The International Seismological Summary.

1947 April, May, June.

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

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

The second quarter for 1947 contains 128 epicentres, 88 of which are repetitions from previously adopted epicentres.

Cases of deep focus :—

April	1d. 14h.	17·7S.	69·2W.	0·020
	5d. 14h.	33·3N.	140·5E.	Suggested Deep
	9d. 0h.	36·7N.	70·5E.	0·020
	10d. 15h.	30·5S.	180	0·040
	14d. 21h.	48·2.N	9·0E.	Suggested Deep
May	6d. 1h.	31·5S.	68·6W.	0·010
	26d. 13h.	46·2N.	151·2E.	0·030
	26d. 19h.	9·2S.	159·5E.	0·070
	27d. 3h.	8·7S.	124·1E.	0·015
	28d. 14h.	Undetermined Shock		Suggested Deep
June	12d. 9h.	1·1N.	126·4E.	Base of Superficial Layers
	12d. 18h.	1·1N.	126·4E.	Base of Superficial Layers
	23d. 21h.	36·8N.	69·4E.	0·005
	28d. 11h.	48·2N.	9·0E.	Suggested Deep

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

KEW OBSERVATORY,
Richmond,
SURREY.

September, 1955.

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1947 APRIL, MAY, JUNE.

April 1d. 14h. 17m. 19s. Epicentre 17°·7S. 69°·2W. Depth of focus 0·020. (as on 1945, June 19d.).

A = +·3385, B = −·8911, C = −·3022; $\delta = -3$; $h = +5$;
D = −·935, E = −·355; G = −·107, H = +·282, K = −·953.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
La Paz	Z.	1·6	40	i 0 36a	+ 4	i 1 3	+ 7	—	—	1·3
Huancayo		8·2	313	e 2 6	+ 9	e 2 52	−36	—	—	e 3·4
Santa Lucia	N.	15·7	185	3 31	− 3	6 35	+12	—	—	—
Bogota	Z.	22·7	349	e 4 55	+ 7	—	—	—	—	—
Fort de France		33·2	15	e 6 22	− 2	—	—	—	—	—
Florissant	N.	59·6	340	e 9 46	− 3	e 17 44	− 1	i 18 35	sS	—
Weston		59·8	340	i 9 49	− 1	—	—	i 10 2	pP	—
Tucson		63·7	321	e 10 14	− 3	(e 18 31)	− 5	—	—	—
Palomar		68·2	318	i 10 44	− 1	e 20 23	+52	—	—	—
Pierce Ferry		68·3	322	i 10 45	− 1	e 19 37	+ 5	—	—	—
Boulder City		68·7	322	i 10 48	0	—	—	—	—	—
Overton		68·8	323	i 10 48	− 1	—	—	—	—	—
Riverside	Z.	68·9	318	i 10 50	+ 1	—	—	—	—	—
Pasadena	Z.	69·5	318	i 10 53	0	—	—	—	—	—
Haiwee		70·7	321	e 11 3	+ 3	—	—	—	—	—
Tinemaha		71·5	320	i 11 4	− 1	e 20 15	+ 6	i 11 37	pP	—
Shasta Dam		76·2	321	i 11 31	− 1	—	—	—	—	—

Tucson readings are given as P for two distinct earthquakes.

April 1d. Readings also at 1h. (Tucson), 4h. (near Andijan and near Tashkent), 8h. (near Triest), 10h. (Bogota, La Paz, Tucson, Tinemaha, near Triest, and near Tchimkent), 11h. (Andijan, near Obi-garm, and Stalinabad), 12h. (Granada), 13h. (Weston), 14h. (near Mineral), 19h. (Palomar, Tinemaha, Tucson, and St. Louis).

April 2d. 5h. 39m. 11s. Epicentre 1°·0S. 138°·2E. (as on 1940, December 17d.).

A = −·7453, B = +·6664, C = −·0173; $\delta = -14$; $h = +7$;
D = +·667, E = +·745; G = +·013, H = −·012, K = −1·000.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	N.	29·9	152	i 6 5	− 7	i 11 17	+ 8	i 12 44	SS	—
Kagosima		33·2	347	e 6 48	+ 8	—	—	—	—	—
Miyazaki		33·4	351	e 6 1	−41	(e 11 49)	−14	—	—	e 11·8
Kumamoto		34·4	349	e 6 51	0	—	—	—	—	—
Kôti		34·7	355	e 6 51	− 3	12 28	+ 4	—	—	—
Owase		34·9	358	e 6 55	0	—	—	—	—	—
Riverview		34·9	161	i 6 53a	− 2	i 12 16	−11	i 8 3	PP	e 16·6
Hukuoka		35·2	349	e 6 57k	− 1	e 12 27	− 4	—	—	e 15·1
Sumoto		35·3	357	i 6 37	−22	—	—	—	—	—
Mera		35·8	2	e 6 1	−62	—	—	—	—	—
Shizuoka		35·8	0	e 6 54	− 9	—	—	—	—	—
Kyoto		35·9	357	e 7 4	0	12 36	− 6	—	—	—
Nagoya		36·0	359	7 2	− 3	—	—	—	—	—
Hamada		36·2	352	7 6	0	12 54	+ 7	—	—	—
Hunatu		36·3	0	7 2	− 5	12 26	−22	—	—	—
Yokohama		36·3	1	e 6 53	−14	12 45	− 3	—	—	e 16·4
Toyooka		36·5	355	e 7 9	0	—	—	—	—	—
Tokyo		36·5	2	7 22	+13	—	—	8 30	PP	e 18·1
Kakioka		37·1	3	e 7 13	− 1	—	—	—	—	—
Mito		37·2	3	e 6 56	−19	—	—	—	—	—

