—	e 23·0
Fort de France		49·5	15	e 8 49	0	—	—	—	—	—
Tacubaya		59·1	330	e 10 1	+ 1	—	—	—	—	—
Morgantown		73·6	354	i 11 31	− 1	—	—	e 13 45	PcP	—
St. Louis		74·2	345	e 11 33	− 2	i 21 6	+ 1	i 11 45	pP	—
Florissant		74·4	345	—	—	e 20 33	−34	—	—	—
Fordham		74·5	359	e 11 34	− 3	i 21 11	+ 3	—	—	—
Palisades		74·7	359	i 11 36k	− 2	i 21 13	+ 2	i 26 20	SS	—
Cleveland		75·6	353	i 11 41a	− 2	i 21 19	− 2	i 11 54	pP	—
Weston		76·0	1	i 11 45	− 1	—	—	—	—	—
Harvard		76·1	1	i 11 46	0	e 21 30	+ 4	i 11 56	pP	e 42·2
Terre Adélie		76·3	193	e 11 47	0	—	—	—	—	—
Grahamstown	Z.	78·4	122	i 11 27	−32	—	—	—	—	—
Ottawa		79·1	358	i 12 1	− 2	e 22 2	+ 4	—	—	—
Riverside	Z.	79·9	323	i 12 6a	− 1	—	—	i 12 58	?	—
Shawinigan Falls	N.	80·2	0	e 12 7	− 2	—	—	—	—	—
Pasadena	Z.	80·4	323	i 12 9	− 1	—	—	i 13 1	?	—
Seven Falls	E.	80·8	1	e 12 12	0	e 22 18	+ 2	—	—	35·0
China Lake		81·5	325	i 12 13a	− 3	e 22 26	+ 3	i 12 25	pP	—
Tinemaha	Z.	82·8	325	i 12 22a	0	—	—	i 12 32	pP	—
Fresno	Z.	83·3	324	e 12 23a	− 2	—	—	—	—	—
Pretoria	Z.	83·8	117	i 14 56	?	—	—	—	—	—
Lick	Z.	84·7	322	i 12 31a	− 1	—	—	i 12 46	pP	—
Berkeley		85·4	322	i 12 35a	0	—	—	i 12 46	pP	e 34·9
Reno	Z.	85·5	325	e 12 6a	−30	—	—	e 13 4	?	—
Mineral	Z.	87·0	324	i 12 42k	− 1	—	—	i 12 54	pP	—
Tamanrasset	Z.	92·8	64	i 13 10k	0	e 16 58	PP	i 13 37	pP	45·0
Malaga		94·4	48	i 13 16	− 2	i 24 30	+ 6	i 17 2	PP	49·1
Granada		95·2	48	13 32	+11	24 29	− 2	—	—	—
Almeria		95·7	49	13 23	− 1	24 39	+ 4	17 16	PP	54·0
Toledo		96·6	46	e 13 32	+ 4	—	—	e 17 29	PP	—
Alicante		97·9	48	13 51	+17	25 5	+11	19 11	PPP	e 47·9
Algiers Univ.	Z.	99·2	52	13 24	−16	—	—	—	—	—
Rome		108·1	52	—	—	e 33 43	SS	—	—	e 53·3
Strasbourg		108·6	44	e 18 46	PP	—	—	—	—	e 52·0
De Bilt		108·9	39	—	—	e 28 20	PS	—	—	e 54·0
Padova		109·0	49	e 14 45	P	—	—	19 10	PP	—
Resolute Bay	E.	109·5	354	—	—	e 26 33	S	e 34 9	SS	e 41·8
Stuttgart		109·5	44	e 18 32?	[+ 5]	e 28 20	PS	e 57 2?	Q	59·0
Collmberg	Z.	112·8	43	e 19 22	PP	—	—	—	—	—
Lwow		118·7	47	e 21 41?	PPP	e 22 40	PKS	—	—	—
Istanbul		119·0	58	e 19 44	PP	e 30 2	PS	—	—	e 53·0
Ksara		121·4	69	e 20 26	PP	e 30 18	PS	—	—	—
Moscow		128·1	43	e 19 2	[− 1]	—	—	e 21 5	PP	—
Borzhomi		129·5	61	e 22 31	PKS	—	—	—	—	—
Leninakan		129·6	62	e 19 42	[+36]	—	—	—	—	—
Gori		130·1	61	e 19 29	[+22]	—	—	e 22 27	PKS	—
Grozny		131·5	59	e 19 7	[− 2]	—	—	e 22 36	PKS	—
Lenkoran		132·8	67	19 10	[− 2]	—	—	22 41	PKS	—
Shemakla		133·1	63	19 10	[− 2]	i 22 36	PKS	—	—	—
Ashkabad		140·0	70	—	—	—	—	i 23 47	PKS	—
Sverdlovsk		140·7	40	e 19 19	[− 7]	—	—	i 22 23	PP	—
Mary		142·7	72	e 19 26	[− 4]	—	—	—	—	—
Tashkent		148·7	65	e 19 47?	[+ 7]	e 23 16	PKS	e 20 3	PKP_2	—

Continued on next page.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tchimkent	148·9	63	i 19 40?	[0]	—	—	—	—	—
Fergana	150·6	67	i 19 48?	[+ 5]	—	—	e 23 26	PP	—
Andijan	151·0	66	i 19 44?	[0]	30 36	SKKS	i 23 28	PP	—
Frunse	152·5	61	e 19 46	[0]	e 30 30	SKKS	e 23 33	PP	—
Naryn	153·7	64	e 19 50	[+ 3]	e 23 44	PP	i 20 8	PKP_2	—
Rybach'e	153·7	63	e 19 49	[+ 2]	e 30 32	SKKS	e 20 9	PKP_2	—
Almata	154·1	59	19 48	[0]	—	—	—	—	—
Ili	154·1	57	e 19 45	[− 3]	—	—	—	—	—
Kabansk	161·9	4	e 20 2	[+ 5]	e 24 26	PP	e 20 42	PKP_2	—

Additional readings :—
La Plata PZ = 2m.46s., PN = 2m.50s., S?E = 5m.8s., SZ = 5m.12s., N = 5m.26s.
La Paz iZ = 5m.12s., i = 8m.3s., iSS = 8m.10s.
Palisades i = 27m.14s.
Cleveland eZ = 11m.50s., eE = 21m.31s. and 21m.40s., ePSN = 21m.50s.
Tinemaha iZ = 12m.28s.
Lick iZ = 12m.37s.
Berkeley eZ = 13m.1s. and 13m.43s.
Tamanrasset eZ = 13m.18s.
Malaga ePPP = 19m.24s.
Almeria PPP = 19m.23s.
Alicante PS = 26m.27s., Q = 41m.35s.
Andijan eSKSP = 33m.53s.
Long waves were also recorded at Seattle, Scoresby Sund, Wellington, Bombay, and other European stations.

May 10d. Readings also at 1h. (Brisbane), 4h. (near Apia), 7h. (Stuttgart), 8h. (Tamanrasset, Ashkabad, Chilisk, Ili, Lunacharskoe (2), Mary, Rybach'e, near Almata, Andijan (2), Dzhergetal (2), Fergana (2), Frunse (2), Garm, Khorog (2), Krasnogorka (2), Murgab (2), Naryn (2), Obi-garm (2), Przhevalsk, Samarkand, Stalinabad, and Tchimkent), 9h. (La Paz, near Huancayo, Mineral, Andijan, Fergana, near Khorog, Garm, Murgab, and Obi-garm), 10h. (Makhach-Kala, Tchimkent, and near Tacubaya), 11h. (Apia, Brisbane, Palomar, China Lake, Mineral, and Stuttgart), 12h. (Pretoria, Tamanrasset (2), Lunacharskoe, Murgab, Tchimkent, near Andijan, Dzhergetal, Garm, Khorog, Obi-garm, Stalinabad, near Bogota, and Chinchina), 14h. (Apia and Paris), 15h. (near Athens), 16h. (Ili, Naryn, Przhevalsk, near Andijan, Dzhergetal, Fergana, Frunse, Garm, Khorog, Murgab, Obi-garm, and Tchimkent), 17h. (Pretoria, Almata, Dzhergetal, Frunse, Mary, Naryn, Przhevalsk, Rybach'e, Samarkand, near Andijan, Fergana, Garm, Khorog, Lunacharskoe, Murgab, Obi-garm, Stalinabad, Tchimkent, and near Alicante), 19h. (Apia (2), Palomar, Pasadena, China Lake, Tinemaha, Fresno, St. Louis, Stuttgart, Rome, Taranto, Istanbul, Ksara (2), and near Adak), 20h. (Stuttgart, Fergana, near Murgab, Andijan, Dzhergetal, Khorog, and Obi-Garm), 21h. (near Dzhergetal), 22h. (Pretoria), 23h. (Brisbane and near Obi-garm).

May 11d. 2h. 15m. 57s. Epicentre 13°·0N. 87°·8W. Depth of focus 0·010.
(as 1951, May 7d.).

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Merida		8·1	348	2 2	+ 5	3 36	+ 9	—	—	—
Vera Cruz		10·1	309	e 2 27	+ 3	i 4 19	+ 3	—	—	—
Puebla		11·6	302	e 2 46	+ 2	e 4 53	+ 1	—	—	e 5·5
Galerazamba		12·5	99	—	—	e 5 3?	−10	—	—	e 5·4
Tacubaya		12·6	302	e 3 6	+ 9	e 5 26	+11	—	—	—
Chinchina		14·4	122	i 3 12	− 8	e 6 3	+ 5	e 16 3	S_cS	6·8
Bogota		15·9	120	e 3 30	− 9	i 6 34	+ 2	i 3 43	pP	—
St. Louis		25·6	4	i 5 21	− 1	e 10 32	SS	e 5 36	pP	—
Florissant		25·8	4	e 5 21	− 3	e 10 36	SS	—	—	—
Fort de France		25·9	84	e 5 14	−11	—	—	—	—	—
Morgantown		27·4	13	e 5 37	− 1	—	—	e 7 29	?	—
Huancayo		27·8	155	e 5 40	− 2	e 10 17	+ 1	—	—	—
Cleveland		28·9	9	e 5 49	− 3	i 10 37	+ 3	i 6 29	PP	—
Fordham		30·3	22	e 6 3	− 1	e 11 3	+ 7	—	—	—
Palisades		30·4	22	i 6 2a	− 3	i 11 3	+ 6	—	—	e 14·9
Harvard		32·6	23	i 6 23	− 1	i 11 36	+ 4	e 6 39	pP	e 15·8
Palomar	z.	33·3	313	i 6 30	0	—	—	e 12 46	ScP	—
Ottawa		33·9	15	e 6 34	− 2	e 11 54	+ 2	e 6 50	pP	—
Riverside	z.	34·0	314	e 6 36	0	—	—	i 12 48	ScP	—
Pasadena		34·7	314	i 6 41	− 1	i 12 50	ScP	i 7 19	sP	e 19·6

Continued on next page.

		△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	Supp. m. s.		L. m.
China Lake	Z.	35·1	317	i 6 44	− 2	—	—	i 13 2	ScP	—
La Paz		35·2	146	e 6 47	0	i 12 4	− 8	i 14 24	SS	17·4
Shawinigan Falls	N.	35·8	18	e 6 48	− 4	e 12 15	− 6	—	—	—
Tinemaha	Z.	36·3	318	i 6 56	0	—	—	—	—	—
Seven Falls	E.	36·9	19	e 7 5	+ 4	e 12 31	− 7	e 8 32	PP	16·4
Fresno	Z.	37·1	316	e 7 8a	+ 5	—	—	e 7 50	sP	—
Reno		38·6	319	e 7 15k	0	—	—	e 7 56	sP	—
Lick	Z.	38·7	316	e 7 15k	− 1	—	—	i 7 36	pP	—
Berkeley		39·4	316	e 7 21a	− 1	e 13 38	+22	e 16 40	SS	e 24·2
Mineral	Z.	40·2	319	e 7 27k	− 1	—	—	i 7 45	pP	—
Arcata		42·1	318	—	—	e 12 3	?	e 12 27	?	—
Victoria		45·9	328	9 13	+59	—	—	—	—	—
Resolute Bay		61·8	358	e 10 5	− 6	e 18 25	0	e 10 20	pP	e 30·4
Scoresby Sund		69·8	19	e 11 18	+16	—	—	—	—	38·0
Toledo		77·0	52	e 11 53	+ 9	—	—	e 15 23	PP	—
Malaga		77·1	54	i 11 58	+14	i 21 10	−14	14 40	PP	36·1
Stuttgart		84·9	41	e 12 34	+ 9	—	—	—	—	e 43·0
Jena	E.	85·8	39	e 12 43?	+13	—	—	e 12 48	PcP	—
Collmberg	Z.	86·6	39	e 12 54	+20	—	—	e 16 13	PP	—
Istanbul	E.	100·8	44	—	—	e 29 48	PKKP	—	—	e 46·0

Additional readings :—
Bogota iEN =7m.37s., iScSEN =15m.34s.
St. Louis ePP =6m.33s.
Cleveland ePN =6m.6s., iPPPE =6m.54s., iE =8m.47s., eE =9m.20s., iE =11m.34s.
Harvard isP =6m.51s., ePP =7m.38s., e =13m.37s.
Palomar iZ =7m.8s. and 7m.37s.
Lick iZ =8m.18s.
Reno eZ =8m.23s.
Berkeley e =7m.25s., eE =16m.52s., eQEN =23·0m.
Mineral iZ =7m.56s.
Resolute Bay eE =22m.37s., 25m.12s., 25m.34s., and 28m.30s.
Malaga PPP =16m.48s.
Long waves were also recorded at De Bilt, Potsdam, Paris, Seattle, and Tamanrasset.

May 11d. 3h. 15m. 15s. Epicentre 6°·7N. 82°·5W. (as on 1950, April 30d.).

$A = +·1296$, $B = -·9848$, $C = +·1159$; $\delta = +6$; $h = +7$;
$D = -·991$, $E = -·131$; $G = +·015$, $H = -·115$, $K = -·993$.

		△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	Supp. m. s.		L. m.
Chinchina		7·1	104	e 1 45	− 3	e 3 21	+11	—	—	—
Bogota		8·6	104	i 2 8	− 1	i 3 56	+ 8	—	—	—
Huancayo		20·0	159	e 4 29	− 8	e 8 6	−11	e 5 5	PP	e 9·5
La Paz		27·1	147	e 5 49	+ 3	i 10 46	+22	—	—	—
St. Louis		32·6	349	i 6 34	− 1	—	—	—	—	—
Harvard		37·0	15	i 7 15	+ 2	—	—	—	—	e 19·8
Ottawa	Z.	39·0	8	e 7 30	0	—	—	—	—	—
Palomar	Z.	41·4	315	i 7 51	+ 1	—	—	—	—	—
Riverside	Z.	42·1	315	i 7 55	0	—	—	—	—	—
Pasadena	Z.	42·8	315	i 8 1	0	—	—	—	—	—
China Lake	Z.	43·3	317	i 8 4	− 1	—	—	e 8 19	?	—
Lick	Z.	46·8	317	i 8 34k	+ 1	—	—	i 8 41	?	—
Mineral	Z.	48·4	320	e 8 45a	− 1	—	—	—	—	—

Long waves were also recorded at Kew.

May 11d. Readings also at 1h. (Manila, Santa Lucia, Dzhergetal (2), Obi-garm, Stalinabad, near Ashkabad, Kizyl-Arvat, and Mary), 2h. (Puebla and near Tacubaya), 5h. (near Dzhergetal), 8h. (Almata II, Dzhergetal, Krasnogorka, near Andijan, Fergana, and Naryn), 9h. (near Dzhergetal), 10h. (Pietermaritzburg, Mount Wilson, Palomar, and China Lake), 11h. (Pretoria and near Dzhergetal), 12h. (Manila, Obi-garm, near Fergana, Khorog, and Murgab), 13h. (near Dzhergetal), 15h. (Calcutta, Krasnogorka, Almata, Almata II, Ili, Khorog, Kurmenty, Obi-garm, Tashkent, near Andijan), Fergana, Frunse, Murgab, Naryn, and near Dzhergetal (2)), 16h. (Bombay and Chatra), 18h. (Nanking, Zi-ka-wei, Almata II, Kulyab, Tchimkent, near Andijan, Dzhergetal (2), Fergana, Garm, Khorog, Murgab, Obi-garm, Tashkent, and near Alicante (3)), 21h. (Copiapo and near Dzhergetal), 22h. (near Dzhergetal) 23h. (Fresno, Lick, Collmberg, Stuttgart, Alicante, Malaga, and Tamanarsset).

May 12d. 22h. 7m. 53s. Epicentre 39°·6N. 71°·3E.

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

$A = +·2477$, $B = +·7318$, $C = +·6349$; $\delta = -2$; $h = -2$;
$D = +·947$, $E = -·321$; $G = +·204$, $H = +·601$, $K = -·773$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Dzhergetal		0·4	190	0 7	− 6	—	—	—	—	—
Fergana		0·9	25	i 0 16	− 4	—	—	—	—	—
Andijan		1·4	35	i 0 27	0	i 0 47	+ 1	—	—	—
Obi-garm		1·5	234	0 26	− 2	—	—	—	—	—
Khorog		2·1	172	i 0 38	+ 1	—	—	—	—	—
Kulyab		2·1	215	0 37	0	—	—	—	—	—
Stalinabad		2·2	242	0 39	+ 1	e 1 9	+ 3	—	—	—
Lunacharskoe		2·3	319	i 0 40	0	e 1 17	+ 8	—	—	—
Tashkent		2·3	318	i 0 40	0	i 1 18	+ 9	—	—	—
Murgab		2·4	121	i 0 41	0	—	—	—	—	—
Tchimkent		3·0	335	i 0 50	0	i 1 35	S*	0 56?	P*	—
Samarkand		3·3	271	0 57	+ 4	1 36	+ 1	1 7	P_g	—
Naryn		4·0	61	i 1 3	− 1	2 13	S_g	i 1 14	P*	—
Frunse		4·1	36	i 1 7	+ 2	i 1 55	0	i 1 19	P_g	—
Rybach'e		4·6	50	e 1 14	+ 2	—	—	—	—	—
Almata		5·6	47	i 1 26	− 1	i 2 57	S*	i 1 45	P*	—
Almata II		5·8	49	e 1 33	+ 4	—	—	—	—	—
Ili		6·1	43	i 1 32	− 2	i 2 55	+10	i 3 9	S_g	—
Przhevalsk		6·1	59	e 1 35	+ 1	—	—	—	—	—
Chilisk		6·6	51	i 1 40	− 1	—	—	—	—	—
Mary		7·7	258	i 1 55	− 1	e 3 30	+ 5	—	—	—
Ashkabad		10·2	265	e 2 27	− 4	—	—	—	—	—
Kizyl-Arvat		11·7	272	e 2 45	− 6	4 57	− 7	—	—	—
Semipalatinsk		12·5	27	e 2 58	− 4	—	—	—	—	—
Baku		16·4	280	e 3 59	+ 6	e 7 6	+10	—	—	—
Lenkoran		17·5	275	4 4	− 3	7 16	− 5	—	—	—
Makhach-Kala		18·2	288	e 4 12	− 4	i 7 35	− 2	—	—	—
Chatra		18·4	127	e 4 14	− 4	e 7 7?	−34	—	—	—
Sverdlovsk		18·6	341	e 4 15	− 6	—	—	—	—	—
Kirovobad		19·1	282	4 22	− 5	i 7 48	− 9	—	—	—
Grozny		19·5	289	e 4 33	+ 2	e 8 10	+ 4	—	—	—
Tiflis		20·2	285	e 4 36	− 3	e 8 24	+ 3	—	—	—
Bombay		20·7	176	e 4 47	+ 3	e 8 28	− 3	5 12	PP	9·4
Poona	E.	21·1	173	e 4 50	+ 2	i 8 33	− 6	—	—	—
Piatigorsk		21·5	291	4 49	− 3	—	—	—	—	—
Calcutta	E.	22·3	134	e 5 12	+11	i 9 13?	+11	5 39	PP	10·6
Irkutsk		26·0	48	e 5 36	0	—	—	—	—	—
Kabansk		27·3	50	e 5 47	− 1	e 10 28	+ 1	—	—	—
Moscow		27·5	317	e 5 50	0	e 10 27	− 3	—	—	—
Ksara		28·8	269	e 6 15	+13	11 32?	+41	—	—	—
Kodaikanal	E.	29·8	168	—	—	e 11 55	+48	—	—	—
Kishinev		31·5	298	6 23	− 3	11 32	− 2	—	—	—
Istanbul		32·0	287	—	—	e 11 39	− 3	e 14 4?	SS	e 15·9
Pulkovo		32·6	322	e 6 55?	+20	11 44	− 7	—	—	—
Helwan	N.	34·0	266	—	—	e 12 19	+ 6	—	—	—
Lwow		34·6	303	e 6 49	− 4	—	—	—	—	—
Helsinki		35·3	322	e 7 2	+ 3	e 12 24	− 9	e 8 8	PP	e 18·1
Uzhgorod		35·8	301	e 7 32	+29	—	—	—	—	—
Timisoara		36·8	296	9 7?	PPP	—	—	—	—	—
Skalnate Pleso		37·1	302	e 7 17	+ 3	e 15 19	SS	e 8 33	PP	e 21·2
Belgrade		37·5	294	e 7 22a	+ 5	e 13 10	+ 3	e 8 48	PP	e 25·2
Raciborzu	N.	38·3	304	e 7 26	+ 2	e 13 0	−19	e 8 59	PP	e 18·4
Ogyalla		38·6	300	e 9 13	PP	e 13 29	+ 6	e 17 53	Q	e 19·2
Upsala		38·8	319	e 8 56	PP	e 15 49	SS	e 16 32	SSS	e 20·4
Nanking		38·9	86	—	—	e 13 29	+ 1	—	—	e 21·0

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Prague		40·7	304	e 7 47	+ 3	e 13 55	0	e 9 19	PP	e 20·3
Potsdam		41·3	308	e 7 50	+ 1	i 14 6	+ 2	e 9 21	PP	23·1
Zi-ka-wei	z.	41·3	85	—	—	e 12 43	?	e 17 25	SS	—
Copenhagen		41·4	313	i 7 54	+ 4	e 14 4	− 1	—	—	21·1
Collmberg	z.	41·5	306	e 7 50	0	—	—	e 9 31	PP	e 22·6
Triest		42·0	298	e 7 56	+ 2	i 14 17	+ 3	i 9 39	PP	e 23·8
Cheb		42·1	305	—	—	e 17 58	SS	—	—	e 19·3
Jena	E.	42·4	306	e 7 56?	− 2	—	—	e 9 41	PP	—
Stuttgart		44·3	303	e 8 11	− 2	e 14 51	+ 3	e 18 7	SS	24·1
Chur		44·6	299	e 8 18k	+ 2	—	—	—	—	—
Witteveen	z.	45·1	310	i 8 23	+ 3	—	—	i 10 26	PP	—
Zürich		45·1	302	e 8 23	+ 3	e 15 37	+38	—	—	—
Pavia		45·2	299	e 8 13	− 7	e 14 57	− 4	—	—	e 27·1
Strasbourg		45·3	303	e 8 20	− 1	e 15 7	+ 5	e 18 23	SS	e 22·1
Basle		45·7	302	e 8 23	− 1	—	—	—	—	—
De Bilt		46·2	309	e 10 46	PP	e 15 17	+ 2	e 18 27	SS	e 24·1
Besançon		46·8	302	e 8 36	+ 3	e 9 15	?	—	—	—
Paris		48·6	305	e 8 45	− 2	i 15 53	+ 4	e 10 25	PcP	e 23·1
Aberdeen	E.	49·3	317	—	—	e 19 25	SS	—	—	i 24·4
Durham	E.	49·5	313	—	—	e 19 45	SS	—	—	—
Kew		49·6	309	e 7 11	?	e 16 1	− 2	e 19 29	SS	e 25·1
Algiers Univ.	z.	52·5	290	e 9 15	− 2	—	—	—	—	—
Rathfarnham C.	z.	52·6	313	e 9 20	+ 2	—	—	—	—	—
Toledo		56·2	296	e 9 42	− 2	—	—	—	—	—
Almeria		56·5	292	9 54	+ 8	17 28	− 9	—	—	24·9
Granada		57·1	293	10 22k	+32	17 40	− 5	—	—	25·9
Tamanrasset	z.	57·5	274	e 9 51	− 2	e 12 2	PP	e 13 19	PPP	e 27·1
Malaga		57·9	293	i 9 56	0	i 17 16	−39	—	—	28·7
Resolute Bay	E.	65·6	356	—	—	e 19 33	0	e 28 1	SSS	e 33·7
Victoria		91·3	10	13 13	+ 4	—	—	—	—	—

Additional readings :—
Samarkand iP* =1m.2s.
Frunse iS* =2m.6s., iS_g =2m.21s.
Calcutta SSE =9m.57s., PcSE =12m.40s.
Helsinki eN =17m.34s.
Skalnate Pleso e =7m.34s., eE =10m.42s., e =14m.33s., eSSS? =15m.55s., e =17m.41s., 20m.1s., and 20m.55s.
Belgrade eNW =19m.38s.
Raciborzu eN =15m.0s., eSSN =15m.37s., eN =16m.15s.
Upsala eN =17m.42s., eE =19m.35s.
Prague ePP =9m.27s., ePPP =9m.54s., eSS? =16m.31s. and many unidentified e readings.
Potsdam ePPE =9m.24s., iN =16m.39s., eSSZ =17m.1s.
Collmberg eZ =7m.54s.
Triest iSS =17m.30s.
Jena ePEN =8m.2s.
Stuttgart eP =8m.17s.
Strasbourg eP =8m.23s., e =8m.55s.
Paris i =8m.59s., ePcP =9m.7s., eScS =18m.34s., eSS =19m.14s.
Tamanrasset eZ =9m.55s. and 11m.41s.
Long waves were also recorded at Alicante, Reykjavik, Scoresby Sund, and Harvard.

May 12d. Readings also at 0h. (Chinchina), 2h. (Granada), 3h. (Pietermaritzburg and Pretoria), 9h. (Christchurch, Tamanrasset, Istanbul, Collmberg, Stuttgart (2), and near Athens), 10h. (Stuttgart), 12h. (near Reykjavik), 13h. (Tortosa, Chatra, and near Obi-garm), 14h. (Tamanrasset), 16h. (Pasadena, Riverside, China Lake, Seattle, Resolute Bay, Ottawa, Seven Falls, and Santa Lucia), 17h. (Copiapo), 23h. (Almata, Almata II, Frunse, Ili, Naryn, Obi-garm, Rybach'e, near Andijan (2), Dzhergetal (5), Fergana (2), Khorog, Kulyab (2), Lunacharskoe, Murgab, Samarkand, Stalinabad, Tashkent, and Tchimkent).

May 13d. 1h. 45m. 52s. (I)
7h. 17m. 35s. (II)
7h. 52m. 4s. (III)
Epicentre 39°·5N. 71°·1E. (as on 1944, Oct. 17d.).

A = +·2506, B = +·7320, C = +·6335; δ = −5; h = −1;
D = +·946, E = −·324; G = +·205, H = +·599, K = −·774.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
I	Dzhergetal	0·3	162	0 9	− 2	0 14	− 4	—	—	
II		0·3	162	0 9	− 2	0 14	− 4	—	—	
III		0·3	162	0 9	− 2	0 14	− 4	—	—	
I	Fergana	1·0	31	—	—	e 0 30	− 6	—	—	
II		1·0	31	e 0 17	− 4	i 0 30	− 6	—	—	
III		1·0	31	e 0 18	− 3	i 0 31	− 5	—	—	
II	Obi-garm	1·4	234	i 0 27	0	i 0 48	+ 2	—	—	
III		1·4	234	e 0 26	− 1	i 0 54	+ 8	—	—	
I	Andijan	1·6	38	e 0 28	− 2	0 48	− 3	—	—	
II		1·6	38	e 0 29	− 1	i 0 49	− 2	—	—	
III		1·6	38	e 0 30	0	i 0 49	− 2	—	—	
I	Kulyab	1·9	213	i 0 40	+ 6	i 1 10	S_g	—	—	
II		1·9	213	i 0 39	+ 5	i 1 10	S_g	—	—	
III		1·9	213	e 0 41?	+ 7	i 1 10	S_g	—	—	
II	Stalinabad	2·0	243	i 0 41	P_g	i 1 11	S_g	—	—	
III		2·0	243	e 0 42	P_g	i 1 12	S_g	—	—	
I	Khorog	2·1	169	e 0 42	P_g	—	—	—	—	
II		2·1	169	e 0 40	+ 3	1 6	+ 2	—	—	
III		2·1	169	e 0 42	P_g	e 1 12	S_g	—	—	
II	Lunacharskoe	2·3	324	i 0 36?	− 4	i 1 10?	+ 1	—	—	
II	Tashkent	2·3	323	e 0 43?	+ 3	i 1 15?	S_g	—	—	
II	Murgab	2·5	117	e 0 45	+ 2	e 1 21?	S_g	—	—	
II	Tchimkent	3·0	335	e 0 52	+ 2	i 1 26	S*	—	—	
III		3·0	335	e 0 54	+ 4	e 1 37	S_g	—	—	
II	Samarkand	3·2	273	—	—	1 51	S_g	—	—	
II	Naryn	4·2	62	i 1 21	P_g	2 15	S_g	—	—	
II	Frunse	4·3	37	e 1 9	+ 1	e 2 15	S*	e 1 22	P_g	
II	Rybach'e	4·6	51	e 1 32	P_g	e 1 56	−11	—	—	
II	Almata II	6·0	49	i 1 31	− 1	—	—	i 1 49	P*	
II	Przhevalsk	6·3	59	e 1 52	P*	—	—	—	—	

May 13d. 10h. 0m. 14s. Epicentre 19°·4N. 75°·8W. Depth of focus 0·010.
(as on 1947, August 6d.).

A = +·2315, B = −·9151, C = +·3302; δ = +3; h = +5;
D = −·969, E = −·245; G = +·081, H = −·320, K = −·944.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Kingston		1·7	214	e 0 28	− 1	i 0 48	− 3	—	—	—
Port au Prince		3·4	103	i 0 50	− 2	i 1 25	− 7	i 1 45	SS	e 1·9
Chinchina		14·3	179	e 3 21	+ 2	i 6 13	SS	—	—	—
Bogota		14·8	173	(i 3 31)	+ 6	(i 6 31)	SS	—	—	—
Palisades		21·6	5	i 4 35	− 8	i 8 17	−14	—	—	—
Cleveland		22·6	349	i 4 53	0	e 9 6	+17	—	—	—
St. Louis		22·9	330	e 4 56	0	e 12 16	ScP	e 13 16	?	—
Florissant		23·1	330	—	—	e 10 52	SSS	—	—	—
Weston		23·2	9	e 4 58	− 1	e 8 52	− 8	i 5 17	pP	—
Harvard		23·3	9	i 5 2	+ 2	e 8 52	−10	—	—	—
Ottawa		25·9	0	e 5 28	+ 3	e 15 21	?	—	—	—
Seven Falls	E.	27·9	7	—	—	e 10 42	sS	—	—	—
La Paz	Z.	36·5	167	e 6 58	0	—	—	—	—	—
Fresno	Z.	42·1	304	e 7 47a	+ 3	—	—	—	—	—
Mineral	Z.	44·3	308	e 8 4k	+ 2	—	—	i 8 24	pP	—
Stuttgart	Z.	72·4	44	e 13 54	PP	—	—	—	—	e 32·2
Tamanrasset	Z.	75·0	71	e 11 31	− 1	—	—	e 11 42	pP	—

Bogota readings have been increased by 1m.
Long waves were also recorded at Besançon and Strasbourg.

May 13d. 17h. 2m. 8s. Epicentre 17°·8S. 169°·2E. (Strasbourg).

A = −·9359, B = +·1785, C = −·3038 ; δ = +7 ; h = +5 ;
D = +·187, E = +·982 ; G = +·298, H = −·057, K = −·953.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		18·7	81	e 4 23?	+ 1	—	—	—	—	—
Riverview		22·7	221	i 4 59a	− 5	i 9 7	− 2	i 5 27	PP	e 10·9
Cobb River	E.	23·4	173	e 5 4	− 7	—	—	—	—	—
Wellington		23·9	170	e 5 2	−14	e 9 10	−20	i 10 15	SS	e 12·9
Christchurch		25·8	174	—	—	10 3	+ 1	—	—	e 12·7
Terre Adélie		52·2	194	e 9 4	−11	—	—	—	—	—
Lick	Z.	85·0	48	e 12 37a	− 1	—	—	e 13 7	P	—
Fresno	Z.	86·1	50	e 12 45a	+ 1	—	—	—	—	—
Mineral	Z.	86·4	47	e 12 45	0	—	—	—	—	—
Riverside	Z.	86·7	53	e 12 44	− 3	—	—	—	—	—
Palomar	Z.	86·9	54	e 12 49	+ 1	—	—	—	—	—
China Lake	Z.	87·3	51	i 12 50	0	—	—	—	—	—
Reno	Z.	87·3	48	e 12 50k	0	—	—	—	—	—
Tinemaha	Z.	87·4	50	e 12 51	+ 1	—	—	—	—	—
Ksara		135·4	300	16 36	?	—	—	e 20 18	?	—
Aberdeen	E.	140·2	352	e 10 10	?	e 16 22	?	—	—	—
Collmberg	Z.	141·6	335	e 19 27	[− 6]	—	—	e 22 43	PP	—
Prague		142·0	333	e 19 36	[+ 2]	—	—	—	—	—
Jena	E.	142·4	336	e 19 31	[− 4]	e 19 35	PKP	e 22 42	PP	—
Rathfarnham C.	Z.	144·4	355	i 19 47	[+ 9]	—	—	e 20 9	PKP	—
Stuttgart		145·1	336	e 19 39	[0]	—	—	e 23 3	PP	—
Karlsruhe	Z.	145·2	337	e 19 40	[0]	—	—	—	—	—
Triest	Z.	145·5	329	e 19 41	[+ 1]	—	—	—	—	—
Strasbourg		145·8	337	e 19 42k	[+ 1]	—	—	e 22 58	PP	—
Zürich		146·5	336	e 19 43a	[+ 1]	—	—	—	—	—
Basle		146·7	336	e 19 45	[+ 3]	—	—	—	—	—
Paris		147·2	344	e 19 46	[+ 3]	e 29 59	{− 4}	i 33 47	PS	e 80·9
Besançon		147·5	338	e 19 42	[− 1]	e 19 47	PKP_2	e 20 34	?	—
Toledo		157·2	346	i 20 33	PKP_2	—	—	—	—	—
Malaga		160·3	344	i 20 44	PKP_2	—	—	i 24 30	PP	81·9
Tamanrasset	Z.	163·9	292	i 20 3a	[− 2]	e 24 50	PP	i 20 55	PKP_2	—

Additional readings :—
Riverview iPPPZ =5m.38s., iN =6m.16s. and 6m.23s., iE =9m.10s., iZ =9m.13s., isSE =9m.22s.
Prague e =20m.25s., 20m 34s , 21m.4s., and 22m.0s.
Stuttgart iPKPZ =19m.46s., e =19m.56s., eZ =20m.1s. and 21m.5s.
Strasbourg i =19m.46s., e =20m.3s., 21m.16s., and 22m.14s.
Paris i =19m.58s., e =21m.1s., 21m.59s., 28m.45s., and 33m.8s.
Tamanrasset iZ =21m.15s.
Long waves were also recorded at Berkeley, Seven Falls, Harvard, Palisades, Almeria, and Granada.

May 13d. 20h. 49m. 50s. Epicentre 38°·6N. 70°·5E. (as on April 2d.).

A = +·2615, B = +·7386, C = +·6213 ; δ = −7 ; h = −1 ;
D = +·943, E = −·334 ; G = +·207, H = +·586, K = −·784.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Obi-garm	0·6	279	i 0 10	− 5	i 0 20	S_g	—	—	—
Dzhergetal	0·8	42	i 0 15	− 3	i 0 29	− 2	—	—	—
Khorog	1·4	142	0 22	− 5	0 39	S_g	—	—	—
Stalinabad	1·4	268	i 0 25	− 2	i 0 46	0	—	—	—
Fergana	2·0	29	e 0 39	+ 4	i 1 10	S_g	—	—	—
Andijan	2·6	34	e 0 47	+ 3	i 1 27	S_g	—	—	—
Murgab	2·7	95	e 0 50	+ 5	1 34	S_g	—	—	—
Samarkand	2·9	291	e 1 0?	P_g	1 44	S_g	—	—	—
Tashkent	2·9	341	e 0 53	+ 5	i 1 31	S*	—	—	—
Tchimkent	3·8	352	e 1 1	0	—	—	—	—	—
Frunse	5·3	35	e 1 39	P*	e 2 37	S*	i 2 56	S_g	—
Rybach'e	5·7	46	—	—	e 2 28	− 7	e 3 7	S_g	—
Przhevalsk	7·2	55	e 2 9	P*	—	—	—	—	—

May 13d. Readings also at 0h. (near Dzhergetal (4)), 1h. (near Dzhergetal and near Mizusawa), 2h. (near Dzhergetal (3)), 3h. (near Dzhergetal (2)), 4h. (Colombo and near Dzhergetal), 5h. (near Dzhergetal), 6h. (Tamanrasset and near Dzhergetal), 8h. (Tamanrasset, Stuttgart, Collmberg, Kodaikanal, Reno, and Mineral), 9h. (Tamanrasset, Strasbourg, Stuttgart (3), Wellington, Christchurch, and near Dzhergetal (2)), 10h. (Apia, Stuttgart, and near Alicante (5)), 11h. (Palisades, Harvard, Stuttgart, Collmberg, Paris, near Fort de France, and near Alicante), 12h. (Christchurch, Wellington, Riverview, Tamanrasset, Strasbourg, Stuttgart, and Paris), 13h. (near Dzhergetal), 14h. (Stuttgart, Christchurch, Wellington, near Bogota, and near Dzhergetal), 15h. (near Dzhergetal), 16h. (Zürich and Dzhergetal), 17h. (Stuttgart), 18h. (near Copiapo and near Dzhergetal), 19h. (China Lake, Tamanrasset, Stuttgart (3), Strasbourg, Paris, and near Dzhergetal (2)), 20h. (Reykjavik and Dzhergetal), 21h. (near Dzhergetal), 22h. (Kurmenty, Przhevalsk, near Almata, Almata II, Chilisk, Frunse, Ili, and Krasnogorka).

May 14d. 4h. 7m. 32s. Epicentre 30°·2N. 70°·0E. (as on 1950, September 6d.).

$A = +\cdot2961$, $B = +\cdot8135$, $C = +\cdot5005$; $\delta = -4$; $h = +2$;
$D = +\cdot940$, $E = -\cdot342$; $G = +\cdot171$, $H = +\cdot470$, $K = -\cdot866$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Khorog		7·4	10	e 1 55	+ 3	3 21	+ 3	—	—	—
Stalinabad		8·4	353	i 2 7	+ 1	3 46	+ 3	—	—	—
Obi-garm		8·5	358	e 2 6	− 1	e 3 42	− 3	—	—	—
Murgab		8·8	21	i 2 15	+ 4	3 56	+ 3	—	—	—
Mary		10·0	320	i 2 31?	+ 4	—	—	—	—	—
Fergana		10·3	8	2 33	+ 1	e 4 28	− 2	—	—	—
Andijan		10·7	10	e 2 38	0	e 4 37	− 2	—	—	—
Lunacharskoe		11·1	357	i 2 43	0	e 4 53	+ 4	—	—	—
Tashkent		11·1	357	e 2 43	0	—	—	—	—	—
Bombay		11·6	167	e 2 45	− 5	e 4 52	− 9	3 3	PP	5·3
Poona		12·1	162	i 2 52	− 5	5 13	− 1	5 27	SS	5·1
Tchimkent		12·1	359	i 2 54	− 3	i 5 21	+ 7	—	—	—
Naryn		12·2	22	e 2 58	0	i 5 11	− 5	—	—	—
Ashkabad		12·3	311	i 3 1	+ 2	—	—	—	—	—
Frunse		13·2	15	e 3 2?	− 9	i 5 36?	− 4	—	—	—
Rybach'e		13·2	20	i 3 11	0	—	—	—	—	—
Przhevalsk		14·0	26	i 3 21	− 1	—	—	—	—	—
Almata		14·2	21	i 3 25	+ 1	i 6 3	− 1	—	—	—
Ili		14·8	20	e 3 32	0	—	—	—	—	—
Hyderabad	N.	14·9	147	e 3 31	− 3	e 6 21	+ 1	—	—	7·8
Chatra		15·5	98	e 3 38	− 4	i 6 34	− 1	3 51	PP	7·4
Calcutta	E.	18·1	110	e 4 11	− 3	i 7 33	− 2	i 8 12	SS	8·5
Baku		19·3	307	e 4 32	+ 3	e 8 10	+ 8	—	—	—
Lenkoran		19·4	303	4 31	+ 1	8 7	+ 3	—	—	—
Shemakha		20·2	306	4 37	− 2	—	—	—	—	—
Kodaikanal	E.	21·2	159	4 48	− 1	8 49	+ 8	—	—	10·0
Kirovobad		21·9	305	i 4 56	− 1	—	—	—	—	—
Makhach-Kala		22·0	311	e 4 59	+ 1	—	—	—	—	—
Grozny		23·3	311	e 5 15	+ 5	—	—	—	—	—
Gori		23·9	307	e 5 18	+ 2	—	—	—	—	—
Borzhomi		24·4	306	5 26	+ 5	e 9 46	+ 7	—	—	—
Sverdlovsk		27·4	349	e 5 50	+ 1	10 34	+ 6	—	—	—
Ksara		29·1	286	e 6 12	+ 8	e 11 48?	+52	—	—	—
Yalta		31·6	307	e 6 25	− 1	—	—	—	—	—
Helwan	N.	33·4	279	—	—	e 12 4	+ 1	—	—	—
Irkutsk		33·5	38	e 6 46	+ 3	e 12 4	− 1	—	—	—
Moscow		34·3	327	e 6 50	0	12 19	+ 2	—	—	—
Istanbul		34·7	300	e 6 54	0	12 23	− 1	e 17 14	ScS	e 17·9
Kabansk		34·7	40	6 56	+ 2	12 26?	+ 2	—	—	—
Kishinev		35·8	310	7 0	− 3	e 12 39	− 2	—	—	—
Lwow		39·6	313	7 35	0	—	—	—	—	—
Pulkovo		39·8	330	e 7 38	+ 2	e 13 48	+ 6	—	—	—
Uzhgorod		40·4	311	i 8 26?	+45	14 38?	+48	—	—	—
Timisoara		40·8	307	8 28?	+43	—	—	—	—	—
Nanking		41·5	75	e 8 1	+11	—	—	(e 17 34)	SSS	e 17·6

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Skalnate Pleso		41·9	311	e 8 40	+46	e 14 0	−13	e 17 40	SSS	—
Ogyalla		43·1	310	e 10 52	PPP	e 14 28	− 2	—	—	—
Prague		45·7	313	e 8 25	+ 1	e 15 8	0	e 10 16	PP	e 25·5
Upsala		45·7	326	e 8 21	− 3	e 15 13	+ 5	e 18 28	SS	e 23·5
Triest		46·0	306	e 8 29	+ 2	i 15 8	− 4	i 10 14	PP	e 27·0
Collmberg	z.	46·7	314	e 8 33	+ 1	e 10 31	PP	e 10 7	PcP	—
Potsdam		46·8	316	e 8 34	+ 1	i 15 25	+ 1	—	—	26·5
Rome		47·1	301	e 10 29	PP	e 15 25	− 3	—	—	—
Padova		47·4	305	e 10 26	PP	e 16 9	+37	—	—	—
Copenhagen		47·5	320	e 8 40	+ 2	i 15 35	+ 1	19 5	SS	25·5
Jena		47·6	313	e 8 40	+ 1	e 15 41	+ 6	e 10 32	PP	—
Stuttgart		49·1	310	e 8 50a	− 1	e 15 53	− 3	e 10 48	PP	e 27·5
Pavia		49·3	306	—	—	e 15 57	− 2	e 20 44	SSS	—
Strasbourg		50·1	311	e 8 58?	− 1	e 16 4	− 6	e 11 50	PPP	e 26·5
Besançon		51·3	309	e 9 7	− 1	—	—	e 10 26	PcP	—
De Bilt		51·6	315	e 11 38	PP	e 16 33	+ 2	—	—	e 25·5
Paris		53·5	311	e 9 23	− 1	e 16 54	− 3	e 17 6	PS	e 27·5
Kew		55·0	314	e 9 34	− 1	—	—	—	—	e 22·5
Aberdeen	E.	55·6	322	i 8 39	−61	e 22 18	?	—	—	i 28·9
Jersey	E.	56·5	312	—	—	e 23 15	SSS	—	—	—
Alicante		57·5	299	9 45	− 8	18 1	+11	i 9 56	ScS	e 28·8
Tamanrasset	z.	57·5	280	i 9 51k	− 2	e 17 30	−20	e 11 35	PP	e 28·2
Rathfarnham Castle		58·4	317	e 10 15	+15	e 18 12	+10	—	—	e 34·6
Almeria		59·5	298	9 58	− 9	18 26	+10	13 46	PPP	33·0
Toledo		59·8	301	i 10 8	− 1	—	—	e 11 18	?	34·8
Granada		60·2	299	10 0a	−12	18 25	0	12 31	PP	e 28·7
Malaga		61·0	299	i 10 15	− 3	i 18 49	+14	—	—	30·9
Scoresby Sund		62·5	338	i 10 30	+ 2	18 58	+ 4	25 28	SSS	—
Pretoria	z.	68·6	220	i 11 3	− 4	—	—	—	—	i 28·5
Resolute Bay		74·9	356	e 11 44	0	21 23	+ 1	—	—	e 30·1
La Paz		139·4	280	e 19 8	[−21]	29 16	{− 2}	26 51	SKS	—

Additional readings :—
Poona SSSE = 5m.43s., PcPE = 8m.27s., ScPE = 11m.33s.
Chatra PPPNZ = 3m.58s., Q = 6m.31s., SS = 6m.54s., SSS = 7m.5s.
Calcutta iSSE = 7m.37s.
Skalnate Pleso e = 10m.40s.
Prague e = 8m.42s., 8m.57s., 9m.11s., 9m.25s., 9m.56s., and 11m.35s.
Upsala ePcSE = 14m.7s., eN = 14m.14s., eSE = 14m.57s., eE = 16m.3s., eN = 16m.48s. and 17m.44s.
Triest ePcPZ = 10m.2s., iPPPZ = 11m.1s., iSS = 18m.57s.
Jena eE = 8m.59s., eN = 9m.2s. and 9m.6s., ePcP?N = 9m.55s.
Stuttgart eZ = 8m.58s., ePcPZ = 10m.19s., e = 16m.51s. and 21m.46s.
Pavia e = 17m.31s.
Strasbourg e = 9m.4s. and 9m.12s., ePcP = 10m.20s., ePP = 10m.45s., ePcS? = 13m.50s., eScS = 18m.52s., eSSS? = 21m.52s.
Besançon e = 9m.16s.
Paris i = 9m.32s., e = 9m.42s. and 10m.17s., iPcP = 10m.27s., e = 10m.36s., ePS = 18m.26s., eScS = 19m.13s., e = 20m.2s., eSSS = 22m.42s., e = 23m.6s.
Alicante PPS = 18m.37s., Q = 23m.43s.
Tamanrasset eZ = 10m.21s., ePPP?Z = 12m.42s., eZ = 27m.13s., 27m.36s., and 27m.42s.
Almeria PP = 12m.24s.
Granada PcP = 11m.19s., SS = 23m.1s.
Long waves were also recorded at Brisbane, Palisades, Weston, Harvard, Seven Falls, Seattle, Ottawa, Helsinki, Clermont-Ferrand, Taranto, and Tortosa.

May 14d. 6h. 2m. 4s. Epicentre 37°·1N. 71°·2E. Depth of focus 0·010.
(as on 1951, March 30d.).

A = +·2577, B = +·7569, C = +·6006 ; δ = +3 ; h = −1 ;
D = +·947, E = −·322 ; G = +·194, H = +·569, K = −·800.

	△	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Khorog	0·5	41	0 16	0	0 28	0
Obi-garm	2·0	324	i 0 32	− 1	e 0 57	0
Dzhergetal	2·1	0	0 37	+ 3	—	—
Stalinabad	2·4	307	i 0 37	− 1	i 1 6	− 1
Murgab	2·5	60	e 0 43	+ 3	1 16	+ 6

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Fergana	3·3	7	0 53	+ 2	1 33	+ 4
Andijan	3·8	13	0 58	0	1 44	+ 2
Samarkand	4·2	309	1 2	− 1	1 50	− 1
Lunacharskoe	4·5	341	e 1 6	− 1	i 1 58	− 1
Tashkent	4·5	341	i 1 6	− 1	i 1 57	− 2
Tchimkent	5·3	347	i 1 17	− 1	2 20	+ 2
Naryn	5·7	39	e 1 24	0	2 34	+ 6
Frunse	6·3	22	e 1 34	+ 2	i 2 45	+ 2
Rybach'e	6·5	34	e 1 37	+ 1	—	—
Almata	7·5	34	e 1 49	+ 1	—	—
Przhevalsk	7·7	44	1 52	+ 1	—	—
Almata II	7·8	35	e 1 53	+ 1	—	—
Ili	8·2	31	e 1 57	− 1	—	—

May 14d. 13h. 2m. 40s. Epicentre 9°·0N. 86°·1W. Depth of focus 0·010. (J.S.A.).

A = +·0672, B = −·9856, C = +·1554 ; δ = +7 ; h = +7 ;
D = −·998, E = −·068 ; G = +·011, H = −·155, K = −·988.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Chinchina		11·1	110	e 2 39	− 2	e 4 55	+15	—	—	5·3
Bogota		12·7	109	e 3 14	PP	i 5 54	SSS	—	—	7·3
Puebla		15·4	312	e 3 35	+ 2	—	—	—	—	—
Tacubaya		16·3	311	e 3 47	+ 3	—	—	—	—	—
Huancayo		23·5	152	e 5 11	+ 9	e 9 33	sS	e 11 32	?	—
Fort de France		25·1	75	e 5 32?	+15	e 9 46?	+14	—	—	—
La Paz		31·0	144	e 6 33	pP	—	—	i 14 3	?	15·8
Morgantown		31·0	9	i 5 35	−35	—	—	e 7 35	PPP	—
Fordham		33·5	18	e 6 32	0	—	—	e 7 46	PP	16·7
Palisades		33·7	18	e 6 28	− 6	e 11 46	− 3	e 7 40	PP	e 16·6
Harvard		35·7	19	e 6 42	− 9	—	—	—	—	e 16·8
Weston		35·7	19	e 6 46	− 5	—	—	—	—	—
Palomar	Z.	37·3	316	i 7 5	+ 1	—	—	i 7 13	pP	—
Riverside	Z.	38·0	316	i 7 11	+ 1	—	—	—	—	—
Pasadena	Z.	38·6	316	i 7 13	− 2	—	—	—	—	—
China Lake	Z.	39·2	319	i 7 18	− 2	—	—	—	—	—
Seven Falls	E.	40·2	16	e 8 58	PP	(e 16 26)	SS	—	—	e 16·4
Tinemaha	Z.	40·3	319	e 7 29	0	—	—	—	—	—
Fresno	Z.	41·2	318	e 7 38a	+ 2	e 9 58	PPP	e 7 55	pP	—
Lick	Z.	42·7	317	i 7 51a	+ 2	—	—	—	—	—
Reno		42·8	321	e 7 50k	0	—	—	e 8 10	pP	—
Berkeley		43·4	317	e 7 56k	+ 2	e 14 32	SPP	e 11 10	?	—
Mineral	Z.	44·4	321	e 8 3a	0	—	—	i 8 18	pP	—
Seattle		49·2	328	i 8 41k	+ 1	—	—	—	—	e 27·3
Resolute Bay		65·8	358	e 9 26	−71	e 19 20	+ 6	e 20 30	ScS	—
Malaga		78·0	54	i 11 56	+ 7	e 21 34	0	—	—	36·4
Granada		78·7	54	i 11 55a	+ 2	21 53	+12	—	—	34·5
Almeria		79·6	54	11 49	− 9	21 36	−15	14 48	PP	36·0
Alicante		81·1	52	11 29	−37	21 28	−38	31 16	Q	36·8
Strasbourg		85·9	42	e 12 36	+ 6	—	—	e 15 57	PP	—
Stuttgart		86·8	42	e 12 33	− 2	e 23 0	− 2	e 12 37	P	e 42·3
Collmberg	Z.	88·7	38	e 12 43	− 1	—	—	—	—	—
Istanbul		102·5	45	—	—	e 24 29	[+13]	e 28 20	?	—
Ksara		110·5	50	—	—	e 26 37	?	e 37 34	?	—

Additional readings :—
Lick iZ = 7m.59s., eZ = 8m.21s.
Seattle i = 8m.48s., 8m.55s., and 9m.13s.
Alicante PP = 14m.8s., PPP = 15m.27s., SSS = 29m.32s.
Long waves were also recorded at Vera Cruz, Scoresby Sund, Paris, Clermont-Ferrand, Potsdam and De Bilt.

May 14d. 22h. Undetermined shock.

Brisbane eP =3m.54s., iZ =4m.3s., eSE =7m.57s.
Almata eP =11m.42s., S =21m.53s.
Frunse eP =11m.43s.?, iS =22m.3s.
Andijan eP =11m.53s., iS =22m.8s.
Fergana eP =11m.56s.
Stalinabad eP =12m.4s., iS =22m.22s.
Palomar ePZ =12m.21s.
Mount Wilson ePZ =12m.28s.
Riverside ePZ =12m.29s.
China Lake ePZ =12m.29s., eZ =12m.36s.
Reno ePZ =12m.30s.a.
Tinemaha ePZ =12m.32s.
Stuttgart ePKPZ =18m.9s., eZ =18m.18s.
Tamanrasset ePKPZ =18m.39s.
Obi-garm S =22m.12s.
Tashkent S =22m.23s.

May 14d. Readings also at 0h. (Mount Wilson, Riverside, Palomar, Tinemaha, Lick, Fresno, Mineral, Reno, Stuttgart, Jena, and Collmberg), 1h. (Cobb River, Kaimata, Tuai, Wellington, Collmberg, Apia, Mount Wilson, Riverside, Palomar, China Lake, Oaxaca, near Puebla, Tacubaya, and Vera Cruz), 2h. (Collmberg, Mount Wilson, Riverside, Palomar, China Lake, Tinemaha, Resolute Bay, Mineral, Harvard, and Weston), 4h. (Christchurch, Wellington, Brisbane (2), Riverview, Berkeley, Lick, Fresno, Mineral, Reno, China Lake, Granada, and Stuttgart), 5h. (Brisbane (2), Santa Lucia, and near Copiapo,), 6h. (Brisbane (2) and Wellington), 7h. (Ksara and near Prague), 8h. (Tacubaya), 9h. (Prague, Stuttgart, Triest, and Zürich), 10h. (Collmberg, Grahamstown, and near Bandong), 11h. (Collmberg), 12h. (near Copiapo), 14h. (near Apia, and near Mizusawa), 15h. (Resolute Bay, Brisbane, Collmberg, Andijan, Fergana, Samarkand, Tchimkent, near Khorog, Murgab, Obi-garm, and Stalinabad), 17h. (near Dzhergetal), 20h. (Almata, Almata II, Chilisk, near Andijan, Dzhergetal, Fergana, Khorog, Naryn, Obi-garm, Rybach'e, Stalinabad, and near Klyuchi), 21h. (Pretoria, Ksara, Ashkabad, and near Dzhergetal (2)), 22h. (Apia, Brisbane, Ashkabad, and near Dzhergetal),.

May 15d. 5h. 18m. 44s. Epicentre 21°·2S. 69°·7W. Depth of focus 0·010.

A = +·3237, B = −·8752, C = −·3595 ; δ = 0 ; h = +4 ;
D = −·938, E = −·347 ; G = −·125, H = +·337, K = −·933.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Antofagasta	E.	2·5	195	e 0 37	− 3	—	—	—	—	—
La Paz		4·9	18	i 1 16a	+ 3	i 2 16	+ 7	i 1 32	PP	2·5
Copiapo	N.	6·2	185	1 20	−10	i 2 32	− 9	—	—	—
Huancayo		10·6	328	e 2 28	− 2	e 4 30	+ 2	i 2 43	PP	i 5·3
Santa Lucia		12·2	184	e 2 54	+ 2	i 5 21	+15	—	—	—
Santiago		12·2	184	e 3 0	+ 8	i 5 28	+22	—	—	—
Concepción		15·9	190	e 4 3	+24	—	—	—	—	e 7·2
Buenos Aires		16·6	146	3 48	0	7 17	+29	—	—	—
La Plata		17·1	145	e 3 52	− 2	6 52	− 8	7 10	SS	8·4
Bogota		26·0	350	i 5 26	0	i 9 52	+ 5	i 5 44	pP	—
Chinchina		26·6	348	i 5 33	+ 2	i 10 1	+ 4	i 5 59	pP	—
Fort de France		36·7	14	e 6 57	− 2	e 12 53	+18	—	—	—
Tacubaya		49·6	323	i 8 59	+16	e 15 52	+ 9	—	—	—
Morgantown		61·3	351	i 10 6	− 2	e 15 52	?	—	—	—
Fordham		61·8	357	i 10 14	+ 3	i 18 30	+ 5	i 10 42	pP	—
Palisades		62·0	357	i 10 11	− 1	e 18 20	− 7	i 10 27	pP	—
Pittsburgh		62·1	352	i 10 22	+ 9	i 18 44	+16	i 10 36	pP	—
St. Louis		62·6	342	i 10 12	− 4	i 18 33	− 2	i 10 39	pP	—
Florissant		62·8	342	i 10 15	− 3	e 18 37	0	e 19 0	sS	—
Cleveland		63·3	350	i 10 19a	− 2	e 18 43	− 1	i 10 34	pP	—
Weston		63·3	359	i 10 20	− 1	e 18 44	0	i 10 41	pP	—
Harvard		63·4	359	i 10 22	0	i 18 48	+ 3	i 10 36	pP	e 33·5
Halifax		66·4	5	e 10 40	− 1	19 19	− 3	—	—	29·1
Ottawa		66·5	355	e 10 41	0	19 28	+ 5	i 10 55	pP	34·3
Shawinigan Falls	N.	67·5	358	e 10 48	0	19 31	− 4	20 7	PS	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m. s.			m.
Seven Falls	E.	68·0	359	10 52	+ 1	19 48	+ 7	20 16	PS		—
La Jolla	Z.	70·4	319	e 11 8	+ 2	—	—	i 11 22	pP		—
Palomar		70·5	320	i 11 8a	+ 2	i 20 21	+11	i 11 21	pP		—
Riverside		71·2	320	i 11 11a	+ 1	—	—	i 11 26	pP		—
Pasadena		71·8	320	i 11 15a	+ 1	i 20 35	+10	i 11 29	pP		e 35·3
China Lake		72·6	321	i 11 19a	0	e 20 36	+ 2	i 11 34	pP		—
Tinemaha		73·8	321	i 11 28a	+ 2	e 20 59	+11	i 11 42	pP		—
Fresno		74·5	320	e 11 29a	− 1	e 21 12	+17	e 11 44	pP		—
Lick	Z.	76·0	320	i 11 40a	+ 2	—	—	i 11 54	pP		—
Reno	Z.	76·4	322	e 11 42a	+ 2	—	—	i 11 57	pP		—
Berkeley		76·8	320	i 11 44a	+ 1	e 21 26	+ 5	i 11 58	pP		—
Mineral	Z.	78·0	322	i 11 49a	0	—	—	i 12 4	pP		—
Seattle		83·2	327	i 12 18a	+ 1	i 22 36	+ 9	i 12 53	pP		—
Grahamstown	Z.	83·6	123	i 12 21	+ 2	—	—	—	—		—
Kimberley	Z.	83·8	118	i 12 21	+ 1	—	—	—	—		—
Malaga		84·3	47	i 12 25	+ 3	e 22 42	+ 4	i 12 46	pP		e 36·4
Granada		85·1	47	i 12 28k	+ 2	i 23 19	+33	12 49	PcP		41·6
Tamanrasset	Z.	85·3	63	i 12 31k	+ 4	e 22 50	+ 2	e 12 52	pP		—
Almeria		85·7	48	i 12 31	+ 2	23 3	+11	15 51	PP		47·2
Toledo		86·2	45	i 12 35	+ 3	24 8	PS	i 12 55	pP		—
Pretoria	Z.	87·7	117	i 12 40	+ 1	—	—	—	—		—
Alicante		87·8	47	12 51	+12	23 32	+20	16 40	PP		e 42·2
Terre Adélie		89·2	192	i 13 1	+15	—	—	13 34	pP		—
Algiers Univ.	Z.	89·6	50	e 12 49	+ 1	—	—	e 13 9	pP		—
Tortosa		89·7	46	—	—	i 23 24	− 6	—	—		e 46·3
Rathfarnham Castle		92·1	32	i 13 1	+ 1	e 23 23	[+ 2]	e 16 46	PP		e 41·3
Reykjavik	Z.	92·8	18	i 13 5	+ 2	—	—	e 13 19	pP		—
Kew		94·3	36	e 13 10	0	e 23 42	[+ 8]	e 16 54	PP		e 41·3
Paris		94·7	39	e 13 12	+ 1	i 24 11	− 2	i 13 35	pP		e 43·3
Besançon		96·1	41	e 13 39	pP	—	—	e 17 33	PP		—
Aberdeen	E.	96·2	30	e 13 26	+ 8	i 24 20	− 6	i 17 32	PP		—
Resolute Bay		97·0	353	e 13 37	+15	e 24 36	+ 3	e 17 12	PP		—
Basle		97·2	42	e 13 46	pP	—	—	—	—		—
Pavia		97·3	44	e 14 5	pP	—	—	e 17 2	PP		e 49·8
Scoresby Sund		97·3	14	e 13 34	+11	e 24 28	− 7	e 17 38	PP		43·8
De Bilt		97·6	37	i 13 27	+ 2	e 24 3	[+11]	i 13 46	pP		e 42·3
Strasbourg		97·7	40	e 13 24	− 1	e 24 28	−11	e 13 48	pP		e 43·3
Zürich		97·7	42	e 14 25	+60	—	—	e 17 38	PP		—
Karlsruhe	Z.	98·3	40	e 13 28	0	—	—	—	—		—
Rome		98·3	48	e 13 27	− 1	e 24 31	−13	e 17 24	PP		e 46·5
Stuttgart		98·7	41	e 13 29	− 1	e 24 7	[+ 9]	e 13 51	pP		e 50·3
Padova		98·8	45	e 13 49	+19	—	—	17 52	PP		—
Triest		100·5	44	e 13 54	+16	i 24 41	SKKS	i 17 45	PKP		—
Jena	Z.	100·9	39	e 13 41	+ 1	e 17 45	PP	e 13 57	pP		—
Bergen	Z.	101·1	28	e 38 37	P'P'	—	—	e 40 41	SKPP'		—
Collmberg	Z.	101·9	39	e 13 43	− 1	e 17 50	PP	e 14 4	pP		—
Potsdam		102·2	37	e 13 48	+ 3	i 24 25	[+10]	e 14 9	pP		e 50·3
Prague		102·3	40	e 17 38	?	e 24 27	[+12]	e 17 58	PP		—
Copenhagen		103·0	34	18 23	PP	24 30	[+12]	24 58	SKKS		46·3
Belgrade		104·7	47	e 18 14a	PKP	e 25 4	SKKS	i 18 35	PP		—
Upsala		106·8	31	e 16 12	?	e 28 11	PS	e 18 30	PKP		e 52·3
Uzhgorod		106·9	44	e 18 33	PP	—	—	—	—		—
Lwow		108·3	43	e 18 42	PP	e 24 51	[+ 9]	e 28 12	PS		—
Istanbul		110·1	52	e 18 57	PP	e 25 45	SKKS	e 22 22	PKS		e 51·3
Helsinki	E.	110·4	31	—	—	e 28 49	PS	—	—		—
Pulkovo		113·1	33	e 19 14	PP	e 25 9	[+ 8]	e 19 34	pPP		—
Yalta		114·3	50	e 19 24	PP	i 25 12	[+ 6]	e 19 46	pPP		—
Ksara		114·9	62	i 19 26	PP	29 12	PS	19 46	pPP		—
Moscow		117·0	37	e 18 37	[+ 3]	e 28 40	PS	e 19 31	PP		—
Leninakan		121·1	54	e 20 31	PP	—	—	—	—		—
Grozny		122·6	51	e 19 6	[+22]	—	—	e 20 38	PP		—
Kirovobad		123·0	54	i 20 27	PP	—	—	—	—		—
Makhach-Kala		123·9	52	i 20 33	PP	—	—	—	—		—
Shemakla		124·8	54	18 53	[+ 4]	—	—	i 20 39	PP		—
Baku		125·7	54	e 20 47	PP	—	—	—	—		—

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Sverdlovsk	129·2	32	i 19 16?	[+19]	22 44?	PS	20 59?	PP	—
Ashkabad	132·4	57	e 19 7	[+ 4]	—	—	—	—	—
Mary	135·2	57	i 19 13	[+ 5]	—	—	—	—	—
Samarkand	138·8	54	22 4	PP	—	—	—	—	—
Tchimkent	140·0	48	e 19 21?	[+ 4]	—	—	19 42	pPKP	—
Tashkent	140·1	50	e 19 14?	[− 3]	i 29 31?	sSKKS	i 22 19	PP	—
Stalinabad	140·4	53	i 19 21?	[+ 3]	—	—	i 22 18	PP	—
Dzhergetal	142·1	52	e 19 24	[+ 3]	—	—	—	—	—
Andijan	142·5	50	i 19 22	[0]	—	—	e 22 55	PKS	—
Murgab	144·4	53	i 19 29	[+ 4]	—	—	i 23 10	PKS	—
Rybach'e	144·4	46	i 19 27	[+ 2]	—	—	e 23 10	—	—
Almata	144·6	43	i 19 29	[+ 4]	e 23 12	PKS	19 50	pPKP	—
Bombay	144·8	87	e 19 28	[+ 2]	—	—	e 22 45	PKS	—
Naryn	144·8	47	i 19 28	[+ 2]	—	—	i 23 4	PKS	—
Almata II	144·9	43	i 19 30	[+ 4]	—	—	—	—	—
Chilisk	145·4	41	i 19 30	[+ 3]	—	—	—	—	—
Poona	145·7	88	i 19 31	[+ 4]	22 51	PKS	19 48	PKP_2	—
Irkutsk	148·6	7	e 19 36	[+ 4]	23 8	PKS	—	—	—
Kabansk	149·0	4	19 36	[+ 3]	23 11	PKS	e 19 55	pPKP	—
Vladivostok	151·7	325	i 19 34	[− 3]	e 23 14	PKS	e 22 10	PP	—

Additional readings :—
La Plata E =6m.40s. and 7m.52s.
Bogota isSEN =10m.18s., iScPEN =12m.30s.
Chinchina e =5m.42s., isS =10m.28s.
Palisades ePS =18m.53s.
St. Louis esS =19m.0s., ePS =19m.57s.
Florissant ePS =19m.52s.
Cleveland isPZ =10m.47s., esSE =19m.10s., iE =20m.10s. and 20m.36s.
Harvard isP =10m.42s., iPcP? =11m.15s., i =11m.27s., eScS? =20m.12s.
Ottawa PS =19m.54s., ScS =20m.36s., e =20m.58s., 23m.52s., and 26m.41s.
Seven Falls eE =21m.7s., SSE =24m.3s.
Palomar iN =11m.38s., eN =13m.5s.
Pasadena isP?N =11m.37s., iZ =11m.47s., isSEN =21m.0s., iN =21m.36s.
China Lake isP?Z =11m.40s., iZ =11m.58s. and 12m.15s., eN =21m.10s., ePKP,PKPZ = 39m.16s., ePKP,PKP,PKPZ =56m.7s.
Tinemaha isP?Z =11m.49s.
Fresno eN =13m.59s., eE =21m.17s.
Berkeley isPZ =12m.4s., iZ =12m.13s., eZ =12m.28s., ePPZ =14m.48s.
Mineral iZ =12m.25s., eZ =13m.43s.
Seattle iP? =12m.33s., esP? =13m.4s.
Granada iPP =15m.55s., PPP =18m.4s., PS =24m.21s., SS =28m.58s.
Tamanrasset eZ =12m.41s., isPZ =13m.13s., iZ =13m.18s., ePPZ =15m.43s., epSZ = 23m.19s., ePSZ =24m.16s., ePKP,PKPZ =38m.56s.
Almeria PPP =17m.47s., SS =28m.30s.
Toledo PP =16m.7s.
Alicante PPP =18m.30s., PS =24m.47s., PPS =25m.29s., SS =29m.27s., Q =36m.17s.
Rathfarnham Castle eSEN =24m.22s.
Kew eEN =22m.18s., ePPSEN =26m.22s.
Paris e =13m.27s., i =13m.32s., ePP =17m.0s., ipPP =17m.18s., e =18m.29s., ePPP = 19m.13s., iSKKS =23m.52s., epS =24m.36s., isS =24m.50s., e =25m.15s., ePS = 25m.48s., ePPS =26m.40s., eSS =30m.36s.
Aberdeen iE =21m.36s., eE =22m.46s. and 31m.26s.
Resolute Bay eE =27m.6s., 29m.18s. and 31m.12s.
De Bilt iPP =17m.23s., ipPP =17m.42s., eSKKS =24m.28s., eSS =31m.31s.
Strasbourg e =14m.50s., ePKP? =16m.55s., ePP =17m.20s., epPP =17m.42s., ePPP? = 19m.54s., eSKS =24m.1s., esS =25m.4s., ePPS =26m.40s., eSS=31m.16s., e=36m.46s.
Rome eSKKS? =24m.4s., eSS? =31m.52s.
Stuttgart ePP =17m.28s., e =17m.46s. and 19m.2s., epSKS? =24m.30s., ePS =26m.40s., eSS =31m.58s., eQ =47·3m.
Triest iPP =18m.4s., iPS? =26m.49s., iPPS? =27m.50s.
Jena eZ =14m.42s. and 17m.18s., ePP?N =17m.50s., e =18m.6s., eZ =21m.25s. and 22m.13s.
Collmberg eZ =18m.12s.
Potsdam iPPZ =17m.59s., ipPPEZ =18m.17s., iSKSE =24m.55s.
Prague epPPZ =18m.19s., epPP =18m.25s., ePPP =20m.20s., eSE =24m.54s., epSE = 25m.27s., eSS =32m.28s., and other unidentified e readings.
Belgrade eNE =27m.38s., eNW =36m.47s.
Upsala ePP =18m.48s., ePPPE =21m.4s.
Lwow ePPP =21m.1s.
Istanbul ePP?N =19m.16s., eN =27m.6s., eE =27m.15s., ePSN =28m.36s., ePPSE = 29m.43s., eSSE =34m.41s.
Pulkovo PPS =29m.24s.
Yalta ePS =28m.58s.
Tashkent pPP =22m.39s.
Long waves were also recorded at Wellington.

May 15d. 9h. 48m. 18s. Epicentre 18°·3N. 145°·2E. Depth of focus 0·025.
(as on 1950, May 26d.).

$A = -·7802$, $B = +·5422$, $C = +·3121$; $\delta = +10$; $h = +5$;
$D = +·571$, $E = +·821$; $G = -·256$, $H = +·178$, $K = -·950$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Mera		17·2	345	3 51	+ 1	6 54	+ 1	—	—	—
Omaesaki		17·4	342	e 3 54	+ 2	i 6 59	+ 1	—	—	—
Misima		17·6	344	e 3 55	+ 1	7 14	+12	—	—	—
Shizuoka		17·7	342	e 3 57	+ 1	7 4	0	—	—	—
Yokohama		17·8	345	3 58	+ 1	7 6	0	—	—	—
Tokyo		18·0	346	e 3 58	− 1	7 9	− 1	—	—	—
Hunatu		18·1	344	i 3 58	− 2	i 7 11	− 1	—	—	—
Kameyama		18·2	339	4 3	+ 2	e 7 14	0	—	—	—
Kohu		18·3	343	e 4 2	0	e 7 16	0	—	—	—
Nagoya		18·3	341	e 4 2	0	e 7 16	0	—	—	—
Iida		18·4	342	e 4 3	0	e 7 17	− 1	—	—	—
Koti		18·4	328	e 4 7	+ 4	e 7 18	0	i 7 26	?	—
Kumagaya		18·5	345	i 4 3	− 1	7 19	− 1	—	—	—
Mito	z.	18·5	347	4 4	0	7 24	+ 4	—	—	—
Hikone		18·7	339	e 4 8	+ 2	e 7 25	+ 1	—	—	—
Kyoto		18·7	338	e 4 4	− 2	e 7 18	− 6	—	—	—
Maebasi	z.	18·8	345	i 4 6	− 1	e 7 21	− 5	—	—	—
Utunomiya		18·8	346	e 4 5	− 2	e 7 25	− 1	—	—	—
Oiwake		18·9	343	4 8	0	7 31	+ 3	—	—	—
Matumoto		19·0	342	e 4 10	+ 1	e 7 30	0	—	—	—
Matusiro		19·2	343	i 4 11	0	i 7 32	− 2	—	—	—
Nagano		19·3	344	e 4 12	0	e 7 33	− 2	e 4 59	PP	—
Shirakawa		19·3	346	e 4 11	− 1	e 7 37	+ 2	—	—	—
Toyama		19·6	342	4 23	+ 8	7 48	+ 7	e 4 56	PP	—
Inawashiro		19·7	346	i 4 18	+ 2	i 7 45	+ 2	—	—	—
Kanazawa		19·7	339	e 4 16	0	e 7 49	+ 6	—	—	—
Hukusima		19·8	349	4 18	+ 1	7 48	+ 3	—	—	—
Sendai		20·2	352	4 20	− 1	7 57	+ 5	—	—	—
Niigata		20·3	343	4 26	+ 4	7 59	+ 5	—	—	—
Yamagata		20·3	346	e 4 23	+ 1	7 58	+ 4	—	—	—
Wazima		20·4	342	e 4 22	− 1	e 7 56	0	—	—	—
Aikawa		20·6	343	e 4 25	0	7 58	− 1	—	—	—
Mizusawa		21·1	352	4 29	− 1	e 8 6	− 3	8 1	S	—
Miyako		21·5	353	4 33	− 1	e 8 14	− 2	—	—	—
Morioka		21·6	353	i 4 35	0	i 8 23	+ 6	—	—	—
Akita		21·8	351	i 4 32	− 5	i 8 12	− 9	—	—	—
Aomori		22·8	351	4 48	+ 1	8 42	+ 4	6 11	PP	—
Manila		23·5	266	e 4 54	0	e 5 37	pP	—	—	—
Urakawa		23·9	356	e 5 0	+ 3	e 8 56	− 1	e 5 11	PP	e 10·9
Sapporo		24·9	353	i 5 8	+ 1	e 9 12	− 1	—	—	—
Vladivostok		27·2	338	i 5 26	− 2	i 9 49	− 2	i 6 7	pP	—
Nanking		27·4	305	e 5 39	+ 9	—	—	—	—	e 11·3
Petropavlovsk		36·3	12	e 6 43	− 4	—	—	—	—	—
Klyuchi		39·7	13	i 7 14	− 1	i 13 0	− 4	—	—	—
Kabansk		45·2	327	7 59	0	e 14 25	+ 1	e 8 43	pP	—
Brisbane	z.	46·1	170	e 8 11	+ 4	—	—	—	—	—
Przhevalsk		60·9	310	i 9 56	+ 1	—	—	—	—	—
Ili		61·9	311	i 10 0	− 1	—	—	—	—	—
Almata		62·0	311	i 10 3	+ 1	i 18 12	+ 3	10 49	pP	—
Naryn		62·6	309	i 10 6	0	i 18 19	+ 2	i 10 53	pP	—
Rybach'e		62·6	309	e 10 5	− 1	—	—	—	—	—
Frunse		63·7	310	i 10 14	+ 1	i 18 33	+ 2	i 11 2	pP	—
Murgab		64·4	305	i 10 20	+ 2	i 18 42	+ 3	—	—	—
Andijan		65·4	308	i 10 25	+ 1	i 18 53	+ 2	e 11 13	pP	—
Fergana		65·9	308	i 10 27	0	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Khorog		66·3	303	e 10 31	+ 1	—	—	—	—	—
Tchimkent		67·4	310	i 10 39	+ 2	—	—	—	—	—
Tashkent		67·7	399	i 10 39	0	i 19 18	− 1	i 11 27?	pP	—
Bombay		68·1	284	e 10 45	+ 4	e 19 29	+ 5	i 20 56	sS	—
Stalinabad		68·4	306	i 10 43	0	e 19 26	− 1	—	—	—
Samarkand		69·6	306	e 10 52	+ 2	—	—	—	—	—
Sverdlovsk		71·9	326	i 11 4	0	20 3	− 5	e 21 30	sS	—
Mary		73·9	305	i 11 17	+ 1	—	—	—	—	—
Ashkabad		76·6	306	i 11 32	+ 1	—	—	—	—	—
Seattle		78·3	43	i 11 41 a	+ 1	e 22 32?	PS	e 12 25	pP	—
Resolute Bay		79·9	13	e 11 47	− 2	e 21 29	− 6	e 12 35	pP	e 25·9
Mineral		80·8	51	i 11 52 a	− 1	—	—	i 12 33	pP	—
Berkeley		80·9	54	i 11 53 a	− 1	e 21 25	−20	i 12 45	pP	—
Lick	z.	81·6	54	i 11 56 a	− 2	—	—	i 12 46	pP	—
Reno	z.	82·3	50	i 12 1 a	0	—	—	—	—	—
Fresno	z.	83·1	55	e 12 5 a	− 1	—	—	e 12 57	pP	—
Shemakla		83·1	311	12 5	− 1	i 22 3	− 4	—	—	—
Tinemaha		84·2	53	i 12 12 a	± 1	—	—	i 13 3	pP	—
Grozny		84·3	314	e 12 16	− 4	—	—	—	—	—
Kirovobad		84·7	311	i 12 14	0	i 22 19	− 4	—	—	—
Terre Adélie		84·9	181	e 12 18	+ 3	—	—	—	—	—
China Lake		85·1	53	i 12 15 a	0	—	—	i 13 7	pP	—
Pasadena		85·2	56	i 12 15	− 1	—	—	i 13 7	pP	—
Tiflis		85·5	312	e 12 16	− 1	—	—	—	—	—
Gori		85·9	312	e 12 25	+ 6	—	—	—	—	—
Riverside		85·9	56	i 12 18 a	− 1	—	—	—	—	—
Pulkovo		86·2	332	—	—	e 22 25	[− 1]	—	—	—
Palomar		86·5	56	i 12 22 a	0	—	—	i 13 15	pP	—
Scoresby Sund		91·0	356	i 12 42 a	− 2	e 16 21	PP	i 13 33	pP	—
Copenhagen		96·2	335	i 13 5	− 2	—	—	—	—	—
Istanbul		96·4	317	e 13 7	− 1	e 23 21	[− 4]	e 16 52	PP	—
Prague		98·4	40	e 17 27	PP	e 18 37	sPP	e 18 8	pPP	—
Stuttgart		102·6	331	e 13 35	− 1	—	—	e 17 50	PP	e 56·7
Florissant		103·0	42	e 17 48	PP	—	—	—	—	—
St. Louis		103·2	42	e 17 2	PKP	e 23 56	[− 3]	e 17 49	PP	—
Paris		105·4	335	e 18 10	PP	—	—	—	—	e 59·7
Tamanrasset	z.	122·3	314	i 18 36 k	[+ 4]	e 32 22	SKKP	e 19 45	pPKP	—
La Paz		148·2	93	i 19 24	[+ 4]	—	—	e 22 58	PP	—

Additional readings :—
Urakawa ePPP? =5m.30s.
Vladivostok e =10m.58s.
Andijan esS =20m.22s.
Seattle e =12m.13s., esP =12m.46s.
Resolute Bay eZ =12m.4s.
Mineral iZ =11m.58s.
Berkeley eZ =12m.3s., 12m.20s., and 12m.51s.
Lick iZ =12m.7s.
Fresno eN =13m.14s.
Palomar iZ =13m.35s.
Istanbul eE =25m.13s., ePSE =25m.45s., ePPSE =26m.5s.
Prague e =17m.46s. and 19m.6s.
Paris ePP =18m.13s.
Tamanrasset ePPZ =20m.15s., epPPZ =21m.6s.
La Paz iPKP$_2$?Z =19m.28s.

May 15d. 11h. 22m. 44s. Epicentre 6°·1S. 150°·5E. (as on 1950, May 10d.).

$A = -·8655$, $B = +·4897$, $C = -·1055$; $\delta = +3$; $h = +7$;
$D = +·492$, $E = +·870$; $G = +·092$, $H = -·052$, $K = -·994$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	N.	21·4	174	i 4 46	− 5	i 8 47	+ 2	—	—	—
Riverview		27·6	178	i 4 43	−68	i 10 28	− 4	—	—	e 14·3
Manila		35·8	306	e 5 16?	?	—	—	—	—	—
Perth		41·3	227	—	—	i 17 1	SS	—	—	i 21·2
Christchurch		42·1	156	—	—	e 19 41	Q	—	—	e 24·5

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Vladivostok		51·8	343	e 9 29	+17	e 16 39	+ 6	—	—	—
Kabansk		68·9	332	e 11 18	+ 9	e 20 17	+ 4	—	—	—
Bombay		80·4	290	e 12 19	+ 4	i 22 27	+ 6	—	—	—
Almata		82·3	315	e 12 27?	+ 2	i 22 48	+ 8	—	—	—
Rybach'e		82·7	313	e 12 31	+ 4	e 22 47	+ 3	—	—	—
Murgab		83·3	309	—	—	i 22 51	+ 1	—	—	—
Frunse		83·9	314	e 12 33	0	e 22 55	− 1	—	—	—
Stalinabad		87·3	309	—	—	i 23 18	[+ 2]	—	—	—
Berkeley	z.	91·5	52	e 13 9	− 1	e 23 30	[−12]	—	—	e 45·2
Mineral	z.	92·3	50	e 13 16k	+ 3	—	—	—	—	—
Fresno	z.	93·4	53	e 13 22	+ 4	—	—	—	—	—
Reno	z.	93·6	51	e 13 26k	+ 7	—	—	—	—	—
Tinemaha	z.	94·6	54	e 13 20	− 4	—	—	e 13 36	?	—
China Lake	z.	95·1	54	e 13 20	− 6	—	—	e 13 38	?	—
Riverside	z.	95·1	56	e 13 18	− 8	—	—	e 13 37	?	—
Ashkabad		95·4	307	—	—	24 4?	[+ 1]	—	—	—
Stuttgart		126·4	329	e 19 1	[− 4]	e 32 40	PPS	e 21 0	PP	—
Paris		129·5	333	e 21 50	PP	i 22 32	PKS	—	—	—
Tamanrasset	z.	142·4	300	e 19 26	[− 9]	e 22 11	?	—	—	—

Additional readings :—
Brisbane eE = 4m.51s., eSE = 8m.51s.
Stuttgart eZ = 19m.14s.
Long waves were also recorded at Wellington.

May 15d. 11h. 51m. 47s. Epicentre 12°·1N. 46°·7E.

A = +·6708, B = +·7118, C = +·2083 ; δ = +2 ; h = +6 ;
D = +·728, E = −·686 ; G = +·143, H = +·152, K = −·978.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Helwan	N.	22·7	323	—	—	e 9 19	+10	—	—	—
Ksara		23·8	336	i 5 17	+ 2	9 51?	+23	—	—	—
Lenkoran		26·6	5	5 48	+ 6	—	—	—	—	—
Nakicheven		27·0	359	e 5 48	+ 3	i 10 32	+10	—	—	—
Ashkabad		27·8	21	i 5 52	− 1	e 10 40	+ 5	—	—	—
Baku		28·3	5	e 6 0	+ 3	e 10 53	+10	—	—	—
Kirovobad		28·5	0	i 5 59	0	i 10 53	+ 7	—	—	—
Shemakha		28·5	3	6 1	+ 2	i 10 55	+ 9	—	—	—
Mary		28·8	26	6 1	− 1	—	—	—	—	—
Tiflis		29·5	357	e 6 9	+ 1	—	—	—	—	—
Gori		29·9	356	e 6 16	+ 4	—	—	—	—	—
Istanbul		32·7	335	e 6 36	0	e 11 40	−12	e 14 12	Q	e 18·0
Stalinabad		32·9	33	e 6 40	+ 2	e 12 4	+ 8	—	—	—
Tashkent		35·2	30	e 6 57	− 1	i 12 38	+ 7	—	—	—
Fergana		35·8	34	e 7 3	0	—	—	—	—	—
Tchimkent		36·1	29	e 7 4	− 1	—	—	—	—	—
Andijan		36·4	34	e 7 6	− 2	12 52	+ 2	—	—	—
Kishinev		37·9	340	e 7 11	− 9	—	—	—	—	—
Frunse		39·0	33	e 7 32	+ 2	e 13 36	+ 7	—	—	—
Almata		40·6	34	—	—	e 13 49	− 5	—	—	—
Tamanrasset	z.	40·6	291	e 7 43	0	—	—	e 9 46	PcP	—
Pretoria	z.	41·7	204	i 7 52	0	—	—	—	—	—
Sverdlovsk		45·9	10	—	—	e 15 14	+ 3	—	—	—
Stuttgart		48·0	327	e 8 40	− 3	e 15 38	− 3	e 10 31	PP	e 25·2
Strasbourg		48·6	326	e 8 46	− 1	—	—	—	—	—
Besançon		48·9	324	e 8 48	− 2	—	—	—	—	—
Granada		51·4	308	i 8 43k	−26	—	—	—	—	28·9
Paris		51·7	323	e 9 17	+ 6	e 16 36	+ 4	e 12 11	PPP	e 27·2
Malaga		51·9	307	i 9 9	− 3	e 17 41	+66	—	—	30·1

Additional readings :—
Tamanrasset eZ = 8m.12s.
Strasbourg e = 9m.7s.
Besançon e = 8m.55s.
Paris e = 9m.33s. and 9m.45s.
Long waves were also recorded at Tacubaya, Scoresby Sund, Harvard, Potsdam, Almeria, and Alicante.

May 15d. 22h. 54m. 26s. Epicentre 45°·5N. 9°·6E. (Strasbourg).

Intensity VI at Mendrisotto; V throughout the remainder of Tessin; IV-V in the Alps and Mittelland (Berne); III in Jura, Scaffhausen, and around Lake Constance. Felt throughout North Italy with intensity VI at Pavia and Milan (with much damage), also as far as Brescia, Verona, Padova, Bologna, Venice, and Southern Germany.
Monthly Seismo. Bulletin, Rome, 1951, May, p.9. Energy approx. 10^{21} ergs.

E. Wanner.
Jahresbericht des Erdbebendienstes der Schweiz im Jahre, 1951, Zürich, 1952, p.2, macroseismic chart, fig. 5.

$A = +\cdot6935$, $B = +\cdot1173$, $C = +\cdot7109$; $\delta = +8$; $h = -4$;
$D = +\cdot167$, $E = -\cdot986$; $G = +\cdot701$, $H = +\cdot119$, $K = -\cdot703$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Pavia		0·4	224	i 0 12a	− 1	i 0 18	− 3	i 0 16	S*	—
Salo		0·7	81	i 0 27k	+10	i 0 40	+12	—	—	—
Chur		1·4	358	i 0 30a	+ 3	i 0 43	− 3	—	—	—
Bologna		1·6	129	i 0 30k	0	i 0 54	Sg	i 0 36	Pg	—
Padova		1·9	122	i 0 30k	− 4	—	—	i 0 36	P	—
Prato		1·9	147	i 0 34	0	i 2 9	?	—	—	—
Zürich		2·0	339	i 0 38a	+ 3	i 1 3	+ 1	i 0 46	Pg	—
Florence		2·1	146	e 0 36	− 1	i 0 58	− 6	i 0 43	Pg	—
Pieve de Cadore		2·1	64	0 20k	−17	1 6	+ 2	—	—	—
Ravensburg		2·3	0	e 0 42a	+ 2	i 1 7	− 2	e 0 51	Pg	—
Neuchatel		2·4	309	i 0 42a	+ 1	e 1 9	− 3	e 0 49	Pg	—
Basle		2·5	326	i 0 43a	0	—	—	e 0 54	Pg	—
Ebingen		2·7	351	e 0 47	+ 2	i 1 34	Sg	e 0 55	Pg	i 1·8
Triest		2·9	89	i 0 50	+ 2	i 1 39	Sg	1 3	Pg	i 2·0
Besançon		3·0	305	i 0 51	+ 1	—	—	i 1 0	Pg	—
Strasbourg		3·3	338	i 0 55a	+ 2	i 1 32	− 3	i 1 4	Pg	i 2·2
Stuttgart		3·3	355	e 0 54	+ 1	i 1 30	− 5	i 1 5	Pg	i 1·8
Karlsruhe		3·6	347	e 1 4	+ 6	i 1 54	+12	e 1 10	Pg	i 2·2
Rome		4·2	149	i 1 4k	− 3	i 1 48	− 9	e 1 13	P*	i 2·3
Clermont-Ferrand		4·6	275	i 1 10	− 2	—	—	—	—	—
Vienna		5·4	57	i 1 24	0	i 2 28	0	i 1 40	Pg	—
Jena		5·6	13	i 1 35	+ 8	i 2 38	+ 5	i 1 50	Pg	i 3·8
Prague		5·6	34	i 1 29	+ 2	i 2 33	0	i 2 0	Pg	—
Paris		5·9	307	i 1 29	− 2	i 2 33	− 7	i 3 10	Sg	—
Ogyalla		6·4	65	e 1 38	0	e 2 45	− 8	e 2 17	Pg	e 3·8
Kalossa		6·6	78	e 2 16	Pg	e 2 55	− 3	e 3 21	S*	4·1
Barcelona		6·8	236	—	—	i 4 0	?	—	—	i 4·4
Budapest		6·8	70	e 1 45	+ 1	e 3 0	− 3	e 2 6	P*	e 3·8
De Bilt		7·2	338	e 2 14	P*	e 3 20	+ 7	i 4 0	Sg	—
Potsdam		7·3	17	e 2 28	Pg	i 3 10	− 5	e 3 20	S	e 3·6
Raciborzu		7·4	49	e 2 9	P*	e 3 21	+ 3	i 3 54	Sg	e 4·3
Taranto		7·5	129	1 48	− 5	3 8	−12	3 48	S*	—
Witteveen	z.	7·6	346	e 1 57	+ 2	e 3 39	S*	i 2 30	Pg	—
Belgrade		7·7	91	e 1 54k	− 2	e 3 54	S*	e 4 23	Sg	—
Skalnate Pleso		8·1	59	—	—	e 3 25	−10	e 4 25	Sg	—
Timisoara		8·1	84	e 2 3	+ 1	e 4 31	Sg	—	—	i 5·6
Tortosa		8·1	238	e 2 9	+ 7	—	—	—	—	i 4·6
Messina	z.	8·5	147	i 2 4k	− 3	e 3 46	+ 1	i 2 56	Pg	—
Jersey	E.	8·8	299	e 2 17	+ 6	e 3 46	− 7	e 4 48	Sg	—
Kew		8·9	316	e 2 13	+ 1	e 3 48	− 7	i 2 43	P*	—
Uzhgorod		9·2	66	e 2 15	− 1	e 4 1	− 2	—	—	—
Algiers Univ.	z.	10·0	212	i 2 29	+ 2	—	—	e 3 18	Pg	—
Sofia		10·2	101	e 2 28	− 3	e 4 52	+25	e 2 58	?	e 5·4
Alicante		10·4	230	2 41	+ 7	5 7	+35	—	—	—
Copenhagen		10·4	9	e 2 52	+18	—	—	—	—	—
Lwow		10·6	61	e 2 49	+13	e 4 48	+11	—	—	—
Toledo		11·5	246	i 2 44	− 4	e 5 6	+ 7	e 3 3	PP	—
Durham		11·7	326	e 4 47	?	i 4 59	− 5	—	—	i 6·0
Almeria		12·5	231	3 5	+ 3	5 18	− 5	3 14	PP	8·0
Athens		12·9	121	—	—	i 5 45	+12	—	—	—
Granada		12·9	235	i 3 3a	− 4	5 16	−17	3 40	PP	—
Rathfarnham Castle		12·9	313	i 3 6	− 1	i 5 19	−14	i 3 13	PP	e 6·1
Kishinev		13·4	77	—	—	e 6 2	+17	—	—	—
Malaga		13·7	235	i 3 4	−14	e 6 29	+37	6 55	SS	e 10·2
Istanbul		14·8	101	e 3 30	− 2	e 8 13	?	i 3 38	PP	e 9·8

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Upsala		15·2	16	i 3 42	+ 4	e 6 37?	+ 9	7 0	SS	e 9·6
Lisbon		15·5	251	—	—	6 30	− 5	7 44	Q	8·5
Yalta		17·4	85	4 4	− 2	—	—	—	—	—
Pulkovo		18·9	34	e 4 38	+14	e 8 2	+ 9	—	—	—
Moscow		20·4	49	e 4 51	+10	e 8 32	+ 7	—	—	—
Tamanrasset	z.	22·9	189	e 5 2	− 4	e 9 11	− 2	i 5 28	PP	—
Ksara		23·2	111	i 5 12	+ 3	e 9 10?	− 8	—	—	—
Borzhomi		24·6	86	e 5 26	+ 3	—	—	—	—	—
Resolute Bay		50·3	342	e 8 57	− 3	—	—	—	—	e 27·6
Shawinigan Falls	N.	54·6	303	e 9 35	+ 3	—	—	—	—	—
Harvard		56·0	298	e 9 36	− 7	—	—	—	—	e 30·2
Weston		56·0	298	i 9 38	− 5	—	—	—	—	—
Ottawa		57·0	303	e 9 46	− 4	—	—	—	—	—
Morgantown		62·9	299	i 10 25	− 5	—	—	—	—	—
Florissant		69·6	305	e 11 8	− 5	—	—	—	—	—
St. Louis		69·6	305	i 11 6	− 7	e 19 27	−54	e 25 4	SS	—
Pretoria	z.	72·9	162	i 11 27	− 6	—	—	—	—	—
Kimberley	z.	75·2	167	i 11 47	+ 1	—	—	—	—	—
Seattle		78·1	329	i 12 1a	− 1	—	—	—	—	—
Reno		83·9	323	e 12 32a	− 1	—	—	e 12 45	?	—
Mineral	z.	84·0	325	i 12 31a	− 2	—	—	e 12 44	?	—
Tinemaha		85·3	321	i 12 39	− 1	—	—	i 12 53	?	—
China Lake	z.	86·1	320	i 12 42	− 2	—	—	e 15 54	PP	—
Fresno	z.	86·3	322	e 12 42k	− 3	—	—	—	—	—
Riverside	z.	87·5	319	i 12 47	− 4	—	—	—	—	—
Pasadena	z.	87·7	319	e 12 49	− 3	—	—	e 15 51	PP	—
Palomar	z.	87·8	318	i 12 50	− 2	—	—	e 15 56	PP	—

Additional readings :—
Chur i = 49s.
Bologna iZ = 42s. and 59s.
Padova i = 46s., iS_g = 2m.2s.
Florence i = 52s.
Pieve di Cadore S_g = 1m.21s.
Ravensburg e = 1m.0s., iS? = 1m.11s., i = 1m.19s. and 1m.22s., iS_g? = 1m.30s., i = 1m.34s
Neuchatel e = 59s.
Basle e = 1m.3s.
Ebingen e = 58s. and 1m.4s.
Triest iS_g = 1m.51s.
Strasbourg iP_g = 1m.16s., iS_g = 1m.56s., and other unidentified i readings.
Stuttgart iS_g? = 1m.52s., also many other unidentified readings.
Karlsruhe iNZ = 1m.21s., iEN = 1m.30s.
Rome iS_g = 2m.11s.
Vienna eS* = 2m.50s., eS = 2m.59s.
Jena iP*?N = 1m.56s., iP_gEN = 2m.7s., iS_gEN = 3m.4s. and other i readings.
Prague iP* = 1m.42s., eS*? = 2m.50s., eS_g? = 3m.17s. and other unidentified readings.
Paris iS* = 2m.57s. and other i readings.
Ogyalla eS* = 3m.15s., eS_g = 3m.35s. and other e readings.
Kalossa eE = 2m.43s. and 3m.54s.
Budapest eEN = 2m.34s.
De Bilt eZ = 2m.42s., eS* = 3m.40s.
Raciborzu eE = 2m.35s., eZ = 2m.46s., eEZ = 3m.0s., eE = 3m.5s. and 3m.30s., eSEZ = 3m.39s., eE = 3m.42s.
Witteveen eP*Z = 2m.15s., eS_gZ = 4m.10s.
Belgrade eP_gS_gNW = 4m.8s. and other unidentified phases.
Skalnate Pleso eS* = 3m.58s., e = 4m.12s. and 4m.39s., eN = 4m.48s. and 5m.8s.
Messina iZ = 2m.12s. and 2m.28s., eZ = 3m.55s.
Jersey eE = 4m.33s., 5m.27s., and 5m.42s.
Kew iP_g?Z = 3m.12s., iS?Z = 3m.28s., eS_g? = 4m.4s.
Algiers Univ. eP*Z = 2m.54s.
Toledo SS? = 5m.34s.
Durham iE = 5m.17s., iEN = 5m.52s.
Rathfarnham Castle i = 4m.20s. and 5m.22s.
Malaga i = 4m.31s.
Istanbul eE = 8m.48s.
Upsala eE = 7m.54s., iN = 8m.24s., eE = 9m.4s.
Lisbon N = 6m.48s. and 7m.6s.
Tamanrasset eZ = 5m.6s. and 5m.14s.
Seattle e = 12m.5s., 12m.19s., and 12m.49s.
Pasadena eZ = 13m.2s. and 16m.0s.
Palomar eZ = 13m.2s.
Long waves were also recorded at Edinburgh, Aberdeen, Helsinki, and Scoresby Sund.

May 15d. Readings also at 0h. (near Dzhergetal), 1h. (Christchurch, Wellington, Riverside, China Lake, Tinemaha, Tamanrasset, Stuttgart (2), and near Collmberg (2)), 2h. (near Dzhergetal (2) and near Averroes), 3h. (Apia, Palomar, Riverside, China Lake, Tinemaha, Fresno, Mineral, Collmberg, Paris, Strasbourg, and Stuttgart), 4h. (Christchurch, Wellington, Terre Adélie, Brisbane, Riverview, China Lake, Jena, Paris, Besançon, Rathfarnham Castle, Strasbourg, Stuttgart, and Tamanrasset), 5h. (Collmberg, Manila, and near Dzhergetal), 6h. (Strasbourg and Stuttgart), 7h. (near Istanbul), 8h. (Stuttgart and near Apia), 10h. (near Dzhergetal (2)), 12h. (Brisbane), 13h. (Riverside, China Lake, and Tinemaha), 14h. (Apia, 17h. (Shemakla, near Erevan, Gori, Grozny, Kirovobad, Tiflis, and near Dzhergetal), 18h. (Ottawa), 21h. (near Antofagasta and Copiapo), 23h. (Brisbane, Pretoria, Scoresby Sund, Ksara, Rome, Paris, Strasbourg, Kew, Granada, Algiers Univ. ,and Tamanrasset).

May 16d. 0h. 3m. 31s. Epicentre 15°·3S. 172°·5W. Depth of focus 0·010.
(as on 1948, Aug. 29d.).
Intensity II-III at Apia. Depth 100km.ca.
U.S.C.G.S. suggest epicentre 15°·0S. 172°·5W.

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

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		1·6	19	i 0 23	− 5	i 0 42	− 7	—	—	—
Lick	z.	70·9	41	i 11 9k	+ 1	—	—	i 11 32	pP	—
Pasadena		71·3	46	i 11 12k	+ 1	—	—	i 11 34	pP	e 32·5
Fresno	z.	71·7	42	e 11 13k	0	—	—	e 11 53	sP	—
Palomar	z.	71·8	47	i 11 15k	+ 1	—	—	—	—	—
Riverside	z.	71·8	46	i 11 11k	− 3	—	—	—	—	—
China Lake		72·7	44	i 11 19k	0	—	—	—	—	—
Mineral	z.	72·8	39	e 11 20a	0	—	—	—	—	—
Tinemaha	z.	72·9	43	i 11 21k	+ 1	—	—	—	—	—
Reno	z.	73·4	40	e 11 23k	0	—	—	—	—	—
La Paz		99·0	110	e 13 41	+10	—	—	17 55	pPP	—
Paris		146·3	6	i 19 29	[+ 1]	e 23 17	PKS	i 19 55	pP′	e 70·5
Stuttgart	z.	146·6	357	e 19 29	[0]	—	—	e 19 55	pP′	—
Strasbourg		146·8	358	e 19 31	[+ 2]	e 20 3	sP′	e 19 56	pP′	—
Besançon		148·1	2	e 19 33	[+ 2]	—	—	e 19 59	pP′	—
Istanbul	z.	148·2	328	e 19 32	[+ 1]	—	—	—	—	—

Paris also gives e = 19m.46s. and 21m.11s.
Long waves were also recorded at Tacubaya, Harvard, and Kew.

May 16d. 2h. 26m. 59s. Epicentre 45°·5N. 9°·6E. (as on 15d.).

Intensity V at Mendrisotto ; IV-V at Pavia and in the Alps between the Rhine and the Rhône ; IV in the Engadine valley ; III in the Jura region. Epicentre 45°·5N. 9°·6E.

Dr. E. Wanner.
Jahresbericht des Erdbebendienstes der Schweiz im Jahre, 1951, Zürich, 1952, p.2, with macroseismic chart fig. 6.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Pavia	0·4	224	i 0 10k	− 3	i 0 16	− 5	—	—	—
Salo	0·7	81	i 0 25k	+ 8	i 0 38	+10	—	—	—
Chur	1·4	358	i 0 29a	+ 2	e 0 47	+ 1	i 0 42	S_g	—
Bologna	1·6	129	i 0 30k	0	i 0 51	0	—	—	—
Padova	1·9	122	0 29	− 5	i 1 1	+ 2	i 0 35	P*	—
Prato	1·9	147	i 0 34	0	i 1 9	S_g	—	—	—
Zürich	2·0	339	i 0 36a	+ 1	i 1 4	+ 2	i 1 16	SS	—
Florence	2·1	146	e 0 35	− 2	i 1 11	S_g	—	—	—
Ravensburg	2·3	0	e 0 41a	+ 1	i 1 9	0	e 0 51	P_g	—
Neuchatel	2·4	309	i 0 41	0	i 1 10	− 2	i 0 47	P_g	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Basle		2·5	326	i 0 42 a	− 1	e 1 10	− 4	e 1 3	?	—
Ebingen		2·7	351	e 0 46	+ 1	e 1 31	S_g	e 1 6	?	—
Triest		2·9	89	i 0 47	− 1	i 1 39	S_g	i 0 59	P_g	—
Besançon		3·0	305	i 0 49	− 1	—	—	i 0 59	P_g	—
Stuttgart		3·3	355	e 0 53	0	i 1 33	− 2	e 1 3	P_g	—
Strasbourg		3·3	338	i 0 55 a	+ 2	i 1 32	− 3	i 1 4	P_g	i 2·2
Karlsruhe		3·6	347	e 1 3	P*	e 1 55	S*	—	—	i 2·1
Rome		4·2	149	1 20	P*	2 8	S*	1 29	P_g	i 2·6
Vienna		5·4	57	e 1 24	0	i 2 26	− 2	e 2 57	S_g	—
Jena		5·6	13	e 1 34?	+ 7	i 2 27	− 6	e 1 50	P_g	—
Prague		5·6	34	i 1 27	0	e 2 33	0	i 1 40	P*	—
Paris		5·9	307	e 1 27	− 4	e 2 41	+ 1	i 3 0	S*	—
Ogyalla		6·4	65	e 2 0	P*	e 3 11	S*	e 2 8	P_g	—
Kalossa		6·6	78	e 2 34	?	e 3 21	S*	e 3 34	P_g	—
Budapest		6·8	70	e 2 17	P_g	e 3 38	S_g	—	—	—
De Bilt		7·2	338	—	—	e 3 28	SS	e 3 45	S*	—
Potsdam		7·3	17	e 2 43	?	e 3 1	−14	e 3 49	S*	4·0
Raciborzu		7·4	49	e 2 45	?	e 3 15	− 3	4 0	S_g	—
Taranto		7·5	129	1 47	− 6	3 7	−13	—	—	—
Witteveen	z.	7·6	346	e 1 59	+ 4	e 2 45	?	e 2 35	P_g	—
Tortosa		8·1	238	e 3 38	S	(e 3 38)	+ 3	—	—	i 4·6
Messina	z.	8·5	147	e 1 59	− 8	—	—	e 2 45	?	—
Kew		8·9	316	e 2 11	− 1	e 3 11	−44	e 2 41	?	—
Algiers Univ.	z.	10·0	212	e 2 27	0	8 29	PcP	e 2 52	P*	—
Toledo		11·5	246	i 2 41	− 7	e 5 6	+ 7	e 3 1?	PP	—
Almeria		12·5	231	(2 51)	−11	(5 3)	−20	—	—	(7·8)
Rathfarnham Castle		12·9	313	i 3 4	− 3	e 5 18	−15	—	—	e 5·8
Istanbul	z.	14·8	101	e 3 36	+ 4	—	—	—	—	e 11·6
Tamanrasset	z.	22·9	189	e 5 2	− 4	e 9 13	0	e 5 27	PP	—
Reno	z.	83·9	323	e 12 31 k	− 2	—	—	—	—	—
Mineral		84·0	325	i 12 30 a	− 3	—	—	—	—	—
Tinemaha	z.	85·3	321	e 12 38	− 2	—	—	—	—	—
China Lake	z.	86·1	320	e 12 40	− 4	—	—	—	—	—
Riverside	z.	87·5	319	e 12 47	− 4	—	—	—	—	—
Palomar	z.	87·8	318	e 12 50	− 2	—	—	—	—	—

Additional readings :—
Bologna iZ = 41s., i = 58s.
Florence i = 45s., 51s., 1m.15s., and 1m.27s.
Ravensburg eZ = 53s., e = 58s., i = 1m.21s., iS_g? = 1m.27s.
Neuchatel i = 59s.
Triest iS_gS_g = 1m.43s.
Stuttgart eZ = 1m.15s., iZ = 1m.19s., i = 1m.31s.
Strasbourg iP_g? = 1m.15s., i = 1m.39s., iS* = 1m.43s., i = 1m.52s., iS_g = 1m.55s.
Rome e = 1m.52s., S* = 2m.22s., S_g = 2m.29s.
Vienna eS_g = 2m.48s.
Jena eP*?N = 1m.56s., iP_gEN = 2m.5s., iS_gEN = 3m.23s. and other unidentified readings
Prague e = 1m.50s., iP_g = 2m.0s., eP_g = 2m.3s., i = 2m.28s., 2m.41s., and 2m.48s., iS* = 2m.57s., iS_g = 3m.13s.
Paris i = 1m.37s., iP* = 1m.47s., i = 2m.4s., eS = 2m.34s., eS*? = 2m.55s., iS_g = 3m.11s.
Ogyalla e = 2m.32s., eS = 2m.46s., e = 3m.23s., eS_g = 3m.30s. and 3m.36s.
Kalossa eE = 2m.37s., eN = 4m.2s., eE = 4m.21s., eN = 5m.6s.
Budapest PN = 2m.26s., eE = 3m.35s., iE = 4m.8s.
Raciborzu eSZ = 3m.12s., eE = 3m.47s., eZ = 3m.53s., eE = 4m.16s., eZ = 4m.24s., eE = 4m.33s. and 4m.37s.
Almeria readings have been reduced by 6m.
Rathfarnham Castle eZ = 3m.13s., 3m.25s., and 3m.37s.
Tamanrasset iZ = 5m.18s.
Long waves were also recorded at Copenhagen and Harvard.

May 16d. 13h. 23m. 11s. Epicentre 15°·08. 69°·5W. Depth of focus 0·025.
(as on 1940, Dec. 22d.).

Intensity IV at Moquegua ; III-IV at Vitor.

F. Greve.
Boletin del año 1951, Instituto sismológico, Universidad de Chile, Santiago, p.22.

E. Silgado.
Datos sismológicos del Perú, 1951, Boletin No. 8, Lima, Peru, 1953, p.13.

U.S.C.G.S. gives epicentre as adopted.

$A = +\cdot3384$, $B = -\cdot9052$, $C = -\cdot2572$; $\delta = +5$; $h = +6$;
$D = -\cdot937$, $E = -\cdot350$; $G = -\cdot090$, $H = +\cdot241$, $K = -\cdot966$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
La Paz		1·8	139	i 0 46k	+10	i 1 24	+19	i 14 55	ScS	—
Huancayo		6·4	297	i 1 32	− 1	e 2 29	−17	—	—	—
Antofagasta	E.	8·7	186	e 1 52	−11	3 21	−19	—	—	—
Santa Lucia		18·4	183	e 3 54	− 9	e 7 11	− 7	e 5 33	?	—
Bogota		20·0	346	i 4 27	− 8	i 8 57	SSS	—	—	—
Buenos Aires		21·8	153	e 4 38	+ 1	8 26	+ 5	—	—	—
La Plata		22·4	155	4 43	0	(8 37)	+ 6	—	—	8·6
Galerazamba		26·2	348	—	—	e 11 19	SS	—	—	—
Fort de France		30·7	17	—	—	e 10 46	0	—	—	—
Tacubaya		45·0	319	e 8 4	+ 6	—	—	—	—	—
St. Louis		56·8	340	e 9 25	− 1	e 16 59	− 4	e 10 14	pP	—
Weston		57·1	358	i 9 32	+ 3	—	—	—	—	—
Harvard		57·2	358	i 9 30	+ 1	—	—	e 10 21	pP	—
Lawrence		58·8	337	i 9 41	+ 1	—	—	e 10 27	pP	—
Palomar	Z.	66·0	318	i 10 27	− 1	—	—	i 11 22	pP	—
Riverside	Z.	66·7	317	i 10 32	0	—	—	i 11 26	pP	—
Pasadena		67·3	317	i 10 36a	0	i 12 0	sP	i 11 30	pP	—
China Lake		68·0	320	i 10 40	0	—	—	i 11 35	pP	—
Tinemaha	Z.	69·2	319	i 10 48	0	—	—	i 11 43	pP	—
Fresno	Z.	69·9	318	e 10 52a	0	e 19 47	+ 2	e 11 44	pP	—
Lick	Z.	71·5	318	i 11 2a	0	—	—	i 11 57	pP	—
Reno	Z.	71·7	322	e 11 3	0	—	—	—	—	—
Mineral	Z.	73·3	321	i 11 12k	0	—	—	i 12 7	pP	—
Seattle		78·1	327	i 11 42k	+ 3	e 21 19	+ 3	e 12 32	pP	—
Granada		80·8	47	i 12 53	+60	23 22	PPS	—	—	—
Tamanrasset	Z.	82·4	64	e 12 6	+ 4	i 13 2	sP	e 12 55	pP	—
Tortosa		85·2	46	i 22 33	S	(i 22 33)	+ 5	i 24 15	PPS	—
Algiers Univ.	Z.	85·5	50	e 13 16	pP	—	—	—	—	—
Scoresby Sund		91·3	14	e 13 43	pP	e 23 3	[+ 6]	e 25 10	SPP	—
Collmberg	Z.	96·9	39	e 14 7	pP	—	—	35 31	SSS	—

Additional readings :—
La Paz i = 56s. and 1m.33s.
St. Louis e = 11m.56s., 18m.28s., 18m.51s., and 20m.22s.
Fresno eZ = 11m.7s.
Lick iZ = 11m.20s.
Tamanrasset eZ = 12m.17s., ePPZ = 15m.16s.

May 16d. 14h. 6m. 10s. Epicentre 2°·2N. 126°·9E. (as on 1951, March 25d.).

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

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bandong		21·2	246	4 40	− 9	—	—	—	—	10·0
Djakarta		21·7	248	e 4 14	−41	e 7 47	−64	—	—	—
Zi-ka-wei	Z.	29·3	352	i 6 7	+ 1	e 11 21	+22	—	—	—
Nanking	N.	30·6	346	6 19	+ 1	i 11 17	− 3	—	—	—
Brisbane		38·8	141	i 7 29k	+ 1	e 13 20	− 6	e 9 3	PP	i 18·9
Vladivostok		41·0	6	i 7 48	+ 2	i 13 59	0	—	—	—
Riverview		42·5	149	i 8 2k	+ 3	i 14 22	0	e 10 15	PPP	e 24·0
Kodaikanal	E.	49·7	282	e 8 21	−35	—	—	—	—	—
Kabansk		52·5	345	9 18	+ 1	—	—	—	—	—
Irkutsk		53·3	343	9 24	+ 1	16 51	− 3	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Poona		54·4	291	i 9 29	− 2	i 16 59	−10	—	—	—
Bombay		55·4	291	—	—	i 17 14	− 8	e 19 22	ScS	—
Petropavlovsk		57·1	22	e 9 52	+ 2	e 18 14	PPS	—	—	—
Almata II		60·0	321	i 10 20	+ 9	—	—	—	—	—
Naryn		60·1	319	i 10 9	− 2	e 18 15	− 9	—	—	—
Murgab		60·2	314	i 10 12	0	i 18 22	− 3	—	—	—
Almata		60·3	321	i 10 10	− 3	e 18 23	− 3	—	—	—
Frunse		61·6	318	i 10 21	− 1	e 18 40	− 3	—	—	—
Andijan		62·3	316	10 25	− 1	18 47	− 5	—	—	—
Dzhergetal		62·5	315	i 10 27	− 1	—	—	—	—	—
Fergana		62·5	316	e 10 26	− 2	e 18 48	− 6	—	—	—
Obi-garm		63·4	313	i 10 32	− 2	e 19 3	− 3	—	—	—
Stalinabad		64·1	313	i 10 35	− 3	i 19 8	− 6	—	—	—
Tashkent		64·4	315	i 10 40	0	—	—	—	—	—
Tchimkent		64·8	317	i 10 42	− 1	—	—	—	—	—
Samarkand		65·7	313	e 10 50	+ 2	—	—	—	—	—
Terre Adélie		69·6	173	i 11 14	+ 1	e 20 18	− 3	—	—	—
Ashkabad		71·9	309	11 27	0	20 38?	−10	—	—	—
Sverdlovsk		75·3	329	i 11 47	0	—	—	—	—	—
Baku		78·7	311	e 12 7	+ 1	e 22 4	+ 1	—	—	—
Lenkoran		79·3	309	12 10	+ 1	22 7	− 2	—	—	—
Shemakla		79·7	311	i 12 10	− 1	i 22 8	− 5	—	—	—
Makhach-Kala		80·7	314	e 12 17	+ 1	e 22 20	− 4	—	—	—
Kirovobad		81·4	311	i 12 20	0	e 22 26	− 5	—	—	—
Grozny		82·0	313	i 12 26	+ 3	e 22 41	+ 4	—	—	—
Nakichevan		82·0	39	e 12 24	+ 1	e 22 38	+ 1	—	—	—
Tiflis		82·6	311	e 12 28	+ 2	—	—	—	—	—
Gori		83·2	311	12 34	+ 5	—	—	—	—	—
Borzhomi		83·7	312	e 12 33	+ 1	e 23 6	ScS	—	—	—
Moscow		87·8	326	i 12 51	− 1	23 28	− 6	29 13	SS	—
Ksara		89·6	304	i 13 2a	+ 1	i 23 53	+ 2	—	—	—
Pulkovo		91·4	330	e 13 8	− 1	i 24 2	− 5	—	—	—
Istanbul		94·5	313	e 13 22	− 1	e 23 55	[− 3]	—	—	e 49·8
Lwow		96·6	321	e 13 49	+16	i 24 6?	[− 4]	—	—	—
Resolute Bay		99·3	11	e 13 47	+ 2	(e 31 59)	SS	e 17 7	?	e 32·0
Copenhagen		101·7	328	32 26	?	—	—	35 35	?	49·8
Prague		102·5	323	—	—	25 43	+ 2	—	—	—
Potsdam		102·6	326	—	—	e 25 44	+ 2	i 25 47	S	e 54·8
Collmberg	z.	103·0	323	e 14 0	− 2	—	—	e 18 13	PP	—
Jena		103·9	324	e 14 8	+ 2	—	—	—	—	—
Scoresby Sund		104·6	351	e 14 38	+29	24 52	[+ 3]	17 14	?	54·3
Mineral	z.	104·8	48	27 59k	PS	28 32	PPS	—	—	—
Stuttgart		106·2	322	e 14 15	0	26 12	0	e 24 52	SKS	62·8
Rome		106·4	315	e 23 41	?	e 26 13	− 1	—	—	e 58·2
Strasbourg		107·1	323	27 57	PS	e 24 53	[− 7]	e 26 23	S	e 51·8
Tinemaha	z.	108·2	50	e 19 0	PP	—	—	e 29 58	PKKP	—
China Lake	z.	109·1	51	e 29 53	PKKP	—	—	—	—	—
Pasadena		109·1	53	i 19 3	PP	—	—	—	—	e 52·2
Riverside	z.	109·8	53	e 19 9	PP	—	—	—	—	—
Paris		110·2	325	e 14 14	P	e 25 19	[+ 6]	i 28 48	PS	e 61·8
Kew		110·4	328	e 28 28	PS	—	—	—	—	e 50·8
Palomar	z.	110·4	54	e 19 14	PP	—	—	e 29 47	PKKP	—
Tamanrasset	z.	117·7	297	i 18 52a	[+ 4]	—	—	e 19 58	PP	—
Malaga		120·5	316	i 30 7	PS	e 41 5	SSS	—	—	62·6
Ottawa		128·5	20	e 19 11	[+ 2]	—	—	—	—	—
Harvard		132·5	17	e 19 19	[+ 2]	—	—	e 21 43	PP	66·6

Additional readings :—
Brisbane ePPPEN =9m.23s., eScS =17m.33s.
Riverview iScS?E =17m.46s., iE =20m.59s.
Moscow SKS =23m.17s.
Prague e =27m.42s., 28m.37s., and 35m.14s.
Jena ePP?E =14m.11s.?, eN =14m.19s., eE =16m.15s., eN =17m.24s., eE =19m.14s.
Stuttgart eZ =11m.14s., ePP =18m.37s., ePS =27m.47s., eSS? =33m.2s., eQ =56·8m.
Strasbourg ePPS =28m.50s.
Paris e =14m.30s., ePKP? =18m.18s., e =24m.32s. and 25m.28s., eS =26m.42s., e = 27m.12s., 30m.30s., 40m.8s., 45m.38s., and 50m.15s.
Malaga PP =34m.5s., PPP =36m.3s.; readings wrongly identified.
Long waves were also recorded at Helsinki, De Bilt, Jersey, Granada, Almeria, Upsala, and Palisades.

May 16d. Readings also at 1h. (Manila), 2h. (Mount Wilson, Riverside, Palomar, China Lake, Fresno, Tamanrasset, Brisbane, Cobb River, Granada, Algiers University, near Malaga and near Apia), 3h. (Harvard, Zürich, Jena, Stuttgart, and near Triest (2)), 5h. (Mount Wilson, Riverside, Palomar, China Lake, Tinemaha, Mineral, Tamanrasset, Prague, and near Dzhergetal), 7h. (Apia, near Khorog, Obi-garm, Dzhergetal, and near Zürich), 8h. (near Dzhergetal), 9h. (Manila and Strasbourg), 10h. (near Collmberg and near Apia), 11h. (near Dzhergetal), 12h. (Ksara and near Apia), 13h. (Stuttgart, Strasbourg, and near Dzhergetal), 14h. (Scoresby Sund, Copenhagen, China Lake, Tinemaha, Mineral, Collmberg, and Manila (2)), 15h. (Manila and Brisbane), 16h. (Collmberg), 18h. (Kimberley and near Dzhergetal), 20h. (near Dzhergetal), 21h. (near Kurmenty), 22h. (Jena, Stuttgart, Timisoara, near Taranto, near Triest, near Prague, near Istanbul, and near Dzhergetal), 23h. (Apia).

May 17d. 1h. South-West Pacific.

Apia e =45m.27s.?
Brisbane ePZ =45m.39s., iPPE =45m.45s., ePPPE =45m.56s., eS?E =48m.44s., iE = 49m.6s., eLE =51m.7s.
Riverview iPZ =46m.54s., iPPEN =47m.19s., iPPPE =47m.27s., iSE =50m.46s., iPcPEN =50m.55s., iE =51m.25s., iSSSN =51m.37s., eLE =52·2m.
Lick ePZ =54m.18s.a, eZ =54m.37s.
Fresno ePZ =54m.24s.a, eZ =56m.10s.
Mineral eP?Z =54m.25s.
Reno ePZ =54m.26s.k.
China Lake ePZ =54m.28s.
Riverside ePZ =54m.31s.
Palomar ePZ =54m.33s.
Tinemaha ePZ =54m.35s.
Jena ePKP?Z =61m.10s., eZ =61m.22s. and 64m.27s.
Paris ePKP? =61m.14s., iPKP$_2$ =61m.38s., e =62m.26s., ePKS? =64m.50s., e =66m.10s. and 69m.40s., eSKKS? =72m.17s., eL =114m.
Rathfarnham Castle iPKP? =61m.15s.
Stuttgart ePKPZ =61m.18s., eZ =61m.30s. and 61m.40s., e =62m.25s. and 72m.0s.
Strasbourg ePKP =61m.19s., e =61m.22s., 61m.32s., 61m.36s., 62m.19s., and 62m.30s., ePP =64m.42s., e =66m.30s.
Karlsruhe eZ =61m.20s.
Kew e =61m.20s.
Triest ePKPZ =61m.20s., eZ =64m.24s.
Besançon ePKP =61m.26s.
Rome ePKP =61m.28s.a, e =62m.57s. and 65m.55s.
Tamanrasset ePKPZ =61m.42s., ePKP$_2$Z =62m.38s.
Malaga ePKP =61m.52s., iPKP$_2$ =62m.24s., iPP =66m.18s., L =130m.14s.
Toledo eP? =62m.13s.
Ksara e? =90m.43s.
Long waves were also recorded at Wellington, Ottawa, Harvard, Palisades, and Granada.

May 17d. 12h. Samoa or Tonga region.

Apia eP =24m.41s., eS =25m.57s., L =26m.50s.
Terre Adélie eP =32m.26s.
Wellington e? =34m.30s.
Mount Wilson ePZ =34m.46s., eZ =34m.52s. and 35m.2s.
Lick iPZ =34m.46s.k, iZ =35m.4s.
Palomar ePZ =34m.49s., iZ =34m.54s. and 35m.7s.
Riverside ePZ =34m.50s., eZ =34m.54s. and 35m.6s.
Berkeley iPZ =34m.50s., eZ =35m.2s.
China Lake ePZ =34m.53s., iZ =34m.58s., eZ =36m.9s.
Fresno ePZ =34m.54s.
Mineral ePZ =34m.56s.k, eZ =35m.15s., iZ =35m.23s.
Tinemaha ePZ =34m.57s., iZ =35m.2s. and 35m.15s.
Reno ePZ =35m.1s., eE =35m.18s.
Paris e =42m.30s., ePKP =42m.47s., i =42m.53s., 43m.2s., and 43m.7s., e =44m.38s., ePP =46m.30s., e =48m.30s., eSSS =71m.46s., eL =110m.
Copenhagen eP =42m.32s.
Rathfarnham Castle eZ =42m.37s. and 43m.16s.
Jena eEZ =42m.46s., eZ =42m.49s., eNZ =42m.54s., eN =43m.19s., 43m.56s., and 45m.11s., eE =45m.20s.
Stuttgart ePKP?Z =42m.46s., eZ =43m.8s.
Prague i =42m.50s., e =43m.1s., 43m.41s., 44m.25s., and 44m.41s.
Ksara e =42m.50s. and 46m.34s.
Besançon ePKP =42m.54s.
Strasbourg ePKP? =42m.56s., e =43m.36s.
Tamanrasset ePKP?Z =42m.57s., ePKPZ =43m.11s., ePKP$_2$Z =45m.0s., eZ =47m.31s., ePPZ =48m.52s., eZ =51m.57s.
Karlsruhe eZ =42m.58s.
Santa Lucia iPN =43m.1s.
Long waves were also recorded at Harvard, Palisades, and Granada.

May 17d. Readings also at 0h. (Brisbane and Stuttgart). 1h. (Riverside, China Lake, Besançon, Paris, Strasbourg, Stuttgart, Tamanrasset, Ksara, and near Dzhergetal (4)), 2h. and 3h.(2) (near Dzhergetal), 4h. (Palomar and China Lake). 5h. (Berkeley and near Dzhergetal (2)), 6h. (Apia), 7h. (Copiapo), 8h. (Stuttgart, Mary, Fergana, Lunacharskoe, near Andijan, Dzhergetal, Khorog, Samarkand, Stalinabad, Tashkent, and Tchimkent), 9h. (near Andijan, Dzhergetal, and Obi-garm), 10h. (Apia). 11h. (China Lake, Fergana, Khorog, Lunacharskoe, Tashkent, Tchimkent, near Andijan, Dzhergetal, Obi-garm, and near Huancayo), 12h. (Harvard), 13h. (near Klyuchi and near Dzhergetal), 14h. (near Dzhergetal), 15h. (Palomar (2), China Lake, Tinemaha, Fresno, Berkeley, Seattle, Obi-garm, near Andijan, Dzhergetal, Fergana, Lunacharskoe, Stalinabad, Tashkent, and Tchimkent), 16h. (Antofagasta, Copiapo, Concepción, Huancayo, Santa Lucia, La Plata, La Paz, Ottawa, Palomar, Pasadena, Riverside, China Lake, Lick, Reno, Mineral, Kimberley, Pretoria, Tamanrasset, and near Dzhergetal (2)), 17h. (near Dzhergetal), 19h. (near Djakarta), 20h. (near Apia), 21h. (near Dzhergetal), 22h. (Brisbane, near Apia, Terre Adélie, La Paz, Palomar, Pasadena, Riverside, China Lake, Tinemaha, Lick, Fresno, Stuttgart, and Tamanrasset), 23h. (near Dzhergetal).

May 18d. 12h. 17m. 29s. Epicentre 38°·5N. 21°·8E. (as on 1949, October 5d.).

Intensity IV at Patras and Astakos. Epicentre 38°·5N. 21°·5E. (Strasbourg).

A. Galanopoulos.
Seismological Institute Bulletin, 1951, Athens, 1952, p. 18.

$A = +·7285$, $B = +·2914$, $B = +·6199$; $\delta = -10$; $h = -1$;
$D = +·371$, $E = -·928$; $G = +·576$, $H = +·230$, $K = -·785$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Athens		1·6	110	i 0 28k	− 2	e 0 53	+ 2	—	—	—
Taranto		4·0	301	1 12	P*	1 52	0	—	—	—
Sofia		4·4	15	e 1 12	+ 2	e 2 0	− 2	e 2 15	S_g	e 2·6
Messina	z.	4·9	268	i 1 20	+ 3	i 2 16	+ 1	—	—	—
Istanbul		6·2	63	e 1 31	− 4	e 3 14	S*	i 2 3	P_g	—
Belgrade		6·4	351	—	—	e 3 5	+12	e 3 22	S*	—
Bucharest		6·7	27	—	—	e 2 55	− 5	e 3 23	S*	—
Rome		7·9	298	—	—	e 3 53	?S*	—	—	e 4·7
Triest		9·3	323	—	—	e 4 4	− 1	i 5 48	S?	i 6·0
Prague		12·7	338	e 3 18	+13	e 5 25	− 3	e 7 7	S_g	—
Stuttgart		13·7	323	e 3 16	− 2	—	—	—	—	e 8·0
Collmberg	z.	14·3	335	e 3 32	+ 6	—	—	—	—	e 8·3
Tamanrasset	z.	21·0	227	e 4 49	+ 2	—	—	—	—	—

Additional readings :—
Istanbul eE = 3m.7s., esSS_gE = 3m.32s., eN = 3m.37s.
Belgrade eZ = 3m.51s. and 3m.58s., eNE = 4m.31s., eNW = 5m.0s.
Triest eZ = 4m.26s., e = 5m.30s.
Prague e = 4m.26s. and 4m.59s.
Long waves were also recorded at Timisoara and Potsdam.

May 18d. Readings also at 0h. (Fergana, Lunacharskoe, near Andijan, Dzhergetal, Tchimkent, and near Tacubaya), 1h. (Tacubaya, Potsdam, Rome, Bombay, Almata, Tashkent, near Almata II, Andijan, Dzhergetal, Fergana, Frunse, Lunacharskoe, Obi-garm, Stalinabad, and Tchimkent), 2h. (Palomar, Riverside, China Lake, and Tacubaya), 4h. (near Dzhergetal), 5h. (Nanking, near Dzhergetal, Khorog, and Obi-garm), 6h. (Christchurch, Paris, Strasbourg, Almata II, near Almata, Chilisk, Ili, and near Dzhergetal), 7h. (Pretoria and near Copiapo), 8h. (Strasbourg), 9h. (Apia), 12h. (near Dzhergetal), 13h. (Tortosa, Ashkabad, Mary, Dzhergetal, Frunse, Tchimkent, near Andijan, Fergana, Khorog, Samarkand, Stalinabad, and Tashkent), 14h. (Dzhergetal, Manila, and Tortosa), 15h. (Ashkabad, Mary, Fergana, Khorog, Lunacharskoe, near Andijan, Dzhergetal (2), Obi-garm, Samarkand, and Stalinabad), 16h. (Tortosa, Collmberg, Tchimkent, near Andijan, Dzhergetal, Fergana, Khorog, and near Ottawa), 17h. (Palomar, Pasadena, Riverside, China Lake, Tinemaha, Fresno, Lick, Reno, Ottawa, La Paz, Copiapo, near Antofagasta, Almata, Chilisk, Frunse, Ili, Krasnogorka, Kurmenty, Lunacharskoe, Tchimkent, near Andijan, Dzhergetal (2), Fergana, Khorog, Obi-garm, Stalinabad, Tamanrasset, and near Alicante (2)), 20h. (Reno), 21h. (Copiapo and near Dzhergetal), 22h. (Apia, Mount Wilson, Palomar, Riverside, China Lake, Tinemaha, Harvard, Antofagasta, Copiapo, Huancayo, La Paz, La Plata, Tamanrasset, and near Dzhergetal), 23h. (near Dzhergetal).

May 19d. 7h. 22m. 41s. Epicentre 35°·5S. 179°·6E. Depth of focus 0·005.
(as on 1938, Feb. 13d.).

A = −·8160, B = +·0057, C = −·5781 ; δ = +9 ; h = 0 ;
D = +·007, E = +1·000 ; G = +·578, H = −·004, K = −·816.

		△	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Tuai	N.	3·8	209	i 0 59	+ 1	i 1 44	+ 3	—	—
Auckland	N.	4·1	249	i 1 3?	+ 1	e 1 56	+ 7	—	—
New Plymouth	E.	5·7	229	e 1 27	+ 3	e 2 25	− 4	i 2 9	?
Wellington		6·9	211	e 1 37	− 4	2 51	− 8	—	—
Cobb River	E.	7·8	222	e 1 48	− 5	3 14	− 7	—	—
Kaimata	N.E.	9·5	220	e 2 16	− 1	3 59	− 4	—	—
Christchurch		9·6	211	e 2 15	− 3	3 55	−10	—	—
Brisbane	Z.	24·0	283	i 5 13k	+ 3	—	—	—	—
Terre Adélie		38·3	204	e 7 16	0	—	—	—	—
Manila		74·5	302	e 11 19?	−14	—	—	—	—
Mount Wilson	Z.	90·6	49	i 12 56a	0	—	—	e 13 11	pP
Palomar	Z.	90·7	50	i 12 58a	+ 1	i 13 20	sP	i 13 12	pP
Riverside	Z.	90·8	49	i 12 56	− 1	—	—	i 13 11	pP
Fresno	Z.	91·3	45	e 12 59a	− 1	—	—	—	—
China Lake	Z.	91·9	47	i 13 2a	0	—	—	i 13 21	pP
Tinemaha	Z.	92·4	46	i 13 5	0	—	—	—	—
Mineral	Z.	92·9	42	e 13 5k	− 2	—	—	e 13 22	pP
Reno	Z.	93·3	44	e 13 8k	− 1	—	—	—	—
Ottawa	Z.	123·8	55	e 18 49	[− 2]	—	—	—	—
Collmberg	Z.	161·5	332	e 19 53	[0]	—	—	—	—
Tamanrasset	Z.	166·3	204	i 19 59k	[+ 1]	e 24 49	PP	e 20 19	pPKP

Tamanrasset gives also eZ = 20m.57s. and 24m.13s.

May 19d. 11h. 54m. 49s. Epicentre 39°·0N. 71°·3E. (as on 12d.).

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

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Dzhergetal	0·4	190	i 0 9	− 4	—	—	—	—	—
Fergana	0·9	25	i 0 18	− 2	i 0 31	− 3	—	—	—
Andijan	1·4	35	e 0 29	+ 2	i 0 49	+ 3	—	—	—
Obi-garm	1·5	234	i 0 28	0	0 49	0	—	—	—
Khorog	2·1	172	e 0 41	P_g	1 9	S_g	—	—	—
Stalinabad	2·2	242	i 0 43	P_g	i 1 13	S_g	—	—	—
Lunacharskoe	2·3	319	i 0 45	P_g	i 1 16	S_g	—	—	—
Tashkent	2·3	318	e 0 44	P_g	i 1 14?	S_g*	—	—	—
Tchimkent	3·0	335	i 0 56	P*	i 1 37	S_g	—	—	—
Samarkand	3·3	271	1 1	P*	1 46	S_g	—	—	—
Naryn	4·0	61	e 1 9	P*	i 1 53	+ 1	i 1 19	P_g	—
Frunse	4·1	36	e 1 9	+ 4	i 2 24	S_g	i 1 23	P_g	—
Rybach'e	4·6	50	e 1 23	P*	—	—	—	—	—
Krasnogorka	4·7	37	—	—	—	—	e 3 15	Q	e 3·3
Almata	5·6	47	—	—	e 3 0	S_g	—	—	—
Almata II	5·8	49	i 1 32	+ 3	—	—	i 1 50	P_g	—
Ili	6·1	43	i 1 35	+ 1	—	—	—	—	—
Kurmenty	6·3	54	e 1 47	P*	—	—	i 1 59	P_g	i 4·4
Ashkabad	10·2	265	—	—	e 4 26	− 1	—	—	—

Naryn gives also iS_g = 2m.9s.

May 19d. 15h. 54m. 24s. Epicentre 38°·1N. 3°·7W. (as on 1951, March 10d.).

Felt strongly in southern Spain and throughout Portugal with damage in the provinces of Jaen and Cordoba. Intensity VI at Granada; V at Leiria and Portalegre: IV at Alter do Chão.
Epicentre 37°·6N. 4°·1W. (Madrid).
38°·3N. 4°·2W. (Granada).

A. Due Rojo, S.J.
El periodo sismico de la provincia de Jaen. Las Ciencias, Madrid, 1952, Vol. 17. No. 1, pp.49-54. with macroseismic chart p.50.

Die sudspanischer Erdbeben von März bis August, 1951, Neues Jahrb, Geol. Paläontol., Monatshefte, Stuttgart, Januar, 1952, No. 1, p.p.4-5.

Notas sismológicas de 1951, Trabajos cientificos del Observatorio de Cartuja (Granada), Serie B, Año VI, No. 51, Revista de Geofisica, No. 41, Madrid, 1952.

Movimentos sismicos en España durante el año 1951, Boletin de la Real sociedad Española de Historia Natural, Tomo L.I, 1953, p.61.

A. Rey Pastor.
Estudio morfo-tectónico de la Falla del Quadalvivir. Comisión de Geografia sismica y Fisica del interior de la tierra, Madrid, May, 1954, with isoseismic chart in appendix.

$A = +\cdot7873$, $B = -\cdot0509$, $C = +\cdot6145$; $\delta = +4$; $h = -1$;
$D = -\cdot065$, $E = -\cdot998$; $G = +\cdot613$, $H = -\cdot040$, $K = -\cdot789$.

		△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	Supp. m. s.		L. m.
Granada		0·9	175	i 0 13	P_g	i 0 25	S_g	—	—	—
Malaga		1·5	202	i 0 16	−12	—	—	—	—	—
Almeria		1·6	142	i 0 25	− 5	i 0 45	− 6	0 28	P*	—
Toledo		1·8	351	i 0 37	P_g	—	—	—	—	—
Alicante		2·5	84	0 45	+ 2	1 19	+ 5	0 52	P_g	—
Tortosa		4·2	49	i 1 11	+ 4	i 2 27	S_g	—	—	—
Lisbon		4·3	283	1 2k	− 6	2 0	0	11 58	PcS	—
Algiers Univ.	z.	5·5	102	—	—	e 2 22	− 8	—	—	—
Averroes		5·6	213	1 26	− 1	2 26	− 7	—	—	—
Barcelona		5·6	52	1 30	+ 3	i 3 9	S_g	—	—	3·9
Bagneres		5·8	29	i 1 36	+ 7	e 2 46	+ 8	i 1 43	P*	—
Clermont-Ferrand		9·2	31	i 2 20	+ 4	i 3 57	− 6	i 3 8	P_g	i 5·0
Jersey	E.	11·2	6	e 3 36	?	e 4 58	+ 6	—	—	e 6·1
Besançon		11·6	35	e 2 51	+ 1	i 5 12	+11	e 3 2	PP	i 6·0
Paris		11·6	21	e 2 52	+ 1	i 4 57	− 4	e 3 0	PP	i 5·8
Neuchatel		11·9	38	e 2 56	+ 2	—	—	e 6 10	Q	e 6·7
Pavia		11·9	50	e 3 14	PPP	e 5 28	SS	e 3 29	?	e 7·2
Basle		12·5	38	e 3 10	PP	e 6 0	?	e 4 36	?	—
Florence		12·6	59	e 3 14	PP	—	—	e 4 8	?	e 6·8
Prato		12·6	58	e 3 6	+ 3	i 5 54	SSS	—	—	—
Zürich		12·9	40	e 3 8	+ 1	e 6 2	SSS	—	—	—
Bologna		13·0	56	e 3 22	PPP	—	—	e 6 33	Q	e 8·3
Rome		13·0	68	i 3 9a	0	5 37	+ 2	3 16	PP	6·6
Salo		13·0	50	e 3 18	PP	—	—	e 4 34	?	e 7·0
Chur		13·1	44	e 3 15k	+ 5	—	—	—	—	e 7·7
Padova		13·4	56	e 3 24	PP	e 6 26	SSS	—	—	—
Strasbourg		13·4	35	e 3 16	+ 2	e 5 51	+ 6	i 3 27	PP	i 6·8
Kew		13·6	9	e 2 46	−31	e 4 51	−59	e 3 31	PP	e 7·6
Ravensburg		13·7	41	e 3 22	+ 4	e 3 29	PP	e 7 6	Q	e 8·0
Karlsruhe		14·0	35	e 3 30	PP	e 5 54	− 5	—	—	e 8·2
Stuttgart		14·2	37	e 3 30k	+ 6	e 6 32	SSS	e 3 36	PP	e 8·4
Triest		15·0	54	i 3 37	+ 2	i 6 26	+ 3	i 3 48?	PP	e 8·9
De Bilt		15·3	21	e 3 44	PP	e 6 53	SS	e 7 36	Q	e 8·1
Rathfarnham Castle		15·3	354	i 3 43	PP	i 6 27	− 3	e 6 58	SSS	8·9
Witteveen	z.	16·4	23	i 3 58	+ 5	e 7 43	SSS	e 4 4	PP	e 8·3

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Taranto		16·4	75	3 50	− 3	7 14	8S	—	—	—
Cheb		16·6	39	—	—	e 7 14	8S	e 8 2	Q	e 8·8
Durham		16·7	4	i 4 6	PP	i 7 21	8S	i 7 26	SSS	7·6
Jena		16·8	35	e 4 2	+ 4	e 7 36	SSS	e 4 10	PP	e 8·8
Tamanrasset	z.	17·2	151	e 3 58	− 5	e 7 8	− 6	—	—	e 9·1
Prague		17·6	40	e 4 12	+ 4	e 7 44	8S	e 4 22	PP	e 9·1
Collmberg		17·7	37	e 4 15	+ 5	e 7 57	SSS	e 4 27	PP	e 10·0
Edinburgh	E.	17·8	2	—	—	7 44	8S	—	—	—
Vienna		17·8	49	e 4 13	+ 2	e 7 41	8S	—	—	9·9
Potsdam		18·5	33	i 4 24	+ 5	i 8 6	8S	i 4 37	PP	e 9·6
Ogyalla		18·7	50	e 4 37	PP,	e 8 3	8S	e 8 37	SSS	e 9·3
Kalossa		18·7	53	e 4 25	+ 3	e 8 3	8S	e 4 39	PP	e 8·6
Aberdeen	E.	19·1	2	—	—	i 8 9	+12	i 9 2	Q	9·7
Belgrade		19·3	62	e 4 33a	+ 4	e 8 13	+11	e 5 0	PPP	e 12·1
Raciborzu		19·7	43	e 4 38	+ 4	8 33	SS	e 4 51	PP	10·8
Timisoara		20·0	60	e 4 52	PP	e 5 7	PPP	e 4 57	PP	e 8·6
Skalnate Pleso		20·5	48	e 4 44	+ 2	e 8 39	+12	e 5 8	PP	—
Copenhagen		20·7	25	e 4 49	+ 5	e 8 36?	+ 5	i 4 55	PP	10·8
Sofia		21·1	69	e 4 51	+ 3	e 8 44	+ 5	—	—	—
Uzhgorod		21·5	51	4 56	+ 4	9 0	+13	—	—	—
Lwow		23·0	50	e 5 10	+ 3	e 9 23	+ 9	—	—	—
Bergen	N.	23·0	11	e 5 24	+17	—	—	—	—	e 13·1
Bucharest		23·2	64	e 5 12	+ 3	e 9 22	+ 4	e 5 41	PP	14·6
Istanbul		25·3	72	e 5 35	+ 5	e 9 56	+ 2	e 9 48	?	e 12·9
Kishinev		25·4	57	e 5 44?	+13	e 10 21?	+25	—	—	—
Upsala		25·7	24	e 6 5	PP	i 10 1	0	e 11 4	SS	e 12·6
Pulkovo		30·6	33	—	—	e 11 20	0	—	—	—
Ksara		32·2	86	e 6 6	−26	e 10 58	−47	—	—	—
Moscow		32·7	43	e 6 37	+ 1	—	—	—	—	—
Scoresby Sund		33·8	348	i 6 48	+ 2	—	—	—	—	16·6
Borzhomi		35·9	69	e 7 10	+ 6	—	—	—	—	—
Tiflis		37·0	69	e 7 27	+14	—	—	—	—	—
Kirovobad		38·3	70	e 7 28	+ 4	e 13 32	+13	—	—	—
Sverdlovsk		45·5	44	8 24	+ 1	15 6	+ 1	—	—	—
Ashkabad		48·0	70	—	—	e 15 20	−21	—	—	—
Weston		50·6	298	i 8 57	− 5	—	—	—	—	—
Harvard		50·7	298	e 8 58	− 5	—	—	—	—	e 26·6
Ottawa		52·6	303	e 9 12	− 6	—	—	—	—	e 25·1
Resolute Bay		54·0	342	e 9 26	− 2	e 17 12	+ 9	e 10 46	PcP	e 24·5
Tashkent		54·7	62	e 9 30	− 3	e 17 13	0	—	—	—
Stalinabad		55·4	65	e 9 36	− 2	—	—	—	—	—
Fergana		56·8	62	e 9 47	− 1	—	—	—	—	—
Andijan		57·0	62	e 9 49	− 1	e 17 45	+ 2	—	—	—
San Juan		57·3	269	i 9 46?	− 6	—	—	—	—	—
Morgantown		57·6	298	i 9 49	− 5	—	—	—	—	—
Frunse		57·7	59	e 9 53	− 2	e 17 54	+ 1	—	—	—
Cleveland	z.	58·0	301	i 9 52a	− 5	—	—	—	—	—
Ili		58·9	56	i 10 0	− 3	—	—	—	—	—
Rybach'e		58·9	59	e 10 1	− 2	—	—	—	—	—
Almata		59·1	57	e 10 2	− 2	e 18 10	− 1	—	—	—
Kurmenty		60·1	57	i 10 18	+ 7	—	—	—	—	—
St. Louis		65·2	302	e 10 39	− 6	e 19 23	− 5	i 11 14	PcP	—
Pretoria	z.	70·2	149	i 10 40	−37	—	—	—	—	—
Kimberley	z.	71·6	154	i 11 16	− 9	—	—	—	—	—
Kabansk		71·7	38	11 26	0	e 20 45?	0	—	—	—
College		73·6	345	e 11 35	− 2	i 11 54	PcP	e 12 14	?	—
Hungry Horse		74·0	320	i 11 35	− 4	—	—	—	—	—
Grahamstown	z.	76·4	154	i 11 57	+ 4	—	—	—	—	—
Victoria		78·5	324	12 1	− 3	—	—	—	—	—
Seattle		78·6	323	i 12 3k	− 2	—	—	e 12 17	PcP	—
Boulder City		82·6	310	e 12 23	− 3	—	—	—	—	—
Reno	z.	83·0	316	e 12 28a	0	—	—	—	—	—
Huancayo		83·4	249	i 12 27	− 3	—	—	—	—	—
Mineral	z.	83·4	318	i 12 18k	−12	—	—	i 13 0	?	—
Shasta Dam		83·6	318	e 12 27	− 4	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tinemaha	z.	83·9	313	i 12 32	− 1	—	—	—	—	—
China Lake	z.	84·4	312	i 12 33k	− 3	—	—	—	—	—
Fresno	z.	85·0	314	e 12 36k	− 2	—	—	—	—	—
Perris	z.	85·5	310	i 12 39	− 2	—	—	—	—	—
Riverside	z.	85·5	310	i 12 38	− 3	—	—	—	—	—
Palomar	z.	85·6	310	i 12 39	− 2	—	—	—	—	—
Pasadena	z.	85·9	310	i 12 40	− 3	—	—	—	—	—

Additional readings :—
Lisbon 1m.30s., iSN = 1m.49s., E = 2m.11s., S_g = 2m.14s., EN = 8m.11s., iPcPN = 8m.21s.
Bagneres eP_g = 2m.13s., i = 3m.1s., eS_g? = 3m.31s.
Clermont-Ferrand iSS = 4m.18s., iSSS = 4m.30s.
Besançon e = 2m.56s., ePPP = 3m.9s., e = 3m.22s., 3m.26s., 3m.56s., 4m.20s., and 4m.49s., iSS = 5m.26s., iSSS = 5m.42s.
Paris iPPP? = 3m.6s., i = 3m.18s., 3m.30s., and 3m.39s., iS = 5m.14s., i = 5m.24s., iSS = 5m.28s., iSSS = 5m.38s.
Rome e = 4m.0s. and 4m.30s., SS? = 6m.21s.
Strasbourg e = 3m.20s., i = 3m.54s., e = 4m.42s., i = 5m.1s., eSSS = 6m.5s. and 6m.10s.
Kew eSS = 6m.6s.
Karlsruhe eZ = 3m.36s., 3m.44s., 4m.6s., and 4m.42s.
Stuttgart eZ = 3m.44s., e = 3m.48s., eZ = 4m.5s., 4m.10s., 4m.26s., and 5m.5s., e = 7m.57s.
Triest i$P_gP_gP_g$ = 4m.53s., iPS = 7m.38s.
Rathfarnham Castle i = 3m.48s.
Witteveen eZ = 4m.29s.
Cheb e = 8m.18s.
Jena eN = 4m.40s. and 4m.56s., eEN = 8m.19s., eN = 8m.24s.
Tamanrasset eZ = 6m.1s. and 6m.54s.
Prague e = 4m.35s., 4m.57s., and 5m.27s., eSS = 8m.17s.
Ogyalla e = 4m.55s., 5m.52s., and 6m.5s., eE = 6m.58s.
Kalossa eE = 4m.28s., eN = 4m.53s., 5m.46s., and 6m.56s.
Belgrade iZ = 4m.41s., eNW = 10m.25s.
Raciborzu eNZ = 4m.48s., ePPPNZ = 5m.3s., eNZ = 5m.9s., eZ = 6m.9s.
Skalnate Pleso e = 4m.48s. and 5m.44s., eN = 8m.15s. and 9m.1s., eE = 9m.12s., eSS? = 9m.24s., e = 11m.2s. and 11m.44s., eScP? = 12m.11s., eE = 12m.23s.
Sofia eEN = 5m.34s. and 5m.59s.
Bucharest eN = 5m.18s. and 9m.30s.
Upsala eN = 7m.23s., 8m.26s., and 12m.4s.
St. Louis e = 13m.40s. and 18m.31s.
Fresno eE = 13m.4s., eN = 13m.16s.
Long waves were also recorded at Helsinki.

May 19d. Readings also at 1h. (Apia, Wellington, Pasadena, Riverside, China Lake, Tinemaha, Ksara, Collmberg, Paris, Strasbourg, and Stuttgart), 4h. (near Yalta, near Sofia, and Istanbul), 5h. (Brisbane, Collmberg, and Tamanrasset), 6h. (near Dzhegetal), 9h. (Paris, Manila, near Kurmenty, near Klyuchi, near Istanbul (2), and Bucharest), 10h. (Wellington and near Dzhergetal), 11h. (Granada (3)), 12h. (near Yalta), 13h. (near Dzhergetal), 14h. (Huancayo, Apia, and near Galerazamba), 15h. (Ashkabad and near Granada), 16h. (Weston, Almeria (2), Malaga (10), near Granada (6), and Alicante), 17h. (Malaga (2), Granada (4), near Manila, near Apia, near Ashkabad, and near Dzhergetal), 18h. (Malaga (2), Granada, and near Dzhergetal), 19h. (Malaga), 20h. (Ashkabad, Apia, near Manila, Almeria, Malaga, near Granada (2), Alicante, and Toledo), 21h. (Apia, Malaga, and near Granada), 22h. (Fresno, Almeria, Malaga (3), near Granada, Alicante, and Toledo), 23h. (near Dzhergetal and near Granada).

May 20d. 7h. 8m. 13s. Epicentre 0°·4N. 123°·7E. (as on 1946, September 28d.).

A = −·5548, B = +·8319, C = +·0070 ; δ = −9 ; h = +7 ;
D = +·832, E = +·555 ; G = −·004, H = +·006, K = −1·000 ;

	△	Az.	P.	O−C.	S.	O−C.		Supp.
	°	°	m. s.	s.	m. s.	s.	m.	s.
Manila	14·4	349	e 3 38	+11	e 3 58	?	—	—
Bandong	17·6	246	e 4 13	+ 5	e 7 37	+14	—	—
Djakarta	18·1	248	e 4 21	+ 7	e 7 46	+11	—	—
Riverview	42·7	146	i 7 59a	− 1	i 14 12	−12	i 17 37	ScS
Vladivostok	43·2	9	i 8 6	+ 2	e 14 21	−11	—	—
Kabansk	53·4	347	9 24	0	e 16 46	− 9	—	—
Kurmenty	58·7	322	i 10 2	0	—	—	—	—
Murgab	59·2	315	e 10 6	+ 1	e 18 8	− 4	—	—
Naryn	59·3	319	e 10 4	− 2	—	—	—	—
Almata	59·7	322	10 9	0	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Rybach'e		59·8	320	e 10 9	0	—	—	—	—
Khorog		60·5	313	e 10 15	+ 1	—	—	—	—
Frunse		60·9	321	e 10 17	0	e 18 32	− 2	—	—
Andijan		61·4	317	10 20	0	e 18 36	− 4	—	—
Dzhergetal		61·5	315	e 10 20	− 1	—	—	—	—
Fergana		61·6	317	e 10 20	− 2	—	—	—	—
Obi-garm		62·3	314	i 10 26	0	—	—	—	—
Stalinabad		62·9	314	e 10 30	0	—	—	—	—
Terre Adélie		68·2	171	i 11 0	− 4	—	—	—	—
Sverdlovsk		75·2	330	e 11 44	− 2	—	—	—	—
Moscow		87·4	325	e 12 49	− 1	—	—	—	—
Pretoria	z.	95·1	245	i 12 45	−61	—	—	—	—
Tinemaha	z.	111·8	50	e 18 37	[0]	—	—	—	—
China Lake	z.	112·7	51	e 18 39	[0]	—	—	—	—
Pasadena	z.	112·8	53	i 18 39	[0]	—	—	—	—
Riverside	z.	113·5	53	e 18 41	[+ 1]	—	—	—	—
Palomar	z.	114·0	53	e 18 41	[0]	—	—	—	—
Tamanrasset	z.	115·6	297	e 18 45	[+ 1]	—	—	—	—
Ottawa	z.	131·3	18	e 19 12	[− 2]	—	—	e 22 27	PKS
Harvard		135·1	16	i 19 21	[− 1]	—	—	i 22 42	PKS
Weston		135·3	16	i 19 21	[− 1]	—	—	—	—
Palisades		135·8	19	i 19 23	[0]	—	—	22 44	PKS
Chinchina	z.	160·0	73	i 19 55	[− 6]	—	—	e 20 39	PKP_2
Bogota		161·6	73	i 20 5	[− 3]	—	—	i 20 51	PKP_2

Additional readings :—
Riverview iZ = 8m.29s., iN = 9m.51s. and 15m.4s.
Terre Adélie e = 11m.23s., 11m.32s., and 12m.24s.

May 20d. 12h. 4m. 49s. Epicentre 19°·9S. 33°·8E. (as on May 10d.).

Intensity IV at Beira ; II-III at Vila Gouveia, Espungabera, and Chuigane.
Observaçoes macrossismicas (1951). Anuario sismologico de Portugal, No. 5, 1951, p. 6.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Pretoria	z.	7·8	220	i 1 57	− 1	i 3 20	− 8	—	—	—
Pietermaritzburg	z.	10·2	197	i 2 29	− 2	i 4 16	−11	i 5 18	S*	—
Kimberley	z.	12·0	221	i 2 51	− 4	i 4 58	−13	—	—	i 6·1
Tananarive		13·0	88	3 20	+11	e 5 41	+ 6	—	—	i 6·1
Grahamstown	z.	14·8	204	e 3 32	0	e 5 58	−20	—	—	—
Tamanrasset	z.	50·6	325	i 9 3a	+ 1	i 9 14	PcP	e 11 0	PP	e 25·8
Ksara		53·5	1	e 9 27	+ 3	e 18 2	PPS	—	—	—
Stuttgart	z.	71·8	343	e 11 27	+ 1	—	—	e 11 38	PcP	—
Collmberg	z.	73·2	347	e 11 35	0	—	—	e 11 47	PcP	—
Jena		73·2	346	e 11 36	+ 1	—	—	e 11 47	PcP	—
Paris		73·9	339	e 11 39	0	i 11 51	PcP	e 12 0	PP	e 46·2
Victoria		146·1	333	19 43	[+ 2]	—	—	—	—	—
Seattle		146·2	331	e 19 46	[+ 5]	—	—	—	—	—
Reno		150·0	317	e 19 52k	[+ 5]	—	—	e 20 15	PKP_2	—
Tinemaha	z.	150·2	312	e 19 56	[+ 8]	—	—	—	—	—
China Lake	z.	150·3	310	e 19 51	[+ 3]	—	—	—	—	—
Mineral	z.	150·7	320	i 19 51k	[+ 3]	—	—	i 20 11	PKP_2	—
Palomar	z.	150·7	304	i 19 57	[+ 9]	—	—	i 20 16	PKP_2	—
Riverside	z.	150·8	306	e 19 57	[+ 8]	—	—	—	—	—
Pasadena	z.	151·4	306	e 19 58	[+ 8]	—	—	—	—	—
Fresno	z.	151·5	313	e 19 53a	[+ 3]	—	—	—	—	—
Lick	z.	152·4	316	e 20 2k	[+11]	—	—	i 20 21	PKP_2	—

Additional readings :—
Tananarive e = 3m.29s., iS? = 5m.28s.
Seattle e = 20m.6s. and 20m.22s.
Mineral iZ = 19m.56s.
Palomar iZ = 20m.7s.
Lick iZ = 20m.14s.

May 20d. 14h. Undetermined shock. Eastern Pacific region, in a low South Latitude.

Palomar ePZ = 39m.29s.
Riverside ePZ = 39m.35s.
Pasadena iP = 39m.38s., iSN = 45m.53s., iL = 51·0m.
China Lake ePNZ = 39m.48s.
Tinemaha ePZ = 39m.59s.
Fresno ePZ = 40m.1s. a.
Lick ePZ = 40m.10s. k, iZ = 40m.17s.
Berkeley ePZ = 40m.15s., eZ = 20m.22s. and 40m.36s., eSN = 47m.2s., iN = 47m.33s., eQN = 52·4m., eREZ = 53·5m.
Reno ePZ = 40m.22s. k.
Mineral eP?Z = 40m.42s. a, iZ = 41m.39s.
Seattle eP? = 41m.30s., eL = 60m.
Copiapo PN = 43m.37s., i = 43m.45s.
Puebla e = 44m.0s. and 45m.12s.
Resolute Bay ePZ = 44m.3s., eSE = 54m.7s., eE = 59m.10s. and 63m.40s., eLE = 64m.45s.
Tacubaya e = 44m.12s.
Vera Cruz e = 44m.30s.
Guadalajara e = 44m.48s. and 45m.42s.
Riverview iSKSE = 56m.20s., eSSE = 64m.22s., eLZ = 79·2m.
Scoresby Sund e = 62m.18s. and 69m.26s., L = 77m.
Long waves also at La Plata, Harvard, and Weston.

May 20d. 16h. Undetermined shock. Suggested repetition of that at 14h.

Palomar ePZ = 26m.15s.
Riverside ePZ = 26m.22s.
Pasadena ePZ = 26m.24s., eSN = 32m.15s., eLNZ = 37·8m.
China Lake ePZ = 26m.35s.
Tinemaha ePZ = 26m.46s.
Fresno ePZ = 26m.52s. a, eZ = 27m.56s. and 29m.1s.
Lick ePZ = 26m.56s. a, iZ = 27m.2s.
Reno ePZ = 27m.6s., eZ = 28m.13s. and 43m.0s.
Mineral ePZ = 27m.24s. k, eZ = 27m.46s.
Vera Cruz e = 30m.21s. and 31m.12s.
Guadalajara e = 30m.36s. and 31m.44s.
Tacubaya e = 30m.42s., i = 31m.23s.
Resolute Bay ePZ = 30m.50s., eSE = 40m.50s., eE = 45m.51s. and 50m.22s., eLE = 51·7m.
Puebla e = 31m.2s.
Berkeley eS?N = 33m.52s., eLN = 39·2m.
Scoresby Sund e = 49m.13s., L = 66m.
Long waves also at La Plata, Galerazamba, Harvard, Palisades, Seattle, and Paris.

May 20d. 19h. 1m. 35s. Epicentre 8°·7S. 124°·1E. (as on 1951, March 9d.).

A = −·5543, B = +·8186, C = −·1503 ; δ = −6 ; h = +7 ;
D = +·828, E = +·561 ; G = +·084, H = −·124, K = −·989.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bandong		16·4	275	—	—	e 7 9	+13	—	—	—
Manila		23·3	353	e 4 25?	−45	—	—	—	—	—
Riverview		35·7	139	i 5 44	−78	i 12 38	− 1	i 12 46	?	e 18·9
Colombo	E.	46·7	287	7 44	?	—	—	—	—	—
Kodaikanal	E.	50·1	292	e 11 16	PP	—	—	—	—	—
Vladivostok		52·1	7	e 9 14	0	i 16 37	− 1	—	—	—
Bombay		57·5	298	—	—	e 16 25?	?	—	—	—
Terre Adelie		59·2	171	e 10 0	− 5	—	—	—	—	—
Kabansk		62·3	349	e 10 27	+ 1	e 18 49	− 3	—	—	—
Irkutsk		63·1	347	—	—	e 19 0	− 2	—	—	—
Przhevalsk		65·8	325	e 10 51	+ 2	—	—	—	—	—
Kurmenty		66·2	325	e 10 53	+ 1	—	—	—	—	—
Naryn		66·6	323	e 10 55	+ 1	e 19 34	−11	—	—	—
Almata		67·1	326	e 10 59	+ 2	19 45	− 6	—	—	—
Khorog		67·2	317	e 11 0	+ 2	—	—	—	—	—
Rybach'e		67·2	324	e 10 58	0	—	—	—	—	—
Petropavlovsk		68·2	21	e 11 7	+ 3	e 20 6	+ 2	—	—	—
Andijan		68·4	320	11 5	− 1	20 2	− 5	—	—	—
Fergana		68·6	320	e 11 5	− 2	—	—	—	—	—
Stalinabad		69·7	317	e 11 13	− 1	e 20 16?	− 6	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Mary		74·1	313	—	—	e 21 13	+ 1	—	—	—
Sverdlovsk		83·3	330	e 12 32	+ 2	e 22 44?	− 6	—	—	—
Pretoria	z.	91·5	244	i 13 11	+ 1	—	—	—	—	—
Ksara		93·3	303	e 11 20	?	e 22 16	?	—	—	—
Tinemaha	z.	117·2	53	e 18 52	[+ 5]	—	—	—	—	—
Pasadena	z.	117·7	56	e 18 51	[+ 3]	—	—	i 18 57	PKP	—
China Lake	z.	117·9	54	e 18 50	[+ 1]	—	—	i 18 58	PKP	—
Riverside	z.	118·4	56	e 18 51	[+ 1]	—	—	—	—	—
Palomar	z.	118·9	57	e 18 59	[+ 8]	—	—	—	—	—
Tamanrasset	z.	119·6	292	e 18 58	[+ 6]	—	—	—	—	—
Harvard		143·6	19	e 19 36	[− 1]	—	—	—	—	—
Weston		143·8	19	e 19 37	[0]	—	—	—	—	—
Palisades		144·1	23	i 19 36	[− 2]	—	—	—	—	—
Huancayo		151·7	137	i 20 0	[+10]	—	—	—	—	—

Long waves were also recorded at Wellington, Istanbul, Kew, and Paris.

May 20d. Readings also at 0h. (Malaga (2), Tortosa, near Almeria, Granada, and Toledo), 1h. (Almeria, Granada, Malaga (2), near Apia, and near Dzhergetal), 2h. (Malaga (2)), 3h. (Pretoria), 4h. (Chinchina, Galerazamba, Ottawa, Palisades, Morgantown, Harvard, Weston, Palomar, Pasadena, Riverside, China Lake, Tinemaha, Fresno, Lick, Reno, Mineral, Malaga, and near Dzhergetal), 5h. (Collmberg and Stuttgart), 6h. (Malaga (2), Frunse, Lunacharskoe, Obi-garm, Tchimkent, near Andijan, Dzhergetal (2), Fergana, Khorog, Samarkand, Stalinabad, and Tashkent), 7h. (Granada (2), Malaga, Copiapo, and near Dzhergetal), 8h. (Malaga, near Alicante (2), and Granada), 9h. (Malaga and Prague), 10h. and 11h. (near Alicante), 12h. (Grozny, Piatigorsk, near Borzhomi, Gori, Kirovobad, Shemakla, and Tiflis), 13h. (Malaga, near Dzhergetal, Khorog, Obi-garm, Stalinabad, and Tchimkent), 14h. (Pretoria, Bandong, and near Dzhergetal), 15h. (Palomar, Pasadena, Riverside, China Lake, Tinemaha, Harvard, Weston, Palisades, Kew, Paris, Ksara, Almata, Frunse, Khorog, Przhevalsk, Stalinabad, Tchimkent, near Andijan, Dzhergetal, Kurmenty, Murgab, Naryn, and Rybach'e), 16h. (Mount Wilson, Palomar, Riverside, Malaga (2), Fergana, Khorog, Lunacharskoe, near Andijan, Dzhergetal (2), Murgab, Obi-garm, Stalinabad, Tashkent, and near Apia (2), 17h. (Antofagasta, Copiapo, La Paz, Tamanrasset, Mount Wilson, Palomar, Riverside, China Lake, Tinemaha, and Scoresby Sund), 18h. (Malaga and Tacubaya), 20h. (near Dzhergetal), 21h. (Besançon, Almeria, Malaga, near Granada, and near Ashkabad), 22h. (near Dzhergetal (2)), 23h. (Malaga and near Dzhergetal).

May 21d. 8h. 27m. 26s. Epicentre 6°·2S. 154°·8E. Depth of focus 0·020.
(as on 1951, March 8d.).

$A = -·8996$, $B = +·4233$, $C = -·1073$; $\delta = -2$; $h = +7$;
$D = +·426$, $E = +·905$; $G = +·097$, $H = -·046$, $K = -·994$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane		21·2	184	e 4 41	+ 7	i 8 28	+13	i 9 19	sS	—
Guam		22·0	332	4 37	− 5	—	—	—	—	—
Korror		24·3	303	5 2	− 2	—	—	—	—	—
Riverview		27·7	187	i 5 38$_a$	+ 3	i 10 9	+ 5	i 6 8	pP	e 12·5
Apia		33·7	105	6 28?	0	(12 41?)	sS	—	—	12·7
Auckland	N.	35·6	151	i 6 49?	+ 5	—	—	—	—	—
Tuai	N.	38·2	152	7 10	+ 4	i 12 51	+ 4	—	—	—
Cobb River	E.	38·3	158	7 14	+ 8	12 59	+11	—	—	—
Kaimata	N.E.	39·1	161	7 16	+ 3	13 4	+ 4	—	—	—
Wellington		39·2	156	e 7 16	+ 2	i 13 4	+ 2	i 14 2	sS	e 20·1
Manila		39·4	303	e 7 16	0	i 13 4	− 1	i 7 50	pP	—
Christchurch		40·3	160	i 7 26	+ 3	13 21	+ 3	8 4	pP	e 20·0
Kameyama		44·3	339	e 8 0	+ 5	e 13 34	−42	—	—	—
Kôti		44·4	334	e 7 55	− 1	e 15 29	sS	—	—	—
Kumagaya		44·5	342	7 54	− 3	e 14 2	−17	e 18 32	SSS	—
Osaka		44·5	337	e 7 54	− 3	e 14 29	+10	—	—	—
Perth		44·5	230	14 26	S	(14 26)	+ 7	15 17	sS	—
Matusiro		45·3	341	7 58	− 5	14 23	− 8	i 18 24	SSS	i 20·4
Kumamoto		45·4	332	e 8 5	+ 1	14 36	+ 4	—	—	—
Hukuoka		45·8	332	8 5	− 2	14 33	− 6	(18 0)	SS	18·0

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Sendai		46·1	345	8 12	+ 2	e 14 36	− 6	e 18 10	SS	—
Hamada		46·2	334	8 7	− 3	e 14 38	− 6	—	—	—
Bandong		46·8	267	i 8 17	+ 2	i 14 56	+ 4	—	—	—
Mizusawa		46·8	346	e 8 8	− 7	14 41	−11	e 8 12	P	—
Djakarta		47·7	268	e 8 19	− 3	i 15 0	− 5	—	—	—
Zi-ka-wei		49·0	322	e 8 34	+ 2	i 15 21	− 2	—	—	—
Urakawa		49·4	349	i 8 32	− 3	i 14 35	−53	—	—	—
Nanking		51·2	320	i 8 47a	− 2	i 15 52	− 1	i 9 21	pP	—
Vladivostok		53·3	340	i 9 2	− 2	i 16 17	− 5	9 35	pP	—
Honolulu		53·9	58	e 9 6	− 3	—	—	—	—	—
Petropavlovsk		59·2	3	i 9 44	− 3	i 17 38	− 2	i 10 20	pP	—
Terre Adelie		61·2	185	i 10 2	+ 2	i 18 12	+ 7	i 10 40	pP	—
Klyuchi		62·5	4	e 10 0	− 9	—	—	—	—	—
Mitchell Field		62·9	20	i 10 10	− 1	i 18 26	0	—	—	—
Calcutta	E.	70·9	267	i 11 0a	− 2	i 20 6	+ 4	i 21 5	sS	—
Kabansk		71·0	331	11 0	− 2	20 0	− 3	11 36	pP	—
Irkutsk		72·3	330	i 11 7	− 3	e 20 17?	− 1	—	—	—
Chatra	N.	73·2	300	e 11 10	− 5	i 20 29	+ 1	i 21 26	sS	—
Colombo	E.	75·5	279	11 27	− 1	20 55	+ 1	—	—	34·6
Kodaikanal	E.	78·7	283	i 11 44	− 2	21 24	− 4	14 36	PP	35·3
Hyderabad	E.	78·9	290	i 11 44	− 3	i 21 25	− 5	—	—	37·0
College		82·4	21	12 3	− 2	22 2	− 4	—	—	—
Poona	E.	83·4	290	i 12 10	0	i 22 15	− 1	12 43	pP	—
Bombay		84·4	290	i 12 14	− 1	i 22 23	− 3	23 12	SP	37·2
Almata		85·4	316	i 12 19	− 1	i 22 35	− 1	i 12 55	pP	—
Naryn		85·4	312	i 12 21	+ 1	i 22 39	+ 3	i 12 58	pP	—
Ili		85·5	315	e 12 21	0	—	—	—	—	—
Rybach'e		85·8	313	i 12 22	0	i 22 39	− 1	i 13 0	pP	—
Murgab		86·7	309	e 12 27	0	22 49	0	i 13 5	pP	—
Frunse		87·1	314	i 12 28	− 1	i 22 53	+ 1	i 13 4	pP	—
Arcata	Z.	87·3	49	e 12 34?k	+ 4	—	—	e 13 14	pP	—
Berkeley		88·2	53	i 12 35a	+ 1	e 22 50	[+ 5]	e 13 13	pP	e 47·9
Andijan		88·3	311	i 12 34	0	i 23 4	0	13 10	pP	—
Khorog		88·4	307	i 12 41	+ 6	—	—	—	—	—
Santa Clara		88·4	52	i 12 37	+ 2	i 23 16	+12	i 13 17	pP	e 48·9
Lick	Z.	88·6	52	i 12 39a	+ 3	e 23 19	+13	i 13 18	pP	—
Shasta Dam		88·6	49	i 12 36	0	e 23 8	+ 2	e 13 14	pP	—
Fergana		88·7	311	i 12 35	− 1	23 6	− 1	e 13 11	pP	—
Mineral	Z.	89·1	50	e 12 39a	+ 1	—	—	e 30 16	PKKP	—
Victoria		89·2	42	12 38	− 1	22 52	[+ 1]	e 24 3	sSKS	29·3
Seattle		89·8	42	i 12 43a	+ 1	i 23 8	− 9	i 13 21	pP	e 41·6
Fresno		90·0	53	i 12 44a	+ 2	e 23 25	+ 6	e 13 23	pP	—
Obi-garm		90·0	309	12 50	+ 8	—	—	—	—	—
Reno		90·4	51	e 12 46a	+ 2	e 23 0	[+ 2]	e 24 35	sS	—
Lunacharskoe		90·7	312	e 12 49	+ 3	e 23 1?	[+ 1]	—	—	—
Stalinabad		90·7	309	i 12 43	− 3	i 23 21	− 4	i 13 21	pP	—
Tashkent		90·7	312	i 12 45?	− 1	i 23 20?	− 5	e 13 23	pP	—
Pasadena		91·0	56	i 12 49a	+ 2	e 23 7	[+ 5]	i 13 27	pP	e 38·2
Tinemaha		91·3	53	i 12 50a	+ 1	e 23 38	+ 7	i 13 30	pP	—
China Lake		91·6	54	i 12 51a	+ 1	e 23 42	+ 9	i 13 30	pP	—
Riverside		91·6	56	i 12 51a	+ 1	e 23 41	+ 8	i 13 29	pP	—
Palomar	Z.	92·0	57	i 12 54a	+ 2	i 30 9	PKKP	i 30 48	pPKKP	—
Samarkand		92·2	309	12 50	− 3	e 23 34	− 4	—	—	—
Boulder City		93·9	55	i 13 2	+ 2	i 16 50	PP	i 17 26	pPP	—
Hungry Horse		95·4	42	i 13 6	− 1	e 23 22	[− 4]	i 13 46	pP	—
Mary		96·1	307	13 11	+ 1	i 23 17?	[−13]	13 47	pP	—
Tucson		97·0	58	i 13 17	+ 2	—	—	i 13 53	pP	—
Sverdlovsk		97·4	327	i 13 13	− 3	23 36	[− 1]	i 13 51	pP	—
Ashkabad		98·9	307	e 13 22	− 1	e 24 4	SKKS	—	—	—
Resolute Bay		100·7	14	i 13 31	0	e 24 54	+ 4	i 14 14	pP	e 44·6
Tananarive		104·2	238	—	—	e 25 21	+ 1	32 49	SS	49·0
Baku		105·3	310	e 13 51	− 1	—	—	e 18 8	PP	—
Grozny		108·1	314	e 18 36	PP	e 27 40	PS	—	—	—
Tiflis		109·0	312	e 18 33	PP	—	—	—	—	—
Leninakan		109·9	311	e 18 37	PP	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Borzhomi		110·0	312	e 14 13	P	—	—	—	—	—
Moscow		110·2	327	e 14 12	P	25 32	SKKS	e 18 50	PP	—
Pulkovo		112·2	333	e 18 52	PP	e 28 2	SP	—	—	—
St. Louis		113·7	50	e 18 42	[+23]	i 26 51	S	e 19 6	pPKP	—
Helsinki		114·3	336	e 19 19	PP	—	—	—	—	e 53·6
Scoresby Sund		115·5	359	i 18 24	[+ 1]	e 28 56	SP	e 19 28	PP	—
Yalta		115·9	317	e 14 40	P	—	—	e 19 23	PP	—
Ksara		117·4	304	e 14 44	P	29 48	PS	i 19 41	PP	—
Upsala		117·4	337	e 19 37?	PP	e 25 2	[− 1]	e 29 52	PS	e 52·6
Pretoria	z.	119·2	237	i 18 33	[+ 3]	i 28 49	SP	—	—	—
Lwow		120·2	325	e 18 32	[0]	26 42	SKKS	e 20 0	PP	—
Istanbul		120·6	315	e 18 31	[− 2]	e 26 2	[+48]	e 20 1	PP	e 57·6
Kimberley	z.	120·7	127	i 18 35	[+ 2]	i 28 40	SP	—	—	—
Morgantown		120·8	47	i 18 32	[− 1]	e 28 40	SP	—	—	—
Ottawa		121·4	39	18 34	[0]	25 26	[+10]	20 6	PP	—
Uzhgorod		121·7	325	e 18 34	[− 1]	e 20 10	PP	e 20 41	pPP	—
Pennsylvania	E.	121·8	45	i 20 9	PP	e 21 10	sPP	i 20 47	pPP	—
Reykjavik	z.	122·1	358	i 18 36	[0]	—	—	—	—	—
Copenhagen		122·3	336	i 18 38	[+ 2]	37 8	SS	20 7	PP	—
Shawinigan Falls	N.	122·3	36	18 38	[+ 2]	—	—	20 18	PP	—
Ivigtut		122·5	12	i 18 34	[− 2]	36 46	SS	20 14	PP	—
Skalnate Pleso		122·6	326	e 18 58	[+22]	e 25 13	[− 8]	e 20 18	PP	—
Seven Falls	E.	123·6	34	20 30	PP	25 32?	[+ 8]	37 2	SS	50·0
Timisoara	N.	123·8	322	e 19 34?	pPKP	—	—	e 20 34?	PP	—
Budapest		124·2	325	e 20 37	PP	e 22 50	PKS	—	—	e 59·6
Potsdam		124·3	333	e 18 43	[+ 3]	e 30 16	PS	e 19 16	pPKP	e 61·6
Ogyalla		124·5	326	e 20 34	PP	e 26 55	SKKS	e 23 28	PPP	—
Palisades		124·5	43	i 18 41	[+ 1]	e 37 34	SS	i 20 25	PP	e 58·5
Fordham		124·6	43	i 18 43	[+ 3]	—	—	e 20 28	PP	—
Kalossa		124·7	325	e 20 37	PP	—	—	—	—	—
Belgrade		124·8	321	e 20 29k	PP	e 25 54	[+27]	—	—	—
Collmberg	z.	125·0	332	e 18 41	[0]	e 28 25	?	e 22 6	?	—
Prague		125·1	330	e 18 42	[+ 1]	e 25 26	[− 3]	e 19 29	pPKP	e 54·6
Harvard		125·4	40	i 18 42	[0]	e 30 12	SP	e 20 27	PP	e 60·1
Weston		125·6	40	i 18 43	[+ 1]	e 32 2	PKKS	i 19 23	pPKP	e 46·5
Aberdeen	E.	126·0	343	e 18 38	[− 5]	i 22 26	SKP	i 31 6	PS	e 67·2
Jena		126·0	331	e 18 43	[0]	e 25 39	[+ 8]	e 20 39	PP	—
Cheb		126·1	331	e 20 46	PP	e 25 38	[+ 6]	e 22 16	SKP	—
Witteveen	z.	126·7	337	i 18 46	[+ 2]	—	—	—	—	—
De Bilt		127·9	337	e 18 43	[− 4]	e 22 11	SKP	e 19 29	pPKP	e 57·6
Durham		128·0	343	i 19 3	[+16]	i 22 10	SKP	i 20 58	PP	—
Triest		128·2	327	i 20 55	PP	i 22 11	SKP	i 37 58	SS	e 62·1
Stuttgart		128·6	332	e 18 45	[− 3]	e 25 44	[+ 5]	e 19 41	pPKP	65·6
Karlsruhe		128·8	333	e 18 47	[− 2]	—	—	e 21 1	PP	—
Strasbourg		129·4	332	e 18 50	[0]	e 25 56	[+16]	e 20 56	PP	e 64·1
Chur		129·7	330	e 18 45	[− 5]	—	—	—	—	—
Chinchina		129·8	88	i 18 51	[0]	i 22 13	SKP	e 31 28	PS	—
Taranto		129·8	318	19 50	pPKP	e 22 20	SKP	39 20	PSS	—
Zürich		129·8	331	e 18 48	[− 3]	—	—	e 21 1	PP	—
Padova		130·0	326	e 18 7	[−44]	i 22 13	SKP	—	—	—
Basle		130·2	331	e 18 53	[+ 2]	e 21 9	PP	e 19 56	pPKP	—
Bologna		130·3	327	e 18 53	[+ 1]	e 22 23	SKP	e 21 2	PP	—
Kew		130·4	340	—	—	e 26 48	SKKS	—	—	e 59·6
Rathfarnham Castle		130·6	346	—	—	e 27 15	SKKS	—	—	e 59·6
Prato		130·8	325	e 18 4	[−48]	—	—	—	—	—
Pavia		131·0	329	e 21 10k	PP	i 22 17	SKP	31 21	PS	e 63·1
Besançon		131·1	332	e 18 54	[+ 1]	e 22 8	SKP	e 21 14	PP	—
Rome		131·2	321	i 18 52a	[− 1]	25 49	[+ 4]	39 32	pPKP	—
Bogota		131·3	89	e 18 46	[− 8]	i 22 16	SKP	e 21 8	PP	—
Paris		131·5	336	i 18 54	[0]	i 25 48	[+ 2]	i 19 34	pPKP	e 62·6
La Paz		131·9	118	19 0	[+ 5]	31 44	PS	21 36	PP	—
Clermont-Ferrand		133·7	333	e 22 46	PKS	i 25 7	[−44]	i 23 47	PPP	—
Tortosa		138·6	329	i 23 49	?	—	—	—	—	e 68·6
Algiers Univ.	z.	140·1	323	e 19 0	[−10]	e 22 10	SKP	e 19 40	pPKP	—
Alicante		140·9	329	19 27	[+16]	26 11	[+ 8]	22 17	PP	e 66·6

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Toledo		141·5	334	e 19 5	[− 7]	i 22 19	PP	i 19 15	PKP	66·9
Almeria		143·1	329	19 14	[− 1]	26 24	[+18]	22 26	PP	72·5
Granada		143·4	331	19 15a	[0]	i 25 43	[−24]	20 27	pPKP	73·3
Fort de France		143·7	73	e 19 15	[− 1]	—	—	e 22 32	PP	—
Malaga		144·2	331	i 19 12	[− 5]	25 44	[−24]	i 28 34?	SKKS	64·0
Tamanrasset	z.	146·1	303	i 19 21k	[+ 1]	i 22 47	PP	i 20 1	pPKP	—
Averroes		148·3	331	i 19 30?	[+ 6]	e 22 36	PP	i 19 54	PKP_2	—

Additional readings :—
Riverview iNZ =5m.41s. and 6m.25s., iN =6m.39s., eZ =10m.19s., iN =10m.26s., isSN =11m.12s., iE =11m.24s., iN =11m.31s., iE =11m.42s.
Wellington iS?Z =13m.16s.
Manila i =8m.39s., iSS =13m.42s.
Christchurch pPZ =8m.14s., cPPNZ =9m.6s., eNZ =9m.49s., eEN =13m.59s., SS = 16m.19s., S_cS?Z =16m.49s.
Perth S =17m.47s., i =18m.29s. and 19m.6s., sS given as PPP.
Hukuoka e =13m.36s.
Mizusawa SE =14m.19s.
Nanking i =9m.39s., iP_cP =10m.11s., iPPZ =10m.44s., i =16m.40s., isSE =16m.56s.
Petropavlovsk csS =18m.42s., S_cS =19m.35s.
Terre Adelie ePS =18m.29s., eSSS =25m.1s.
Chatra PPSN =21m.4s.
Kodaikanal PPPE =16m.21s., SSE =26m.19s., SSSE =29m.24s., QE =31m.44s.
Poona iE =23m.4s., sSE =23m.15s.
Bombay PPPE =16m.23s., PPSE =23m.51s., PPSN =24m.9s.
Almata isS =23m.40s.
Naryn PP =16m.0s.?, PPP =17m.33s., isS =23m.42s.
Rybach'e isS =23m.45s.
Frunse isS =23m.54s.
Berkeley eSKSE =22m.21s., eN =22m.54s., isSZ =24m.15s., eSSE =29m.4s., eN = 29m.58s.
Andijan isS =24m.11s.
Santa Clara iE =30m.19s.?
Lick ePPZ =16m.7s., ePKKPZ =30m.13s.
Fergana sS =24m.8s.
Mineral iZ =12m.50s. and 12m.58s.
Seattle isP =13m.39s., ePP =16m.22s., iSE =23m.26s., iSKS =23m.58s., isS =24m.30s., iSP =24m.51s., ipSP =25m.17s., iSPP =26m.7s., iSS =29m.14s., ePKKP = 30m.34s., eSSS =33m.4s., eSKS(△ >180°) =36m.10s., and other readings without phase.
Fresno eZ =14m.16s., eN =16m.30s.
Reno ePKKPZ =30m.14s.
Stalinabad PP =16m.26s.
Tashkent isS =24m.32s.
Pasadena isPZ =13m.46s., ePPZ =16m.58s., epPPZ =17m.35s., iSEN =23m.37s., ePKKPZ =30m.12s., epPKKPZ =30m.52s.
China Lake iNZ =13m.3s., iE =13m.51s., ePKKPZ =30m.12s., epPKKPZ =30m.50s.
Riverside iPKKPZ =30m.11s., ipPKKPZ =30m.50s.
Hungry Horse iPKKP =29m.49s., ePKP,PKP =38m.9s.
Mary PP =17m.10s., PPP =19m.29s., SKKS =23m.59s., isS =25m.9s.
Sverdlovsk PP =17m.11s., isS =25m.24s., iPS =25m.50s.
Resolute Bay ePPZ =17m.39s., eE =19m.52s., ePSEZ =26m.35s., eE =27m.40s., eZ = 30m.7s.
Tananarive PPS =28m.27s., e =43m.21s.
Moscow ePKS =21m.34s., eS =26m.8s., csS =27m.12s., ePS =28m.15s.
St. Louis epPP =19m.48s., esSKS =26m.1s., ePS =29m.2s., epPS =29m.28s., eSS = 34m.40s.
Scoresby Sund e =20m.6s., ePS =29m.11s., 29m.57s., 31m.11s., and 32m.28s., eSS = 35m.26s., 37m.11s.
Upsala eN =19m.56s., e =20m.46s., eN =23m.4s. and 26m.6s., eE =29m.34s., 29m.57s., and 31m.17s., ess?S =35m.4s., eSSS?N =39m.34s.
Lwow epPP =20m.31s.
Istanbul eEZ =21m.30s., ePKS =21m.55s., eSKKSE =26m.57s., ePKKPEN =28m.37s., ePSE =29m.34s., N =29m.38s., ePKKSN =32m.44s.
Ottawa e =28m.2s., eZ =28m.38s., e =29m.50s., 35m.41s., and 45m.34s.
Copenhagen 28m.10s. and 30m.10s.
Ivigtut 30m.7s. and 31m.10s.
Skalnate Pleso esPKP? =19m.45s., e =20m.34s., epPP =21m.5s., esPP =21m.30s., ePPP =23m.19s., eSKSPN =29m.59s., eE =30m.3s., e =32m.58s., eSS =36m.46s., esSS =37m.42s., eSSS =40m.58s.
Seven Falls SKKSE =28m.38s., PSE =30m.0s.
Budapest eSKSN =27m.55s., eSKKKSN =30m.19s., S_cSPKPE =65m.19s.
Potsdam iPPZ =20m.21s., iPPN =20m.27s., ePSN =30m.23s.
Belgrade eZ =22m.5s., eNE =34m.18s. and 38m.47s.