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Perth		37·3	212	7 11	− 5	13 1	− 3	8 44	PP	—
Utunomiya		37·4	2	e 7 15	− 1	—	—	—	—	—
Nanking		37·7	332	8 3	+44	14 0	+50	—	—	—
Wazima		38·2	358	e 7 21?	− 2	—	—	—	—	—
Hukusima		38·6	4	e 7 29	+ 3	13 13	−10	—	—	—
Sendai		39·2	6	e 7 29	− 2	13 24	− 8	—	—	—
Mizusawa		40·0	6	7 43	+ 5	13 51	+ 7	—	—	e 19·5
Miyako		40·6	5	7 38	− 5	13 39	−15	—	—	—
Morioka		40·6	4	e 7 43	0	13 56	+ 2	—	—	—
Aomori		41·7	3	e 7 46	− 6	14 13	+ 3	—	—	—
Mori		42·9	4	e 8 4	+ 2	14 25	− 2	—	—	21·4
Sapporo		44·0	3	e 8 10	− 1	(14 49)	+ 6	—	—	14·8
Auckland		49·2	141	e 8 51	− 1	15 58	0	10 33	PcP	20·8
New Plymouth		50·1	143	8 59	0	16 9?	− 1	11 11	PP	20·8
Arapuni		50·4	141	9 19	+18	16 37	+23	—	—	21·8
Kaimata		51·0	148	9 10	+ 4	16 24	+ 2	—	—	—
Apia		51·1	107	e 9 13	+ 7	e 16 34	+10	e 11 11	PP	29·1
Tuai		51·8	143	9 12	0	16 32	− 1	—	—	—
Wellington	Z.	51·9	145	9 10	− 2	16 29	− 6	11 19	PP	23·2
Calcutta	N.	53·9	300	e 9 24	− 3	i 16 54	− 8	—	—	—
Colombo	E.	58·7	279	9 58	− 4	18 0	− 6	—	—	24·9
Irkutsk		60·2	338	e 10 8	− 4	18 15	−10	12 21	PP	—
Kodaikanal	E.	61·4	283	i 10 17	− 3	i 18 29	−11	12 19	PP	29·7
Hyderabad		61·6	291	10 24	+ 2	18 42	− 1	11 9	PcP	—
Dehra Dun	N.	65·1	304	e 10 29	−16	i 19 11	−16	—	—	i 25·9
New Delhi		65·3	302	e 10 45	− 1	i 19 23	− 6	i 19 53	PS	—
Honolulu		66·2	66	e 10 47	− 5	i 20 21	+41	—	—	e 29·4
Bombay		67·1	291	e 10 54	− 3	i 19 52	+ 1	—	—	32·0
Almata		70·2	319	e 11 21	+ 4	20 29	+ 1	—	—	—
Frunse		71·6	316	e 11 27	+ 2	e 20 47?	+ 3	—	—	—
Andijan		72·6	314	e 11 35	+ 4	i 20 58	+ 2	-	—	—
Obi-garm		74·0	311	e 11 38	− 1	21 8	− 3	—	—	—
Stalinabad		74·6	311	i 11 44	+ 1	i 21 18	0	—	—	—
Tashkent		74·9	314	e 11 43	− 1	e 26 1	SS	e 14 42	PP	—
Tchimkent		75·0	315	i 11 44	− 1	i 21 19	− 4	—	—	—
Samarkand		76·3	311	i 11 51	− 1	i 21 35	− 2	—	—	—
Sverdlovsk		84·0	328	i 12 46	+13	i 22 52	− 5	—	—	—
College		84·1	25	e 12 35	+ 1	i 23 0	+ 2	e 16 0	PP	e 35·6
Sitka		88·9	34	e 12 58	0	i 23 32	[+ 6]	e 16 27	PP	e 36·2
Baku		89·3	310	i 13 4	+ 5	23 24	[− 5]	—	—	—
Tananarive		90·3	251	e 13 5	+ 1	23 55	− 2	16 46	PP	—
Grozny		92·5	313	e 13 22	+ 8	23 48	[+ 1]	e 17 6	PP	—
Erevan		93·5	310	13 40	+21	e 24 12	−13	e 17 11	PP	—
Leninakan		94·0	311	e 13 26	+ 5	23 59	[+ 3]	—	—	—
Victoria		96·3	42	13 45	+13	24 13	[+ 5]	26 13	PS	43·8
Ferndale		96·4	49	e 14 2	+30	i 24 20	[+11]	e 18 19	PP	e 44·1
Moscow		96·8	326	13 34	0	24 5	[− 6]	17 28	PP	—
Shasta Dam		97·8	49	e 13 40	+ 2	e 24 21	[+ 5]	—	—	—
San Francisco		98·0	53	e 17 52	PP	e 24 21	[+ 4]	—	—	e 45·1
Berkeley		98·1	53	i 13 51	+11	i 24 17	[− 1]	i 17 39	PP	e 43·3
Branner		98·2	53	e 13 49?	+ 9	e 23 49?	[−29]	e 31 49?	SS	e 44·8
Santa Clara		98·4	53	e 13 52	+11	e 24 25	[+ 6]	e 17 53	PP	e 45·1
Mineral	E.	98·4	50	e 18 24	PP	e 27 14	PPS	—	—	e 45·9
Lick		98·7	53	e 13 55	+13	e 25 25	+15	e 17 57	PP	e 45·9
Grand Coulee		99·3	41	e 13 52	+ 7	—	—	e 17 53	PP	—
Fresno	N.	100·2	53	e 14 10	+21	—	—	e 18 15	PP	—
Ksara		100·8	304	e 13 49	− 3	e 24 37	[+ 6]	—	—	—
Tinemaha		101·4	53	e 13 58	+ 3	e 24 40	[+ 6]	—	—	—
Pasadena		101·8	56	e 14 0	+ 4	i 24 38	[+ 2]	i 18 10	PP	e 41·5
Helsinki		102·3	333	e 14 3	+ 4	e 24 34	[− 4]	e 18 15	PP	e 44·8