Continued on next page.

Prague ePP =20m.22s., e =21m.52s., 23m.7s., and 29m.58s., ePSE =30m.33s., esPS?E = 31m.22s., ePPS =32m.0s., eSS =37m.4s., eSSS? =41m.34s.
Harvard i =20m.35s., ipPP =21m.13s., isPP =21m.47s., iPPP =23m.30s., epPS = 31m.20s., isPS =32m.15s., iSS =37m.33s., esSS =38m.43s.
Weston ePP =20m.30s.
Aberdeen iPPPE =24m.1s., iE =24m.43s.
Jena ePKPE =18m.46s., eEN =18m.53s., eZ =18m.57s. and 19m.49s., eN =19m.58s., eZ =21m.2s., eN =21m.24s., eSKP?N =21m.43s., eSKP?Z =21m.49s., eSKP?E = 21m.52s., eE =22m.57s., ePPP?N =23m.37s.
Cheb e =22m.54s., 24m.56s., and 27m.48s., eSS =36m.51s.
De Bilt iPP =20m.49s., ipPP =21m.25s., ePS =30m.53s., eSS =38m.16s.
Durham iN =19m.16s.
Triest iSKS =27m.48s.?
Stuttgart ePKPZ =18m.48s., eZ =18m.52s., ePP =20m.54s., eSKP =21m.56s., ePPP = 23m.34s., e =24m.36s., ePSKS =30m.28s., eZ =30m.32s., ePPS =32m.17s., e = 33m.12s., eSS =37m.40s. and 38m.58s., e =41m.46s., eQ =63·6m.
Karlsruhe eZ =18m.50s., 19m.58s.. 21m.55s., and 23m.33s.
Strasbourg e =20m.1s., ePP? =20m.52s., epPP =21m.35s., eSKP =22m.6s., e =22m.11s., 22m.16s., and 23m.34s., ePPP =23m.43s., ePS =31m.2s., ePPS =32m.44s., eSS = 38m.0s., e =39m.14s.
Pavia eZ =22m.28s., eE =34m.14s., eSS =38m.3s., e =41m.5s.
Besançon e =20m.1s., 20m.52s., and 32m.13s.
Rome iPP =21m.13s., iSKP =22m.19s., SS =38m.34s.?, SSS =43m.49s.?
Paris iPP =21m.16s., ipPP =21m.51s., iSKP =22m.9s., iPKS =22m.21s., ipPKS = 23m.1s., iPPP =23m.58s., iPS =31m.22s., epPS =31m.55s., esSP =32m.12s., iPPS =32m.50s., iSS =38m.12s., iSSP =38m.58s., ePSS =39m.36s., iSSS =43m.2s. and many unidentified readings.
La Paz i =22m.27s., SS =38m.48s.
Algiers Univ. ePPZ =22m.1s.
Alicante PPP =25m.19s., PPS =34m.34s.?, SSP =41m.47s., SSS =46m.9s., Q =57m.49s.
Almeria PPP =25m.30s., Q =70m.14s.
Granada sPKP =20m.55s., iPP =22m.12s., pPP =22m.34s., PPP =24m.42s., SKKS = 28m.24s., SKSP =32m.12s., iSS =41m.3s., SSS =46m.23s., Q =69m.10s.
Malaga iPP =21m.38s., PPP =24m.40s.
Tamanrasset ePPPZ =26m.6s., epPPPZ =26m.52s.

May 21d. Readings also at 0h. (Ksara, Naryn, Almata, Almata II, near Dzhegetal (2), Fergana, Khorog, Stalinabad, Andijan, Murgab, Tashkent, Lunacharskoe, and Samarkand), 2h. (Manila and Tacubaya), 3h. (Almeria, Granada, Malaga, Zürich, Stuttgart, Collmberg, Prague, Triest, Padova, Prato, near Florence, Rome, near Ashkabad, and near Bogota), 4h. (La Paz, Malaga, Seattle, Mineral, Berkeley, Lick, Fresno, Pasadena, Riverside, Palomar, China Lake, Tinemaha, Tacubaya, Puebla, Vera Cruz, Guadalajara, La Plata, near Ashkabad, and near Dzhegetal), 5h. (Mount Wilson, Riverside, Palomar, China Lake, Palisades, Weston, Istanbul, Collmberg, Jena, Stuttgart, Basle, Chur, Zürich, Strasbourg, Besançon, and Tamanrasset), 6h. (La Paz, Prague, and Malaga), 7h. (Apia and near Triest), 8h. (near Apia), 9h. (La Paz and near Dzhegetal), 10h. (Pretoria), 11h. (Terre Adelie, Pasadena, Riverside, Palomar, China Lake, Tinemaha, Berkeley, Lick, Fresno, Mineral, Reno, Stuttgart, Collmberg, Fergana, Samarkand, Lunacharskoe, Almata II, Frunse, Naryn, Rybach'e, near Obi-garm, Dzhergetal, Stalinabad, Khorog, Tashkent, Andijan, and Murgab) 12h. (Prague and Granada), 13h. (near Apia), 14h. (Angra do Heroismo), 15h. (Algiers Univ., Manila, and near Dzhergetal), 17h. (Obi-garm, Fergana, near Dzhergetal (2), Stalinabad, Andijan, and Khorog), 18h. (Collmberg, Apia, and near Dzhergetal), 20h. (Malaga and near Granada (2)), 22h. (Collmberg), 23h. (near Dzhergetal).

May 22d. 4h. 55m. 31s. Epicentre 23°·2S. 177°·4W. Depth of focus 0·010.
(as on 1949, September 30d.).

$A = -·9191$, $B = -·0417$, $C = -·3917$; $\delta = -9$; $h = +4$;
$D = -·045$, $E = +·999$; $G = +·391$, $H = +·018$, $K = -·920$.

		△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	m. s.	Supp. s.
Apia		10·8	31	2 33?	0	4 22	−10	—	—
Lick	z.	79·9	42	i 11 59k	− 1	—	—	i 12 47	sP
Pasadena	z.	80·1	47	i 12 1	0	—	—	—	—
Fresno	z.	80·6	44	e 12 4a	+ 1	—	—	—	—
Palomar	z.	80·6	48	i 12 3	0	—	—	e 12 35	pP
Riverside	z.	80·6	47	e 12 2	− 1	—	—	e 12 36	pP
China Lake	z.	81·5	45	i 12 8	0	—	—	e 12 42	pP
Mineral	z.	81·8	40	i 12 10a	0	—	—	i 12 47	pP
Tinemaha	z.	81·8	45	e 12 8	− 2	—	—	—	—
Reno	z.	82·4	42	e 12 13k	0	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Ksara		149·0	297	e 19 37	[+ 4]	—	—	e 18 4	?
Collmberg	z.	150·8	346	e 19 38	[+ 3]	—	—	—	—
Jena		151·4	347	e 19 37?	[+ 1]	—	—	e 19 57	pP′
Prague		151·6	344	i 19 44	[+ 8]	—	—	i 19 55	PKP_2
Stuttgart	z.	154·0	350	e 19 39	[− 1]	—	—	e 20 3	pP′
Strasbourg		154·3	353	i 20 5	PKP_2	—	—	—	—
Zürich		155·4	351	e 20 5	PKP_2	—	—	—	—
Besançon		155·9	354	e 20 12	PKP_2	—	—	—	—
Tamanrasset	z.	177·3	—	e 19 59	[0]	—	—	e 20 27	pP′

Additional readings :—
Mineral eZ = 12m.24s.
Collmberg iEZ = 19m.45s. and 19m.53s.
Jena eEN = 19m.44s., eE = 20m.14s., eN = 20m.21s. and 20m.33s., eE = 21m.6s.
Prague i = 20m.52s.
Stuttgart eZ = 19m.48s.
Tamanrasset eZ = 20m.7s., $ePKP_2Z$ = 21m.45s., $epPKP_2Z$ = 22m.23s., ePPZ = 25m.38s.

May 22d. 5h. 35m. 5s. Epicentre 37°·6N. 3°·5W. (as on 1945, June 5d.).

Intensity V near the epicentre ; III at Granada.

A. Due Rojo, S.J.
Movimientos sismicos en Espana durante el año, 1951, Boletin de la Real sociedad Española de Historia Natural, Tome L1, 1953, p.61.

$A = +·7928$, $B = -·0485$, $C = +·6076$; $\delta = +6$; $h = -1$;
$D = -·061$, $E = -·998$; $G = +·606$, $H = -·037$, $K = -·794$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Granada		0·4	191	i 0 8	− 5	i 0 18	− 3	0 15	P	—
Almeria		1·1	132	i 0 26	+ 4	i 0 36	− 3	—	—	—
Malaga		1·1	220	i 0 15	− 7	—	—	—	—	—
Toledo		2·3	349	i 0 35	− 5	i 1 8	− 1	i 0 43	P_g	—
Alicante		2·5	72	0 45	+ 2	1 18	+ 4	0 51	P_g	—
Tortosa		4·5	43	i 1 16	+ 5	—	—	—	—	—
Lisbon		4·6	286	i 1 28k	P_g	i 2 8	+ 1	—	—	—
Algiers Univ.	z.	5·3	97	i 1 22k	0	i 2 26	+ 1	e 1 36	P*	—
Besançon		11·9	33	—	—	e 5 34	SSS	—	—	e 6·1
Stuttgart	z.	14·5	36	e 3 39?	PP	—	—	—	—	7·5
Tamanrasset	z.	16·7	150	e 3 56	− 1	e 6 50	−13	—	—	—
Jena	E.	17·1	34	e 4 7?	+ 5	—	—	—	—	e 8·6
Collmberg	z.	18·0	35	4 25	PP	—	—	—	—	—

Additional readings :—
Granada S_1 = 0m.27s., P_4 = 30s., P_5 = 37s., S_3 = 43s., PS_3 = 54s., S_4 = 57s., P_2S_3 = 1m.3s., PS_g = 1m.8s., P_5 = 1m.10s.
Lisbon P_gEN = 1m.46s., N = 4m.18s., Z = 4m.56s.
Algiers Univ. eZ = 1m.51s., iZ = 2m.37s.
Long waves were also recorded at Paris, Zürich, Basle, Strasbourg, and Prague.

May 22d. 17h. 41m. 28s. Epicentre 24°·3N. 122°·3E. (as on 1951, Jan. 28d.).

$A = -·4876$, $B = +·7713$, $C = +·4092$; $\delta = +10$; $h = +4$;
$D = +·845$, $E = +·534$; $G = -·219$, $H = +·346$, $K = -·912$.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m.	s.	m.
Zi-ka-wei	6·9	354	e 1 55	PP	e 3 10	+ 5	—	—	i 3·5
Nanking	8·3	339	e 2 7a	+ 3	3 39	− 1	—	—	3·9
Vladivostok	20·4	22	e 4 43	+ 2	—	—	—	—	—
Kabansk	30·2	341	6 16	+ 2	—	—	—	—	—
Irkutsk	31·1	338	e 6 22	0	e 11 25	− 3	—	—	—
Almata	41·6	309	e 7 52	+ 1	—	—	—	—	—
Rybach'e	42·1	308	e 7 55	0	e 14 12	− 4	—	—	—
Frunse	43·2	308	e 8 10	+ 6	—	—	—	—	—
Murgab	43·2	301	e 8 4	0	e 14 31	− 1	—	—	—
Andijan	44·6	304	8 16	0	14 53	+ 1	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Obi-garm		46·5	302	i 8 32	+ 1	—	—	—	—	—
Tashkent		46·9	305	e 8 33	− 1	e 15 25	0	—	—	—
Stalinabad		47·2	301	e 8 32	− 4	—	—	—	—	—
Sverdlovsk		54·6	324	i 9 32	0	17 6	− 5	—	—	—
Ashkabad		55·4	300	9 42	+ 4	e 17 26	+ 4	—	—	—
Gori		65·7	307	e 10 52	+ 4	—	—	—	—	—
Borzhomi		66·2	307	e 10 56	+ 4	—	—	—	—	—
Moscow		67·4	323	e 10 57	− 2	e 19 48	− 7	—	—	—
Ksara		74·1	300	e 14 46	PP	—	—	—	—	—
Resolute Bay		78·4	10	(e 12 3)	− 1	—	—	—	—	(e 32·5)
Scoresby Sund		82·2	348	i 12 24	0	—	—	—	—	50·5
Collmberg	z.	82·6	323	e 12 26	0	—	—	e 12 42	PcP	—
Witteveen	z.	85·1	327	12 40	+ 1	—	—	—	—	—
Stuttgart		86·0	322	e 12 42	− 1	—	—	—	—	e 43·5
De Bilt		86·2	327	e 12 44	0	—	—	—	—	e 51·5
Strasbourg		86·9	323	i 12 46	− 2	—	—	—	—	—
Seattle		87·9	38	i 12 56a	+ 3	—	—	e 13 14	P	—
Besançon		88·6	322	e 12 56	0	—	—	—	—	—
Paris		89·6	325	i 13 1	0	—	—	—	—	e 51·5
Mineral	z.	92·5	44	i 13 15k	+ 1	—	—	—	—	—
Lick	z.	94·1	46	i 13 24k	+ 2	—	—	i 13 36	P	—
Reno	z.	94·1	43	e 13 14	− 8	—	—	—	—	—
Tinemaha	z.	96·5	45	e 13 35	+ 3	—	—	—	—	—
China Lake	z.	97·7	45	i 13 39	+ 1	—	—	—	—	—

Resolute Bay readings have been increased by 2 minutes.
Paris also gives i = 13m.13s. and 13m.25s.
Long waves were also recorded at Potsdam and Kew.

May 22d. 19h. 31m. 9s. Epicentre 10°·0N. 57°·5E. (as on 1940, Oct. 31d.).

$A = +·5292$, $B = +·8307$, $C = +·1725$; $\delta = -13$; $h = +7$;
$D = +·843$, $E = -·537$; $G = +·093$, $H = +·145$, $K = -·985$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bombay		17·3	57	i 4 3	− 1	e 8 21	PcP	4 28	PP	10·0
Poona		18·0	59	i 4 14	+ 1	i 8 41	PcP	—	—	11·1
Kodaikanal	E.	19·7	87	i 4 32	− 2	i 8 32	SS	—	—	—
Hyderabad	N.	21·6	68	e 4 40	−14	i 8 53	+ 4	—	—	10·3
Colombo	E.	22·3	97	4 59	− 2	9 23	+21	—	—	14·2
Lenkoran		29·7	346	6 13	+ 3	e 11 11?	+ 5	—	—	—
Obi-garm		30·6	18	e 6 19	+ 1	—	—	—	—	—
Ksara		30·9	323	6 27	+ 7	e 16 55	ScS	—	—	18·8
Baku		31·0	348	e 6 18	− 3	—	—	—	—	—
Shemakla		31·5	347	6 23	− 3	11 33	− 1	—	—	—
Chatra		32·6	54	e 6 35	0	—	—	—	—	e 18·4
Tashkent		32·9	17	e 6 37	− 1	e 11 56	0	—	—	—
Andijan		33·3	20	6 42	+ 1	e 12 3	+ 1	—	—	—
Frunse		36·0	22	i 7 7	+ 2	i 12 49	+ 5	—	—	—
Rybach'e		36·2	23	e 7 9	+ 3	—	—	—	—	—
Almata		37·2	24	i 7 16	+ 1	—	—	—	—	—
Istanbul		39·8	326	e 7 42	+ 6	e 13 41	− 1	e 9 42	PcP	e 18·8
Yalta		39·8	334	e 7 37	+ 1	13 45	+ 3	—	—	—
Sverdlovsk		46·8	3	8 32	− 1	15 22	− 2	—	—	—
Tarauto		46·8	317	8 43	+10	e 15 33	+ 9	—	—	—
Pietermaritzburg	z.	47·3	212	i 8 37	0	—	—	—	—	—
Moscow		48·2	346	8 44	0	15 43	0	—	—	—
Uzhgorod		48·5	330	8 48	+ 2	—	—	—	—	—
Rome		50·6	318	e 9 5	+ 3	e 16 15	− 2	e 11 4	PP	—
Triest	z.	51·5	322	e 9 12	+ 3	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Prague		53·4	327	i 9 36	+12	—	—	e 11 28	PP	—
Collmberg	z.	54·9	327	e 9 33	− 2	—	—	—	—	—
Potsdam	z.	55·7	329	e 9 36	− 4	—	—	—	—	e 32·8
Algiers Univ.	z.	55·8	308	e 9 38	− 3	—	—	e 10 42	PcP	—
Stuttgart	z.	55·8	323	e 9 45	+ 4	—	—	—	—	—
Irkutsk		56·6	32	e 9 46	− 1	e 17 32	− 6	—	—	—
Kabansk		57·8	33	9 55	0	e 17 51	− 3	—	—	—
Nanking		60·5	58	10 11	− 3	e 18 27	− 2	—	—	—
Manila		62·0	79	e 20 55	ScS	—	—	—	—	—
Zi-ka-wei	z.	62·6	59	e 10 20	− 8	e 19 3	+ 7	—	—	—
Vladivostok		71·9	47	e 11 17	−10	—	—	—	—	—
Scoresby Sund		77·1	340	i 11 57	0	e 21 50	+ 4	—	—	42·8
China Lake	z.	134·2	355	e 19 21	[+ 1]	—	—	—	—	—

Additional readings :—
Bombay QEN =8m.51s., SSE =9m.4s., SSN =9m.8s.
Poona QE =9m.44s., SSE =9m.59s., SSSE =10m.14s., ScSN =14m.58s.
Istanbul ePPZ =9m.19s., eSN =13m.53s., eSSE =16m.41s.?, eSSSN =17m.27s., eScSE = 17m.41s.?.
Rome SS =20m.19s.
Prague e =9m.54s.
Long waves were also recorded at Granada.

May 22d. Readings also at 1h. (Messina and near Istanbul), 2h. (near Athens and near Dzhergetal), 4h. (Malaga, near Alicante, Almeria, Granada, and Toledo), 5h. (near Granada (2)), 6h. (Manila and Malaga), 7h. (Krasnogorka (2), Kurmenty, Przhevalsk, Samarkand, near Almata (2), Almata II (2), Andijan (2), Dzhergetal (2), Fergana (2), Frunse (2), Khorog, Lunacharskoe (2), Murgab (2), Naryn (2), Obi-garm (2), Rybach'e (2), Stalinabad, and Tashkent), 8h. (Mount Wilson, Riverside, Palomar, China Lake, Lick, and La Paz), 9h. (Seattle) 10h. (Terre Adelie), 12h. (Pretoria and Huancayo), 13h. (Stuttgart and Victoria), 14h. (Tamanrasset, Stuttgart, near Prague, near Dzhergetal (2), Khorog, and Obi-garm (2)), 15h. (near Yalta, near Dzhergetal, and near Tiflis), 16h. (near Dzhergetal and near Khorog), 18h. (Terre Adelie and near Dzhergetal), 20h. (Andijan, Frunse, Tashkent, Stalinabad, Shemakla, Sverdlovsk, Kabansk, Moscow, Collmberg, Kimberley, and Pretoria), 22h. (near Dzhergetal), 23h. (Apia).

May 23d. 6h. 46m. 23s. Epicentre 0°·5N. 131°·0E.

A = −·6560, B = +·7547, C = +·0087 ; δ = −2 ; h = +7 ;
D = +·755, E = +·656 ; G = −·006, H = +·007, K = −1·000.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Manila		17·1	326	e 4 4	+ 2	—	—	—	—	—
Zi-ka-wei	z.	31·8	345	e 6 26	− 2	e 11 35	− 3	—	—	—
Nanking		33·4	341	e 6 46	+ 4	e 12 1	− 2	—	—	—
Riverview		39·1	152	e 9 8	PP	i 13 32	+ 1	i 16 28	SS	e 19·9
Vladivostok		42·4	1	e 7 49	− 9	e 14 5	−15	—	—	—
Kabansk		55·3	342	e 9 33?	− 5	e 17 18	− 3	—	—	—
Irkutsk		56·2	341	e 9 43	− 1	e 17 32	− 1	—	—	—
Petropavlovsk		57·3	19	e 9 40	−12	—	—	—	—	—
Andijan		66·4	315	e 10 53	0	19 51	+ 8	—	—	—
Fergana		66·6	315	e 10 55	+ 1	—	—	—	—	—
Terre Adelie		67·6	175	e 11 2	÷ 1	—	—	—	—	—
Stalinabad		68·2	312	e 11 6	+ 2	20 12	+ 8	—	—	—
Tashkent		68·7	315	e 11 10	+ 3	e 20 18	+ 8	—	—	—
Samarkand		69·9	312	e 11 17	+ 2	—	—	—	—	—
Sverdlovsk		78·9	328	12 5	− 2	22 3	− 2	—	—	—

Riverview gives also iE =14m.48s.
Long waves were also recorded at Bandong, Bombay, Stuttgart, and Mineral.

May 23d. 20h. 12m. 24s. Epicentre 41°·8N. 71°·7E. (as on 1949, March 9d.).

Epicentre given by U.S.S.R.

$A = +·2348$, $B = +·7099$, $C = +·6641$; $\delta = +12$; $h = -2$;
$D = +·949$, $E = -·314$; $G = +·209$, $H = +·630$, $K = -·748$.

	△	Az.	P.	O − C.	S.	O − C.	Supp.	
	°	°	m. s.	s.	m. s.	s.	m. s.	
Andijan	1·2	155	e 0 20	− 4	i 0 35	− 6	—	—
Fergana	1·4	177	0 25	− 2	i 0 44	− 2	—	—
Lunacharskoe	1·9	255	i 0 37	+ 3	i 1 3	+ 4	—	—
Tashkent	1·9	255	i 0 35?	+ 1	i 1 0?	+ 1	—	—
Frunse	2·4	63	i 0 45	+ 4	1 18	S_g	i 0 48	P_g
Dzhergetal	2·6	188	e 0 44	0	1 19	+ 2	—	—
Krasnogorka	2·9	60	e 0 50	+ 2	—	—	—	—
Naryn	3·2	97	e 0 56	+ 4	i 1 32	0	—	—
Rybach'e	3·3	79	e 1 2	P*	e 1 36	+ 1	—	—
Obi-garm	3·5	207	i 1 0	+ 3	—	—	—	—
Stalinabad	3·9	216	e 1 5	+ 3	2 15	S_g	1 24	P_g
Almata	4·2	67	e 1 10	+ 3	2 1	+ 4	e 1 19	P*
Samarkand	4·2	241	1 10	+ 3	2 11	S*	—	—
Khorog	4·3	181	e 1 9	+ 1	—	—	—	—
Almata II	4·4	69	e 1 11	+ 1	i 2 19	S*	—	—
Kurmenty	5·0	73	i 1 30	P*	—	—	—	—
Przhevalsk	5·0	80	e 1 28	P*	—	—	—	—
Chilisk	5·3	68	e 1 35	P*	i 3 2	S_g	—	—

Additional readings :—
Stalinabad P* = 1m.15s., S* = 1m.59s.
Almata iS_g = 2m.16s.

May 23d. Readings also at 0h. (Almata, Almata II, Frunse, Kurmenty, Rybach'e, near Andijan, Dzhergetal, Fergana, Khorog, Lunacharskoe, Murgab, Obi-garm, Samarkand, Stalinabad, and Tashkent), 1h. (Apia, Malaga (3), and near Granada (2)), 4h. (near Dzhergetal (2) and near Istanbul), 6h. (near Dzhergetal), 8h. (Huancayo and Apia), 9h. (near Apia, Stuttgart, near Ebingen, near Dzhergetal, and near Kurmenty), 10h. (Calcutta, Chatra, Bombay, Nanking, Almata, Almata II, Andijan, Dzhergetal, Przhevalsk, Naryn, Rybach'e, Stalinabad, Tashkent, and Kabansk), 17h. (Obi-garm, near Andijan, Dzhergetal, Fergana, Khorog, and Stalinabad), 19h. (Manila, Vladivostok, Irkutsk, Kabansk, Tashkent, Sverdlovsk, near Andijan, Dzhergetal, Fergana, Lunacharskoe, Naryn, Obi-garm, and Stalinabad), 20h. and 22h. (near Dzhergetal), 23h. (China Lake, Palomar, Obi-garm, near Andijan, Dzhergetal, and Khorog).

May 24d. 15h. 11m. 6s. Epicentre 41°·3N. 143°·1E. Depth of focus 0·005.

Intensity IV at Hatinohe and Noheji; II-III at Urakawa.
Seismo. Bull. Cent. Met. Obs., Japan, May 1951, Tokyo 1951, p. 113, with macroseismic chart. Epicentre as adopted.

$A = -·6025$, $B = +·4524$, $C = +·6575$; $\delta = -2$; $h = -2$;
$D = +·600$, $E = +·800$; $G = -·526$, $H = +·395$, $K = -·753$.

	△	Az.	P.	O − C.	S.	O − C.
	°	°	m. s.	s.	m. s.	s.
Urakawa	0·9	344	0 12	− 6	0 23	− 8
Hatinohe	1·4	237	0 22	− 2	0 39	− 4
Obihiro	1·6	3	0 27	0	0 45	− 2
Aomori	1·8	255	0 32	+ 2	0 49	− 3
Miyako	1·9	207	0 30	− 1	0 55?	+ 1
Mori	2·1	293	0 28	− 6	0 50	− 9
Morioka	2·2	223	0 35a	0	0 59	− 3
Sapporo	2·2	324	0 30	− 5	0 54	− 8
Mizusawa	2·6	215	0 44	+ 3	e 1 14	+ 2
Akita	2·8	235	0 58	+14	—	—

Continued on next page.

	△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.
Nemuro	2·8	42	0 43	− 1	1 14	− 3
Sendai	3·5	210	0 56	+ 2	1 38	+ 4
Hukusima	4·1	211	1 2	0	1 55	+ 6
Inawasiro	4·4	213	1 10	+ 4	2 16	+19
Onahama	4·7	202	1 32	+22	2 4	0
Shirakawa	4·7	209	1 42	+32	2 17	+13
Mito	5·3	204	1 27	+ 8	—	—
Utunomiya	5·4	209	1 19	− 1	2 33	+11
Maebasi	5·8	214	2 6	?	—	—
Kumagaya	5·9	211	1 35	+ 8	2 43	+ 9
Tokyo	6·2	206	1 43	+12	2 46	+ 5
Hunatu	6·7	212	1 45	+ 7	2 52	− 2
Misima	7·0	209	2 34	?	—	—

May 24d. 15h. 31m. 0s. Epicentre 37°·6N. 71°·6E. Depth of focus 0·010.
(as on 1951, April 26d.).

Given by stations of U.S.S.R.

A = +·2507, B = +·7537, C = +·6076 ; δ = +9 ; h = −1 ;
D = +·949, E = −·316 ; G = +·192, H = +·577, K = −·794.

	△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.
Khorog	0·1	180	i 0 12	− 2	i 0 22	− 2
Obi-garm	1·9	306	i 0 29	− 3	i 0 54	− 1
Murgab	2·0	67	0 36	+ 3	1 5	+ 8
Stalinabad	2·4	293	i 0 35	− 3	i 1 3	− 4
Fergana	2·8	3	0 45	+ 1	1 19	+ 2
Andijan	3·2	11	0 51	+ 1	e 1 35	+ 8
Samarkand	4·1	302	—	—	1 41	− 8
Lunacharskoe	4·1	336	e 0 59	− 3	e 1 49	0
Tashkent	4·1	336	i 1 1	− 1	i 1 49	0
Rybach'e	5·9	34	i 1 29	+ 3	e 2 41	+ 8
Krasnogorka	6·2	25	e 1 31	+ 1	—	—
Almata	7·0	35	e 1 42	0	i 3 7	+ 7
Przhevalsk	7·1	45	i 1 42	− 1	—	—
Almata II	7·2	36	i 1 44	0	—	—
Mary	7·7	273	e 1 40	−11	3 6	−11
Ashkabad	10·5	276	e 2 19	−10	i 4 11	−14
Kabansk	28·4	48	e 6 0	+13	—	—

May 24d. 21h. 13m. 8s. Epicentre 46°·3N. 15°·2E. (as on 1949, June 10d.).

Intensity III at Bela Cerkev. Macroseismic epicentre 45°·9N. 15°·3E.

M. D. Uzelac.
Annuaire macroséismique pour l'Année 1951 de l'Institut séismologique de Beograd, Nouvelle série, No. 11, Belgrade, 1953, p. 56.

A = +·6690, B = +·1818, C = +·7206 ; δ = −12 ; h = −4 ;
D = +·262, E = −·965 ; G = +·695, H = +·189, K = −·693.

		△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	Supp. m. s.	
Vienna		2·1	22	e 0 47?	P_g	e 1 22	S_g	e 1 26	?
Prague		3·8	353	e 1 1	0	e 1 51	+ 4	e 1 23	P_g
Zürich		4·7	286	e 1 39	P_g	e 2 36	S_g	—	—
Stuttgart		4·8	303	e 1 39	P_g	e 2 46	S_g	e 2 50	?
Jena		5·2	334	e 1 46	P_g	e 2 18	− 4	e 3 1	S_g
Collmberg	z.	5·3	345	e 1 41	P_g	e 3 0	S_g	—	—
Basle		5·4	286	—	—	e 2 54	S_g	—	—
Strasbourg		5·5	297	—	—	e 2 46	S*	e 3 15	S_g

Additional readings :—
Prague iP* = 1m.11s., e = 1m.26s., i = 1m.40s., e = 1m.44s. and 1m.58s., iS* = 2m.4s., iS$_g$ = 3m.17s.
Jena eN = 2m.14s., eS?E = 2m.25s., eEN = 2m.42s. and 2m.56s., eE = 3m.10s.
Strasbourg e = 3m.24s.

May 24d. Readings also at 0h. (Lick), 2h. (near Dzhergetal), 3h. (near Obi-garm), 4h. (near Dzhergetal), 5h. (Stuttgart), 7h. (near Tacubaya), 8h. (Apia, Wellington, Palomar, China Lake, Fresno, Reno, Lick, Mineral, Jena, Paris, Collmberg, Strasbourg, Stuttgart, Witteveen, and Tamanrasset), 9h. (Apia, Palomar, China Lake, Tinemaha, Fresno, Reno, Mineral, Jena, near Bogota, near Malaga, and Granada), 10h. (Collmberg), 11h. (Baku (2)), 12h. (Terre Adélie), 16h. (Christchurch, Palomar, Riverside, Pasadena, China Lake, Lick, Fresno, Mineral, Rome, Taranto, near Stuttgart, near Dzhergetal, Khorog, and Obi-garm), 17h. (Bucharest, Istanbul, Ksara, Messina, Timisoara, Collmberg, Rome, near Athens, Sofia, near Taranto, near Granada, and Malaga), 18h. (La Paz and near Huancayo), 19h. (Istanbul), 21h. (near Istanbul), 22h. (Apia and near Dzhergetal), 23h. (Istanbul and near Sofia).

May 25d. 0h. 2m. 48s. Epicentre 9°·7N. 69°·8W. (as on 1950, August 5d.).

$A = +\cdot3404$, $B = -\cdot9253$, $C = +\cdot1674$; $\delta = +8$; $h = +7$;
$D = -\cdot938$, $E = -\cdot345$; $G = +\cdot058$, $H = -\cdot157$, $K = -\cdot986$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Galerazamba		5·5	282	i 1 23	− 2	i 2 39	+ 9	i 3 22	S_g	—
Bogota		6·6	220	e 1 39	− 2	i 3 0	+ 2	—	—	i 4·1
Chichina		7·4	231	i 1 56	+ 4	i 3 23	+ 5	e 4 5	S_g	—
San Juan		9·3	22	e 2 17	0	i 3 53	−12	2 20	P	e 4·3
Fort de France		9·8	59	—	—	e 3 46	−31	—	—	—
Huancayo		22·3	194	i 5 2	+ 1	e 8 41	−21	e 6 5	PPP	—
La Paz		26·1	175	e 5 57	+20	10 30	+23	11 48	SSS	13·2
Tucson		44·0	307	e 8 13	+ 2	—	—	—	—	—
Boulder City		48·5	310	i 8 48	+ 2	—	—	—	—	—
Palomar	z.	49·2	306	e 8 53	+ 1	—	—	—	—	—
Riverside	z.	49·8	307	e 8 57	+ 1	—	—	—	—	—
Pasadena	z.	50·5	307	e 9 4	+ 2	—	—	—	—	—
China Lake	z.	50·5	309	e 9 2	0	—	—	—	—	—
Tinemaha	z.	51·4	310	e 9 10	+ 1	—	—	—	—	—
Fresno	z.	52·5	310	e 9 17a	0	—	—	—	—	—
Hungry Horse		53·4	325	e 9 22	− 2	—	—	—	—	—
Reno	z.	53·4	313	e 9 24	0	—	—	—	—	—
Lick	z.	54·1	310	i 9 29a	0	—	—	e 9 33	P	—
Mineral	z.	55·0	313	e 9 35k	0	—	—	—	—	—
Shasta Dam		55·7	313	e 9 36	− 4	—	—	—	—	—
Tamanrasset	z.	72·8	68	e 11 33	+ 1	—	—	e 11 58	PcP	—
College		76·2	335	e 11 51	− 1	—	—	—	—	—

May 25d. 20h. 42m. 23s. Epicentre 42°·8N. 14°·2E.

Felt at San Benedetto and Pescara; Intensity IV at Benkovac, Bukovic, and Pakostene. Monthly Seismo. Bull. of National Institute of Geophysics, Rome, May, 1951, p. 15. Epicentre as adopted.

M. D. Uzelac.
Annuaire macroséismique pour l'Année 1951 de l'Institut séismologique de Beograd, Nouvelle série, No. 11, Belgrade 1953, p. 56.

$A = +\cdot7135$, $B = +\cdot1805$, $C = +\cdot6770$; $\delta = -1$; $h = -3$;
$D = +\cdot245$, $E = -\cdot969$; $G = +\cdot656$, $H = +\cdot166$, $K = -\cdot736$.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Rome	1·6	235	i 0 41	+11	i 0 53	+ 2	i 1 1	S_g	—
Florence	2·3	294	i 0 48a	P_g	e 1 12	S*	—	—	—
Padova	2·4	315	0 53	P_g	1 45	S_g	—	—	—
Prato	2·5	296	i 0 51	P_g	i 1 18	S*	—	—	—
Bologna	2·7	309	i 0 51a	P*	e 1 26	+ 7	e 1 33	S_g	—
Triest	2·8	354	i 0 46	− 1	i 1 27	S*	i 0 53	P_g	—
Taranto	3·3	136	0 54	+ 1	1 35	0	i 1 24	?	—
Salo	3·9	318	i 1 5a	+ 3	i 1 48	− 2	e 1 32	P_g	—
Pavia	4·3	305	i 1 14a	+ 6	e 2 6	+ 6	i 2 19	S_g	—
Belgrade	4·9	64	e 1 31a	P*	e 2 35	S_g	1 37	P_g	i 2·6

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Kalossa		5·1	41	1 40	P_g	i 2 40	S*	i 2 50	S_g	e 3·0
Chur		5·2	322	e 1 24k	+ 3	e 2 23	+ 1	—	—	—
Vienna		5·6	15	i 1 22	− 5	e 3 2	S_g	i 1 47	P_g	—
Budapest		5·8	35	e 1 49	P*	i 2 36	− 2	1 54	P_g	e 3·6
Ogyalla		5·8	28	e 1 23	− 6	e 2 33	− 5	e 1 53	P_g	—
Timisoara		5·8	57	e 1 46?	P*	e 2 34	− 4	e 1 55	P_g	—
Ravensburg		5·9	329	e 1 31	0	e 2 47	+ 7	e 3 27	S_g	—
Zürich		6·0	321	e 1 35a	+ 3	e 2 42	− 1	—	—	—
Basle		6·6	318	e 1 42	+ 1	e 2 52	− 6	—	—	—
Neuchatel		6·6	312	e 1 43	+ 2	e 2 48	−10	—	—	—
Stuttgart		6·9	331	e 1 43a	− 2	e 3 3	− 2	e 2 18	P_g	—
Besançon		7·3	310	e 1 46	− 4	e 3 9	− 6	e 2 22	P_g	—
Prague		7·3	1	i 1 45	− 5	i 3 12	− 3	e 2 27	P_g	—
Strasbourg		7·3	324	e 1 50	0	e 3 11	− 4	i 2 24	P_g	e 4·2
Karlsruhe		7·4	329	e 1 59	+ 7	e 3 12	− 6	e 2 36	P_g	e 4·2
Skalnate Pleso		7·6	31	—	—	e 3 24	+ 1	e 3 54	S*	—
Raciborzu		7·8	19	e 2 0	+ 2	e 3 34	+ 6	e 2 49	P_g	—
Jena		8·3	349	e 2 2?	− 2	e 3 30	−10	e 2 46	P_g	—
Clermont-Ferrand		8·5	294	i 2 10	+ 3	i 3 49	+ 4	i 2 29	P*	e 5·1
Collmberg	z.	8·6	355	i 2 3	− 6	(i 3 36)	−12	i 2 37	P*	—
Potsdam		9·6	356	e 3 31	?	e 4 19	+ 7	e 4 25	SS	e 4·6
Paris		10·1	310	i 2 31	+ 2	i 4 39	+14	i 2 48	PP	e 6·6
Istanbul		11·2	94	e 1 41	−63	e 5 24	+32	e 6 14	Q	e 6·9
Witteveen	z.	11·2	336	e 3 7	+23	—	—	—	—	—
Kew		13·1	316	e 2 37	−33	—	—	—	—	—
Almeria		14·1	251	4 9	+46	7 7	L	—	—	9·1
Granada		14·7	254	i 3 19	−12	—	—	—	—	8·2
Tamanrasset	z.	21·2	203	e 4 56	+ 7	—	—	e 5 21	PP	—
Weston		60·2	302	e 9 39	−33	—	—	—	—	—
Tacubaya		93·0	300	i 13 31	+14	—	—	—	—	—

Additional readings and note :—
Rome i = 47s.
Florence e = 58s. and 1m.4s.
Bologna e = 1m.11s.
Triest $iP_gP_gP_g$ = 1m.9s., i = 1m.18s., $iS_gS_gS_g$? = 1m.36s.
Salo eSE = 1m.41s.
Pavia e = 2m.47s.
Belgrade iZ = 2m.23s.
Kalossa P*N = 1m.49s., eN = 2m.7s., eEN = 2m.24s., SE = 2m.46s., eE = 2m.56s.
Vienna eS* = 2m.51s.
Budapest iS_g = 3m.0s., i = 3m.10s.
Ogyalla eP* = 1m.39s., e = 1m.59s., eS = 2m.27s., e = 2m.40s., eS* = 2m.50s., eS_g = 3m.2s.
Timisoara eP_gN = 2m.4s., iS*E = 2m.51s., eS_gE = 3m.2s.
Stuttgart eSZ = 3m.6s., eS_g = 3m.51s., and 3m.55s., and many other e readings.
Besançon eP* = 2m.5s., eS*? = 3m.33s., eS_g = 3m.59s. and other e readings.
Prague eP* = 2m.6s., iP_g = 2m.33s., iS* = 3m.31s., iS_g = 3m.45s., and other e readings.
Strasbourg eP* = 2m.8s., iS* = 3m.38s., eS_g = 3m.55s. and other unidentified readings.
Karlsruhe ePE = 2m.5s., eEN = 2m.56s., eSEN = 3m.36s., eEN = 3m.55s.
Skalnate Pleso eS? = 3m.7s., e = 3m.42s.
Raciborzu eZ = 2m.11s., eE = 3m.26s., 3m.51s., and 4m.13s.
Jena eS_g?E = 4m.32s., eS_g?N = 4m.37s. and many other e readings.
Clermont-Ferrand iS* = 4m.20s.
Collmberg iEZ = 2m.12s., iS*EZ = 4m.29s., iS_gEZ = 4m.46s., S is given as iP_gEZ.
Paris i = 2m.45s., iPPP = 2m.54s., i = 3m.5s., 4m.9s., 6m.0s., and 6m.19s.
Tamanrasset iZ = 5m.2s., eZ = 7m.13s.
Long waves were also recorded at De Bilt, Copenhagen, and Upsala.

May 25d. 21h. 47m. 16s. Epicentre 17°·8S. 178°·8W. Depth of focus 0·060.
(as on 1951, April 24d.).

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

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		7·9	60	1 56	+ 1	i 3 23	− 3	—	—	—
Auckland	N.	19·8	195	(i 4 9)	+ 7	i 4 9	P	—	—	—
Brisbane	Z.	27·7	245	i 5 21k	+ 7	—	—	—	—	—
Terre Adélie		55·3	198	i 8 56	+ 1	—	—	—	—	—
Mitchell Field		69·5	2	i 10 26	− 1	—	—	—	—	—
Berkeley	Z.	76·7	44	i 11 8k	0	—	—	—	—	—
Lick	Z.	76·8	43	i 11 8k	− 1	—	—	e 11 40	PcP	—
Pasadena	Z.	77·4	48	i 11 12k	0	—	—	—	—	—
Fresno	Z.	77·7	45	e 11 12k	− 2	—	—	—	—	—
Palomar	Z.	77·9	50	e 11 14	− 1	—	—	e 14 16	sP	—
Riverside	Z.	77·9	48	i 11 14k	− 1	—	—	—	—	—
Mineral	Z.	78·6	42	i 11 18a	0	—	—	—	—	—
China Lake	Z.	78·7	47	i 11 18k	− 1	e 14 20	sP	e 13 9	pP	—
Tinemaha	Z.	78·9	45	i 11 20k	0	—	—	i 11 46	PcP	—
Reno		79·2	43	e 11 22k	0	e 20 43	− 3	e 11 37	PcP	—
Seattle		82·4	36	e 11 40a	+ 2	—	—	—	—	—
La Paz		103·7	113	e 11 49	?	—	—	—	—	—
Rathfarnham C.	Z.	144·1	7	e 18 47	[− 1]	—	—	e 23 39	PP	—
Potsdam	Z.	144·2	349	e 18 48	[0]	—	—	—	—	—
Witteveen	Z.	144·8	354	18 52	[+ 3]	—	—	—	—	—
Ksara		145·1	303	e 18 53	[+ 4]	—	—	e 22 22	PP	—
Collmberg	Z.	145·3	349	e 18 51	[+ 1]	—	—	e 21 45	sPKP	—
De Bilt		145·6	356	i 18 53	[+ 3]	—	—	—	—	—
Jena		145·9	348	e 18 53	[+ 2]	—	—	e 20 8	pPKP	—
Prague		146·1	345	e 18 54	[+ 3]	e 19 14	PKP_2	e 21 6	pPKP	—
Istanbul		146·7	319	e 18 54	[+ 2]	—	—	—	—	e 48·7
Stuttgart	Z.	148·4	352	e 18 55	[+ 1]	i 19 0	PKP_2	e 21 9	pPKP	—
Strasbourg		148·8	352	i 19 1	[+ 6]	—	—	—	—	—
Paris		149·0	358	i 19 1	[+ 6]	—	—	i 19 6	?	—
Basle		149·9	351	e 19 3	[+ 7]	—	—	—	—	—
Zürich		149·9	351	e 19 3	[+ 7]	—	—	—	—	—
Tamanrasset	Z.	173·6	—	e 19 23	[+ 3]	e 30 53	SKKS	e 21 48	pPKP	—

Additional readings :—
Seattle e =11m.54s., 12m.12s., and 12m.18s.
Jena eEN =19m.12s., eE =19m.26s., eN =19m.31s.
Prague e =19m.32s. and 19m.52s.
Strasbourg i =19m.6s., e =19m.30s.
Tamanrasset $iPKP_2Z$ =20m.56s., iPPZ =24m.50s., eZ =31m.38s.

May 25d. Readings also at 0h. (Mount Wilson, Palomar, China Lake, and near Dzhergetal), 1h. (Fergana, Naryn, Obi-garm, Stalinabad, Tashkent, near Andijan, Dzhergetal, and Khorog), 2h. (Tamanrasset and near Algiers Univ.), 3h. (near Dzhergetal (2)), 4h. (near Tananarive), 5h. (Murgab, near Khorog, Obi-garm, and Stalinabad), 6h. (Apia, Christchurch, Wellington, Helwan, Ksara, Istanbul, Rome, and Collmberg), 7h. (near Apia and near Dzhergetal), 9h. (Apia and near Taranto), 10h. (Apia and Istanbul), 12h. (Fergana, Naryn, Rybach'e, Tashkent, near Dzhergetal, Khorog, Murgab, Obi-garm, Stalinabad, Istanbul, and near Sofia), 13h. (Apia), 14h. (Apia and near Dzhergetal), 17h. (near Copiapo, near Dzhergetal, and near Apia), 18h. (near Dzhergetal), 19h. (Brisbane and near Santa Clara) 20h. (Clermont-Ferrand and near Apia), 22h. (Palisades and near Dzhergetal (2)),

May 26d. 11h. 7m. 19s. Epicentre 38°·3N. 20°·8E. (Strasbourg).

Intensity IV at Vathy.

A. Galanopoulos.
Seismological Institute Bulletin, 1951, Athens, 1952, p.18.

$A = +\cdot7355$, $B = +\cdot2794$, $C = +\cdot6172$; $\delta = -4$; $h = -1$;
$D = +\cdot335$, $E = -\cdot935$; $G = +\cdot577$, $H = +\cdot219$, $K = -\cdot787$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Athens		2·3	98	e 0 46	P_g	e 1 22	S_g	—	—	—
Taranto		3·5	309	0 57	0	1 45	S*	—	—	—
Messina	z.	4·2	270	i 0 58	− 9	i 1 45	−12	i 1 14	P*	—
Sofia		4·8	23	e 1 21	+ 6	2 19	+ 7	e 2 46	S_g	—
Belgrade	z.	6·5	358	e 1 53	P*	e 3 29	S_g	e 2 10	P_g	—
Istanbul		7·0	64	e 1 49	+ 3	e 3 55	S_g	e 2 19	P_g	e 4·4
Bucharest		7·3	32	—	—	e 3 23	SS	4 3	S_g	4·2
Rome		7·3	302	e 1 57	PP	3 17	+ 2	i 3 51	S*	i 4·2
Timisoara		7·4	2	e 2 26	P_g	e 3 49	S*	e 4 17	S_g	—
Triest		9·0	327	e 2 9	− 4	i 3 46	−12	i 4 55	S_g	—
Padova		9·1	316	—	—	e 3 52	− 8	—	—	e 5·8
Prato		9·2	310	e 2 41	PPP	i 4 29	SSS	—	—	—
Bologna		9·5	314	e 2 28	PP	e 4 41	SSS	—	—	—
Ogyalla		9·7	350	e 3 8	P_g	—	—	—	—	—
Salo	z.	10·6	317	e 2 34	− 2	—	—	e 2 40	P	—
Kishinev		10·5	32	—	—	5 15	S	—	—	(5·3)
Skalnate Pleso		10·9	358	e 2 52	+12	—	—	—	—	—
Pavia		11·1	312	—	—	e 5 22	SSS	6 17	Q	8·8
Lwow		11·8	11	e 2 53	0	5 12	+ 6	—	—	—
Prague		12·6	341	e 3 5	+ 2	e 5 35	SS	e 3 22	PPP	6·6
Zürich		12·7	319	e 2 49	−16	e 5 14	−14	—	—	—
Ksara		13·0	106	e 3 22	PP	7 14?	?	—	—	—
Basle		13·4	318	—	—	e 5 28	−17	—	—	e 7·8
Stuttgart		13·4	325	e 3 10	− 4	e 6 1	SS	e 3 18	PP	e 7·7
Strasbourg		14·0	322	e 3 23	+ 1	e 6 18	SS	—	—	7·7
Collmberg	z.	14·1	340	e 3 30	+ 7	—	—	e 8 24	?	e 9·2
Besançon		14·1	314	e 3 19	− 4	e 5 50	−12	—	—	—
Jena		14·2	336	e 3 25?	+ 1	e 6 44	SSS	—	—	—
Paris		16·9	314	e 4 1	+ 2	6 54	−13	e 4 16	PP	9·7
Copenhagen		18·3	345	—	—	i 7 48	+ 9	—	—	10·7
Granada		19·3	274	i 4 35k	+ 6	—	—	—	—	—
Kew		19·8	318	—	—	e 7 41?	−32	—	—	—
Kirovobad		19·9	75	i 4 34	− 2	e 8 28	+13	—	—	—
Tamanrasset	z.	20·3	225	i 4 33k	− 7	e 8 22	− 1	e 8 50	PcP	e 9·8
Moscow		20·8	27	e 4 50	+ 5	e 8 46	+13	—	—	—
Pulkovo		22·3	13	e 5 0	− 1	e 9 5	+ 3	—	—	—
Weston		66·9	306	e 10 52	− 4	—	—	—	—	—

Additional readings :—
Belgrade iZ = 2m.31s., eNW = 3m.50s., iNW = 4m.4s.
Istanbul eSPP$_g$Z = 2m.24s., eZ = 3m.24s., eN = 3m.44s.
Bucharest eN = 3m.52s.
Rome e = 2m.15s.
Timisoara eP*?EN = 2m.46s., eP$_g$?E = 3m.3s., eS$_g$N = 4m.33s.
Triest eP$_g$P$_g$Z = 2m.38s.
Ogyalla e = 5m.48s. and 6m.16s., eN = 7m.3s., eE = 7m.11s., eN = 7m.21s.
Skalnate Pleso e = 4m.4s., eS? = 5m.28s., e = 5m.59s.
Prague e = 3m.59s., 4m.21s., 4m.47s., 5m.54s., and 6m.11s.
Stuttgart eZ = 3m.31s., eS?Z = 5m.26s.
Strasbourg e = 4m.8s. and 6m.40s.
Jena eE = 4m.5s. and 4m.47s., eN = 5m.9s., eS?E = 6m.50s., eEN = 7m.13s.
Paris e = 4m.11s., ePPP? = 4m.24s., Q = 8m.41s.
Tamanrasset ePPZ = 4m.53s., ePPPZ = 5m.0s.
Long waves were also recorded at Potsdam and Upsala.

May 26d. Readings also at 0h. (Andijan, Fergana, Naryn, Samarkand, near Dzhergetal, Khorog, Murgab, Obi-garm, and Stalinabad), 1h. (Krasnogorka, Tashkent, near Andijan, Dzhergetal (3), Fergana, Frunse, Khorog, Lunacharskoe, Obi-garm, Rybach'e, Stalinabad, and Samarkand), 3h. (near Tananarive), 4h. (Mitchell Field, Ottawa, Mount Wilson, Riverside, Palomar, China Lake, Tinemaha, Fresno, Mineral, Reno, Palisades, Weston, Andijan, Samarkand, near Dzhergetal, Fergana, Khorog, Murgab, and Obi-garm), 6h. (Ottawa, Palomar, China Lake, Tinemaha, Weston, Huancayo, and near Klyuchi), 7h. (near Dzhergetal), 9h. (Ksara, Tamanrasset, and near Obi-garm), 12h. (Tacubaya, and near Dzhergetal), 13h. (Tamanrasset, Antofagasta, Palisades, Galerazamba, China Lake, Mount Wilson, Riverside, Palomar, Fort de France, Tacubaya, near Merida, Andijan, Fergana, Naryn, near Dzhergetal, Khorog, Murgab, and Obi-garm), 14h. (near Dzhergetal (2)), 15h. (Paris and Tamanrasset), 16h. (Stuttgart), 17h. (Terre Adélie and near Dzhergetal), 18h. (near Dzhergetal), 19h. (Apia, and near Copiapo), 20h. (Palomar, China Lake, and near Manila), 21h. (Lick, Berkeley, China Lake, Mount Wilson, Palomar, Bogota, Chinchina, Merida, Tacubaya, Puebla, Vera Cruz, Oaxaca, Resolute Bay, Pasadena, Fort de France, Palisades, Berkeley, Weston, Harvard, Seattle, and near Dzhergetal), 22h. (Scoresby Sund, Huancayo, Kew, and Potsdam).

May 27d. 4h. 30m. 55s. Epicentre 23°·6N. 44°·9W. (as on 1949, June 28d.).

$A = +\cdot6498$, $B = -\cdot6475$, $C = +\cdot3981$; $\delta = -2$; $h = +4$;
$D = -\cdot706$, $E = -\cdot708$; $G = +\cdot282$, $H = -\cdot281$, $K = -\cdot917$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Fort de France		17·7	241	e 4 18	PP	—	—	—	—	—
San Juan		20·5	260	i 4 37	− 5	e 8 27	0	—	—	—
Weston		28·8	318	e 5 59	− 3	—	—	—	—	—
Harvard		29·0	318	i 6 1	− 3	—	—	—	—	e 13·7
Seven Falls	E.	31·3	326	—	—	e 11 29	− 2	—	—	e 15·3
Shawinigan Falls	N.	32·0	324	e 6 27	− 3	—	—	—	—	—
Ottawa		33·1	320	e 6 37	− 3	e 11 35	−24	—	—	—
Bogota		33·9	241	e 6 50	+ 3	e 12 14	+ 3	e 7 0	?	14·1
Granada		37·8	59	7 19	− 1	(13 5?)	− 6	—	—	13·1
Almeria		38·7	60	7 23	− 4	13 15	−10	9 43	PcP	20·0
St. Louis		41·2	303	e 7 48	0	e 14 5	+ 3	—	—	—
Clermont-Ferrand		44·4	48	8 23	+ 9	—	—	—	—	—
Paris		44·8	44	i 8 19	+ 2	e 15 3	+ 8	i 8 34	pP	e 20·1
Aberdeen	E.	45·5	31	e 8 21	− 2	i 13 42	PcS	e 17 41	ScS	—
La Paz		45·9	211	e 8 28	+ 2	i 15 17	+ 6	18 38	SS	22·3
Tamanrasset	Z.	46·1	80	i 8 33k	+ 5	—	—	e 10 17	PP	—
De Bilt		47·4	40	e 8 35	− 3	e 15 35	+ 3	—	—	e 22·1
Strasbourg		48·2	45	e 8 48	+ 4	e 18 5?	ScS	e 21 5?	Q	24·1
Pavia		48·5	50	—	—	e 16 0	+12	—	—	—
Stuttgart		49·1	45	e 8 53	+ 2	e 16 2	+ 6	—	—	e 23·1
Rome		50·7	55	e 11 5	PP	e 16 27	+ 9	—	—	—
Jena		51·0	43	e 9 23	+17	e 10 34	PcP	e 9 30	?	—
Collmberg	Z.	52·0	43	e 9 15	+ 2	—	—	—	—	—
Resolute Bay		57·3	346	e 9 59	+ 7	e 23 23	SSS	e 22 53	?	e 26·2
Tucson		58·1	295	e 9 57	− 1	—	—	—	—	—
Hungry Horse		59·0	314	e 10 2	− 2	—	—	—	—	—
Boulder City		60·8	300	e 10 16	0	—	—	—	—	—
Palomar	Z.	62·9	297	e 10 31	+ 1	—	—	—	—	—
China Lake	Z.	63·0	300	e 10 30	− 1	—	—	—	—	—
Riverside	Z.	63·2	298	e 10 32	0	—	—	—	—	—
Reno	Z.	64·1	304	e 10 43a	+ 5	—	—	—	—	—
Mineral	Z.	65·3	305	e 10 44k	− 2	—	—	i 10 53	?	—
Shasta Dam		65·8	305	e 10 47	− 2	—	—	—	—	—
Lick	Z.	65·9	302	e 10 49a	− 1	—	—	i 10 58	?	—
Ksara		70·0	62	e 11 24	+ 9	e 23 34	?	—	—	—
College		74·2	335	11 39	− 1	—	—	—	—	—

Additional readings :—
Paris i = 8m.45s., eSS = 18m.36s.
Tamanrasset iZ = 8m.42s., eZ = 10m.35s.
Strasbourg e = 9m.2s., 9m.22s., and 9m.45s.
Long waves were also recorded at Palisades, Berkeley, Scoresby Sund, Malaga, and Potsdam.

May 27d. 11h. Undetermined shock attributed to 9°N. 122°·5E. by U.S.S.R. with depth 200km. This position does not account for the readings.

Manila eP =15m.46s., iS =17m.40s.
Brisbane, iPZ =20m.30s. a.
Djakarta eEN =21m.10s.
Kabansk eP =21m.22s.?, eS =27m.42s.
Kurmenty iP =22m.0s.
Naryn P =22m.6s., eS =29m.10s.
Rybach'e iP =22m.6s., eS =29m.10s.
Murgab iP =22m.7s.
Almata iP =22m.7s., S =29m.12s.
Khorog eP =22m.13s.
Frunse iP =22m.15s., iS =29m.30s.
Andijan iP =22m.19s., iS =29m.36s.
Fergana iP =22m.20s.
Dzhergetal iP =22m.21s.
Stalinabad iP =22m.23s., iS =29m.49s., isS =31m.13s.
Nanking iPE =22m.31s., iSE =28m.0s., eL?E =30m.52s.
Tashkent iP =22m.34s., e =30m.4s., isS =31m.25s.
Lunacharskoe eP =22m.35s.
Samarkand eP =22m.38s.
Sverdlovsk iP =23m.43s., eS =32m.12s.
Kirovobad iP =24m.14s.
Tiflis eP =24m.20s.
Moscow iP =24m.48s., eS =34m.22s.
Ksara iP =24m.57s.k, e =35m.3s.
Collmberg eZ =30m.13s.
Stuttgart eZ =30m.36s.
China Lake eZ =31m.18s.
Mount Wilson eZ =31m.25s.
Tamanrasset ePKP?Z =31m.33s., eZ =31m.48s.
Harvard iP =33m.58s.
Weston eP =33m.59s.

May 27d. Readings also at 0h. (Apia and near Dzhergetal), 2h. (near Fort de France), 3h. (Tamanrasset), 5h. (Apia), 6h. (near Tacubaya), 7h. (Murgab, near Stalinabad, Fergana, Khorog, Andijan, Tashkent, and Samarkand), 8h. (Zürich, Stuttgart, Besançon, near Bologna, Prato, and Florence), 9h. (near Huancayo), 10h. (Punta Arenas, Santa Lucia, La Plata, Pasadena, Riverside, Palomar, and China Lake), 12h. (Harvard and Weston), 13h. (Chatra, Athens, Istanbul, Collmberg, Stuttgart, Strasbourg, and Tamanrasset), 14h. (Ksara, Apia, and near Dzhergetal), 15h. (Wellington, Christchurch, Terre Adélie, Resolute Bay, Tiflis, Erevan, Leninakan, near Kirovobad, Shemakla, Nakhichevan, Grozny, Borzhomi, and near Dzhergetal), 16h. (Ksara, Malaga, and Potsdam), 18h. (Ksara and near Mizusawa), 19h. (near Kurmenty), 20h. (near Copiapo, near Khorog, and near Mizusawa), 21h. (Tamanrasset, Kew, and Granada), 22h. (Huancayo).

May 28d. 14h. 16m. 21s. Epicentre 31°·8N. 27°·0E. (Strasbourg).

A = +·7587, B = +·3866, C = +·5244 ; δ = +8 ; h = +1 ;
D = +·454, E = −·891 ; G = +·467, H = +·238, K = −·852.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Helwan	N.	4·2	116	e 1 9	+ 2	—	—	—	—	e 2·6
Ksara		7·7	72	e 2 43?	P_g	—	—	—	—	e 6·3
Istanbul		9·4	10	e 2 14	− 4	e 4 12	+ 5	e 2 55	PP	e 5·6
Messina	z.	11·4	307	i 2 38	− 9	i 4 18	?	i 2 46	P	i 6·2
Rome		15·4	315	e 1 21	?	—	—	—	—	e 7·3
Triest		17·2	327	e 4 9	+ 6	e 5 50	?	—	—	—
Chur		20·1	322	e 4 39	+ 1	e 6 20	?	—	—	—
Prague		20·5	336	e 4 59	+17	e 8 57	+30	—	—	e 10·3
Zürich		21·0	322	e 4 46a	− 1	e 8 21	−16	—	—	—
Tamanrasset	z.	21·1	251	e 4 50	+ 2	i 7 27	?	e 6 36	PP	e 9·9
Neuchatel		21·6	320	i 4 52	− 2	—	—	—	—	—
Stuttgart		21·6	326	e 4 54	0	e 8 42	− 7	—	—	e 13·6
Collmberg	z.	22·1	336	e 5 0	+ 1	—	—	—	—	—
Karlsruhe	z.	22·2	327	e 4 59	− 1	—	—	—	—	—
Strasbourg		22·2	325	e 5 2	+ 2	e 8 52	− 8	e 5 36	PP	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Besançon		22·3	320	e 5 2	+ 1	—	—	e 5 28	PP	—
Jena		22·3	333	e 5 4	+ 3	e 9 2	0	e 5 30	PP	—
Paris		25·1	320	e 5 28	0	e 9 46	− 5	i 5 58	PP	—
Granada		25·7	291	e 6 15k	+42	—	—	—	—	—
Ottawa	Z.	76·1	315	e 11 58	+ 7	—	—	—	—	—

Additional readings :—
Istanbul eZ = 2m.25s. and 3m.3s., eSSZ = 5m.7s.
Prague e = 5m.51s., eN = 6m.30s. and 8m.19s., eE = 9m.17s.
Zürich e = 4m.54s.
Stuttgart eZ = 5m.9s. and 6m.42s.
Collmberg eZ = 5m.2s. and 6m.54s.
Karlsruhe eZ = 5m.5s. and 6m.7s.
Strasbourg e = 6m.42s., i = 7m.15s. and 7m.29s.
Besançon e = 5m.8s., ePPP = 5m.38s., e = 6m.43s., 6m.52s., and 7m.13s.
Jena gives many other unidentified readings at intervals of a few seconds.
Paris i = 5m.36s., iP_2? = 7m.14s., i = 7m.19s., iPP_2 = 7m.41s., i = 7m.58s., iS_2 = **11m.32s.** suggesting a second shock.

May 28d. 15h. 59m. 19s. Epicentre 29°·0N. 87°·0E.

A = +·0458, B = +·8748, C = +·4823 ; δ = −1 ; h = +2 ;
D = +·999, E = −·052 ; G = +·025, H = +·482, K = −·876.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Chatra		2·2	176	i 0 43	+ 5	i 1 12	+ 6	0 50	P_g	—
Calcutta	E.	6·6	169	e 1 42	+ 1	i 2 50	− 8	i 2 10	P_g	—
Hyderabad	N.	13·9	216	i 3 18	− 3	i 5 37	−20	—	—	6·7
Murgab		14·3	314	3 24	− 2	i 5 58	− 8	—	—	—
Przhevalsk		15·2	335	i 3 39	+ 1	—	—	—	—	—
Naryn		15·3	327	—	—	6 28	− 2	—	—	—
Khorog		15·4	307	3 37	− 3	—	—	—	—	—
Poona		15·7	232	i 3 43	− 1	i 6 29	−10	3 57	PP	7·1
Rybach'e		16·1	329	i 3 49	0	6 49	0	—	—	—
Almata		16·4	333	i 3 53	0	7 1	+ 5	—	—	—
Bombay		16·4	235	i 3 51	− 2	i 6 42	−14	4 2	PP	7·2
Andijan		16·8	318	3 56	− 2	i 6 57	− 8	—	—	—
Fergana		16·9	316	e 3 55	− 4	e 9 29	L	—	—	(e 9·5)
Frunse		17·1	326	i 4 2?	0	i 7 23?	+11	—	—	—
Obi-garm		17·3	309	—	—	i 7 3	−13	—	—	—
Stalinabad		17·9	308	i 4 9	− 3	i 7 19	−11	—	—	—
Lunacharskoe		19·0	315	i 4 26	0	i 7 45	−10	—	—	—
Tashkent		19·0	315	i 4 21	− 5	—	—	—	—	—
Samarkand		19·6	317	i 4 37?	+ 5	8 1?	− 7	—	—	—
Kodaikanal		20·7	209	i 4 43	− 1	i 8 40	+ 9	9 38	Q	10·1
Mary		22·6	299	i 5 7	+ 4	—	—	—	—	—
Colombo	E.	23·0	198	5 9	+ 2	9 26	+12	—	—	12·2
Ashkabad		25·4	298	i 5 34	+ 3	—	—	—	—	—
Irkutsk		26·6	24	5 42	0	e 10 19	+ 3	—	—	—
Kabansk		27·3	26	5 49	+ 1	—	—	—	—	—
Nanking		27·5	75	e 5 51	+ 1	10 32	+ 2	—	—	i 13·0
Zi-ka-wei	Z.	29·8	76	6 9	− 2	e 11 11	+ 4	—	—	—
Sverdlovsk		33·5	334	i 6 44	+ 1	12 5	0	—	—	—
Kirovobad		35·0	301	6 58	+ 2	—	—	—	—	—
Grozny		35·9	305	e 7 10	+ 6	—	—	—	—	—
Tiflis		36·3	302	e 7 7	0	—	—	—	—	—
Gori		36·9	303	e 7 18	+ 6	—	—	—	—	—
Leninakan		37·0	300	e 7 20	+ 7	—	—	—	—	—
Borzhomi		37·4	302	e 7 20	+ 4	—	—	—	—	—
Vladivostok		38·5	55	i 7 24	− 2	e 13 18	− 4	—	—	—
Ksara		43·5	289	i 8 11	+ 4	—	—	18 18	SSS	—
Moscow		43·9	322	i 8 9	− 1	e 14 38	− 4	—	—	—
Istanbul		48·1	301	e 8 43	0	e 15 41	− 1	e 10 41	PP	28·7
Pulkovo		48·7	326	e 8 49	+ 1	e 15 51	+ 1	—	—	—
Lwow		51·3	312	i 9 6	− 2	e 16 23?	− 3	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Helsinki		51·5	326	e 9 12	+ 3	—	—	—	—	e 24·7
Belgrade		54·1	306	e 4 29k	?	e 16 59	− 6	e 14 17	PcS	e 33·2
Upsala		55·1	325	e 9 35	− 1	e 17 14	− 4	e 10 38	PcP	e 27·7
Prague		57·5	313	e 9 51k	− 2	e 17 47	− 3	—	—	—
Potsdam		58·0	316	i 9 58a	+ 1	i 17 57	0	—	—	e 28·7
Collmberg	z.	58·2	314	e 9 57	− 1	—	—	—	—	—
Triest		58·6	308	e 9 59	− 2	e 18 23	+19	e 12 13	PP	—
Messina	z.	58·9	299	e 10 3	0	—	—	—	—	—
Jena	N.	59·1	314	e 10 4	0	—	—	—	—	—
Padova		60·1	308	—	—	e 21 10	ScS	—	—	—
Rome		60·3	304	i 10 11a	− 2	e 18 17	− 9	i 12 25	PP	e 25·3
Stuttgart		61·0	313	e 10 16	− 2	e 18 35	0	e 13 59	PPP	e 30·7
Karlsruhe	z.	61·5	313	e 10 21	0	—	—	—	—	—
Pavia		61·9	311	e 12 34	PP	e 18 47	0	—	—	—
Strasbourg		62·0	313	e 10 22	− 2	e 18 48	0	e 10 54	PcP	e 30·0
De Bilt		62·8	317	i 10 29	− 1	e 19 1	+ 3	—	—	e 30·7
Besançon		63·5	311	e 10 35	+ 1	—	—	—	—	—
Paris		65·3	314	i 10 45	− 1	e 19 31	+ 2	e 20 42	ScS	—
Clermont-Ferrand		65·8	310	10 41?	− 8	—	—	—	—	e 40·9
Kew		66·3	317	i 10 53	+ 1	—	—	—	—	e 31·7
Scoresby Sund		69·0	340	e 11 11	+ 2	20 17	+ 3	—	—	27·7
Rathfarnham Castle		69·2	320	e 11 12	+ 2	—	—	—	—	e 32·2
Tortosa		69·2	306	i 11 13	+ 3	20 17	+ 1	—	—	—
Alicante		70·8	304	11 11	− 9	20 35	0	13 49	PP	e 34·4
Tamanrasset	z.	72·2	286	i 11 29	0	e 21 1	+10	e 12 1	PcP	—
Toledo		72·8	306	e 11 32	0	e 14 8	PP	i 11 37	pP	—
Almeria		72·9	303	i 11 29	− 4	e 20 59	0	14 15	PP	41·0
Granada		73·6	303	i 11 39a	+ 2	31 29	Q	14 24	PP	42·3
Malaga		74·3	303	i 11 40	− 1	i 21 16	+ 1	i 14 28	PP	35·8
Resolute Bay	z.	76·6	1	e 11 53	− 1	—	—	—	—	—
Mineral	z.	106·1	22	e 17 58	PKP	—	—	—	—	—
Harvard		106·2	343	e 18 43	PP	—	—	—	—	e 58·2
Cleveland	z.	109·1	350	e 19 4a	PP	—	—	—	—	—
China Lake	z.	111·5	20	e 19 31	PP	—	—	—	—	—
Mount Wilson	z.	112·8	21	e 19 27	PP	—	—	—	—	—
Palomar	z.	114·0	21	e 19 31	PP	—	—	—	—	—
La Paz		154·0	293	20 4	[+11]	—	—	—	—	—

Additional readings : —
Chatra P*EN =45s., PPPEN =56s., S*EN =1m.14s., S_gEN =1m.17s., SSEN =1m.22s., SSSEN =1m.33s.
Calcutta iS_gE =3m.28s.
Poona PPPE =4m.3s., QE =6m.27s., SSE =6m.39s., SSSE =7m.0s.
Bombay SSEN =6m.59s.
Istanbul ePSN =15m.55s., ePPSEN =16m.2s.
Belgrade eNW =30m.43s.
Upsala eS_cSE =19m.15s., eN =22m.41s.
Prague iP_gN =9m.55s., e =10m.53s.
Jena eN =10m.15s., eE =10m.24s., eN =10m.36s.
Stuttgart eP =10m.20s., eSSS? =24m.41s.
Strasbourg i =10m.25s., ePP =12m.42s., e =25m.4s., eSSS =26m.10s., e =27m.51s.
Paris i =11m.48s. and 15m.36s., eSSS =26m.56s.
Alicante P_cS =15m.53s., PS =21m.5s., S_cS =21m.23s., SS =24m.59s., Q =29m.1s.
Tamanrasset iZ =11m.32s., eZ =13m.38s., iPPZ =14m.14s., ePPPZ =16m.0s.
Malaga ePPP =16m.20s.
Long waves were also recorded at Aberdeen and Copenhagen.

May 28d. 17h. 23m. 33s. Epicentre 23°·7S. 68°·1W. Depth of focus 0·020.

A = +·3419, B = −·8505, C = −·3996; δ = −7; h = +4;
D = −·928, E = −·373; G = −·149, H = +·371, K = −·917.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Antofagasta	E.	2·1	271	i 0 33	− 4	—	—	—	—	i 1·0
Copiapo	N.	4·2	209	0 55	− 9	—	—	—	—	1·7
La Paz		7·2	0	i 1 44	0	i 3 4	0	i 3 39	SS	4·4
Huancayo		13·5	328	e 3 7	+ 1	—	—	—	—	—
Morgantown		64·0	350	i 10 18	− 1	—	—	—	—	—
Harvard		65·7	358	i 10 29	− 1	—	—	—	—	—
Weston		65·8	358	i 10 29	− 1	—	—	—	—	—
Ottawa	Z.	69·1	55	e 10 49	− 2	—	—	—	—	—
Palomar	Z.	73·3	320	i 11 17k	+ 1	i 12 12	sP	i 11 50	pP	—
Riverside	Z.	74·1	320	i 11 21k	+ 1	i 12 15	sP	i 11 56	pP	—
Pasadena		74·7	320	i 11 23k	− 1	i 12 17	sP	i 11 59	pP	—
China Lake		75·5	321	i 11 28k	0	—	—	i 12 4	pP	—
Tinemaha		76·7	321	i 11 36k	+ 1	—	—	e 12 10	pP	—
Fresno	Z.	77·4	320	e 11 39a	0	—	—	—	—	—
Lick	Z.	78·9	320	i 11 48k	+ 1	e 12 34	sP	i 12 24	pP	—
Mineral	Z.	80·8	322	e 11 58a	+ 1	—	—	e 12 52	sP	—
Tamanrasset	Z.	85·1	63	i 12 20a	+ 1	e 13 8	sP	e 12 55	pP	—

Additional readings :—
La Paz iS = 3m.25s.
Huancayo i = 3m.14s.
Tamanrasset eZ = 13m.50s.

May 28d. 19h. 57m. 17s. Epicentre 19°·0S. 169°·5E. Depth of focus 0·030.
(as on 1950, Oct. 4d.).

A = −·9304, B = +·1724, C = −·3236; δ = +8; h = +5;
D = +·182, E = +·983; G = +·318, H = −·059, K = −·946.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	E.	17·3	238	i 3 50	+ 1	i 7 0	+ 7	—	—	—
Riverview		22·0	225	i 4 38k	+ 1	i 8 25	+ 5	i 5 20	pP	—
Wellington		22·7	171	—	—	i 9 47	SS	—	—	—
Christchurch		24·6	175	—	—	e 10 27	SS	—	—	—
Perth		49·7	244	e 15 17	?	i 20 23	SSS	—	—	—
Terre Adélie		51·1	194	i 8 41	− 1	—	—	i 9 38	pP	—
Manila		58·3	302	i 9 29	− 5	—	—	—	—	—
Vladivostok		70·8	333	i 10 51	− 3	19 49	0	—	—	—
Petropavlovsk		72·4	353	11 0	− 3	20 5	− 2	—	—	—
Berkeley	Z.	84·5	48	i 12 12a	− 1	—	—	i 12 21	PcP	—
Lick	Z.	85·6	48	i 12 13a	− 1	e 15 35	PP	i 12 56	pP	—
Fresno	Z.	86·7	50	e 12 19a	− 1	e 13 23	sP	e 13 3	pP	—
Pasadena		86·7	53	i 12 18a	− 2	—	—	e 15 43	PP	—
Mineral	Z.	87·0	46	e 12 30a	+ 9	—	—	i 12 35	PcP	—
Riverside	Z.	87·2	53	i 12 21a	− 1	—	—	e 15 48	PP	—
Palomar		87·4	55	i 12 23a	0	i 22 31	[+ 4]	e 15 49	PP	—
China Lake		87·8	52	i 12 24a	− 1	e 22 27	[− 2]	e 14 52	sP	—
Tinemaha	Z.	87·9	51	i 12 25a	0	—	—	—	—	—
Kabansk		89·3	327	e 12 26?	− 6	i 22 58	− 2	—	—	—
Calcutta	E.	89·4	294	—	—	i 22 39	[0]	i 23 6	S	—
Frunse		106·2	310	i 18 12	PP	e 24 4?	[− 1]	25 24	S	—
Andijan		107·4	308	18 17	PP	24 13	[+ 3]	25 45	S	—
Fergana		107·8	308	e 18 22	PP	—	—	—	—	—
Stalinabad		109·8	306	e 18 35	PP	—	—	—	—	—
Tashkent		109·8	308	e 18 20	PP	e 24 19?	[− 2]	25 14?	SKKS	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
La Paz	z.	113·2	119	e 18 55	PP	—	—	—	—	—
Sverdlovsk		116·0	325	e 19 16	PP	26 45	S	28 35	PS	—
Ashkabad		117·9	304	—	—	i 26 15	SKKS	—	—	—
Ksara		136·3	298	e 21 37	PP	e 31 9	PS	—	—	—
Collmberg	z.	142·8	335	e 19 3	[− 4]	—	—	—	—	—
Jena		143·7	335	e 19 5	[− 3]	—	—	e 19 59	pPKP	—
Stuttgart		146·3	336	e 19 12	[− 1]	e 41 13	SKP,P′	e 20 14	pPKP	—
Triest	z.	146·7	328	i 19 14	[+ 1]	—	—	i 20 15	pPKP	—
Strasbourg		147·0	337	i 19 14	[0]	e 20 48	sPKP	e 20 16	pPKP	—
Paris		148·5	343	e 19 17	[+ 1]	e 41 44	SKP,P′	i 20 22	pPKP	e 49·7
Besançon		148·8	338	e 19 22	[+ 5]	—	—	—	—	—
Rome		150·0	324	e 19 22	[+ 3]	e 41 57	SS	i 20 12	pPKP	—
Tamanrasset	z.	164·6	287	i 19 37k	[+ 1]	e 21 32	sPKP	e 20 34	PKP_2	—

Additional readings :—
Riverview iE = 5m.29s., iEN = 8m.33s., iN = 9m.3s., isSE = 9m.27s., iN = 9m.42s. and 10m.0s., iScSE = 15m.28s.
Fresno eZ = 14m.41s.
Pasadena iZ = 12m.25s.
Riverside iZ = 12m.30s.
Palomar iZ = 12m.29s.
China Lake eZ = 15m.53s.
Frunse eSKKS = 24m.52s.
Tashkent ePS = 27m.47s.
Sverdlovsk eSS = 35m.1s.
Jena eN = 20m.12s.
Stuttgart eZ = 20m.26s., ePP? = 21m.45s.
Triest i = 20m.47s.
Strasbourg e = 19m.34s.
Paris esPKP = 21m.6s.
Rome e = 21m.32s. and 54m.3s.?
Tamanrasset epPKPZ = 20m.58s., ePPZ = 24m.11s.
Long waves were also recorded at La Plata.

May 28d. Readings also at 1h. (Kew and near Djakarta), 3h. (Oaxaca, Puebla, Tacubaya, Vera Cruz, Clermont-Ferrand, Basle, Jena, near Zürich, Strasbourg, Stuttgart, Besançon, Paris, and Collmberg), 4h. (Huancayo), 5h. (Ebingen, Ravensburg, near Karlsruhe, and Stuttgart), 7h. (near Apia and near Rome), 8h. (near Copiapo), 9h. (near Alicante), 11h. (Tamanrasset), 13h. (Bombay), 15h. (Brisbane, Riverview, Tamanrasset, and Prague), 17h. (near Fort de France), 19h. (Antofagasta, Copiapo, Huancayo, La Paz, Santa Lucia, Concepción, La Plata, Ashkabad, Bombay, Calcutta, and near Chatra), 20h. (Antofagasta, Concepción, and Santa Lucia (2)), 21h. (Paris, China Lake, Riverside, and near Copiapo), 22h. (Andijan, Fergana, Ili, Tashkent, Ashkabad, Sverdlovsk, Kabansk, and Valdivostok), 23h. (Palomar, Pasadena, Riverside, China Lake, Tinemaha, Lick, Resolute Bay, Moscow, Paris, Rome, Ksara, and near Istanbul).

May 29d. 1h. 3m. 8s. Epicentre 31°·2N. 138°·0E. Depth of focus 0·050.
(as on 1951, April 16d.).

C.M.O., Japan, gives 31°·5N. 138°·2E., with depth 300km.

$A = -·6368$, $B = +·5734$, $C = +·5155$; $\delta = +4$; $h = +1$;
$D = +·669$, $E = +·743$; $G = -·383$, $H = +·345$, $K = -·857$.

	△	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Siomisaki	2·9	320	1 12	+13	—	—
Owase	3·2	332	1 8	+ 6	1 54	+ 4
Omaesaki	3·4	3	1 13	+10	2 0	+ 7
Osima	3·7	18	1 15	+ 9	2 3	+ 5
Shizuoka	3·8	5	1 9	+ 2	2 4	+ 4
Kameyama	3·9	341	1 14	+ 6	2 3	+ 1
Mera	4·0	22	1 15	+ 6	2 6	+ 2
Misima	4·0	11	1 15	+ 6	2 6	+ 2
Osaka	4·0	330	1 12	+ 3	2 7	+ 3
Nagoya	4·1	348	1 16	+ 6	2 6	0

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Sumoto		4·1	321	1 14 a	+ 4	2 5	− 1
Kobe		4·2	327	1 15	+ 3	2 8	0
Hikone		4·3	341	1 17	+ 4	2 8	− 2
Hunatu		4·3	8	1 17k	+ 4	2 13	+ 3
Kohu		4·4	6	1 17	+ 3	2 12	+ 1
Yokohama		4·4	18	1 16	+ 2	2 12	+ 1
Tokyo		4·7	18	1 21	+ 4	2 15	− 2
Tsuruga		4·7	341	1 19	+ 2	2 15	− 2
Titibu		4·9	10	1 21	+ 2	2 18	− 3
Matumoto		5·0	0	1 14	− 6	2 21	− 2
Kumagaya		5·1	13	1 22k	+ 1	2 20	− 5
Oiwake		5·1	5	1 25	+ 4	2 23	− 2
Tyosi		5·1	27	1 27	+ 6	2 25	0
Maebasi		5·3	9	1 30k	+ 6	2 21	− 8
Matusiro		5·3	2	1 26	+ 2	2 24	− 5
Tukubasan		5·3	19	1 32	+ 8	2 22	− 7
Kanazawa		5·4	348	2 28	S	(2 28)	− 3
Nagano		5·4	2	1 26	+ 1	2 26	− 5
Toyama		5·5	353	1 27	+ 1	2 49	+16
Mito		5·6	21	1 30	+ 3	2 32	− 3
Utunomiya		5·6	16	1 28	+ 1	2 26	− 9
Takada		5·9	2	1 37	+ 7	2 36	− 5
Onahama		6·2	22	1 38	+ 4	2 42	− 5
Shirakawa		6·2	17	1 34	0	2 39	− 8
Wazima		6·2	352	2 40	S	(2 40)	− 7
Inawasiro		6·6	15	1 40	+ 2	2 50	− 6
Hukusima		6·8	17	1 41	0	2 53	− 7
Yamagata		7·3	15	3 2	S	(3 2)	− 8
Sendai		7·4	18	1 48	0	3 6	− 7
Mizusawa		8·3	18	3 21	S	(3 21)	−11
Akita		8·7	11	3 29	S	(3 29)	−11
Morioka		8·9	16	2 5	− 1	3 32	−13
Miyako		9·0	20	3 35	S	(3 35)	−12
Aomori		9·8	12	3 50	S	(3 50)	−14
Sapporo		12·1	12	4 51	S	(4 51)	− 3
Obihiro		12·4	18	4 52	S	(4 52)	− 8
Nemuro		13·5	24	5 5	S	(5 5)	−19
Resolute Bay	z.	68·9	14	e 10 26	− 3	—	—
Berkeley	z.	78·4	53	i 11 25 a	+ 1	—	—
Lick	z.	79·1	53	i 11 27 a	− 1	i 11 33	PcP
Tinemaha	z.	81·6	52	i 11 42	+ 1	—	—
China Lake	z.	82·7	52	i 11 46 a	0	—	—
Pasadena	z.	83·2	54	i 11 49 a	0	—	—
Riverside	z.	83·9	54	i 11 53	+ 1	—	—
Palomar	z.	84·6	54	i 11 56	0	—	—

Mizusawa gives also SE = 3m.46s.

May 29d. 6h. 3m. 9s. Epicentre 3°·3S. 139°·8E. (as on 1943, December 3d.).

A = −·7625, B = +·6444, C = −·0572; $\delta = -7$; $h = +7$;
D = +·645, E = +·764; G = +·044, H = −·037, K = −·998.

	△	Az.	P.	O−C.	S.	O−C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Guam	17·4	14	4 9	+ 3	—	—	—	—
Manila	25·8	314	i 5 31	− 3	e 9 14	−48	—	e 10·8
Brisbane	27·2	153	e 5 50	+ 3	e 10 34	+ 9	e 6 46 PP	—
Riverview	32·2	162	i 6 35k	+ 3	i 11 48	+ 3	i 7 54 PPP	e 14·0
Djakarta	33·0	264	e 6 27	−12	i 11 45	−12	—	—
Perth	36·3	215	7 19	+12	12 54	+ 6	8 38 PP	—
Koti	37·1	352	e 7 14	0	e 12 59	− 2	e 15 44 SS	—
Hukuoka	37·7	348	e 7 12	− 7	e 13 9	− 1	e 16 7 Q	e 17·2
Sumoto	37·7	355	i 7 38	+19	i 13 8	− 2	—	18·2
Osaka	38·0	355	e 7 29	+ 8	e 13 10	− 4	—	e 17·9

Continued on next page.

		Δ	Az.	P.	O − C.	S.	O − C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Kameyama		38·1	357	e 7 24	+ 2	e 12 58	−18	—	—	e 18·8
Zi-ka-wei	Z.	38·5	335	e 7 26	0	13 20	− 2	—	—	16·4
Tokyo		38·8	0	e 7 35	+ 7	13 18	− 8	i 10 11	?	18·6
Nanking		40·4	332	e 7 41	0	13 46	− 4	16 51	Q	19·8
Hukusima		40·8	2	7 46	+ 1	e 13 56	0	—	—	e 17·1
Cobb River	E.	47·9	149	e 8 43	+ 1	—	—	—	—	—
Kaimata	N.E.	48·2	148	e 8 54	+10	—	—	—	—	—
Tuai	N.	49·0	141	(8 51?)	+ 1	—	—	—	—	8·8
Wellington		49·1	145	i 8 51	0	e 15 52	− 4	e 19 37	SS	e 23·4
Christchurch		49·5	149	i 8 55	+ 1	i 16 5	+ 3	10 48	PP	e 24·2
Petropavlovsk		58·4	13	e 10 7	+ 7	—	—	—	—	—
Colombo	E.	60·7	280	10 6	− 9	18 28	− 4	—	—	28·8
Kabansk		61·9	337	e 10 22	− 2	18 44	− 3	—	—	—
Irkutsk		63·0	337	e 10 28	− 3	e 18 58	− 3	—	—	—
Terre Adélie		63·4	178	i 10 33	− 1	i 19 8	+ 2	i 11 9	PcP	32·4
Kodaikanal	E.	63·5	284	e 10 24	−10	—	—	—	—	—
Hyderabad	N.	63·9	292	—	—	e 19 12	0	—	—	—
Honolulu		65·7	65	e 10 49	+ 1	e 19 35	+ 1	—	—	—
Poona		68·4	292	i 11 3	− 3	i 19 58	− 9	11 33	PcP	27·8
Bombay		69·4	292	e 11 13	+ 1	e 20 16	− 2	24 29	SS	29·3
Almata II		72·6	318	e 11 30	− 1	—	—	—	—	—
Almata		72·9	318	11 32	− 1	—	—	—	—	—
Naryn		72·9	315	e 11 33	0	i 20 57	− 2	—	—	—
Rybach'e		73·2	317	e 11 33	− 2	—	—	—	—	—
Murgab		73·4	312	e 11 37	+ 1	—	—	—	—	—
Frunse		74·4	317	e 11 40	− 2	i 21 13	− 3	—	—	—
Andijan		75·3	314	11 45	− 2	i 21 23	− 3	—	—	—
Fergana		75·6	314	e 11 46	− 2	e 21 25	− 4	—	—	—
Obi-garm		76·7	311	i 11 56	+ 1	e 21 38	− 3	—	—	—
Stalinabad		77·3	311	i 11 57	− 1	i 21 43	− 5	—	—	—
Tashkent		77·7	314	i 11 58	− 2	i 21 46	− 6	—	—	—
Mary		82·5	308	e 12 26	0	—	—	—	—	—
Ashkabad		85·3	308	i 12 49	+ 9	i 23 8	− 2	—	—	—
College		85·6	24	12 39	− 2	22 59	[− 6]	—	—	—
Sverdlovsk		86·8	328	e 12 44	− 3	23 18	− 7	16 14	PP	—
Sitka		90·0	33	e 12 54	− 9	e 23 54	0	16 47	PP	—
Baku		92·0	311	—	—	e 24 15	+ 3	—	—	—
Shemakla		93·0	310	i 13 13	− 4	—	—	i 17 6	PP	—
Kirovobad		94·7	310	e 17 19	PP	—	—	—	—	—
Seattle		97·7	43	—	—	e 24 19	[+ 4]	e 26 41	PS	e 45·8
Shasta Dam		98·1	50	e 13 39	− 1	—	—	—	—	—
Berkeley		98·3	53	i 13 41k	0	e 24 41	{− 1}	e 31 41	SS	e 47·0
Mineral	Z.	98·7	50	i 13 42k	0	—	—	i 13 58	?	—
Lick	Z.	98·8	53	e 13 42k	− 1	—	—	—	—	—
Moscow		99·6	327	e 13 53	+ 7	—	—	—	—	—
Fresno	Z.	100·3	54	e 13 49k	− 1	—	—	—	—	—
Pasadena		101·8	56	e 13 57	+ 1	e 26 57	PS	e 41 33	Q	e 46·6
Resolute Bay	Z.	102·0	13	e 13 57	0	—	—	—	—	—
China Lake	Z.	102·1	54	e 13 59	+ 1	—	—	e 18 17	PP	—
Riverside	Z.	102·5	56	e 13 59	− 1	—	—	—	—	—
Pulkovo		102·6	332	e 17 46	PKP	e 25 39	− 3	e 18 13	PP	—
Hungry Horse		103·2	41	i 14 2	− 1	—	—	e 29 44	PKKP	—
Ksara		103·4	304	e 13 55	− 9	27 43	PS	18 19	PP	—
Boulder City		104·4	54	e 14 13	+ 5	—	—	e 18 28	PP	—
Istanbul		107·7	313	e 18 36	[+ 8]	e 24 58	[− 5]	e 20 54	PPP	e 58·8
Tucson		108·1	57	e 14 26	P	e 28 15	PS	e 18 43	PP	—
Upsala		108·5	333	e 19 30	PP	e 28 15	PS	e 34 3	SS	e 49·8
Lwow		108·9	322	e 19 5	PP	e 26 29	S	e 28 32	PS	—
Scoresby Sund		111·9	354	e 19 27	PP	34 45	SS	38 57	SSS	54·8
Belgrade		112·9	318	e 14 21	P	e 32 53	?	e 21 29	PPP	e 65·2
Bergen	N.	113·4	338	—	—	e 26 8	{−21}	—	—	e 60·4
Potsdam		114·2	328	e 19 39	PP	—	—	—	—	e 54·8
Prague		114·6	325	e 24 32	?	e 27 17	S	—	—	e 44·8
Jena	E.	115·8	326	e 19 30	PP	e 22 46	PPP	e 20 8	?	—
Taranto		116·5	314	19 15	PP	—	—	e 22 25	PPP	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m. s.			m.
Triest		116·9	321	e 18 12	[−35]	e 29 26	PS	e 20 21		PP	—
Stuttgart		118·2	326	e 19 11	[+22]	e 29 39	PS	e 20 5		PP	e 55·8
Aberdeen	E.	118·4	338	i 20 21	PP	e 30 4	PS	e 22 40		PPP	e 55·7
De Bilt		118·5	330	e 20 0	PP	e 29 56	PS	e 36 51		SSP	e 54·8
Rome		118·7	317	e 20 8	PP	30 7	PS	36 12		SS	—
Strasbourg		119·1	327	e 20 6	PP	e 30 11	PS	e 22 48		PPP	e 57·8
Pavia		120·0	322	e 20 24	PP	e 37 32	SSP	e 20 32		?	e 59·3
Kew		121·6	332	e 20 33	PP	e 30 21	PS	e 23 8		PPP	—
Ivigtut		121·9	4	—	—	30 30	PS	—		—	57·8
Paris		121·9	329	e 20 14	PP	e 26 12	[+16]	e 23 4		PPP	e 58·8
Florissant		122·4	45	e 20 41	PP	e 30 8	PS	e 37 11		SS	—
St. Louis		122·5	45	—	—	e 30 34	PS	e 41 51		SSS	—
Rathfarnham Castle		122·9	337	e 20 28	PP	e 25 47	[−12]	e 37 18		SS	e 58·8
Cleveland		126·9	39	e 19 14 a	[+ 8]	e 22 37	SKP	i 21 0		PP	—
Ottawa		127·8	31	e 19 4	[− 4]	e 31 3	PS	—		—	59·6
Seven Falls	E.	128·9	26	e 21 19	PP	28 7	{− 5}	22 37		PKS	—
Morgantown		129·0	40	e 19 30	[+20]	—	—	—		—	—
Pennsylvania	E.	129·6	37	i 21 29	PP	i 22 46	PKS	—		—	—
Alicante		129·7	320	19 9	[− 2]	26 11	[− 8]	24 11		PPP	e 59·8
Tamanrasset	Z.	131·7	298	e 19 23	[+ 8]	e 22 40	PKS	e 21 38		PP	—
Palisades		131·8	34	i 21 26	PP	i 22 55	PKS	i 31 48		PS	e 65·1
Fordham		131·9	34	e 21 46	PP	e 22 44	PKS	—		—	—
Harvard		132·0	31	e 19 6	[−10]	i 22 38	PKS	i 21 43		PP	e 64·2
Weston		132·2	31	e 19 0	[−16]	e 22 31	PKS	e 39 9		SS	e 61·2
Granada		132·4	320	—	—	39 52	SSP	—		—	68·2
Malaga		133·2	320	e 21 46	PP	e 28 44	{+ 5}	i 31 2		?	73·0
Huancayo		141·9	115	e 19 33	[− 1]	e 41 33	SS	e 22 21		PP	—
Chinchina		144·6	85	e 19 35	[− 3]	e 27 27	[+41]	e 41 52		SS	—
La Paz		146·1	127	i 19 45 a	[+ 4]	23 31	PKS	i 42 11		SS	71·0
Bogota		146·2	86	e 19 41	[0]	i 42 7	SS	—		—	e 72·8
Fort de France		156·4	60	—	—	e 23 35	SKP	—		—	—

Additional readings and note :—
Manila iPP =5m.51s., iPPP =5m.58s.
Brisbane eEN =10m.42s., iSSEN =11m.40s.
Perth SS =15m.1s., SSS =15m.39s.
Nanking iEN =7m.51s.
Wellington Q =21·2m.
Christchurch PPP =12m.3s., eSEN =16m.17s., SS =19m.41s., eQEN =21m.11s.
Terre Adélie ePP =13m.8s., e =14m.50s., iPS =19m.37s., eSS =23m.52s., eSSS =26m.27s.
Poona PPE =13m.42s., PPPE =15m.17s., PSE =20m.17s., PPSE =20m.31s., ScSE =23m.59s., SSSE =26m.50s.
Sverdlovsk SKS =23m.6s., SS =29m.10s.
Seattle ePPS =27m.31s., eSS =32m.21s.
Berkeley iZ =13m.51s. and 13m.55s., ePSN =27m.7s.
Pasadena eZ =14m.7s., eSSZ =31m.45s.
Istanbul eN =32m.29s., eSSN =33m.54s.
Tucson e =23m.25s.
Upsala eN =27m.15s., eQN =44m.51s.?
Scoresby Sund 28m.50s.
Stuttgart eZ =20m.37s., ePPP =22m.39s., eS? =27m.51s., e =33m.45s. and 36m.27s., eSS =36m.57s., e =46m.51s.?
Aberdeen iE =26m.46s., eSSE =36m.41s., iSSSE =41m.18s.
De Bilt eZ =20m.11s.
Rome SSS =41m.34s.
Strasbourg e =21m.1s., 21m.31s., 21m.45s., and 27m.44s., eS =28m.19s., e =32m.7s., eSS =36m.24s., e =45m.41s.
Kew eL =37m.51s.? (=SSP).
Paris e =20m.38s., eSKKS? =27m.52s., eS =28m.10s., ePS =30m.20s., e =30m.52s., ePPS =31m.20s., ePKKS =33m.2s., e =36m.28s., eSS =37m.18s., e =38m.34s., eSSS? =40m.21s., i =47m.4s.
Rathfarnham Castle eSEN =28m.21s.
Cleveland ePPE =21m.13s., ePSE =31m.11s., eSSN =37m.59s., eSSE =38m.22s.
Alicante PPS =32m.6s., SS =37m.43s., Q =52m.21s.
Seven Falls SSE =39m.21s.
Tamanrasset eZ =21m.11s. and 23m.8s.
Palisades iPP =21m.42s.
Harvard ePPP? =24m.41s., eSKSP =31m.55s., ePSPS =40m.11s., eSSS =44m.19s.
Huancayo e =21m.27s., ePPP? =25m.18s., e =27m.8s., eSKSP =33m.1s., ePPS =35m.41s.
La Paz iPPS =36m.21s.
Long waves were also recorded at Tananarive, Budapest, Copenhagen, Almeria, and La Plata.

May 29d. Readings also at 0h. (near Istanbul), 1h. (near Ili, Almata, Almata II, and Chilisk), 2h. (Resolute Bay, Manila, Nanking, and Zi-ka-wei), 3h. (Manila, Collmberg, Rome, Kew, Paris, and Terre Adélie), 4h. (Manila, near Cobb River, Wellington, Kaimata, New Plymouth, and Auckland), 5h. (near Malaga, Almeria, Toledo, and Alicante), 7h. (Apia), 9h. (Jena), 10h. (Collmberg), 11h. (Upsala), 13h. (Stuttgart, Copiapo, Resolute Bay, Mount Wilson, China Lake, Tinemaha, Mineral, and Santa Lucia), 14h. (Pretoria, Clermont-Ferrand, and Granada), 15h. (Apia), 16h. (Christchurch, Antofagasta, near Alicante (3), and near Copiapo), 18h. (Huancayo), 20h. (Rome, Manila, Vladivostok, Kabansk, Irkutsk, Sverdlovsk, and Ksara), 21h. (near Copiapo), 22h. (Copiapo and near Apia), 23h. (near Dzhergetal).

May 30d. 0h. 54m. 52s. Epicentre 52°·3N. 177°·3W. Depth of focus 0·015.
(as on 1946, February 4d.).

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

		△	Az.	P.	O−C.	S.	O−C.	Supp.
		°	°	m. s.	s.	m. s.	s.	m. s.
Adak		0·6	136	i 0 23	+ 3	i 0 43	+ 8	—
Victoria		34·0	74	6 33	0	—	—	—
Mineral	z.	39·3	85	i 7 20a	+ 2	—	—	i 9 20 PP
Berkeley	z.	40·5	88	i 7 29a	+ 1	—	—	i 9 24 PP
Reno		40·9	84	i 7 34a	+ 3	—	—	e 13 1 PcS
Lick	z.	41·2	88	i 7 35a	+ 2	—	—	i 9 30 PP
Fresno		42·7	88	e 7 47a	+ 1	—	—	e 8 14 pP
Tinemaha		43·4	86	i 7 54	+ 3	i 13 12	Scp	i 9 35 PcP
China Lake	z.	44·6	87	i 8 2a	+ 1	i 13 15	ScP	i 9 37 PcP
Pasadena		45·4	89	i 8 8a	+ 1	—	—	i 9 41 PcP
Riverside	z.	46·0	89	i 8 12a	0	—	—	i 9 42 PcP
Palomar		46·7	89	i 8 19a	+ 1	i 13 25	ScP	i 9 46 PcP
Ottawa		61·8	52	e 10 2	− 5	e 15 8	PcS	—
Morgantown		63·9	58	i 10 18	− 3	—	—	—
Harvard		65·9	51	i 10 30	− 4	—	—	e 10 56 pP
Palisades		65·9	53	i 10 31	− 3	—	—	—
Weston		66·1	51	i 10 32	− 4	—	—	—
Collmberg	z.	76·4	354	e 11 29	− 8	—	—	—
Stuttgart	z.	79·2	356	e 11 45	− 7	—	—	—
Paris		79·3	1	e 11 43	−10	—	—	i 11 47 P
Pretoria	z.	147·2	314	i 19 23	[− 3]	—	—	—

Additional readings :—
Mineral iZ = 7m.27s.
Berkeley iZ = 7m.38s.
Reno eE = 8m.11s.
Lick iZ = 7m.44s., 8m.20s., 9m.26s., and 13m.2s.
Fresno eZ = 8m.2s.
Pasadena iZ = 8m.26s.
Palomar iScSEN = 23m.58s.

May 30d. 13h. 43m. 49s. Epicentre 35°·5N. 22°·8E. (as suggested by Strasbourg).

A = +·7525, B = +·3156, C = +·5781 ; δ = +6 ; h = +4 ;
D = +·387, E = −·922 ; G = +·533, H = +·224, K = −·816.

		△	Az.	P.	O−C.	S.	O−C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Athens		2·6	17	i 0 42k	− 2	e 1 21	+ 4	—	—	—
Messina	z.	6·4	297	e 1 36	− 2	i 2 45	− 8	i 3 11	S*	—
Taranto		6·6	321	—	—	e 2 51	− 7	e 5 28	?	—
Sofia		7·2	3	e 2 10	P*	e 3 34	S*	—	—	e 4·1
Istanbul	z.	7·5	40	e 1 56	+ 3	e 3 33	+13	e 2 30	SP_g	—
Belgrade		9·5	350	e 3 22	+62	—	—	—	—	—
Rome		10·2	312	e 2 53	+22	e 5 13	+46	—	—	e 6·2
Triest		12·2	328	e 5 1	?	e 5 10	− 6	—	—	e 6·9
Pavia		14·1	317	—	—	e 6 54	SSS	e 9 54	?	—
Prague		15·8	340	e 3 43	− 2	e 6 52?	+10	e 4 22	?	—

Continued on next page.

		△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	Supp. m. s.		L. m.
Stuttgart		16·6	327	e 3 59	+ 3	e 7 18	+18	e 4 10	PP	e 9·7
Strasbourg		17·1	325	e 4 6	+ 4	—	—	—	—	e 8·2
Jena		17·4	337	e 4 21	+15	e 7 47	+28	e 4 36	PP	e 10·1
Tamanrasset	z.	19·6	235	e 4 32	0	—	—	—	—	e 9·4
Paris		20·0	318	e 4 29?	− 8	e 8 20?	+ 3	—	—	—
Kew		23·0	321	e 6 11	+64	—	—	—	—	—
Harvard		69·9	308	e 11 2	−13	—	—	—	—	—

Additional readings :—
Istanbul eSZ = 4m.1s., esS_gNZ = 4m.16s., esS_gEN = 4m.22s.
Belgrade e = 3m.52s., eNW = 4m.19s., eZ = 4m.40s., eNE = 5m.7s. and 5m.25s., eZ = 5m.57s.
Prague e = 4m.50s. and 7m.20s.
Paris e = 4m.55s.?, 9m.15s.?, 11m.12s.?, 12m.11s.?, and 12m.41s.?.
Long waves were also recorded at Potsdam, De Bilt, and Timisora.

May 30d. 19h. 56m. 58s. Epicentre 3°·3S. 126°·5E. (as on 1948, March 10d.).

A = −·5938, B = +·8025, C = −·0572 ; δ = −12 ; h = +7 ;
D = +·804, E = +·595 ; G = +·034, H = −·046, K = −·998.

		△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	Supp. m. s.		L. m.
Korror		13·2	37	3 9	− 2	—	—	—	—	—
Manila		18·6	344	i 4 17	− 4	—	—	—	—	—
Bandong		19·1	261	i 4 34	+ 7	i 8 7	+10	—	—	—
Djakarta		19·8	263	e 4 38	+ 3	i 8 17	+ 4	—	—	—
Guam		24·6	46	5 52	+29	—	—	—	—	—
Perth		30·2	198	i 7 19	PP	i 11 41	+28	i 9 27	PcP	—
Brisbane		34·9	136	i 7 0	+ 5	e 12 32	+ 5	e 8 17	PP	—
Nanking	E.	35·6	348	e 6 58	− 3	i 12 38	0	—	—	i 15·2
Riverview		38·1	146	i 7 27	+ 5	i 13 25	+ 9	i 7 38	pP	e 20·8
Osaka		38·7	12	e 7 27	0	e 13 0	−25	—	—	—
Shizuoka		39·6	15	e 7 24	−11	e 13 32	− 6	—	—	e 16·2
Gihu		39·7	14	e 7 31	− 5	e 13 32	− 8	—	—	—
Tokyo		40·7	16	e 7 44	0	e 12 56	−59	—	—	—
Toyama		41·0	13	e 7 54	+ 8	e 13 59	0	9 48	PP	—
Kumagaya		41·1	16	e 7 43	− 4	e 13 39	−22	—	—	—
Maebasi		41·2	15	e 7 56	+ 8	e 13 52	−10	—	—	—
Nagano	N.	41·2	14	e 7 58	+10	e 13 55	− 7	—	—	—
Sendai		43·5	17	e 8 6	− 1	e 14 32	− 4	—	—	e 19·6
Akita		44·6	15	8 16	0	e 14 51	− 1	—	—	—
Miyako		45·0	16	e 8 16?	− 3	e 14 50?	− 8	—	—	—
Aomori		45·8	15	9 33	+68	16 9	+60	—	—	—
Vladivostok		46·5	6	i 8 29	− 2	i 15 15	− 4	—	—	—
Sapporo		48·1	14	e 8 43	0	e 15 39	− 3	—	—	—
Kodaikanal	E.	50·6	286	i 9 2	0	i 16 17	0	10 57	PP	21·3
Hyderabad	N.	51·7	295	9 13	+ 2	—	—	—	—	—
Poona	Z.	56·2	295	i 9 46	+ 2	i 17 17	−16	—	—	—
Christchurch		57·1	141	e 10 32	PcP	—	—	—	—	e 17·9
Bombay		57·2	295	i 9 55	+ 4	i 17 45	− 1	10 38	PcP	26·7
Wellington		57·4	138	—	—	e 17 49	0	i 20 31	SS	—
Kabansk	Z.	57·7	346	i 9 55	0	17 52	− 1	—	—	—
Irkutsk		58·5	344	i 10 0	0	17 59	− 4	—	—	—
Petropavlovsk		62·4	21	i 10 27	0	e 18 49	− 4	—	—	—
Przhevalsk		63·0	322	i 10 33	− 2	—	—	—	—	—
Murgab		63·8	316	i 10 39?	+ 3	i 19 13?	+ 2	—	—	—
Naryn		63·9	320	i 10 36	− 1	i 19 16	+ 4	—	—	—
Almata II		64·0	323	i 10 39	+ 1	—	—	—	—	—
Terre Adélie		64·2	173	i 10 42	+ 3	e 19 21	+ 5	e 11 5	PcP	31·0
Almata		64·3	323	i 10 42	+ 3	i 19 21	+ 4	—	—	—
Rybach'e		64·4	320	i 10 42	+ 2	i 19 20	+ 2	—	—	—
Frunse		65·6	321	i 10 50	+ 2	i 19 34	+ 1	—	—	—
Khorog		65·6	314	e 10 47	− 1	—	—	—	—	—
Andijan		66·0	318	i 10 51	+ 1	i 19 39	+ 1	—	—	—
Dzhergetal		66·0	316	i 10 57?	+ 7	i 19 41?	+ 3	—	—	—
Obi-garm		66·9	315	i 10 58	+ 2	i 19 49	0	—	—	—
Fergana		67·1	317	e 10 52	− 5	19 39	−12	e 13 23	PP	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Stalinabad		67·5	314	i 11 1	+ 1	i 19 56	0	—	—	—
Lunacharskoe		68·3	318	e 11 10	+ 5	i 20 8	+ 2	—	—	—
Tashkent		68·3	318	i 11 7	+ 2	i 20 7	+ 1	—	—	—
Samarkand		69·2	315	e 11 18	+ 8	—	—	—	—	—
Honolulu		77·9	67	i 12 2	+ 1	—	—	—	—	—
Sverdlovsk		79·8	330	12 11	− 1	i 22 10	− 4	—	—	—
Baku		82·0	312	i 12 31?	+ 8	i 22 39?	+ 2	—	—	—
Lenkoran		82·5	309	12 27	+ 1	22 45	+ 3	—	—	—
Shemakla		83·0	311	i 12 27	− 1	i 22 46	− 1	i 14 46	PP	—
Kirovobad		84·7	311	12 39	+ 2	i 23 4	0	—	—	—
Grozny		85·5	314	e 12 36	− 5	e 23 4	− 8	—	—	—
Tiflis		86·0	312	e 12 45?	+ 2	e 23 12?	− 5	—	—	—
Gori		86·5	312	—	—	e 23 15	− 7	—	—	—
Leninakan		86·6	311	e 12 51	+ 5	—	—	—	—	—
Borzhomi		87·1	311	e 12 53	+ 4	e 23 22	[+ 7]	—	—	—
College		91·1	25	e 13 7	− 1	e 23 38	[− 1]	—	—	—
Moscow		92·1	325	e 13 12	0	i 24 10	− 3	i 23 47	SKS	—
Ksara		92·3	303	i 13 16	+ 3	—	—	25 36	PS	—
Yalta		94·0	313	13 22	+ 1	23 59	[+ 3]	e 17 0	PP	—
Pulkovo		96·0	329	e 13 31	+ 1	e 24 44	− 3	24 8	SKS	—
Sitka		97·2	32	e 13 38	+ 2	e 24 56	− 1	24 16	SKS	—
Kishinev		97·6	317	13 38	0	—	—	17 44	PP	—
Istanbul		97·8	312	e 13 26	−12	e 24 20	[+ 4]	e 17 32	PP	—
Helsinki		98·6	330	e 13 42	0	e 24 19	[− 1]	e 18 3	PP	—
Lwow		100·6	320	i 13 51	0	—	—	18 3	PP	—
Upsala		102·3	331	e 18 13	PP	e 24 36	[− 2]	—	—	48·0
Timisoara		103·0	316	19 2	?	—	—	—	—	—
Skalnate Pleso		103·1	319	e 18 24	PP	e 24 44	[+ 2]	e 20 40	PPP	—
Belgrade		103·7	315	e 18 22	PP	e 24 51	[+ 6]	e 18 36	PP	—
Ogyalla		104·7	318	e 18 15	[− 7]	e 25 38	(+10)	e 18 45	PP	—
Resolute Bay		104·7	10	—	—	e 24 51	[+ 2]	(e 33 2)	SS	e 33·0
Copenhagen		106·1	328	18 24	[− 1]	25 2	[+ 7]	33 50	SS	e 54·0
Potsdam		106·4	324	e 14 20	P	25 0	[+ 3]	e 18 48	PP	e 60·0
Prague		106·6	321	e 18 39	PP	25 39	(− 2)	e 24 43	SKS	e 59·0
Seattle		106·6	41	e 30 17	PKKP	25 2	[+ 4]	25 37	SKKS	—
Taranto		106·7	311	—	—	e 24 36	[−22]	e 29 46	?	—
Cheb		107·8	322	e 18 52	PP	25 7	[+ 4]	e 25 59	SKKS	—
Jena		108·1	323	e 18 46	[+17]	—	—	e 19 43	PP	—
Triest		108·1	317	i 19 3	[+34]	25 45	(− 7)	e 26 31	S	—
Messina		108·4	309	e 18 59	PP	—	—	—	—	—
Berkeley		108·7	51	e 18 17	[−13]	26 17	−15	e 20 6	PP	e 59·6
Mineral	z.	108·8	48	18 58k	PP	—	—	—	—	—
Lick	z.	109·3	51	e 19 4a	PP	—	—	—	—	—
Padova		109·5	317	e 19 47	?	—	—	—	—	—
Scoresby Sund		109·9	349	e 18 21	[−12]	26 9	(+ 5)	28 36	PS	52·4
Rome		110·0	314	e 19 4	PP	25 6	[− 6]	e 26 8	SKKS	52·9
Bologna	z.	110·1	317	e 19 23	PP	—	—	e 19 43	?	—
Stuttgart		110·2	321	e 18 20	[−14]	e 25 20	[+ 7]	e 19 10	PP	58·0
Reno	z.	110·3	49	e 19 2	PP	—	—	—	—	—
Prato		110·4	315	19 2	PP	—	—	—	—	—
Karlsruhe	z.	110·7	322	e 18 34	[− 1]	—	—	e 19 21	PP	—
Fresno	z.	110·9	51	e 18 14	[−21]	—	—	e 20 11	PP	—
Strasbourg		111·2	321	e 18 39	[+ 3]	e 25 28	[+11]	e 19 16	PP	e 58·0
De Bilt		111·4	325	e 18 30	[− 6]	e 28 42	PS	i 19 24	PP	e 58·0
Pavia		111·4	318	e 19 19a	PP	e 25 27	[+ 9]	e 28 57	PS	—
Hungry Horse		111·7	38	e 18 23	[−14]	e 29 42	PPS	e 19 15	PP	—
Pasadena		112·7	53	i 18 43	[+ 5]	—	—	e 19 27	PP	e 52·0
Besançon		112·8	320	e 18 32	[− 7]	—	—	e 19 35	PP	—
Aberdeen	E.	112·8	332	i 18 55	[+16]	i 25 24	[0]	i 19 24	PP	e 57·5
China	z.	112·8	52	e 18 46	[+ 7]	—	—	e 19 26	PP	—
Riverside	z.	113·4	53	e 19 31	PP	—	—	—	—	—
Palomar	z.	114·0	54	e 19 36	PP	—	—	—	—	—
Paris		114·3	323	e 14 57	P	i 25 33	[+ 4]	e 18 41	PKP	e 57·0
Kew		114·8	327	e 18 32	[−11]	e 29 17	?	e 19 40	PP	e 53·0
Clermont-Ferrand		115·3	320	e 19 44	PP	—	—	—	—	—

Continued on next page.

	△	Az.	P.		O−C.	S.		O−C.	Supp.			L.
	°	°	m.	s.	s.	m.	s.	s.	m.	s.		m.
Rathfarnham Castle	116·9	331	e 18	48	[+ 1]	e 33	53	?	e 35	12	SS	e 67·0
Algiers Univ. Z.	118·4	310	e 18	53	[+ 3]	e 22	51	PPP	e 20	9	PP	—
Tamanrasset Z.	119·8	294	i 18	58k	[+ 6]	e 32	56	PKKS	i 20	13	PP	—
Alicante	120·5	314	19	0	[+ 6]	26	2	[+10]	20	42	PP	57·9
Ivigtut	122·1	357	19	0	[+ 3]	e 26	2	[+ 5]	e 30	20	PS	62·0
Toledo	122·4	316	21	12	PP	38	12	SSP	23	37	PPP	—
Almeria	122·5	312	19	9	[+11]	23	37	PPP	20	59	PP	—
Granada	123·2	313	i 19	5k	[+ 6]	29	42	?	37	44	SSP	70·4
Malaga	124·0	313	i 20	46	PP	24	44	?	28	2	SKKS	67·1
Florissant	131·3	38	e 21	12	PP	—		—	—		—	—
St. Louis	131·5	38	e 22	44	SKP	28	40	{+11}	—		—	—
Tacubaya	132·6	67	—		—	e 22	52	PKS	—		—	—
Ottawa	133·8	20	e 19	22	[+ 3]	e 26	42	[+13]	e 22	52	PPP	—
Seven Falls E.	133·8	15	e 22	51	PPP	e 27	5	[+36]	e 31	20	PS	—
Shawinigan Falls N.	133·8	16	e 22	48	PPP	—		—	—		—	—
Cleveland	134·4	30	e 19	23k	[+ 3]	i 39	42	SS	i 22	54	SKP	—
Morgantown	136·6	30	e 19	22	[− 2]	—		—	e 22	9	PP	—
Pennsylvania	136·7	27	i 19	22	[− 2]	i 23	22	PKS	i 23	19	PKS	—
Harvard	137·8	18	19	31	[+ 4]	i 32	18	SKSP	e 22	16	PP	67·2
Weston	138·0	18	e 19	22	[− 5]	e 40	44	SS	e 23	6	PKS	—
Palisades	138·2	22	i 19	32	[+ 5]	e 40	31	SS	e 23	7	PKS	69·5
Fordham	138·4	22	i 19	31	[+ 3]	—		—	e 23	7	PKS	—
Huancayo	153·5	125	i 20	2	[+ 9]	e 34	11	SKSP	e 23	37	PP	—
La Paz	155·5	144	i 20	3	[+ 8]	31	42	{+53}	i 20	17	pPKP	75·0
Chinchina	157·9	84	i 20	7	[+ 9]	—		—	e 24	19	PP	—
Bogota	159·4	85	i 20	7	[+ 7]	46	38	SSP	24	59	PP	80·6
Fort de France	166·4	33	e 19	36	[−31]	—		—	—		—	—

Additional readings :—
Riverview iN =8m.53s., iPPN =9m.4s., iPPPNZ =9m.25s., iSSZ =16m.9s., iN =16m.32s. and 17m.23s.
Tokyo e =8m.30s., ePP? =9m.33s., e =14m.56s. and 17m.46s.
Kodaikanal PPPE =11m.56s., SSE =19m.54s.
Bombay PPEN =11m.59s., SSN =21m.26s., SSE =21m.33s., QN =24m.11s.
Terre Adélie ePPP =14m.43s., e =24m.30s., eSSS =26m.23s., Q =26·5m.
Moscow ePP =16m.46s., ePPP =19m.4s., SKKS =23m.55s., ePS =25m.19s., eSS =30m.29s.
Yalta ePPP =19m.21s.
Pulkovo ePP =17m.26s., ePPP =19m.28s., eSS =31m.8s.
Istanbul ePSE =26m.26s., eSSEN =31m.36s.
Upsala ePPN =18m.18s., ePPP =20m.24s., eE =23m.32s., eSKKSE =25m.12s., ePS =27m.6s., eE =28m.26s., eSS? =32m.2s.?.
Skalnate Pleso e =19m.2s., and 22m.25s., ePS =27m.26s., ePPS? =28m.31s., e =31m.35s., eSS =33m.8s.
Belgrade eNW =29m.28s., eNE =33m.31s.
Ogyalla e =18m.25s., eN =21m.7s., eE =21m.22s., eN =23m.29s., ePS =27m.32s., ePPS =28m.44s., e =30m.14s., eSS =33m.20s., e =37m.8s. and 39m.17s.
Resolute Bay eEN =25m.33s., 27m.29s., and 28m.50s.
Copenhagen 18m.56s., PS =27m.48s. and 29m.37s.
Potsdam ePPN =18m.56s., ePPEZ =18m.59s., ePPPEZ =20m.56s., SN =26m.22s., ePSZ =28m.8s.
Prague e =18m.55s., 19m.33s., 20m.23s., 22m.34s., and 27m.12s., ePS =27m.53s., ePPS =28m.44s., e =28m.56s., eSS =33m.44s.
Seattle eS =25m.52s., e =26m.42s., ePS =27m.46s., ePPS =28m.22s., eSS =32m.37s., eSSS =36m.2s., ePKP,PKP =38m.17s.
Cheb ePPP =21m.1s., ePS =28m.16s., eSS =34m.17s., eSSS =38m.15s.
Jena eZ =18m.56s., eEN =19m.6s., eE =19m.17s., eZ =21m.12s., 22m.23s., 26m.32s., and 28m.10s.
Triest ePPP =21m.59s., ePS =28m.46s., ePPS =30m.1s., eSS =34m.31s.
Berkeley eE =24m.33s., eN =26m.42s., ePSE =28m.10s., eEZ =51m.44s.
Scoresby Sund e =19m.16s., 25m.19s., 29m.34s., and 30m.12s.
Rome iE =19m.22s., ePPS =29m.22s.?, e =30m.52s., eSS =34m.16s., eSSS? =38m.12s.
Stuttgart eZ =18m.37s. and 19m.18s., i =19m.28s., e =20m.2s., ePPP =21m.34s., eS =26m.50s., ePS? =29m.8s., e =33m.14s., eSS =34m.38s., eSSS =38m.36s.
Fresno eZ =19m.6s.
Strasbourg e =19m.7s., 19m.24s., 20m.10s., 20m.21s., and 20m.59s., ePPP? =21m.22s., e =22m.2s., eS? =27m.2s., ePS? =28m.33s., e =29m.9s., 31m.18s., and 35m.14s., eSS? =35m.29s., eQ =36m.55s.
De Bilt eSS =35m.2s.?
Pavia eZ =20m.5s., e =20m.42s., ePPS =29m.58s., iSS =35m.3s.
Hungry Horse 18m.59s.
Aberdeen iE =21m.40s., iPSE =28m.48s., iE =29m.16s., eSSE =35m.17s., eE =42m.35s.

Continued on next page.

Paris i =18m.53s., iPP =19m.41s., i =19m.44s., iPPP =22m.11s., i =24m.1s., iS? = 27m.55s., i =28m.5s. and 28m.47s., iSP =29m.12s., i =29m.33s., iPKKP? = 29m.54s., iPPS? =30m.15s., i =31m.3s., iPKKS =33m.31s., i =35m.27s., iSS = 35m.33s., iPSS =35m.51s., iSSS =39m.59s.
Rathfarnham Castle e =33m.32s.
Tamanrasset iZ =18m.44s., eZ =21m.3s. and 22m.32s., ePPPZ =23m.1s., iZ =23m.40s., iPKKPZ =29m.9s.
Alicante PS =30m.2s., PPS =31m.41s., SS =37m.12s., SSP =47m.12s., Q =50m.34s.
Granada iPP =20m.50s., SKP =22m.14s., SSS =42m.2s.
Ottawa e =24m.2s., 27m.22s., 28m.27s., and 33m.42s.
Cleveland ePPZ =21m.55s., iEN =24m.2s.
Harvard iPKS =23m.15s., ePPP =24m.28s., ePPS =34m.16s., eSS =40m.16s.
Palisades e =24m.5s. and 42m.7s.
Huancayo e =25m.17s., eSSS =49m.25s.
La Paz iPKP$_2$Z =20m.42s., iPPZ =24m.2s., i =35m.25s., iPPS =37m.52s., iSSP =45m.12s.
Bogota iPKP$_2$EN =20m.27s.
Long waves were also recorded at Bergen.

May 30d. Readings also at 0h. (near Dzhergetal), 1h. (near Manila), 2h. (Pretoria and near Dzhergetal), 3h. (Timisoara and near Athens), 4h. (Collmberg, Bombay, and near Dzhergetal), 5h. (Apia, Copiapo, Stuttgart, near Athens, and near Dzhergetal), 7h. (Stuttgart, Andijan, Kabansk, Naryn, Stalinabad, Irkutsk, Sverdlovsk, Tashkent, Vladivostok, Nanking, near Dzhergetal, near Manila, and near Apia (2)), 8h. (Potsdam, Mizusawa, and near Tacubaya), 10h. (Apia and near Dzhergetal), 13h. (Ksara), 14h. (Brisbane, Alicante, Toledo, Granada, Malaga, and near Dzhergetal), 15h. (Manila), 17h. (Victoria (4), Ottawa, and Alicante (3)), 18h. (Brisbane), 19h. (China Lake, Pasadena, Riverside, Harvard, Weston, La Paz, Tamanrasset, Brisbane, Riverview, Guam, and Terre Adélie), 20h. (Triest, Rome, near Istanbul, and near Dzhergetal), 21h. (Naryn), 22h. (Pavia, Ksara, near Bucharest, Istanbul, and near Dzhergetal), 23h. (Mineral).

May 31d. 20h. 56m. 1s. Epicentre 18°·6N. 121°·2E. Depth of focus 0·010.

Felt in the north of Luzon. Intensity VI at Laoag, with damage and casualties; V at Aparri and Vigan; IV at Tuguegarao, Cagayan, etc.; III in the Manila region. Depth 100km.

$A = -·4913$, $B = +·8112$, $C = +·3170$; $\delta = -9$; $h = +5$;
$D = +·855$, $E = +·518$; $G = -·164$, $H = +·271$, $K = -·948$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Manila		4·0	183	i 0 58	− 2	—	—	—	—	—
Zi-ka-wei	N.	12·6	1	e 2 50	− 7	5 6	− 9	—	—	—
Nanking		13·6	351	i 3 5a	− 5	i 5 30	− 9	i 3 17	P	i 5·7
Yakusima		14·5	34	3 19	− 3	5 57	− 3	—	—	—
Nagasaki		16·1	27	3 40	− 2	—	—	—	—	—
Kumamoto		16·5	29	e 3 47	0	6 59	+13	—	—	—
Saga		16·7	27	3 49	0	—	—	—	—	—
Hukuoka		17·1	27	3 56	+ 2	7 1	+ 1	15 46	ScS	8·9
Oita		17·3	31	e 3 58	+ 1	e 15 45	ScS	e 5 6	?	—
Simidu		17·7	35	i 4 1	− 1	7 30	SS	—	—	—
Koti		18·5	33	e 4 9	− 2	e 7 51	SS	e 15 49	ScS	—
Hamada		18·9	28	e 4 11	− 4	e 7 46	+ 7	—	—	—
Sumoto		19·9	35	i 4 25	− 1	i 8 8	+ 8	i 15 53	ScS	—
Kobe	N.	20·3	35	i 4 30	0	—	—	—	—	—
Owase		20·4	36	4 33	+ 2	8 19	+10	—	—	—
Osaka		20·5	35	i 4 32	0	i 15 55	ScS	—	—	—
Tu		21·1	36	i 4 38	0	8 23	+ 1	—	—	—
Hikone		21·3	35	i 4 40	0	e 8 37	+11	e 15 58	ScS	—
Tsuruga		21·5	35	i 4 43	+ 1	i 8 39	+ 9	i 15 58	ScS	—
Nagoya		21·6	36	4 43	0	e 8 43	+12	—	—	—
Omaesaki		22·0	39	4 50	+ 3	8 47	+ 8	—	—	—
Kanazawa		22·5	33	e 4 55	+ 3	e 8 59	+11	e 16 7	ScS	—
Misima		22·8	39	e 4 10	−45	8 9	−44	16 4	ScS	10·1
Humatu		22·9	39	i 4 58	+ 2	i 9 1	+ 7	16 5	ScS	—
Matumoto		23·0	36	e 4 59	+ 2	e 9 7	+11	e 16 7	ScS	—
Guam		23·2	99	5 19	pP	—	—	—	—	—
Matusiro		23·3	35	4 58	− 2	9 9	+ 7	i 5 13	pP	—
Tokyo		23·7	39	e 5 15	+11	e 9 26	+18	e 15 54	ScS	—
Hukusima		25·4	37	5 19	− 1	9 41	+ 4	—	—	—
Sendai		26·1	37	e 5 23	− 3	9 54	+ 5	6 22	PPP	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Vladivostok		26·1	17	e 5 22	− 4	—	—	—	—	—
Morioka		27·2	35	e 5 35	− 1	e 10 18	+12	—	—	—
Djakarta		28·4	211	i 6 47a	+60	i 11 50	88	—	—	—
Bandong		28·7	208	i 5 49	− 1	i 10 37	+ 6	—	—	—
Sapporo		29·8	29	5 58	− 2	e 16 31	Sc8	—	—	—
Urakawa		29·8	32	e 6 8	+ 8	e 11 10	s8	—	—	e 15·0
Calcutta	E.	31·0	283	i 6 4k	− 6	i 10 36	−31	i 11 45	s8	12·7
Chatra	N.	32·4	292	e 6 23	+ 1	e 11 53	s8	16 38	Sc8	15·4
Kabansk		35·3	344	i 6 48	+ 1	12 16	+ 2	—	—	—
Hyderabad	N.	40·6	275	—	—	e 13 33	− 1	—	—	—
Colombo	E.	41·9	259	7 41	− 1	13 58	+ 5	—	—	23·0
Almata		44·6	314	i 8 5	+ 1	e 14 39	+ 7	—	—	—
Naryn		44·6	311	i 8 5	+ 1	i 14 38	+ 6	i 8 23	pP	—
Poona		44·8	278	i 8 5	− 1	i 14 24	−11	9 52	PP	20·7
Rybach'e		44·9	312	i 8 7	0	i 14 43	+ 6	—	—	—
Petropavlovsk		45·0	31	i 8 7	0	14 39	+ 1	8 26	pP	—
Murgab		45·4	306	8 9	− 1	—	—	—	—	—
Semipalatinsk		45·4	325	e 8 11	+ 1	—	—	—	—	—
Bombay		45·7	279	i 8 12	− 1	i 14 48	0	i 10 2	PP	20·8
Frunse		46·1	312	i 8 16	0	15 0	+ 6	—	—	—
Andijan		47·1	308	i 8 26	+ 2	e 15 16	+ 8	i 8 42	pP	—
Fergana		47·5	308	8 27	0	e 15 17	+ 4	e 8 42	pP	—
Stalinabad		49·4	306	10 48?	PP	15 46?	+ 6	16 13	sS	—
Lunacharskoe		49·5	309	e 8 44	+ 2	i 15 48	+ 7	—	—	—
Tashkent		49·5	309	i 8 43	+ 1	i 15 48	+ 7	—	—	—
Perth		50·5	185	i 8 51	+ 1	i 15 9	−46	i 13 57	PcS	—
Samarkand		51·0	306	—	—	16 11	+ 9	—	—	—
Brisbane		55·2	145	i 9 24a	− 1	—	—	—	—	—
Ashkabad		57·6	304	i 9 43	+ 1	—	—	—	—	—
Mitchell Field		58·5	39	i 9 45	− 3	—	—	—	—	—
Sverdlovsk		58·6	326	9 48	− 1	18 9	sS	i 10 2	pP	—
Riverview		59·4	151	i 9 55a	+ 1	e 18 1	+ 7	i 10 20	pP	—
Shemakla		65·0	307	10 32	0	19 10	+ 6	—	—	—
Kirovobad		66·8	307	i 10 49	+ 6	—	—	—	—	—
Grozny		67·0	310	10 46	+ 1	i 19 35	+ 6	—	—	—
Erevan		68·2	307	e 10 55	+ 3	—	—	—	—	—
Gori		68·4	309	10 55	+ 2	—	—	—	—	—
Leninakan		68·7	308	e 10 58	+ 3	—	—	—	—	—
Borzhomi		68·9	309	e 10 56	0	—	—	—	—	—
Piatigorsk		68·9	312	10 54	− 2	i 19 54	+ 2	—	—	—
Moscow		71·3	324	i 11 9	− 2	i 20 18	− 1	i 11 23	pP	—
Sotchi		71·4	311	e 11 10	− 2	e 20 21	+ 1	—	—	—
Apia		73·5	110	(11 24)	0	11 24	P	8 48	?	—
College		73·8	26	i 11 24	− 2	e 20 49	+ 1	e 11 42	pP	—
Pulkovo		74·6	328	i 11 29	− 1	i 20 56	0	—	—	—
Auckland	N.	74·8	137	i 11 34	+ 3	i 21 13	+14	—	—	—
Yalta		75·1	312	11 32	− 1	21 4	+ 2	—	—	—
Honolulu		75·3	72	i 11 35	+ 1	e 21 8	+ 4	—	—	—
Ksara		76·1	301	i 11 40k	+ 1	21 20	+ 7	—	—	—
Cobb River	E.	76·2	142	e 11 42	+ 3	—	—	—	—	—
Kaimata	N.E.	76·4	144	e 11 41	+ 1	—	—	—	—	—
Helsinki		77·1	330	i 11 22k	−22	e 21 24	0	e 14 40	PP	e 40·0
Tuai	N.	77·5	138	11 42	− 5	e 21 33	+ 5	—	—	—
Wellington		77·5	141	i 11 46	− 1	i 21 32	+ 4	i 16 36	PPP	—
Christchurch		77·7	144	i 11 50	+ 2	i 21 41	+11	12 19	pP	e 37·2
Kishinev		78·2	316	11 50	0	21 35	− 1	—	—	—
Istanbul		79·6	310	i 11 57	− 1	i 21 53	+ 2	e 15 0	PP	e 40·0
Lwow		80·5	319	i 12 3	0	i 22 1	+ 1	—	—	—
Upsala		80·7	330	e 12 3?	− 1	i 22 3?	+ 1	e 12 25	pP	e 37·0
Bucharest		80·8	314	e 12 7	+ 3	i 22 8	+ 5	22 20	SKS	39·0
Sitka		81·7	32	e 12 9	0	i 22 17	+ 5	—	—	—
Skalnate Pleso		83·1	320	e 12 19	+ 3	e 22 32	+ 6	e 12 46	pP	—
Sofia		83·2	313	e 12 18	+ 1	22 32	+ 5	e 15 34	PP	—
Timisoara		83·6	316	e 12 24	+ 5	e 22 40	+ 9	e 23 15	SP	—
Baciborzu	Z.	84·0	321	e 12 23	+ 2	22 40	+ 5	e 16 8	PP	—

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		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Resolute Bay		84·2	9	i 12 21	− 1	e 22 36	− 1	e 12 41	pP	—
Belgrade		84·4	315	e 12 23a	0	e 22 40	+ 1	—	—	e 46·9
Budapest		84·4	318	12 22	− 1	i 22 38	− 1	15 38	PP	e 46·0
Athens		84·5	308	—	—	e 22 37	− 3	—	—	—
Kalossa		84·8	318	e 12 28	+ 3	e 22 41	− 2	—	—	—
Ogyalla		84·8	319	e 12 27	+ 2	e 22 44	+ 1	e 23 34	SP	—
Copenhagen		84·9	328	i 12 26k	+ 1	i 22 42	− 2	15 47	PP	40·0
Bergen		86·0	334	i 12 30	− 1	i 22 52	− 3	i 13 2	pP	e 41·0
Potsdam		86·0	325	i 12 30k	− 1	i 22 50	[+ 5]	i 12 53	pP	e 43·0
Prague		86·2	322	i 12 31k	− 1	i 22 49	[+ 3]	e 12 51	pP	e 40·0
Collmberg		86·5	323	e 12 33	0	e 22 50	[+ 3]	e 12 56	pP	e 40·0
Terre Adélie		86·5	172	i 12 34	+ 1	e 23 3	+ 3	i 12 59	pP	—
Cheb		87·4	322	e 12 37	0	e 23 1	− 7	e 13 0	pP	—
Jena		87·5	323	e 12 38	0	e 22 59	[+ 5]	e 12 58	pP	—
Scoresby Sund		87·5	349	i 12 38	0	i 23 5	− 4	23 55	sS	39·0
Triest		88·5	318	e 12 44	+ 1	i 23 20	+ 2	e 13 13	pP	—
Witteveen	z.	89·3	327	i 12 50k	+ 4	—	—	i 12 54	P	—
Stuttgart		89·9	322	i 12 49k	0	i 23 12	[+ 3]	i 13 13	pP	e 47·0
Karlsruhe	z.	90·2	323	e 12 53	+ 2	e 16 29	PP	e 13 12	pP	—
Padova		90·2	318	e 12 49	− 2	23 15	[+ 4]	23 52	S	—
De Bilt		90·4	326	e 12 50	− 2	i 23 21	[+ 9]	e 13 15	pP	e 44·0
Messina		90·4	311	i 12 51	− 1	16 25	PP	i 13 12	pP	—
Bologna		90·5	318	i 12 54k	+ 2	e 23 45	+ 8	e 16 27	PP	—
Chur		90·6	320	i 12 53k	0	e 23 15	[+ 1]	e 16 39	PP	—
Strasbourg		90·8	322	i 12 54	0	i 23 42	+ 3	13 18	pP	e 45·0
Florence		90·9	317	e 12 57?	+ 3	i 23 17?	[+ 2]	e 13 20?	pP	—
Rome		90·9	315	i 12 54k	0	i 23 19	[+ 4]	13 18	pP	35·3
Aberdeen	E.	91·0	333	i 12 53	− 1	i 23 18	[+ 2]	i 23 48	S	e 44·6
Prato		91·0	317	e 12 55	+ 1	i 23 21	[+ 5]	—	—	—
Basle		91·4	321	e 12 56	0	e 23 19	[+ 1]	—	—	—
Pavia		91·6	319	i 12 58	+ 1	i 23 23	[+ 4]	e 13 13	pP	e 46·1
Victoria		91·9	37	13 0	+ 1	—	—	—	—	—
Durham		92·2	331	12 6	−54	i 23 28	[+ 6]	—	—	—
Edinburgh	E.	92·3	332	—	—	23 25	[+ 2]	—	—	—
Reykjavik	z.	92·7	345	i 13 4	+ 2	—	—	i 13 24	pP	—
Seattle		93·0	37	i 13 7a	+ 3	i 24 9	+10	i 13 32	pP	—
Kew		93·6	327	e 13 6	0	i 23 35	[+ 5]	e 25 31	PS	e 44·0
Paris		93·6	325	i 13 7	+ 1	i 24 9	+ 5	i 13 25	pP	e 44·0
Clermont-Ferrand		95·0	322	e 13 12	− 1	—	—	e 19 3	PPP	—
Rathfarnham Castle		95·3	331	i 13 16	+ 2	e 23 39	[0]	13 49	pP	e 44·5
Jersey	E.	95·9	327	—	—	e 23 51	[+ 8]	—	—	—
Shasta Dam		96·6	43	i 13 20	0	e 23 52	[+ 5]	i 13 47	pP	—
Hungry Horse		97·2	33	i 13 24	+ 1	e 23 55	[+ 5]	e 30 1	PKKP	—
Mineral	z.	97·3	43	e 13 24k	+ 1	—	—	i 13 49	pP	—
Berkeley		98·1	46	e 18 4	sPP	i 24 1	[+ 6]	e 30 56	SSP	e 45·8
Santa Clara	E.	98·6	46	i 24 5	SKS	(i 24 5)	[+ 7]	—	—	—
Lick	z.	98·8	46	e 13 29k	− 1	—	—	e 17 14	PP	—
Reno		98·8	43	e 13 32a	+ 2	24 0	[+ 1]	e 13 50	pP	—
Tortosa		99·3	319	e 16 28	?	i 24 4	[+ 4]	—	—	—
Algiers Univ.	z.	99·8	314	e 13 55	pP	—	—	e 17 36	PP	—
Ivigtut		100·0	354	17 36	PP	i 24 6	[+ 2]	24 41	SKKS	45·0
Fresno	z.	100·4	45	e 13 55a	pP	—	—	—	—	—
Alicante		101·3	317	17 55	PP	24 13	[+ 3]	26 52	PS	49·5
China Lake	z.	102·4	46	e 13 47	+ 1	e 30 9	PKKP	e 17 58	PP	—
Toledo		102·6	320	e 17 39	PP	i 24 21	[+ 5]	i 18 1	pPP	53·3
Pasadena		102·9	47	e 13 50	+ 2	i 23 26	[−51]	e 18 9	PP	e 42·0
Almeria		103·4	317	13 29	−21	25 9	−17	17 51	PP	55·8
Riverside	z.	103·6	47	e 14 10	pP	—	—	—	—	—
Granada		104·0	318	i 13 53k	0	i 24 29	[+ 6]	i 18 11	PP	i 56·6
Boulder City		104·2	44	e 13 57	+ 3	e 24 34	[+10]	i 18 19	PP	—
Kimberley	z.	104·2	245	i 17 33	?	—	—	—	—	—
Palomar	z.	104·3	47	e 16 37	?	—	—	e 18 10	PP	—
Malaga		104·8	318	i 18 18	PP	25 6	−32	i 30 8	PKKP	54·3
Tamanrasset	z.	104·9	301	e 13 58	+ 1	i 18 24	PP	e 18 42	pPP	—
Tucson		109·0	45	e 18 46	PP	—	—	e 27 34	?	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Seven Falls	E.	113·7	9	e 19 25	PP	25 4	[0]	29 0	PS	51·0
Ottawa		114·5	13	e 18 49	pP′	e 25 12	[+ 5]	e 19 27	PP	46·7
Florissant		115·7	27	—	—	i 25 17	[+ 6]	e 25 50	sSKS	—
St. Louis		115·9	27	e 18 19	[−13]	e 25 18	[+ 6]	e 25 51	sSKS	—
Harvard		118·1	10	e 18 37	[+ 1]	e 25 14	[− 6]	i 29 32	SP	e 61·4
Pennsylvania	E.	118·1	16	e 29 30	SP	i 25 26	[+ 6]	e 36 33	sSS	—
Weston		118·2	10	e 18 37	[+ 1]	—	—	—	—	e 55·8
Morgantown		118·8	19	i 18 38	[0]	e 24 37	[−45]	—	—	—
Palisades		119·1	13	e 18 39	[+ 1]	i 25 30	[+ 7]	e 19 59	PP	—
Fordham		119·2	13	e 20 2	PP	i 25 30	[+ 6]	—	—	62·8
Fort de France		146·8	3	e 19 35	[+ 6]	—	—	i 19 43	pP′	—
Chinchina		151·3	36	i 19 39	[+ 3]	—	—	(i 20 6)	pP′	—
Bogota		152·4	34	i 19 30	[− 8]	—	—	—	—	84·5
Huancayo		162·8	70	i 19 57	[+ 7]	e 44 49	SS	i 20 15	pP′	e 68·4
La Paz		170·8	—	i 20 3a	[+ 7]	26 45	[− 3]	i 25 11	PP	81·5

Additional readings :—
Hukuoka SN = 7m.5s.
Kôti e = 5m.49s.
Osaka e = 4m.48s., eS = 6m.32s.
Misima PP = 5m.5s., PPP? = 5m.12s., PcP? = 7m.29s.
Matumoto ePPN = 5m.23s.
Matusiro iScS?N = 15m.45s.
Sendai PcP? = 8m.41s., ScSN = 16m.15s.
Calcutta PcSE = 13m.13s.
Chatra PcSN = 12m.45s., QN = 13m.42s., SSSN = 14m.38s.
Poona PPPE = 10m.40s., PSE = 14m.31s., PPSE = 14m.35s., SSE = 17m.50s., ScSE = 18m.9s., QE = 18m.29s., SSSE = 18m.40s.
Bombay SSEN = 18m.0s., QEN = 18m.50s.
Andijan isS = 15m.42s.
Fergana sS = 15m.42s.
Stalinabad ipP = 9m.33s.
Riverview iPcPZ = 10m.44s., iScSN = 19m.45s.
Moscow isS = 20m.44s.
College i = 11m.31s.
Scoresby Sund 13m.20s. and 16m.2s., pPP = 16m.25s., pS = 23m.31s., PS = 24m.16s., SS = 29m.10s.
Helsinki eZ = 12m.22s. and 13m.17s., eEN = 21m.49s.
Wellington iPcPZ = 11m.58s., PPZ = 15m.2s., iSSS? = 29m.30s.
Christchurch iPPZ = 14m.51s., eEN = 22m.14s., eSSEN = 26m.59s., eQEN = 32m.59s.
Istanbul ePPPE = 16m.52s., eSKSEN = 22m.7s., ePSEN = 22m.23s., eSSEN = 26m.53s.
Upsala esP = 12m.45s., e = 14m.14s., ePP = 15m.13s., eN = 16m.38s. and 16m.51s., isS = 22m.32s., esPSN = 23m.25s., esPSE = 23m.29s., e = 24m.20s., eN = 25m.18s., eSS = 27m.14s., esSSE = 27m.45s., eSSS?N = 30m.21s., eE = 31m.59s., eQN = 32m.59s.
Bucharest eN = 12m.54s., 14m.12s., and 18m.6s., eE = 18m.26s.
Skalnate Pleso e = 12m.38s. and 13m.37s., ePP = 15m.32s., epS = 23m.4s., esS = 23m.23s., eSS = 28m.5s.
Raciborzu eN = 14m.21s., eN = 16m.31s.
Resolute Bay eNZ = 12m.32s., eZ = 13m.32s. and 14m.25s., ePPN = 15m.38s., eE = 23m.6s., eN = 27m.37s., eE = 27m.58s.
Belgrade eNE = 16m.28s. and 19m.14s., eNW = 34m.54s.
Budapest iE = 12m.38s., eN = 13m.36s., iSN = 22m.41s., eN = 23m.11s., ePSE = 23m.14s., PPSE = 23m.52s., SSE = 27m.59s.?, eSSSN = 30m.41s.
Kalossa eN = 13m.29s., eE = 13m.41s., eN = 23m.31s.
Ogyalla e = 13m.32s., 14m.19s., 15m.13s., and 15m.41s., ePPN = 16m.0s., e = 18m.41s., eN = 22m.18s., e = 26m.11s.
Copenhagen 23m.34s.
Potsdam iPE = 12m.33s., iPPZ = 16m.8s., iS? or SKKS?E = 23m.16s., iPSZ = 24m.15s.
Prague esP = 13m.7s., ePP = 15m.51s., esPP? = 16m.36s., ePPP = 18m.3s., esS = 23m.28s., e = 27m.45s., eSS = 28m.15s., esSS? = 29m.2s., eSSS = 31m.52s.
Collmberg ePPZ = 15m.57s., eSZ = 23m.32s., eSSE = 30m.29s.
Terre Adélie iPP = 15m.56s.
Cheb eN = 13m.35s., e = 13m.43s., eN = 14m.18s., e = 15m.39s., ePP = 16m.19s., ePPP? = 17m.59s., e = 23m.35s., eN = 24m.9s., ePS = 24m.25s., e = 26m.31s. and 27m.11s., eSS? = 29m.7s., e = 30m.36s., 31m.36s., and 32m.23s.
Jena epP?N = 12m.43s., esP?N = 12m.51s., eEN = 13m.27s., eE = 14m.16s., eN = 14m.24s. and 15m.38s., ePPN = 16m.1s., eN = 16m.38s., eE = 17m.9s., eSKS?N = 23m.3s.?, eEN = 24m.7s., eN = 24m.13s. and 28m.15s.
Triest iPPZ = 16m.12s., epPPZ = 16m.44s., ePPP = 18m.10s., iSKS = 23m.3s., isSKS = 23m.52s., iPPS = 24m.58s., eSS = 29m.19s.
Stuttgart eZ = 13m.19s., ePP = 16m.22s., e = 16m.41s., isSKS = 23m.34s., ePPS = 25m.2s., eSS = 29m.59s.
De Bilt iPP = 16m.31s., ePPP = 18m.41s., iPS = 24m.43s., eSS = 29m.41s.

Continued on next page.

Bologna e =17m.48s., eS =23m.56s., ePPS =25m.15s.
Strasbourg i =13m.8s., ePP =16m.29s., ePPP =18m.26s., iSKS =23m.18s., ePS = 24m.47s., eSPP =25m.25s.
Florence eS =23m.46s?
Rome iPP =16m.31s., iS =23m.46s., eN =23m.59s., PPS? =25m.17s., SS =30m.10s.?
Aberdeen iE =13m.56s., iPPE =16m.37s., ePPPE =18m.25s., iPSE =24m.52s., eE = 29m.45s. and 33m.34s.
Pavia ePP? =16m.38s., ePPP? =18m.35s., e =23m.9s., iS =23m.56s., iPPS =25m.46s.
Durham EN =12m.21s., E =14m.13s., EN =16m.42s.
Reykjavik i?Z =13m.20s.
Seattle isP =13m.45s., iSKSNW =23m.39s., ipS =24m.41s., isS =24m.48s., iSPN = 25m.5s., ePS =25m.29s., eSPP =26m.7s., ePPS =27m.19s.
Kew e =16m.54s., iPPP =17m.14s., iPS =24m.8s., ePPSZ =25m.18s., eSSEN =30m.58s.
Paris i =13m.22s., iPP =16m.51s., ipPP =17m.7s., i =17m.50s., ePPP =19m.5s., iSKS = 23m.37s., iSP =25m.21s., ipSP =25m.48s., iPPS =26m.11s., i =26m.51s., eSSP = 30m.36s., e =36m.11s.
Rathfarnham Castle iZ =13m.21s., ePPZ =17m.8s., ePPPZ =19m.46s., eS =24m.11s., eSSEN =30m.29s.?
Hungry Horse e =16m.44s., ePKP,PKP =38m.9s.
Santa Clara ipPE =24m.29s., eSE =26m.14s., esSE =26m.45s., eLE =27m.49s.; readings wrongly identified.
Reno eZ =16m.42s., eNZ =24m.3s.
Algiers University eZ =21m.13s. and 30m.24s.
Alicante PPP =20m.29s., PPS =27m.43s., SS =32m.49s., SSS =37m.12s., Q =42m.49s.
Almeria PPP =19m.53s., SS =32m.13s.
Granada pPP =18m.32s., PPP =20m.35s., S =25m.59s., PPS =28m.47s., SS =33m.47s.
Boulder City e =17m.8s.
Tamanrasset eZ =16m.53s. and 17m.19s., ePKP?Z =17m.37s., ePPPZ =20m.39s., ePKKPZ =29m.37s., iZ =30m.2s., ePKP,PKPZ =38m.3s.
Seven Falls eE =19m.49s., SKSE =23m.53s., eE =27m.19s., SSE =34m.32s., eE = 37m.57s.
Ottawa e =26m.20s. and 28m.54s.
Florissant eSKKS =26m.27s., eS =27m.16s.
St. Louis ePP =19m.38s., eSKKS =26m.29s., eS =27m.15s., iPS =29m.12s., e =34m.58s. and 39m.19s.
Harvard ePP =19m.50s., ipPP =20m.9s., e =26m.43s., esSS =36m.36s.
Pennsylvania iE =26m.45s., eS?E =27m.14s., ipSE =28m.5s., ePKP,PKP?E =39m.42s.
Palisades eSKKS =26m.50s., ePS =29m.26s., eSS =36m.16s.
Huancayo ePP =24m.28s., e =29m.23s., eSSS =50m.59s.
La Paz iPKP$_2$ =21m.10s., iSKKS =31m.53s., PPS =39m.13s., iSS =46m.12s., SSS = 53m.35s.

May 31d. 23h. 58m. 11s. Epicentre 4°·5N. 127°·5E. (as on 1944, November 15d.).

A = −·6069, B = +·7910, C = +·0779; δ = +8; h = +7;
D = +·793, E = +·609; G = −·047, H = +·062, K = −·997.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
	°	°	m. s.	s.	m. s.	s.	m. s.	
Manila	11·9	328	i 2 57	+ 3	—	—	—	—
Vladivostok	38·7	6	e 7 24	− 3	—	—	—	—
Kabansk	50·5	344	e 9 4	+ 2	e 16 22	+ 6	—	—
Irkutsk	51·3	342	e 9 8	0	e 16 30	+ 4	—	—
Petropavlovsk	54·8	23	e 9 35	+ 1	—	—	—	—
Naryn	58·8	317	e 10 0	− 2	—	—	—	—
Almata	58·9	319	e 10 8	+ 5	—	—	—	—
Andijan	61·1	314	e 10 16	− 2	—	—	—	—
Tashkent	63·5	315	—	—	e 19 4	− 3	—	—
Sverdlovsk	73·7	329	11 35	− 3	21 7	− 1	—	—
Tiflis	81·6	312	e 12 24	+ 3	—	—	—	—
Moscow	86·2	326	12 42	− 2	23 17	− 2	—	—
Pulkovo	89·8	331	13 9	+ 7	e 23 33	[+ 1]	e 23 49	SKKS

Long waves only were recorded at Granada.

May 31d. Readings also at 0h. (Apia, Kurmenty, Samarkand, near Almata II, Andijan, Dzhergetal, Fergana, Frunse, Khorog, Krasnogorka, and Naryn), 1h. (Bandong, Djakarta, and near Kurmenty), 2h. (Mount Wilson, Riverside, China Lake, Palisades, and Istanbul), 3h. (near Copiapo), 4h. (near Copiapo and near Manila), 5h. (near Dzhergetal), 12h. (near Basle), 13h. (near Athens), 14h. and 15h. (near Dzhergetal), 18h. (Apia, Copiapo, and near Ashkabad), 20h. (Bogota, and near Istanbul), 21h. (Collmberg, Rome, Stuttgart, Palisades, and near Chinchina), 22h. (Prague, near Bogota, and Chinchina), 23h. (China Lake, Oaxaca, Puebla, Vera Cruz, Merida, and Tacubaya).

June 1d. 16h. 23m. 31s. Epicentre 12°·8N. 145°·4E.

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

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Guam		0·9	316	0 25	+ 5	—	—	—	—	—
Siomisaki		22·4	338	e 4 33	−29	e 9 0	− 4	—	—	—
Misima		23·0	347	e 4 39	−28	e 9 13	− 1	—	—	—
Hunatu		23·4	347	5 9	− 2	e 9 22	+ 1	—	—	—
Kameyama		23·4	343	e 5 12	+ 1	—	—	—	—	—
Tokyo		23·4	349	e 5 34	PP	9 19	− 2	e 6 10	PPP	10·6
Osaka		23·5	339	e 5 13	+ 1	—	—	—	—	—
Sumoto		23·5	338	i 5 11	− 1	e 9 20	− 3	—	—	—
Nagoya		23·6	344	e 5 12	− 1	—	—	—	—	—
Kobe	E.	23·7	339	e 5 12	− 2	—	—	—	—	—
Manila		23·8	277	e 5 17	+ 2	—	—	—	—	—
Hikone		23·9	342	e 5 15	− 1	—	—	—	—	—
Kumagaya		23·9	348	e 6 7	PPP	e 10 27	SS	—	—	e 12·2
Ooita		23·9	331	e 5 19	+ 3	—	—	—	—	—
Maebasi		24·2	348	e 5 19	0	e 9 37	+2	—	—	—
Oiwake		24·2	347	e 5 4	−15	—	—	—	—	—
Matumoto	N.	24·3	344	e 5 19	− 1	—	—	—	—	—
Matusiro		24·5	347	e 5 27	+ 5	e 10 31	SS	—	—	11·5
Nagano	N.	24·6	347	e 5 21	− 2	—	—	—	—	—
Inawasiro		25·1	351	—	—	e 9 50	− 1	—	—	—
Nanking		31·0	312	e 6 17	− 4	e 11 22	− 4	e 7 19	PP	—
Vladivostok		32·4	341	i 6 31	− 3	e 11 44	− 4	—	—	—
Petropavlovsk		41·6	12	e 7 47	− 4	—	—	—	—	—
Riverview	Z.	46·7	172	i 8 48k	+16	—	—	—	—	e 22·6
Kabansk		50·0	329	e 8 59	+ 1	e 16 8	− 1	—	—	—
Irkutsk		51·3	329	e 9 5	− 3	e 16 22	− 4	—	—	—
Przhevalsk		64·5	311	i 10 43	+ 2	—	—	—	—	—
Ili		65·6	313	i 10 48	0	—	—	—	—	—
Almata		65·7	312	i 10 49	+ 1	—	—	—	—	—
Frunse		67·4	310	e 10 59	0	—	—	—	—	—
College		68·7	25	11 3	− 4	—	—	—	—	—
Andijan		68·9	308	11 9	0	e 20 10	− 3	—	—	—
Fergana		69·4	308	e 11 12	0	—	—	—	—	—
Khorog		69·5	305	e 11 15	+ 3	—	—	—	—	—
Bombay	E.	69·7	285	e 11 13	− 1	e 21 0	PPS	—	—	—
Obi-garm		71·0	307	i 11 23	+ 1	—	—	—	—	—
Tashkent		71·3	309	—	—	e 20 45	+ 4	—	—	—
Sverdlovsk		76·5	326	—	—	21 31	− 8	—	—	—
Ashkabad		79·9	306	—	—	22 21	+ 5	—	—	—
Victoria		81·3	42	12 19	− 1	—	—	—	—	—
Seattle		82·2	43	e 12 37	+13	e 22 44	+ 5	—	—	e 46·5
Shasta Dam		83·4	50	i 12 30	0	—	—	—	—	—
Berkeley		84·1	53	i 12 35a	+ 1	e 22 44	−14	e 32 59	Q	e 45·9
Mineral	Z.	84·1	50	i 12 33k	− 1	—	—	i 12 42	PcP	—
Lick	Z.	84·7	53	i 12 37a	0	—	—	—	—	—
Resolute Bay		85·2	13	e 12 38	− 1	22 58	[− 4]	e 24 26	PPS	e 42·5
Reno	Z.	85·6	50	e 12 41a	0	—	—	—	—	—
Baku		85·9	310	—	—	e 23 2	[− 5]	—	—	—
Fresno	Z.	86·3	53	e 12 47a	+ 2	—	—	e 15 57	PP	—
Hungry Horse		87·4	41	i 12 50	0	—	—	—	—	—
Pasadena	Z.	88·1	55	e 12 52	− 2	—	—	—	—	—
China Lake	Z.	88·2	53	i 12 54	0	—	—	e 13 8	pP	—
Riverside	Z.	88·8	55	e 12 57	0	—	—	e 13 11	pP	—
Tiflis		89·3	313	e 12 59	0	—	—	—	—	—
Palomar	Z.	89·4	56	i 12 53	− 7	—	—	—	—	—
Boulder City		90·3	53	i 13 5	+ 1	—	—	—	—	—
Scoresby Sund		96·5	356	e 13 31	− 1	24 53	+ 2	—	—	54·5
Ksara		98·6	307	e 17 52	PP	e 27 46	PPS	—	—	—
Potsdam	N.	103·2	333	—	—	e 24 44	[+ 2]	—	—	e 53·5
Collmberg	Z.	104·0	332	e 14 5	− 1	—	—	e 18 2	PP	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Cheb	E.	105·1	332	e 17 37	?	—	—	—	—	—
De Bilt		106·8	336	e 18 43	PP	e 28 5	PS	—	—	e 54·5
St. Louis		107·1	43	e 18 50	PP	e 33 45	SS	e 20 57	PPP	—
Stuttgart		107·5	332	e 18 47	PP	—	—	e 18 57	?	e 54·7
Strasbourg		108·3	333	e 18 44	PP	—	—	e 21 34	PPP	e 52·5
Rathfarnham C.	Z.	109·8	343	e 18 55	PP	e 25 33	[+21]	e 45 19	Q	e 51·5
Paris		110·4	335	—	—	e 29 6	PS	—	—	e 56·5
Alicante		119·9	330	e 18 51	[− 2]	25 51	[+ 1]	22 43	PPP	e 55·4
Granada		122·3	332	20 56a	PP	38 20	SSP	—	—	65·0
Tamanrasset	Z.	127·1	312	e 19 11	[+ 5]	—	—	e 20 44	PP	—
La Paz		147·4	101	19 54	[+11]	e 42 41	SSP	23 7	PP	70·9

Additional readings :—
Seattle epP? = 13m.8s., e = 13m.12s., esP? = 13m.24s., epS? = 23m.15s., e = 24m.13s.
Berkeley eZ = 12m.47s. and 14m.1s.
Lick iZ = 12m.51s. and 13m.9s.
Fresno eZ = 12m.57s., 13m.21s., and 13m.51s.
China Lake iZ = 13m.13s.
St. Louis e = 19m.35s., 21m.13s., and 29m.26s.
Strasbourg e = 19m.27s. and 35m.29s.?.
Alicante PS = 29m.48s., PPS = 31m.9s., SS = 40m.45s., Q = 48m.19s.
Tamanrasset eZ = 19m.32s. and 19m.59s.
Long waves were also recorded at Wellington, Kimberley, Pretoria, Harvard, Palisades, and at other European stations.

June 1d. 20h. 2m. 13s. Epicentre 53°·1N. 172°·5W. Depth of focus 0·005.

A = −·5979, B = −·0787, C = +·7977 ; δ = 0 ; h = −7 ;
D = −·131, E = +·991 ; G = −·791, H = −·104, K = −·603.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Mitchell Field		2·8	245	i 0 44	0	i 1 15	− 2	—	—	—
Klyuchi		15·8	292	e 3 44	+ 4	—	—	—	—	—
College		17·2	35	4 1	+ 4	7 20	+15	—	—	—
Petropavlovsk		17·3	282	i 4 0	+ 1	—	—	—	—	—
Sitka		21·4	63	i 4 46	+ 2	i 8 43	+10	5 4	pP	—
Victoria		30·9	77	6 11	− 2	—	—	—	—	—
Seattle		31·9	78	e 6 24	+ 3	e 11 32	+ 5	i 12 45	PcS	—
Arcata	Z.	34·6	89	e 6 43a	− 2	—	—	—	—	—
Shasta Dam		35·7	88	i 6 53	− 1	e 12 28	+ 3	i 9 18	PcP	—
Hungry Horse		36·4	72	i 7 0	0	i 12 36	0	i 9 21	PcP	—
Mineral	Z.	36·4	88	i 6 58a	− 2	—	—	i 7 24	sP	—
Resolute Bay		36·6	24	e 7 2	0	e 12 37	− 2	e 15 31	SS	e 12·9
Berkeley		37·6	92	i 7 8a	− 2	e 12 54	0	e 7 32	pP	e 18·6
Vladivostok		37·6	277	i 7 6	− 4	—	—	e 7 31	pP	—
Reno		38·0	88	e 7 13a	0	e 12 58	− 3	e 8 49	PP	e 17·1
Lick	Z.	38·3	92	i 7 14a	− 2	i 13 4	− 1	i 8 37	PP	—
Fresno	Z.	39·8	92	e 7 27a	− 1	e 13 11	−17	—	—	—
Tinemaha		40·5	90	e 7 34a	0	i 7 58	sP	i 9 35	PcP	—
China Lake	Z.	41·7	91	i 7 43a	− 1	i 13 17	PcS	i 9 37	PcP	—
Pasadena		42·5	93	e 7 48a	− 3	i 13 20	PcS	e 8 6	pP	—
Riverside	Z.	43·1	93	i 7 53a	− 2	i 13 22	PcS	i 9 41	PcP	—
Boulder City		43·3	88	i 7 56	− 1	i 14 20	+ 1	i 13 24	PcS	—
Palomar		43·8	93	i 8 0a	− 1	i 14 27	0	i 13 25	PcS	—
Irkutsk		47·7	304	8 30	− 2	—	—	10 27	PP	—
Tucson		48·2	89	i 8 34	− 2	—	—	i 8 57	pP	—
Nanking		52·6	275	9 4	− 5	e 16 21	− 9	e 9 40	pP	—
Scoresby Sund		54·9	12	e 9 27	+ 1	e 17 3	+ 2	e 9 53	PcP	—
Florissant		55·8	69	e 9 30	− 3	i 17 9	− 4	e 17 53	sS	—
St. Louis		56·0	69	e 9 31	− 3	i 17 12	− 4	i 9 58	pP	—
Cleveland		58·8	61	i 9 51a	− 3	e 17 47	− 6	i 10 19	pP	—
Ottawa	Z.	58·9	54	e 9 53	− 2	—	—	e 10 20	pP	—
Seven Falls	E.	60·0	50	—	—	e 18 3	− 5	e 19 38	ScS	29·3
Morgantown		60·9	62	i 10 6	− 2	—	—	e 10 34	pP	—
Pennsylvania	E.	61·2	59	—	—	i 18 25	+ 2	e 19 6	sS	—
Sverdlovsk		62·1	330	i 10 17	+ 1	18 38	+ 3	i 10 44	pP	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
	Harvard	63·1	54	i 10 21	− 2	—	—	i 10 48	pP	e 27·3
•	Palisades	63·1	56	i 10 21	− 2	i 18 44	− 3	i 10 47	pP	—
	Weston	63·3	54	i 10 23	− 1	—	—	e 10 48	pP	—
	Manila	64·4	260	i 10 27	− 5	—	—	—	—	—
	Columbia	64·5	66	i 10 55	+23	—	—	—	—	—
	Ili	66·4	312	i 10 42	− 2	—	—	—	—	—
-	Almata	67·0	312	i 10 48	0	—	—	i 11 15	pP	—
	Przhevalsk	67·0	310	e 10 49	+ 1	—	—	—	—	—
	Rybach'e	68·1	312	e 10 54	− 1	e 19 49	+ 1	e 13 22	PP	—
	Frunse	68·4	313	i 10 56	− 1	e 19 52	0	i 11 23	pP	—
	Moscow	68·7	342	e 10 58	− 1	—	—	—	—	—
	Naryn	68·9	311	i 10 59	− 1	—	—	—	—	—
	Tchimkent	71·0	316	i 11 13	0	—	—	—	—	—
	Andijan	71·1	313	e 11 13	0	20 24	+ 1	11 40	pP	—
	Fergana	71·6	313	11 16	0	—	—	e 11 43	pP	—
	Tashkent	71·9	315	e 14 0	PP	e 20 32	− 1	e 21 14	sS	—
	Lunacharskoe	71·9	315	e 11 22	+ 4	—	—	—	—	—
	Obi-garm	73·9	314	i 11 33	+ 3	—	—	—	—	—
	Khorog	74·1	311	e 11 33	+ 2	—	—	—	—	—
	Stalinabad	74·5	314	i 11 33	0	—	—	—	—	—
	Potsdam	74·8	357	e 11 35	0	i 21 5	0	e 12 3	pP	—
	De Bilt	75·2	1	e 11 17	−20	e 21 11	+ 1	e 21 59	PS	—
	Collmberg z.	75·9	356	e 11 41	0	—	—	e 12 18	sP	—
	Jena	76·3	357	e 11 43?	− 1	—	—	e 11 54	pP	—
	Prague	77·0	355	e 11 50	+ 2	e 21 30	+ 1	e 12 21	sP	—
	Paris	78·4	4	e 15 8	PP	e 21 44	0	e 15 36	pPP	e 37·8
	Stuttgart	78·5	358	e 11 56	0	e 21 47	+ 2	e 12 26	pP	e 32·8
	Strasbourg	78·7	359	e 11 57	0	e 21 50	+ 2	e 14 47	PP	—
	Ashkabad	79·2	321	e 11 59	− 1	—	—	—	—	—
	Baku	79·9	328	e 12 6?	+ 3	e 22 4?	+ 4	—	—	—
	Shemakha	80·2	330	e 12 7	+ 2	—	—	—	—	—
	Pavia	82·2	358	—	—	e 22 19	− 5	—	—	—
	San Juan	84·9	66	i 12 28	− 1	—	—	i 12 56	pP	—
	Rome	85·3	356	—	—	e 21 47	[−60]	—	—	—
	Ksara	89·9	337	e 12 53	0	e 23 32	− 6	16 32	PP	—
	Bogota	91·4	81	—	—	e 23 7	[−18]	—	—	—
	Huancayo	103·8	92	e 13 57	+ 1	—	—	—	—	—
	Pretoria z.	148·6	322	i 19 39	[+ 3]	—	—	—	—	—
	Pietermaritzburg z.	151·2	316	i 19 45	[+ 5]	—	—	i 22 21	PKS	—
	Kimberley z.	152·5	326	i 20 18	PKP_2	—	—	—	—	—

Additional readings :—
Seattle eSS =13m.20s., iS_cSN =16m.49s., and other readings without phase.
Shasta Dam e =7m.57s.
Resolute Bay eZ =12m.57s.
Berkeley iZ =7m.18s., ePPZ =8m.39s., eN =16m.11s.
Reno eZ =7m.39s. and 7m.54s.
Lick iZ =9m.26s.
China Lake iZ =7m.57s., 8m.7s., 9m.22s., and 10m.6s.
Pasadena isP?Z =8m.14s., eP_cPZ =9m.29s., iZ =9m.34s., eS_cSN =17m.36s.
Riverside iZ =8m.20s.
Boulder City i =16m.1s. and 17m.48s.
Palomar iN =8m.24s. and iE =9m.46s.
Scoresby Sund e =17m.50s., eS_cS =19m.5s.
Florissant e =19m.9s.
St. Louis i =10m.12s., e =14m.20s., isS =17m.57s., e =19m.10s. and 20m.0s., eSs = 21m.7s.
Cleveland ePPZ =12m.4s., esSN =18m.32s., eEN =19m.29s., eN =20m.18s.
Seven Falls SSSE =24m.47s.
Sverdlovsk esS =19m.25s.
Palisades ePPS =19m.29s.
Andijan sS =21m.13s.
Potsdam isSE =21m.55s.
Jena eEN =12m.10s.
Prague esP? =12m.29s., esS?E =22m.16s., ePSN =22m.35s., eSS =26m.59s.
Paris eSP =22m.31s.
Stuttgart ePS =22m.36s.
Strasbourg eSP =22m.36s., eSS =26m.47s.
Long waves were also recorded at Almeria.