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m. s.			m.
Riverside		102·5	56	e 14 3	+ 3	e 24 45	[+ 4]	—		—	—
Palomar	Z.	103·0	56	i 14 12	+10	—	—	—		—	—
Butte		104·0	42	e 18 38	PP	e 25 48	− 6	e 33 43		SS	e 43·1
Boulder City		104·3	53	e 14 11	+ 3	e 25 26	{+ 1}	i 18 37		PP	—
Overton		104·5	52	i 14 17	+ 9	—	—	e 18 6		PP	—
Pierce Ferry		104·9	53	e 14 16	+ 6	e 25 54	− 7	e 18 14		PP	—
Istanbul		105·0	313	e 14 6	− 5	e 26 35	+33	—		—	—
Helwan		105·1	300	i 14 13a	+ 2	24 54	[+ 3]	18 22		PP	—
Bozeman		105·1	43	e 18 32	PP	i 24 57	[+ 6]	i 25 39		SKKS	e 44·0
Logan		105·5	47	e 17 54	?	i 24 59	[+ 6]	e 18 51		PP	e 43·8
Salt Lake City		105·7	48	e 18 14	PKP	c 25 16	[+22]	e 19 11		PP	e 43·1
Upsala		105·8	333	e 17 7	?	24 53	[− 1]	e 18 39		PP	e 46·8
Saskatoon		106·0	35	18 44	PP	25 1	[+ 6]	28 1		PS	45·8
Bucharest		106·4	316	e 18 37	PP	i 25 4	[+ 7]	e 26 13		S	33·8
Warsaw		107·1	325	e 14 23	P	25 0	[0]	e 18 43		PP	e 51·8
Tucson		108·2	57	e 14 35	P	e 25 6	[+ 1]	e 18 55		PP	e 44·1
Scoresby Sund		109·6	354	19 3	PP	25 13	[+ 2]	28 23		PS	—
Budapest	E.	110·0	321	e 18 40	[+ 7]	e 25 12	[0]	e 34 14		SS	e 56·3
	N.	110·0	321	e 19 19	PP	e 26 49?	S	e 34 29		SS	e 53·8
Belgrade		110·1	317	i 18 58	PP	25 15	[+ 2]	e 28 8		PS	e 47·8
Copenhagen		110·2	331	i 14 35k	P	25 15	[+ 2]	26 18		SKKS	50·8
Bergen	Z.	110·7	338	19 21	PP	28 44?	PS	29 44?		PPS	48·8
Potsdam	N.	111·5	328	e 19 31?	PP	e 27 4?	?	e 29 49?		PPS	e 50·8
Prague		111·8	325	e 18 49	[+12]	c 25 3	[−17]	e 20 28		PP	e 48·8
Zagreb		112·7	320	e 19 44	PP	c 29 0	PS	—		—	—
Cheb		113·0	326	e 19 35	PP	e 25 36	[+12]	e 29 3		PS	e 62·8
Jena		113·0	326	e 14 54	P	e 27 10	S	e 18 44		PKP	—
Triest		114·1	321	e 19 43	PP	i 25 30	[+ 1]	e 22 2		PPP	—
Stuttgart		115·4	326	e 15 1	P	i 25 27	[− 6]	e 18 52		PKP	e 53·8
Aberdeen		115·7	337	i 19 49	PP	i 25 13	[−22]	i 29 28		PS	53·0
De Bilt		115·7	331	e 15 4?	P	e 25 39	[+ 4]	i 19 52		PP	e 50·8
Chur		116·2	324	e 18 50	[+ 5]	—	—	—		—	e 87·6
Strasbourg		116·3	326	e 15 7	P	e 25 37	[0]	e 18 55		PKP	54·3
Zürich		116·5	325	e 18 43	[− 3]	e 29 32	PS	e 19 59		PP	—
Florence		116·6	320	i 20 1	PP	i 25 12	[−26]	i 27 32		SKKS	—
Rome		116·6	317	e 15 16	P	e 25 41	[+ 3]	e 18 56		PKP	—
Lincoln		116·6	44	e 15 10	P	e 26 57	{+ 6}	e 20 3		PP	e 52·4
Uccle		116·9	329	e 18 56	[+ 9]	e 25 49	[+10]	e 20 1		PP	e 53·8
Basle		117·0	325	e 18 54	[+ 7]	e 29 9	PS	—		—	—
Edinburgh		117·0	337	—	—	26 9	[+30]	29 49		PS	—
Durham		117·2	335	e 20 51	PP	i 29 44	PS	i 39 51		SSS	—
Neuchatel		117·6	325	e 19 49	[+61]	e 27 53	{+55}	—		—	—
Besançon		118·0	325	—	—	e 29 49	PS	e 39 49		SSS	57·8
Kew		118·8	332	e 20 14	PP	e 26 1	[+15]	e 22 17		PKS	e 55·8
Ivigtut		119·8	4	20 22	PP	25 50	[+ 1]	26 30		SKKS	—
Clermont-Ferrand		120·5	325	e 15 20	P	e 26 2	[+10]	e 19 12		PKP	56·8
Florissant		121·9	43	e 18 59	[+ 3]	i 25 58	[+ 2]	i 20 33		PP	i 57·0
Chicago		122·2	39	e 20 29	PP	e 25 53	[− 4]	e 27 30		SKKS	e 48·7
Barcelona		123·6	322	e 20 51	PP	—	—	37 34		SS	e 62·6
Tortosa		124·9	321	21 16	PP	28 26	?	22 42		PKS	e 63·8
Ottawa		126·7	29	19 10	[+ 4]	26 13	[+ 2]	21 4		PP	59·8
Alicante		127·0	319	19 38	[+32]	26 18	[+ 6]	21 32		PP	e 62·3
Shawinigan Falls		127·2	26	19 15	[+ 9]	28 5	{+ 4}	21 0		PP	62·8
Seven Falls		127·6	24	19 19	[+12]	28 7	{+ 3}	21 21		PP	65·8
New Kensington		127·8	36	e 20 59	PP	i 28 6	{ 0}	e 32 33		PPS	e 56·4
Almeria		128·4	318	i 19 19	[+10]	26 25	[+10]	i 21 27		PP	59·8
Pennsylvania	E.	128·7	35	e 21 23	PP	e 26 14	[− 2]	e 22 23		PKS	—
Granada		129·7	320	19 23a	[+12]	26 8	[−11]	22 47		PKS	65·1
Malaga	Z.	130·4	321	i 19 20	[+ 7]	26 20	[− 1]	i 22 42		PKS	64·0
Columbia		130·8	44	e 21 32	PP	e 28 31	{+ 6}	e 22 49		PKS	54·9
Fordham		130·8	32	19 19	[+ 5]	i 28 30	{+ 5}	e 21 35		PP	66·0

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Harvard		130·8	28	i 19 23	[+ 9]	i 28 30	{+ 5}	e 21 47	PP	e 63·8
Philadelphia		130·8	33	e 19 28	[+14]	e 28 23	{− 2}	e 21 27	PP	e 58·3
Weston		131·0	28	i 19 22	[+ 8]	e 26 31	[+ 9]	i 21 29	PP	—
Lisbon		132·0	326	22 58	PKS	31 37	PS	39 21	SS	61·7
Halifax		132·4	21	23 8	PKS	28 54	{+20}	32 7	PS	60·8
Santa Lucia	N.	136·2	144	22 57	PKS	34 49?	PPS	—	—	63·8
La Plata	E.	141·2	158	22 49	PP	30 25	{+57}	42 13	SS	73·2
	N.	141·2	158	17 25	?	28 37	{−51}	35 7	PPS	71·9
	Z.	141·2	158	19 37	[+ 4]	—	—	—	—	75·6
Bermuda		142·1	32	e 19 38	[+ 4]	e 29 35	{+ 1}	e 22 45	PP	e 59·6
Huancayo		144·3	112	i 19 32	[− 6]	i 29 39	{− 7}	e 22 49	PP	e 59·1
Bogota		147·6	83	i 19 48	[+ 4]	30 16	{+11}	e 23 40	PKS	—
La Paz		148·7	125	i 19 51	[+ 6]	26 44	[− 8]	i 23 18	PP	72·1
San Juan		150·5	52	e 19 54	[+ 6]	e 30 23	{+ 2}	i 23 48	PP	e 62·7
Fort de France		156·5	54	e 20 2	[+ 5]	—	—	—	—	—