June 1d. 20h. 4m. 48s. Epicentre 53°·1N. 172°·5W. Depth of focus 0·005. (as at 20h. 2m.).

		△	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Seattle		31·9	78	11 37	S	(11 37)	+10
Shasta Dam		35·7	88	i 6 55	+ 1	—	—
Berkeley	z.	37·6	92	i 7 10a	0	—	—
Lick	z.	38·3	92	i 7 16a	0	—	—
Fresno	z.	39·8	92	e 7 28k	0	—	—
Tinemaha	z.	40·5	90	e 7 35	+ 1	e 7 58	pP
China Lake	z.	41·7	91	i 7 44a	0	i 8 8	pP
Pasadena		42·5	93	i 7 51	0	e 8 16	pP
Riverside	z.	43·1	93	i 7 55	0	i 8 20	pP
Palomar		43·8	93	i 8 2a	+ 1	i 8 24	pP
St. Louis		56·0	69	e 9 36	+ 2	e 9 44	pP
Harvard		63·1	54	e 10 23	0	e 10 50	pP
Palisades		63·1	56	i 10 12	−11	i 10 50	pP
Weston		63·3	54	i 10 24	0	e 10 51	pP

Additional readings :—
China Lake iPcPZ = 9m.39s., iScPZ = 13m.19s.

June 1d. Readings also at 3h. (near Tacubaya and near Rome), 4h. (Manila, Brisbane, near Basle, Neuchatel, and Stuttgart), 5h. (near Toledo and Tortosa), 6h. (Manila, Santa Lucia, Andijan, near Dzhergetal, Khorog, Obi-garm, and near Tacubaya), 8h. (Fergana, near Dzhergetal, Khorog, Obi-garm, and Stalinabad), 9h. (near Manila), 10h. (near Collmberg), 12h. (Ksara, Grozny, Frunse, Rybach'e, Stalinabad, near Andijan, Dzhergetal, Fergana, Ili, and Naryn), 13h. (Pretoria and near Dzhergetal), 16h. (near Alicante (2)), 18h. (Chinchina, Andijan, Lunacharskoe, Tashkent, Tchimkent, near Dzhergetal, Fergana, Khorog, Obi-garm, and Stalinabad), 19h. (Copiapo and near Apia), 20h. (Mount Wilson, Palomar, China Lake, Palisades, and Manila), 21h. and 22h. (near Dzhergetal), 23h. (near Bogota).

June 2d. 6h. 47m. 51s. Epicentre 6°·9N. 116°·8E.

A = −·4477, B = +·8862, C = +·1194 ; δ = +4 ; h = +7 ;
D = +·893, E = +·451 : G = −·054, H = +·107, K = −·993.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Manila		8·7	28	i 2 16	+ 6	e 4 30	S*	i 2 20	PP	e 5·1
Djakarta		16·4	218	i 3 53	0	i 7 11	SS	—	—	—
Bandoong		16·5	214	e 3 53	− 1	i 7 11	SS	—	—	—
Zi-ka-wei	N.	24·5	9	e 5 26	+ 4	e 9 46	+ 6	—	—	—
Nanking		25·1	3	i 5 30	+ 2	i 9 58	+ 7	i 6 4	PP	i 11·8
Yakusima		26·7	26	e 5 33	−10	—	—	—	—	—
Guam		28·2	73	6 31	PP	—	—	—	—	—
Saga		29·1	23	e 6 16	+12	—	—	—	—	—
Ooita		29·6	25	e 6 21	+12	—	—	—	—	—
Calcutta	N.	31·5	303	e 6 49	+23	i 11 57	+23	7 53	PPP	—
Osaka		32·6	29	e 6 31	− 4	—	—	—	—	—
Nagoya		33·7	31	e 6 33	−12	—	—	—	—	—
Shizuoka		34·3	32	e 6 43	− 7	—	—	—	—	—
Chatra	N.	34·4	310	e 6 55	+ 4	e 12 20	+ 1	i 17 20	Q	e 20·9
Hunatu		34·9	32	6 55	0	—	—	—	—	—
Matusiro		35·4	30	6 59	− 1	12 43	+ 9	e 8 29	PP	15·4
Oiwake		35·4	30	e 7 7	+ 7	—	—	—	—	—
Nagano	N.	35·5	30	e 7 6	+ 6	—	—	—	—	—
Kumagaya		35·7	31	e 7 4	+ 2	e 15 4	SS	—	—	—
Maebasi		35·7	30	e 7 5	+ 3	e 15 20	SSS	e 8 47	PPP	—
Tokyo		35·8	32	e 7 22	+19	12 47	+ 6	8 27	PP	—
Colombo		36·7	272	8 9?	PP	—	—	—	—	18·5
Niigata		36·9	28	e 7 21	+ 9	—	—	—	—	—
Hukusima		37·5	31	e 6 8	−69	e 11 1	?	e 7 6	P	—
Sendai		38·1	31	7 22	0	—	—	e 9 45	PcP	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Vladivostok		38·4	18	i 7 26	+ 1	i 13 23	+ 3	—	—	—
Akita		38·8	29	e 7 38	+10	—	—	—	—	—
Hyderabad	E.	38·8	289	e 7 30	+ 2	i 13 30	+ 4	9 3	PP	19·9
Mizusawa		38·9	30	7 40	+11	13 40	+12	e 13 44	S	—
Kodaikanal	E.	39·0	278	i 7 35	+ 5	e 13 30	+ 1	9 5	PP	18·3
Miyako		39·7	30	e 7 38	+ 2	e 13 45	+ 5	—	—	—
Aomori		40·0	28	7 46	+ 8	—	—	—	—	—
Sapporo		42·0	26	e 8 3	+ 9	—	—	—	—	—
Urakawa		42·8	28	e 8 6	+ 5	e 14 8	−18	e 9 22	PP	e 19·3
Poona	E.	43·3	290	i 8 8	+ 3	i 14 37	+ 4	—	—	—
Bombay		44·4	290	8 15	+ 1	i 14 53	+ 4	10 8	PP	21·1
Kabansk		45·8	351	8 26	+ 1	15 9	0	—	—	—
Irkutsk		46·4	349	8 31	+ 1	15 19	+ 1	—	—	—
Brisbane		49·0	135	i 8 49a	− 1	i 15 52	− 3	—	—	—
Przhevalsk		49·0	323	i 8 53	+ 3	—	—	—	—	—
Naryn		49·9	320	e 8 58?	+ 1	e 16 4?	− 3	—	—	—
Almata		50·3	323	i 9 3	+ 3	—	—	—	—	—
Rybach'e		50·4	321	i 9 3	+ 3	i 16 18	+ 4	—	—	—
Khorog		51·0	321	e 9 8	+ 2	—	—	—	—	—
Andijan		52·0	317	i 9 15	+ 2	i 16 42	+ 6	—	—	—
Dzhergetal		52·0	316	i 9 16	+ 3	—	—	—	—	—
Riverview		52·0	143	i 9 14k	+ 1	i 16 38	+ 2	i 12 4	PPP	e 26·6
Fergana		52·2	317	i 9 14	− 1	i 16 35	− 4	—	—	—
Obi-garm		52·9	314	i 9 23	+ 3	i 16 51	+ 3	—	—	—
Stalinabad		53·5	314	i 9 24	0	i 16 55	− 2	—	—	—
Tashkent		54·3	317	i 9 32	+ 2	i 17 6?	− 1	—	—	—
Samarkand		55·2	314	9 41	+ 4	—	—	—	—	—
Petropavlovsk		57·2	28	e 9 47	− 4	i 17 43	− 3	—	—	—
Kizyl-Arvat		62·9	311	i 10 29	− 1	—	—	—	—	—
Sverdlovsk		66·2	330	i 10 49	− 3	19 39	− 1	—	—	—
Lenkoran		68·6	309	11 11	+ 4	20 14	+ 5	—	—	—
Shemakla		69·0	311	11 14	+ 5	—	—	—	—	—
Grozny		71·5	313	e 11 26	+ 2	—	—	—	—	—
Tiflis		72·0	312	11 29	+ 1	—	—	—	—	—
Gori		72·5	312	e 11 36	+ 6	—	—	—	—	—
Tananarive		72·9	248	—	—	e 21 30	PS	e 21 42	PPS	e 35·3
Borzhomi		73·1	311	11 36	+ 2	—	—	—	—	—
Terre Adelie		75·7	169	i 11 48	− 1	—	—	—	—	—
Moscow		78·2	325	i 12 3	0	21 57	0	—	—	—
Ksara		78·7	302	i 12 7	+ 1	e 23 18	PPS	—	—	—
Yalta		80·0	314	e 12 10	− 3	e 22 12	− 5	—	—	—
Pulkovo		82·3	329	i 12 25	0	i 22 39	− 1	—	—	—
Kishinev		83·6	317	e 12 33	+ 2	—	—	—	—	—
Istanbul		83·8	311	e 12 33	+ 1	e 22 54	− 1	e 15 49	PP	—
Helsinki		85·0	330	i 12 39a	+ 1	e 23 4	− 3	e 13 32	?	—
Bucharest		85·7	314	e 12 39	− 3	e 23 16	+ 2	12 53	PcP	—
College		86·1	25	12 43	− 1	23 19	+ 1	—	—	—
Lwow		86·6	319	i 12 47	+ 1	i 23 23	0	—	—	—
Uzhgorod		87·8	318	i 12 55	+ 3	23 35	+ 1	—	—	—
Upsala		88·7	330	e 13 58	+61	e 23 37	− 6	e 24 45	PS	e 47·2
Timisoara	E.	89·0	316	e 12 48	−10	e 23 41	− 4	e 13 27	?	—
Skalnate Pleso		89·1	319	e 13 0	+ 2	e 23 50	+ 4	e 23 29	SKS	—
Belgrade		89·7	315	e 13 1a	0	e 23 49	− 3	e 16 38	PP	e 60·9
Pietermaritzburg	Z.	90·3	240	i 12 45	−19	—	—	—	—	—
Pretoria	Z.	91·7	244	i 13 11	+ 1	—	—	—	—	—
Copenhagen		92·3	327	i 13 15	+ 2	i 24 22	+ 7	23 53	SKS	—
Prague		92·6	321	13 16?	+ 1	e 23 49	[+ 1]	e 24 22	S	e 36·2
Taranto		92·8	311	e 19 20?	PPP	—	—	—	—	—
Potsdam		92·9	323	e 13 19	+ 3	i 24 24	+ 4	e 23 45	SKS	e 47·2
Collmberg	Z.	93·2	322	e 13 17	0	e 17 13	PP	e 16 48	?	—

Continued on next page.

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		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Cheb		93·9	322	e 17 5	PP	e 23 56	[+ 1]	e 24 23	S	—
Triest		94·1	317	e 17 52	PP	e 24 10	{− 2}	e 24 50	S	—
Jena		94·2	322	e 13 22	0	e 17 20	PP	e 16 29	?	—
Messina		94·5	309	e 13 28	+ 5	e 24 6	[+ 8]	e 17 13	PP	—
Kimberley	z.	95·0	243	i 13 27	+ 1	—	—	—	—	—
Rome		96·0	313	e 17 30	PP	e 24 7	[0]	e 29 29	?	e 47·2
Resolute Bay		96·3	8	e 13 32	0	e 24 50	+ 1	e 24 4	SKS	e 36·2
Stuttgart		96·3	321	e 13 32	0	e 24 51	+ 2	e 17 30	PP	e 50·2
Witteveen	z.	96·5	325	i 13 34	+ 2	—	—	—	—	—
Strasbourg		97·2	321	e 13 20	−16	e 24 14	[+ 1]	e 24 59	S	e 51·2
Pavia		97·4	318	e 17 45	PP	e 24 16	[+ 2]	e 26 57	PPS	—
De Bilt		97·6	325	e 13 34	− 4	e 24 14	[− 1]	e 25 4	S	e 50·2
Scoresby Sund		98·0	348	e 13 45	+ 6	e 25 8	+ 4	—	—	48·2
Paris		100·4	322	e 18 3	PP	e 24 37	[+ 8]	i 25 5	SKKS	e 44·2
Kew		100·9	326	e 17 50	PP	e 25 28	0	e 24 36	SKS	e 47·2
Rathfarnham C.	z.	103·3	329	e 14 9	+ 6	e 23 19	?	e 18 18	PP	—
Algiers Univ.	z.	104·5	311	e 17 36	?	—	—	—	—	—
Tortosa		104·8	315	—	—	i 26 5	+ 5	—	—	e 52·2
Seattle		104·9	37	—	—	e 24 59	[+ 9]	e 25 27	SKKS	—
Alicante		106·5	314	18 37	PP	25 52	{+12}	29 19	PPS	e 51·1
Tamanrasset	z.	106·7	297	e 17 33	?	e 18 38	PP	e 20 56	PPP	—
Shasta Dam		108·0	43	e 18 55	PP	—	—	—	—	—
Toledo		108·4	316	e 18 29	[− 1]	e 33 56	SS	—	—	—
Almeria		108·5	313	e 18 46	PP	25 45	{− 9}	21 32	PPP	62·2
Mineral	z.	108·7	43	e 18 23	[− 7]	—	—	e 19 4	PP	—
Granada		109·2	314	18 58 a	PP	25 21	[+12]	21 33	PPP	65·2
Hungry Horse		109·2	33	i 18 33	[+ 2]	—	—	e 14 30	P	—
Berkeley		109·3	46	e 19 6	PP	e 24 53	−16	e 28 30	PS	e 50·2
Malaga		110·0	314	e 28 40	PS	e 29 48	PPS	i 32 32	?	64·6
Reno	z.	110·3	43	e 18 59	[+25]	—	—	e 19 17	PP	—
China Lake	z.	113·6	46	e 18 43	[+ 3]	—	—	e 19 32	PP	—
Pasadena		113·9	48	e 18 43	[+ 2]	—	—	e 29 25	PKKP	e 52·4
Boulder City		115·5	45	e 18 47	[+ 3]	—	—	e 20 8	PP	—
Tucson		120·1	46	e 18 56	[+ 3]	—	—	e 20 47	PP	—
Seven Falls	E.	125·8	6	—	—	28 9	{+16}	38 4	SS	—
Ottawa		126·7	11	19 7	[+ 1]	e 26 29	[+18]	e 32 52	PPS	—
St. Louis		128·2	27	e 19 19	[+10]	e 28 13	{+ 5}	e 21 17	PP	—
Cleveland		129·0	18	i 19 21k	[+11]	e 31 30	PS	e 21 18	PP	—
Harvard		130·2	8	e 19 16	[+ 4]	i 22 36	PKS	i 21 38	PP	e 66·8
Weston		130·4	8	e 19 15	[+ 2]	—	—	e 21 24	PP	—
Pennsylvania	E.	130·7	14	—	—	38 9?	SS	—	—	—
Palisades		131·3	10	e 19 16	[+ 2]	e 39 2	SS	e 21 30	PP	e 67·2
Tacubaya		136·0	53	e 16 25	P	e 23 4	PKS	—	—	—
Bogota		164·2	43	e 19 12	[−53]	e 44 59	SS	e 20 11	P	—
Huancayo		167·0	114	e 20 12	[+ 5]	—	—	—	—	—
La Paz		169·3	154	e 20 22	[+13]	32 35	{+35}	i 21 31	PKP_2	81·6

Additional readings :—
Manila i = 2m.23s., e = 4m.50s.
Nanking iZ = 5m.51s., iN = 10m.5s., iEN = 10m.37s.
Tokyo PPP?E = 8m.47s., PcP?N = 9m.41s., L = 13m.54s.
Hukusima e = 6m.31s. and 12m.38s., eL = 14m.34s.
Sendai e = 9m.23s. and 10m.51s.
Urakawa ePPP = 9m.52s.
Bombay PPPE = 10m.58s., iSSEN = 18m.12s.
Riverview iZ = 9m.18s. and 10m.52s., iE = 16m.40s., iN = 16m.49s., eN = 21m.39s.
Istanbul eSSE = 28m.27s.
Upsala e = 19m.37s., eN = 28m.51s.
Skalnate Pleso ePP = 16m.28s., e = 21m.22s., ePPS = 25m.0s., eSS = 29m.39s., eSSS = 33m.33s.
Belgrade eNW = 21m.33s., eScSNE = 24m.4s.
Copenhagen 30m.39s., SSS = 34m.45s.
Prague ePP = 16m.59s., ePSN = 25m.21s., ePPSN = 25m.58s. and other unidentified e readings.
Potsdam ePPZ = 17m.6s., ePSZ = 25m.33s., eSSN = 30m.44s.
Cheb e = 19m.13s., ePPS = 26m.4s., e = 28m.6s., eSS = 30m.21s., eSSS = 34m.45s.
Messina e = 27m.30s.

Continued on next page.

Resolute Bay eN = 17m.38s., eEN = 26m.6s.
Stuttgart eZ = 16m.34s., eSKS = 23m.57s., ePS = 26m.9s., ePPS = 27m.9s., eSS? = 31m.15s., e = 39m.15s.
Strasbourg e = 16m.55s., ePS = 26m.22s., ePPS = 26m.59s., eSS = 31m.9s.?.
Pavia e = 18m.33s. and 28m.8s., eSS = 31m.51s.
De Bilt ePP = 17m.39s., eSS = 31m.54s.
Paris ePS = 26m.59s., ePPS = 27m.45s., eSS = 32m.21s., e = 37m.47s.
Rathfarnham Castle eSS? = 33m.16s., eEZ = 36m.9s.
Seattle ePPS = 28m.57s., ePKKP = 29m.31s.
Alicante SSS = 38m.21s., Q = 44m.45s.
Tamanrasset eZ = 29m.46s., ePKKPZ = 30m.5s.
Berkeley eZ = 20m.11s., ePS?N = 28m.15s., eN = 38m.49s.
Granada PPS = 29m.46s.
Seven Falls eE = 29m.2s., PSE = 32m.3s.
Ottawa eN = 31m.36s.
St. Louis eSKP = 22m.31s., e = 30m.51s., ePS = 31m.23s.
Cleveland ePPZ = 21m.21s., iZ = 24m.59s.
Harvard ePPS = 33m.7s., eSS = 38m.39s.
Bogota eSKKSEN = 30m.15s.
La Paz PPS = 39m.41s., iSS = 46m.21s.
Long waves were also recorded at Christchurch, Wellington, and Bergen.

June 2d. Readings also at 0h. (near Dzhergetal and near Huancayo), 1h. (near Dzhergetal (2) and near Chinchina), 2h. (Apia), 3h. (Huancayo, Apia, Przhevalsk, Krasnogorka, Fergana, Dzhergetal, Khorog, Obi-garm, Tchimkent, near Naryn, Rybach'e, Kurmenty, Almata II, Frunse, Almata, Chilisk, Ili, Andijan, near Scoresby Sund, and near Copiapo), 4h. (Apia), 5h. (Oaxaca, Puebla, Merida, Tacubaya, Vera Cruz, Collmberg, and near Apia), 8h. (Mineral), 9h. (near Dzhergetal), 10h. and 11h. (near Manila), 13h. (Oaxaca, Puebla, Vera Cruz, and near Tacubaya), 14h. (Christchurch, Wellington, Stuttgart, Strasbourg, Paris, Toledo, near Granada, Malaga, Puebla, and near Tacubaya), 15h. (Alicante and near Dzhergetal), 16h. (near Antofagasta, near Basle, and near Alicante), 17h. (Manila, Frunse, Ili, near Tashkent, Dzhergetal, Lunacharskoe, Obi-garm, Fergana, Stalinabad, Andijan, Tchimkent, Khorog, and Samarkand), 19h. (Tacubaya and Puebla), 20h. (Tortosa), 21h. (Tortosa, Grozny, near Kurmenty, and near Triest), 22h. (Mount Wilson, Riverside, China Lake, La Paz, Copiapo, and near Antofagasta), 23h. (Tortosa and near Dzhergetal).

June 3d. 13h. 7m. 35s. Epicentre 17°·5N. 94°·1W. (as on 1945, Jan. 18d.).

A = −·0682, B = −·9519, C = +·2989; δ = +11; h = +5;
D = −·997, E = +·071; G = −·021, H = −·298, K = −·954.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Oaxaca		1·3	259	0 41	+16	1 11	+27	—	—	—
Vera Cruz		2·6	311	0 43	− 1	1 14	− 3	—	—	—
Puebla		4·2	292	1 4	− 3	(2 0)	+ 3	—	—	2·0
Tacubaya		5·2	292	1 20	− 1	(2 34)	S*	—	—	2·6
Merida		5·4	50	1 23	− 1	2 30	+ 2	—	—	—
Morgantown		25·2	25	i 5 41	+12	e 10 36	−16	—	—	—
Palomar	z.	25·8	313	e 5 28	− 6	—	—	i 5 44	pP	—
Riverside	z.	26·5	314	i 5 51	+10	—	—	i 6 4	?	—
Mount Wilson	z.	27·1	314	e 5 39	− 7	—	—	i 5 55	pP	—
Pasadena	z.	27·2	314	i 5 55	+ 8	—	—	e 6 3	pP	—
China Lake	z.	27·7	317	e 5 45	− 7	—	—	i 6 0	pP	—
Tinemaha	z.	28·7	318	i 6 12	+11	—	—	i 6 19	pP	—
Lick	z.	31·3	16	e 6 18a	− 6	—	—	i 6 32	?	—
Ottawa	z.	31·8	24	6 43	+15	—	—	—	—	—
Mineral	z.	32·9	320	6 35a	− 3	—	—	e 6 47	?	—
Rathfarnham Castle		74·9	38	—	—	e 21 25	+ 3	—	—	—
Paris		81·3	41	i 12 13	− 7	—	—	—	—	—
Strasbourg		84·6	40	e 12 29	− 7	—	—	—	—	—
Stuttgart	z.	85·5	40	e 12 33	− 8	—	—	—	—	—
Jena	z.	86·1	38	e 12 37	− 7	—	—	e 12 55	?	—
Tamanrasset	z.	91·8	65	i 13 3a	− 8	—	—	—	—	—

Additional readings :—
Palomar iZ = 5m.52s. and 6m.6s.
Mount Wilson iZ = 5m.50s. and 6m.3s.
Pasadena iZ = 6m.13s.
China Lake iZ = 6m.9s., eZ = 6m.23s.
Lick iZ = 6m.54s.
Long waves were also recorded at Tortosa.

June 3d. 18h. 30m. 24s. Epicentre 24°·3N. 122°·3E. (as on May 22d.).

$A = -·4876$, $B = +·7713$, $C = +·4092$; $\delta = +10$; $h = +4$;
$D = +·845$, $E = +·534$; $G = -·219$, $H = +·346$, $K = -·912$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Zi-ka-wei	N.	6·9	354	e 1 47	+ 2	e 3 14	+ 9	—	—	—
Nanking		8·3	339	e 2 7	+ 3	e 3 41	+ 1	—	—	e 3·8
Manila		9·7	188	i 2 18	− 4	—	—	—	—	—
Hukuoka		11·6	36	e 2 54	+ 4	e 6 1	+60	—	—	e 7·1
Ooita		12·1	41	e 3 2	+ 5	—	—	—	—	—
Osaka		15·3	44	e 4 30	+51	—	—	—	—	—
Hunatu		18·1	47	e 4 34	+20	—	—	—	—	—
Matusiro		18·3	41	—	—	e 7 51	+12	e 11 28	PcS	—
Oiwake		18·4	42	e 4 48	+30	—	—	—	—	—
Vladivostok		20·4	22	e 4 40	− 1	i 8 52	+27	—	—	—
Korror		20·5	143	4 39	− 3	—	—	—	—	—
Kabansk		30·2	341	e 6 12	− 2	—	—	—	—	—
Petropavlovsk		39·7	33	i 7 44	+ 8	—	—	—	—	—
Almata		41·6	309	i 7 53	+ 2	—	—	—	—	—
Naryn		41·9	305	i 7 56	+ 2	—	—	—	—	—
Rybach'e		42·1	308	i 7 56	+ 1	—	—	—	—	—
Frunse		43·2	308	i 8 7	+ 3	—	—	—	—	—
Andijan		44·6	304	i 8 17	+ 1	—	—	—	—	—
Khorog		44·9	299	i 8 21	+ 3	—	—	—	—	—
Dzhergetal		45·3	302	i 8 23?	+ 2	15 6?	+ 4	—	—	—
Tchimkent		46·8	306	i 8 34	+ 1	—	—	—	—	—
Lunacharskoe		46·9	305	i 8 38	+ 4	—	—	—	—	—
Tashkent		46·9	305	i 8 33	− 1	e 15 27	+ 2	—	—	—
Mary		52·7	300	9 20	+ 2	—	—	—	—	—
Sverdlovsk		54·6	324	i 9 31	− 1	17 23	+12	—	—	—
Grozny		64·2	308	e 10 40	+ 1	—	—	—	—	—
Kirovobad		64·2	305	i 10 39	0	—	—	—	—	—
Tiflis		65·2	307	e 10 45	0	—	—	—	—	—
Gori		65·7	307	e 10 48	0	—	—	—	—	—
Moscow		67·4	323	e 10 59	0	—	—	—	—	—
Ksara		74·1	300	i 11 40	0	e 22 7	+55	—	—	—
Resolute Bay		78·4	10	e 12 1	− 3	e 22 3	+ 3	—	—	e 29·6
Uzhgorod		78·4	318	12 5	+ 1	—	—	—	—	—
Helwan	z.	79·1	298	e 12 6	− 2	—	—	—	—	—
Copenhagen		80·7	327	—	—	e 22 24	0	—	—	38·6
Potsdam		82·0	324	e 12 23	0	—	—	—	—	e 41·6
Scoresby Sund		82·2	348	i 12 12	−12	—	—	—	—	e 41·6
Prague		82·4	322	e 12 24	− 1	e 22 30	−11	—	—	—
Jena	z.	83·5	323	e 12 31	0	—	—	—	—	—
Witteveen	z.	85·1	327	e 12 39	0	—	—	—	—	—
Stuttgart		86·0	322	e 12 41	− 2	e 23 6	[− 1]	e 14 26	?	e 46·3
De Bilt		86·2	327	e 12 36	− 8	—	—	—	—	e 44·6
Strasbourg		86·9	323	e 12 47	− 1	—	—	—	—	e 47·6
Paris		89·6	325	i 13 1	0	—	—	e 16 32	PP	e 47·6
China Lake	z.	97·7	45	e 13 37	− 1	—	—	—	—	—
Granada		100·4	319	18 22a	PP	—	—	—	—	59·2
Tamanrasset	z.	102·8	303	17 32	?	e 18 16	PP	e 18 3	PKP	—

Additional readings :—
Hukuoka eS?N =6m.39s.
Calcutta iN =20m.33s.
Prague e =12m.46s., 13m.42s. and 16m.46s.
Long waves were recorded at Kew, Aberdeen, Tortosa, Almeria, Malaga, Upsala, Harvard, Calcutta, and Chatra.

June 3d. Readings also at 0h. (near Grozny), 2h. (Terre Adelie, Brisbane, and near Bogota), 3h. (Riverside, China Lake, Palomar, Rybach'e, and near Dzhergetal), 5h. (Victoria, near Seattle, China Lake, Palomar, Apia, and near Dzhergetal), 6h. (Mineral and near Dzhergetal), 7h. (near Alicante), 8h. (near Riverview), 9h. (Puebla and Tacubaya), 10h. (China Lake, Palomar, and Apia), 11h. (Mineral, China Lake, Apia, and near Alicante), 12h. (China Lake, Mount Wilson, Stuttgart (2), Strasbourg, Paris, near Kirovobad, Tiflis, Gori, Borzhomi, Erevan, Leninakan, and Grozny), 14h. and 16h. (Tortosa), 17h. (Manila, Tamanrasset, and near Istanbul), 18h. (near Zürich), 19h. (near Istanbul and near Dzhergetal (2)), 21h. (China Lake, Tinemaha, Riverside, Palomar, Mineral, Seattle, Victoria, Fresno, and near Apia), 23h. (Apia).

June 4d. Readings also at 0h. (Wellington, Pavia, Brisbane, near Dzhergetal, and Fergana), 1h. (Lunacharskoe, Przhevalsk, Ili, Samarkand, near Obi-garm, Andijan, Stalinabad, Khorog, Tashkent, Naryn, and near Dzhergetal), 3h. (near Dzhergetal), 5h. (near Santa Lucia), 6h. (near Chatra), 7h. (Apia), 9h. (Almeria, Toledo, near Granada, and Malaga), 10h. (near Kirovobad), 11h. (Apia), 12h. (Tamanrasset, Harvard, Palomar, Pasadena, Riverside, China Lake, Lick, Reno, Mineral, Victoria, Copiapo, La Paz, and near Antofagasta), 14h. (Ashkabad, Naryn, Frunse, Rybach'e, Almata, Ili, near Obi-garm, Khorog, Fergana, Stalinabad, Andijan, Murgab, Tashkent, Lunacharskoe, Samarkand, and Tchimkent), 16h. (Riverview), 17h. (Nanking, Mount Wilson, Riverside, Palomar, and China Lake), 18h. (Palisades, Harvard, Granada, Tortosa, and near Chatra), 22h. (Huancayo).

June 5d. 1h. 34m. 19s. Epicentre 9°·0N. 86°·1W. Depth of focus 0·005.
(as on May 14d.).

$A = +·0672$, $B = -·9856$, $C = +·1554$; $\delta = +7$; $h = +7$;
$D = -·998$, $E = -·068$; $G = +·011$, $H = -·155$, $K = -·988$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Balboa Heights		6·5	89	e 1 35	0	—	—	—	—	—
Galerazamba		10·8	80	i 2 52	PPP	i 5 48	L	—	—	(i 5·8)
Chinchina		11·1	110	i 2 37	− 1	i 4 26	−16	—	—	—
Merida		12·3	345	2 59	+ 5	—	—	—	—	e 6·2
Bogota		12·7	109	i 3 0	0	5 42	SS	—	—	—
Puebla		15·4	312	e 3 33	− 2	—	—	—	—	—
Tacubaya		16·3	311	e 3 51	+ 5	i 6 53	+ 9	—	—	—
San Juan		21·5	60	e 4 45	0	e 8 44	PcP	e 4 53	pP	—
Huancayo		23·5	152	i 5 17	pP	i 9 47	SS	—	—	—
Fort de France		25·1	75	e 5 6	−14	e 9 49	sS	—	—	—
Cherry Point		26·2	17	—	—	e 10 14	+18	—	—	—
St. Louis		29·7	353	e 5 58	− 4	e 10 45	− 7	e 9 7	PcP	e 13·3
Washington		30·9	14	i 6 9	− 4	e 12 46	SS	i 6 18	pP	—
La Paz		31·0	144	e 6 17	+ 3	11 11	−1	13 13	SS	14·9
Pennsylvania		32·5	11	—	—	14 41	SSS	—	—	—
Cleveland	N.	32·6	6	i 6 23	− 5	—	—	i 6 34	pP	—
	Z.	32·6	6	i 6 26	− 2	—	—	i 7 41	PP	—
Tucson		32·6	318	e 6 28	0	e 10 59	?	e 6 40	pP	—
Palisades		33·7	18	i 6 33	− 4	e 11 52	− 2	i 7 45	PP	e 16·7
Harvard		35·7	19	i 6 51	− 3	—	—	—	—	e 17·2
Weston		35·7	19	e 6 47	− 7	—	—	—	—	—
Palomar	Z.	37·3	316	i 7 9a	+ 1	—	—	i 9 32	PcP	—
Ottawa		37·4	12	i 7 3	− 5	12 49	− 2	8 31	PP	e 19·4
Boulder City		37·5	320	i 7 10	+ 1	—	—	—	—	—
Riverside	Z.	38·0	316	i 7 15	+ 2	i 7 34	sP	e 9 31	PcP	—
Pasadena		38·6	316	i 7 20a	+ 2	i 7 38	sP	i 9 42	PcP	—
Shawinigan Falls	N.	39·1	14	e 7 16	− 7	—	—	—	—	—
China Lake	Z.	39·2	319	i 7 24	+ 1	i 7 41	sP	i 7 37	pP	—
Seven Falls	E.	40·2	16	e 14 52	?	—	—	—	—	e 18·8
Tinemaha	Z.	40·3	319	i 7 31	+ 2	—	—	i 9 38	PcP	—
Fresno	Z.	41·2	318	e 7 39a	− 1	e 7 59	sP	e 9 39	PcP	—
Reno	Z.	42·8	321	e 7 55k	+ 2	—	—	—	—	—
Berkeley	Z.	43·4	317	e 7 56a	− 2	e 8 12	sP	i 8 6	pP	—
Mineral	Z.	44·4	321	e 8 5a	− 1	—	—	i 8 17	pP	—
Shasta Dam		45·1	321	e 8 9	− 3	—	—	9 53	PP	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Hungry Horse		45·7	334	i 8 17	+ 1	—	—	i 9 56	PP	—
Arcata	z.	46·2	319	e 8 10k	−10	—	—	e 8 23	P	—
Seattle		49·2	328	e 8 43k	− 1	e 9 5	sP	e 8 52	pP	—
Victoria		50·3	328	8 51	− 1	—	—	—	—	—
Resolute Bay		65·8	358	e 10 35	− 6	e 20 37	PPS	—	—	e 31·6
College		70·1	336	e 11 6	− 1	—	—	—	—	—
Malaga		78·0	54	i 11 56	+ 3	e 21 58	sS	e 15 34	sPP	36·4
Tortosa		81·6	49	—	—	e 28 9	sSS	—	—	e 37·7
Paris		82·4	41	e 12 16	0	e 22 34	+ 8	e 15 18	PP	e 37·7
Strasbourg		85·9	42	e 12 35	+ 1	e 22 57	− 4	e 12 48	pP	39·7
Stuttgart		86·8	42	e 12 39	+ 1	e 23 8	− 1	e 12 46	PcP	e 42·7
Jena	z.	87·9	38	e 12 44	0	—	—	e 12 52	PcP	—
Tamanrasset	z.	88·0	66	i 12 47a	+ 3	—	—	e 16 2	PP	—
Cheb		88·6	39	e 21 23	?	—	—	—	—	e 45·2
Prague		89·9	39	e 13 2	+ 9	23 28	−10	e 13 22	pP	e 45·7
Nanking		132·8	331	e 22 41	PKS	(e 27 48)	SKKS	—	—	e 27·8

Additional readings :—
St. Louis ePP =6m.53s., eSS =12m.21s.
La Paz iZ =7m.57s.
Riverside iZ =9m.40s.
China Lake iPcPZ =9m.35s., iZ =9m.45s.
Fresno eN =8m.55s., eZ =11m.6s.
Paris e =13m.14s.
Tamanrasset eZ =13m.45s.
Prague eN =16m.41s., eSS =29m.17s.
Long waves were also recorded at Scoresby Sund, Aberdeen, Kew, Pavia, Copenhagen, Potsdam, Almeria, and Granada.

June 5d. 3h. 34m. 49s. Epicentre 36°·0N. 48°·5E.

$A = +·5373$, $B = +·6073$, $C = +·5852$; $\delta = -4$; $h = 0$;
$D = +·749$, $E = -·663$; $G = +·388$, $H = +·438$, $K = -·811$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Lenkoran		2·8	5	0 52	P*	—	—	—	—	—
Shemakla		4·6	1	1 14	+ 2	—	—	—	—	—
Kirovobad		5·0	341	1 20	+ 2	i 2 28	S*	—	—	—
Leninakan		6·0	324	e 1 40	P*	—	—	—	—	—
Tiflis		6·4	334	1 41	+ 3	—	—	—	—	—
Gori		6·9	332	e 1 51	+ 6	—	—	—	—	—
Grozny		7·6	345	e 1 58	+ 3	—	—	—	—	—
Ksara		10·6	261	e 2 41?	+ 5	i 5 27	?	—	—	—
Mary		10·9	77	2 47	+ 7	—	—	—	—	—
Yalta		13·8	312	3 20	+ 1	—	—	—	—	—
Helwan	z.	15·7	252	e 3 46	+ 2	—	—	4 7	PPP	—
Istanbul		16·0	294	e 3 46	− 2	e 6 50	+ 4	e 7 3	SS	—
Stalinabad		16·4	75	3 57	+ 4	—	—	—	—	—
Lunacharskoe		17·1	65	i 4 8	+ 6	—	—	—	—	—
Obi-garm		17·1	75	4 5	+ 3	—	—	—	—	—
Tashkent		17·1	65	e 4 4	+ 2	—	—	—	—	—
Khorog		18·6	77	e 4 24	+ 3	—	—	—	—	—
Andijan		19·3	68	e 4 30	+ 1	8 12	+10	—	—	—
Athens		19·9	282	i 4 36	0	—	—	—	—	—
Frunse		21·2	63	e 4 53	+ 4	i 8 55	PcP	—	—	—
Moscow		21·2	344	i 4 48	− 1	e 8 38	− 3	—	—	—
Naryn		22·1	66	e 4 59	0	i 9 0	+ 2	—	—	—
Rybach'e		22·3	63	e 5 3	+ 2	—	—	—	—	—
Sverdlovsk		22·4	17	5 2	0	9 12	+ 8	—	—	—
Lwow		22·5	317	i 5 2?	0	—	—	—	—	—
Almata		23·0	61	e 5 15	+ 8	9 31	+17	—	—	—
Belgrade	z.	23·0	302	e 5 8a	+ 1	—	—	e 5 57	PPP	—
Uzhgorod		23·0	313	i 5 3?	− 4	—	—	—	—	—
Przhevalsk		24·0	63	e 5 20	+ 3	—	—	—	—	—
Skalnate Pleso		24·5	313	e 5 28	+ 6	e 12 49	PcS	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Pulkovo		26·6	340	i 5 42	0	e 10 19?	+ 3	—	—	—
Triest	z.	27·8	302	e 5 54	+ 1	—	—	6 58	PPP	—
Prague		28·3	312	e 5 55	− 2	—	—	6 53	PP	—
Cheb		29·6	311	—	—	e 11 8	+4	e 12 39	SS	—
Potsdam		29·8	315	—	—	e 12 11?	SS	—	—	e 16·2
Jena		30·3	312	e 6 15?	0	—	—	—	—	—
Chur		30·9	303	e 6 19k	− 1	—	—	—	—	—
Pavia		31·0	300	—	—	e 11 22	−4	—	—	—
Copenhagen		31·4	321	i 6 25	0	—	—	—	—	14·2
Stuttgart		31·4	307	e 6 23	− 2	—	—	e 14 17	Q	e 18·2
Zürich		31·6	305	e 6 24a	− 2	—	—	—	—	—
Basle		32·2	305	e 6 33	0	—	—	—	—	—
Strasbourg		32·3	307	e 6 30	− 3	—	—	e 7 54	PP	—
Wittevecn	z.	33·7	315	i 6 46	+ 1	—	—	—	—	—
Paris		35·8	306	i 7 1	− 2	e 13 29	PcS	e 8 39	PPP	e 23·2
Tamanrasset	z.	39·4	263	i 7 32k	− 1	e 8 41	PP	e 9 44	PcP	—
Rathfarnham C.	z.	41·5	313	e 8 1	+11	—	—	e 10 0	PPP	—
Pretoria	z.	64·4	199	i 10 42	+ 2	—	—	—	—	—
Resolute Bay		67·0	350	e 10 53	− 4	e 19 53	+ 3	—	—	—
Kimberley	z.	68·2	201	i 10 24	−40	—	—	—	—	—
Harvard		84·6	320	i 12 37	+ 1	—	—	—	—	—

Additional readings :—
Helwan eZ = 5m.14s. and 6m.35s., PcPZ = 8m.43s., iZ = 9m.34s.
Istanbul ePcPEN = 8m.50s.
Skalnate Pleso e = 5m.44s., 6m.29s., and 8m.46s.
Triest eZ = 6m.7s.
Prague i = 6m.18s., e = 6m.32s., 7m.25s., 8m.6s., and 10m.8s.
Jena eN = 6m.19s. and 7m.57s.
Paris e = 7m.30s. and 11m.50s., eSS = 16m.42s., eSSS = 17m.48s., e = 21m.37s.
Tamanrasset iZ = 7m.50s., eZ = 8m.2s.
Long waves were also recorded at Tortosa, Granada, De Bilt, and Scoresby Sund.

June 5d. 16h. 57m. 45s. Epicentre 29°·8N. 131°·2E. Depth of focus 0·005.
(as on 1942, Aug. 25d.).

Intensity V at Kumamoto and surrounding area ; IV at Yaku-shima, Naze, Unzendake, Ooita ; II-III at Nagasaki, Uwajima, Aso-san. Epicentre 29°·8N. 131°·7E. Depth 90km.

Seismological Bulletin of the Central Meteorological Observatory, Japan, for June, 1951, Tokyo, 1951, p.130, macroseismic chart p.130.

A = −·5725, B = +·6540, C = +·4945 ; δ = 0 ; h = +2 ;
D = +·752, E = +·659 ; G = −·326, H = +·372, K = −·869.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Yakusima	0·9	317	0 17a	− 1	0 33	+ 2	—	—	—
Miyazaki	2·1	5	0 32k	− 2	0 57	− 2	—	—	—
Kumamoto	3·0	352	0 48a	+ 1	1 21	− 1	—	—	—
Nagasaki	3·1	339	0 45	− 3	1 26	+ 2	—	—	—
Unzendake	3·1	345	0 46a	− 2	1 21	− 3	—	—	—
Simidu	3·3	27	0 39	−12	1 36	+ 7	—	—	—
Ooita	3·4	6	0 50	− 2	—	—	—	—	—
Saga	3·5	347	0 55	+ 1	1 46	+12	—	—	—
Uwazima	3·6	18	0 50	− 5	1 29	− 8	—	—	—
Hukuoka	3·8	349	0 59a	+ 1	1 41	− 1	—	—	—
Simonoseki	4·1	357	1 3	+ 1	1 48	−1	—	—	—
Kôti	4·2	27	1 0k	− 3	1 48	− 4	—	—	—
Matuyama	4·2	17	1 0k	− 3	1 45	− 7	—	—	—
Muroto	4·3	35	1 0	− 5	1 57	+ 3	—	—	—
Hirosima	4·7	12	1 3	− 7	1 52	−12	—	—	—
Ituhara	4·7	340	1 10	0	2 22	SS	—	—	—
Hamada	5·1	8	1 16	0	2 9	− 5	—	—	—
Takamatsu	5·1	27	1 12	− 4	2 8	− 6	—	—	—
Okayama	5·4	24	1 15	− 5	2 26	+ 4	—	—	—
Siomisaki	5·4	46	1 14	− 6	2 8	−14	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Sumoto		5·5	34	1 18k	− 3	2 16	− 8	—	—	—
Matsue		5·8	15	2 39	S	(2 39)	+ 7	4 43	?	—
Kobe		5·9	33	1 24	− 3	2 51	SS	—	—	—
Yonago		5·9	17	2 39	S	(2 39)	+ 5	4 44	?	—
Osaka		6·0	36	1 25	− 3	2 49	SS	—	—	—
Owase		6·0	44	1 25k	− 3	2 31	− 6	—	—	—
Tottori		6·2	23	1 44	PP	2 47	+ 6	—	—	—
Toyooka		6·4	27	1 31k	− 3	2 45	− 1	—	—	—
Saigo		6·6	15	1 40	+ 3	3 9	SS	—	—	—
Tu		6·6	41	1 36	− 1	—	—	—	—	—
Kameyama		6·7	40	1 35	− 3	3 18	SS	—	—	—
Maizuru		6·7	31	1 29	− 9	2 51	− 3	—	—	—
Hikone		6·9	37	1 37	− 4	3 8	+ 9	—	—	—
Tsuruga		7·1	34	1 40	− 4	—	—	—	—	—
Gihu		7·2	38	1 43	− 2	3 6	0	—	—	—
Nagoya		7·2	41	1 42k	− 3	—	—	—	—	—
Hukui		7·5	33	1 47	− 2	3 15	+ 1	—	—	—
Omaesaki		7·6	49	1 47	− 3	3 45	SS	—	—	—
Torisima		7·8	83	1 53	0	3 38	SS	—	—	—
Iida		8·0	43	1 50	− 6	—	—	—	—	—
Shizuoka		8·0	48	1 45	−11	3 6	−20	—	—	—
Kanazawa		8·1	33	1 57	0	3 31	+ 3	—	—	—
Takayama		8·1	37	1 57	0	—	—	—	—	—
Misima		8·4	47	1 57	− 5	3 42	+ 6	—	—	—
Hunatu		8·5	46	1 59k	− 4	4 8	SS	—	—	—
Kohu		8·5	45	2 0	− 3	3 45	+ 7	—	—	—
Matumoto		8·5	39	1 41	−22	—	—	—	—	—
Osima		8·5	52	1 59	− 4	3 40	+ 2	—	—	—
Toyama		8·5	35	1 59	− 4	3 52	SS	—	—	—
Zi-ka-we	N.	8·5	281	—	—	3 38	0	—	—	—
Matusiro		8·9	39	2 5	− 3	3 58	SS	—	—	—
Mera		8·9	53	2 2	− 6	3 59	SS	—	—	—
Wazima		8·9	31	2 6	− 2	4 27	SSS	—	—	—
Oiwake		9·0	41	2 6	− 4	3 50	− 1	—	—	—
Titibu		9·0	45	2 8	− 2	—	—	—	—	—
Nagano		9·0	38	2 5	− 5	—	—	—	—	—
Yokohama		9·1	49	2 9	− 2	3 55	+ 2	—	—	—
Kumagaya		9·3	45	2 11k	− 3	4 33	SSS	—	—	—
Maebasi		9·3	43	2 12	− 2	4 37	+39	—	—	—
Tokyo		9·3	48	2 9k	− 5	4 5	+ 7	—	—	—
Takada		9·4	37	2 11	− 4	—	—	—	—	—
Tukubasan		9·8	47	2 17	− 4	—	—	—	—	—
Utunomiya		9·9	45	2 18	− 4	—	—	—	—	—
Mito		10·2	47	2 24	− 2	4 24?	+ 4	—	—	—
Niigata		10·4	37	2 28	− 1	4 21	− 4	—	—	—
Shirakawa		10·5	43	2 27	− 3	4 39	SS	—	—	—
Nanking		10·9	285	i 2 34	− 2	e 4 38	+ 1	i 5 8	SSS	—
Hukusima		11·0	42	2 33	− 4	4 47	+ 8	—	—	—
Yamagata		11·3	40	2 41	0	4 53	+ 7	—	—	—
Sakata		11·5	36	2 55	PP	5 26	SSS	—	—	—
Sendai		11·7	41	2 41	− 5	5 33	SSS	—	—	—
Isinomaki		12·0	41	2 44	− 6	—	—	—	—	—
Akita		12·3	34	2 50	− 4	—	—	—	—	—
Mizusawa		12·4	39	2 53	− 3	6 0	SSS	—	—	9·5
Morioka		12·8	37	2 58k	− 3	5 25	+ 3	—	—	—
Miyako		13·2	39	3 1	− 5	—	—	—	—	—
Vladivostok		13·3	2	i 3 7	− 1	i 5 41	+ 7	—	—	—
Mori		14·4	29	3 27	+ 5	—	—	—	—	—
Sapporo		15·5	29	3 33k	− 3	6 50	+24	—	—	—
Urakawa		15·5	34	3 36	0	6 17	− 9	—	—	—
Asahigawa		16·5	29	3 45	− 4	—	—	—	—	—
Kusiro		16·9	35	3 50	− 4	6 55	− 3	—	—	—
Abasiri		17·6	33	4 6	+ 4	—	—	—	—	—
Wakkanai		17·6	25	4 1	− 1	8 9	SSS	—	—	—
Nemuro		17·7	36	4 1	− 2	7 45	SS	—	—	—

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		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Manila		17·8	215	i 4 5	0	i 10 9	L	—	—	(i 10·2)
Guam		20·5	140	4 35	0	—	—	—	—	—
Kabansk		28·7	327	5 53	0	—	—	—	—	—
Irkutsk		29·9	326	6 4	0	—	—	—	—	—
Petropavlovsk		30·8	32	i 6 10	− 2	e 11 13	+ 4	—	—	—
Klyuchi		33·7	29	e 6 54	pP	—	—	—	—	—
Chatra		38·7	278	e 7 20	+ 1	e 13 15	+ 4	9 10	PP	19·7
Calcutta	E.	39·0	270	e 7 26	+ 4	i 13 39	sS	9 6	PP	19·1
Bandoeng		42·9	216	e 7 56	+ 2	—	—	—	—	—
Kurmenty		43·9	303	i 8 4	+ 2	—	—	—	—	—
Mitchell Field		44·1	44	i 8 1	− 3	i 14 40	+ 9	i 9 47	PP	—
Almata II		44·5	304	e 8 8	+ 1	—	—	—	—	—
Ili		44·8	305	i 8 8	− 1	—	—	—	—	—
Almata		44·9	304	i 8 9	− 1	—	—	—	—	—
Rybach'e		45·5	302	i 8 13	− 2	—	—	—	—	—
Naryn		45·7	301	i 8 15	− 1	14 59	+ 5	—	—	—
Frunse		46·6	302	i 8 23	0	e 15 12	+ 5	—	—	—
Andijan		48·4	300	e 8 37	0	15 37	+ 5	—	—	—
Fergana		48·9	300	e 8 41	0	—	—	—	—	—
Dzhergetal		49·5	299	i 8 48	+ 2	—	—	—	—	—
Hyderabad	N.	49·5	268	e 8 43	− 3	i 16 3	PS	10 50	PP	25·3
Khorog		49·5	296	e 8 47	+ 1	15 59	+12	—	—	—
Lunacharskoe		50·7	301	e 8 57	+ 3	—	—	—	—	—
Tashkent		50·7	301	i 8 55	0	i 16 26	PPS	—	—	—
Samarkand		52·7	299	9 5	− 5	—	—	—	—	—
Poona		53·0	272	i 9 23	pP	16 44	+ 8	—	—	25·2
Colombo	E.	53·3	255	8 45	−30	17 0	PS	—	—	26·1
Kodaikanal	E.	53·6	261	8 56	−21	e 17 11	PPS	24 11	Q	26·8
Bombay		53·8	272	e 9 22	+ 4	16 52	+ 6	10 20	PcP	25·0
Sverdlovsk		55·1	321	e 9 28	0	i 17 8	+ 4	—	—	—
Mary		57·0	299	9 42	+ 1	11 38	sPP	i 13 5	PPP	—
Ashkabad		59·6	299	i 10 1	+ 2	e 18 9	+ 6	—	—	—
College		59·6	29	i 9 59	0	—	—	i 10 7	pP	—
Brisbane		60·7	158	i 10 4a	− 3	e 18 20	+ 3	10 21	pP	—
Kizyl-Arvat		60·9	302	10 9	+ 1	—	—	—	—	—
Honolulu		63·7	79	i 10 24	− 3	e 19 0	+ 5	—	—	—
Baku		65·2	304	10 38	+ 1	—	—	—	—	—
Riverview		66·0	162	i 10 41k	− 1	e 19 34	+11	i 10 51	pP	e 27·0
Shemakha		66·0	304	i 9 56	−46	—	—	—	—	—
Lenkoran		66·5	302	10 52	+ 7	—	—	—	—	—
Grozny		67·1	308	10 48	− 1	19 40	+ 4	—	—	—
Sitka		67·3	36	i 10 50	0	i 20 9	PS	11 36	sP	—
Kirovobad		67·6	305	10 54	+ 2	19 49	+ 7	—	—	—
Moscow		67·9	323	e 10 53	− 1	e 19 48	+ 2	—	—	—
Tiflis		68·4	307	e 10 58?	+ 1	e 20 2?	+10	—	—	—
Gori		68·7	307	e 11 4	+ 5	e 20 7	+12	—	—	—
Piatigorsk		68·7	310	10 53?	− 6	20 0?	+ 5	—	—	—
Erevan		69·1	305	e 11 6	+ 5	—	—	—	—	—
Borzhomi		69·3	307	11 7	+ 5	e 20 15	+12	—	—	—
Leninakan		69·4	306	e 11 7	+ 4	—	—	—	—	—
Pulkovo		69·9	328	e 11 5	− 1	i 20 14	+ 4	—	—	—
Apia		70·0	119	11 6	− 1	—	—	—	—	—
Sotchi		71·1	310	e 11 17	+ 4	20 34	+11	—	—	—
Helsinki		72·1	331	e 12 2	pPcP	e 20 39	+ 4	—	—	e 35·0
Theodosia		73·4	313	e 11 27	0	20 53	+ 3	—	—	—
Yalta		74·4	312	11 33	0	e 21 6	+ 5	—	—	—
Upsala		75·4	332	i 11 40	+ 2	i 21 12	0	i 11 59	pP	e 35·2
Kishinev		76·5	317	11 44	− 1	e 21 25	+ 1	—	—	—
Victoria		77·5	41	11 48	− 2	21 43	+ 8	22 0	sS	—
Lwow		77·8	321	i 11 53	+ 1	e 21 45	+ 7	—	—	—
Ksara		78·1	302	i 11 55	+ 1	22 5	sS	—	—	—
Scoresby Sund		78·2	352	i 11 55k	+ 1	21 49	+ 7	12 17	pP	39·2
Seattle		78·6	41	i 11 58k	+ 2	i 22 18	sSKS	12 15	pP	e 35·2
Istanbul		79·3	312	e 12 3	+ 3	i 22 4	+10	e 15 10	PP	e 37·2
Uzhgorod		79·4	320	i 12 4	+ 3	i 22 1	+ 6	—	—	—

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		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bucharest		79·5	315	e 12 7	+ 6	e 22 2	+ 6	e 15 3	PP	31·2
Bergen		79·9	336	e 11 57	− 6	i 22 28	sS	12 27	pP	32·2
Copenhagen		80·2	330	i 12 6k	+ 1	21 57	− 6	i 12 21	pP	38·2
Skalnate Pleso		80·3	322	e 12 9	+ 4	e 22 10	+ 6	e 12 26	pP	40·8
Tuai	N.	80·6	145	e 11 15?	?	—	—	—	—	—
Raciborzu		80·8	324	i 12 11	+ 3	e 22 17	+ 7	i 12 24	pP	e 43·2
Arcata	Z.	81·1	48	e 12 10a	0	—	—	e 12 26	pP	—
Wellington	Z.	81·4	148	i 12 10	− 1	i 22 23	+ 7	i 12 20	PcP	39·2
Timisoara		81·7	318	e 12 18	+ 5	e 22 28	+ 9	e 27 31	SS	e 43·2
Budapest		81·9	321	12 17	+ 3	i 22 29	+ 8	i 12 30	pP	e 40·2
Potsdam		82·0	328	i 12 15	+ 1	i 22 28	+ 6	12 31	pP	e 42·2
Ogyalla		82·1	322	e 12 22	+ 7	22 35	+12	e 12 42	sP	e 40·2
Sofia		82·1	315	e 12 19	+ 4	22 33	+10	—	—	i 42·0
Christchurch		82·3	151	e 12 25	+ 9	22 43	sS	e 31 15	SSS	e 40·8
Shasta Dam		82·3	47	i 12 15	− 1	—	—	—	—	—
Kalossa		82·5	320	e 12 21	+ 4	e 22 38	+11	e 15 37	PP	e 42·8
Belgrade		82·6	318	e 12 19a	+ 2	e 22 36	+ 8	i 12 34	pP	e 44·4
Collmberg		82·7	326	e 12 19	+ 1	e 22 37	+ 8	e 12 34	pP	e 37·2
Hungry Horse		82·8	38	i 12 19	+ 1	—	—	—	—	—
Prague		82·8	325	i 12 21	+ 3	22 36	+ 6	e 12 41	pP	e 39·2
Vienna		82·9	323	e 12 21	+ 2	e 22 43	+12	—	—	—
Mineral	Z.	83·0	47	i 12 19a	− 1	e 15 26	PP	i 12 39	pP	—
Helwan		83·4	300	12 23	+ 1	22 42	+ 6	15 36	PP	—
Jena		83·6	326	e 12 24	+ 1	e 22 43	+ 5	e 12 46	pP	e 43·2
Cheb		83·8	326	e 12 27	+ 3	e 22 47	+ 7	e 15 29	PP	—
Berkeley		83·9	50	i 12 24k	0	i 23 7	+26	i 12 40	pP	—
Reykjavik	Z.	84·0	349	(i 12 28)	+ 3	—	—	(i 12 44)	pP	—
Saskatoon		84·0	32	12 24	− 1	22 49	+ 7	—	—	41·6
Santa Clara		84·4	50	i 12 32	+ 5	e 23 8	sS	—	—	—
Athens		84·5	311	i 12 29k	+ 2	e 22 55	+ 8	—	—	—
Reno		84·6	48	i 12 27k	− 1	e 22 44	− 4	e 22 58	ScS	—
Witteveen	Z.	84·6	330	i 12 31	+ 3	e 16 4	pPP	i 12 42	PcP	—
Aberdeen	E.	84·8	337	i 12 31	+ 2	i 22 52	+ 2	i 12 41	pP	38·4
De Bilt		85·8	330	i 12 38	+ 4	e 22 58	− 2	i 13 22	pP	40·2
Triest		85·9	321	i 12 36a	+ 2	i 23 9	+ 8	i 24 7	PS	e 44·2
Edinburgh	E.	86·2	336	—	—	i 23 7	+ 3	—	—	—
Fresno	Z.	86·2	49	e 12 35k	0	e 23 20	sS	e 12 46	pP	—
Stuttgart		86·2	326	e 12 37k	+ 2	e 22 59	− 5	i 12 58	pP	47·2
Karlsruhe		86·4	327	e 12 38	+ 2	e 23 15	+10	e 12 42	PcP	e 42·2
Durham		86·5	335	e 12 39	+ 2	i 23 10	+ 4	i 12 51	pP	—
Strasbourg		87·0	326	i 12 41	+ 2	e 23 7	[+ 9]	i 12 53	pP	e 44·2
Tinemaha	Z.	87·0	49	i 12 40k	+ 1	—	—	i 12 57	pP	—
Taranto		87·1	316	12 42	+ 2	23 22	+10	—	—	46·7
Chur		87·3	324	e 12 40	− 1	e 23 10	− 4	e 16 1	PP	e 45·2
Zürich		87·5	326	e 12 41	− 1	e 23 22	+ 6	e 16 0	PP	—
Padova		87·7	321	12 49	+ 6	23 22	+ 4	23 44	sS	—
Basle		87·8	326	e 12 45a	+ 2	e 23 27	+ 8	e 13 2	pP	—
Bologna		88·0	322	e 12 47	+ 3	i 23 32	+11	e 24 2	sS	—
China Lake	Z.	88·1	49	i 12 44k	− 1	i 13 11	sP	i 12 57	pP	—
Florence		88·5	321	e 12 48	+ 1	i 23 33	+ 8	i 23 56	sS	—
Kew		88·5	332	i 12 48a	+ 1	i 23 14	[+ 6]	e 13 0	pP	e 41·2
Neuchatel		88·5	325	e 12 48	+ 1	e 23 33	+ 8	—	—	—
Prato		88·5	321	e 12 51	+ 4	i 23 37	+12	—	—	—
Pavia		88·6	324	e 12 51a	+ 4	i 23 21	− 5	e 18 28	PPP	e 42·0
Pasadena		88·7	51	i 12 47k	0	e 23 31	+ 4	i 16 20	PP	e 36·2
Rome		89·0	319	e 12 50	+ 1	e 23 16	[+ 5]	i 16 32	PP	—
Ivigtut		89·3	0	e 12 49	− 1	i 23 37	+ 4	25 5	SPP	41·2
Paris		89·3	329	i 12 51	+ 1	i 23 40	+ 7	i 13 3	pP	e 42·2
Rathfarnham Castle		89·4	336	i 12 50	− 1	e 23 39	+ 5	i 13 9	pP	e 43·2
Riverside	Z.	89·4	51	e 12 50	− 1	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Boulder City		89·8	48	i 12 54	+ 1	e 23 48	+11	—	—	—
Palomar		90·1	51	i 12 53	− 1	e 23 53	+13	i 16 26	PP	—
Jersey	E.	91·0	331	e 13 17	pP	e 23 49	+ 1	—	—	44·2
Tananarive		93·9	251	e 22 46	?	30 20	SS	34 33	SSS	50·2
Tortosa		96·2	324	e 13 42	pP	—	—	i 17 32	pPP	—
Algiers Univ.	Z.	97·8	321	e 13 36	+ 7	e 24 38	− 8	e 17 28	PP	—
Alicante		98·6	324	13 43	+10	25 20	sS	26 31	PS	e 46·2
Toledo		99·2	327	i 13 35	− 1	31 43	SS	i 13 54	pP	51·6
Almeria		100·7	324	13 49	+ 7	25 11	0	17 57	PP	44·6
Seven Falls	E.	100·9	15	17 29	?	24 41	SKKS	e 32 15	SS	47·8
Granada		101·0	325	e 13 54a	+10	23 18	[−58]	25 36	sS	i 54·2
Shawinigan Falls	N.	101·0	16	e 17 26	?	e 24 20	[+ 4]	—	—	—
Ottawa		101·3	19	i 13 45	0	24 33	sSKS	e 27 5	PS	e 40·9
St. Louis		101·7	32	e 13 47	0	24 27	[+ 8]	e 14 10	pP	—
Malaga		101·8	325	i 18 10	PP	26 12	sSP	i 19 44	PPP	56·5
Lisbon		102·4	329	19 5	?	i 24 51	SKKS	50 45	Q	e 55·8
Cleveland		102·9	25	i 13 53a	+ 1	e 24 48	SKKS	e 18 3	PP	—
Pittsburgh		104·4	24	—	—	i 24 57	SKKS	—	—	—
Halifax		104·7	11	18 35	PP	25 1	SKKS	27 43	PS	—
Pennsylvania	E.	104·8	23	i 18 35	PP	e 24 38	[+ 5]	i 25 54	S	—
Harvard		105·1	17	e 18 12	PKP	e 25 43	− 4	i 18 27	PP	e 53·4
Weston		105·2	17	e 14 0	− 2	e 25 1	sSKS	e 18 11	PP	—
Palisades		105·8	19	i 14 5	0	e 25 58	+ 5	e 18 23	PP	—
Tamanrasset	Z.	106·1	309	e 18 12	[− 4]	e 27 40	SP	e 17 31	?	—
Tacubaya		111·1	51	e 19 1	PP	e 25 35	SKKS	—	—	—
Pretoria	Z.	113·0	253	i 18 36	[+ 6]	—	—	—	—	—
Chinchina		136·9	41	e 49 31	?	e 52 51	Q	—	—	66·2
Bogota		138·1	40	e 19 19	[+ 1]	e 22 37	PKS	30 47	S	e 73·9
Huancayo		149·7	61	i 19 43	[+ 5]	e 42 49	SS	e 36 27	PPS	—
La Paz		157·9	58	i 19 52	[+ 3]	i 37 21	PPS	i 20 29	PKP_2	76·2
La Plata		170·8	127	39 9	PPS	33 39	SKKS	52 39	SSS	83·2

Additional readings :—
Nanking iZ = 2m.50s.
Manila iPP = 5m.35s., iPPP = 6m.0s.
Chatra PPPN = 9m.34s., SSN = 16m.10s., ScSN = 16m.50s., QN = 17m.18s., SSSN = 17m.44s.
Calcutta PcSE = 13m.21s., iPSE = 13m.51s., PPSE = 13m.59s.
Bombay PPPEN = 12m.42s., ScSE = 19m.8s., ScSN = 19m.25s., SSE = 20m.49s., SSN = 21m.22s.
Brisbane iE = 18m.39s.
Riverview iN = 10m.55s., iNZ = 11m.38s., isSEN = 19m.51s., iE = 20m.46s., iN = 21m.3s.
Upsala iPcP = 11m.49s., e = 12m.45s., eE = 13m.35s., ePP = 14m.41s., eN = 15m.45s., ePPP = 16m.31s., eE = 17m.37s., iSKS?E = 21m.33s., ePPS?E = 22m.4s., eN = 22m.19s.?, eE = 22m.38s., eSS = 26m.7s., eN = 28m.37s., eSSS?E = 29m.1s., e = 30m.33s.
Scoresby Sund 12m.36s. and 22m.1s.
Seattle iPcP = 12m.11s., isP = 12m.23s., ipPcP = 12m.28s., isPcP = 12m.38s., iP? = 12m.49s. and 13m.51s., ePP = 15m.13s., ePPP = 17m.5s., iPS = 23m.11s., iPPS = 23m.40s., ePKKP = 30m.0s., ePKKS = 33m.21s., and many other unidentified readings.
Istanbul ePPPE = 16m.51s., eE = 18m.7s., eSKSE = 22m.19s., ePSE = 22m.55s., ePPSE = 23m.12s., eSSE = 27m.8s., eSSSE = 30m.40s.
Bucharest eN = 14m.20s. and 22m.21s., iE = 22m.39s.
Skalnate Pleso esP = 12m.40s., e = 12m.53s., ePP = 15m.20s., epPPN = 15m.43s., esS?N = 22m.36s., e = 23m.9s., eSS = 27m.21s., eSSS = 30m.3s.
Raciborzu eN = 12m.37s., eEZ = 13m.18s., e = 13m.38s., eEN = 15m.26s., and 17m.45s., eN = 19m.31s., eE = 19m.39s. and 22m.23s., esSEN = 22m.47s., eEN = 23m.21s., eN = 27m.13s.
Arcata eZ = 12m.21s.
Wellington iZ = 12m.50s., eSSZ = 27m.39s., eQ? = 35m.15s.?.
Timisoara eN = 14m.8s.
Budapest ePPE = 15m.7s., ePPN = 15m.42s., iSN = 22m.54s., eE = 23m.35s., ePSN = 24m.20s., ePPSN = 24m.53s., ePPSE = 25m.4s., eSSPN = 29m.45s., eSSPE = 29m.48s., eSSSE = 32m.20s., eSSSN = 33m.38s.
Potsdam iPEN = 12m.21s., iZ = 13m.44s., iE = 13m.50s., eN = 15m.13s., iZ = 15m.17s., iPPE = 15m.32s., iSN = 22m.15s., ePSZ = 23m.24s., eN = 32m.45s., iSSSSE = 32m.51s., eSSSSZ = 32m.57s.
Ogyalla ePPE = 15m.31s., epS = 22m.59s., ePSN = 23m.33s., eSS? = 27m.33s. and other unidentified e readings.
Christchurch ePPNZ = 16m.20s., ePPPZ = 17m.55s., ePSN = 24m.15s., eSSN = 27m.55s.

Continued on next page.

Kalossa PN =12m.25s., iE =12m.37s., iN =12m.41s., eE =14m.29s., eN =14m.58s., eSKSN =22m.44s., SE =22m.57s., eSN =23m.4s., eE =23m.25s., eN =24m.41s.
Belgrade eNE =17m.16s., iScSNW =23m.4s., eNW =27m.12s., eSSNE =32m.13s.
Collmberg eE =12m.37s., ePPZ =15m.41s., eSSSE =33m.3s.
Prague esPE =12m.51s., ePPE =15m.31s., epPP =15m.49s., ePPP =17m.25s., epSE =22m.59s., esSE =23m.6s., ePSE =23m.26s., esPS =24m.6s., e =24m.41s., eN =25m.0s., eSS =27m.59s., esSS? =28m.43s., eSSSE =31m.37s. and other unidentified e readings.
Helwan iZ =12m.33s., eZ =13m.15s., PSZ =23m.32s.
Jena ePcP?N =12m.30s., eE =12m.37s., eEN =12m.40s., epP?E =12m.51s., eE =13m.33s., ePPE =15m.40s., eSE =22m.28s., eE =22m.59s. and 33m.11s.
Cheb e =13m.41s., epPP =15m.58s., e =26m.11s. and 27m.15s., eSS =27m.58s., esSS? =28m.45s., eSSS =31m.36s., e =32m.46s.
Berkeley iZ =12m.30s., eZ =13m.53s., ePPZ =15m.51s., eN =34m.45s., eEN =23m.45s.
Reykjavik iZ =(13m.23s.)., readings have been decreased by one minute.
Saskatoon SS =27m.30s., SSS =32m.21s.
Aberdeen iE =13m.49s., iPPE =15m.59s., iSE =23m.10s., iE =24m.59s., eSSE =28m.41s., eSSSE =32m.53s.
De Bilt iPcP =12m.45s., iPP =16m.9s., eSS =29m.15s.?.
Triest iPPZ =16m.11s., iS =23m.32s.
Fresno eZ =13m.19s.
Stuttgart iPcPZ =12m.43s., eZ =12m.49s. and 13m.20s., e =14m.4s., ePP =15m.45s., e =19m.25s., iPS =23m.33s., e =24m.0s., 25m.4s., and 27m.37s., eSS =28m.45s., eSSS =31m.45s. and 33m.15s., eQ =41m.15s.
Karlsruhe eZ =13m.39s.
Durham iEN =12m.59s., iN =13m.4s., iPPE =16m.15s., iSEN =23m.31s., iPSN =24m.31s.
Strasbourg ePP =16m.11s., ePPP =17m.58s., iS =23m.20s., eSS =29m.13s., eSSS =32m.51s.
Zürich e =23m.41s.
Kew ePP =16m.31s., eSEN =23m.51s., ePS =24m.24s.
Pavia ePP? =15m.54s., e =22m.6s., iPS =24m.24s., eSS =29m.34s., e =37m.14s.
Pasadena iZ =12m.58s., iEN =23m.50s., eEN =24m.47s.
Rome eSS? =30m.15s.?, e =33m.15s.
Ivigtut 23m.54s.
Paris i =12m.57s., isP? =13m.10s., i =16m.13s., iPP =16m.27s., ipPP =16m.37s., e =20m.2s., iSKKS =23m.21s., i =23m.50s., iSP =24m.39s., iPS =25m.0s., iPPS =25m.30s., iSS =29m.50s., i =31m.3s., 34m.3s., 34m.58s., 36m.34s., and 36m.54s.
Rathfarnham Castle ePP =16m.29s., eSEN =23m.24s., ePSEN =24m.33s., eSSEN =27m.20s., eSSSEN =30m.51s., eEN =37m.35s.
Tananarive eS? =24m.43s., Q =43m.28s.
Algiers Univ. eZ =21m.28s., eSSZ =31m.22s.
Alicante PP =17m.49s., PPP =19m.49s., PPS =27m.33s., SS =32m.14s., SSS =35m.53s., Q =41m.5s.
Toledo i =13m.43s., ePP =17m.41s., pPP? =17m.59s., SKS? =24m.15s.?, e =27m.17s., Q =47m.35s.
Almeria PPP =19m.59s., SSS =35m.51s.
Seven Falls eE =22m.14s. and 25m.19s., SSE =31m.4s., SSSE =34m.49s., QE =39m.45s.
Granada pP =17m.12s., pPP =18m.10s., ipPPP =19m.49s., SKKS =24m.42s., PS =26m.27s., SS =31m.37s., sSS =33m.24s., SSS =35m.12s.
Ottawa PPZ =17m.5s., e =17m.51s. and 21m.49s., PS =25m.51s.
St. Louis e =14m.3s., ePP? =17m.54s., i =18m.21s., 24m.44s., and 25m.47s., iSS =32m.49s.
Cleveland epPPZ =18m.18s., isPPN =18m.28s., esSKKSE =25m.41s., iE =25m.55s., ePS?N =27m.17s., eE =27m.28s.
Halifax e =22m.37s., PPS =28m.47s., e =31m.53s., SS =33m.29s., SSS =37m.14s.
Pennsylvania eSKKSEN =24m.59s., ePSE =27m.32s., isPSE =28m.14s.
Harvard esPP =19m.16s., ePPP =20m.56s., epPPP =21m.15s., e =22m.42s., eSKKS =24m.59s., ePS =27m.47s., isPS =28m.9s., iPPS =28m.37s., eSS =33m.25s.
Palisades ePPP =20m.36s., eSKS =25m.3s., e =28m.3s., eSS =33m.13s.
Tamanrasset ePP =18m.30s., eZ =20m.21s. and 23m.40s., eSKSZ =25m.20s., ePKKP?Z =29m.37s., eZ =31m.25s.
Tacubaya e =20m.8s. and 30m.37s.
Huancayo e =24m.29s., ePPP? =27m.15s., e =34m.24s. and 48m.56s.
La Paz iPPZ =24m.25s., iZ =28m.15s.
La Plata SKSPN =36m.3s., PSSE =46m.21s., PSSN =46m.27s., N =48m.39s., SSSE =53m.15s.
Long waves were also recorded at Barcelona.

June 5d. Readings also at 1h. (Resolute Bay, Ksara, and Stuttgart), 2h. (Resolute Bay and near Istanbul), 3h. (Mount Wilson, Riverside, Palomar, China Lake, Tinemaha, Chatra, and near Petropavlovsk), 6h. (near Dzhergetal), 7h. (Stuttgart, Nanking, and Zi-ka-wei), 8h. (Scoresby Sund, De Bilt, Potsdam, Strasbourg, and Tortosa), 9h. (near Istanbul), 11h. (Tortosa), 12h. (Stuttgart, near Basle, and Zürich), 13h. (Ksara), 14h. (Bombay), 15h. (Resolute Bay, Scoresby Sund, Paris, Strasbourg, Stuttgart (2), Potsdam, Ksara, Djakarta, and near Bandong), 16h. (Zürich, near Alicante, near Dzhergetal, and near Santa Lucia (2)), 17h. (near Djakarta), 18h. (near Andijan, Dzhergetal (2), Fergana, Khorog, Lunacharskoe, Naryn, Obi-garm, Samarkand, and Stalinabad), 23h. (near Dzhergetal).

June 6d. 5h. 42m. 52s. Epicentre 37°·8N. 142°·2E. Depth of focus 0·005.
(as on 1946, Nov. 2d.).

Intensity V at Isinomaki, Miyako, Sanuma, Nakahata, Siroiwa, Ichinoseki; IV at Sendai, Hukusima, Shirakawa, Morioka, Onahama, Utunomiya, Hatinohe, Watari, Kogota, Ogawara, Toyoma, etc. Epicentre 37°·8N. 142°·0E. Depth 60km.

The Seismological Bulletin of the C.M.O., Japan, for June, 1951, Tokyo, 1951, p.132, with macroseismic chart.

$A = -·6259$, $B = +·4855$, $C = +·6103$; $\delta = -7$; $h = -1$;
$D = +·613$, $E = +·790$; $G = -·482$, $H = +·374$, $K = -·792$.

		△	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Isinomaki		0·9	314	0 18	0	0 28	− 3
Sendai		1·1	294	0 19k	− 1	0 31	− 5
Hukusima		1·4	268	0 21k	− 3	0 34	− 9
Yamagata		1·5	287	0 23	− 3	0 39	− 6
Mizusawa		1·6	328	0 26	− 1	0 43	− 4
Inawasiro		1·7	262	0 26	− 2	0 44	− 6
Shirakawa		1·7	247	0 27	− 1	0 44	− 6
Miyako		1·8	355	0 31	+ 1	0 52	0
Mito		2·0	224	0 32a	0	0 53	− 4
Morioka		2·1	337	0 33a	− 1	0 53	− 6
Sakata		2·2	301	0 33	− 2	0 56	− 6
Utunomiya		2·2	236	0 35	0	0 49	−13
Tukubasan		2·3	227	0 35	− 2	0 58	− 6
Tyosi		2·3	208	0 37	0	1 2	− 2
Akita		2·5	319	0 38	− 1	1 5	− 4
Niigata		2·5	273	0 40	+ 1	1 4	− 5
Hatinohe		2·8	350	0 42	− 2	1 14	− 3
Kumagaya		2·8	234	0 42	− 2	1 12	− 5
Maebasi		2·9	241	0 43	− 2	1 14	− 5
Tokyo		2·9	223	0 44	− 1	1 13	− 6
Aikawa		3·1	275	0 43	− 5	1 8	−16
Titibu		3·1	235	0 47	− 1	1 19	− 5
Yokohama		3·1	221	0 54	+ 6	1 21	− 3
Aomori		3·2	340	0 49	0	1 14	−13
Takada		3·2	259	0 45	− 4	1 26	− 1
Oiwake		3·3	244	0 50	− 1	1 23	− 6
Matusiro		3·4	250	0 50	− 2	1 13	−19
Nagano		3·4	252	0 50	− 2	1 12	−20
Hunatu		3·6	231	0 54	− 1	1 32	− 5
Kohu		3·6	235	0 56	+ 1	1 24	−13
Matumoto		3·7	247	0 55	− 1	—	—
Shizuoka		4·2	228	1 2	− 1	1 46	− 6
Wazima		4·2	266	1 1	− 2	—	—
Omaesaki		4·5	226	1 48	S	(1 48)	−11
Gihu		5·0	243	1 19	+ 5	—	—
Nagoya		5·0	240	1 15	+ 1	—	—
Obihiro		5·2	8	2 10	S	(2 10)	− 7
Sapporo		5·3	353	1 16	− 3	2 20	+ 1
Hikone		5·4	244	1 23	+ 3	—	—
Kusiro		5·4	17	0 29	−51	—	—
Tsuruga		5·4	248	1 56	+36	—	—
Kameyama		5·5	239	1 37	+16	—	—
Nemuro		6·1	24	1 30	0	2 34	− 5
Osaka		6·2	242	2 11	+40	—	—
Mineral	z.	71·1	53	i 11 12a	− 1	—	—
Tinemaha	z.	74·9	55	i 11 38	+ 2	—	—
China Lake	z.	76·0	56	i 11 42	0	—	—

Additional readings :—
Mineral eZ = 11m.50s.
China Lake iZ = 11m.54s. and 12m.6s.

June 6d. 10h. 9m. 48s. Epicentre 40°·9N. 142°·7E. Focus as Base of the Superficial Layers. (as on 1948, Sept. 23d.).

Intensity V at Sannohe; II-III at Hatinohe and Noheji. Epicentre 40°·9N. 143°·0E. Depth 60km.

The Seismological Bulletin of the C.M.O., Japan, for June, 1951, Tokyo, 1951, p.133.

A = −·6030, B = +·4594, C = +·6522; δ = +2; h = −2;
D = +·606, E = +·795; G = −·519, H = +·395, K = −·758.

	△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.
Hatinohe	0·9	247	0 11	− 5	0 22	− 6
Urakawa	1·3	3	0 23	+ 1	0 42	+ 4
Miyako	1·4	203	0 17	− 6	0 33	− 8
Aomori	1·5	267	0 21	− 3	0 41	− 3
Morioka	1·7	224	0 22	− 6	0 40	− 9
Mori	2·0	307	1 30	+58	—	—
Mizusawa	2·1	214	0 30	− 3	0 52	− 7
Obihiro	2·1	10	0 58	+25	1 21	+22
Akita	2·3	239	0 40	+ 4	—	—
Sapporo	2·4	235	0 37	− 1	1 4	− 2
Kusiro	2·4	31	0 45	+ 7	—	—
Sendai	3·0	208	0 50	+ 4	1 13	− 9
Nemuro	3·2	41	1 5	+16	—	—
Hukusima	3·6	209	0 58	+ 3	1 40	+ 3
Inawasiro	3·9	212	1 5	+ 6	1 52	+ 8
Onahama	4·2	200	1 6	+ 3	1 52	0
Shirakawa	4·2	208	1 9	+ 6	2 0	+ 8
Utunomiya	4·9	208	1 13	0	—	—
Macbasi	5·3	214	1 20	+ 1	2 23	+ 3
Kumagaya	5·4	210	1 22	+ 2	2 24	+ 2
Nagano	5·5	221	2 24	S	(2 24)	− 1
Oiwake	5·6	217	1 16	− 7	—	—
Hunatu	6·2	211	1 21	−11	2 48	+ 6
Misima	6·5	208	2 15	+39	—	—

Mizusawa gives also ePN = 35s.

June 6d. 16h. 10m. 48s. Epicentre 71°·3N. 9°·7W.

Suggested depth 60km. (U.S.C.G.S. and Strasbourg), 50km. (J.S.A.).

A = +·3179, B = −·0543, C = +·9465; δ = −13; h = −12;
D = −·168, E = −·986; G = +·933, H = −·159, K = −·323.