Additional readings and notes :—
Miyazaki i =7m.25s., eS =7m.52s.
Riverview iP =6m.59s., iPPPE =8m.21s., iE =12m.30s., iN =12m.47s. and 13m.16s., iE =13m.21s., iN =13m.59s., iE =15m.23s. and 16m.32s., iS_cS?E =17m.4s.
Tokyo PPP? =8m.52s., e =17m.1s.
Sapporo eS =12m.39s.
Auckland P_cS? =14m.39s.
New Plymouth P_cS =14m.21s.?
Apia eSS?E =18m.55s.
Wellington sP_cPZ =10m.12s., PPPZ =12m.15s., iZ =13m.23s., S_cPZ =14m.19s., iZ = 14m.45s. and 15m.6s., sS =16m.44s., SS =19m.37s.
Irkutsk PPP =13m.30s., iS_cS =20m.2s.
Kodaikanal P_cPE =10m.57s., PSE =18m.39s., S_cS?E =19m.49s., SSE =22m.17s.
Hyderabad PSE =19m.19s., S_cSN =20m.13s., SSE =23m.3s.
New Delhi PSN =19m.56s., S_cSN =20m.36s., iE =20m.59s., and 22m.34s., SSE = 23m.35s., iE =25m.36s., iN =27m.18s.
Bombay iE =11m.0s.
Tashkent ePPP =16m.10s.
College ePS =23m.56s., eSS =28m.51s., eSSS =32m.17s.
Sitka ePPP? =18m.54s., iSS =29m.31s., iSSS =33m.31s.
Tananarive S =24m.21s., PS =25m.10s., SS =29m.54s.
Victoria SS =31m.52s., SSS =35m.21s., e =38m.34s.
Ferndale eN =23m.59s. and 40m.29s.
Moscow S_cS =24m.51s.
Berkeley eN =13m.56s., eE =17m.25s., eN =18m.14s., iE =23m.8s., iSKSEN =24m.21s., eSZ =25m.33s., iE =26m.27s., iPPSN =27m.31s., iN =29m.37s., iEN =31m.1s., eE =32m.3s., iZ =38m.31s.
Santa Clara ePPSE =26m.50s., eSSE =32m.28s.
Tinemaha eZ =14m.6s.
Pasadena iZ =14m.6s. and 25m.19s., iPSE =26m.53s., iZ =27m.10s., eSSZ =32m.1s., iNZ =32m.52s., eSSSZ =36m.1s.
Helsinki e =17m.58s. and 18m.37s., ePPP =20m.36s., ePKS =21m.59s., eSKKS = 25m.13s., eS =25m.37s., ePS =27m.22s., ePPS =28m.1s., eSS =32m.51s., ePKKS = 34m.6s., 37m.53s., 39m.37s. and 42m.15s.
Riverside eZ =14m.9s.
Boulder City i =14m.19s.
Overton i =16m.26s., ePKKP =29m.58s., ePKP,PKP =37m.49s.
Pierce Ferry e =17m.18s., ePKKP? =29m.46s., ePKP,PKP =37m.52s.
Helwan SKKSE =25m.36s., PSE =27m.30s.
Bozeman iS =26m.16s., iPS =27m.49s., iPPS =28m.41s., eSS =33m.15s., i =33m.57s., iSSS =37m.41s.
Logan e =19m.55s. and 25m.38s., eS =26m.13s., ePS =27m.5s., e =27m.53s., ePPS = 28m.45s., eSS? =32m.35s., e =33m.51s.
Salt Lake City iPS? =28m.16s., e =29m.5s., eSS =34m.0s., eSSS =37m.55s.
Upsala eSKKSE =25m.32s., PSE =27m.48s.?, ePPSN =28m.40s., eSSN =33m.12s., eSSSE =37m.30s., eN =43m.24s., eE =43m.55s.
Saskatoon SKKS =25m.52s., PPS =28m.52s., SS =33m.52s., SSS =37m.45s.
Warsaw eN =18m.11s., iPPZ =18m.48s., ePPE =18m.55s., eN =19m.14s., eE = 19m.51s., ePPP?E =20m.48s., ePPP?N =20m.53s., PPPZ =21m.11s., SKSZ = 25m.3s., SKKSZ =25m.45s., SKKSN =25m.51s., SKKSE =25m.54s., iS?N = 26m.21s., PSZ =28m.6s., PPSZ =29m.7s., PPSE =29m.10s., iPKKP?Z =29m.48s., iN =30m.25s., SSZ =33m.43s., SSN =33m.53s., SSE =33m.57s., SSSZ =37m.57s., SSSE =38m.3s., SSSN =38m.8s.
Tucson eSKKS? =26m.7s., iPS =28m.12s., iPPS? =29m.26s., eSS =34m.28s., iSSS = 38m.5s.
Scoresby Sund 25m.49s., 26m.49s., 29m.43s., 32m.19s., and 34m.31s.
Budapest eE =28m.36s., eN =29m.15s. and 30m.30s.

Continued on next page.