		△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	Supp. m. s.		L. m.
Scoresby Sund		4·1	265	i 1 2k	− 3	—	—	—	—	—
Reykjavik		8·5	219	i 2 9a	+ 2	—	—	e 2 38	P*	i 4·0
Bergen		12·5	144	i 2 58	− 4	—	—	6 20	Q	7·6
Aberdeen	E.	14·6	163	i 3 29	− 1	e 6 26	+13	i 3 37	PP	7·9
Upsala		15·9	122	i 3 42	− 5	i 6 51	+ 7	i 3 58	PP	e 7·7
Durham		17·0	164	i 3 56	− 5	i 7 53	SSS	i 4 24	PPP	i 8·8
Helsinki		17·8	111	e 4 9	− 2	e 7 53	SS	e 4 22	PP	e 8·2
Ivigtut		18·1	256	e 4 15	+ 1	i 7 49	SS	i 4 20	?	9·1
Rathfarnham Castle		18·2	173	i 4 15	− 1	e 7 47	+10	i 4 32	PP	9·2
Copenhagen		18·3	137	i 4 16	− 1	—	—	—	—	8·2
Pulkovo		19·7	104	i 4 31	− 3	e 8 6	− 4	—	—	—
Witteveen	Z.	20·0	149	i 4 36a	− 1	—	—	—	—	—
De Bilt		20·4	152	i 4 40a	− 1	e 8 26	+ 1	e 9 3	SSS	e 10·5
Kew		20·4	163	i 4 38a	− 3	i 8 32	+ 7	i 4 55	PP	e 10·2
Potsdam		21·5	140	i 4 52a	0	i 9 25	SS	i 8 59	PcP	11·2
Jersey	E.	22·5	166	e 5 9	+ 7	e 9 26	+21	e 5 51	PPP	12·3
Collmberg		22·6	139	e 5 2	− 1	e 9 36	SS	e 5 44	PPP	e 13·2
Jena		22·6	142	i 5 2	− 1	e 9 10	+ 3	i 5 28	PP	e 11·8
Resolute Bay		23·1	318	i 5 7	− 1	e 9 18	+ 2	e 5 28	PP	—
Paris		23·3	159	i 5 10	0	i 9 35	+15	i 5 25	pP	e 11·7

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
	Cheb	23·6	142	i 5 14	+ 1	i 9 25	0	e 10 12	SS	—
	Karlsruhe	23·9	148	i 5 17	+ 1	e 9 40	+10	e 5 46	PP	e 12·2
	Prague	24·0	139	i 5 17a	0	i 9 37	+ 5	e 5 41	PP	e 11·8
	Strasbourg	24·2	150	i 5 19a	0	i 9 43	+ 8	i 5 44	PP	e 12·2
	Stuttgart	24·3	148	i 5 20	0	e 9 40	+ 3	e 5 48	PP	e 12·2
	Raciborzu	24·8	133	e 5 25	0	e 9 43	− 3	e 5 31	pP	e 12·7
	Basle	25·2	151	e 5 28a	− 1	e 10 24	+32	e 6 21	PPP	—
	Moscow	25·3	102	e 5 28	− 2	9 55	+ 1	—	—	—
	Zürich	25·5	150	e 5 31a	− 1	e 10 2	+ 5	e 6 38	PPP	—
	Neuchatel	25·6	152	e 5 32	0	e 10 13	+14	—	—	—
	Skalnate Pleso	26·1	131	e 5 35	− 2	e 9 49	−18	i 5 47	pP	e 14·4
	Vienna	26·1	138	i 5 37	0	e 10 11	+ 4	e 6 19	PP	—
	Chur	26·2	149	e 5 36	− 2	e 10 31	+22	—	—	e 17·3
	Clermont-Ferrand	26·4	159	i 5 40	0	e 10 18	+ 6	e 11 36	SSS	e 14·7
	Lwow	26·5	126	i 5 41	0	i 10 13	− 1	—	—	—
	Ogyalla	26·9	136	e 5 58	+13	e 10 29	+ 9	e 6 27	PP	e 14·7
	Uzhgorod	27·2	129	i 5 46?	− 1	e 10 13?	−12	—	—	—
	Budapest	27·5	134	5 53	+ 3	e 10 50	+20	16 16	ScS	18·1
	Pavia	27·7	150	e 5 52a	0	i 10 53	+20	e 6 34	PP	i 14·1
	Triest	28·1	143	e 5 53	− 2	e 10 42	+ 2	e 6 38	PP	e 13·6
	Kalossa	28·3	135	e 6 3	+ 6	e 11 15	+32	e 16 31	ScS	e 17·7
	Bologna	28·8	147	e 6 2k	0	e 10 54	+ 3	e 7 9	PPP	—
	Padova	28·9	146	6 2	− 1	12 23	SS	7 4	PPP	—
	Prato	29·3	147	e 6 4	− 2	i 11 2	+ 3	—	—	—
	Florence	29·5	147	e 6 7	− 1	e 11 28	+26	e 7 4	PP	—
	Timisoara	29·6	132	i 6 14k	+ 5	e 11 38	+34	e 7 37	PPP	e 17·2
	Belgrade	30·3	134	e 6 16a	+ 1	e 13 12	SSS	—	—	e 21·3
	Kishinev	30·4	122	6 15	− 1	11 9	− 7	—	—	—
	Barcelona	30·5	162	e 6 19	+ 2	e 11 40	+22	—	—	e 15·5
	Tortosa	31·0	164	i 6 21	0	i 11 55	+29	—	—	—
	Rome	31·5	147	i 6 25a	− 1	e 11 51	+17	e 7 27	PP	e 15·9
	Toledo	31·6	172	i 6 27	+ 1	e 11 36	+ 1	i 6 50	pP	17·5
	Sverdlovsk	31·8	80	i 6 26	− 2	11 42	+ 4	—	—	—
	Bucharest	32·1	127	e 6 38	+ 7	e 11 48	+ 5	e 8 4	PPP	e 16·2
	Lisbon	32·7	178	6 40a	+ 4	11 57	+ 5	i 6 57	pP	16·8
	Sofia	33·0	132	e 6 40	+ 1	e 12 25	+28	i 7 31	PP	e 16·9
	Alicante	33·4	167	6 54	+12	12 22	+19	8 6	PPP	e 17·9
	Taranto	33·8	142	6 47	+ 1	12 27	+17	—	—	e 20·8
	Theodosia	34·0	116	e 6 50	+ 2	—	—	—	—	—
	Yalta	34·2	118	e 6 51	+ 2	e 12 12	− 4	—	—	—
	Granada	34·3	171	i 6 52k	+ 2	i 12 34	+17	7 10	pP	15·3
	Almeria	34·7	169	i 6 51	− 3	i 12 27	+ 3	8 31	PPP	17·8
	Malaga	34·8	172	i 6 55	+ 1	i 12 7	−18	i 8 9	PP	16·4
	Algiers Univ.	Z. 35·2	162	i 6 57k	− 1	e 12 52	+21	e 8 22	PP	—
	Messina	35·6	144	i 7 0	− 1	13 6	+28	e 8 22	PP	—
	Istanbul	E. 35·9	126	e 6 48	−16	e 12 27	−16	—	—	—
	Tunis	36·1	151	i 7 18	+13	e 12 53	+ 8	i 8 38	PPP	e 18·2
	Sotchi	36·6	112	e 7 17	+ 7	—	—	—	—	—
	Halifax	37·0	254	7 30	+17	13 12	+13	8 58	PPP	e 16·9
	Seven Falls	E. 37·1	263	7 13	− 1	13 12	+11	8 44	PP	—
	Piatigorsk	37·2	108	7 15	0	—	—	—	—	—
	Athens	37·6	134	i 7 19	+ 1	—	—	—	—	—
	Shawinigan Falls	N. 38·2	265	7 22	− 1	13 25	+ 8	8 55	PP	20·8
	Borzhomi	39·3	109	e 7 34	+ 2	—	—	—	—	—
	Gori	39·4	108	e 7 39	+ 6	—	—	—	—	—
	Tiflis	39·8	108	e 7 37	+ 1	—	—	—	—	—
	Ottawa	40·2	267	i 7 39	− 1	13 54	+ 6	9 20	PP	e 21·8
	Leninakan	40·4	109	e 7 51	+10	—	—	—	—	—
	College	41·1	336	i 7 45	− 2	14 2	+ 1	i 7 59	pP	—
	Erevan	41·2	109	7 51	+ 3	—	—	—	—	—
	Kirovobad	41·2	107	7 48	0	—	—	—	—	—
	Harvard	41·4	261	e 7 49	− 1	e 14 11	+ 6	e 8 2	pP	e 19·6
	Weston	41·5	261	e 7 49	− 1	e 14 18	+11	e 9 34	PP	—
	Shemakla	42·0	105	7 58	+ 4	—	—	—	—	—
	Baku	42·6	103	i 8 1?	+ 2	e 14 21?	− 2	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Palisades		43·5	262	i 8 12	+ 5	i 14 50	+14	i 8 25	pP	e 22·4
Fordham		43·7	262	e 8 15	+ 7	i 14 44	+ 5	i 18 3	ScS	21·4
Lenkoran		43·8	105	8 10	+ 1	i 14 40	0	—	—	—
Saskatoon		43·8	299	8 17	+ 8	14 37	− 3	17 24	SS	19·5
Ksara		44·6	122	e 8 18?	+ 2	15 6?	+14	—	—	—
Pennsylvania	E.	45·0	266	e 8 25	+ 6	i 15 1	+ 3	i 10 26	PP	e 18·4
Cleveland		45·6	270	i 8 22k	− 2	i 15 13	+ 7	i 8 33	pP	—
Kizyl-Arvat		45·9	97	i 8 26	0	—	—	—	—	—
Pittsburgh		46·0	268	e 8 34	+ 7	i 15 19	+ 7	i 10 33	PP	—
Sitka		46·4	323	e 8 42	+12	i 15 30	+12	10 25	PP	—
Washington		46·5	264	i 8 35	+ 4	e 15 26	+ 7	i 8 48	pP	—
Helwan		47·1	129	e 8 40	+ 5	e 15 45	PPS	10 29	PP	—
Tchimkent		47·2	83	i 8 36	0	—	—	—	—	—
Ashkabad		47·5	96	i 8 39	+ 1	15 35	+ 1	—	—	—
Lunacharskoe		48·0	84	e 8 44	+ 1	—	—	—	—	—
Tashkent		48·0	84	i 8 41?	− 2	e 15 43?	+ 2	—	—	—
Irkutsk		48·2	49	9 7?	+23	—	—	—	—	—
Frunse		48·3	79	i 8 46	+ 1	15 48	+ 3	—	—	—
Almata		48·7	76	i 8 47	− 1	—	—	—	—	—
Almata II		48·8	76	i 8 49	0	—	—	—	—	—
Samarkand		48·8	87	8 47	− 2	—	—	—	—	—
Kabansk		49·0	48	8 49?	− 1	16 6?	+11	—	—	—
Mary		49·0	93	8 51	+ 1	—	—	—	—	—
Rybach'e		49·1	78	i 8 52	+ 1	16 7	+11	—	—	—
Hungry Horse		49·3	302	i 8 50	− 3	—	—	—	—	—
Tamanrasset	Z.	49·3	162	i 8 53	0	e 15 53	− 6	i 10 49	PP	—
Andijan		49·5	82	8 54	0	16 4	+ 2	—	—	—
Fergana		49·7	82	i 8 55	− 1	—	—	—	—	—
Przhevalsk		49·8	75	i 8 56	0	—	—	—	—	—
Naryn		50·0	78	i 8 58	0	16 14	+ 5	—	—	—
Stalinabad		50·4	86	i 9 0	− 1	16 18	+ 4	—	—	—
Obi-garm		50·5	85	i 9 1	− 1	16 18	+ 2	—	—	—
Dzhergetal		50·5	84	i 9 2	0	—	—	—	—	—
Florissant		50·8	277	e 9 2	− 2	i 16 27	+ 7	i 20 14	SS	—
St. Louis		50·9	277	e 9 2	− 3	i 16 23	+ 2	i 9 12	pP	—
Victoria		51·6	309	9 8	− 2	16 38	+ 7	—	—	20·9
Seattle		52·2	308	e 9 14	− 1	e 16 38	− 1	i 10 27	PcP	e 25·2
Khorog		52·3	84	e 9 16	+ 1	—	—	—	—	—
Petropavlovsk		55·6	9	i 9 58	+18	—	—	—	—	—
Shasta Dam		58·7	305	i 9 57	− 5	—	—	—	—	—
Mineral		58·8	304	e 9 59a	− 3	—	—	i 10 54	PcP	e 30·7
Arcata		58·9	307	e 10 0a	− 3	e 18 18	+10	e 10 19	pP	e 26·6
Reno		59·0	302	e 10 1a	− 3	e 18 21	+11	e 10 18	pP	e 32·2
Tinemaha	Z.	60·9	300	e 10 16	− 1	—	—	—	—	—
Boulder City		61·0	297	i 10 16	− 2	e 18 48	+13	—	—	—
Berkeley		61·3	304	e 10 16	− 4	e 18 42	+ 3	i 10 32	pP	e 29·1
Lick		61·6	304	i 10 19a	− 3	e 18 56	+13	i 10 38	pP	e 33·5
Fresno		61·7	302	e 10 19a	− 3	e 18 53	+ 9	e 10 34	pP	e 30·8
Santa Clara		61·7	304	i 10 21	− 1	e 18 46	+ 2	i 10 40	pP	e 30·8
China Lake	Z.	61·9	299	i 10 22	− 2	i 12 47	PP	e 39 46	P'P'	—
San Juan		62·2	244	e 10 29	+ 3	e 19 6	+15	—	—	—
Vladivostok		62·6	31	e 10 29	+ 1	i 19 6	+10	—	—	—
Tucson		63·3	292	i 10 31	− 2	e 19 8	+ 4	i 10 49	?	—
Pasadena		63·6	299	i 10 33a	− 2	e 19 16	+ 8	e 12 38	PP	e 29·2
Riverside	Z.	63·6	299	i 10 33	− 2	—	—	—	—	—
Palomar	Z.	64·0	298	i 10 37	− 1	—	—	i 13 6	PP	—
Fort de France		64·3	237	e 10 48	− 9	i 19 42	PS	—	—	—
Chatra		67·0	75	10 56.	− 1	e 20 17	PS	20 36	PPS	29·2
Merida		67·1	268	—	—	e 20 20	PS	—	—	e 27·6
Bombay		69·9	91	e 11 15	0	e 20 29	+ 5	i 20 52	PS	28·7
Poona		70·5	90	e 11 8	−10	20 58	PS	21 7	ScS	—
Nanking		70·8	45	e 11 18	− 2	20 45	+10	29 5	Q	e 34·6
Vera Cruz		70·8	273	e 11 25	+ 5	e 20 36	+ 1	e 28 36	Q	39·0
Calcutta	E.	71·4	75	e 11 25	+ 1	21 13	PS	31 38	Q	35·3
Puebla		71·6	276	e 12 0	PcP	—	—	—	—	e 28·9

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
	Tacubaya	71·6	276	e 11 37	+12	e 21 4	PS	—	—	e 29·0
	Guadalajara	71·8	281	—	—	e 21 57	PPS	—	—	e 35·9
«	Hyderabad N.	73·0	86	e 11 31	+ 1	i 21 9	+ 9	21 23	PS	—
	Bogota	77·6	248	i 12 5	+ 5	i 21 52	+ 1	e 34 50	Q	e 36·9
	Chinchina	77·7	249	e 12 16	PcP	i 22 10	+18	e 26 48	SS	36·2
	Kodaikanal E.	79·5	90	—	—	e 22 22	+11	—	—	—
»	Colombo E.	83·4	88	11 36	−54	23 31	PS	—	—	50·0
	Manila	88·1	47	i 13 16	+22	i 23 45	+ 8	e 25 45	PPS	—
	Guam	93·7	25	17 38	PP	—	—	—	—	—
	Huancayo	93·8	243	e 13 34	+14	e 24 12	{+ 2}	e 24 50	S	—
	La Paz	96·0	235	13 20	−10	24 46	− 1	i 17 38	PP	44·2
	La Plata	111·3	221	29 30	PPS	34 54	SS	39 18	SSS	54·7
	Riverview	141·1	26	i 20 9	[+37]	—	—	i 22 20	PP	66·6
	Wellington	149·8	353	i 20 9	[+22]	i 29 39	{−38}	i 26 40	PPP	e 61·2

Additional readings :—
Reykjavik iZ =2m.14s., eE =2m.22s., eQ EN =3m.6s.
Bergen iN =4m.20s. and 4m.50s.
Aberdeen iE =3m.49s. and 4m.44s., eE =5m.49s., iSSE =6m.51s.
Upsala iPP? =3m.53s., iPPPN =4m.10s., i =4m.32s. and 4m.47s., iE =4m.59s., iN = 5m.7s., i =5m.30s., iN =5m.46s., iSSE =7m.8s., eSSS =7m.16s.?.
Durham iPPPN =4m.36s.
Helsinki eZ =4m.44s.
Kew ePPP =5m.57s., iSS =8m.53s.
Potsdam iPPN =5m.12s.
Jersey eSSE =9m.57s.
Collmberg eZ =6m.35s.
Jena iEZ =5m.7s., iPP?Z =5m.22s., iPP?E =5m.25s., iEN =5m.35s., eE =5m.48s. and 6m.1s., eS?N =9m.16s., and 9m.20s., eS?E =9m.37s.
Resolute Bay iNZ =5m.19s.
Paris isP =5m.34s., iPP =5m.51s., iPPP =6m.4s., isS =9m.52s., iSS =10m.11s., iSSS = 10m.28s. and many other i readings given without phase.
Cheb esP? =5m.31s., e =6m.12s. and 6m.37s., ePcP =8m.37s., e =8m.56s. and 9m.50s.
Karlsruhe eZ =6m.14s.
Prague ipP? =5m.25s., esP? =5m.31s., ePPP =6m.1s., e =6m.29s., ePcPZ =8m.42s., e =10m.6s., eSS =10m.41s.
Strasbourg i =5m.29s. and 10m.13s.
Stuttgart iZ =5m.24s., 5m.31s., and 5m.40s., eZ =6m.3s. and 6m.15s., e =6m.27s., eZ =6m.40s., e =7m.30s.
Baciborzu eEN =5m.39s., ePPEN =5m.56s., eN =6m.8s., ePPPEN =6m.13s., eEN = 8m.10s., eSE =9m.40s., iN =10m.24s., iSSN =10m.41s., eSSSN =10m.53s., eEN = 11m.17s.
Basle e =6m.49s.
Skalnate Pleso eN =5m.41s. and 5m.59s., ePP =6m.29s., e =6m.38s. and 7m.23s., ePcPN =8m.46s., e =10m.25s., eSSN =11m.3s., eSSSE =11m.25s., e =11m.55s.
Vienna ePcP =8m.55s.
Clermont-Ferrand i =6m.46s., 7m.19s., and 8m.5s.
Ogyalla epP? =6m.14s., e =7m.42s., eE =7m.54s., e =8m.18s., ePcP =8m.45s., e = 9m.27s., esS?E =10m.46s., esS? =10m.50s., eN =11m.18s., eSS =11m.46s., eScPN = 12m.36s.
Budapest iN =6m.20s., ePPE =7m.4s., SE =11m.2s., ePcSE =11m.55s., ePcSN =12m.2s., eN =12m.36s., eSSE =12m.58s., SSSN =13m.28s., SSSE =13m.54s.
Pavia ipP?Z =6m.17s., ePPP =6m.56s., i =8m.5s., iZ =11m.0s., iSS =12m.17s.
Triest ipP?Z =6m.25s., epPP? =7m.33s., esS? =11m.8s.
Kalossa eE =6m.7s., eEN =6m.23s., eN =6m.34s., PPN =7m.15s., ePPPN =7m.40s., iE =8m.38s., eSN =11m.18s., eN =12m.36s., eE =12m.45s.
Bologna eZ =6m.10s., e =6m.29s., 6m.45s., 8m.32s., and 11m.21s.
Padova PP? =6m.47s.
Florence ePPP =7m.28s., eSS =13m.12s.
Timisoara ePE =6m.17s., eN =6m.48s., eSE =12m.2s.
Belgrade iZ =6m.37s., eNE =7m.50s., eNW =11m.44s., iNE =11m.50s. and 16m.30s., iNW =18m.7s.
Rome ePPP =7m.53s., eSS? =13m.23s.
Toledo ePP? =7m.29s., ePPP =7m.47s., e =8m.26s., and 12m.2s., Q =15m.32s.
Bucharest eE =6m.53s. and 7m.14s., iS?E =12m.14s., iE =12m.56s., eN =13m.10s.
Lisbon iNZ =6m.46s., sSN =12m.23s., E =13m.40s., QEN =14m.48s.
Alicante PPP =8m.24s., PcS =13m.34s., Q =14m.18s., SSS =15m.6s.
Granada iPP =8m.10s., PPP =8m.52s., PcP =9m.12s., PcS =12m.58s., SS =14m.19s.
Malaga iPcP =9m.43s., ScP =13m.1s.
Algiers Univ. eZ =7m.4s. and 7m.43s.
Tunis e =7m.29s., 7m.33s., and 9m.11s.
Halifax e =14m.6s. and 15m.5s.
Seven Falls PPPE =9m.8s., SSE =15m.47s.
Ottawa SS =16m.52s., e =18m.17s. and 18m.46s.

Continued on next page.

Harvard e=9m.1s., ePP=9m.28s., epPP=9m.46s., esPP=10m.0s., isS=14m.28s., iSS=17m.12s.
Weston iP=7m.55s., eSS=17m.14s.
Palisades ePP=10m.0s., iScS=18m.0s.
Cleveland iZ=8m.28s., iN=8m.41s. and 15m.20s., iSSE=18m.33s., iN=18m.40s.
Helwan iZ=8m.48s. and 8m.58s., eZ=9m.45s.
Tamanrasset eZ=9m.11s., 9m.20s., and 9m.48s., ePPPZ=11m.44s., eZ=16m.28s. and 16m.53s.
Florissant eP?=9m.9s., ipP?=9m.19s., e=16m.3s.
St. Louis iP?=9m.8s., ipP?=9m.20s., e=11m.21s., i=12m.2s., e=15m.54s., i=16m.35s.
Seattle ePP=11m.17s., ipPP?=11m.30s., ePPP=12m.17s., ePcS=14m.29s., ePS=16m.48s., eSS=20m.17s., eSSS=21m.53s. and other unidentified readings.
Arcata eZ=10m.8s. and 18m.29s.
Reno eZ=10m.8s., eE=10m.33s., eN=15m.8s., eE=29m.18s., eN=30m.0s., eZ=31m.0s.
Berkeley ePcPZ=10m.57s., eZ=13m.8s., eN=14m.5s., eSSN=22m.48s., eEN=25m.6s.
Lick iZ=10m.27s. and 11m.34s., iPPZ=12m.43s., eE=29m.42s., eZ=32m.0s.
Fresno ePPE=12m.43s., eQ=25·6m.
China Lake iZ=10m.30s., 10m.36s., and 10m.41s.
Pasadena iZ=10m.40s., eZ=10m.45s., eSSEN=22m.30s., iEN=25m.48s., eQEN=26·4m.
Riverside iZ=10m.39s. and 10m.46s.
Palomar iZ=10m.45s. and 10m.52s.
Chatra PPSN=20m.55s., SSSN=27m.51s.
Poona eSE=20m.12s.
Nanking i=11m.34s.
Calcutta iPSE=21m.55s., iPPSE=22m.8s., iSSE=26m.4s.
Tacubaya eP=11m.41s., iP=11m.45s.
Bogota iPP=15m.26s., eSS?EN=28m.46s.
Chinchina esSEN=22m.49s.
Manila i=13m.40s., ePP?=16m.58s., e=17m.4s., eSS=29m.49s., eSSS=34m.1s.
Huancayo i=13m.57s., ePP=17m.27s., e=21m.27s., ePS=25m.56s., e=30m.40s. and 34m.36s.
La Paz PS=26m.42s., iSS=31m.36s.
La Plata SSN=35m.6s., EN=44m.18s., QN=47m.30s.
Riverview iZ=23m.27s., eZ=30m.34s. and 40m.7s., eQE=59·2m.
Wellington esPKP?Z=21m.12s., iZ=21m.57s., iPKS?=24m.12s., iZ=24m.58s., eSS=43·2m.?.
Long waves were also recorded at Terre Adélie and Christchurch.

June 6d. 22h. 10m. 18s. Epicentre 37°·3N. 141°·3E. Depth of focus 0·005.
(as on 1950, July 12d.).

Intensity V at Nakahata and Nihonmatu: IV at Onahama, Shirakawa, Inawasiro, Tukubasan, Ononii, Wakamata, Koriyama, etc.; II-III at Hukusima, Sendai. Mito, Tokyo, Miyako, etc. Epicentre as adopted. Depth 45km.

Seismological Bulletin of the C.M.O., Japan, for June, 1951, Tokyo, 1951, p.134, with macroseismic chart.

$A = -·6223$, $B = +·4986$, $C = +·6034$; $\delta = -5$; $h = -1$;
$D = +·625$, $E = +·780$; $G = -·471$, $H = +·377$, $K = -·797$.

		△	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Onahama		0·5	221	0 11a	− 2	0 19	− 4
Hukusima		0·8	304	0 15a	− 2	0 25	− 4
Shirakawa		0·9	258	0 15	− 3	0 26	− 5
Inawasiro		1·0	286	0 18	− 1	0 28	− 5
Sendai		1·0	342	0 18a	− 1	0 30	− 3
Isinomaki		1·1	1	0 14	− 6	0 30	− 6
Mito		1·1	216	0 19a	− 1	0 33	− 3
Yamagata		1·2	322	0 19	− 3	—	—
Tukubasan		1·4	222	0 22	− 2	0 39	− 4
Utunomiya		1·4	237	0 22	− 2	0 39	− 4
Mizusawa	E.	1·8	356	0 32	+ 2	0 53	+ 1
Kumagaya		1·9	233	0 33	+ 2	0 53	− 1
Niigata		1·9	290	0 55	S	(0 55)	+ 1
Maebasi		2·0	243	0 30a	− 2	0 54	− 3
Sakata		2·0	324	0 42	+10	1 3	+ 6

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Tokyo	2·0	218	0 32	0	0 54	− 3
Titibu	2·2	234	0 40	+ 5	0 59	− 3
Miyako	2·4	13	0 40	+ 2	1 6	− 1
Morioka	2·4	358	0 38	0	1 5	− 2
Oiwake	2·4	246	0 40	+ 2	1 4	− 3
Takada	2·4	265	0 42	+ 4	1 14	+ 7
Aikawa	2·5	287	0 44	+ 5	1 20	+11
Akita	2·6	339	1 9	S	(1 9)	− 3
Matusiro	2·6	253	0 49	+ 8	1 12	0
Mera	2·6	206	0 40	− 1	1 10	− 2
Hunatu	2·7	229	0 40	− 2	1 11	− 3
Kohu	2·8	233	0 47	+ 3	1 13	− 4
Matumoto	2·9	248	1 3	+18	—	—
Nagano	3·0	256	0 33	−14	1 2	−20
Osima	3·0	211	0 43	− 4	1 19	− 3
Hatinohe	3·2	3	0 51	+ 2	1 26	− 1
Shizuoka	3·3	225	0 51	0	1 29	0
Toyama	3·3	259	1 9	+18	—	—
Takayama	3·4	252	0 52	0	—	—
Aomori	3·6	353	1 0	+ 5	1 42	+ 5
Omaesaki	3·7	224	1 32	S	(1 32)	− 7
Hamamatu	3·9	229	0 58	− 1	1 42	− 2
Nagoya	4·1	240	1 7	+ 5	—	—
Hikone	4·5	245	1 24	+17	—	—
Tsuruga	4·5	250	1 9	+ 2	1 58	− 1
Kameyama	4·6	239	1 25	+16	—	—
Urakawa	5·0	13	1 17	+ 3	2 15	+ 3
Owase	5·3	233	1 44	+25	—	—
Osaka	5·4	242	2 0	+40	—	—
Obihiro	5·8	14	2 30	S	(2 30)	− 2
Sapporo	5·8	0	2 22	S	(2 22)	−10
Nemuro	6·8	27	2 53	S	(2 53)	− 3

Mizusawa gives also SN = 56s.

June 6d. Readings also at 0h. (Obi-garm, Stalinabad, near Dzhergetal, Fergana, Andijan, and near Santa Lucia), 1h. (near Dzhergetal), 3h. (near Manila), 5h. (Ksara and near Dzhergetal), 6h. (Apia, Huancayo, and near Dzhergetal), 8h. (near Dzhergetal), 10h. (near Manila), 11h. (near Copiapo, near Dzhergetal, near Chilisk, Ili, and Almata II), 14h. (near Mizusawa), 15h. (Ottawa, Stuttgart, Pretoria, Nanking, Bombay, Calcutta, Chatra, and near Dzhergetal (2)), 18h. (Apia and Ksara), 19h. (Toledo, near Almeria, and Alicante), 20h. (Tortosa and near Dzhergetal), 21h. (near Dzhergetal (3)), 22h. (Apia, Grozny, near Athens, and near Santa Lucia), 23h. (Obi-garm, Fergana, Andijan, near Khorog, Dzhergetal, and Murgab).

June 7d. 4h. 6m. 29s. Epicentre 47°·2N. 10°·8E. (as on 1951, Jan. 29d.).

Intensity VI-VII at Barwies, with slight damage, Obermiening, Obsteig, and Silg. Felt also at Garmisch-Partenkirchen and La Zugspitze.
Epicentre 47°18′N. 10°58′E. Macroseismic Area 3300sq.km.

Makroseismische Beobachtungen, 1951, Jahrbücher der Zentralanstalt für Meteorologie und Geodynamik, Jahrgang, 1951, Neue Folge, 88 Band, Vienna, 1952, pp. E1, E2, macroseismic chart E3.

A = +·6698, B = +·1278, C = +·7314; δ = −9; h = −4;
D = +·187, E = −·982; G = +·718, H = +·137, K = −·682.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
	°	°	m. s.	s.	m. s.	s.	m. s.	
Chur	0·9	248	e 0 19a	− 1	i 0 34	0	—	—
Ravensburg	1·0	306	e 0 19	− 2	i 0 36	0	—	—
Zürich	1·5	276	e 0 29a	+ 1	i 0 51	+ 2	—	—
Ebingen	1·6	309	—	—	e 0 51	0	—	—
Stuttgart	1·9	326	e 0 31	− 3	e 0 54	− 5	i 0 37	P_g

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
	°	°	m. s.	s.	m. s.	s.	m. s.	
Basle	2·2	279	e 0 45	P*	e 1 16	S_g	—	—
Karlsruhe	2·4	319	e 0 45	P*	i 1 19	Z_g	—	—
Strasbourg	2·5	304	e 0 47	+ 4	i 1 19	S*	i 0 54	P_g
Neuchatel	2·6	266	e 0 44	0	e 1 27	S_g	—	—
Triest	2·6	127	e 0 44	0	i 1 23	S*	i 0 50	P_g
Jena	3·8	8	e 1 7	P*	i 1 55	S*	e 1 13	P_g
Prague	3·8	39	e 1 6	P*	e 1 41	− 6	i 1 19	P_g
Collmberg	4·4	19	e 1 2	− 8	e 1 51	−11	e 1 37	P_g

Additional readings: —
Stuttgart eP*Z = 34s., eS?Z = 57s., eZ = 1m.0s., iS_gZ = 1m.3s. and 1m.5s., iZ = 1m.10s.
Triest i = 1m.14s.
Jena eNZ = 1m.21s., eE = 1m.26s., eN = 1m.35s., iEN = 2m.2s.
Prague i = 1m.11s. and 1m.35s., e = 1m.47s., eS* = 1m.51s., iS_g = 1m.55s.
Collmberg eZ = 1m.10s., eP*EZ = 1m.22s., eZ = 1m.56s., eS*EZ = 2m.13s.. eE = 2m.24s., eS_gE = 2m.42s.

June 7d. 11h. New Guinea.

Riverview iP?Z = 36m.43s. a, eLE = 46·3m.
Manila e = 38m.14s.
Vladivostok eP = 40m.43s., iS = 47m.42s.
Brisbane eSEN = 41m.52s.
Kabansk eP = 42m.42s., eS = 51m.21s.
Irkutsk eP = 42m.46s., eS = 51m.30s.
Rybach'e eP = 44m.3s., eS = 53m.50s.
Frunse eP = 44m.9s., iS = 54m.4s.
Andijan P = 44m.15s., eS = 54m.13s.
Fergana eP = 44m.16s.
Tashkent eP = 44m.23s., eS = 54m.36s.?.
Tchimkent P = 44m.24s.
Sverdlovsk eP = 45m.9s., eS = 55m.53s.?
Nanking e = 46m.36s., i = 49m.56s.
Christchurch e?NZ = 47m.15s., eNZ = 51m.0s., eRZ = 55m.
Wellington e = 50m.?., eQ? = 55m.?, eR?Z = 60m.
Perth i = 50m.10s. and 52m.40s.
Ksara ePKP = 50m.56s., PP? = 54m.19s., PPS? = 67m.16s.
Mary iS = 55m.18s.
Ashkabad eSKS = 55m.22s.
De Bilt eZ = 62m.18s., eL = 90m.
Stuttgart eZ = 74m.45s.?, eQ = 95m., R = 98m.
Long waves were also recorded at Berkeley, Harvard, Palisades, Potsdam, Kew, Paris, and Strasbourg.

June 7d. 22h. 41m. 20s. Epicentre 71°·5N. 12°·0W. (as on 1938, Dec. 6d.).

Not a repetition of shock on 6d.

A = +·3122, B = −·0664, C = +·9477 ; δ = +1 ; h = −12 ;
D = −·208, E = −·978 ; G = +·927, H = −·197, K = −·319.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Scoresby Sund		3·4	257	e 0 48	− 7	i 1 31	− 6	—	—	2·4
Reykjavik		8·3	212	i 2 7	+ 3	e 3 57	+17	i 2 33	P_g	e 4·3
Helsinki	N.	18·5	110	e 4 20	+ 1	—	—	—	—	—
Copenhagen		19·0	136	i 4 25	− 1	—	—	—	—	10·7
Potsdam		22·2	139	e 4 58	− 2	—	—	—	—	e 12·7
Resolute Bay		22·5	319	e 5 4	+ 2	e 9 8	+ 3	—	—	e 11·3
Jena	Z.	23·2	141	e 5 10	+ 1	—	—	—	—	—
Paris		23·8	158	i 5 15	0	—	—	—	—	—
Stuttgart		24·8	145	e 5 27	+ 2	—	—	—	—	e 16·7
Besançon		25·8	153	e 5 40	+ 6	—	—	—	—	—

Reykjavik gives also iZ = 2m.15s.
Long waves were also recorded at Ivigtut, Harvard, and Palisades.

June 7d. 22h. 58m. 56s. Epicentre 28°·58. 175°·9W.

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

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Auckland	N.	11·4	221	i 3 4	+17	i 5 4	+ 8	i 3 29	PP	i 6·0
Tuai	N.	11·8	208	e 3 4	+11	e 4 54	−12	—	—	—
New Plymouth	E.	13·4	216	—	—	e 5 56	+11	—	—	—
Wellington		14·9	208	i 3 39	+ 5	i 6 1	−19	i 6 24	SS	i 8·0
Apia		15·1	16	e 4 35	+59	6 28	+ 3	—	—	6·8
Cobb River	E.	15·6	213	—	—	e 6 19	−18	—	—	—
Kaimata	N.E.	17·4	212	4 3	− 3	e 6 57	−22	—	—	—
Christchurch		17·6	207	e 4 9	+ 1	e 7 27	+ 4	—	—	9·0
Brisbane		27·4	264	i 5 50a	+ 1	e 10 29	+ 1	i 6 38	PP	e 13·6
Riverview		28·6	250	i 6 6k	+ 6	i 10 48	0	i 6 40	PP	e 13·5
Terre Adélie		46·2	202	e 8 32	+ 4	e 15 16	+ 1	e 10 24	PP	—
Guam		56·7	312	9 45	− 3	—	—	—	—	—
Manila		74·5	296	e 11 42	0	—	—	—	—	—
Bandong		74·8	270	e 12 30	+46	—	—	—	—	—
Mera		75·7	323	e 11 48	− 1	—	—	—	—	—
Tokyo		76·3	324	e 11 56	+ 4	21 47	+10	e 14 42	PP	—
Kumagaya		76·9	324	e 11 44	−12	e 21 46	+ 3	—	—	—
Maebasi		77·2	324	e 11 51	− 6	e 21 51	+ 4	—	—	—
Matusiro		77·8	324	e 12 0	− 1	e 21 55	+ 2	—	—	—
Niigata		78·4	325	e 12 40	+36	—	—	—	—	—
Toyama		78·4	323	e 12 21	+17	—	—	—	—	—
Mitchell Field		80·1	359	e 12 12	− 1	—	—	e 15 18	PP	—
Sapporo		81·3	330	e 12 23	+ 3	e 22 35	+ 5	—	—	—
Pasadena		82·8	45	i 12 33	+ 6	i 22 56	+11	—	—	e 38·5
Santa Clara		82·8	40	e 12 41	+14	e 22 58	+13	—	—	—
Lick	z.	82·9	40	e 12 26a	− 2	—	—	—	—	—
Berkeley		83·0	40	e 12 28	0	e 22 57	+10	e 28 29	SS	e 40·2
Palomar		83·1	46	i 12 34	+ 5	—	—	—	—	—
Riverside	z.	83·2	45	e 12 29	0	—	—	e 12 34	PcP	—
Fresno	z.	83·6	42	e 12 31a	0	—	—	—	—	e 41·6
Arcata	z.	84·1	36	e 12 40	+ 6	e 23 21	+23	—	—	e 42·8
Zi-ka-wei	z.	84·2	309	i 12 35	+ 1	e 23 5	+ 6	—	—	—
China Lake	z.	84·3	44	e 12 34	− 1	—	—	i 12 41	PcP	—
Petropavlovsk		84·3	344	i 12 39	+ 4	e 23 1	+ 1	—	—	—
Tinemaha	z.	84·4	43	e 12 36	0	—	—	—	—	—
Shasta Dam		84·9	37	12 37	− 1	—	—	—	—	—
Mineral	z.	85·1	38	e 12 39a	0	—	—	—	—	—
Reno	z.	85·5	40	e 12 42a	+ 1	e 23 21	+ 9	—	—	e 42·8
Vladivostok		85·9	324	i 12 46	+ 3	i 23 34	+18	e 16 21	PP	—
Boulder City		86·1	45	e 12 45	+ 1	e 23 21	+ 3	—	—	—
Tucson		86·4	50	e 12 45	0	e 23 20	− 1	—	—	—
Nanking		86·5	308	12 48k	+ 2	i 23 17	− 5	—	—	—
Tacubaya		88·0	67	e 17 54	PP	e 23 32	− 4	e 24 53	PPS	—
Huancayo		93·4	105	e 13 23	+ 5	e 24 48	+24	e 24 5	SKS	—
La Plata	E.	93·9	133	—	—	23 46	[− 9]	26 46	PPS	47·5
Hungry Horse		94·4	36	e 12 58	−25	—	—	—	—	—
College		95·6	11	e 13 26	− 2	—	—	e 17 20	PP	—
La Paz		97·1	113	i 13 48a	+13	25 4	+ 8	i 17 42	PP	47·1
Chinchina		101·4	90	—	—	e 24 44	[+10]	e 27 18	PS	49·8
Bogota		102·6	91	e 18 28	PP	e 24 51	[+11]	e 26 34	PS	e 51.1
St. Louis		104·1	53	e 21 23	?	e 25 36	−19	e 24 31	SKS	—
Kabansk		104·8	20	e 14 16	+ 6	e 24 52	[+ 2]	28 4	PS	—
Irkutsk		106·2	20	e 18 36	PP	e 25 1	[+ 5]	—	—	—
Kodaikanal	E.	109·4	271	e 21 24	PPP	—	—	—	—	—
Pennsylvania	E.	113·7	55	e 19 56	PP	i 25 24	[− 3]	i 26 38	SKKS	—
Resolute Bay		114·9	16	e 18 58	[+15]	e 27 41	?	e 35 40	SS	e 61·1
Ottawa		116·5	50	—	—	e 25 40	[+ 2]	e 29 40	PS	—
Palisades		116·7	56	e 20 1	PP	e 25 46	[+ 8]	e 29 36	PS	e 60·4
Bombay		117·1	277	e 22 38	PPP	—	—	—	—	—
Fort de France		118·5	88	—	—	e 30 10	PS	—	—	—

Continued on next page.

		△	Az.	P.	O − C.	S.	O − C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Harvard		118·7	54	e 20 14	PP	e 30 8	PS	e 36 44	SS	e 60·2
Seven Falls	E.	120·2	49	—	—	25 59	[+ 8]	30 2	PS	62·6
Frunse		122·5	304	e 20 50	PP	25 37	[−21]	27 35	SKKS	—
Andijan		123·8	301	e 19 7	[+ 7]	26 6	[+ 4]	21 25	PP	—
Dzhergetal		124·4	300	e 19 5	[+ 4]	e 22 48	PKS	—	—	—
Stalinabad		126·1	299	e 19 11	[+ 7]	e 26 18	[+ 9]	e 21 39	PP	—
Mary		131·4	296	e 19 19	[+ 4]	22 46?	PKS	—	—	—
Sverdlovsk		131·6	322	19 14	[− 1]	22 45	PKS	e 21 25	PP	—
Ivigtut		132·5	31	e 22 33	PKS	e 24 19	PPP	—	—	63·1
Scoresby Sund		135·5	12	(22 28)	PP	—	—	—	—	22·5
Kizyl Arvat		135·9	298	e 19 27	[+ 4]	—	—	—	—	—
Reykjavik	Z.	140·7	17	i 19 25	[− 7]	i 23 1	PKS	—	—	—
Baku		140·8	300	19 40	[+ 8]	e 29 40	(+14)	—	—	—
Lenkoran		141·7	297	i 23 13	PKS	—	—	—	—	—
Moscow		143·7	328	e 19 38	[+ 1]	e 29 45	(+ 2)	e 22 49	PP	—
Pulkovo		144·0	337	e 19 39	[+ 2]	e 23 35	PKS	—	—	—
Tiflis		144·5	303	e 19 48	[+10]	—	—	—	—	—
Gori		145·0	303	e 19 40	[+ 1]	—	—	—	—	—
Helsinki	N.	145·3	343	e 19 43	[+ 3]	—	—	—	—	—
Borzhomi		145·5	303	e 19 38?	[− 2]	—	—	—	—	—
Upsala		147·3	348	e 19 45	[+ 2]	e 30 4?	(0)	e 23 42	PKS	e 78·1
Yalta		151·3	312	e 19 53	[+ 4]	—	—	—	—	—
Copenhagen		152·2	351	e 19 54	[− 3]	23 44	PKS	43 10	SS	73·1
Ksara		152·4	289	e 19 58	[+ 7]	—	—	23 42	PP	—
Kishinev		153·3	322	e 19 55	[+ 3]	—	—	—	—	—
Lwow		153·8	330	e 19 58	[+ 5]	e 30 48	(+ 9)	e 27 22	PPP	—
Rathfarnham Castle		154·1	14	e 22 36	?	e 43 38?	SS	e 24 8?	PP	e 83·1
Potsdam		155·2	348	e 19 56	[+ 1]	e 24 4	PP	e 23 59	PP	e 81·1
Uzhgorod		155·5	332	e 20 0	[+ 5]	e 34 25	PSKS	—	—	—
Skalnate Pleso		155·9	334	e 20 16	PKP_2	27 34	[+33]	e 24 23	PP	—
Istanbul		156·1	309	e 20 1	[+ 5]	e 30 51	(− 1)	e 23 57	PP	—
Collmberg	Z.	156·2	346	e 20 27	PKP_2	—	—	—	—	—
Helwan	Z.	156·2	280	20 1	[+ 5]	24 4	PP	20 28	PKP_2	—
De Bilt		156·4	358	e 20 4	[+ 8]	e 44 4	SS	e 20 30	PKP_2	e 83·1
Kew		156·8	6	e 20 32	PKP_2	e 43 59	SS	e 52 15	SSS	e 81·1
Jena	Z.	156·9	348	e 20 9	[+12]	—	—	e 24 19	PP	—
Prague		157·1	343	e 20 42	PKP_2	34 27	SKSP	e 44 2	SS	e 87·1
Cheb		157·6	348	e 24 5	PP	e 34 27	SKSP	e 44 11	SS	—
Ogyalla		157·8	335	e 20 23	[+25]	e 27 10	[+ 7]	e 24 7	PP	—
Belgrade		159·2	326	e 20 19	[+19]	e 33 21	?	e 25 49	PP	e 96·0
Stuttgart		159·4	351	e 20 4	[+ 4]	e 34 28	PSKS	e 20 36	PKP_2	e 87·1
Paris		159·7	3	e 20 7	[+ 7]	e 27 4	[0]	e 20 35	PKP_2	e 84·1
Strasbourg		159·7	353	e 20 4	[+ 4]	e 44 34	SS	e 20 36	PKP_2	e 83·1
Besançon		161·2	355	e 20 48	PKP_2	—	—	e 21 12	?	—
Triest	Z.	161·3	339	e 20 16	[+14]	e 24 24	SKP	e 24 48	PP	—
Padova		162·8	342	e 20 4	[0]	—	—	e 25 30	PP	—
Pavia	Z.	162·9	348	e 20 42a	PKP_2	e 27 32	[+25]	e 24 42	PP	—
Rome		165·0	336	e 20 6	[0]	e 45 25	SS	e 24 48	PP	—
Toledo		166·8	29	e 20 14	[+ 7]	—	—	—	—	89·6
Malaga		169·1	38	i 20 13	[+ 4]	i 27 21	[+10]	i 25 15	PP	87·3
Granada		169·2	36	20 17a	[+ 8]	31 39	(−20)	21 29	PKP_2	82·3
Alicante		169·4	21	20 14	[+ 5]	27 29	[+18]	21 26	PKP_2	e 78·5
Almeria		170·0	—	i 20 12	[+ 3]	46 10	SS	21 30	PKP_2	90·6
Algiers Univ.	Z.	171·7	—	e 20 17	[+ 7]	—	—	—	—	—
Tamanrasset	Z.	174·2	—	e 20 32	[+21]	e 32 39	(+16)	e 21 46	PKP_2	—

Additional readings :—
Wellington iSSSZ =6m.35s., iQZ =7m.4s.
Christchurch ePZ =4m.22s., eS =7m.38s.
Riverview iEZ =6m.49s., iZ =7m.14s., iN =7m.20s., iE =11m.31s.
Tokyo eE =22m.11s.
Mitchell Field i =12m.16s.
Lick iZ =12m.33s., eZ =13m.46s.
Berkeley iZ =12m.33s. and 12m.47s., eZ =13m.52s., eQEN =35·7m.
Fresno eZ =12m.37s. and 13m.50s.

Continued on next page.

Arcata eZ =13m.46s., eN =23m.24s.
China Lake iZ =12m.55s. and 13m.13s.
Reno eZ =13m.46s.
Vladivostok ePPP =18m.15s., iSKS =23m.12s., iPS =24m.40s.
Tacubaya eS =23m.36s., e =29m.59s. and 31m.55s.
Huancayo ePS =25m.28s., eSS =30m.51s.
La Paz iSKS =24m.22s., iPS =26m.34s.
Chinchina eSSEN =33m.3s.
St. Louis e =26m.9s.
Pennsylvania ePSE =29m.8s., iSSE =35m.7s.
Ottawa eEN =27m.52s.
Palisades e =36m.29s.
Harvard ePP =20m.36s., ePPS =31m.38s., e =37m.50s.
Seven Falls SKKSE =27m.28s., eE =30m.34s., PPSE =31m.36s., SSE =36m.49s.
Frunse ePS =30m.41s.
Andijan PPP =23m.49s., eSKSP =30m.41s.
Stalinabad ePPP =24m.23s., eSKKS =28m.27s.
Moscow ePPP =26m.8s., eSKSP =33m.3s., ePPS =35m.30s.
Upsala ePKPE =19m.50s., ePKKPE =28m.39s., eSSE =42m.20s.
Copenhagen e =20m.1s.
Rathfarnham Castle eZ =44m.24s., eSSSEN =50m.4s.
Skalnate Pleso e =20m.28s., 22m.12s., 23m.20s., and 25m.26s., eSKP =34m.10s., e =38m.54s., eSS =43m.10s.
Helwan iZ =21m.2s., eZ =24m.44s., PPPZ =27m.40s.
De Bilt eZ =20m.54s., ePP =24m.4s.
Kew e =26m.18s.
Jena eZ =20m.28s., 20m.47s., and 25m.34s.
Prague e =21m.44s. and 22m.45s., eN =36m.24s., eSSN =44m.14s., eSSS =49m.47s.
Cheb e =24m.28s., 25m.18s., 28m.38s., 30m.16s., 32m.49s., 43m.1s., 48m.38s., 51m.28s., and 54m.22s.
Ogyalla eSKSP =34m.14s., eSSN? =43m.28s. and other unidentified e readings.
Belgrade eZ =20m.59s. and 22m.59s., eNW =26m.31s., eNE =45m.26s.
Stuttgart ePP =24m.16s., ePPSZ =37m.34s., eSS =44m.16s. and other unidentified e readings.
Paris epPKP =20m.58s., iPP =24m.23s., epPP =25m.12s., ePcP,PKP =30m.49s., ePPP($\Delta > 180°$) =33m.7s., eSPP =37m.24s., eSKSP =38m.48s., eSSS =50m.4s. and other unidentified readings.
Strasbourg e =21m.11s., ePP =24m.23s., eSSS =50m.54s.
Triest ePPP =28m.45s., ePSKS =34m.50s., eSS =45m.43s.
Pavia ePPP =29m.18s., e? =44m.22s., eSS? =44m.56s., eSSS? =53m.8s.
Malaga iPPP =29m.31s.
Granada iPP =25m.38s., PP? =30m.5s., SKSP =36m.44s., iSS =46m.23s., SSS =57m.38s.
Alicante PPP =29m.19s., PPS =38m.37s., SS =45m.18s., SSP =46m.20s., SSS =52m.15s., Q =68m.54s.
Almeria PP =25m.18s., PP? =29m.18s., PPS =39m.10s.
Tamanrasset ePPZ =25m.36s., eZ =28m.54s.
Long waves were also recorded at Tananarive, Galcrazamba, Vera Cruz, Seattle, Weston, Bergen, Clermont-Ferrand, and Tortosa.

June 7d. Readings also at 0h. (Almeria, Alicante, Toledo, near Granada, Malaga, and near Dzhergetal), 1h. (near Manila (2)), 4h. (near Mizusawa), 5h. (Apia, Mount Wilson, Palomar, China Lake, Riverside, Ottawa, Puebla, Tacubaya, and Vera Cruz), 6h. (near Apia and near Dzhergetal (2)), 7h. (Ivigtut and Manila), 8h. (Andijan, Fergana, Khorog, Kurmenty, Przhevalsk, Tashkent, Tchimkent, near Almata, Almata II, Frunse, Ili, Murgab, Naryn, Rybach'e, and near Apia), 9h. (Mineral, Almata II, Fergana, Khorog, Kurmenty, Lunacharskoe, Stalinabad, Tashkent, near Andijan, Almata, Chilisk, Dzhergetal, Frunse, Murgab, Naryn, Przhevalsk, and Rybach'e), 14h. (near Dzhergetal), 15h. (Rome and near Istanbul), 16h. (Brisbane and near Dzhergetal), 18h. (Reno and near Dzhergetal), 19h. (Apia and near Obi-garm), 20h. (near Dzhergetal), 21h. (Scoresby Sund, near Dzhergetal, Khorog, and Obi-garm), 22h. (Scoresby Sund, Frunse, Naryn, Tchimkent (2), near Andijan (2), Dzhergetal (2), Fergana (2), Khorog (2), Lunacharskoe (2), Murgab, Obi-garm (3), Samarkand (2), Stalinabad, and Tashkent (2)), 23h. (near Calcutta, Chatra, and near Obi-garm).

June 8d. 13h. 34m. 36s. Epicentre 24°·3N. 122°·3E. (as on June 3d.).

$A = -\cdot4876$, $B = +\cdot7713$, $C = +\cdot4092$; $\delta = +10$; $h = +4$;

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Zi-ka-wei		6·9	354	e 1 49	+ 4	3 2	− 3	—	—	i 3·2
Nanking		8·3	339	e 2 1	− 3	3 13	−27	—	—	—
Vladivostok		20·4	22	e 4 59	+18	i 8 41	+16	—	—	—
Kabansk		30·2	340	e 6 16	+ 2	11 7	− 6	—	—	—
Ili		41·6	310	i 7 52	+ 1	—	—	—	—	—
Almata		41·6	309	i 7 51	0	—	—	—	—	—
Naryn		41·9	305	i 7 55	+ 1	—	—	—	—	—
Frunse		43·2	308	i 8 5	+ 1	—	—	—	—	—
Andijan		44·6	304	8 16	0	—	—	—	—	—
Khorog		44·9	299	e 8 19	+ 1	—	—	—	—	—
Fergana		45·0	304	e 8 18	− 1	—	—	—	—	—
Dzhergetal		45·3	302	i 8 23	+ 3	—	—	—	—	—
Obi-garm		46·5	302	i 8 29	− 2	—	—	—	—	—
Tashkent		46·9	305	e 8 34	0	—	—	—	—	—
Lunacharskoe		46·9	305	e 8 35	+ 1	—	—	—	—	—
Stalinabad		47·2	301	i 8 36	0	—	—	—	—	—
Sverdlovsk		54·6	324	i 9 30	− 2	17 1	−10	—	—	—
Shemakla		62·6	305	e 10 29	+ 1	—	—	—	—	—
Kirovobad		64·2	305	i 10 39	0	—	—	—	—	—
Tiflis		65·2	307	e 10 38	− 7	—	—	—	—	—
Borzhomi		66·2	306	e 10 52	0	—	—	—	—	—
Moscow		67·4	323	e 11 16	+17	—	—	—	—	—
Ksara		74·1	300	e 11 29?	−11	—	—	e 8 38?	?	—
Istanbul	z.	76·8	309	e 11 53	− 2	—	—	e 12 13	PcP	—
Resolute Bay	z.	78·4	10	e 12 3	− 1	—	—	—	—	—
Stuttgart	z.	86·0	322	e 12 42	− 1	—	—	—	—	—
Mineral	z.	92·5	44	i 13 13k	− 1	—	—	i 13 25	?	—
Reno	z.	94·1	43	e 13 38a	+16	—	—	—	—	—

June 8d. 22h. South Pacific. Pasadena suggests depth 100km.
Auckland iN = 24m.15s. and 25m.19s.
Wellington iP? = 25m.28s., eP? = 27m.0s., eS = 28m.45s.?, eSS = 29m.5s., eLZ = 30m.45s.
Tuai PN = 25m.53s.
Brisbane ePZ = 27m.2s.
Cobb River eE = 27m.18s.
Kaimata eEN = 28m.1s.
Christchurch e = 28m.4s.
Terre Adelie eP? = 29m.30s.
Lick ePZ = 33m.28s. a.
Mount Wilson ePZ = 33m.29s., eZ = 33m.45s.
Riverside ePZ = 33m.29s.
Fresno eP = 33m.31s.
Palomar ePZ = 33m.33s., eZ = 33m.48s.
China Lake ePZ = 33m.35s.
Mineral ePZ = 33m.38s.
Reno ePZ = 33m.42s., eE = 34m.0s., eZ = 34m.5s.
Tamanrasset ePKPZ = 40m.56s., iZ = 41m.14s., iPKP$_2$Z = 42m.46s., ePPZ = 46m.43s.
Alicante PKP = 41m.0s., PKP$_2$ = 42m.10s., PP = 45m.46s., SKS = 47m.10s., PPP = 48m.52s., SS = 62m.54s., Q = 82m.40s., eR = 91m.20s.
Prague ePKP = 41m.27s., e = 41m.44s., 42m.4s., 42m.25s., 42m.46s., and 43m.4s.
Long waves were also recorded at Apia, Berkeley, Harvard, Palisades, Almeria, and Granada.

June 8d. Readings also at 0h. (China Lake), 2h. (Bandong), 3h. (near Dzhergetal (2), and near Istanbul), 4h. (Tacubaya and near Dzhergetal), 5h. (Ksara and Santa Lucia), 6h. (near Istanbul (3)), 9h. (Obi-garm, Frunse, Kurmenty, near Dzhergetal, Fergana, Murgab, Andijan, Khorog, Stalinabad, Tashkent, and Naryn), 11h. (near Tchimkent, Dzhergetal, Obi-garm, Fergana, Khorog, Murgab, and Stalinabad), 12h. (near Dzhergetal), 15h. (Ksara and Istanbul), 18h. (Apia, Kimberley, and Scoresby Sund), 19h. (Pretoria, Terre Adélie, Tamanrasset, China Lake, La Paz, Huancayo, and near Tacubaya), 21h. (Huancayo), 22h. (Pasadena, Riverside, China Lake, Tamanrasset, Ksara, near Stuttgart (2), Ebingen, Strasbourg, and Zürich), 23h. (Ksara and near Dzhergetal).

June 9d. 3h. 52m. 1s. Epicentre 21°·5S. 179°·0W. Depth of focus 0·090.
(as on 1951, April 29d.).

A = −·9311, B = −·0163, C = −·3644; δ = 0; h = +4;
D = −·017, E = +1·000; G = +·364, H = +·006, K = −·931.

		△	Az.	P.	O − C.	S.	O − C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		10·3	44	e 2 24?	+ 2	i 4 9	− 7	i 4 22	SS	—
Tuai	N.	17·6	191	e 3 28	− 5	e 6 14	−10	—	—	—
New Plymouth	E.	18·5	197	e 3 42	+ 1	—	—	—	—	—
Wellington		20·4	194	i 3 55	− 3	e 7 4	− 6	14 7	ScS	—
Cobb River	E.	20·7	198	i 3 59	− 2	e 7 9	− 9	—	—	—
Kaimata	N.E.	22·5	199	i 4 14	− 4	7 35	− 9	e 7 39	S	—
Christchurch		23·0	195	e 4 23	+ 1	e 7 46	− 6	—	—	—
Brisbane	Z.	26·1	252	i 4 50k	+ 1	—	—	—	—	—
Lick	Z.	79·6	43	e 13 15a	pP	—	—	i 13 22?	pP	—
Mount Wilson	Z.	80·2	47	e 11 12	+ 2	—	—	13 20	pP	—
Fresno	Z.	80·5	45	e 13 17k	pP	—	—	—	—	—
China Lake	Z.	81·4	46	e 11 17	+ 1	—	—	e 13 29	pP	—
Mineral		81·5	41	i 11 18a	+ 2	—	—	e 13 24	pP	—
Tinemaha	Z.	81·7	45	e 11 20	+ 3	—	—	—	—	—
Copenhagen		144·8	349	i 18 31	[+ 1]	—	—	—	—	—
Ksara		146·9	298	i 16 39	?	e 16 22	?	—	—	—
Potsdam	Z.	147·8	347	e 18 39	[+ 5]	—	—	—	—	—
Witteveen	Z.	148·4	353	i 18 42	[+ 7]	—	—	e 21 1	pPKP	—
Istanbul	Z.	149·3	317	e 18 42	[+ 6]	—	—	—	—	—
Jena	E.	149·5	345	e 18 38	[+ 1]	—	—	e 21 1	pPKP	—
Stuttgart	Z.	152·0	348	e 18 43	[+ 3]	e 19 2	PKP_2	e 21 7	pPKP	—
Strasbourg		152·4	349	e 18 51	[+10]	—	—	e 19 4	PKP_2	—
Tamanrasset	Z.	175·7	—	e 19 4	[+ 3]	i 20 48	PKP_2	e 21 17	pPKP	—

Additional readings :—
Jena eEN = 18m.44s.
Stuttgart iZ = 18m.50s.
Tamanrasset epPKP$_2$Z = 23m.24s., ePPZ = 24m.41s., epPPZ = 27m.4s.

June 9d. 11h. 22m. 3s. Epicentre 32°·2N. 49°·3E. (as on 1939, Nov. 28d.).

A = +·5528, B = +·6427, C = +·5303; δ = −13; h = +1;
D = +·758, E = −·652; G = +·346, H = +·402, K = −·848.

	△	Az.	P.	O − C.	S.	O − C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Lenkoran	6·6	355	i 1 39	− 2	—	—	—	—	—
Baku	8·2	3	e 2 3	0	—	—	—	—	—
Kirovobad	8·9	345	i 2 13	+ 1	—	—	—	—	—
Kizyl-Arvat	8·9	38	i 2 7	− 5	—	—	—	—	—
Ashkabad	9·4	50	2 17?	− 1	i 4 4	− 3	4 21?	SS	—
Tiflis	10·2	340	e 2 34	+ 3	—	—	—	—	—
Gori	10·6	339	2 40	+ 4	—	—	—	—	—
Ksara	11·4	282	2 57	+10	5 33?	+37	—	—	—
Grozny	11·5	347	2 47	− 1	i 6 27	L	—	—	(i 6·4)
Mary	11·8	59	2 46	− 7	—	—	—	—	—
Piatigorsk	12·8	339	3 7	+ 1	5 41?	+11	—	—	—
Sotchi	13·7	329	e 3 19	+ 1	—	—	—	—	—
Helwan	15·6	266	i 3 44k	+ 1	6 49	+12	4 7	PP	—
Theodosia	16·8	324	e 4 3	+ 5	e 7 11	+ 6	—	—	—
Yalta	17·1	319	4 5	+ 3	7 20	+ 8	—	—	—
Stalinabad	17·1	61	i 3 54?	− 8	i 7 14?	+ 2	—	—	—
Obi-garm	17·8	61	i 4 3	− 8	7 27	− 7	—	—	—
Tashkent	18·4	54	i 4 14	− 4	e 7 48	+ 7	—	—	—
Lunacharskoe	18·4	54	i 4 15	− 3	e 7 51	+10	—	—	—
Istanbul	18·5	304	i 4 20	+ 1	e 7 45	+ 1	—	—	10·6

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Khorog		19·0	67	e 4 19	− 7	—	—	—	—	—
Dzhergetal		19·1	59	i 4 20	− 7	—	—	—	—	—
Fergana		19·9	59	i 4 29	− 7	e 8 17	+ 2	—	—	—
Andijan		20·4	59	i 4 34	− 7	8 22	− 3	—	—	—
Athens		21·7	290	e 5 0	+ 5	e 9 0	+ 9	—	—	—
Bucharest		21·8	312	e 5 0	+ 4	e 9 0	+ 8	i 9 3	S	—
Frunse		22·6	55	i 5 0?	− 3	i 9 7?	0	—	—	—
Sofia		23·0	303	e 5 12	+ 5	e 9 23	+ 9	—	—	—
Naryn		23·2	58	i 5 5	− 4	i 9 16	− 2	—	—	—
Rybach'e		23·5	55	i 5 9	− 3	—	—	—	—	—
Almata		24·4	54	i 5 17	− 4	—	—	—	—	—
Almata II		24·7	54	i 5 20	− 4	—	—	—	—	—
Moscow		24·9	346	e 5 25	− 1	e 9 46	− 1	—	—	—
Bombay		25·0	116	e 4 57	−30	e 10 9	+20	—	—	—
Timisoara		25·5	309	e 5 26	− 6	i 10 3	+ 6	e 10 41	SS	—
Belgrade		25·7	307	e 5 53	+20	e 10 4	+ 3	e 12 15	Q	e 18·8
Lwow		25·9	319	i 5 32	− 3	i 10 1	− 3	—	—	—
Sverdlovsk		25·9	14	i 5 32	− 3	10 0	− 4	—	—	—
Uzhgorod		26·1	316	i 5 38	+ 1	i 10 11	+ 4	—	—	—
Kalossa		27·3	310	e 5 51	+ 3	e 10 26	− 1	e 6 29	PP	—
Skalnate Pleso		27·6	316	e 9 5	PcP	e 10 34	+ 2	—	—	e 13·6
Budapest		27·6	311	5 57	+ 6	10 32	0	6 37	PP	18·0
Ogyalla		28·3	312	e 8 3	?	e 11 13	+30	e 12 1	SS	e 14·1
Vienna		29·5	312	e 6 8	0	11 3	+ 1	e 9 6	PP	—
Hyderabad	N.	30·2	112	—	—	i 11 1	−12	12 38	SS	16·4
Pulkovo		30·3	342	i 6 13	− 2	i 11 11	− 4	—	—	—
Triest		30·5	307	e 6 31	+14	i 11 16	− 2	—	—	—
Rome		30·6	300	e 7 28	PPP	e 11 24	+ 4	e 13 38	SSS	e 17·0
Prague		31·4	315	e 6 35	+10	e 11 31	− 1	e 7 21	PP	e 17·4
Bologna		31·9	304	e 6 49	+20	e 11 47	+ 7	—	—	—
Florence		31·9	302	e 6 27	− 2	—	—	e 7 19	PP	—
Helsinki		32·3	337	e 6 31	− 2	e 11 42	− 4	—	—	—
Cheb		32·6	313	e 7 48	PP	e 11 51	0	e 12 34	SS	e 15·6
Collmberg	Z.	32·7	315	e 6 35	− 1	—	—	—	—	—
Potsdam		33·1	318	i 6 38	− 2	i 12 8	+ 9	—	—	e 18·0
Chur		33·6	307	e 6 43k	− 1	e 12 4	− 2	—	—	—
Pavia		33·6	304	e 6 53	+ 9	i 12 8	+ 2	e 14 48	SSS	e 16·4
Stuttgart		34·2	310	e 6 47	− 2	e 12 13	− 3	e 16 3	Q	e 19·0
Zürich		34·3	308	e 6 48a	− 2	e 12 14	− 3	—	—	—
Upsala		34·7	332	e 6 50	− 4	i 12 19	− 5	e 8 10	PP	e 19·0
Copenhagen		34·8	323	i 6 54a	0	i 12 25	0	—	—	18·0
Basle		35·0	308	e 6 55	− 1	e 12 23	− 5	e 7 15	?	—
Strasbourg		35·1	310	e 7 12	+15	e 12 24	− 6	e 8 8	PP	20·0
Neuchatel		35·4	307	e 6 59	− 1	e 12 1	−33	—	—	—
Witteveen	Z.	36·9	317	i 7 12	0	—	—	i 7 29	?	—
De Bilt		37·6	315	e 7 17	− 1	e 13 9	+ 1	e 8 39	PP	e 18·0
Clermont-Ferrand		37·9	304	i 7 28	+ 8	e 13 13	0	—	—	e 18·6
Algiers Univ.	Z.	38·1	289	e 7 23	+ 1	e 13 15	− 1	e 8 45	PP	—
Paris		38·6	309	i 7 26	0	i 13 7	−16	i 9 25	PPP	e 20·0
Tamanrasset	Z.	39·3	267	i 7 36a	+ 4	e 13 40	+ 6	e 13 27	PcS	—
Tortosa		39·7	296	i 7 51	+15	i 13 39	− 1	—	—	—
Bergen		40·3	328	i 7 43	+ 3	—	—	—	—	e 20·0
Alicante		40·7	292	7 50	+ 6	13 55	0	9 22	PP	e 19·5
Kew		40·8	313	i 7 43	− 2	e 13 53	− 3	e 9 24	PP	e 20·0
Durham		42·1	317	10 5	PPP	i 14 12	− 4	i 11 36	?	—
Almeria		42·5	290	e 7 48	−11	e 14 8	−14	9 32	PP	23·5
Aberdeen	E.	42·9	321	i 7 20	?	i 14 28	+ 1	i 9 41	PP	24·4
Toledo		43·3	295	i 8 6	+ 1	i 14 32	− 1	18 2	SS	e 27·8
Granada		43·3	291	i 8 38s	+33	i 14 35	+ 2	18 26	ScS	23·0
Malaga		44·0	291	i 8 11	0	i 14 41	− 2	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Irkutsk		44·2	46	8 8	− 4	e 14 41	− 5	—	—	—
Rathfarnham Castle		44·6	315	i 8 18	+ 2	i 14 49	− 3	e 9 58	PP	e 19·0
Kabansk		45·6	47	8 22	− 2	e 15 8	+ 2	—	—	—
Scoresby Sund		53·8	337	i 9 24 a	− 2	i 17 1	0	11 15	PP	28·0
Nanking		57·9	70	—	—	17 23	−32	e 28 37	?	33·6
Pretoria	z.	61·1	201	i 10 15	− 3	—	—	—	—	—
Kimberley	z.	64·9	203	i 10 31	−12	—	—	—	—	—
Manila		67·0	86	—	—	e 19 41	− 9	—	—	—
Grahamstown	z.	68·6	199	i 11 4	− 3	—	—	—	—	—
Resolute Bay		70·8	350	e 11 17	− 3	e 20 33	− 2	e 12 57	?	30·0
Petropavlovsk		75·3	36	e 11 35	−12	—	—	—	—	—
Weston		87·9	320	e 12 51	− 2	e 23 33	− 2	—	—	—
Harvard		88·0	320	i 12 52	− 1	—	—	—	—	e 51·0
Ottawa		88·1	325	e 12 51	− 3	e 23 35	− 2	e 36 21	?	—
Morgantown		94·4	323	e 13 17	− 6	—	—	—	—	—
Mineral	z.	107·3	354	e 18 25k	[− 3]	—	—	e 19 12	PP	—
China Lake	z.	111·2	350	e 18 56	[+20]	—	—	e 19 11	PP	—
Pasadena	z.	113·0	350	e 19 14	[+35]	—	—	e 19 25	PP	—
Palomar	z.	113·5	349	e 19 32	PP	—	—	—	—	—
La Paz		121·6	271	e 19 7	[+11]	i 25 22	[−33]	—	—	68·4

Additional readings :—
Helwan iZ =8m.2s., PcPEZ =8m.37s.
Timisoara eN =5m.53s.
Belgrade eZ =7m.11s., iS?NW =10m.15s.
Kalossa eN =5m.59s., eE =6m.33s. and 10m.45s.
Skalnate Pleso eE =9m.27s., eN =9m.34s., eE =11m.13s.
Budapest eSSN =11m.31s., SSSN =12m.1s., SSSE =12m.7s., ePcSN =13m.2s., PcSE = 13m.6s., ScSN =16m.32s., eScSE =16m.37s.
Ogyalla e =8m.24s., eScS? =16m.27s.
Prague eN =8m.31s. and 12m.5s., e =12m.46s., eSS =12m.57s., eN =15m.25s., eScSN = 16m.52s.
Cheb eSSS =12m.53s., e =14m.3s., eScS =17m.4s.
Stuttgart eZ =7m.11s.
Upsala i =12m.29s., eSS =14m.28s., eN =15m.7s., eE =16m.25s., eScSN =17m.7s.
De Bilt eSS =15m.57s.
Clermont-Ferrand i =7m.47s., 10m.8s., and 10m.47s.
Paris i =7m.39s., 7m.54s., and 8m.28s., e =9m.3s., i =9m.39s. and 9m.46s., iS =13m.7s., iPcS =13m.45s., e =14m.43s., 16m.31s., and 16m.48s., iScS =17m.32s.
Tamanrasset eZ =7m.42s. and 11m.56s.
Alicante PcP =10m.9s., Q =16m.37s.
Kew ePSEN =14m.4s., eSS =16m.52s.
Aberdeen i =12m.28s.
Toledo i =8m.28s.
Granada PcS =14m.56s., SS =16m.39s.
Rathfarnham Castle eSEN =14m.6s.
Resolute Bay eEN =25m.8s.
Long waves were also recorded at Chatra, Palisades, and Ivigtut.

June 9d. 17h. 41m. 48s. Epicentre 39°·1N. 143°·4E.

Intensity II-III at Miyako.
Seismological Bulletin of Central Meteorological Observatory, Japan, for June, 1951, Tokyo, 1951, p.135.

A = −·6247, B = +·4639, C = +·6281 ; δ = −4 ; h = −1 ;
D = +·596, E = +·803 ; G = −·504, H = +·374, K = −·778.

		Δ	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Miyako		1·3	294	0 18 a	− 7	0 34	−10
Mizusawa	E.	1·8	271	0 31	− 1	0 52	− 4
Morioka		1·9	288	0 27 a	− 7	0 52	− 7
Hatinohe		2·0	316	0 26	− 9	0 56	− 6
Sendai		2·1	247	0 37	0	1 5	+ 1
Yamagata		2·6	253	0 46	+ 2	1 19	+ 2
Aomori		2·7	309	0 46	+ 1	1 22	+ 3
Hukusima		2·7	240	0 45	0	1 12	− 7
Onahama		2·9	222	1 2	P_g	1 40	S_g
Urakawa		3·0	351	0 45	− 5	1 16	−11

Continued on next page.

	△	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Inawasiro	3·0	241	0 56	+ 6	1 42	+15
Shirakawa	3·2	234	0 53	+ 1	—	—
Mori	3·8	325	1 0	− 1	1 39	− 8
Utunomiya	3·8	229	1 1	0	—	—
Obihiro	3·8	358	1 22	P_g	2 38	?
Tukubasan	4·0	224	1 2	− 2	1 47	− 5
Aikawa	4·2	257	1 21	P_g	—	—
Sapporo	4·3	339	1 13	+ 5	—	—
Maebasi	4·4	233	1 8	− 2	2 0	− 2
Kumagaya	4·4	229	1 12	+ 2	2 15	+13
Tokyo	4·5	222	1 12	+ 1	2 12	+ 7
Yokohama	4·7	221	1 55	S	(1 55)	−15
Matusiro	4·8	240	1 21	+ 6	2 19	+ 7
Oiwake	4·8	236	1 21	+ 6	2 30	+18
Matumoto	5·2	238	1 24	+ 3	—	—
Kohu	5·2	230	1 32	+11	2 47	+25
Misima	5·3	223	1 16	− 6	—	—
Wazima	5·4	254	1 23	− 1	—	—
Omaesaki	6·1	225	2 11	?	—	—

June 9d. Readings also at 0h. (near Obi-garm), 2h. (near Apia and near Istanbul), 3h. (Apia and near Athens), 5h. (Ottawa and Apia), 8h. (near Apia and near Dzhergetal), 9h. (Tamanrasset, Apia, and near Dzhergetal), 10h. (Belgrade), 11h. (Scoresby Sund, Pretoria, near Dzhergetal, Obi-garm, Fergana, Stalinabad, and Khorog), 13h. (near Dzhergetal), 14h. (Ottawa), 16h. (Harvard, Belgrade, and near Dzhergetal), 17h. (Apia and near Collmberg), 18h. (Seattle), 19h. (Tacubaya, Ottawa, and near Chatra), 20h. (near Dzhergetal).

June 10d. 0h. Undetermined shock. Off coast of China.

Zi-ka-wei ePZ = 10m.7s., eS?Z = 11m.39s.
Manila e = 12m.13s.
Guam e = 12m.57s.
Kabansk eP = 14m.5s.
Irkutsk eP = 14m.33s.?
Frunse eP = 17m.16s.
Fergana eP = 17m.30s.
Sverdlovsk eP = 17m.40s., S = 25m.18s.
Moscow eP = 19m.6s.?, eS = 27m.56s.?
Resolute Bay ePZ = 19m.22s., eSE = 28m.44s., eEN = 33m.30s., eLEN = 48m.
Jena eZ = 20m.31s. and 20m.40s.
Reno ePZ = 20m.34s., eZ = 21m.3s.
Stuttgart ePZ = 20m.40s., eS = 31m.2s., eScS = 31m.21s., e = 41m.48s. and 47m.0s., eQ = 56m.
Alicante eP = 21m.35s., S = 32m.58s., PS = 34m.26s., eL = 56m.19s.
Apia S = 21m.43s.
Strasbourg e? = 22m.0s., eL = 55·0m.
Andijan eS = 24m.29s.
Tashkent eS = 24m.41s.
Skalnate Pleso e? = 29m.8s., eSS? = 34m.0s., eSSS = 38m.52s.
Potsdam iE = 30m.39s., eLN = 52m.
Triest eSKS = 31m.13s.
Prague e = 35m.6s., eSS?N = 36m.42s.
Long waves were also recorded at other European stations.

June 10d. Readings also at 3h. (Ksara, Prague, Paris, Zürich, Rathfarnham Castle, near Stuttgart, and near Triest), 4h. (near Dzhergetal, Khorog, Obi-garm, and Stalinabad), 6h. (Bogota and Chinchina), 7h. (Zi-ka-wei, Nanking, Copiapo, Stuttgart, and near Alicante), 8h. (Apia, Chinchina, Huancayo, La Paz, La Plata, Kimberley, Pretoria, Tananarive, Algiers Univ., Granada, Alicante (2), Toledo, Prague, Stuttgart, Potsdam, Pavia, Ksara, and Tamanrasset), 9h. (Apia, Bogota, Almeria, Tortosa, Aberdeen, Kew, De Bilt, Copenhagen, Potsdam, Paris, Clermont-Ferrand, Strasbourg, Skalnate Pleso, Istanbul, and near Dzhergetal), 10h. (near Alicante (4)), 12h. (Istanbul, Andijan, near Dzhergetal, Khorog, Stalinabad, and near Mizusawa), 14h. (Pretoria, Kimberley, and near Dzhergetal), 15h. (Jena, near Prague, Stuttgart, Triest, and near Istanbul), 17h. (Ottawa, Seven Falls, Shawinigan Falls, near Palisades, and Weston), 18h. (near Dzhergetal, near Andijan, and near Chatra), 19h. (Apia, Zi-ka-wei, Nanking, Stuttgart, Kimberley, and near Dzhergetal), 21h. Wellington), 22h. (Puebla and near Tacubaya).

June 11d. 16h. 58m. 52s. Epicentre 44°·2N. 10°·2E. (as on 1950, December 11d.).

A = +·7079, B = +·1274, C = +·6947 ; δ = −4 ; h = −3 ;
D = +·177, E = −·984 ; G = +·684, H = +·123, K = −·719.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Prato		0·7	116	i 0 17	0	i 0 28	0	—	—
Florence		0·9	120	e 0 20	0	i 0 34	0	—	—
Pavia		1·2	323	e 0 25	+ 1	i 0 41	0	e 0 56	S_g
Salo		1·4	9	i 0 26a	− 1	i 0 44	− 2	—	—
Chur		2·7	350	e 0 48	+ 3	e 1 16	− 3	—	—
Triest		2·9	60	e 0 50	+ 2	e 1 22	− 2	—	—
Zürich		3·4	340	e 0 57	+ 2	e 1 44	S*	—	—
Basle		3·8	332	e 1 16	P_g	e 2 1	S_g	—	—
Stuttgart	z.	4·6	352	e 1 9?	− 3	e 2 0	− 7	e 1 26	P*
Strasbourg		4·7	340	—	—	e 2 13	+ 3	—	—
Clermont-Ferrand		5·2	290	—	—	2 8?	−14	—	—
Prague		6·5	25	—	—	e 2 45	−10	e 3 20	S_g
Jena		6·8	9	e 2 22?	P_g	e 3 38	S_g	—	—

Additional readings :—
Salo e = 35s., i = 50s., iN = 55s.
Stuttgart eZ = 1m.36s. and 1m.51s., eS_gZ = 2m.28s. and 2m.37s., eZ = 2m.41s.
Prague eS* = 3m.4s., e = 3m.12s., 3m.27s., 3m.35s., and 3m.45s.
Jena eP_g?E = 2m.27s., eN = 2m.37s., eE = 2m.40s., eN = 3m.17s., eS_g?E = 3m.42s., eE = 3m.52s.
Long waves were recorded at Rome.

June 11d. Readings also at 3h. (near Copiapo), 4h. (Reykjavik, Almata, Almata II, Frunse, Krasnogorka, Samarkand, near Andijan, Dzhergetal, Fergana, Khorog, Murgab, Obi-garm, Stalinabad, and Tashkent), 5h. (near Dzhergetal (2)), 7h. (Stuttgart), 11h. (near Ashkabad), 12h. (Ashkabad, Stuttgart, and near Tacubaya), 13h. (Ashkabad, near Copiapo, near Lwow, and near Dzhergetal), 15h. (near Dzhergetal), 16h. (Prague), 19h. (Kimberley, Murgab, Obi-garm, Samarkand, Stalinabad, near Andijan, Dzhergetal (2), Fergana, and Khorog), 22h. (Nanking, Scoresby Sund, and Pretoria), 23h. (near Ashkabad).

June 12d. 5h. 42s. 35s. Epicentre 13°·1S., 76°·2W. (as on 1948, May 28d.).

Intensity V-VI at Huaytara ; IV-V at Pisco ; IV at Ica, Lima, Miraflores, Chorillos, etc. E. Silgado, Datos Sismológicos del Perú, 1951, Boletîn 8, Lima, Peru, 1953, p.14.

A = +·2324, B = −·9462, C = −·2252 ; δ = +2, h = +6 ;
D = −·971, E = −·239 ; G = −·054, H = +·219 ; K = −974.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Huancayo		1·3	39	i 0 34	+ 9	i 0 52	+ 8	—	—	—
La Paz		8·5	114	i 2 11	+ 4	i 3 45	0	i 2 43	P_g	4·2
Bogota		17·7	7	e 4 16	+ 6	e 7 24	− 2	—	—	—
Chinchina		18·0	3	e 4 17	+ 4	e 8 11	+39	—	—	—
Palomar	z.	60·3	322	i 10 9	− 4	—	—	e 10 29	pP	—
Riverside	z.	61·1	321	i 10 14	− 4	—	—	e 10 36	pP	—
Pasadena		61·6	321	e 10 18	− 4	e 10 53	sP	e 10 40	pP	—
China Lake	z.	62·4	323	i 10 22	− 5	—	—	e 10 45	pP	—
Tinemaha	z.	63·7	323	i 10 31	− 5	—	—	—	—	—
Lick	z.	65·9	321	i 10 46a	− 4	—	—	—	—	—
Mineral	z.	67·8	324	e 10 48k	−14	—	—	—	—	—
Tamanrasset	z.	87·5	66	e 12 50	− 1	e 13 31	sP	e 13 13	pP	—
Pretoria	z.	97·0	118	i 7 25	?	—	—	—	—	—

La Paz also gives iS_g = 4m.40s.

June 12d. 7h. Undetermined shock.

Perth P = 48m.35s., S = 53m.48s., L = 58m.3s.
Riverview PZ = 56m.0s., iSE = 61m.6s., eLZ = 64·4m.
Brisbane iPZ = 56m.39s., iZ = 56m.55s.
Pretoria iZ = 60m.8s.
Kimberley iZ = 60m.38s.
Stuttgart eZ = 68m.48s. and 74m.3s.
Palomar ePKPZ = 68m.55s., iZ = 69m.2s.
Riverside ePKPZ = 68m.55s., iZ = 69m.1s.
Mineral ePZ = 68m.57s.k.
Lick ePZ = 69m.0s.k.
Pasadena iPKPZ = 69m.1s.
Fresno ePZ = 69m.2s., eZ = 69m.22s.
China Lake ePKPZ = 69m.3s.
Tinemaha ePKPZ = 69m.3s.
Scoresby Sund eP = 69m.27s.
Resolute Bay ePZ = 69m.29s., eZ = 69m.39s., 71m.40s., and 73m.33s., eLEN = 126m.
Long waves were also recorded at La Plata, Wellington, and Almeria.

June 12d. 22h. 40m. 39s. Epicentre 36°·3N., 71°·0E. Depth of focus 0·030.
(as on 1948, September 7th).

Intensity VII at Srinagar. Epicentre 36°·5N. 70°·5E.
Seismc. Bull. Gov. of India Met. Dept. June 1951 p. 6.

$A = +·2630$, $B = +·7638$, $C = +·5894$; $\delta = -5$; $h = 0$;
$D = +·946$, $E = -·326$; $G = +·192$, $H = +·557$, $K = -·808$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Khorog		1·4	23	i 0 36	+ 1	i 0 57	− 6	—	—	—
Obi-garm		2·6	293	i 0 47	0	1 18	− 5	—	—	—
Dzhergetal		2·9	3	i 0 51	+ 1	i 1 25	− 4	—	—	—
Stalinabad		2·9	322	i 0 50	0	i 1 23	− 6	—	—	—
Fergana		4·1	9	i 1 5	+ 1	i 1 50	− 4	—	—	—
Samarkand		4·6	319	i 1 6	− 5	1 53	−12	—	—	—
Andijan		4·6	14	i 1 10	− 1	i 2 0	− 5	—	—	—
Tashkent		5·2	347	i 1 17	− 1	i 2 11	− 8	—	—	—
Naryn		6·5	36	i 1 33	− 2	i 2 45	− 4	—	—	—
Frunze		7·1	22	i 1 43	+ 1	i 2 57	− 5	—	—	—
Rybach'e		7·3	31	i 1 45	0	i 3 3	− 4	—	—	—
Mary		7·4	283	i 1 45	− 1	—	—	—	—	—
Krasnogorka		7·6	23	1 41?	− 8	—	—	—	—	—
Almata		8·3	32	i 1 59	+ 1	i 3 30	0	—	—	—
Przhevalsk		8·4	41	i 1 58	− 1	—	—	—	—	—
Almata II		8·5	33	i 2 0	0	—	—	—	—	—
Kurmenty		8·8	38	i 2 3	− 1	—	—	—	—	—
Chilisk		9·2	36	i 2 7	− 2	—	—	—	—	—
Ashkabad		10·2	283	i 2 21	− 2	4 3	−11	—	—	—
Chatra		16·7	120	3 47	+ 5	i 6 47	+ 7	—	—	7·4
Baku		17·0	290	e 3 50	+ 4	—	—	—	—	—
Bombay		17·4	174	e 3 15	−35	e 5 55	−60	—	—	—
Lenkoran		17·8	287	3 58	+ 4	—	—	—	—	—
Kirovobad		19·8	291	e 4 17	+ 2	—	—	—	—	—
Hyderabad	N.	19·9	159	e 4 33	+17	i 7 53	+11	—	—	9·7
Grozny		20·6	299	4 22	− 1	—	—	—	—	—
Tiflis		21·0	295	e 4 29	+ 2	—	—	5 7	pP	—
Sverdlovsk		21·7	345	i 4 34	0	8 18	+ 3	—	—	—
Borzhomi		22·1	294	e 4 43	+ 6	—	—	—	—	—
Piatigorsk		22·6	300	4 42	0	8 31	+ 1	i 5 20	pP	—
Ksara		28·8	275	i 6 28a	+49	10 51	+40	—	—	—
Moscow		29·8	321	i 5 47	− 1	10 30	+ 3	11 42	sS	—
Istanbul		32·8	292	e 6 15	+ 1	e 11 19	+ 5	e 7 3	pP	—
Kishinev		32·9	305	6 14	− 1	—	—	—	—	—
Pulkovo		35·1	325	i 6 33	− 1	—	—	—	—	—
Lwow		36·3	306	i 6 44	0	e 12 4	− 4	—	—	—
Uzhgorod		37·4	308	i 6 55	+ 2	e 12 25	+ 1	e 10 42?	?	—
Helsinki		37·7	325	e 6 55	0	e 12 26	− 3	e 15 10	SS	—
Timisoara	N.	38·2	301	e 8 28	PP	e 16 9	SSS	—	—	—
Skalnate Pleso		38·7	307	e 7 9	+ 5	e 12 40	− 4	e 8 47	PS	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m. s.			m.
Belgrade		38·8	298	e 7 1	− 3	e 13 40	+55	e 15 59	SS		—
Nanking		39·5	82	e 7 19	+ 9	i 12 58	+ 2	e 8 26	PP		—
Budapest		39·6	303	e 8 21	PP	e 9 36	PPP	e 10 1	PPPP		—
Kalossa		39·7	302	e 8 30	PP	e 9 38	PPP	—	—		—
Ogyalla		40·1	304	e 8 28	sP	e 16 21	ScS	e 9 48	PPP		—
Upsala		41·2	322	e 8 34	sP	16 32	SS	e 9 38	PPP		e 17·4
Prague		42·5	308	e 7 35a	0	e 13 38	− 2	e 9 30	PP		—
Potsdam		43·2	311	e 7 44	+ 3	i 10 35	PPP	e 8 56	pP		—
Collmberg		43·2	310	e 7 42	+ 1	—	—	e 9 36	PP		—
Triest		43·3	301	e 7 42	+ 1	i 13 51	0	i 8 56	pP		—
Copenhagen		43·6	315	i 7 44a	0	i 17 29	ScS	i 10 38	PPP		—
Cheb		43·8	308	e 7 44	− 1	e 13 59	+ 1	e 16 17	sS		—
Jena		44·2	308	e 7 49	+ 1	e 9 36	PP	e 8 40	pP		—
Stuttgart		46·0	306	e 8 3a	0	e 14 27	− 3	e 9 18	pP		—
Karlsruhe	z.	46·5	307	e 8 9	+ 2	—	—	i 9 23	PcP		—
Zürich		46·6	304	e 8 8	+ 1	—	—	e 9 0	pP		—
Strasbourg		47·0	306	i 8 12	+ 2	e 18 21	SS	e 9 2	pP		—
Witteveen	z.	47·1	314	i 8 12	+ 1	—	—	i 10 11	PP		—
Basle		47·3	304	e 8 12	− 1	—	—	e 9 5	pP		—
De Bilt		48·1	312	e 8 4	−15	—	—	—	—		—
Paris		50·4	307	i 8 36	0	i 16 44	PS	i 9 25	pP		—
Clermont-Ferrand		50·7	303	i 8 39	0	—	—	i 9 55	sP		—
Rathfarnham C.	z.	54·7	315	e 9 7	− 1	e 12 42	PPP	e 10 2	pP		—
Alicante		55·5	296	8 51	−23	16 39	− 1	—	—		e 35·1
Scoresby Sund		57·2	337	i 9 26a	0	e 18 38	PPS	—	—		—
Toledo		57·5	298	i 9 27	− 1	i 10 23	?	i 10 48	?		—
Almeria		57·6	294	e 9 22	− 7	e 17 6	− 1	—	—		—
Tamanrasset	z.	57·6	277	i 9 28k	− 1	e 17 11	+ 4	e 10 15	pP		—
Petropavlovsk		60·6	44	e 9 47	− 2	—	—	—	—		—
Resolute Bay		68·9	357	e 10 44	+ 2	e 19 31	+ 4	e 12 1	?		—
Pretoria	z.	73·8	220	i 11 14?	+ 2	—	—	—	—		—
Pietermaritzburg	z.	75·9	216	i 11 26	+ 2	—	—	—	—		—
Grahamstown	z.	80·7	217	i 11 52	+ 3	—	—	—	—		—
Ottawa		93·3	336	e 12 51	0	—	—	—	—		—
Victoria		94·7	9	12 57	0	—	—	—	—		—
Mineral	z.	102·9	10	e 17 54	[+ 4]	—	—	—	—		—
China Lake	z.	107·8	8	e 18 16	[+16]	—	—	i 18 30	PP		—
Palomar	z.	110·5	6	e 18 48	pPKP	—	—	—	—		—
Huancayo		141·3	300	e 19 2	[− 3]	—	—	—	—		—

Additional readings :—
Chatra PP =4m.2s., PPP =4m.9s., Q =6m.44s., SS =7m.7s., SSS =7m.18s.
Bombay ePN =3m.19s., iSE =5m.4s.
Istanbul ePPNZ =7m.25s., eEN =11m.12s., eSSE =12m.39s.?
Skalnate Pleso esP =8m.21s., ePPN =8m.56s., ipPPE =9m.18s., esPP? =9m.39s., e = 14m.43s. and 15m.32s., eSS =15m.46s., eN =16m.16s., esSSE =16m.31s., eScSE = 16m.47s., e =17m.29s., 18m.26s., 19m.9s., 20m.21s., and 22m.34s.
Belgrade eZ =7m.9s. and 7m.52s., iZ =8m.11s., eNE =9m.48s.
Ogyalla e =10m.2s., 11m.0s., 17m.37s., 17m.52s., 18m.50s., and 20m.51s.
Upsala ePP =9m.9s., i =10m.3s., eN =16m.5s., eSSE =16m.40s.
Prague esP =8m.48s., ePPP? =9m.53s., e =10m.18s., esPP =10m.27s., e =11m.41s., eScPN =12m.30s., eE =14m.7s.. and 14m.30s., esS?N =14m.48s., eSS? =15m.43s. eScS =17m.1s., e =17m.59s., esScS? =18m.32s., e =21m.36s. and 24m.21s.
Potsdam ePN =7m.48s., eN =19m.52s.
Triest ePPZ =9m.29s., ipPPZ =10m.36s., iPPPZ =10m.42s., eScS =17m.13s., iSS = 17m.35s.
Copenhagen 8m.58s.
Cheb esP? =8m.44s., e =10m.44s., eScS? =17m.33s.
Jena eEN =8m.9s., eN =8m.24s., ePP?E =9m.5s., eN =9m.43s.
Stuttgart eZ =9m.36s. and 13m.6s., e =18m.9s. and 23m.21s.
Strasbourg isP =9m.26s., epPP =10m.47s., ePPP =11m.10s., e =11m.46s. and 16m.2s.
Paris i =9m.29s., esP =9m.49s., iPcP =9m.53s., epPP =11m.18s., iPPP =11m.46s., eScP =13m.22s., iPcS =13m.40s., isSS =20m.38s.
Rathfarnham Castle eZ =10m.29s., e =13m.51s.
Tamanrasset eZ =9m.54s., esPZ =10m.45s., ePPZ =11m.43s., epPPZ =12m.29s., esSZ =18m.24s.
Resolute Bay eEN =20m.58s.
Long waves were recorded at Bergen.

June 12d. Readings also at 0h. (Istanbul), 1h. (near Dzhergetal), 3h. (Brisbane, near Khorog, Obi-garm, Fergana, Samarkand, Andijan, Tashkent, Naryn, Rybach'e, Almata II, Murgab, Stalinabad, and Dzhergetal), 4h. (Tamanrasset, Kimberley, near Granada, and Malaga), 5h. (Strasbourg and Paris), 6h. (near La Paz), 7h. (Apia and near Alicante), 8h. (Granada and Ksara), 9h. (Kimberley), 11h. (Istanbul and Brisbane), 12h. and 13h. (near Obi-garm), 16h. (near Ashkabad, near Obi-garm, Frunse, Ili, Dzhergetal, Stalinabad, Murgab, Naryn, Tashkent, Andijan, Fergana, Khorog, and near Apia (2)), 18h. (Apia and Ashkabad), 20h. (Samarkand, Obi-garm, Frunse, Dzhergetal, Stalinabad, Naryn, Tashkent, Andijan, Murgab, Khorog, and Fergana), 21h. (Lick, Mount Wilson, Palomar, China Lake, Tinemaha, Palisades, and near Stalinabad), 22h. (China Lake, Mount Wilson, Scoresby Sund, Clermont-Ferrand, near Granada, Toledo, Malaga, Almeria, and Alicante).

June 13d. 1h. 6m. 28s. Epicentre 18°·5N. 63°·0W. (as on 1947, Oct. 23d.).

Epicentre appears rather further south than the adopted position.
Depth suggested 60km (Pasadena).

A = +·4308, B = −·8456, C = +·3154 : δ = +11 ; h = +5 ;
D = −·891, E = −·454 ; G = +·143, H = −·281, K = −·949.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
San Juan		2·9	268	i 0 59	+11	i 1 48	S_g	i 1 13	?	i 2·1
Fort de France		4·1	154	i 0 48	−17	1 42	−13	e 1 3	P	—
Bogota		17·5	220	e 4 5	− 2	e 7 57	+36	—	—	11·2
Chinchina		18·1	223	e 4 24	+10	e 8 0	+25	—	—	11·3
Washington		23·7	333	i 5 17	+ 3	—	—	e 5 37	sP	—
Fordham		24·1	342	e 5 17	− 1	—	—	—	—	—
Palisades		24·3	342	i 5 19	− 1	i 9 56	+19	i 5 33	pP	—
Weston		24·8	347	i 5 18	− 7	e 10 1	+15	—	—	—
Harvard		25·0	347	i 5 24	− 3	e 9 52	+ 3	—	—	e 11·8
Morgantown		25·7	328	i 5 34	+ 1	—	—	—	—	—
St. Louis		31·0	317	e 7 12	PP	e 11 36	+10	e 7 18	PP	—
Florissant		31·2	317	e 7 21	PP	—	—	—	—	—
Huancayo		32·7	204	e 6 28	− 8	e 11 42	−10	—	—	e 18·6
La Paz		35·1	189	e 6 52	− 5	e 12 8	−22	—	—	15·5
Tucson		45·0	299	e 8 22	+ 3	e 13 29	?	e 8 38	pP	—
Palomar	z.	50·1	298	e 8 59	0	—	—	e 9 14	pP	—
Riverside	z.	50·6	300	e 9 21	pP	—	—	—	—	—
Hungry Horse		50·7	318	i 9 2	− 1	—	—	—	—	—
Mount Wilson	z.	51·2	300	e 9 7	0	—	—	e 9 20	pP	—
Lick	z.	54·3	304	e 9 15a	−15	—	—	e 9 35	PcP	—
Mineral	z.	54·4	307	i 9 32k	+ 1	—	—	—	—	—
Victoria		56·8	316	9 45	− 3	—	—	—	—	—
Stuttgart	z.	64·6	45	e 10 41	0	—	—	—	—	—
College		71·2	334	e 11 17	− 6	—	—	—	—	—

Additional readings :—
Fort de France P_g = 54s., iS = 1m.25s., S* = 1m.32s.
Long waves were also recorded at Pennsylvania.