Belgrade ePP? =20m.8s., eSS? =33m.21s.
Copenhagen 18m.12s., 19m.15s., 19m.49s., and 26m.43s., iPS =28m.33s., 28m.56s., iPPS =29m.40s., SS =34m.7s., SSP =35m.2s.
Potsdam ePPN =20m.11s.?, eN =29m.3s.?, 34m.55s.?, and 39m.13s.?
Prague eP =15m.31s.?, ePPP =21m.57s., e =26m.25s., eSKKS =26m.59s., ePS =28m.20s., ePPS =29m.23s., eSS =34m.37s., eSSS =39m.1s.
Cheb eSS =35m.18s.
Jena eN =19m.39s. and 34m.49s.
Triest iPS =29m.15s., iSS =35m.31s., iSSS =39m.31s.
Stuttgart ePKKP =29m.25s., e =42m.29s.
Aberdeen iEN =26m.49s., SKSEN =30m.13s., iSEN =30m.33s., iPSEN =31m.28s., iSSN =35m.59s., iSSSE =39m.36s.
De Bilt ePPP =21m.57s., iPS =29m.33s., iSS =36m.2s., iSSS =39m.34s.
Strasbourg ePP =19m.57s. and 20m.0s., eSKS =25m.47s., eSKKS =26m.54s., iS =27m.40s., i =29m.7s., ePPS =31m.19s., ePKKS =33m.19s., e =34m.51s., i =35m.0s., eSS =35m.51s., eSSS =41m.23s.
Rome ePPZ =20m.0s., ePPPZ =22m.36s., e =24m.24s., SKKS? =26m.56s., S? =27m.46s., iPSE =29m.36s., iSSN =36m.0s., iSSSEN =39m.46s.
Lincoln ePS =29m.44s., eSS =36m.3s., eSSS =40m.34s.
Uccle ePPN =20m.4s., eSKKSE =26m.59s., ePSZ =29m.32s., ePSE =29m.35s., ePSN =29m.40s., eSSN =36m.19s., ePSSE =36m.37s., eSSSN =39m.48s.
Edinburgh SS =36m.39s., i =39m.49s.
Durham iEN =29m.54s.
Kew ePPPE =22m.32s., eE =23m.19s. and 24m.25s., iSKKSEN =27m.10s., iEN =28m.4s., iPSZ =29m.57s., iPSEN =30m.0s., ePPS?EN =31m.24s.?, eSSE =35m.44s., eSSNZ =36m.37s., eSSSE =39m.59s., eQEN =47·8m.
Ivigtut PS =30m.6s., SS =36m.25s.
Clermont-Farrand iPP =20m.37s., iSKKS =27m.34s., iS =28m.22s., e =35m.1s. and 40m.15s.
Florissant iSKKSE =27m.32s., eSE? =28m.35s., iPSE =30m.40s.
Chicago ePS =30m.42s., eSS =36m.36s., eSSS? =41m.59s.
Tortosa PPPE =25m.54s., PSN =32m.38s., SSN =40m.11s., SSSN =44m.55s.
Ottawa SKP =22m.23s., SKKS =28m.3s., PS =31m.14s., PPSN =32m.55s., SS =38m.25s., SSSN =42m.49s.?
Alicante PPP =23m.28s., SKKS =28m.26s., iS =30m.2s., S_cSP =31m.0s., PS =32m.16s., PPS =34m.35s., SKKS =36m.48s., SS =38m.50s., SPS =39m.35s., SSS =43m.36s., Q =53m.56s.
Shawinigan Falls SKP =22m.31s.
Seven Falls e =36m.49s. and 41m.55s.
Almeria PKS =22m.43s., PPP =24m.11s., PS =31m.27s., PPS =32m.57s., SS =38m.23s., SSS =43m.15s.
Pennsylvania eSKKS?E =28m.2s., ePSE =32m.0s., eSSE =39m.5s.
Granada pPKP =23m.33s., iPP =24m.41s., PPP =27m.20s., SKS =29m.15s., SKKS =31m.11s., S =32m.14s., pS =33m.26s., sS =34m.15s., PS =34m.50s., PPS =36m.2s., SS =41m.20s., sSS =43m.32s., SSS =46m.2s., sSSS =48m.14s., record interpreted as that of a deep focus earthquake and the phases wrongly identified.
Malaga PKSZ =23m.40s., PPSZ =35m.44s., SSZ =41m.56s.
Columbia eSKSP =31m.27s., ePPS =33m.30s., e =34m.53s., eSS =39m.1s., ePSPS =39m.48s., e =41m.27s.
Fordham e =22m.43s., eSS =39m.34s., eSSS =44m.15s.
Harvard iPKSNZ =22m.40s., iPKSE =22m.50s., eZ =23m.53s., ePSN =31m.30s., ePSZ =31m.39s., ePPSNZ =33m.14s., ePPPSNZ =34m.12s., eN =37m.16s., eSSN =38m.42s., ePSPSE =40m.2s., eE =40m.28s., eN =40m.50s., iS_cSS_cSEN =41m.21s., eSSSN =43m.54s., eE =44m.21s.
Philadelphia iPKS =22m.46s., iPPP =23m.50s., iSKKS =28m.29s., eSKSP =31m.42s., ePS =32m.1s., eSS =38m.51s., eSSS =43m.54s.
Weston i =22m.45s., eSKKS =28m.30s., ePPS =33m.19s., eSS =39m.27s., eSSS =44m.1s.
Lisbon PSE =31m.44s.
Halifax SS =39m.55s., SSS =44m.55s.
La Plata PKS?N =21m.37s., SKSPN =29m.31s., PSN =31m.43s., PSSN =39m.19s., SSSN =46m.55s., SSSE =47m.13s., N =53m.55s., E =58m.19s., QN =58·4m., QE =60·2m.
Bermuda iPKP =19m.50s., iSKSP =32m.54s., iPPS =35m.14s., e =37m.27s., eSS =41m.9s.
Huancayo i =19m.42s., iPKS? =24m.49s., eSKS? =27m.27s., e =30m.6s., iSS =41m.58s., eSSS? =47m.28s.
Bogota $iPKP_2Z$ =19m.53s., iNZ =20m.51s.
La Paz iEN =20m.49s., iZ =23m.32s., SKKS?Z =29m.24s., SSE =43m.58s.
San Juan e =21m.39s., ePKS =24m.48s., e =33m.50s., ePPS =36m.49s., eSS =42m.51s., eSSS =48m.50s.
Long waves were also recorded at Osaka.

April 2d. 20h. 45m. 6s. Epicentre 24°·3N. 122°·3E. (as on 1947, March 16d.).

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

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Nanking		8·3	339	4 41	?	6 56	?	—	—	i 7·2
Mizusawa	E.	21·7	43	e 5 22	+27	9 3	+12	—	—	—
Irkutsk		31·1	338	6 20	− 2	11 27	− 1	—	—	—
Calcutta	N.	31·2	274	e 6 34	+11	i 11 17	−12	9 33	P_cP	15·5
New Delhi	N.	40·4	287	e 7 58	+17	e 13 48	− 2	14 2	PS	21·4
Hyderabad		41·4	269	7 53	+ 3	14 8	+ 3	17 23	SSS	21·0
Almata		41·6	309	7 54	+ 3	—	—	—	—	—
Semipalatinsk		41·6	320	—	—	e 14 6	− 2	—	—	—
Frunse		43·2	308	8 5	+ 1	—	—	—	—	—
Colombo	E.	44·1	255	8 13	+ 1	18 11	S_cS	—		24·8
Andijan		44·6	304	e 8 18	+ 2	—	—	—	—	—
Kodaikanal	E.	44·8	261	e 8 22	+ 5	e 14 52	− 3	—	—	21·5
Bombay		46·1	274	e 8 31	+ 3	—	—	—	—	—
Obi-garm		46·5	302	8 32	+ 1	15 22	+ 3	—	—	—
Tchimkent		46·8	306	i 8 34	+ 1	—	—	—	—	—
Tashkent		46·9	305	e 8 34	0	—	—	e 10 27	PP	—
Stalinabad		47·2	301	i 8 38	+ 2	i 15 32	+ 3	—	—	—
Samarkand		48·6	302	i 8 50	+ 3	15 51	+ 2	—	—	—
Sverdlovsk		54·6	324	i 10 4	+32	17 39	+28	—	—	—
Brisbane	N.	59·4	148	e 10 7	+ 1	e 18 7	− 8	—	—	—
Riverview		64·0	153	i 10 37a	− 1	i 19 11	− 2	i 19 36	PS	—
Grozny		64·2	308	10 39	0	—	—	11 11	P_cP	—
Erevan		65·7	305	e 10 49	+ 1	—	—	—	—	—
Leninakan		66·1	306	10 54	+ 3	—	—	—	—	—
Moscow		67·4	323	10 55	− 4	19 46	− 9	—	—	—
College		68·2	27	—	—	e 19 55	− 9	e 25 11	SS	e 31·4
Simferopol		72·0	312	e 11 29	+ 1	—	—	—	—	—
Yalta		72·1	311	11 14	−14	—	—	—	—	—
Helsinki		72·8	330	e 11 31	− 1	e 20 51	− 7	e 25 54	SS	e 39·9
Ksara		74·1	300	e 11 41	+ 1	21 26	+14	—	—	—
Sitka		76·2	33	e 12 4	+12	e 21 58	PS	e 22 32	S_cS	e 33·4
Upsala		76·3	330	e 12 28	+36	e 21 32	− 5	i 22 11	PS	e 38·9
Istanbul		76·8	309	i 11 51	− 4	—	—	—	—	—
Warsaw	N.	77·7	322	e 12 11	+11	21 51	− 1	22 16	S_cS	—
	Z.	77·7	322	12 0	0	21 58	+ 6	14 53	PP	e 39·9
Helwan		79·1	298	i 12 7k	− 1	25 6	?	15 6	PP	—
Arapuni		79·7	140	—	—	e 22 54	PS	—	—	—
Copenhagen		80·7	327	e 12 16	0	i 22 23	− 1	i 23 29	PS	37·9
Budapest	E.	80·9	318	12 17	0	e 22 27	+ 1	—	—	e 47·9
	N.	80·9	318	12 27	+10	e 22 16	−10	—	—	e 45·9
Belgrade		81·1	315	e 12 16	− 2	e 21 25	− 3	e 16 7	PP	e 46·4
Kalocsa	E.	81·3	317	e 12 21	+ 1	—	—	—	—	—
Wellington		81·4	143	—	—	22 24	− 7	—	—	41·9
Scoresby Sund		82·2	348	12 23	− 1	22 43	+ 4	—	—	—
Prague		82·4	322	e 12 33	+ 8	e 22 24	−17	e 15 12	PP	e 39·9
Jena	N.	83·5	323	e 12 29	− 2	e 23 7	+15	—	—	—
Cheb		83·5	323	e 12 34	+ 3	e 22 54	+ 2	e 17 9	PPP	e 50·9
Zagreb		83·5	318	e 12 30	− 1	e 22 53	+ 1	—	—	e 47·9
Triest		85·0	319	—	—	e 23 3	[+ 2]	—	—	—
Stuttgart		86·0	322	i 12 42a	− 1	e 23 4	[− 3]	—	—	e 45·9
De Bilt		86·2	327	i 12 43	− 1	e 23 8	[− 1]	e 16 4	PP	e 38·9
Aberdeen		86·4	333	—	—	e 22 59	[−11]	—	—	46·2
Chur		86·8	321	e 12 46k	− 1	e 23 23	− 2	—	—	—
Strasbourg		86·9	323	e 12 46	− 2	e 23 11	[− 2]	e 15 59	PP	e 42·8
Zürich		87·1	322	e 12 47a	− 2	—	—	—	—	—
Florence		87·4	317	—	—	i 23 33	+ 3	i 24 33	PS	—
Uccle		87·4	326	e 12 50	0	e 23 13	[− 4]	e 16 19	PP	e 42·9
Basle		87·6	322	e 12 49	− 2	—	—	e 16 17	PP	—
Rome		87·6	316	—	—	23 9	[− 9]	e 29 56	SS	45·5
Durham		87·8	331	—	—	e 23 4	[−15]	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Kew		89·3	328	e 12 54 a	− 5	i 23 32	[+ 3]	e 16 34?	PP	e 43·9
Grand Coulee		89·5	37	e 12 59	− 1	—	—	—	—	—
Paris		89·6	325	i 13 0	− 1	e 23 24	[− 6]	e 16 28	PP	e 46·9
Clermont-Ferrand		91·1	322	e 13 8	0	e 24 2	− 2	—	—	49·3
Shasta Dam		91·8	44	e 13 8	− 3	—	—	—	—	—
Berkeley		93·4	46	—	—	e 23 17	[−35]	e 39 42	Q	e 42·5
Butte		94·2	35	—	—	e 24 34	+ 3	—	—	e 49·7
Tinemaha	z.	96·5	45	e 13 32	0	—	—	—	—	—
Salt Lake City		98·0	39	—	—	e 24 36	[+19]	e 25 35	S	e 50·0
Mount Wilson	z.	98·3	47	e 13 42	+ 1	—	—	i 17 37	PP	—
Pasadena	z.	98·3	47	e 13 42	+ 1	—	—	e 17 38	PP	e 46·2
Riverside	z.	98·9	47	e 13 44	+ 1	—	—	e 17 42	PP	—
Boulder City		99·3	44	e 17 41	PP	—	—	—	—	—
Pierce Ferry		99·8	43	i 17 50	PP	—	—	—	—	—
Almeria		100·0	318	e 13 50	+ 2	24 20	[− 7]	17 48	PP	47·9
Granada		100·4	319	—	—	25 40	+16	26 40	PS	i 54·2
Lisbon		102·6	323	14 36	+36	24 54?	[+14]	—	—	53·3
Tucson		104·3	45	e 18 23	PP	—	—	e 20 3	PPP	e 48·6
Ottawa	z.	108·7	13	—	—	e 25 6	[− 1]	e 28 18	PS	51·9
Harvard	z.	112·3	12	—	—	e 30 6	PPS	—	—	e 60·9
Weston		112·5	12	—	—	e 25 24	[+ 2]	e 28 56	PS	—
Bogota	z.	147·1	31	i 19 44	[+ 1]	—	—	—	—	—
La Paz		167·5	53	e 20 1	[− 7]	26 42	[−28]	i 25 9	PP	82·9