June 13d. 7h. 40m. 54s. I ; Epicentre 47°·2N. 10°·8E.
7h. 43m. 13s. II ; (as on 7d.).

Shock II, Intensity IV-V Eastward of Nassereith. Macroseismic area 2500sq.km.

Makroseismische Beobachtungen, 1951, Jahrbücher der Zentralanstalt für Meteorologie und Geodynamik, Jahrgang, 1951, Neue Folge, 88, Band, Vienna, 1952, pp.E1, E2, macroseismic chart p.E3.

A = +·6698, B = +·1278, C = +·7314 ; δ = −9 ; h = −4 ;
D = +·187, E = −·982 ; G = +·718, H = +·137, K = −·682.

		△	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
I	Chur	0·9	248	e 0 20	0	i 0 36	+ 2	i 0 24	P_g
II		0·9	248	e 0 20k	0	i 0 35	+ 1	e 0 23	P_g
I	Ravensburg	1·0	306	e 0 21	0	i 0 38	+ 1	—	—
II		1·0	306	e 0 21	0	e 0 35	− 1	i 0 37	S_g
I	Zürich	1·5	276	e 0 31	P_g	e 0 53	S_g	—	—
II		1·5	276	e 0 29	+ 1	e 0 53	S_g	—	—

Continued on next page.

			△	Az.	P.	O−C.	S.	O−C.	Supp.	
			°	°	m. s.	s.	m. s.	s.	m. s.	
	I	Ebingen		1·6	309	—	—	e 0 53	+ 2	—	—
	II			1·6	309	—	—	e 0 53	+ 2	—	—
	I	Stuttgart	z.	1·9	326	e 0 34?	0	e 1 2	+ 3	i 0 39	P_g
	II		z.	1·9	326	e 0 33	− 1	e 0 57	− 2	i 0 38	P_g
	I	Basle		2·2	279	e 0 50	P_g	e 1 16	S_g	—	—
	II			2·2	279	e 0 47	P_g	e 1 15	S_g	—	—
*	I	Karlsruhe	z.	2·4	319	e 0 24	−17	i 0 28	?	—	—
	II		z.	2·4	319	e 0 20	−21	i 0 28	?	—	—
	I	Strasbourg		2·5	304	e 0 52	P_g	i 1 22	S_g	—	—
	II			2·5	304	i 0 50	P_g	i 1 12	− 2	i 1 21	S_g
	I	Neuchatel		2·6	266	e 0 52	P_g	e 1 29	S_g	—	—
	II			2·6	266	e 0 48	P*	e 1 28	S_g	—	—
	I	Triest		2·6	127	e 0 45	+ 1	e 1 24	S_g	—	—
	II			2·6	127	i 1 13	S_g	i 1 22	+ 5	—	—
	I	Jena		3·8	8	e 1 11?	P*	e 1 38	− 9	e 1 16	P_g
	II			3·8	8	e 1 8	P*	e 1 38	− 9	e 1 17	P_g
	I	Prague		3·8	39	e 1 29	P_g	e 1 46	− 1	e 2 15	S*
	II			3·8	39	e 1 27	P_g	e 1 55	+ 8	—	—
	I	Collmberg	z.	4·4	19	e 1 2	− 8	e 1 57	− 5	e 1 24	P_g
	II			4·4	19	e 1 3	− 7	e 1 57	− 5	e 1 24	P_g

Additional readings :—
Stuttgart I eZ = 56s., iS_gZ = 1m.4s., iZ = 1m.8s., II eP*Z = 36s., iZ = 1m.1s., iS_gZ = 1m.3s., iZ = 1m.7s.
Jena I iS?E = 1m.28s., iS_gEN = 1m.57s., iE = 2m.2s., II eP_g?Z = 1m.11s., eS?N = 1m.27s., iS_g?E = 1m.56s., iN = 2m.3s.
Prague I eS = 1m.38s., II eS = 1m.41s., eS* = 1m.51s.
Collmberg I eP_gZ = 1m.42s., eEZ = 1m.53s., eS*EZ = 2m.14s., eZ = 2m.18s. and 2m.30s., eS_gZ = 2m.46s., II eZ = 1m.35s., eS*EZ = 2m.14s., eZ = 2m.30s., eS_gZ = 2m.46s.

June 13d. Readings also at 0h. (near Angra do Heroismo, near Ponta Delgada, near Dzhergetal, and near Apia), 2h. (near Dzhergetal)), 4h. (Poona and Tamanrasset), 6h. (Istanbul, Palomar, Riverside, and China Lake), 7h. (Pavia), 8h. (Almata, Frunse, Naryn, Mary, near Andijan, Fergana, Dzhergetal, Khorog, Murgab, Stalinabad, Obi-garm, and Tashkent), 9h. (Apia and Palisades), 10h. (near Messina), 12h. (Stuttgart), 13h. (Apia and Santa Clara), 14h. (Palomar, Pasadena, Riverside, China Lake, Lick, Fresno, near Ottawa, near Andijan, Dzhergetal (2), Fergana, Pietermaritzburg, near Grahamstown, and Kimberley), 15h. (near Antofagasta), 16h. (Grahamstown, Stuttgart, Triest, near Dzhergetal (2), Khorog, and Obi-garm), 17h. (Khorog, near Andijan, Dzhergetal, Obi-garm, Stalinabad, and near Tacubaya), 18h. (Tamanrasset, Chur, Strasbourg, Stuttgart, Jena, Prague, near Taranto, and Triest), 22h. (Apia), 23h. (Ksara).

June 14d. 8h. 19m. 47s. Epicentre 33°·9S. 177°·8W. (as on 1948, Jan. 20d.).

A = −·8312, B = −·0319, C = −·5551 ; δ = +5 ; h = +1 ;
D = −·038, E = +·999 ; G = +·555, H = +·021, K = −·832.

		△	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Tuai	N.	6·4	218	i 1 46	+ 8	e 3 11	+18
Auckland	N.	6·7	242	—	—	i 3 8	+ 8
New Plymouth	E.	8·3	229	e 2 10	+ 6	e 3 51	+11
Wellington		9·4	216	i 2 17	− 1	i 4 11	+ 4
Cobb River	E.	10·4	224	—	—	e 4 25	− 7
Kaimata	N.E.	12·1	221	e 2 49	− 8	e 5 0	−14
Christchurch		12·2	215	e 2 53	− 5	i 5 11	− 5
Mount Wilson	z.	87·9	46	i 11 56	−57	—	—
Palomar	z.	88·0	47	i 11 58	−55	—	—
China Lake	z.	89·3	45	i 12 3	−56	—	—

Welliugton gives also i = 4m.16s.

June 14d. Readings also at 0h. (near Istanbul and near Fort de France), 3h. (Grahamstown, Kimberley, and near Dzhergetal), 4h. (near Scoresby Sund), 6h. (Bogota), 7h. (Basle and Stuttgart), 11h. (Manila, Nanking, Zi-ka-wei, and near Khorog), 12h. (Tacubaya, De Bilt, Paris, Strasbourg, Prague, Fergana, Samarkand, near Dzhergetal (2), Obi-garm, Andijan, Murgab, Stalinabad, and near Apia), 13h. (Ottawa and near Dzhergetal), 15h. (Mount Wilson, Palomar, China Lake, Ottawa, Istanbul, and near Athens), 16h. (Ottawa, Palisades, and Strasbourg), 17h. (near Dzhergetal), 18h. (Messina, near Chatra, and near Dzhergetal), 19h., 20h., 21h., and 22h. (near Dzhergetal), 23h. (near Chatra and near Dzhergetal).

June 15d. 17h. 59m. 49s. Epicentre 30°·9S. 72°·0W. (as on 1947, April 13d.).

Intensity IV in Chile between south latitudes 29° and 30°. Epicentre near 31°S. 74°W.

F. Greve.
Boletín del año 1951, Instituto sismológico, Universidad de Chile, Santiago, p.26.

$A = +\cdot2656$, $B = -\cdot8175$, $C = -\cdot5110$; $\delta = -3$; $h = +2$;
$D = -\cdot951$, $E = -\cdot309$; $G = -\cdot158$, $H = +\cdot486$, $K = -\cdot860$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Santa Lucia	N.	2·8	152	i 0 57	P_g	1 30	S_g	—	—	1·6
Copiapo	N.	3·8	23	e 0 58	− 3	1 37	−10	0 25	?	—
Antofagasta	E.	7·4	11	—	—	e 3 0	−18	e 3 29	S*	—
La Plata		12·5	112	3 5	+ 3	5 17	− 6	5 35	SS	6·0
La Paz		14·8	15	i 3 44	PP	i 6 36	SS	7 9	Q	7·9
Huancayo		19·0	351	e 4 29	+ 3	c 8 14	SS	—	—	e 9·5
Palomar	Z.	76·7	323	e 11 56	+ 1	—	—	—	—	—
Riverside	Z.	77·5	323	e 12 0	+ 1	—	—	—	—	—
Pasadena	Z.	78·1	323	e 12 2	0	—	—	—	—	—
China Lake	Z.	79·0	324	e 12 9	+ 2	—	—	—	—	—
Kimberley	Z.	81·1	118	i 12 18	0	—	—	—	—	—
Pretoria	Z.	85·2	117	i 12 39	0	—	—	—	—	—
Tamanrasset	Z.	91·5	64	e 13 7	− 3	—	—	—	—	—

Additional readings :—
La Plata Z = 3m.23s., S?N = 4m.47s., SE = 5m.23s., N = 5m.47s.
Tamanrasset eZ = 13m.22s. and 14m.35s.
Long waves were also recorded at Concepción, Tortosa, and Paris.

June 15d. 20h. Undetermined Pacific shock.

Wellington iP?Z = 34m.18s., iZ = 49m.45s., Q? = 52m.?, RZ = 54m.?.
Apia eP = 44m.19s.?, S = 45m.39s.
Lick iPZ = 54m.6s.k, ipP?Z = 54m.17s.
Mount Wilson ePZ = 54m.8s., epP?Z = 54m.19s.
Riverside ePZ = 54m.9s., epP?Z = 54m.23s.
Palomar ePZ = 54m.10s., epP?Z = 54m.22s.
China Lake ePZ = 54m.17s., epP?Z = 54m.29s.
Tinemaha ePZ = 57m.18s., epP?Z = 54m.30s.
Victoria P = 54m.42s.
La Paz eP = 59m.24s.
Copenhagen eP = 60m.50s.
Witteveen Z = 62m.1s.
Collmberg eZ = 62m.2s. and 62m 10s.
Stuttgart ePKPZ = 62m.2s., eZ = 62m.8s.
Jena ePKPEZ = 62m.4s.?, eE = 62m.15s., eEZ = 62m.30s., eE = 62m.46s.
Paris ePKP = 62m.10s., e = 62m.26s. and 66m.8s., iPPP? = 68m.21s., eSKSP? = 75m.25s., eL = 121m.
Strasbourg ePKP = 62m.10s., e = 62m.21s. and 77m.0s.
Algiers Univ. ePKPZ = 62m.16s., ePP?Z = 66m.58s., eZ = 72m.36s.
Tamanrasset ePKPZ = 62m.24s., $ePKP_2Z$ = 64m.15s., ePPZ = 68m.10s.
Ksara ePKP? = 64m.10s., e = 81m.8s.
Long waves were also recorded at Christchurch, Auckland, Pretoria, Kimberley, Harvard, Palisades, Kew, and Rome.

June 15d. Readings also at 0h. (Tamanrasset, Apia, near Istanbul, and near Dzhergetal), 2h. and 4h. (near Dzhergetal), 6h. (Samarkand, Naryn, Frunse, Rybach'e, near Kkorog, Obi-garm, Stalinabad, Dzhergetal, Murgab, Fergana, and Andijan, Wellington, New Plymouth, Cobb River, Kaimata, Christchurch, near Tuai, and Karapiro), 8h. (Ottawa and Dzhergetal), 9h. (Lick, Fresno, and Mineral), 12h. (near Dzhergetal), 15h. (near Tacubaya (2)), 16h. (near Dzhergetal), 17h. (Chatra), 18h. (Apia), 19h. (Chatra and near Klyuchi), 20h. (Apia and near Dzhergetal), 21h. (Scoresby Sund and Santa Lucia), 23h. (Chatra and near Apia).

June 16d. 5h. 52m. 54s. Epicentre 37°·0N. 117°·2W. (as on 1945, June 14d.).

$A = -·3660$, $B = -·7120$, $C = +·5992$; $\delta = -6$; $h = -1$;
$D = -·889$, $E = +·457$; $G = -·274$, $H = -·533$, $K = -·801$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Tinemaha		0·8	277	i 0 17a	− 1	i 0 28	− 3	—	—
Haiwee		1·1	215	i 0 22k	0	i 0 36	− 3	—	—
China Lake	z.	1·2	195	i 0 25a	+ 1	—	—	—	—
Boulder City		2·1	118	e 0 39	+ 2	i 0 41	P_g	—	—
Fresno		2·1	263	e 0 37a	0	i 1 7	+ 3	—	—
Pasadena		3·0	195	i 0 50	0	i 1 36	S_g	—	—
Riverside		3·0	183	i 0 51	+ 1	—	—	—	—
Santa Barbara	z.	3·3	220	e 1 4	P_g	—	—	—	—
Lick	z.	3·6	279	i 0 57a	− 1	i 1 47	+ 5	i 1 2	P*
Santa Clara		3·8	276	e 1 13	P_g	i 2 2	S_g	—	—
Branner	z.	4·0	278	e 1 10k	P*	—	—	—	—
Berkeley		4·1	282	i 1 10a	P*	e 1 52	− 3	—	—
Mineral		4·8	316	e 1 15a	0	e 2 34	S_g	i 1 29	P*
Shasta Dam		5·5	314	e 1 22	− 3	e 2 51	S*	—	—
Tucson		7·1	130	i 1 47	− 1	i 3 18	+ 8	i 2 14	P_g
Hungry Horse		11·6	11	e 2 37	−13	e 6 0	+59	—	—

Additional readings :—
Berkeley iZ = 1m.14s. and 1m.32s.
Mineral iZ = 1m.20s.
Long waves were also recorded at Seattle and Palisades.

June 16d. 23h. 47m. 2s. Epicentre 44°·5N. 129°·7W. (as on 1951, Feb. 23d.).

$A = -·4571$, $B = -·5506$, $C = +·6985$; $\delta = 0$; $h = -3$;
$D = -·769$, $E = +·639$; $G = -·446$, $H = -·537$, $K = -·716$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Arcata	E.	5·5	129	—	—	e 2 38	S*	e 3 1	S_g	e 3·8
Victoria		5·9	45	i 1 29	− 2	2 39	− 1	—	—	—
Seattle		6·0	56	i 1 34k	+ 2	i 2 46	+ 3	i 1 49	P*	e 3·8
Mineral		7·3	122	e 1 53k	+ 3	e 3 57	S_g	e 2 4	P*	—
Berkeley		8·7	137	e 2 10k	0	e 4 6	+16	e 2 21	PP	—
Santa Clara		9·2	138	e 3 40	?	i 4 59	S_g	—	—	—
Lick		9·4	137	i 2 18k	0	c 4 43	S*	i 2 28	PP	—
Fresno	z.	10·8	132	e 2 36k	− 3	—	—	—	—	—
Tinemaha	z.	11·4	126	e 2 50	+ 3	—	—	—	—	—
Hungry Horse		11·5	65	i 2 47	− 1	—	—	—	—	—
China Lake	z.	12·7	129	e 3 5	0	—	—	i 3 18	PP	—
Bozeman		13·3	78	e 3 11	− 2	—	—	—	—	—
Mount Wilson	z.	13·6	135	e 3 15	− 2	—	—	i 3 26	PP	—
Pasadena		13·6	135	i 3 26	+ 9	e 5 40	−10	i 3 47	PPP	6·8
Sitka		13·6	347	e 3 10	− 7	e 5 58	+ 8	—	—	—
Boulder City		14·2	122	e 3 28	+ 4	—	—	i 3 33	PP	—
Riverside	z.	14·2	133	e 3 24	0	—	—	i 3 33	PP	—
Palomar		14·9	134	i 3 33	− 1	i 3 47	PP	i 3 41	?	—
Tucson		19·1	124	i 4 28	+ 1	e 8 13	+16	—	—	—
College		22·8	340	5 2	− 3	—	—	—	—	—
Florissant		29·7	87	c 6 58	PP	e 11 20	+14	e 11 48	?	—
Chicago		30·6	81	—	—	e 11 29	+ 9	—	—	—
Cleveland		35·0	78	c 6 32a	−24	e 12 31	+ 3	—	—	e 19·0
Morgantown		36·8	81	c 6 37	−34	—	—	—	—	—
Ottawa		37·6	69	8 47	PP	13 18	+10	—	—	18·8
Pennsylvania	E.	37·8	77	—	—	i 13 16	+ 5	—	—	—
Washington		39·1	79	—	—	e 13 38	+ 7	—	—	—
Seven Falls	E.	40·3	65	9 16	PP	13 48	− 1	17 23	SSS	21·6
Palisades		40·4	75	e 9 14	PP	—	—	—	—	e 21·3
Scoresby Sund		54·2	24	—	—	i 17 13	+ 7	—	—	27·0

Continued on next page.

		△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	Supp. m. s.		L. m.
Kew		74·9	30	—	—	e 22 58	?	—	—	e 38·0
Witteveen	z.	76·1	26	e 11 55	+ 4	—	—	—	—	—
Paris		78·1	31	e 12 2	0	—	—	—	—	e 39·0
Collmberg	z.	79·3	23	e 12 10	+ 1	—	—	—	—	—
Granada		85·2	41	e 13 7k	+28	e 22 27	[−35]	—	—	44·0
Almeria		86·0	40	—	—	e 22 32	[−35]	—	—	e 44·4
Rome		87·6	28	—	—	e 23 32	0	—	—	e 36·0

Additional readings :—
Seattle i = 1m.38s. and 2m.16s.
Mineral iZ = 2m.18s., eZ = 3m.32s.
Pasadena iS? = 6m.20s.
Long waves were also recorded at Harvard, Ivigtut, Stuttgart, De Bilt, and Alicante.

June 16d. Readings also at 0h. (Santa Lucia and near Athens), 1h. (Victoria and near Athens), 2h. and 3h. (near Copiapo), 5h. (Apia, Seattle, near Copiapo, and near Zürich), 6h. and 7h. (near Dzhergetal), 8h. (Apia), 9h. (near Dzhergetal and near Malaga), 12h. (China Lake, Lick, and near Palisades), 15h. (near Palisades), 16h. (Kew, Paris, and near Dzhergetal), 17h. (La Paz), 18h. (Santa Lucia and near Sotchi), 21h. (Palisades, near Bandoug, and Djakarta), 23h. (Seattle, Victoria (3), and near Ashkabad).

June 17d. 9h. 40m. 18s. Epicentre 44°·5N. 129°·7W. (as on 16d.).

		△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	Supp. m. s.		L. m.
Arcata	E.	5·5	129	e 1 51	P_g	e 2 48	+18	—	—	e 3·8
Victoria		5·9	45	1 30	− 1	2 41	+ 1	—	—	—
Seattle		6·0	56	e 1 34a	+ 2	e 2 47	+ 4	i 1 41	P*	i 3·5
Shasta Dam		6·6	122	i 1 45	+ 4	—	—	—	—	—
Mineral		7·3	122	e 1 54k	+ 4	e 3 41	S*	—	—	—
Berkeley	z.	8·7	137	e 2 10a	0	e 4 24	S*	—	—	—
Reno		8·9	120	e 2 16k	+ 4	—	—	—	—	e 4·7
Santa Clara		9·2	138	e 2 18	+ 2	e 3 15	?	—	—	—
Lick	z.	9·4	137	e 2 19a	+ 1	—	—	—	—	e 5·7
Fresno		10·8	132	e 2 38k	− 1	e 4 8	−34	—	—	e 6·2
Tinemaha	z.	11·4	126	i 2 50k	+ 3	—	—	—	—	—
Hungry Horse		11·5	65	i 2 49	+ 1	i 5 23	+24	—	—	—
China Lake	z.	12·7	129	e 3 5k	0	—	—	i 3 17	PP	—
Bozeman		13·3	78	i 3 12	− 1	e 4 4	?	—	—	—
Pasadena		13·6	135	e 3 16k	− 1	i 6 22	+32	3 27	PP	e 6·7
Boulder City		14·2	122	i 3 28	+ 4	i 6 41	+37	—	—	—
Riverside		14·2	133	e 3 24	0	—	—	—	—	—
Palomar		14·9	134	e 3 35k	+ 1	i 6 52	+32	i 3 47	PP	—
Tucson		19·1	124	i 4 29	+ 2	i 8 17	+20	4 49	PP	—
College		22·8	340	5 1	− 4	—	—	—	—	—
Florissant		29·7	87	e 6 10	0	e 11 11	+ 5	—	—	—
Cleveland		35·0	78	i 6 54a	− 2	i 12 34	+ 6	i 12 37	S	—
Pittsburgh		36·5	78	—	—	i 13 1	+10	—	—	—
Morgantown		36·8	81	i 7 11	0	e 13 5	+ 9	—	—	—
Ottawa		37·6	69	i 7 18	0	13 16	+ 8	e 8 50	PP	19·2
Pennsylvania		37·8	77	i 7 20	0	i 13 22	+11	e 8 38	PP	—
Washington		39·1	79	e 7 31	0	e 13 42	+11	—	—	—
Shawinigan Falls	N.	39·2	66	7 31	0	13 26	− 6	9 8	PP	19·4
Seven Falls	E.	40·3	65	9 8	PP	13 48	− 1	—	—	20·9
Palisades		40·4	75	e 7 41	0	e 13 58	+ 8	e 9 19	PP	e 21·7
Fordham		40·5	75	e 9 11	PP	e 14 1	+ 9	—	—	22·4
Harvard		41·4	72	e 7 54	+ 4	i 14 30	+25	e 9 32	PP	e 22·1
Weston		41·7	72	e 7 51	− 1	e 14 11	+ 1	—	—	e 21·6
Halifax		45·9	65	—	—	e 15 18	+ 7	—	—	22·0
Petropavlovsk		46·1	308	e 8 24	− 4	—	—	—	—	—
Ivigtut		49·1	40	—	—	i 15 57	+ 1	—	—	25·7
Scoresby Sund		54·2	24	e 9 28	− 1	i 17 12	+ 6	—	—	26·7
Vladivostok		66·5	308	e 10 48	− 6	i 19 40	− 4	—	—	—
Aberdeen	E.	69·6	28	—	—	e 28 32	SSS	—	—	e 33·1
Kabansk		72·3	328	e 11 28	− 1	e 20 56	+ 4	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Irkutsk		73·0	329	e 11 31	− 2	e 20 59	− 1	—	—	—
Witteveen	z.	76·1	26	e 11 50	− 1	—	—	—	—	—
De Bilt		76·2	27	—	—	e 21 42	+ 6	—	—	e 31·7
Paris		78·1	31	e 11 59	− 3	e 22 4	+ 8	i 12 7	PcP	36·7
Sverdlovsk		78·7	355	i 12 4	− 2	22 3	0	—	—	—
Jena	z.	79·2	24	e 12 6	− 2	—	—	e 12 22	PcP	—
Collmberg	z.	79·3	23	e 12 6	− 3	—	—	—	—	—
Strasbourg		80·1	27	e 12 15	+ 2	e 13 49	?	—	—	e 34·7
Stuttgart		80·4	26	e 12 17	+ 2	e 22 27	+ 6	e 23 12	PS	44·7
Prague		80·8	23	—	—	e 22 24	− 1	e 27 48	SS	—
Clermont-Ferraud		80·9	32	—	—	(e 25 42?)	?	—	—	e 25·7
La Paz		82·5	121	i 12 32	+ 6	22 59	+17	—	—	—
Toledo		82·8	40	e 12 30	+ 3	—	—	—	—	—
Pavia		83·5	28	—	—	e 22 59	+ 7	e 36 23	Q	e 48·0
Granada		85·2	41	12 41k	+ 2	23 14	+ 5	28 59	SS	44·0
Malaga		85·2	41	i 12 39	0	e 23 12	+ 3	—	—	46·7
Alicante		85·6	38	e 13 33	+52	23 17	+ 4	16 5	PP	e 40·7
Almeria		86·0	40	e 12 43	0	23 17	0	15 57	PP	46·2
Rome		87·6	28	—	—	e 22 17	[−61]	—	—	—
Frunse		90·3	343	e 13 7	+ 3	—	—	—	—	—
Tashkent		92·7	346	—	—	e 23 38	[−10]	e 25 36	PS	—
Istanbul	E.	92·7	17	—	—	e 23 48	[0]	e 25 45	PS	e 40·7
Ksara		101·0	14	16 42?	PP	e 27 17	PS	—	—	—
Tamanrasset	z.	101·5	42	e 17 59	PP	—	—	—	—	—

Additional readings :—
Seattle i =1m.47s., 1m.52s., and 2m.1s., e =2m.16s. and 2m.38s.
Mineral iZ =2m.0s. and 3m.2s.
Berkeley eE =4m.16s.
Lick iZ =2m.26s.
Pasadena iNZ =3m.34s., eQN =6·0m.
Boulder City i =3m.33s.
Ottawa SS =15m.58s.
Shawinigan Falls eN =10m.0s., SSN =16m.29s.
Palisades e =17m.4s.
Paris eSS =27m.10s., e =32m.30s.
Collmberg eZ =12m.13s.
Stuttgart e =33m.42s., eQ? =35·7m.
La Paz eP? =11m.9s.
Alicante PPP =18m.1s., PPS =24m.43s., SS =29m.1s., SSS =32m.37s., Q =35m.33s.
Almeria SS =28m.53s.
Tashkent eSS =30m.40s.
Istanbul eE =37m.18s.
Long waves were also recorded at Tacubaya and Kew.

June 17d. 10h. 58m. 49s. Epicentre 44°·5N. 129°·7W. (as at 9h.).

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Victoria		5·9	45	1 29	− 2	e 2 39	− 1	—	—	—
Seattle		6·0	56	e 1 31	− 1	e 2 44	+ 1	—	—	e 3·2
Shasta Dam		6·6	122	e 1 42	+ 1	—	—	—	—	—
Mineral	z.	7·3	122	e 1 53	+ 3	—	—	e 2 9	P*	e 4·9
Berkeley		8·7	137	—	—	e 3 43	− 7	—	—	e 5·1
Reno	z.	8·9	120	e 2 15	+ 3	—	—	—	—	—
Lick	z.	9·4	137	e 2 16k	− 2	—	—	i 2 20	P	—
Fresno	z.	10·8	132	e 2 37a	− 2	—	—	e 3 7	PP	—
Tinemaha	z.	11·4	126	e 2 51	+ 4	—	—	e 3 2	PP	—
Hungry Horse		11·5	65	e 2 45	− 3	—	—	—	—	—
China Lake	z.	12·7	129	i 3 5	0	—	—	i 3 15	PP	—
Pasadena	z.	13·6	135	e 3 15	− 2	—	—	i 3 25	PP	—
Boulder City		14·2	122	i 3 36	+12	—	—	i 3 32	PP	—
Riverside	z.	14·2	133	e 3 23	− 1	—	—	—	—	—
Palomar	z.	14·9	134	i 3 34	0	—	—	—	—	—
Tucson		19·1	124	e 4 26	− 1	—	—	e 4 46	PP	—
Cleveland	z.	35·0	78	e 6 55k	− 1	—	—	—	—	—

Long waves were also recorded at Arcata and Palisades.

June 17d. 18h. 46m. 23s. Epicentre 35°·7N. 57°·0E.

Given by U.S.S.R.

A = +·4433, B = +·6826, C = +·5810 ; δ = +2 ; h = 0 ;
D = +·839, E = −·545 ; G = +·316, H = +·487, K = −·814.

		△	Az.	P.	O−C.	S.	O−C.	L.
		°	°	m. s.	s.	m. s.	s.	m.
Ashkabad		2·5	26	e 0 46	+ 3	1 21	S_g	—
Kizyl-Arvat		3·4	350	e 1 7	P_g	i 1 54	S_g	—
Mary		4·4	63	—	—	e 2 24	S_g	—
Kirovobad		9·7	304	2 22	0	—	—	—
Obi-garm		10·6	70	e 2 34	− 2	e 4 34	− 3	—
Tashkent		11·1	56	e 2 45	+ 2	—	—	—
Tiflis		11·3	306	e 2 50	+ 4	e 5 37	L	(e 5·6)
Grozny		11·6	315	—	—	e 4 55	− 6	—
Dzhergetal		11·8	68	e 2 56	+ 3	—	—	—
Andijan		13·1	63	e 3 4	− 6	—	—	—
Naryn		15·9	63	e 3 48	+ 1	—	—	—
Ksara		17·4	268	—	—	e 7 47	+28	e 10·8
Sverdlovsk		21·3	4	4 48	− 2	—	—	—
Lwow		27·8	311	3 8	?	—	—	—
Collmberg	z.	34·9	310	e 9 53	PcP	—	—	—

June 17d. 20h. 55m. 22s. Epicentre 39°·9N. 142°·4E. (as on 1951, January 5d.).

Intensity IV at Miyako and Hatinohe; II-III at Morioka, Isinomaki, Okunakayama Sanuma, Tsukikate, Gonohe, and Yasuniya.
Epicentre 40·1N. 142°·5E.
Seismo. Bull. Cent. Met. Obs., Japan, for 1951, Tokyo, 1951, p. 136, with macroseismic chart.

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

	△	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Miyako	0·4	230	0 11	− 2	0 20	− 1
Hatinohe	0·9	314	0 14k	− 6	0 26	− 8
Morioka	1·0	258	0 19k	− 2	e 0 33	− 3
Mizusawa	1·2	232	0 24	0	0 41	0
Aomori	1·5	307	0 27	− 1	0 48	− 1
Isinomaki	1·7	210	0 39	+ 8	0 55	+ 1
Akita	1·8	264	0 32	0	0 58	+ 2
Sendai	2·0	215	0 38	+ 3	1 4	+ 2
Urakawa	2·3	7	0 32	− 8	1 2	− 7
Yamagata	2·3	224	0 42	+ 2	1 26	S_g
Hukusima	2·6	215	0 46	+ 2	1 27	S_g
Mori	2·6	328	0 44	0	1 9	− 8
Inawasiro	2·9	217	0 53	+ 5	1 34	+10
Obihiro	3·1	11	0 59	+ 8	1 15	−14
Onahama	3·2	202	1 6	P_g	—	—
Sapporo	3·2	346	0 52	0	1 23	− 9
Shirakawa	3·3	212	1 5	P_g	1 47	S_g
Kusiro	3·4	26	1 9	P_g	—	—
Aikawa	3·7	241	1 2	+ 2	1 47	+ 2
Mito	3·8	204	1 1	0	1 52	+ 5
Utunomiya	3·9	212	1 3	+ 1	—	—
Tukubasan	4·1	207	1 4	− 1	1 53	− 2
Nemuro	4·2	34	0 57	−10	1 38	−19
Kumagaya	4·4	213	1 13	+ 3	2 10	+ 8
Maebasi	4·4	218	1 15	+ 5	2 12	+10
Nagano	4·6	227	1 17	+ 5	2 29	S_g
Matusiro	4·7	226	2 32	S_g	—	—
Oiwake	4·7	222	1 20	+ 6	2 31	S_g
Tokyo	4·7	207	1 6	− 8	2 12	+ 2
Wazima	5·0	241	1 17	− 1	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Yokohama		5·0	207	1 25	+ 7	—	—
Matumoto		5·1	225	2 46	S_g	—	—
Kohu		5·2	217	1 30	P*	2 33	S*
Toyama		5·2	233	1 46	P_g	2 54	S_g
Hunatu		5·3	214	1 28	+ 6	2 39	S*
Misima		5·5	211	1 9	−16	2 46	S*
Kanazawa		5·6	235	1 51	P_g	—	—
Nagoya		6·4	224	1 44	+ 6	—	—
Hikone		6·7	228	1 53	+11	—	—
Kameyama		6·9	225	2 15	P_g	—	—
Osaka		7·6	228	3 48	S*	—	—
Collmberg	z.	79·0	331	e 11 57	−10	—	—
Stuttgart	z.	82·5	331	e 12 3?	−23	—	—

June 17d. 21h. 58m. 0s. Epicentre 36°·1N. 141°·2E. Focus at Base of Superficial Layers. (as on 1948, November 2d.).

Intensity V at Ushiku ; IV at Katsuura, Kisarazu, Otaki, and Kengasaki ; II-III at Mito, Minato, Sanrizuka, Kurume, and Nikko. Epicentre 36°·2N. 141°·1E. Depth 40km. Seismo. Bull. Cent. Met. Obs., Japan, 1951, Tokyo, 1951, p. 137.

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

	△	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Tyosi	0·4	216	0 11	+ 2	0 18	+ 2
Mito	0·7	296	0 11	− 2	0 19	− 4
Onahama	0·9	344	0 4	−12	0 24	− 4
Tukubasan	0·9	277	0 14	− 2	0 24	− 4
Tokyo	1·2	251	0 20	0	0 36	0
Utunomiya	1·2	293	0 17	− 3	0 30	− 6
Shirakawa	1·3	322	0 23	+ 1	—	—
Yokohama	1·4	242	0 21	− 2	—	—
Kumagaya	1·5	272	0 24	0	0 38	− 6
Mera	1·6	223	0 41	S	(0 41)	− 5
Inawashiro	1·7	329	0 28	0	0 45	− 4
Hukusima	1·8	340	0 28	− 1	0 48	− 3
Maebasi	1·8	280	0 27	− 2	0 46	− 5
Hunatu	2·0	253	0 34	+ 2	1 8	+12
Kohu	2·1	258	0 35	+ 2	—	—
Misima	2·1	242	0 41	+ 8	—	—
Oiwake	2·1	276	0 37	+ 4	1 3	+ 4
Sendai	2·2	354	0 35	0	0 58	− 3
Nagano	2·5	283	0 37	− 2	—	—
Matumoto	2·6	273	1 8	S	(1 8)	− 3
Nagoya	3·6	256	1 7	+12	—	—
Kameyama	4·1	253	1 27	+25	—	—

June 17d. Readings also at 0h. (Victoria, Stuttgart, Collmberg, near Triest, and near Dzhergetal), 1h. (Victoria), 2h. (Palomar, Pasadena, Riverside, China Lake, Tinemaha, Berkeley, Lick, Fresno, Mineral, Victoria, Scoresby Sund, and Collmberg), 3h. (Collmberg, Copenhagen, Zürich, Mount Wilson, Palomar, China Lake, Tinemaha Lick, near Dzhergetal, and near Ashkabad), 4h. (Jena, Prague, Stuttgart, Strasbourg, Paris, Basle, and near Kurmenty), 5h. (Ashkabad and near Kurmenty), 6h. (Pretoria (2), Tamanrasset, near Ashkabad (2), and near Dzhergetal), 7h. (Alicante), 8h. (Kimberley, Pretoria (2), and near Ashkabad), 9h. (Stuttgart, Mount Wilson, Palomar, Riverside, China Lake, and Victoria), 11h. (Victoria (2) and near Seattle), 12h. (Apia, Victoria (2), and Pretoria), 14h. (Kimberley), 16h. (Kimberley and near Huancayo), 17h. (Apia), 18h. (Lick, Harvard, Weston, Bogota, Chinchina, Huaucayo, La Plata, and near La Paz), 20h. (Fergana, Naryn, near Andijan, Dzhergetal, Khorog, Samarkand, Stalinabad, and Tashkent), 21h. (Mount Wilson, Palomar, Riverside, China Lake, Reno, and Victoria), 22h. (Mount Wilson, Palomar, Riverside, China Lake, Tinemaha, Lick, Reno, Stuttgart, Terre Adélie, Wellington, and near Apia), 23h. (Collmberg, Stuttgart, and Tamanrasset).

June 18d. 7h. 31m. 30s. Epicentre 31°·5N. 40°·8W. (as on 1950, October 8d.).

A = +·6466, B = −·5582, C = +·5199 ; δ = −3 ; h = +1 ;
D = −·653, E = −·757 ; G = +·394, H = −·340, K = −·854.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Granada		31·1	68	i 5 44	−38	10 48	−40	—	—	14·2
Almeria		32·0	69	6 24	− 6	11 36	− 6	7 44	PPP	16·0
Rathfarnham C.	z.	33·0	37	e 7 16?	+37	e 7 28	PP	e 8 29	?	e 15·6
Alicante		33·6	66	6 44	0	12 6	0	7 50	PP	16·3
Kew		35·7	44	—	—	e 13 30	+51	—	—	—
Scoresby Sund		40·4	9	e 7 42	+ 1	e 13 57	+ 7	—	—	—
Stuttgart		41·1	51	e 7 49	+ 2	e 13 30	−31	—	—	e 20·5
Tamanrasset	z.	41·9	89	e 7 53	− 1	e 9 0	PP	i 8 1	P	—
Collmberg	z.	43·8	47	e 8 11	+ 2	—	—	—	—	—
La Paz		54·5	212	e 9 53	+21	e 17 41	+31	—	—	—
China Lake	z.	62·5	297	e 10 26	− 2	—	—	—	—	—
Riverside	z.	63·0	295	e 10 32	+ 1	—	—	—	—	—
Mount Wilson	z.	63·4	295	e 10 30	− 4	—	—	—	—	—

Additional readings :—
Alicante PcS = 13m.19s., SS = 14m.12s., ScS = 17m.20s.
Long waves were also recorded at Palisades, Pennsylvania, and Pavia.

June 18d. 13h. 35m. 58s. Epicentre 33°·8S. 70°·5W. Depth of focus 0·010.
(as on 1951, April 11d.).

A = +·2780, B = −·7850, C = −·5537 ; δ = +9 ; h = +1 ;
D = −·943, E = −·334 ; G = −·185, H = +·522, K = −·833.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Santa Lucia		0·4	334	i 0 22	+ 7	0 32	+ 5	—	—	0·7
Santiago		0·4	341	i 0 22	+ 7	i 0 32	+ 5	—	—	—
Concepción	N.	3·6	213	1 43	S	(1 43)	+ 6	—	—	2·5
Copiapo	N.	6·4	1	i 1 15	−18	2 18	−28	—	—	—
Antofagasta	E.	10·1	0	—	—	e 4 12	− 4	—	—	—
La Plata		10·4	99	2 50	+22	5 2	+39	—	—	5·7
La Paz		17·4	8	3 56	− 2	i 7 2	− 4	—	—	8·4
Huancayo		22·1	348	i 4 43	− 5	e 8 40	0	—	—	—
Morgantown		73·6	353	i 11 22	− 2	—	—	—	—	—
St. Louis		74·4	344	i 11 27	− 2	—	—	—	—	—
Weston		75·8	0	i 11 37	0	—	—	—	—	—
Tucson		75·9	326	i 11 37	− 1	—	—	—	—	—
Harvard		75·9	0	i 11 38	0	—	—	—	—	—
Kimberley	z.	78·6	117	i 12 20	PcP	—	—	—	—	—
Palomar	z.	79·7	323	i 11 59 a	0	—	—	—	—	—
Riverside	z.	80·5	322	e 12 3	0	—	—	—	—	—
Boulder City		80·8	326	i 12 5	+ 1	—	—	—	—	—
Pasadena	z.	81·0	322	i 12 6 a	0	—	—	—	—	—
China Lake	z.	82·1	324	i 12 10 a	− 1	—	—	e 12 23	PcP	—
Pretoria	z.	82·8	116	i 12 30	PcP	—	—	—	—	—
Tinemaha	z.	83·4	323	i 12 18	0	—	—	—	—	—
Fresno	z.	83·9	323	e 12 14 a	− 6	—	—	—	—	—
Lick	z.	85·3	322	e 12 28 a	+ 1	—	—	—	—	—
Reno	z.	86·0	324	e 12 30 a	− 1	—	—	—	—	—
Mineral	z.	87·6	324	e 12 36 k	− 2	—	—	—	—	—
Shasta Dam		88·2	324	e 12 40	− 1	—	—	—	—	—
Hungry Horse		90·6	333	i 12 52	− 1	—	—	—	—	—
Tamanrasset	z.	91·6	64	i 13 6 k	+ 9	—	—	i 13 19	pP	—

Long waves were also recorded at Paris and Pavia.

June 18d. 16h. 14m. 53s. Epicentre 56°·0S. 5°·0W. (as on 1942, June 2d.).

$A = +·5597$, $B = -·0490$, $C = -·8273$; $\delta = +9$; $h = -8$;
$D = -·087$, $E = -·996$; $G = -·824$, $H = +·072$, $K = -·562$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Kimberley	z.	34·5	50	i 6 40	−12	—	—	—	—	—
Pretoria	z.	38·6	52	i 7 14	−12	—	—	—	—	—
Terre Adélie		54·9	164	e 9 32	− 3	—	—	—	—	29·1
La Paz		61·5	283	e 10 29	+ 8	i 18 39	− 3	—	—	27·1
Huancayo		69·1	280	e 14 16	PP	e 18 35	?	e 21 19	PPS	28·5
Tamanrasset	z.	79·0	10	e 12 4	− 3	—	—	e 12 20	PcP	—
Ksara		96·0	33	e 13 8	−22	26 28	PS	—	—	—
Scoresby Sund		126·8	352	e 19 7	[+ 1]	—	—	—	—	—
Riverside	z.	129·6	274	e 19 19	[+ 8]	—	—	—	—	—
Mount Wilson	z.	130·2	274	e 19 19	[+ 7]	—	—	—	—	—
China Lake	z.	131·1	276	e 19 28	[+14]	—	—	—	—	—

Long waves were also recorded at Kew, Paris, and Pavia.

June 18d. 17h. 44m. 30s. Epicentre 11°·0N. 84°·0W. Depth of focus 0·010. (as on 1942. Nov. 11d.).

$A = +·1026$, $B = -·9765$, $C = +·1896$; $\delta = +3$; $h = +6$;
$D = -·995$, $E = -·105$; $G = +·020$, $H = -·189$, $K = -·982$.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Balboa Heights	4·8	114	i 1 18	+ 7	e 2 18	+12	—	—	e 3·5
Swan Island	6·4	1	i 0 17	?	i 1 29	?	—	—	—
Merida	11·3	332	2 34k	− 6	i 4 46	+ 2	—	—	—
Bogota	11·7	122	i 2 53	+ 8	e 5 29	+35	e 3 53	?	—
Oaxaca	13·7	297	e 3 6	− 5	5 38	− 3	—	—	—
Vera Cruz	14·3	306	e 3 22	+ 3	e 6 0	+ 5	—	—	—
Puebla	15·9	302	e 3 26	−13	e 6 26	− 6	—	—	—
Tacubaya	16·9	301	e 3 48	− 4	i 6 55	0	—	—	—
San Juan	18·8	65	e 4 21	+ 7	i 4 39	pP	—	—	—
Fort de France	22·6	80	—	—	e 9 18	+29	—	—	—
Huancayo	24·5	160	i 5 12	+ 1	i 9 30	+ 8	i 5 30	pP	—
Cincinnati	28·0	0	i 5 46	+ 2	i 10 26	+ 7	i 6 7	pP	—
St. Louis	28·1	350	i 5 44	− 1	e 10 24	+ 3	i 6 5	pP	—
Florissant	28·3	350	i 5 46	0	e 10 30	+ 6	e 11 32	SS	—
Morgantown	28·7	7	i 5 53	+ 3	—	—	i 6 15	pP	—
Pennsylvania	30·2	9	i 6 7	+ 4	i 11 7	+13	i 7 24	PP	—
Cleveland	30·4	3	i 6 8a	+ 3	e 11 5	+ 8	i 6 27	pP	—
Fordham	31·0	15	i 6 16	+ 6	i 11 22	+15	i 6 37	pP	—
Palisades	31·2	15	i 6 17	+ 5	i 11 25	+15	i 6 39	pP	e 15·4
La Paz	31·5	150	i 6 16	+ 1	i 10 47	−28	7 38	PP	16·0
Tucson	32·5	316	e 6 20	− 3	e 10 18	?	e 6 38	pP	—
Weston	33·2	17	i 6 34	+ 4	e 11 54	+13	i 6 56	pP	—
Harvard	33·2	17	i 6 35	+ 5	e 11 47	+ 6	e 6 54	pP	e 15·4
Ottawa	35·0	10	6 48	+ 3	12 19	+10	i 7 10	pP	16·8
Boulder City	36·7	317	i 7 2	+ 3	i 13 1	PcS	—	—	—
Shawinigan Falls N.	36·7	13	7 3	+ 4	12 45	+10	e 7 25	pP	17·1
Palomar	37·4	312	i 7 2	− 3	i 12 45	− 1	e 8 38	PP	—
Seven Falls E.	37·7	15	7 11	+ 3	12 59	+ 9	8 47	PP	18·0
Riverside z.	38·1	313	i 7 9	− 2	i 13 2	ScP	8 41	PP	—
Pasadena	38·8	313	i 7 14a	− 3	i 13 6	− 1	e 8 46	PP	—
China Lake	39·2	316	i 7 16	− 4	i 13 7	ScP	i 17 20	ScS	—
Tinemaha z.	40·3	317	e 7 28	− 1	i 13 12	ScP	—	—	—
Fresno z.	41·2	315	e 7 27a	− 9	e 13 36	− 7	e 8 55	PP	—
Reno z.	42·6	319	e 7 46a	− 2	e 13 41	−22	e 13 21	ScP	—
Lick z.	42·8	315	i 7 46a	− 4	e 13 22	ScP	i 9 38	PP	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Berkeley	z.	43·4	315	e 7 52k	− 2	—	—	—	—	—
Mineral	z.	44·2	318	e 7 58k	− 3	e 9 43	PP	e 8 51	?	—
Hungry Horse		44·7	334	i 8 4	− 1	i 13 30	−64	—	—	—
College		69·1	337	10 54	− 4	—	—	—	—	—
Scoresby Sund		70·5	18	i 11 6a	0	e 20 11	+ 1	—	—	34·5
Malaga		75·2	55	i 11 37	+ 3	—	—	i 12 1	pP	—
Granada		75·8	55	i 11 41a	+ 4	21 26	+16	14 49	PP	—
Almeria		76·8	55	11 45	+ 2	21 37	+16	16 31	PPP	37·7
Alicante		78·2	53	e 11 57	+ 7	21 58	+22	16 39	PPP	37·3
Paris		79·5	42	i 11 59	+ 1	i 22 3	+13	i 12 19	pP	e 36·5
De Bilt		80·9	38	e 12 0	− 5	e 22 10	+ 6	e 15 30	PP	e 42·5
Witteveen	z.	81·7	37	i 12 13	+ 4	i 12 16	PcP	i 12 33	pP	—
Strasbourg		83·0	42	e 12 19	+ 3	e 22 54	+29	e 15 42	PP	39·5
Stuttgart		83·9	42	e 12 22	+ 2	e 22 39	+ 5	e 12 45	pP	e 39·5
Pavia		84·5	45	e 19 32	?	—	—	—	—	e 40·4
Copenhagen		84·6	35	e 12 26	+ 2	e 22 36	− 5	—	—	—
Jena		85·1	39	e 12 28	+ 2	e 22 36?	−10	e 15 50	PP	—
Tamanrasset	z.	85·4	68	e 12 31	+ 3	e 15 54	PP	e 12 53	pP	—
Collmberg	z.	85·8	39	e 12 32	+ 2	—	—	e 12 56	pP	—
Rome		87·5	48	e 12 40	+ 2	—	—	e 16 6	PP	—

Additional readings :—
Huancayo iPP =5m.55s., i =7m.0s. and 8m.12s., eSS =9m.54s.
Cincinnati i =6m.29s.
St. Louis iSS =11m.28s., i =12m.14s.
Florissant e =11m.3s., i =12m.24s.
Cleveland ePPN =7m.11s.
Palisades iPP =7m.23s., eSS =13m.21s.
La Paz iSS =13m.30s.
Harvard ePP =7m.52s., esPP =8m.14s., Q =13·9m.
Ottawa PP =8m.12s., PPP =8m.18s., SSS =15m.10s.
Shawinigan Falls PPN =8m.27s.
Palomar iZ =9m.21s., eScPZ =13m.0s., iScSEN =17m.9s.
Seven Falls SSE =15m.44s.
Riverside eZ =9m.23s.
Pasadena iScSEN =17m.16s.
China Lake eZ =14m.9s.
Fresno eZ =7m.55s., eN =9m.34s., eScPZ =13m.9s., eEN =13m.12s., and 13m.41s., eScSZ =17m.25s., eZ =17m.34s.
Reno eE =9m.48s. and 13m.30s.. eZ =14m.29s. and 16m.33s.
Lick iZ =8m.12s., eZ =12m.41s.
Almeria SS =26m.33s.
Alicante PS =22m.33s., PPS =23m.9s., Q =31m.59s.
Paris ePP =15m.1s., e =21m.51s., iSP =22m.46s., ePS =23m.3s., ePPS =23m.17s., e =33m.21s.
Witteveen ipPcPZ =12m.36s.
Strasbourg e =12m.34s., eSS =28m.0s.
Stuttgart ePP =15m.40s., ePS =24m.3s.
Jena eEN =12m.51s., eN =13m.26s.
Tamanrasset esPZ =13m.11s., eZ =15m.33s., epPPZ =16m.15s.
Long waves were also recorded at Chinchina.

June 18d. Readings also at 1h. (near Ashkabad), 2h. (near Dzhergetal and near Apia), 5h. (near Athens), 6h. (Apia), 7h. (near Borzhomi and near Dzhergetal (2)), 8h. (Scoresby Sund), 9h. (Huancayo, La Paz, Harvard, and Scoresby Sund), 10h. (Huancayo, near Fergana, Stalinabad, Khorog, Obi-garm, and Dzhergetal), 12h. (Bucharest), 13h. (near Dzhergetal), 14h. (Santa Lucia, New Delhi, and near Dzhergetal), 15h. (Reno, Fresno, Mineral, Lick, China Lake, Riverside, Palomar, Mount Wilson, Bombay, Chatra, and Brisbane), 16h. (Apia and Collmberg), 17h. (near Antofagasta), 18h. (Stuttgart and near Manila), 19h. (Palomar, Riverside, China Lake, Lick, Reno, Merida, and near Dzhergetal (3)), 20h. (Kimberley, Stuttgart, near Basle, and Zürich), 21h. (La Paz, Huancayo, Nanking, Paris, and Harvard), 22h. (Pavia, Stuttgart, and Apia), 23h. (Collmberg and Raciborzu).

June 19d. 16h. Fiji region, very deep.

Wellington P = 51m.0s.?.
Cobb River ePE = 51m.50s., eSE = 55m.8s.
Apia eS = 51m.51s. a.
Kaimata ePNE = 52m.8s.
Auckland eS?N = 54m.4s.
Tuai eSN = 54m.21s.
Berkeley ePZ = 58m.46s., eZ = 58m.55s.
Fresno ePZ = 58m.48s. a.
Pasadena iPZ = 58m.51s.
Palomar iPZ = 58m.53s.
Riverside iPZ = 58m.53s.
China Lake iPZ = 58m.57s.k.
Tinemaha iPZ = 59m.0s.
Reno ePZ = 59m.1s.k.
Nanking e = 59m.31s.
Witteveen iPKPZ = 66m.20s., iPKP$_2$Z = 66m.25s.
Collmberg iZ = 66m.25s., eZ = 68m.46s.
Prague ePKP = 66m.26s.. ePKP$_2$ = 66m.34s.
Copenhagen ePKP = 66m.30s.
Stuttgart ePKPZ = 66m.31s., eZ = 66m.42s.
Paris iPKP = 66m.33s.
Strasbourg iPKP = 66m.33s.

June 19d. 19h. 27m. 2s. Epicentre 46°·4N. 7°·7E.

Intensity III at Montana. Epicentre as adopted (Strasbourg).

Dr. E. Wanner.
Jahresbericht des Erdbebendienstes der Schweiz im Jahre, 1951, Zürich, 1952, p.2, macroseismic chart fig. 1.

$A = +\cdot6859$, $B = +\cdot0927$, $C = +\cdot7218$; $\delta = +5$; $h = -4$;
$D = +\cdot134$, $E = -\cdot991$; $G = +\cdot715$, $H = +\cdot097$, $K = -\cdot692$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Neuchatel		0·8	319	i 0 10	− 8	i 0 20	−11	—	—	—
Basle		1·1	356	e 0 20	− 2	i 0 44	+ 5	—	—	—
Zürich		1·1	32	e 0 22	0	i 0 48	+ 9	—	—	—
Chur		1·3	70	e 0 28	+ 3	e 0 52	+ 8	—	—	—
Pavia		1·7	140	—	—	e 1 27	?	—	—	—
Ravensburg	Z.	1·9	43	e 0 41	P_g	e 1 5	S_g	—	—	e 1·2
Strasbourg		2·2	1	—	—	e 1 16	S_g	—	—	—
Stuttgart	Z.	2·6	23	e 0 39	− 5	e 1 26	S_g	e 0 54	P_g	—
Paris		4·3	306	i 1 15	P*	i 2 12	S*	i 1 26	P_g	—
Jena		5·2	28	e 1 56?	P_g	e 2 24	+ 2	e 2 50	S_g	—
Prague		5·8	48	—	—	e 3 14	S_g	—	—	—
Collmberg	Z.	6·0	34	—	—	e 3 18	S_g	—	—	—
Skalnate Pleso	E.	8·9	67	—	—	e 4 2	+ 7	e 8 41	PcP	—

Additional readings :—
Stuttgart eZ = 1m.28s. and 1m.30s., eS_g?Z = 1m.32s. and 1m.34s.
Paris iS_g = 2m.26s.
Jena eS_g?N = 2m.53s.
Prague e = 3m.18s., 3m.54s., and 4m.20s.
Skalnate Pleso e = 4m.10s., eN = 5m.37s. and 7m.16s., eE = 8m.13s.
Long waves were also recorded at Scoresby Sund.

June 19d. Readings also at 1h. (Pasadena, Palomar, and China Lake), 6h. (near Santa Clara), 7h. (Frunse, Naryn, Rybach'e, near Obi-garm, Stalinabad, Dzhergetal, Khorog, Fergana, Samarkand, Tashkent, and Andijan), 9h. (Concepción, near Santa Lucia, and near Dzhergetal), 10h. (Chur, Stuttgart, Ksara, and near Tacubaya), 11h. (Kimberley, Ashkabad (2), Ksara, Algiers Univ., Tamanrasset, Istanbul, Collmberg, Stuttgart, near Apia, and near Obi-garm), 12h. (Lick and near Dzhergetal), 13h. (near Dzhergetal), 14h. (Apia, near Manila, and near Dzhergetal), 15h. (Algiers Univ., near Dzhergetal, near Obi-garm, Stalinabad, and Andijan), 17h. (Palisades, Jena, Chur, Paris, Strasbourg, Stuttgart, Prague, Zürich, Tamanrasset, near Lome, and near Alicante), 18h. (near Kurmenty), 19h. (Nanking, Collmberg, Stuttgart, and Paris), 20h. (Paris, Copenhagen, near Dzhergetal, La Plata, near Copiapo, and near Istanbul), 21h. (Collmberg, Basle, near Zürich, Stuttgart, and near Santa Lucia), 22h. (Mizusawa).

June 20d. 0h. 24m. 0s. Epicentre 46°·4N. 7°·7E. (as on 19d.).

Intensity V at Montana.

Dr. E. Wanner, Jahresbericht des Erdbebendienstes der Schweiz im Jahre, 1951, Zürich, 1952, p. 3, with macroseismic chart, Fig. 1.

$A = +·6859$, $B = +·0927$, $C = +·7218$; $\delta = +5$; $h = -4$;

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Neuchatel		0·8	319	e 0 12	− 6	i 0 22	− 9	i 0 27	S*	—
Basle		1·1	356	e 0 21	− 1	e 0 38	− 1	—	—	—
Zürich		1·1	32	e 0 22	0	i 0 41	+ 2	—	—	—
Chur		1·3	70	e 0 26	+ 1	e 0 48	+ 4	—	—	—
Pavia		1·7	140	—	—	e 1 46	?	—	—	—
Ravensburg		1·9	43	e 0 36	+ 2	e 1 4	+ 5	—	—	—
Strasbourg		2·2	1	e 0 37	− 1	i 1 7	+ 1	—	—	—
Stuttgart	z.	2·6	23	e 0 48?	P*	e 1 26	S_g	e 0 54	P_g	—
Jena		5·2	28	e 1 53?	P_g	e 2 50	S_g	e 2 54	SS	—
Prague		5·8	48	—	—	e 3 7	SSS	i 3 16	S_g	—
Collmberg	z.	6·0	34	—	—	e 3 15	S_g	—	—	e 3·4

Additional readings :—
Stuttgart eZ = 1m.24s., eS_g?Z = 1m.33s., eZ = 1m.38s.
Prague iS_g? = 3m.21s.

June 20d. 4h. 48m. 9s. Epicentre 36°·3N. 71°·0E. Depth of focus 0·010. (as on June 12d.).

$A = +·2630$, $B = +·7638$, $C = +·5894$; $\delta = -5$; $h = 0$;
$D = +·946$, $E = -·326$; $G = +·192$, $H = +·557$, $K = -·808$.

	△	Az.	P.	O−C.	S.	O−C.	Supp.	
	°	°	m. s.	s.	m. s.	s.	m. s.	
Khorog	1·4	23	0 25	0	0 43	− 1	—	—
Obi-garm	2·6	293	i 0 43?	+ 2	i 1 16?	+ 4	—	—
Dzhergetal	2·9	3	i 0 48	+ 3	i 1 24	+ 5	—	—
Stalinabad	2·9	322	i 0 47	+ 2	i 1 22	+ 3	—	—
Fergana	4·1	9	i 1 3	+ 1	i 1 52	+ 3	—	—
Andijan	4·6	14	1 9	0	e 2 2	+ 1	—	—
Samarkand	4·6	319	i 1 10	+ 1	2 5	+ 4	—	—
Lunacharskoe	5·2	347	—	—	i 2 23	SS	—	—
Tashkent	5·2	347	e 1 17	0	—	—	—	—
Mary	7·4	283	—	—	3 9	− 1	—	—
Almata	8·3	32	i 1 59	0	3 29	− 3	—	—
Almata II	8·5	33	i 2 2	0	—	—	—	—
Kurmenty	8·8	38	i 2 4	− 2	—	—	—	—
Ili	9·0	29	2 6	− 3	—	—	—	—
New Delhi	9·3	144	e 2 7	− 6	i 2 53	−63	2 15	PP
Ashkabad	10·2	283	e 2 25	0	—	—	—	—

New Delhi also gives SSSE = 3m.3s.

June 20d. 16h. 49m. 10s. Epicentre 40°·2N. 142°·2E. (as on 1951, March 14d.).

Intensity IV at Miyako; II-III at Hatinohe and Shibutami.
Epicentre 40°·1N. 142°·4E. Depth 40km.
Seismological Bulletin of the Cen. Met. Obs., Japan, for June, 1951, Tokyo, 1951, p.138 with macroseismic chart.

$A = -·6052$, $B = +·4694$, $C = +·6429$; $\delta = -8$; $h = -2$;
$D = +·613$, $E = +·790$; $G = -·508$, $H = +·394$, $K = -·766$.

		△	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Hatinohe		0·6	303	0 16	+ 1	0 26	0
Miyako		0·6	196	0 13	− 2	0 22	− 4
Morioka		0·9	238	0 19k	− 1	0 34	0
Aomori		1·2	300	0 28	+ 4	0 46	+ 5
Mizusawa	E.	1·3	218	0 27	+ 2	0 44	0

Continued on next page.

	△	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Akita	1·7	253	0 36	+ 5	0 58	+ 4
Urakawa	2·0	13	0 36	+ 1	1 1	− 1
Sendai	2·2	208	0 38	0	1 4	− 2
Mori	2·3	327	0 43	+ 3	1 11	+ 2
Sakata	2·3	234	0 38	− 2	1 7	− 2
Hukusima	2·8	209	0 49	+ 2	1 21	− 1
Sapporo	2·9	348	0 56	P_g	1 27	+ 3
Onahama	3·4	198	1 10	P_g	1 31	− 6
Shirakawa	3·5	207	1 18	P_g	1 47	S*
Mito	4·0	201	1 4	0	—	—
Nemuro	4·0	38	1 39	?	—	—
Tukubasan	4·3	204	1 8	0	1 58	− 2
Maebasi	4·5	214	1 44	+33	—	—
Kumagaya	4·6	210	1 18	P*	2 15	S*
Matusiro	4·8	222	2 50?	S_g	—	—
Oiwake	4·8	218	1 35	P_g	—	—
Tokyo	4·9	205	2 17	+60	3 21	+66
Yokohama	5·2	204	2 18	S	(2 18)	− 4
Hunatu	5·4	211	2 26	S	(2 26)	− 2

June 20d. 18h. 37m. 8s. Epicentre 35°·5N. 103°·0W.

Intensity VI at Amarillo and Canyon et Groom.

L. M. Murphy and W. K. Cloud.
U.S.A. Earthquakes 1951, Serial No. 762, Washington 1953, p.8.

A = −·1836, B = −·7951, C = +·5781 ; δ = +9 ; h = 0 ;
D = −·974, E = +·225 ; G = −·130, H = −·563, K = −·816.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tucson		7·2	246	i 1 48	− 1	e 2 52	−21	—	—	i 3·6
Boulder City		9·6	275	e 2 59	P_g	e 4 48	S*	—	—	—
Florissant		10·6	68	—	—	e 4 32	− 5	e 5 30	S*	—
St. Louis		10·7	69	—	—	e 4 32	− 7	5 34	S*	—
Palomar	z.	11·6	264	e 3 42	?	—	—	—	—	e 6·3
China Lake	z.	11·9	276	e 4 12	?	—	—	—	—	e 6·7
Reno	z.	13·9	292	e 3 19a	− 2	—	—	—	—	—
Hungry Horse		15·2	331	i 3 38	0	—	—	—	—	e 8·0
Shasta Dam		16·1	295	3 49	0	—	—	—	—	—
Cleveland		17·8	64	i 7 23	?	i 7 28	0	i 7 39	SS	—
Morgantown		18·7	71	—	—	e 7 9	−39	—	—	e 9·1
Ottawa		22·9	56	—	—	i 9 41	SS	i 10 19	SSS	i 11·9
Shawinigan Falls	N.	25·2	55	—	—	10 52	SS	—	—	13·1
Harvard		25·3	64	i 5 36	+ 6	(e 10 53)	SS	—	—	e 10·9

Cleveland also gives iN = 9m.21s., 9m.27s., and 9m.31s.
Long waves were also recorded at Tacubaya, Pasadena, Riverside, Chicago, Palisades, Seven Falls, Weston, Fresno, and Pittsburgh.

June 20d. 21h. 50m. 18s. Epicentre 23°·9N. 121°·7E. (as on 1948, October 4d.).

Felt at Taipeh.
Seismological Notes, Bulletin of the Seismological Society of America, Vol. 41, No. 4, October, 1951, p. 391.

A = −·4809, B = +·7787, C = +·4029 ; δ = −3 ; h = +4 ;
D = +·851, E = +·525 ; G = −·212, H = +·343, K = −·915.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Zi-ka-wei	7·2	358	1 51	+ 2	3 6	− 7	—	—	—
Nanking	8·5	343	i 2 5a	− 2	3 45	0	i 2 14	PP	i 4·1
Vladivostok	21·0	22	i 4 49	+ 2	—	—	e 8 56	PcP	—
Guam	24·1	110	5 22	+ 4	—	—	—	—	—
Kabansk	30·4	342	6 16	0	11 28	+12	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
New Delhi		40·0	287	7 36	− 2	e 13 36	− 8	—	—	—
Przhevalsk		40·2	308	i 7 41	+ 1	—	—	—	—	—
Petropavlovsk		40·3	33	e 7 45	+ 5	—	—	—	—	—
Kurmenty		40·4	309	7 38	− 3	—	—	—	—	—
Almata II		41·1	310	i 7 49	+ 2	—	—	—	—	—
Naryn		41·7	307	e 7 52	0	i 14 10	0	—	—	—
Rybach'e		41·9	308	e 7 53	− 1	—	—	—	—	—
Frunse		43·0	309	i 8 3	0	i 14 33	+ 4	—	—	—
Andijan		44·4	305	i 8 15	+ 1	i 14 53	+ 4	—	—	—
Fergana		44·7	304	e 8 16	0	e 14 56	+ 2	—	—	—
Poona		44·8	273	i 8 18	+ 1	e 14 34	−21	—	—	—
Bombay	N.	45·6	274	—	—	e 15 9	+ 3	—	—	—
Obi-garm		46·2	302	i 8 29	+ 1	e 15 17	+ 2	—	—	—
Tashkent		46·7	306	i 8 34	+ 2	i 15 28	+ 6	—	—	—
Stalinabad		46·9	302	i 8 33	− 1	i 15 23	− 2	—	—	—
Mary		52·4	301	i 9 19	+ 3	e 16 43	+ 1	—	—	—
Sverdlovsk		54·6	324	i 9 31	− 1	17 12	+ 1	—	—	—
Ashkabad		55·2	301	i 9 38?	+ 1	17 17?	− 3	—	—	—
Baku		61·4	305	i 10 24?	+ 4	18 44?	+ 4	—	—	—
Grozny		64·0	309	e 10 37	− 1	—	—	—	—	—
Tiflis		65·0	307	i 10 45	+ 1	—	—	—	—	—
Moscow		67·3	323	10 57	− 2	—	—	—	—	—
Pulkovo		70·3	328	e 11 17	0	—	—	—	—	—
Ksara		73·8	300	i 11 38k	0	e 21 53	PPS	—	—	—
Kishinev		74·8	315	e 11 42	− 2	—	—	—	—	—
Istanbul		76·6	310	e 11 53	− 1	e 21 41	+ 1	e 14 45	PP	—
Lwow		76·8	319	e 11 56	+ 1	21 44	+ 2	—	—	—
Uzhgorod		78·3	318	i 12 5	+ 2	—	—	—	—	—
Ogyalla		81·1	319	e 16 8	?	e 23 24	PS	—	—	—
Prague		82·1	322	e 12 26	+ 2	e 22 46	+ 8	e 28 6	SS	43·7
Collmberg	Z.	82·6	324	e 12 25	− 1	—	—	e 15 41	PP	—
Cheb		83·5	323	—	—	e 22 49	− 3	e 23 40	PS	e 34·7
Jena		83·5	323	e 12 30	− 1	e 15 47	PP	e 12 38	PcP	—
Witteveen	Z.	85·1	327	i 12 40	+ 1	—	—	i 12 47	PcP	—
Stuttgart		86·0	323	e 12 42	− 1	e 24 8	PS	e 12 50	PcP	e 46·7
De Bilt		86·3	327	e 12 42	− 3	e 23 12	− 8	e 16 2	PP	e 46·7
Aberdeen	E.	86·5	333	i 12 17	−29	i 29 4	88	i 24 22	PS	e 45·4
Strasbourg		86·9	323	e 12 43	− 5	e 23 24	− 2	e 16 7	PP	—
Messina		87·3	311	e 12 49	− 1	e 23 28	− 1	e 16 14	PP	—
Rome		87·5	314	e 12 49	− 2	e 23 33	+ 2	e 16 17	PP	—
Victoria		87·5	37	12 52	+ 1	—	—	—	—	—
Paris		89·6	325	e 12 56	− 5	23 52	+ 1	e 16 34	PP	e 47·7
Mineral	Z.	93·1	44	e 13 19k	+ 2	—	—	e 13 27	PcP	—
Lick	Z.	94·8	46	e 13 28k	+ 3	—	—	—	—	—
Fresno	Z.	96·3	45	e 13 30a	− 2	—	—	e 20 40	?	—
Algiers Univ.	Z.	96·4	314	17 27	PP	—	—	—	—	—
Alicante		97·7	319	e 13 29	− 9	e 24 57	− 4	17 31	PP	e 46·2
Tamanrasset	Z.	102·6	302	e 17 32	?	—	—	e 18 11	PP	—
Chinchina		146·7	32	e 19 45	[+ 3]	—	—	—	—	—
Huancayo		160·0	57	e 20 46	PKP$_2$	—	—	—	—	—
La Paz	Z.	168·2	53	i 20 13	[+ 5]	—	—	i 25 12	PP	—

Additional readings :—
Prague e =12m.48s., 13m.6s., 13m.54s., 14m.15s., 14m.52s., and 16m.25s., eN =23m.8s.
Cheb eSS =28m.0s., e =30m.0s.
Jena eE =12m.57s.
Stuttgart ePP =16m.2s.
De Bilt ePS =24m.14s.
Strasbourg ePS =24m.17s., eSS =29m.2s.
Paris ipP? =13m.8s., isP? =13m.15s., eSP =24m.56s., e =25m.16s., eSPP =15m.32s., e =30m.26s. and 30m.39s., eSSS =33m.48s.
Alicante SS =31m.26s., SSS =35m.7s., Q =40m.15s.
Tamanrasset eZ =18m.45s.
Long waves were also recorded at Calcutta, Chatra, Harvard, Palisades, and at many other European stations.

June 20d. 22h. 40m. 50s. Epicentre 3°·0N. 129°·0E.

A = −·6284, B = +·7761, C = +·0520; δ = −8; h = +7;
D = +·777, E = +·629; G = −·033, H = +·040, K = −·999.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bandong		23·5	245	e 5 12	0	e 9 30	+ 7	—	—	—
Djakarta		23·9	248	e 5 13	− 3	e 9 27	− 3	—	—	—
Brisbane	Z.	38·2	144	i 7 21a	− 2	—	—	—	—	—
Riverview		42·2	152	i 10 27	PPP	e 17 15	SS	—	—	e 23·6
Kabansk		52·3	343	e 9 18	+ 3	e 16 48	+ 8	—	—	—
Irkutsk		53·2	342	9 22	0	—	—	—	—	—
Petropavlovsk		55·6	21	9 48	+ 8	e 17 34	PS	—	—	—
Auckland		58·2	137	—	—	i 18 2	+ 3	—	—	e 33·2
Kurmenty		60·1	320	10 10	− 1	—	—	—	—	—
Almata		61·1	319	10 18	0	—	—	—	—	—
Apia		61·1	107	—	—	15 4	PcS	—	—	—
Rybach'e		61·4	318	e 10 19	− 1	—	—	—	—	—
Frunse		62·5	318	i 10 28	0	—	—	—	—	—
Andijan		63·2	315	10 31	− 1	19 5	+ 2	—	—	—
Dzhergetal		63·5	313	i 10 39	+ 5	—	—	—	—	—
Obi-garm		64·5	312	i 10 55?	+14	e 19 33?	PS	—	—	—
Stalinabad		65·1	312	i 10 43	− 2	i 19 25	− 2	—	—	—
Tashkent		65·6	315	i 10 47	− 1	i 19 32	− 1	—	—	—
Samarkand		66·7	312	10 52	− 3	—	—	—	—	—
Terre Adélie		70·2	175	e 11 13	− 4	—	—	—	—	—
Ashkabad		72·9	309	i 11 35	+ 2	e 21 0	+ 1	—	—	—
Sverdlovsk		75·8	329	i 11 50	0	21 31	0	—	—	—
Baku		79·8	311	—	—	e 22 19	+ 5	—	—	—
Tiflis		83·7	312	e 12 33	+ 1	—	—	—	—	—
Ksara		90·9	304	i 13 8	+ 1	e 22 53	[−45]	—	—	—
Jena	Z.	104·5	325	18 22	[0]	—	—	—	—	—
Stuttgart	Z.	106·8	324	e 18 50	PP	—	—	—	—	—
Algiers Univ.	Z.	116·1	314	e 19 51	PP	—	—	—	—	—
Tamanrasset	Z.	119·2	299	e 19 41	[+50]	—	—	e 20 8	PP	—
Harvard		131·0	20	e 22 20	PKS	—	—	—	—	e 60·1
Chinchina		154·2	72	e 20 47	[+54]	—	—	e 21 25	?	—
Huancayo		154·3	112	e 20 16	PKP_2	—	—	—	—	—
Bogota		155·7	72	e 20 58	[+63]	—	—	e 42 28	?	79·2

Tamanrasset also gives iZ = 20m.26s.
Long waves were also recorded at Christchurch, Pretoria, Pavia, Rome, Strasbourg, Paris, Copenhagen, Kew, and Aberdeen.

June 20d. 23h. 44m. 9s. Epicentre 3°·0N. 129°·0E. (as at 22h.).

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Vladivostok		40·0	4	7 41	+ 3	13 45	+ 1	—	—	—
Riverview		42·2	152	i 10 2	PPP	e 17 14	SS	—	—	e 24·0
Kabansk		52·3	343	9 17	+ 2	e 16 43	+ 3	—	—	—
Petropavlovsk		55·6	21	e 9 45	+ 5	e 17 31	+ 6	—	—	—
Bombay	N.	57·1	291	—	—	e 17 44	− 1	—	—	—
Auckland	N.	58·2	137	—	—	e 17 53	− 6	—	—	e 33·1
Przhevalsk		59·7	319	i 10 8	− 1	—	—	—	—	—
Kurmenty		60·1	320	i 10 10	− 1	—	—	—	—	—
Rybach'e		61·4	318	e 10 18	− 2	e 18 37	− 3	—	—	—
Frunse		62·5	318	i 10 28	0	e 18 55	+ 1	—	—	—
Andijan		63·2	315	i 10 30	− 2	i 19 4	+ 1	—	—	—
Dzhergetal		63·5	313	i 10 34	0	—	—	—	—	—
Obi-garm		64·5	312	10 49?	+ 8	e 19 28?	+ 9	—	—	—
Stalinabad		65·1	312	e 10 42	− 3	e 19 23	− 4	—	—	—
Tashkent		65·6	315	i 10 47	− 1	i 19 31	− 2	—	—	—
Terre Adélie		70·2	175	e 9 33	?	—	—	—	—	—
Ashkabad		72·9	309	i 11 33	0	21 0	+ 1	—	—	—
Sverdlovsk		75·8	329	11 48	− 2	21 28	− 3	—	—	—
Baku		79·8	311	i 12 13	+ 1	e 22 17	+ 3	—	—	—
Ksara		90·9	304	i 13 8	+ 1	e 25 40	PPS	e 11 20	?	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Istanbul		95·5	312	e 17 20	PP	e 23 58	[− 6]	e 26 12	PS	—
Collmberg	z.	103·6	325	e 18 16	PP	—	—	—	—	—
Jena	z.	104·5	325	e 18 39?	PP	—	—	—	—	—
Messina		106·3	312	e 18 53	PP	—	—	—	—	—
Stuttgart		106·8	324	e 18 41?	PP	e 28 57	PPS	—	—	e 53·8
Rome		107·3	316	—	—	e 34 8	SS	—	—	e 54·3
De Bilt		107·6	328	e 18 51	PP	e 28 21	PS	—	—	e 50·8
Strasbourg		107·8	324	e 18 51	PP	e 28 33	PS	—	—	e 53·8
Pavia		108·3	321	e 29 8	PPS	—	—	—	—	—
Paris		110·7	326	e 19 22	PP	—	—	—	—	e 55·8
Algiers Univ.	z.	116·1	314	e 19 38	PP	—	—	—	—	—
Tamanrasset	z.	119·2	299	e 18 57	[+ 6]	i 20 11	PP	e 18 20	?	—

Riverview also gives iE = 17m.27s., eE = 21m.15s.
Long waves were also recorded at Christchurch, Copenhagen, Aberdeen, and Kew.

June 20d. Readings also at 0h. (Apia), 3h. (near Dzhergetal), 4h. (Apia), 6h. (Collmberg), 8h. (near Dzhergetal), 10h. (near Istanbul), 11h. (near Collmberg), 12h. (Pretoria), 13h. (Brisbane and Terre Adélie), 14h. (Pretoria and near Manila), 15h. (Pretoria, near Manila, and near Istanbul), 16h. (Apia and Collmberg), 17h. (Santa Lucia and near Dzhergetal), 18h. (Concepcion and near Dzhergetal), 19h. (Pretoria and near Messina), 20h. (Andijan, Stalinabad, near Dzhergetal (2), Khorog, and Obi-(garm), 21h. (near Dzhergetal), 22h. (Algiers Univ.), 23h. (Bandong, Djakarta, Tamanrasset, Riverside, near Pasadena, and Palomar).

June 21d. Readings at 1h. (Harvard and near Apia (2)), 2h. (Paris, 3h. (Apia), 5h. (near Athens), 6h. (Santa Lucia, Almata, Almata II, Fergana, Frunse, near Andijan, Dzhergetal, Naryn, and Rybach'e), 7h. (Auckland, Christchurch, Cobb River, Kaimata, Tuai, Wellington, Terre Adélie, Mount Wilson, Palomar, Riverside, China Lake, Lick, Fresno, Mineral, Reno, Dzhergetal, and Ksara), 8h. (Harvard and Palisades), 9h. (Copiapo), 10h. (Mineral, near Bandong, and Djakarta), 11h. (Toledo, near Granada, and near Alicante), 12h. (Mineral and near Stalinabad), 15h. (Santa Lucia, Palisades (2), and near Tananarive), 17h. (Christchurch, Wellington, Palomar, Pasadena, Riverside, China Lake, Fresno, Reno, Lick, and Stuttgart), 18h. (Ashkabad, near Dzhergetal, Khorog, and Stalinabad), 20h. (Apia, Andijan (2), Frunse, Lunacharskoe (2), Naryn (2), Tashkent, near Dzhergetal (2), Fergana (2), Khorog (2), and Stalinabad (2)), 21h. (Manila), 22h. (Apia and Manila), 23h. (Dzhergetal, Manlia, and Huancayo).

June 22d. 8h. 0m. 38s. Epicentre 38°·1N. 141°·4E. Depth of focus 0·005.

Intensity II-III at Isinomaki, Sendai, Hukusima, Miyako, Onagawa, Kakuda, Kawatahi, and Hirano. Epicentre as adopted. Depth 60km.

Seismo. Bull. Cent. Met. Obs., Japan, 1951, Tokyo 1951, p.139.

$A = -·6166$, $B = +·4922$, $C = +·6145$; $\delta = +7$; $h = -1$;
$D = +·624$, $E = +·782$; $G = -·480$, $H = +·383$, $K = -·789$.

		△	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Isinomaki		0·3	349	0 8	− 4	0 28	+ 8
Sendai		0·4	293	0 12	0	0 21	− 1
Hukusima		0·8	245	0 18a	+ 1	0 31	+ 2
Yamagata		0·8	280	0 11	− 6	0 25	− 4
Mizusawa	N.	1·0	349	e 0 16	− 3	0 28	−5
Inawashiro		1·2	242	0 25	+ 3	0 39	+ 1
Onahama		1·2	199	0 14	− 8	0 38	0
Shirakawa		1·4	223	0 31	+ 7	0 44	+ 1
Miyako		1·6	16	0 22	− 5	0 40	− 7
Morioka		1·6	354	0 25	− 2	0 38	− 9
Akita		1·9	328	0 57	S	(0 57)	+ 3
Mito		1·9	203	0 34	+ 3	0 55	+ 1
Utunomiya		2·0	218	0 42	+10	1 1	+ 4
Tukubasan		2·2	209	0 36	+ 1	—	—
Kumagaya		2·5	220	0 56	+17	1 20	+11
Tokyo		2·7	209	0 36	− 6	—	—
Oiwake		2·9	232	1 4	+19	—	—
Yokohama		3·0	208	1 27	S	(1 27)	+ 5
Hunatu		3·3	219	1 4	+13	—	—
Kohu		3·4	224	1 2	+10	1 40	+ 8
Misima		3·6	215	0 44	−11	—	—

June 22d. 12h. 56m. 10s. Epicentre 42°·5N. 144°·4E. Focus at base of superficial layers.
(as on 1950, Aug. 1d.).

Intensity V at Shiranuka ; IV at Attoko, Hiroo ; II-III at Kusiro, Obi-hiro, Nemuro, and Kenebetsu. Epicentre 42°·3N. 144°·5E. Depth 40km.

Seismo. Bull. Cent. Met. Obs., Japan, June, 1951, Tokyo, 1951, p.139, with macroseismic chart.

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

	△	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Kusiro	0·5	0	0 12	+ 2	0 21	+ 3
Obi-hiro	1·0	295	0 18	0	0 31	0
Nemuro	1·2	46	0 19	− 1	0 35	− 1
Urakawa	1·3	254	0 22	0	0 39	+ 1
Abashiri	1·5	357	0 20	− 4	—	—
Sapporo	2·3	284	0 42	+ 6	1 0	− 4
Aomori	3·2	238	1 6	+17	1 58	+31
Morioka	3·7	222	0 53	−3	1 30	− 9

June 22d. Readings also at 0h. (La Paz, and near Dzhergetal), 2h. (Raciborzu, Prague, Collmberg, Jena, and Stuttgart), 4h. (near Dzhergetal), 6h. (Apia and near Dzhergetal (2)), 7h. (Apia), 8h. (Christchurch, Cobb River, Kaimata, and Wellington (2)), 9h. (Scoresby Sund), 13h. (Collmberg), 14h. (near Naryn, near Basle, Neuchatel, and Zürich), 15h. (Apia and near Dzhergetal), 16h. (Collmberg and near Manila), 17h. (Copiapo), 18h. (Palisades, Frunse, Naryn, Rybach'e, near Andijan, Dzhergetal, Fergana, Khorog, Lunacharskoe, Obi-garm, Stalinabad, and Tashkent), 21h. (Pretoria and Santa Lucia), 22h. (Pavia), 23h. (Grahamstown (2), Kimberley (2), Pretoria (2), and Prague).

June 23d. 1h. 14m. 27s. Epicentre 37°·3N. 141°·3E. Focus at Base of the Superficial Layers.
(as on 6d.).

Intensity V at Onahama, Sioyasaki, Miyamoto, Tateno, Kasama, Otu, Simodate, Zuiryu, Ose, and Kaminokawa ; IV at Hukusima, Mito, Shirakawa, Inawasiro, Sendai, Utunomiya, Tukubasan, Tyosi, Nakahata, Kakuda, Watari, Yosioka. Epicentre 37°·2N. 141°·2E. Depth 45km.

Seismological Bulletin of the C.M.O., Japan, for June, 1951, Tokyo, 1951, p.140, with macroseismic chart.

$A = -·6223$, $B = +·4986$, $C = +·6034$; $\delta = -5$; $h = -1$;
$D = +·625$, $E = +·780$; $G = -·471$, $H = +·377$, $K = -·797$.

		△	Az.	P.	O−C.	S.	O−C.
			°	m. s.	s.	m. s.	s.
Onahama		0·5	221	0 11a	+ 1	0 18	0
Hukusima		0·8	304	0 18k	+ 3	0 29	+ 3
Shirakawa		0·9	258	0 18	+ 2	0 28	0
Inawasiro		1·0	286	0 20	+ 2	0 31	0
Sendai		1·0	342	0 21	+ 3	0 37	+ 6
Isinomaki		1·1	1	0 26	+ 7	0 42	+ 9
Mito		1·1	216	0 19k	0	0 30	− 3
Yamagata		1·2	322	0 26	+ 6	0 41	+ 5
Tukubasan		1·4	222	0 23	0	0 38	− 3
Utunomiya		1·4	237	0 22	− 1	0 36	− 5
Tyosi		1·6	193	0 25	− 1	0 40	− 6
Mizusawa	z.	1·8	356	0 36	+ 7	0 57	+ 6
Kumagaya		1·9	233	0 30k	− 1	0 51	− 3
Niigata		1·9	290	0 34	+ 3	1 4	+10
Maebasi		2·0	243	0 31	− 1	0 54	− 2
Sakata		2·0	324	0 44	+12	1 12	+16
Tokyo		2·0	218	0 32	0	0 53	− 3
Titibu		2·2	234	0 34	− 1	0 56	− 5
Yokohama		2·3	215	0 37	+ 1	0 59	− 5
Miyako		2·4	13	0 43	+ 5	1 12?	+ 6

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Morioka		2·4	358	0 43	+ 5	1 11	+ 5
Oiwake		2·4	246	0 38	0	1 14	+ 8
Takada		2·4	265	0 39	+ 1	1 15	+ 9
Aikawa		2·5	287	0 39	0	1 17	+ 8
Akita		2·6	339	0 49	+ 8	1 19	+ 8
Matusiro		2·6	253	0 42	+ 1	—	—
Mera		2·6	206	0 46	+ 5	1 16	+ 5
Hunatu		2·7	229	0 41	− 1	1 12	− 2
Kohu		2·8	233	0 42	− 1	1 14	− 2
Matumoto		2·9	248	0 47	+ 2	1 22	+ 3
Misima		2·9	221	0 40	− 5	1 15	− 4
Nagano		3·0	256	0 41	− 5	1 8	−14
Osima		3·0	211	0 44	− 2	1 15	− 7
Hatinohe		3·2	3	0 57	+ 8	1 35	+ 8
Iida		3·3	238	0 50	− 1	1 31	+ 2
Shizuoka		3·3	225	0 52	+ 1	1 25	− 4
Toyama		3·3	259	0 51	0	1 26	− 3
Wazima		3·5	272	0 54	+ 1	—	—
Omaesaki		3·7	224	1 5	+ 9	1 37	− 2
Kanazawa		3·8	260	1 10	+12	1 53	+11
Hamamatu		3·9	229	1 7	+ 8	1 43	− 1
Gihu		4·1	244	1 4	+ 2	1 50	+ 1
Nagoya		4·1	240	1 3	+ 1	1 49	0
Hatidyozima		4·4	197	1 2	− 4	1 56	− 1
Hikone		4·5	245	1 9	+ 1	1 44	−16
Tsuruga		4·5	250	1 8	0	2 3	+ 3
Kameyama		4·6	239	1 15	+ 6	2 3	+ 1
Tu		4·6	238	0 54	−15	—	—
Mori		4·8	353	1 22	+10	2 21	+14
Urakawa		5·0	13	1 19	+ 4	2 20	+ 8
Owase		5·3	233	1 17	− 2	—	—
Osaka		5·4	242	1 28	+ 8	2 41	+19
Kobe		5·6	244	1 34	+11	2 52	+25
Obihiro		5·8	14	2 9	+43	—	—
Sapporo		5·8	0	1 49	+23	—	—
Siomisaki		5·9	231	1 32	+ 5	—	—
Sumoto		6·0	242	1 33	+ 1	—	—
Abashiro		7·1	18	2 3	+19	—	—
Kôti		7·3	242	3 5	S	(3 5)	− 5
Ooita		8·9	246	3 42	S	(3 42)	− 7
Mineral	z.	71·7	53	e 11 40k	PcP	—	—
China Lake	z.	76·9	55	e 11 51	0	e 12 8	sP
Collmberg	z.	80·9	330	e 12 11	− 1	—	—
Stuttgart	z.	84·3	330	e 12 29	− 1	e 12 48	sP

June 23d. Readings also at 3h. (Morgantown, Harvard, Palisades, Seattle, Berkeley, Lick, Fresno, Mineral, Reno, Pasadena, Riverside, and near Palomar), 4h. (near Athens), 5h. (Apia), 6h. (Frunse and near Kishinev), 7h. (Nanking, Harvard, Palisades, Stuttgart, Lwow, near Kishinev, and near Mizusawa), 8h. (Pavia (2), Messina, Triest, Timisoara, Sofia, near Athens, and Istanbul), 9h. (Brisbane, Riverside, Palomar, China Lake, Lick, and Mineral), 10h. (near Manila and near Scoresby Sund), 11h. (near Alicante), 12h. (near Scoresby Sund), 13h. (Kimberley, Brisbane, Riverview, Wellington, Tuai, Christchurch, Riverside, Palomar, China Lake, and Stuttgart), 17h. (Collmberg and Ashkabad), 18h. (near Dzhergetal), 19h. (Tamanrasset and near Apia), 22h. (Dzhergetal), 23h. (Pietermaritzburg).