Additional readings :—
Mizusawa eSN =9m.6s.
New Delhi iSSN =17m.3s., iSSSN =18m.29s.
Riverview iZ =19m.23s., iN =20m.10s., iSKSN =20m.25s., eE =21m.0s. and 22m.52s., eN =22m.55s.
Sitka e =17m.43s.
Upsala eN =28m.35s., eSSSN =30m.25s., eSSSE =30m.53s.?
Istanbul e =17m.40s.
Warsaw P_cPZ =12m.15s., ePPPZ =16m.40s., S_cSEZ =22m.20s., PSN =22m.35s., PPS?E =22m.47s., PPSN =22m.50s., eN =23m.35s. and 26m.33s., eSSE =26m.59s., eSSZ =27m.6s., eSSSN =30m.54s., eSSSE =30m.59s., SSSZ =31m.3s.
Copenhagen i =12m.19s. and 22m.39s.
Belgrade e =22m.12s.
Kalossa eN =12m.25s.
Scoresby Sund 19m.18s. and 22m.59s.
Prague eSS =27m.54s., eSSS =31m.54s.?
Cheb eSS =28m.54s.?, eSSS =32m.54s.?, e =40m.24s.
Zagreb e =12m.34s.
De Bilt eSS =29m.24s.
Aberdeen eE =23m.15s.
Strasbourg e =14m.7s., 14m.10s., and 15m.9s., ePP =16m.10s., ePPP =17m.58s., eSS =29m.22s., e =36m.10s. and 36m.15s.
Uccle ePSE =23m.46s., eSSN =29m.14s.
Durham iEN =23m.35s.
Kew eS =23m.59s.?, iPS =24m.56s., eSSZ =30m.4s.?, eSSSNZ =33m.34s.?
Paris iP =13m.4s., e =22m.3s., ePS =24m.58s.
Berkeley eN =23m.21s.
Almeria PPP =19m.59s., PKS =21m.46s., PS =26m.47s., PPS =27m.30s., SS =32m.9s.
Lisbon Z =14m.55s.
Weston e =30m.6s.
Bogota $iPKP_2Z$ =19m.48s., iZ =20m.3s.
La Paz $iPKPZ$ =20m.8s., PKP_2 =21m.6s., iZ =29m.56s., PSKSZ =35m.30s., iE =42m.1s., SSSE =53m.3s.
Long waves were also recorded at Honolulu, Auckland, San Juan, and other American and European stations.

April 2d. Readings also at 0h. (near Grand Coulee), 1h. (near La Paz), 2h. (Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Overton, Pierce Ferry, Shasta Dam, and near Lick), 3h. (Mizusawa and Tucson), 5h. (Branner, San Francisco, near Berkeley, and Lick), 8h. (Wellington, Auckland, Colombo, Andijan, near Obi-garm, Samarkand, and Stalinabad), 9h. (near Obi-garm, Samarkand, and Stalinabad), 11h. (Overton and near Mineral), 13h. (Istanbul), 14h. (Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, and Tucson), 15h. (Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, near Tucson, Boulder City, Overton, and Pierce Ferry), 16h. (Fresno and Riverview), 18h. (near Mineral), 19h. (Port au Prince), 20h. (Bucharest), 21h. (Nanking, Arapuni, Auckland, Wellington, Alicante, Branner, and Shasta Dam), 23h. (Arapuni, Wellington, and Harvard).

April 3d. 21h. 10m. 43s. Epicentre 39°·2S. 178°·5E. (as on 1946, September 14d.).

Epicentre 39°·2S. 178°·6E. (New Zealand).

$A = -·7768$, $B = +·0203$, $C = -·6295$; $\delta = +10$; $h = -1$;
$D = +·026$, $E = +1·000$; $G = +·629$, $H = -·016$, $K = -·777$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tuai		1·1	291	0 28	+ 6	0 45	+ 6	—	—	—
Havelock North		1·3	249	0 17?	− 8	0 33?	−11	—	—	—
New Plymouth		3·4	271	1 0	+ 5	1 34	− 3	—	—	—
Wellington		3·5	232	0 56	− 1	1 39	− 1	—	—	—
Auckland		3·7	307	1 1?	+ 1	1 25?	−20	—	—	—
Kaimata		6·3	236	—	—	2 45	− 5	—	—	—
Riverview		22·6	276	e 5 5k	+ 2	c 9 32	SS	i 5 43	PPP	e 11·4
Brisbane	N.	24·2	293	i 5 28	+ 9	i 10 42	SSS	—	—	e 14·1
Helwan	Z.	151·5	261	e 19 57	[+ 7]	—	—	e 20 11	PKP	—
Istanbul		156·6	285	e 20 24	PKP_2	—	—	—	—	—

Riverview also gives iPZ = 5m.12s., iPPPZ = 6m.1s. and eQN = 10m.35s.

April 3d. Readings also at 0h. (La Plata, Tucson, and Tinemaha), 2h. (near Huancayo), 3h. (Stuttgart), 4h. (La Paz (2) and Tinemaha), 5h. (La Paz), 11h. (near Mineral), 14h. (near Ksara), 16h. (Tucson), 19h. (Bergen), 20h. (Istanbul, De Bilt, and Huancayo), 21h. (Samarkand, near Obi-garm, and Stalinabad), 22h. (near Ottawa, Obigarm, Samarkand, Erevan, Grozny, Leninakan, Piatigorsk, near Andijan, Tashkent, Tchimkent, and Frunse).

April 4d. 1h. 7m. 33s. Epicentre 24°·3N. 122°·3E. (as on 2d.).

$A = -·4876$, $B = +·7713$, $C = +·4092$; $\delta = +10$; $h = +4$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Nanking		8·3	339	e 1 49	−15	3 21	−19	i 2 9	PP	—
Calcutta	N.	31·2	274	—	—	e 11 44	+15	e 16 42	S_cS	e 18·1
New Delhi	N.	40·4	287	e 9 5	PP	e 14 2	+12	—	—	—
Hyderabad	N.	41·4	269	e 9 45	P_cP	14 22	+17	17 32	SS	20·9
Bombay		46·1	274	e 8 48	+20	—	—	e 10 27	PP	—
Istanbul		76·8	309	e 11 49	− 6	e 22 48	PS	—	—	—
Helwan	Z.	79·1	298	e 12 9	+ 1	—	—	e 12 25	P_cP	—
Prague		82·4	322	—	—	e 22 41	0	—	—	e 43·4
Cheb		83·5	323	—	—	e 23 6	+14	—	—	e 44·4
Stuttgart		86·0	322	e 12 43	0	—	—	—	—	e 45·4
Grand Coulee		89·5	37	e 12 59	− 1	—	—	i 13 12	P_cP	—
Shasta Dam		91·8	44	e 13 11	0	—	—	—	—	—
Bogota	Z.	147·1	31	i 19 42	[− 1]	—	—	i 25 16	?	—

Nanking also gives iN = 3m.38s.
Long waves were also recorded at Weston and numerous other European stations.