June 24d. 1h. 44m. 26s. Epicentre 8°·3S. 79°·8W. (as on 1951, May 8d.).

Intensity V at Trujillo, Pacasmayo; IV-V at Casa Grande, Sayapullo, Hidroelectra, Jungay; IV at Guadalupe Epicentre 8°·5S. 80°·0W.

E. Silgado.
Datos sismologicos del Peru, 1951, Bol. No. 8, Lima, 1953, p.14.

A = +·1753, B = −·9740, C = −·1434; δ = −3; h = +7;
D = −·984, E = −·177; G = −·025, H = +·141, K = −·990.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Huancayo		5·8	131	i 1 18	−11	e 2 17	−21	—	—	—
Chinchina		13·8	18	i 3 29	+10	i 6 12	+18	—	—	7·2
La Paz		14·0	127	e 3 19	− 3	i 5 52	− 7	6 18	SS	7·0
Bogota		14·1	24	i 3 32	+ 9	i 6 26	+24	e 3 37	PP	e 7·6
San Juan		29·8	27	e 6 9	− 2	—	—	—	—	—
Morgantown		47·7	0	e 8 40	0	—	—	8 53	pP	—
St. Louis		47·7	350	e 8 41	+ 1	—	—	e 8 53	pP	—
Tucson		50·0	326	e 9 1	+ 3	—	—	i 9 13	pP	—
Weston		51·0	9	e 9 17	+11	—	—	—	—	—
Harvard		51·1	9	i 9 19	+13	—	—	—	—	e 30·4
Ottawa	Z.	53·6	4	i 9 24	− 1	—	—	i 9 37	pP	—
Palomar	Z.	54·4	322	e 9 34	+ 3	—	—	e 9 55	?	—
Boulder City		55·0	325	e 9 38	+ 3	—	—	—	—	—
Riverside	Z.	55·1	322	e 9 38	+ 2	—	—	e 9 53	pP	—
Pasadena	Z.	55·7	322	i 9 42	+ 2	—	—	—	—	—
China Lake	Z.	56·5	324	i 9 48a	+ 2	—	—	—	—	—
Tinemaha	Z.	57·8	324	i 9 56	+ 1	—	—	e 10 20	?	—
Fresno	Z.	58·4	323	e 9 55a	− 5	—	—	e 13 40	PPP	—
Lick	Z.	59·9	322	e 10 12a	+ 2	—	—	i 10 26	pP	—
Reno	Z.	60·3	326	e 10 15a	+ 2	—	—	—	—	—
Mineral	Z.	61·9	325	e 10 36a	+12	—	—	—	—	—
Shasta Dam		62·6	324	i 10 27	− 1	—	—	—	—	—
Hungry Horse		64·0	335	i 10 37	− 1	—	—	—	—	—
Malaga		83·4	52	i 12 27	− 3	—	—	—	—	—
Scoresby Sund		87·6	17	e 12 47	− 4	—	—	i 13 3	pP	—
College		88·4	337	e 12 53	− 2	e 16 42	PP	i 13 7	pP	—
Tamanrasset	Z.	88·9	67	e 12 52	− 6	—	—	i 13 6	pP	—

Additional readings:—
St. Louis e = 9m.17s.
Riverside eZ = 10m.1s.
China Lake eZ = 10m.7s., and 10m.13s.
Fresno eZ = 10m.30s.
Lick eZ = 10m.36s.
Long waves were also recorded at Merida, Puebla, and Tacubaya.

June 24d. 2h. 26m. 34s. Epicentre 14°·6S. 76°·3W. (as on 1950, Dec. 28d.).

Intensity IV at Lunahuana; III-IV at Chincha, Ica, and Ayacucha; III at Nasca, Miraflores; II-III at Lima. Epicentre 14°·0S. 76°·5W. (U.S. Coast and Geodetic Survey)

E. Silgado.
Datos sismologicos del Peru, Bol. No. 8, Lima, 1953, p.14.

A = +·2293, B = −·9406, C = −·2505; δ = +6; h = +6;
D = −·972, E = −·237; G = −·059, H = +·243, K = −·968.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Huancayo	2·7	20	i 0 40	− 5	e 0 57	−22	—	—	—
La Paz	8·1	105	e 2 12	+10	i 3 42	+ 7	—	—	4·3
Bogota	19·2	5	i 4 22	− 6	i 7 42	−17	i 8 12	SS	—
Chinchina	19·5	2	i 4 21	−10	e 7 48	−18	—	—	—
San Juan	34·3	17	i 6 40	−10	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
St. Louis		54·5	346	e 9 32	0	—	—	—	—	—
Weston		56·9	5	e 10 24	+35	—	—	—	—	—
Tucson		57·1	325	e 9 53	+ 3	—	—	—	—	—
Palomar	Z.	61·4	321	e 10 24	+ 4	—	—	e 10 48	PcP	—
Riverside	Z.	62·2	321	e 10 31	+ 5	—	—	e 10 50	PcP	—
Mount Wilson	Z.	62·7	321	e 10 58	+29	—	—	—	—	—
China Lake	Z.	63·6	323	e 10 38	+ 3	—	—	e 11 5	PcP	—
Lick	Z.	67·0	322	e 11 1a	+ 4	—	—	—	—	—
Reno	Z.	67·4	325	e 11 51	+52	—	—	—	—	—
Hungry Horse		71·1	335	e 11 23	+ 1	—	—	—	—	—
Tamanrasset	Z.	88·2	66	e 12 54	0	—	—	—	—	—
College		95·5	336	e 13 29	+ 1	—	—	—	—	—

Additional readings :—
St. Louis e =9m.58s.
Tucson i =10m.20s., e =10m.34s.
China Lake eZ =11m.28s.
Tamanrasset eZ =13m.22s.

June 24d. 4h. 41m. 45s. Epicentre 39°·4S. 176°·2E.

Intensity VI-VII near the epicentre.

R. C. Hayes.
Earthquake origins in New Zealand during the year 1951.
New Zealand Journal of Science and Technology, Sect. B, Vol. 34, No. 4, Jan., 1953, p.255.
Epicentre as adopted. Macroseismic chart, p.257.

$$A = -\cdot7731,\ B = +\cdot0514,\ C = -\cdot6322;\quad \delta = 0;\quad h = -1;$$
$$D = +\cdot066,\ E = +\cdot998;\quad G = +\cdot631,\ H = -\cdot042,\ K = -\cdot775.$$

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tuai	N.	1·0	51	i 0 23	+ 2	—	—	—	—	—
New Plymouth	E.	1·7	281	i 0 33	+ 2	—	—	—	—	—
Wellington		2·2	210	i 0 39	+ 1	—	—	—	—	—
Auckland	N.	2·8	336	i 0 50	+ 3	i 1 23	+ 1	—	—	—
Cobb River	E.	3·1	238	0 51	0	1 32	+ 3	—	—	—
Kaimata	N.E.	4·8	228	e 1 13	− 2	2 9	− 3	—	—	—
Riverview		20·8	277	i 4 45k	0	e 8 34	+ 1	i 5 1	pP	e 10·2
Brisbane		22·6	294	i 5 4k	+ 1	i 8 8	−59	i 5 17	PP	e 11·0
Manila		74·3	304	e 21 2	S	(e 21 2)	−13	—	—	—
Palomar	Z.	95·3	51	e 13 24	− 3	—	—	—	—	—
Pasadena		95·3	50	e 13 22	− 5	—	—	e 17 0	PP	e 40·2
Riverside	Z.	95·4	50	e 13 25	− 3	—	—	e 13 46	?	—
Berkeley	N.	95·4	44	—	—	e 23 33	[−30]	—	—	—
Lick	Z.	95·4	44	e 13 24a	− 4	—	—	e 17 16	PP	—
Fresno	Z.	96·0	46	e 13 27	− 3	—	—	e 17 25	PP	—
China Lake	Z.	96·6	48	e 13 29	− 4	—	—	e 17 24	PP	—
Mineral	Z.	97·6	42	e 13 36k	− 2	—	—	i 13 45	?	—
Reno	Z.	97·9	44	e 13 37	− 2	—	—	e 17 31	PP	—
Palisades		127·8	64	i 19 3	[− 5]	i 22 22	PKS	i 19 20	pPKP	e 62·1
Ottawa		128·2	58	i 19 3	[− 6]	e 22 23	PKS	—	—	e 38·4
Harvard		130·0	63	e 19 9	[− 3]	e 33 29	PPS	e 21 47	PP	e 61·8
Weston		130·1	63	i 19 9	[− 3]	—	—	—	—	—
Seven Falls	E.	131·9	58	—	—	e 22 39	PKS	—	—	—
Scoresby Sund		147·4	12	e 19 40	[− 3]	—	—	—	—	—
Ksara		147·8	272	i 19 49	[+ 5]	23 31	PP	20 5	pPKP	—
Helwan	Z.	149·8	263	e 19 47	[0]	e 20 42	?	—	—	—
Tamanrasset	Z.	161·6	208	e 19 59	[− 3]	e 20 46	PKP_2	e 24 29	PP	—
Collmberg	Z.	163·3	321	e 20 54	PKP_2	—	—	—	—	—
Jena		164·2	323	e 20 55	PKP_2	—	—	e 21 18	?	—
Stuttgart	Z.	166·8	319	e 21 1?	PKP_2	—	—	e 24 50	PP	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Rome		167·4	287	—	—	e 45 24	SS	—	—	e 72·8
Strasbourg		167·6	322	e 21 11?	PKP_2	e 24 57	PP	e 28 57	PPP	—
Kew		167·7	350	e 24 59	PP	—	—	—	—	e 73·2
Paris		169·6	336	i 20 1	[− 8]	e 27 3	[− 8]	i 20 23	pPKP	e 82·2
Alicante		177·2	—	e 20 17	[+ 5]	—	—	e 25 22	PP	—
Malaga		177·3	—	i 20 12	[0]	28 56	PPP	i 25 26	PP	—
Granada		177·8	—	26 15	PP	32 32	{− 8}	47 33	SS	—

Additional readings :—
Riverview iPPNZ = 5m.11s., iZ = 8m.44s., iE = 8m.50s., isSE = 9m.2s., iZ = 9m.9s., iE = 9m.17s., iN = 9m.50s.
Brisbane iN = 5m.14s., iEN = 5m.26s.
Palomar eZ = 13m.46s. and 13m.53s.
Pasadena eZ = 13m.42s.
Lick eZ = 13m.41s.
China Lake eZ = 13m.55s.
Palisades ePP? = 21m.8s.
Ottawa iZ = 19m.22s.
Tamanrasset eZ = 20m.22s., 21m.8s., and 22m.26s.
Collmberg eZ = 21m.10s.
Strasbourg e = 29m.55s.
Paris iPKP_2 = 21m.15s., ipPKP_2 = 21m.35s., ePP = 25m.1s., ePP_2? = 26m.47s., iPcP, PKP = 28m.20s., iPPP = 28m.49s., eSS = 49m.35s., eSS = 51m.59s. and several other unidentified e and i phases.
Malaga iPS = 32m.24s.
Granada SKSP = 37m.5s.

June 24d. 10h. 55m. 40s. Epicentre 18°·6N. 146°·9E.

A = −·7945, B = +·5179, C = +·3170 ; δ = −6 ; h = +5 ;
D = +·546, E = +·838 ; G = −·266, H = +·173, K = −·948.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Mera		17·4	340	3 59	− 7	e 7 28	+ 9	—	—	e 8·8
Osima		17·4	340	e 4 9	+ 3	e 7 30	+11	—	—	e 10·8
Omaesaki		17·7	336	e 4 13	+ 3	e 7 48	+22	—	—	—
Misima		17·9	338	e 3 55	−17	7 36	+ 6	4 20	PP	8·9
Shizuoka		18·0	336	4 13	0	7 40	+ 8	—	—	—
Tokyo		18·2	340	4 0	−16	8 0	+23	e 4 58	PP	9·5
Hunatu		18·3	338	4 21	+ 4	7 41	+ 2	—	—	—
Mito		18·6	343	e 4 21	0	e 7 54	+ 8	—	—	—
Tukubasan		18·6	342	e 4 20	− 1	e 7 52	+ 6	—	—	—
Kameyama		18·7	334	e 4 28	+ 6	—	—	—	—	—
Nagoya		18·7	335	e 4 23	+ 1	e 7 51	+ 3	—	—	e 11·8
Osaka		18·9	332	e 4 25	+ 1	e 8 46	PcP	e 5 14	PP	—
Onahama		19·0	346	e 4 26	0	e 8 2	+ 7	—	—	—
Kôti		19·1	323	e 4 27	0	e 7 56	− 1	—	—	e 10·8
Matusiro		19·4	338	i 4 27	− 3	i 8 16	+12	5 32	PP	10·5
Hukusima		19·9	344	4 36	0	8 6	− 9	—	—	—
Ooita		20·0	319	e 4 44	+ 7	e 8 23	+ 6	—	—	e 11·5
Toyama		20·0	337	e 4 42	+ 5	e 8 41	+24	e 8 2	PcP	e 12·0
Sendai		20·3	347	e 4 42	+ 2	e 8 13	−10	e 6 28	?	e 11·6
Niigata		20·5	343	e 4 50	+ 8	8 37	+10	i 5 24	PP	—
Waziina		20·7	337	e 4 45	+ 1	e 8 7	−24	—	—	—
Hukuoka		21·0	318	e 4 18	−29	e 8 9	−28	—	—	e 10·4
Mizusawa		21·1	347	4 52	+ 4	e 8 27	−12	8 23	S	—
Saga		21·3	317	e 4 47	− 3	8 50	+ 7	—	—	—
Morioka	N.	21·6	348	e 4 53	− 1	e 8 29	−20	—	—	—
Urakawa		23·7	353	e 5 13	− 1	e 9 27	0	—	—	e 12·1
Sapporo		24·8	351	e 4 53	−32	e 9 35	−11	—	—	—
Manila		25·2	265	(e 5 26)	− 3	e 7 28	?	—	—	i 8·7
Zi-ka-wei	z.	26·2	303	e 5 37	− 1	e 10 19	+10	—	—	—
Vladivostok		27·6	336	i 5 52	+ 1	e 10 27	− 5	—	—	—
Nanking		28·6	303	e 5 58a	− 2	i 11 4	+16	6 53	PP	i 14·1
Petropavlovsk		35·7	13	e 7 6?	+ 4	e 12 29?	−10	e 12 39	S	—
Kabansk		45·9	326	8 26	0	15 6	− 5	—	—	—
Brisbane	z.	46·2	172	e 8 32	+ 4	—	—	—	—	—
Irkutsk		47·2	326	8 35	− 1	15 27	− 2	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Riverview		52·3	175	—	—	e 16 47	+ 7	i 19 10	ScS	e 23·9
Przhevalsk		61·9	310	i 10 25	+ 1	—	—	—	—	—
Kurmenty		62·0	310	10 24	0	—	—	—	—	—
College		62·9	25	i 10 27	− 3	—	—	e 12 52	PP'	—
Almata		63·0	310	e 10 32	+ 1	19 3	+ 2	—	—	—
Rybach'e		63·7	309	e 10 33	− 3	—	—	—	—	—
Naryn		63·8	308	e 10 34	− 2	—	—	—	—	—
Frunse		64·7	309	i 10 43	+ 1	e 19 26	+ 4	—	—	—
Andijan		66·5	307	10 52	− 2	i 19 44	0	—	—	—
Fergana		67·0	307	e 10 55	− 2	—	—	—	—	—
Tashkent		68·8	308	e 11 8	0	20 12	+ 1	—	—	—
Stalinabad		69·5	305	e 11 12	0	20 20	0	—	—	—
Sverdlovsk		72·6	325	i 11 30	− 1	20 54?	− 2	—	—	—
Mary		75·1	306	—	—	e 21 20	− 4	—	—	—
Seattle		77·0	44	e 11 55	− 1	—	—	—	—	e 39·3
Ashkabad		77·7	306	12 1	+ 1	e 21 51	− 1	—	—	—
Shasta Dam		78·6	51	i 12 4	− 1	—	—	—	—	—
Kizyl-Arvat		79·0	308	e 12 20	+13	—	—	—	—	—
Mineral	z.	79·3	51	i 12 8k	− 1	—	—	e 15 19	PP	—
Berkeley	z.	79·5	53	e 12 11	+ 1	e 22 13	+ 2	e 15 35	PP	e 37·7
Lick	z.	80·1	53	i 12 12k	− 1	—	—	e 15 38	PP	—
Reno	z.	80·9	51	e 12 20k	+ 3	—	—	e 15 42	PP	—
Hungry Horse		82·2	41	e 12 23	− 1	—	—	—	—	—
Tinemaha	z.	82·8	53	e 12 27	0	—	—	—	—	—
Baku		83·3	311	12 33	+ 3	e 22 45?	− 5	—	—	—
China Lake	z.	83·6	54	i 12 31	0	—	—	i 15 58	PP	—
Pasadena		83·7	56	e 12 31	− 1	—	—	e 15 57	PP	e 34·5
Riverside	z.	84·4	56	e 12 33	− 3	—	—	—	—	—
Palomar	z.	85·0	56	e 12 38	0	—	—	—	—	—
Grozny		85·2	314	e 12 42	+ 3	—	—	—	—	—
Moscow		85·2	328	12 39	0	23 0	[− 2]	—	—	—
Boulder City		85·7	53	i 12 42	0	—	—	—	—	—
Pulkovo		86·6	333	12 49	+ 3	23 17	− 6	—	—	—
Gori		86·9	313	e 12 52	+ 1	e 23 26	0	—	—	—
Tucson		90·1	56	e 13 3	0	e 23 58	+ 3	e 16 31	PP	—
Scoresby Sund		90·8	356	—	—	i 23 59	− 3	—	—	—
Upsala		91·7	337	—	—	e 23 39	[− 4]	e 39 38	Q	e 48·3
Ksara		96·2	308	e 17 12	PP	e 27 4	PPS	—	—	—
Copenhagen		96·6	336	—	—	24 8	[− 2]	—	—	46·3
Istanbul		97·3	317	e 13 36	0	e 24 57	− 1	e 17 9	PP	e 49·3
Skalnate Pleso		97·6	328	e 16 58	PP	e 20 20	PPP	e 35 20	SSS	—
Collmberg	x.	99·6	332	e 13 44	− 2	—	—	e 17 11	PP	—
Prague		99·8	331	e 18 5	PP'	e 24 34	[+ 8]	e 32 56	SS	e 50·3
Jena	x.	100·4	333	e 17 58	PP	—	—	—	—	—
Cheb		100·7	333	e 17 49	PP	e 24 40	[+10]	e 32 32	SS	e 40·9
De Bilt		102·1	337	e 18 26	PP	—	—	—	—	e 44·3
Stuttgart		103·1	333	e 18 15	PP	e 25 44	− 2	e 27 20	PS	e 51·3
Triest		103·2	329	—	—	e 34 22	SSP	e 37 54	SSS	e 57·8
Strasbourg		103·8	334	e 18 22	PP	e 25 52	0	e 21 14	PPP'	e 50·3
Kew		104·6	339	e 18 24	PP	e 27 40	PS	e 28 32	PPS	e 59·3
Tarauto		104·9	323	13 4	?	e 23 4	?	—	—	—
Paris		105·8	337	e 14 12	− 2	e 27 59	PS	e 18 34	PP	e 55·3
Pavia		105·8	331	—	—	e 23 43	?	—	—	e 52·9
Rome		106·5	326	e 13 36	P	e 25 10	[+13]	e 27 58	PS	e 51·8
Messina		107·4	322	—	—	e 28 6	PS	—	—	e 51·6
Pennsylvania	x.	107·8	34	—	—	28 20?	PS	—	—	—
Palisades		109·6	31	—	—	e 29 26	PPS	—	—	—
Alicante		115·6	333	18 34	[−10]	25 30	[− 4]	19 50	PP	e 53·6
Tamanrasset	z.	124·2	316	i 19 2a	[+ 1]	e 24 12	PPP	e 20 41	PP	—
Bogota		133·5	64	—	—	e 22 54	SKP	—	—	—
La Paz		146·6	92	e 19 46	[+ 4]	i 23 12	SKP	35 44	PPS	66·3

For Notes see next page.

NOTES TO JUNE 24d. 10h. 55m. 40s.

Additional readings and note :—
Misima PPP =4m.55s.
Tokyo eE =5m.33s., eN =8m.38s.
Manila eP =4m.6s., ePP =5m.21s., the reading entered as P is given as PPP but these readings are quite inconsistent with the other observations.
Nanking Q?EN =12m.32s.
Riverview iE =19m.23s.
Mineral iZ =12m.18s., 12m.27s., 15m.35s., and 16m.21s.
Berkeley eQN =33m.14s.
Lick iZ =12m.24s., 12m.46s., and 16m.24s.
Istanbul eSKSN =24m.11s., eSSN =31m.55s.
Collmberg eZ =17m.47s.
Prague e =17m.35s.
Cheb e =26m.41s. and 35m.8s.
Stuttgart eZ =23m.38s., e =40m.50s.
Strasbourg ePS =27m.26s., e =27m.32s., eSS =33m.2s., e =36m.14s.
Paris e =14m.26s., 19m.46s., and 27m.32s., eSS =32m.57s., eSSS =37m.34s., eQ = 42m.18s.
Alicante SSS =39m.45s., Q =46m.14s.
La Paz iPKPZ =19m.51s., iZ =23m.35s.
Long waves were also recorded at Auckland, Christchurch, Wellington, Kimberley, Pretoria, Huancayo, Santa Clara, Harvard, Aberdeen, Almeria, Clermont-Ferrand, and Malaga.

June 24d. 16h. Undetermined shock which does not appear to be a foreshock of the following.

Mera e =49m.29s.
Misima eP =50m.48s., PP =51m.48s., PPP? =52m.37s., S =54m.25s., L =55m.0s.
Osima eP =50m.55s., e =54m.10s.
Hunatu eP =51m.1s., eS =54m.46s.
Shizuoka eP =51m.6s., eS =54m.26s.
Ooita eP =51m.6s., eS? =55m.18s.
Nagoya e =51m.8s.
Osaka eP =51m.8s.
Kumagaya eP =51m.11s., e =54m.42s.
Matusiro eP =51m.13s., iS =54m.55s.
Oiwake P =51m.14s.
Toyama eP? =51m.16s.
Matumoto e =51m.19s.
Nagano ePN =51m.22s.
Maebasi eP =51m.26s., e =55m.4s.
Shirakawa e =51m.33s. and 54m.35s.
Sendai eP =51m.37s., N =54m.56s. and 55m.13s.
Niigata e =52m.0s.
Zi-ka-wei eZ =52m.22s.
Lick ePZ =58m.54s.k, iZ =59m.11s.
Mineral ePZ =58m.55s.k.
Fresno ePZ =59m.3s., eZ =59m.19s.
China Lake eZ =59m.15s.
Tinemaha eZ =59m.15s.
Pasadena ePZ =59m.19s., eZ =59m.30s.
Palomar ePZ =59m.25s., eZ =59m.37s.
Riverside eZ =59m.31s.

June 24d. 16h. 49m. 24s. Epicentre 5°·7S. 154°·0E. Depth of focus 0·005.

A = −·8944, B = +·4362, C = −·0987 ; δ = −4 ; h = +7 ;
D = +·438, E = +·899 ; G = +·090, H = −·043, K = −·995.

		△	Az.	P.	O−C.	S.	O−C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Brisbane		21·7	182	i 4 47k	0	i 8 47	+ 9	i 5 9 PP	—
Riverview		28·1	185	i 5 48a	0	i 10 38	+12	e 6 54 PPP	e 12·0
Manila		38·4	302	e 6 57	−20	i 13 0	− 7	i 7 17 P	i 16·1
Wellington		40·0	156	—	—	e 13 18	−13	i 16 36 SS	e 19·6
Christchurch		41·1	159	e 7 38	− 1	e 13 46	− 1	—	— e 17·5
Kumagaya		43·8	343	e 8 23	+22	—	—	—	— —
Perth		44·2	229	—	—	i 15 0	+28	i 17 56 SS	e 21·2
Shirakawa		44·5	344	e 8 13	+ 6	—	—	—	— —
Sendai	N.	45·4	346	8 22	+ 8	—	—	—	— —
Bandong		46·1	296	e 8 56	+37	e 16 20	?	—	— —

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Zi-ka-wei	z.	48·1	322	e 8 34	− 1	15 33	+ 5	—	—	—
Nanking	z.	50·3	320	i 8 53a	+ 1	i 16 3	+ 5	i 9 15	pP	—
Vladivostok		52·6	340	—	—	i 16 28	− 2	i 17 5	sS	—
Petropavlovsk		58·7	4	i 9 52	− 1	17 49	− 2	i 10 14	pP	—
Kabansk		70·2	331	11 9	+ 1	—	—	—	—	—
Irkutsk		71·5	331	11 15	− 1	20 28	0	e 21 10	sS	—
New Delhi		81·2	300	e 12 10	0	i 22 12	− 2	—	—	—
Przhevalsk		83·3	315	e 12 22	+ 1	—	—	—	—	—
Bombay		83·5	290	e 12 45	pP	i 22 39	+ 2	i 23 22	PS	—
Almata II		84·2	315	e 12 26	0	—	—	—	—	—
Almata		84·5	315	i 12 28	+ 1	22 48	+ 1	—	—	—
Ili		84·6	316	i 12 28	0	i 22 43	− 5	i 12 51	pP	—
Naryn		84·8	312	i 12 28	− 1	i 22 51	+ 1	i 12 52	pP	—
Rybach'e		85·0	313	i 12 31?	+ 1	i 22 52?	0	e 12 54	pP	—
Frunse		86·1	313	i 12 36	+ 1	i 23 4	+ 1	i 12 59	pP	—
Andijan		87·4	311	12 44	+ 3	i 23 18	+ 3	e 13 6	pP	—
Fergana		87·8	311	e 12 42	− 1	e 23 19	0	13 6	pP	—
Lick	z.	88·9	53	i 12 48k	0	e 16 39	PP	i 13 27	pP	—
Obi-garm		89·1	309	12 49	0	23 36	+ 5	—	—	—
Mineral	z.	89·4	50	i 12 53k	+ 2	—	—	i 13 34	sP	—
Stalinabad		89·8	309	i 12 52	− 1	23 39	+ 2	i 24 21	sS	—
Tashkent		89·8	311	i 12 52	− 1	i 23 38	+ 1	i 13 16	pP	—
Seattle		89·9	43	e 13 16	pP	e23 38	0	e 24 16	PS	e 42·6
Fresno	z.	90·3	53	e 12 45	−10	e 16 52	PP	e 13 17	pP	—
Pasadena		91·4	56	e 12 58	− 2	i 23 48	− 3	i 13 23	pP	e 40·7
Tinemaha	z.	91·6	53	e 13 0	− 1	—	—	i 13 24	pP	—
China Lake	z.	92·0	54	e 13 3	0	—	—	i 13 25	pP	—
Palomar		92·4	57	e 13 4	− 1	e 24 2	+ 2	i 13 28	pP	—
Sverdlovsk		96·6	326	e 13 20	− 4	e 24 34	− 2	—	—	—
Ashkabad		97·9	307	—	—	23 57	[− 3]	—	—	—
Scoresby Sund		115·2	358	—	—	27 26	S	29 6	PS	—
Ksara		116·4	305	i 19 50	PP	e 28 58	PS	—	—	—
Pretoria	z.	118·8	237	e 19 37	PP	—	—	—	—	—
Istanbul		119·7	315	e 20 12	PP	e 27 53	S	e 36 23	SS	e 64·4
Kimberley	z.	120·3	232	i 19 10	[+26]	—	—	—	—	—
Helwan	z.	121·3	301	e 20 21	PP	—	—	i 20 42	pPP	—
Ottawa		121·6	39	18 45	[− 1]	27 10	SKKS	31 36	PPS	—
Collmberg	z.	124·2	331	e 18 53	[+ 2]	—	—	e 19 31	pPKP	—
Palisades		124·7	43	i 18 52	[0]	e 20 39	PP	e 19 15	pPKP	e 59·2
Jena		125·1	331	e 18 54	[+ 1]	e 21 8	PP	e 19 16	pPKP	—
Harvard		125·6	40	e 18 53	[− 1]	e 30 28	PS	e 21 4	PP	e 58·6
Weston		125·8	40	i 19 21	pPKP	—	—	—	—	—
Stuttgart	z.	127·7	331	e 19 0	[+ 2]	e 21 0	PP	e 19 20	pPKP	e 37·6
Strasbourg		128·5	332	e 21 4	PP	—	—	—	—	—
Rome		130·3	323	e 21 30	PP	—	—	e 38 56	P′P′	—
Messina		130·4	317	e 21 22	PP	—	—	e 39 22	P′P′	—
Paris		130·7	336	e 21 24	PP	e 30 16	PS	e 23 9	PPP	e 63·6
La Paz		132·8	119	e 17 6	?	i 26 47	[+36]	i 21 46	PP	—
Malaga		143·3	330	i 19 21	[− 6]	—	—	—	—	—
Tamanrasset	z.	145·2	303	i 19 30k	[0]	e 22 45	PP	e 19 54	pPKP	—

Additional readings :—
Brisbane iPE = 4m.50s., iSSE = 9m.24s.
Riverview iN = 10m.48s.
Manila iPP = 8m.36s., isPP = 9m.15s.
Nanking i = 9m.31s.
New Delhi iEN = 12m.34s., iN = 22m.51s. and 23m.5s.
Ili sS = 23m.27s.
Naryn sS = 23m.36s.
Rybach'e esS = 23m.33s.
Andijan isS = 23m.58s.
Fergana sS = 24m.1s.
Tashkent isS = 24m.19s.
Scoresby Sund SS = 35m.24s.
Istanbul eN = 28m.31s.
Ottawa e = 19m.11s., SS = 37m.0s.
Jena eEZ = 19m.42s.

Continued on next page.

Harvard ePPS = 32m.6s.
Stuttgart eZ = 19m.45s.
Paris e = 21m.41s., 22m.10s., 22m.22s., and 34m.8s.
La Paz iSKKS? = 28m.16s., iSS? = 38m.21s.
Tamanrasset esPKPZ = 20m.11s., eZ = 21m.52s., epPPZ = 23m.10s.
Long waves were also recorded at Copenhagen and Kew.

June 24d. Readings also at 1h. (near Apia), 2h. (Bogota, Palomar, and China Lake), 3h. (Collmberg, Raciborzu, Frunse, Kurmenty, near Almata, Almata II, Ili, and Naryn), 4h. (near Kishinev), 6h. (Mount Wilson, Palomar, Riverside, and China Lake), 10h. (Tortosa), 11h. (Mineral and near Dzhergetal), 13h. (Ashkabad and near Tacubaya), 14h. (Prague, Gori, and near Santa Clara), 15h. (Mount Wilson, Palomar, China Lake, Fresno, Lick, and Mineral), 17h. (Ksara and Apia), 18h. (Palomar, Pasadena, Riverside, China Lake, Mineral, Tinemaha, Lick, and Stuttgart), 19h. (Tamanrasset), 20h. (Paris, Prague, Collmberg, Jena, Strasbourg, Stuttgart, Basle, near Chur, Zürich, and Prato), 21h. (Puebla and near Tacubaya), 22h. and 23h. (Tacubaya).

June 25d. 3h. 18m. 26s. Epicentre 56°·2N. 155°·3W. Depth of focus 0·005.
(as on 1939, May 9d.).

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

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
College		9·4	20	e 2 9	− 6	i 3 30	−30	—	—	i 3·7
Seattle		21·9	98	e 5 1	+12	e 8 59	+17	—	—	e 11·1
Hungry Horse		26·1	88	e 5 29	0	—	—	i 8 58	PcP	e 12·6
Shasta Dam		26·5	111	e 5 32	− 1	—	—	—	—	—
Mineral	z.	27·1	111	e 5 39a	0	i 6 33	PP	e 5 57	pP	—
Fresno	z.	30·8	113	e 6 18a	+ 6	—	—	—	—	—
China Lake	z.	32·6	111	e 6 27	− 1	—	—	e 6 35	pP	—
Pasadena	z.	33·6	114	e 6 43	+ 7	—	—	—	—	—
Boulder City		33·9	108	e 6 39	0	—	—	—	—	—
Riverside	z.	34·1	114	e 6 38	− 2	—	—	e 6 48	pP	—
Palomar	z.	34·9	113	e 6 47	0	—	—	e 6 55	pP	—
Tucson		38·9	108	e 7 22	+ 1	—	—	e 7 29	pP	—
St. Louis		45·6	84	e 8 22	+ 6	e 14 50	− 2	—	—	—
Harvard		52·9	66	e 9 11	− 1	—	—	—	—	e 30·0
Weston		53·1	66	i 9 19	+ 6	—	—	—	—	—
Zi-ka-wei	z.	61·3	283	e 20 27	?	21 42	SS	—	—	—
Nanking		61·9	286	e 21 14	?	22 44	SS	—	—	—
Collmberg	z.	72·4	7	e 11 23	+ 2	—	—	—	—	—
Jena	z.	72·7	8	e 11 25	+ 2	—	—	—	—	—
Paris		73·7	15	i 11 30	+ 1	—	—	—	—	—
Stuttgart	z.	74·1	10	e 11 35	+ 4	—	—	—	—	—
Strasbourg		74·6	11	e 11 36	+ 2	—	—	—	—	—
Istanbul	z.	83·0	357	e 12 4	−16	—	—	—	—	—
Malaga		84·2	23	i 12 18	− 8	i 21 8	?	e 15 8	PP	—
Ksara		89·8	351	e 13 31	+38	e 25 14	PS	e 14 11	pP	—
Pretoria	z.	149·5	354	i 20 16	[+39]	—	—	—	—	—
Kimberley	z.	153·0	0	i 19 54	[+12]	—	—	—	—	—

Additional readings :—
Paris i = 11m.37s., 12m.2s., 12m.6s., and 12m.18s.
Malaga PPP = 16m.36s.
Long waves were also recorded at Palisades, Berkeley, Scoresby Sund, and Kew.

June 25d. 5h. 25m. 23s. Epicentre 36°·0S. 53°·0E. (as on 1947, April 11d.).

A = +·4880, B = +·6476, C = −·5852 ; δ = −1 ; h = 0 ;
D = +·799, E = −·602 ; G = −·352, H = −·467, K = −·811.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tananarive		17·7	342	4 9	− 1	e 7 9	−17	4 21	PP	i 7·5
Grahamstown	Z.	22·0	269	i 4 56	− 2	—	—	—	—	—
Pretoria	Z.	23·6	289	i 5 9	− 4	—	—	—	—	—
Kimberley	Z.	24·8	279	i 6 25	+60	—	—	—	—	—
Kodaikanal	E.	51·4	31	—	—	i 21 57	SSS	—	—	—
Terre Adélie		56·9	150	e 10 7	+18	—	—	—	—	—
Bombay	E.	57·7	22	—	—	e 17 58	+ 5	e 24 17	SSS	—
Ksara		71·3	345	11 18	− 5	e 21 2	+21	e 6 42	?	—
Tamanrasset	Z.	73·7	315	e 11 31	− 7	—	—	e 14 9	PP	—
Riverview		76·8	122	—	—	e 22 11	+29	—	—	e 35·9
Istanbul		79·8	342	e 12 8	− 4	e 22 6?	− 8	e 27 22	SS	—
Messina		81·6	331	—	—	e 22 42	+ 9	—	—	e 45·4
Rome		85·9	331	—	—	e 24 17	PS	e 28 57	SS	—
Tortosa		90·4	323	—	—	i 24 7	+ 9	(e 29 37)	SS	e 29·6
Clermont-Ferrand		93·0	328	—	—	e 30 37?	SS	—	—	e 50·0
Stuttgart		93·0	333	e 13 16	− 1	—	—	—	—	e 48·6
Strasbourg		93·3	333	—	—	e 24 25	+ 1	e 30 46	SS	39·6
Collmberg	Z.	93·8	336	e 13 20	0	—	—	—	—	—
Paris		95·6	330	—	—	e 22 49	?	e 31 15	SS	e 45·6
De Bilt		97·2	333	—	—	e 30 49	SS	—	—	e 48·6
Kew		98·8	330	—	—	e 32 3	SS	—	—	e 44·6
Riverside	Z.	171·9	259	e 20 9	[− 1]	20 24	?	—	—	—
China Lake	Z.	172·3	—	e 20 9	[− 2]	20 20	?	—	—	—
Pasadena	Z.	172·5	—	e 20 22	[+11]	—	—	—	—	—
Fresno	Z.	174·2	—	e 20 12	[+ 1]	e 26 1	PP	e 20 44	?	—

Additional readings :—
Tamanrasset eZ =11m.38s. and 12m.58s.
Strasbourg ePS =25m.37s., e =30m.54s.
Paris e =23m.29s., ePPS =26m.37s., e =31m.26s.
Long waves were also recorded at Scoresby Sund, Pavia, Malaga, Alicante, and Harvard.

June 25d. 15h. 43m. 34s. Epicentre 3°·5S. 149°·5E. (as on 1942, Aug. 15d.).

A = −·8601, B = +·5066, C = −·0606 ; δ = +9 ; h = +7 ;
D = +·508, E = +·862 ; G = +·052, H = −·031, K = −·998.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane		24·1	172	i 5 14	− 4	i 9 37	+ 3	i 5 40	PP	i 13·0
Riverview		30·2	176	e 6 7	− 7	e 11 9	− 4	i 7 11	PP	e 14·4
Manila		33·5	303	e 6 49	+ 6	i 12 6	+ 1	e 8 2	PP	i 15·7
Auckland	N.	40·5	150	—	—	i 17 4?	SS	—	—	e 19·9
Perth		42·4	223	—	—	i 14 29	+ 9	i 17 31	SS	i 24·4
Cobb River	E.	42·9	153	e 11 26?	?	—	—	—	—	—
Wellington		43·9	152	i 10 21	PPP	e 14 36	− 6	e 19 8	Q	e 21·1
Christchurch		44·8	156	—	—	e 18 26	SS	—	—	e 20·3
Nanking		45·8	322	e 8 38	+13	15 18	+ 9	—	—	—
Vladivostok		49·1	343	e 8 50	− 1	e 15 58	+ 2	—	—	—
Petropavlovsk		56·9	6	i 9 49	0	i 17 39	− 3	—	—	—
Terre Adélie		63·5	183	e 10 32	− 2	e 18 50	−17	e 11 0	PcP	30·4
Kabansk		66·2	332	e 10 50	− 2	e 19 45	+ 5	—	—	—
Irkutsk		67·4	332	10 58	− 1	20 0	+ 5	—	—	—
Przhevalsk		78·6	315	12 6	+ 1	—	—	—	—	—
Ili		79·9	316	i 12 10	− 2	—	—	—	—	—
Rybach'e		80·2	314	e 12 14	0	—	—	—	—	—
Frunse		81·4	314	e 12 20	0	—	—	—	—	—
Andijan		82·6	311	i 12 27	+ 1	i 22 52	+ 9	—	—	—
Fergana		82·9	311	e 12 28	0	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Obi-garm		84·2	309	i 12 35	+ 1	—	—	—	—	—
Stalinabad		84·9	309	i 12 39	+ 1	i 23 14	+ 8	—	—	—
Lunacharskoe		85·0	311	e 12 44	+ 6	—	—	—	—	—
Tashkent		85·0	311	12 44	+ 6	—	—	—	—	—
Mary		90·2	308	e 16 45	PP	—	—	—	—	—
Sverdlovsk		92·3	326	13 11	− 2	23 47	[+ 1)	—	—	—
Fresno	z.	92·6	53	e 13 12	− 3	—	—	e 16 56	PP	—
Ashkabad		93·0	307	e 16 55	PP	e 23 55	[+ 5]	—	—	—
Pasadena	z.	93·9	56	e 13 20	− 1	—	—	—	—	—
China Lake	z.	94·4	54	e 13 18	− 5	—	—	—	—	—
Riverside	z.	94·5	56	e 13 24	+ 1	—	—	—	—	—
Kizyl-Arvat		94·7	309	e 17 24	PP	—	—	—	—	—
Palomar	z.	94·9	57	e 13 22	− 3	—	—	—	—	—
Moscow		105·1	327	e 18 31	PP	—	—	—	—	—
Yalta		110·4	316	—	—	25 53	{−15}	—	—	—
Ksara		111·5	304	e 19 27	PP	e 30 11	PPS	—	—	—
Helwan	z.	116·1	301	e 20 12	PP	—	—	e 20 37	PP	—
Stuttgart		123·6	329	e 19 11?	[+11]	e 31 26	PPS	—	—	—
Istanbul	z.	125·0	314	e 17 52	[−70]	e 29 26?	?	e 30 39	PS	—
Weston		126·9	37	e 17 53	[−73]	—	—	—	—	—
La Paz		137·8	119	e 19 38	[+11]	—	—	—	—	—
Granada		138·4	327	22 12k	PP	23 12	SKP	25 42	PPP	71·7
Tamanrasset	z.	140·2	302	i 19 30k	[− 1]	—	—	e 19 48	?	—

Additional readings :—
Brisbane iPPPN = 5m.47s., iSSEN = 10m.29s., iSSSN = 10m.44s.
Riverview eZ = 11m.26s., iSSN = 12m.45s., iE = 12m.53s. and 13m.48s.
Manila e = 7m.2s., and 7m.27s., i = 13m.54s.
Granada PS = 33m.30s.
Long waves were also recorded at Harvard.

June 25d. 16h. 12m. 37s. Epicentre 61°·1N. 150°·1W. Depth of focus 0·015.
(as on 1950, Jan. 30d.).
Intensity V at Anchorage and Spenard, less strong at Cordova and Palmer.

L. M. Murphy and W. K. Cloud.
United States Earthquakes, 1951, serial No. 762, Washington, 1953, p.18.

A = −·4211, B = −·2422, C = +·8740 ; δ = −14 ; h = −9 ;
D = −·499, E = +·867 ; G = −·758, H = −·436, K = −·486.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
College		3·9	14	i 0 49	−10	—	—	—	—	i 5·0
Sitka		8·4	109	e 2 11	+11	e 3 39	+ 5	—	—	—
Mitchell Field		17·2	249	i 3 55	+ 1	—	—	—	—	—
Victoria		19·7	117	4 21	0	—	—	—	—	—
Seattle		20·8	117	i 4 35k	+ 2	e 8 35	+23	4 49	pP	11·4
Hungry Horse		24·1	105	i 5 5	0	i 8 48	−22	i 4 16	?	—
Saskatoon		25·1	91	5 33	sP	9 34	+ 7	—	—	—
Shasta Dam		26·5	127	i 5 29	+ 2	—	—	—	—	—
Mineral	z.	27·1	126	i 5 35	+ 2	i 5 58	sP	i 5 47	pP	—
Petropavlovsk		28·3	277	e 5 46	+ 2	e 10 31	+12	—	—	—
Berkeley		29·0	129	i 5 53	+ 3	e 10 37	+ 7	i 6 5	pP	—
Lick	z.	29·7	129	i 5 58k	+ 2	i 6 53	PP	i 6 12	pP	—
Fresno		31·0	127	e 6 9k	+ 1	e 8 31	?	e 6 23	pP	—
Tinemaha	z.	31·3	125	i 6 13k	+ 3	i 6 36	sP	i 6 27	pP	—
China Lake		32·6	124	i 6 23k	+ 2	e 11 38	+12	i 6 37	pP	—
Boulder City		33·6	121	i 6 32	+ 2	—	—	—	—	—
Pasadena		33·9	127	i 6 34k	+ 1	e 11 57	+10	i 6 48	pP	13·9
Riverside	z.	34·3	127	i 6 37k	+ 1	i 6 56	sP	i 6 50	pP	—
Palomar		35·1	125	i 6 43k	0	i 7 4	sP	i 6 57	pP	—
Tucson		38·5	119	i 7 13	+ 2	e 13 5	+ 8	9 1	PP	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
St. Louis		42·7	93	i 7 45	− 1	e 14 6	+ 7	e 9 37	PP	—
Scoresby Sund		43·8	23	i 7 53	− 2	e 14 20	+ 5	9 39	PP	23·4
Ottawa		44·6	75	7 59	− 2	14 27	+ 1	9 42	PP	20·7
Cleveland		44·7	83	i 8 1	− 1	e 14 32	+ 4	i 8 23	pP	—
Shawinigan Falls	N.	45·1	71	8 3	− 2	14 39	+ 5	9 51	PP	22·6
Seven Falls	E.	45·6	69	8 7	− 2	14 44	+ 3	18 6	SS	22·4
Morgantown		47·0	84	i 8 16	− 4	e 15 53	+52	—	—	—
Pennsylvania		47·0	81	i 8 19	− 1	i 15 6	+ 5	e 10 29	PP	—
Harvard		48·7	74	i 8 33	0	e 15 30	+ 5	—	—	e 21·7
Palisades		48·8	77	i 8 31	− 3	e 15 32	+ 6	i 9 57	PcP	e 25·2
Weston		48·9	74	i 8 33	− 2	—	—	i 8 55	pP	25·2
Fordham		48·9	77	i 8 35	0	e 15 33	+ 6	—	—	—
Washington		48·9	81	e 8 31	− 4	—	—	i 8 56	pP	i 24·7
Reykjavik	Z.	49·2	27	i 8 36k	− 1	—	—	e 8 53	pP	—
Kabansk		51·8	310	i 8 59	+ 2	16 20	sS	—	—	—
Irkutsk		52·5	312	e 9 3	+ 1	—	—	—	—	—
Pulkovo		59·5	0	e 9 51	− 1	—	—	—	—	—
Sverdlovsk		60·0	341	i 9 55	0	18 3	+ 7	—	—	—
Rathfarnham Castle		62·4	23	e 10 8	− 3	e 18 23	− 3	e 10 27	pP	e 32·4
Copenhagen		62·7	11	i 10 33	pP	—	—	—	—	e 29·4
Moscow		63·4	355	i 10 18	0	e 18 46	+ 7	—	—	—
Witteveen	Z.	64·9	15	i 10 28	0	—	—	—	—	—
Kew		65·2	20	e 10 43	pP	e 24 56	SS	—	—	e 37·4
Collmberg	Z.	67·1	12	e 10 41	− 1	e 13 48	pPP	e 10 44	P	—
Jena		67·4	12	e 10 43	− 1	e 11 5	PcP	e 10 58	pP	—
Paris		68·2	19	i 10 48	− 1	e 20 29	ScS	i 11 9	PcP	33·4
Ili		68·5	325	i 10 50	0	—	—	—	—	—
Prague		68·5	11	e 10 51	+ 1	e 13 35	PP	e 11 9	pP	—
Karlsruhe		68·9	15	e 10 54	+ 1	e 19 56	+11	—	—	—
Kurmenty		69·0	323	i 10 55	+ 1	—	—	—	—	—
Almata		69·2	325	i 10 55	0	—	—	—	—	—
Strasbourg		69·2	15	i 10 55k	0	e 13 25	PP	e 11 10	pP	31·4
Stuttgart		69·2	14	e 10 54k	− 1	e 19 55	+ 6	e 11 13	PcP	e 32·4
Przhevalsk		69·5	324	i 10 58	+ 1	—	—	—	—	—
Rybach'e		70·2	325	e 11 1	0	—	—	—	—	—
Frunse		70·2	326	11 2	+ 1	i 20 10	+10	—	—	—
Basle		70·2	16	e 11 1	0	—	—	—	—	—
Besançon		70·3	17	e 11 1	0	e 13 36	PP	e 11 22	pP	—
Zürich		70·5	16	e 11 7k	+ 4	—	—	e 13 45	PP	—
San Juan		71·2	86	i 11 6	− 1	—	—	i 11 26	pP	—
Naryn		71·2	324	i 11 8	+ 1	—	—	—	—	—
Clermont-Ferrand		71·3	20	i 11 6	− 1	—	—	i 13 43	PP	e 37·1
Pavia		72·7	15	—	—	e 20 0	−29	—	—	e 38·0
Andijan		72·8	327	11 17	+ 1	i 20 40	+10	11 42	pP	—
Triest		72·8	12	e 11 16	0	e 22 43	sS	e 26 5	SS	—
Lunacharskoe		73·0	330	i 11 19	+ 2	—	—	—	—	—
Tashkent		73·0	330	i 11 18	+ 1	e 20 43	+11	—	—	—
Fergana		73·3	327	e 11 20	+ 1	—	—	—	—	—
Belgrade	Z.	74·2	7	i 11 25a	+ 1	—	—	e 11 46	pP	—
Dzhergetal		74·5	328	e 11 28	+ 2	—	—	—	—	—
Yalta		74·7	357	e 11 27	0	—	—	—	—	—
Grozny		75·1	348	e 11 33	+ 3	—	—	—	—	—
Obi-garm		75·4	329	i 11 31	0	—	—	—	—	—
Toledo		75·6	27	i 11 32	0	—	—	e 17 6	PPP	—
Stalinabad		75·8	330	i 11 34	+ 1	i 21 10	+ 7	—	—	—
Rome		76·4	13	e 11 35	− 2	e 29 25	SSS	—	—	—
Tiflis		76·8	349	e 11 39	0	—	—	—	—	—
Manila		76·9	277	e 14 33	PP	—	—	—	—	—
Baku		77·6	345	e 11 46	+ 3	—	—	—	—	—
Kirovobad		77·6	347	e 11 46	+ 3	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Alicante		77·8	24	11 53	+ 9	21 44	+19	14 40	PP	e 38·3
Kizyl-Arvat		77·9	340	c 11 48	+ 3	—	—	—	—	—
Istanbul		78·2	1	i 11 49k	+ 2	e 21 38?	+ 9	—	—	—
Granada		78·3	27	i 11 51a	+ 4	21 49	+19	12 33	PcP	—
Ashkabad		78·6	337	i 11 51	+ 2	e 21 42	+ 8	—	—	—
Malaga		78·6	28	i 11 49	0	—	—	—	—	47·8
Almeria		78·9	26	11 48	− 3	21 50	+13	14 50	PP	37·4
Ksara		85·3	355	e 12 26	+ 2	e 21 38	−64	—	—	—
Helwan	z.	89·4	358	i 12 45k	+ 2	—	—	e 16 15	PP	—
Tamanrasset	z.	94·1	23	e 13 5	0	e 16 56	PP	e 13 32	pP	—
La Paz		100·9	105	e 13 8	−28	24 9	[+ 8]	26 43	PS	46·7
Pretoria		144·7	3	i 19 23	[+ 1]	—	—	—	—	—
Kimberley	z.	147·5	9	i 19 30	[+ 4]	—	—	—	—	—
Pietermaritzburg	z.	148·5	359	i 19 35	[+ 7]	—	—	—	—	—
Grahamstown	z.	152·1	7	i 19 44	[+11]	—	—	—	—	—

Additional readings :—
Seattle esP =5m.1s., iP? =5m.7s., epP? =5m.24s., esP? =5m.34s., eS? =8m.55s. and other unidentified readings.
Berkeley iZ =6m.15s.
Lick iZ =7m.25s. and 9m.1s.
Tinemaha iZ =6m.21s.
China Lake isPZ =6m.44s., iZ =6m.52s., iPcPNZ =8m.56s., eZ =9m.21s.
Pasadena iZ =6m.42s., isPZ =6m.54s., iZ =6m.57s., and 7m.3s., eZ =9m.33s.
Riverside iZ =7m.0s.
Palomar iZ =6m.49s.
St. Louis i =9m.46s., eSS =17m.0s., e =17m.26s.
Scoresby Sund 17m.29s.
Ottawa SS =17m.43s.
Cleveland eSSE =18m.6s.
Pennsylvania iZ =10m.36s., eSSN =18m.39s.
Rathfarnham Castle iZ =11m.52s., eZ =14m.43s., esS? =19m.0s., eEN =25m.28s.
Paris i =11m.5s., 11m.27s., and 12m.5s.
Prague e =11m.3s., esP =11m.18s., e =12m.2s., and 14m.45s.
Strasbourg i =11m.59s.
Besançon e =11m.51s.
Triest epP? =12m.45s., eSSS =28m.40s.
Toledo e =11m.45s. and 11m.48s.
Alicante PPP =16m.42s., Q =33m.16s.
Granada PP =14m.59s.
Long waves were also recorded at De Bilt and Aberdeen.

June 25d. 18h. 34m. 12s. Epicentre 38°·6S. 175°·9E.

Intensity IV-V in epicentral region. Epicentre as adopted.

R. C. Hayes.
Earthquake origins in New Zealand during the year 1951, New Zealand Journal of Science and Technology, Sec. B, Vol. 34, No. 4, January 1953, p.255.

A = −·7815, B = +·0560, C = −·6213 ; δ = −11 ; h = −1 ;
D = +·071, E = +·997 ; G = +·620, H = −·044, K = −·784.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tuai	N.	1·0	103	e 0 20	− 1	i 0 33	− 3	—	—	—
New Plymouth	E.	1·5	252	e 0 28	0	0 47	− 2	—	—	—
Bunnythorpe		1·7	189	—	—	e 0 57	+ 3	—	—	—
Auckland	N.	1·9	336	e 0 37?	+ 2	e 1 28	?	—	—	—
Wellington		2·8	198	e 0 44	− 3	e 1 18	− 4	—	—	—
Cobb River	E.	3·5	224	e 0 57	0	—	—	—	—	—
Kaimata	N.E.	5·3	220	e 1 23	+ 1	e 3 13	L	—	—	(e 3·2)
Christchurch		5·5	206	e 1 40	+15	e 2 56	+26	—	—	—
Riverview		20·5	275	i 4 53a	+11	i 8 53	SS	i 5 19	PP	e 11·0
Brisbane		22·1	293	e 5 5	+ 6	i 9 21	SS	—	—	—

Long waves were also recorded at Paris.

June 25d. 20h. 16m. 28s. Epicentre 1°·4N. 85°·3W. (as on 1950, October 21d.).

$A = +·0819$, $B = -·9963$, $C = +·0243$; $\delta = -9$; $h = +7$;
$D = -·997$, $E = -·082$; $G = +·002$, $H = -·024$, $K = -1·000$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Balboa Heights		9·4	37	i 2 18	0	e 4 57	+50	e 16 9	ScS	—
Chinchina		10·3	70	i 2 28	− 4	i 4 33	+ 3	—	—	—
Bogota		11·7	74	i 2 49	− 2	i 5 4	0	e 8 45	PcP	e 6·5
Galerazamba	E.N.	13·6	47	e 3 24	+ 7	i 5 59	+ 9	—	—	7·3
Huancayo		16·6	144	e 3 55	− 1	e 7 20	+20	—	—	—
Tacubaya		22·5	324	i 5 25	PP	e 9 31	SS	—	—	—
La Paz		24·6	137	i 5 20	− 3	i 9 48	+ 6	i 5 52	PP	12·6
Copiapo	N.	32·0	154	—	—	e 13 21	SS	—	—	i 14·7
Santa Lucia	N.	37·3	160	e 8 48	PP	e 13 6	+ 2	e 16 13	SSS	e 19·2
St. Louis		37·6	354	e 8 13	+55	e 14 5	+57	e 8 30	PP	—
Tucson		39·0	325	e 7 28	− 2	e 13 15	−14	—	—	—
Cleveland	E.	40·0	4	i 8 14	+36	e 10 56	?	—	—	—
Palisades		40·7	14	—	—	i 19 18	?	—	—	e 19·5
Harvard		42·7	16	i 7 54	− 6	—	—	—	—	e 20·1
Palomar	Z.	43·4	321	e 8 5	− 1	—	—	i 8 20	?	—
Boulder City		44·0	325	e 8 8	− 3	—	—	—	—	—
La Plata		44·3	147	—	—	14 38	−10	21 20	Q	22·8
Ottawa		44·6	10	8 15	− 1	14 46	− 6	17 52	SS	—
Pasadena		44·8	321	e 8 27	+10	—	—	—	—	—
China Lake	Z.	45·5	323	i 8 30	+ 7	—	—	—	—	e 22·1
Fresno	Z.	47·4	322	e 8 42	+ 4	—	—	e 8 22	?	—
Hungry Horse		52·9	337	i 9 18	− 2	e 23 7	SSS	—	—	—
College		77·3	338	e 11 58	0	—	—	e 12 3	P	—
Malaga		81·9	53	i 12 20	− 3	e 22 32?	− 4	—	—	—
Rathfarnham C.	Z.	82·3	37	i 16 3	PP	e 20 30	?	—	—	e 41·0
Almeria		83·4	53	12 35	+ 5	24 1	PPS	15 47	PP	46·8
Alicante		85·1	52	12 33	− 6	22 57	[− 4]	16 6	PP	e 39·1
Paris		87·5	42	e 13 28	?	e 24 32	PS	—	—	e 39·5
Clermont-Ferrand		87·9	45	—	—	e 23 50	+15	—	—	—
Tamanrasset	Z.	90·2	67	e 13 0	− 4	—	—	e 16 42	PP	—
Basle		90·9	43	e 25 39	PPS	e 26 8	?	26 17	?	—
Strasbourg		91·0	41	e 25 10	PS	e 24 2	− 1	e 30 2	SS	e 41·5
Pretoria	Z.	111·7	117	—	—	i 34 10	SS	—	—	—
Ksara		114·7	52	—	—	e 26 53	{+15}	e 37 55	?	—

Additional readings :—
Balboa Heights $eS_cPP_cS = 25m.0s.$
La Paz $SS = 10m.32s.$, $iS_cS = 15m.52s.$
St. Louis $eSSS = 16m.38s.$
Ottawa $SSS = 18m.38s.$
Alicante $PPP = 17m.46s.$, $Q = 33m.45s.$
Long waves were recorded at Seattle, Istanbul, Kew, and Stuttgart.

June 25d. 20h. 35m. 16s. Epicentre 3°·0S. 153°·5E. (as given by U.S.S.R.).

$A = -·8937$, $B = +·4456$, $C = -·0520$; $\delta = -4$; $h = +7$;
$D = +·446$, $E = +·895$; $G = +·047$, $H = -·023$, $K = -·999$.

	△	Az.	P.	O−C.	S.	O−C.		Supp.	
	°	°	m. s.	s.	m. s.	s.		m.	s.
Brisbane	24·4	181	i 5 27 a	+ 6	e 9 49	+10		—	—
Vladivostok	49·9	340	i 9 2	+ 5	16 8	+ 1		—	—
Petropavlovsk	56·1	3	9 58	+15	—	—		—	—
Kabansk	67·6	331	e 11 2	+ 1	—	—		—	—
Irkutsk	68·9	331	e 11 11	+ 2	—	—		—	—
Ili	82·3	316	i 12 23	− 2	—	—		—	—
Naryn	82·6	312	e 12 26	0	e 22 37	− 6		—	—
Rybach'e	82·8	313	i 12 25	− 2	—	—		—	—
Frunse	83·9	313	12 30	− 3	—	—		—	—
Andijan	85·2	311	i 12 38	− 1	e 23 2	− 7		—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Fergana		85·6	310	12 39	− 2	—	—	—	—
Obi-garm		87·0	309	i 12 47	− 1	—	—	—	—
Tashkent		87·6	311	i 12 50	− 1	e 23 24	− 8	—	—
Stalinabad		87·7	309	i 12 51	− 1	23 27	− 6	—	—
Pasadena		90·3	56	e 12 6	−58	—	—	i 13 29	PcP
China Lake		90·8	54	e 12 11	−55	—	—	i 13 22	PcP
Riverside		90·9	56	e 12 2	−65	—	—	i 13 32	PcP
Palomar		91·3	57	e 11 57	−72	—	—	i 12 5	pP
Sverdlovsk		94·1	327	i 13 24	+ 2	—	—	—	—
Tiflis		105·9	313	e 18 35	PP	—	—	—	—
Istanbul		117·5	316	e 19 50	PP	—	—	—	—
Tamanrasset	z.	143·3	306	e 19 42	[+ 6]	22 42	PP	e 16 58	P

June 25d. Readings also at 1h. (Stuttgart and Collmberg), 3h. (Paris and Istanbul), 4h. (Paris, Strasbourg, Scoresby Sund, De Bilt, Clermont-Ferrand, Copenhagen, Stuttgart, and near Istanbul), 5h. (Concepción and Santa Lucia), 6h. (Scoresby Sund), 7h. (Copiapo and Harvard), 8h. (Riverside, China Lake (2), Mineral, Palomar, Lick, and Mount Wilson (2)), 9h. (near Dzhergetal), 10h. (Krasnogorka, Ili, Naryn, Rybach'e, Frunse, Tashkent, near Dzhergetal, Samarkand, Lunacharskoe, Andijan, and Fergana), 12h. (near Apia and near Dzhergetal), 13h. (near Dzhergetal), 15h. (Djakarta and Bandong), 16h. (Collmberg and Scoresby Sund), 17h. (near Alicante (2)), 18h. (Khorog, Fergana, Obi-garm, Lunacharskoe, Stalinabad, Dzhergetal, Naryn, and Riverview), 19h. (Tinemaha, Ottawa, Palisades, Seattle, Berkeley, Mineral, Lick, Pasadena, Fresno, Riverside (2), China Lake (2), Palomar, Haiwee, San Francisco, Brannner, Santa Barbara, Santa Clara, near Almeria, and Pretoria), 20h. (Palomar, Riverside, Mount Wilson, China Lake, Bogota, and La Paz (2)), 21h. (Kimberley and near Zürich), 22h. (Santa Clara), 23h. (near Tashkent, Andijan, Ili, Lunacharskoe, Fergana, Frunse, Obi-garm, Stalinabad, Naryn, Dzhergetal, Kurmenty, and Brisbane).

June 26d. 3h. 40m. 52s. Epicentre 4°·2S. 122°·9E.

$A = -·5418$, $B = +·8374$, $C = -·0728$; $\delta = +9$; $h = +7$;
$D = +·840$, $E = +·543$; $G = +·040$, $H = -·061$, $K = -·997$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m.	s.	m.
Bandong		15·4	259	e 3 46	+ 6	i 5 40	−52	—	—	—
Djakarta		16·1	262	e 3 53	+ 4	i 5 55	−54	—	—	—
Manila		18·8	354	i 4 23	0	e 7 11	−39	e 4 36	PP	e 8·1
Perth		28·4	193	—	—	i 10 58	+13	i 12 8	SS	i 15·2
Zi-ka-wei	z.	35·2	358	6 38	−20	e 12 48	+17	—	—	—
Nanking		36·3	353	e 7 20	+13	12 51	+ 3	i 8 31	PP	—
Brisbane		36·9	132	i 7 11k	− 1	—	—	i 8 35	PP	—
Riverview		39·5	142	i 7 36	+ 2	i 13 38	+ 1	i 16 22	SS	e 18·9
Colombo	E.	44·3	284	8 11	− 2	—	—	—	—	—
Kodaikanal	E.	47·5	288	e 8 36	− 2	e 15 28	− 6	—	—	—
Vladivostok		47·8	9	e 8 40	− 1	e 15 36	− 2	—	—	—
Bombay		54·4	297	—	—	i 17 8	− 1	e 17 44	?	—
New Delhi		54·7	310	i 9 34	+ 1	i 17 8	− 5	11 31	PP	—
Kabansk		57·7	348	e 9 54	− 1	i 17 55	+ 2	—	—	—
Irkutsk		58·4	347	9 59	− 1	18 4	+ 2	—	—	—
Wellington		59·2	136	—	—	e 23 58	SSS	i 32 3	Q	e 33·1
Przhevalsk		61·5	324	i 10 21	0	—	—	—	—	—
Naryn		62·3	322	e 10 25	− 1	e 18 53	+ 1	—	—	—
Almata		62·8	324	i 10 30	0	—	—	—	—	—
Rybach'e		62·9	323	e 10 32	+ 2	—	—	—	—	—
Khorog		63·1	315	e 10 31	− 1	e 19 4	+ 2	—	—	—
Terre Adélie		63·8	171	e 10 34	− 2	—	—	—	—	—
Frunse		64·0	322	e 10 35	− 3	i 19 15	+ 2	—	—	—
Andijan		64·3	319	i 10 41	+ 2	i 19 18	+ 1	—	—	—
Dzhergetal		64·4	318	e 10 38	− 2	i 19 11	− 7	—	—	—
Petropavlovsk		64·6	22	e 10 36	− 5	e 19 14	− 7	—	—	—
Obi-garm		65·0	316	i 10 44	0	e 19 28	+ 2	—	—	—
Stalinabad		65·6	316	e 10 46	− 2	i 19 33	0	—	—	—
Tashkent		66·6	319	e 10 52	− 2	i 19 44	− 1	—	—	—
Samarkand		67·3	316	e 11 1	+ 2	—	—	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Mary		70·2	312	i 11 20	+ 3	—	—	—	—	—
Ashkabad		72·9	311	e 11 33	0	i 21 0	+ 1	—	—	—
Kizyl-Arvat		74·8	313	11 46	+ 2	21 22	+ 2	—	—	—
Sverdlovsk		78·8	330	e 12 6	0	22 0	− 4	—	—	—
Baku		79·9	312	e 12 17	+ 5	e 22 19	+ 3	—	—	—
Kirovobad		82·6	311	12 30	+ 4	22 45	+ 2	—	—	—
Grozny		83·6	314	e 12 35	+ 4	—	—	—	—	—
Tiflis		83·9	313	i 12 36	+ 3	i 22 59	+ 3	—	—	—
Gori		84·5	313	e 12 38	+ 2	—	—	—	—	—
Ksara		89·8	303	i 13 6	+ 4	e 24 4	+11	—	—	—
Moscow		90·8	326	13 8	+ 2	24 1	− 1	23 38	SKS	—
Helwan	z.	93·4	299	e 13 21	+ 3	e 25 38	PS	—	—	—
Istanbul		95·6	311	e 13 26	− 2	e 24 2	[− 2]	e 17 11	PP	e 41·1
Lwow		98·9	320	13 45	+ 2	e 24 14	[− 8]	—	—	—
Prague		105·0	321	e 18 32	PP	e 24 45	[− 6]	e 27 38	PS	—
Collmberg	z.	105·7	322	e 18 31?	PP	—	—	—	—	—
Jena		106·4	322	e 18 47	PP	—	—	e 19 29	?	—
Rome		107·9	313	e 18 53	PP	e 25 1	[− 2]	e 28 15	PS	—
Stuttgart		108·7	321	e 18 49	PP	e 24 58	[− 9]	e 28 21	PS	e 56·1
Pavia		109·6	317	e 19 5	PP	e 25 12	[+ 1]	e 29 57	PPS	—
Strasbourg		109·6	321	e 19 8	PP	e 28 26	PS	e 29 32	PPS	e 54·1
Seattle		109·7	41	—	—	(e 28 38)	PS	—	—	e 28·6
De Bilt		110·1	325	e 19 8	PP	e 28 38	PS	—	—	e 56·1
Besançon		111·1	319	e 19 14	PP	—	—	—	—	—
Paris		112·9	322	e 19 28	PP	i 28 57	PS	e 30 4	PPS	e 55·1
Kew		113·5	325	e 19 37	PP	e 29 6	PS	—	—	e 64·1
China Lake	z.	116·2	52	e 19 54	PP	—	—	—	—	—
Mount Wilson	z.	116·2	54	e 18 44	[− 1]	—	—	e 20 2	PP	—
Riverside	z.	116·8	54	e 20 1	PP	—	—	—	—	—
Tamanrasset	z.	116·8	294	e 19 8	?	e 19 59	PP	e 19 37	?	—
Malaga		121·9	312	i 20 6	PP	—	—	—	—	—
Palisades		140·4	20	e 19 34	[+ 3]	—	—	—	—	—

Additional readings :—
Manila ePP =4m.32s.
New Delhi PPPN =12m.48s.
Prague e =18m.41s., 18m.55s., 19m.23s., and 28m.29s., eSS? =34m.38s.
Stuttgart e =19m.48s., 29m.23s., 33m.50s., 35m.32s., and 46m.8s.
Strasbourg e =23m.16s., eSSS =38m.8s.
Paris i =19m.34s., e =20m.12s. and 33m.30s., eSSS =38m.8s.
Long waves were also recorded at Auckland, Christchurch, Pasadena, Harvard, and Copenhagen.

June 26d. Readings also at 1h. (Seattle and near Santa Clara), 5h. (Rathfarnham Castle), 6h. (Mineral and near Apia), 9h. (Copiapo), 10h. (Terre Adélie and near Santa Clara), 11h. and 12h. (near Apia), 13h. (Fresno, Mineral, Mount Wilson, Palomar, China Lake, and Stuttgart), 14h. (Santa Lucia), 16h. (near Manila), 18h. (Apia, near Seattle and Victoria), 19h. (near Obi-garm), 20h. (Almata II, near Frunse, Rybach'e, Naryn, Almata, Ili, Andijan, Fergana, and near Dzhergetal), 21h. (Dzhergetal), 22h. (Apia and Copiapo).

June 27d. 13h. 17m. 52s. Epicentre 44°·9N. 57°·4W.

Given by Jesuite Seism. Association of U.S.A.

$A = +·3829$, $B = -·5987$, $C = +·7035$; $\delta = -3$; $h = -3$;
$D = -·842$, $E = -·539$; $G = +·379$, $H = -·593$, $K = -·711$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Seven Falls	E.	9·6	288	2 23	+ 2	4 8	− 4	e 2 33	PP	—
Weston		10·4	261	e 2 30	− 4	e 4 16	−16	—	—	—
Harvard		10·5	262	i 2 34	− 1	i 4 30	− 5	—	—	e 7·4
Shawinigan Falls	N.	10·9	284	2 40	0	4 42	− 2	—	—	—
Palisades		12·7	258	i 3 4	− 1	e 5 3	−25	—	—	e 6·9

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ottawa		13·0	279	3 10	+ 1	5 38	+3	—	—	—
Morgantown		17·5	259	i 4 6	− 1	e 8 36	88	—	—	—
St. Louis		25·2	268	e 5 29	0	e 10 13	+21	—	—	—
Tucson		42·9	272	i 9 48	PP	—	—	—	—	—
Mineral	z.	46·4	288	i 8 30k	0	—	—	—	—	—
Shasta Dam		46·7	289	e 8 31	− 1	—	—	—	—	—
Lick	z.	47·9	285	e 8 42k	0	—	—	—	—	—
College		50·7	326	i 9 1	− 2	—	—	—	—	—

Additional readings :—
Harvard i = 2m.44s., 2m.53s., and 4m.55s.
Lick eZ = 8m.56s.
Long waves were also recorded at Halifax.

June 27d. 18h. 11m. 23s. Epicentre 37°·1N. 141°·8E. Depth of focus 0·005.
(as on 1951, March 8d.).

Intensity IV at Inawashiro, Wakamatu, Nakahata, Tsukidate; II-III at Onahama, Hukusima, Shirakawa, Sendai, Hirano, Utunomiya, and Watari.
Epicentre 37°·2N. 141°·9E. Depth 60km.

Seismo. Bull. Cent. Met. Obs., Japan, for 1951, Tokyo, 1951, p.142, with macroseismic chart.

$A = -\cdot6283$, $B = +\cdot4944$, $C = +\cdot6006$; $\delta = -9$; $h = -1$;
$D = +\cdot618$, $E = +\cdot786$; $G = -\cdot471$, $H = +\cdot371$, $K = -\cdot800$.

		△	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Onahama		0·8	257	0 9	− 8	0 20	− 9
Hukusima		1·2	302	0 17k	− 5	0 32	− 6
Mito		1·3	236	0 20	− 3	0 40	0
Sendai		1·3	329	0 17k	− 6	0 31	− 9
Shirakawa		1·3	271	0 18	− 5	0 34	− 6
Inawashiro		1·4	289	0 23	− 1	0 39	− 4
Isinomaki		1·4	344	0 20	− 4	—	—
Tukubasan		1·6	237	0 27	0	0 44	− 3
Yamagata		1·6	315	0 23	− 4	0 41	− 6
Utunomiya		1·7	250	0 28	0	0 48	− 2
Kumagaya		2·1	244	0 38	+ 4	0 57	− 2
Mizusawa	N.	2·1	346	0 24	−10	0 52	− 7
Tokyo		2·1	229	0 33	− 1	0 59	0
Niigata		2·4	291	0 43	+ 5	1 14	+ 7
Sakata		2·4	319	0 39	+ 1	1 3	− 4
Yokohama		2·4	226	0 46	+ 8	1 14	+ 7
Titibu		2·5	243	0 42	+ 3	1 8	− 1
Miyako		2·6	3	0 32	− 9	0 57	−15
Mera		2·7	216	0 52	+10	—	—
Morioka		2·7	349	0 33	− 9	1 1	−13
Oiwake		2·7	254	0 44	+ 2	1 20	+ 6
Takada		2·8	270	1 3	+19	1 38	+21
Hunatu		2·9	237	0 47	+ 2	1 29	+10
Matusiro		2·9	259	0 29	−16	—	—
Nagano		2·9	261	0 54	+ 9	1 31	+12
Aikawa		3·0	288	0 47	0	1 29	+ 7
Akita		3·0	334	0 44	− 3	1 15	− 7
Kohu		3·0	241	0 57	+10	1 30	+ 8
Misima		3·0	229	0 52	+ 5	1 29	+ 7
Matumoto		3·2	254	1 16	S	(1 16)	−11
Toyama		3·4	266	1 10	+18	2 4	+32
Iida		3·6	245	1 14	+19	—	—
Aomori		3·8	348	0 55	− 3	1 41	− 1
Omaesaki		3·8	231	2 0	S	(2 0)	+18
Kanazawa		4·2	264	1 31	+28	—	—
Nagoya		4·4	245	1 21	+15	—	
Tsuruga		4·8	255	1 34	+22	—	
Mori		5·1	349	1 18	+ 2	2 14	0
Urakawa		5·1	8	1 35	+19	2 16	+ 2
Osaka		5·6	247	1 29	+ 6	—	—

Mizusawa gives also eSN = 44s.

June 27d. Readings also at 0h. (Istanbul and Timisoara), 1h. (Collmberg, near Santa Clara, and near Copiapo), 2h. (Apia), 6h. (Grahamstown), 8h. (Ksara, Kimberley, and Mineral), 9h. (China Lake, Lick, Fresno, Mineral, and Stuttgart), 10h. (China Lake, Lick, Fresno, Mineral, Seattle, and Victoria), 12h. (Pretoria), 13h. (near Lwow), 14h. (Kodaikanal, Lick, and near La Paz), 15h. (Pretoria, Kimberley, Ksara, Istanbul, and Stuttgart), 16h. (Apia and Copenhagen), 17h. (Collmberg and Ottawa), 18h. (Ashkabad, and near Dzhergetal), 20h. (Harvard), 21h. (Prague, Lick, Ashkabad, near Manila, and near Dzhergetal), 22h. (Ksara, near Ashkabad, and near Dzhergetal).

June 28d. 1h. Local shock probably from epicentre in Labrador. No determination of epicentre has been made.

Seven Falls PE = 4m.52s. and 4m.59s., SE = 5m.35s., eE = 5m.47s., SE = 5m.52s. and 6m.1s.
Shawinigan Falls ePN = 5m.18s., SN = 6m.9s., eN = 6m.17s., SN = 6m.31s. and 6m.39s.
Ottawa P = 5m.43s., S = 7m.4s., e = 7m.15s. and 7m.44s.
Weston eP = 5m.51s., eS = 7m.10s.
Harvard eP = 5m.53s., iS = 7m.11s.
Palisades e = 8m.44s., i = 9m.3s.

June 28d. 3h. 7m. 46s. Epicentre 19°·3S. 63°·8W. (as on 1950, Sept. 14d.).

Intensity V at Arequipa ; IV-V at Majes, Moquegua, Vitor ; IV at Aplao.

E. Silgado.
Datos sismológicos del Perú, 1951, Bol. No. 8, Lima, 1953, p.15.

$A = +\cdot4170$, $B = -\cdot8475$, $C = -\cdot3285$; $\delta = +6$; $h = +5$;
$D = -\cdot897$, $E = -\cdot442$; $G = -\cdot145$, $H = +\cdot295$, $K = -\cdot944$.

		△	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 12	− 6	i 2 11	− 7	i 1 30	P* —
Huancayo		13·2	301	e 3 10	− 1	e 6 39	+59	—	— —
Bogota		25·8	336	i 5 34	0	i 10 4	+ 2	e 13 18	ScP 12·9
Chinchina		26·8	334	e 5 46	+ 2	e 10 16	− 3	e 13 54	ScP e 13·4
San Juan		37·4	357	i 7 17	+ 1	—	—	—	— —
Harvard		61·9	354	i 10 24	0	—	—	—	— e 36·6
Tucson		68·2	319	e 11 2	− 2	—	—	e 11 24	pP —
Palomar	z.	72·8	316	e 11 33	+ 1	—	—	—	— —
Boulder City		73·2	319	i 11 35	0	—	—	—	— —
Riverside	z.	73·5	316	e 11 37	+ 1	—	—	—	— —
Pasadena	z.	74·2	316	e 11 41	+ 1	—	—	—	— —
China Lake	z.	74·8	318	e 11 44	0	—	—	e 11 59	PcP —
Tinemaha	z.	76·0	318	e 11 50	− 1	—	—	—	— —
Fresno	z.	76·8	318	e 11 56a	+ 1	—	—	—	— —
Lick	z.	78·3	317	i 12 6k	+ 3	—	—	—	— —
Tamanrasset	z.	79·6	61	i 12 21k	+11	—	—	i 12 48	pP —
Mineral	z.	80·0	319	e 12 15a	+ 2	—	—	—	— —
Shasta Dam		80·7	319	e 12 16	0	—	—	—	— —
Hungry Horse		80·9	329	i 12 20	+ 3	—	—	—	— —
Pretoria	z.	83·5	115	i 12 46	+15	—	—	—	— —
Algiers Univ.	z.	84·1	48	i 12 44k	+10	—	—	—	— —

Additional readings :—
La Paz S = 2m.1s., iS_E = 2m.21s.
Boulder City i = 11m.17s.
Lick iZ = 12m.33s.
Algiers Univ. eZ = 12m.47s.
Long waves were also recorded at La Plata, Santa Lucia, Fort de France, Granada, and Alicante.

June 28d. 3h. 37m. 5s. Epicentre 16°·4S. 71°·0W. Depth of focus 0·010.
(as on 1950, Feb. 7d.).

$A = +·3125$, $B = -·9075$, $C = -·2806$; $\delta = -5$; $h = +5$;
$D = -·946$, $E = -·326$; $G = -·091$, $H = +·265$, $K = -·960$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
La Paz		2·8	92	i 0 55a	+11	i 1 23	+ 6	—	—	—
Huancayo		6·0	315	e 1 25	− 3	e 2 37	+ 1	e 1 44	PP	e 2·9
San Juan		34·9	8	i 6 46	+ 2	—	—	e 7 11	PP	—
Morgantown		56·4	352	i 9 34	0	—	—	e 10 28	sP	—
Weston		58·5	0	i 10 49	+61	—	—	i 11 16	pP	—
Harvard		58·6	0	i 9 51	+ 2	—	—	i 10 17	pP	—
Ottawa		61·6	357	e 10 10	0	—	—	e 10 38	pP	—
Tucson		61·6	322	e 10 7	− 3	—	—	—	—	—
Shawinigan Falls	N.	62·7	359	e 10 44	pP	—	—	—	—	—
Palomar	Z.	66·1	319	i 10 39	0	—	—	e 11 4	pP	—
Boulder City		66·6	323	e 10 42	0	—	—	i 11 8	pP	—
Riverside	Z.	66·8	319	i 10 41	− 2	—	—	—	—	—
Pasadena		67·4	319	i 10 46	− 1	—	—	e 11 10	pP	—
China Lake	Z.	68·1	322	i 10 50	− 1	—	—	i 11 17	pP	—
Tinemaha	Z.	69·4	321	e 10 58	− 2	—	—	i 11 25	pP	—
Fresno	Z.	70·1	320	e 11 2a	− 2	—	—	—	—	—
Lick	Z.	71·6	320	e 11 13k	0	—	—	e 11 39	pP	—
Berkeley	Z.	72·3	320	i 11 17a	0	—	—	—	—	—
Mineral	Z.	73·5	323	e 11 17a	− 7	—	—	—	—	—
Shasta Dam		74·2	323	i 11 26	− 2	—	—	—	—	—
Hungry Horse		75·0	333	i 11 33	+ 1	—	—	—	—	—
Tamanrasset	Z.	84·3	65	i 12 28k	+ 6	e 13 0	sP	e 12 46	pP	—

Additional readings: —
La Paz $iP_g = 1m.7s.$, $iS = 1m.36s.$, $iS_g = 1m.55s.$

June 28d. 5h. 57m. 13s. Epicentre 35°·9N. 140°·3E. Depth of focus 0·005.
(as on 1948, Jan. 13d.).

Intensity II-III at Hunatu, Ajiro, and Mizukaido.
Epicentre 35°·8N. 140°·3E. Depth of focus 60km.
Seismo. Bull. Cent. Met. Obs., Japan, 1951, Tokyo, 1951, p.143, with macroseismic chart.

$A = -·6241$, $B = +·5181$, $C = +·5850$; $\delta = +15$; $h = 0$;
$D = +·639$, $E = +·769$; $G = -·450$, $H = +·374$, $K = -·811$.

	△	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Tukubasan	0·3	333	0 12	0	0 21	+ 1
Mito	0·4	16	0 16	+ 4	0 27	+ 5
Tokyo	0·5	245	0 11	− 2	0 21	− 2
Tyosi	0·5	110	0 11	− 2	0 21	− 2
Utunomiya	0·6	332	0 18	+ 4	0 30	+ 5
Kumagaya	0·8	289	0 17a	0	0 31	+ 2
Yokohama	0·8	229	0 15	− 2	0 25	− 4
Titibu	1·0	275	0 21	+ 2	0 33	0
Mera	1·1	201	0 15	− 5	0 27	− 9
Onahama	1·1	25	0 55	?	1 10	?
Shirakawa	1·2	357	0 23	+ 1	0 42	+ 4
Hunatu	1·4	252	0 21	− 3	0 36	− 7
Kohu	1·4	259	0 25	+ 1	0 41	− 2
Misima	1·4	235	0 23	− 1	0 35	− 8
Osima	1·4	213	0 20	− 4	0 33	−10
Oiwake	1·5	287	0 27	+ 1	0 48	+ 3
Inawashiro	1·7	355	0 31	+ 3	0 59	+ 9
Matusiro	1·8	291	0 32	+ 2	—	—
Shizuoka	1·8	239	0 28	− 2	0 49	− 3
Hukusima	1·9	4	0 37	+ 6	1 4	+10

Continued on next page.

	△	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Matumoto	1·9	279	0 34	+ 3	0 58	+ 4
Nagano	1·9	294	0 34	+ 3	—	—
Omaesaki	2·2	233	0 43	+ 8	—	—
Sendai	2·4	11	1 26	?	1 55	?
Toyama	2·6	287	0 52	+11	—	—
Nagoya	2·8	255	0 46	+ 2	—	—
Gihu	3·0	260	0 49	+ 2	—	—
Kanazawa	3·0	282	1 15	+28	—	—
Kameyama	3·2	251	1 0	+11	—	—
Hikone	3·4	259	0 55	+ 3	—	—

June 28d. Readings also at 0h. (Merida, Tacubaya, and Scoresby Sund), 1h. (Apia, La Paz, Mount Wilson, Riverside, and China Lake), 2h. (near Dzhergetal), 3h. (near Mitchell Field), 4h. (San Juan, Chinchina, Mount Wilson, Palomar, China Lake, Tinemaha, Tucson, Boulder City, Mineral, Shasta Dam, Hungry Horse, College, Weston, and Kimberley), 5h. (Collmberg and Stuttgart), 6h. (near Santa Clara), 10h. (near Dzhergetal), 12h. (Collmberg), 13h. (Dzhergetal), 14h. (Collmberg), 15h. (Stuttgart), 16h. (Palomar, Pasadena, Riverside, China Lake, Lick, Mineral, near Dzhergetal, and near La Paz), 17h. (Apia, Toledo, near Granada, Almeria, and Malaga), 20h. (Brisbane, Palomar, Pasadena, China Lake, Tinemaha, and La Paz), 21h. (Apia and La Paz), 22h. (Collmberg, Ksara, near Dzhergetal, and near Ashkabad).

June 29d. 18h. 33m. 49s. Epicentre 3°·5N. 83°·0W. (as on 1949, Dec. 7d.).
Doubtful identification.

$A = +·1216$, $B = -·9907$, $C = +·0606$; $\delta = -5$; $h = +7$;
$D = -·993$, $E = -·122$; $G = +·007$, $H = -·060$, $K = -·998$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Chinchina		7·5	78	e 1 38	−15	e 3 1	−19	—	—	—
Bogota		9·0	83	e 2 11	− 2	i 3 44	−14	i 4 32	P*	—
Galerazamba		10·6	46	—	—	e 4 46	+ 9	—	—	7·2
Huancayo		17·2	154	e 4 8	+ 5	e 7 39	+25	e 5 7	PP	e 8·7
La Paz		24·7	143	i 5 27a	+ 3	i 10 3	+19	i 5 34	pP	13·1
Palisades		38·2	12	e 7 27	+ 4	—	—	—	—	—
Harvard		40·2	13	—	—	e 16 41	SS	—	—	e 19·2
Ottawa		42·2	8	i 7 50	− 6	e 14 11	− 6	—	—	—
Palomar	z.	43·4	317	e 8 5	− 1	—	—	—	—	—
Pasadena	z.	44·7	317	e 8 16	0	—	—	—	—	—
China Lake	z.	45·3	320	e 8 20	− 1	—	—	e 8 37	?	—
Tamanrasset	z.	87·3	67	e 12 51	+ 1	—	—	—	—	—
Stuttgart		88·8	41	e 12 54	− 3	e 24 29	PS	e 18 41	PPP	—
Collmberg	z.	91·0	39	e 13 13?	+ 6	e 20 0?	?	—	—	—

Additional readings :—
La Paz PP = 6m.15s., isS = 10m.13s., SS = 10m.56s.
Stuttgart eP?Z = 17m.18s.?.
Long waves were also recorded at Paris.

June 29d. Readings also at 0h. (Pretoria), 3h. (Fort de France, Harvard, Weston, Palisades, and Mineral), 4h. (near Chatra and near Apia), 5h. (Fergana, Lunacharskoe, Naryn, Tashkent, near Andijan, Dzhergetal, Khorog, Samarkand, and Stalinabad), 6h. (Scoresby Sund (2) and near Dzhergetal), 7h. (near Dzhergetal and near Manila), 9h. (near Apia), 11h. (Stuttgart, Dzhergetal, Fergana, near Andijan, Lunacharskoe, Samarkand, Stalinabad, and Tashkent), 12h. (near La Paz), 13h. (near Obi-garm), 16h. (Tortosa and near Apia), 18h. (Mount Wilson, Palomar, Pasadena, Riverside (2), China Lake (2), Potsdam, Prague, Triest, Padova, Pavia, near Prato, Rocca di Papa, and Rome), 20h. (Apia), 21h. (Fresno, Granada, and near Ashkabad), 22h. (Ksara, Nanking, Pavia, Copenhagen, Collmberg, Jena, Potsdam, De Bilt, Paris, Kew, Strasbourg, Stuttgart, Rathfarnham Castle, Alicante, Almeria, and near Fort de France).

June 30d. Readings at 2h. (Fergana, Krasnogorka, near Andijan, Almata, Frunse, Ili, and near Ashkabad), 3h. (near Dzhergetal and near Ashkabad), 4h. (Ashkabad (4) and Collmberg), 7h. (Ashkabad), 10h. (Ashkabad and near La Paz), 11h. (Apia), 12h. (Kew), 13h. (near Apia), 14h. (La Paz and near Dzhergetal), 15h. (Collmberg, Stuttgart, and near Ottawa), 17h. (Brisbane, Terre Adélie, Palomar, Pasadena, China Lake, Mineral, La Paz, Tamanrasset, and near Alicante), 18h. (Harvard), 19h. (Tortosa (4)), 23h. (near Dzhergetal and near Mizusawa).

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/

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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