April 4d. Readings also at 0h. (Sverdlovsk, Balboa Heights, and near La Paz), 2h. (Malaga, Rome, and Triest), 7h. (Bogota), 9h. (near Triest), 16h. (Stalinabad and near Obi-garm), 18h. (Samarkand, near Stalinabad, Obi-garm, and near Berkeley), 20h. (near Apia).

April 5d. 14h. 22m. 49s. Epicentre 33°·3N. 140°·5E. (as on 1946, August 18d.).

Intensity V at Hachijojima; IV at Ito; II-III at Tokyo and Onahama. Macroseismic radius 200-300km.
Epicentre 33°·6N. 140°·5E. Focal depth 40km.
The Seismological Bulletin of the Central Meteorological Observatory, Japan, for the year 1947, Tokyo, 1950, pp. 19-20, macroseismic chart p. 19.

$A = -\cdot6463$, $B = +\cdot5327$, $C = +\cdot5464$; $\delta = +3$; $h = +1$;
$D = +\cdot636$, $E = +\cdot772$; $G = -\cdot422$, $H = +\cdot348$, $K = -\cdot838$.

		△	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Mera		1·7	341	0 30a	− 1	0 49	− 5
Osima		1·7	328	0 32	+ 1	0 49	− 5
Misima		2·2	325	0 41	+ 3	1 4	− 2
Omaesaki		2·3	304	0 31	− 9	—	—
Yokohama		2·3	342	0 39a	− 1	1 2	− 7
Shizuoka		2·4	314	0 45	+ 4	1 13	+ 1
Tokyo		2·5	345	0 54	P_g	1 22	S_g
Hunatu		2·6	327	0 44k	0	1 9	− 8
Kakioka		2·9	355	0 49	+ 1	1 20	− 4
Tukubasan		2·9	354	0 49	+ 1	1 19	− 5
Mito		3·1	359	0 51	0	1 13	−16
Maebasi		3·3	339	1 5	P_g	—	—
Utunomiya		3·3	351	0 54	+ 1	1 29	− 6
Nagoya		3·5	304	1 1	P*	1 46	S*
Gihu		3·7	306	1 6	P*	—	—
Owase		3·7	283	1 37	+37	—	—
Nagano		3·9	332	0 57	− 5	1 42	− 8
Hikone		4·0	301	1 9	+ 5	1 42	−10
Kyoto		4·3	295	0 50	−18	1 54	− 6
Hukusima		4·4	0	2 10	+60	3 2	+60
Osaka		4·4	290	1 9	− 1	2 38	+36
Kobe		4·6	289	1 12	0	2 3	− 4
Sumoto		4·8	284	1 14	− 1	2 33	S_g
Sendai		5·0	4	1 17	− 1	2 10	− 8
Wazima		5·0	326	1 24	PP	—	—
Toyooka		5·2	297	1 36	PP	2 38	S*
Mizusawa		5·8	5	1 32	+ 3	2 33	− 5
Akita		6·4	357	2 58	+80	3 46	+53
Morioka		6·4	5	1 35	− 3	2 45	− 8
Aomori		7·5	2	2 7	PPP	3 20	0
Shasta Dam		74·0	52	e 11 39	0	—	—
Tinemaha	z.	78·6	53	i 12 5	0	—	—
Riverside	z.	80·9	55	i 12 24	P_cP	—	—
Overton		81·5	52	i 12 21	0	—	—
Pierce Ferry		82·0	52	i 12 23	0	—	—
Tucson		86·4	54	e 12 51	+ 6	—	—

April 5d. Readings also at 2h. (near Andijan), 4h. (near Obi-garm), 6h. (Tucson), 7h. (Overton, La Paz, Erevan, and near Leninakan), 9h. (Tucson, Boulder City, Pierce Ferry, and Overton), 10h. (Ksara), 11h., 12h., 13h., 14h. (3) (near Mineral), 22h. (near Stalinabad, Samarkand, and Obi-garm), 23h. (Shasta Dam, Tucson, Tinemaha, and Mount Wilson).

April 6d. 1h. 8m. 15s. Epicentre 38°·1N. 73°·2E. (as on 1946, March 9d.).

$A = +\cdot2280$, $B = +\cdot7552$, $C = +\cdot6145$; $\delta = -8$; $h = -1$;
$D = +\cdot957$, $E = -\cdot289$; $G = +\cdot178$, $H = +\cdot588$, $K = -\cdot789$.

	△	Az.	P.	O−C.	S.	O−C.	Supp.	
	°	°	m. s.	s.	m. s.	s.	m. s.	s.
Andijan	2·7	346	i 0 48	+ 3	i 1 11	− 8	—	—
Obi-garm	2·8	282	i 0 51?	+ 4	i 1 26?	+ 4	—	—
Stalinabad	3·5	279	i 0 58	+ 1	i 1 39	− 1	—	—
Tashkent	4·4	318	e 1 11?	+ 1	e 1 58	− 4	e 1 49	?
Samarkand	5·1	290	1 23	+ 3	i 2 14	− 6	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Tchimkent		5·1	328	i 1 1	−19	i 1 43	P_g	—	—
Almata		5·9	27	i 1 31	0	i 2 27	−13	—	—
New Delhi	N.	10·1	160	e 2 28	0	i 4 20	− 5	—	—
Bombay		19·1	181	e 4 30	+ 3	e 7 55	− 2	—	—
Calcutta	N.	20·2	135	e 4 39	0	i 8 15	− 6	—	—
Sverdlovsk		20·5	341	i 4 35	− 7	e 8 12	−15	—	—
Hyderabad	N.	21·1	166	4 46	− 2	8 41	+ 2	—	—
Grozny		21·4	293	i 4 48	− 3	i 8 46	+ 1	—	—
Erevan		22·3	285	5 0	− 1	—	—	—	—
Leninakan		22·8	287	e 5 5	0	—	—	e 5 35	PP
Piatigorsk		23·4	295	e 5 14	+ 3	9 28	+ 7	—	—
Simferopol		29·8	297	e 6 7	− 4	—	—	—	—
Stuttgart	Z.	46·4	305	e 8 23	− 7	—	—	—	—

Additional readings :—
New Delhi iN = 4m.15s.
Stuttgart eZ = 8m.54s.

April 6d. Readings also at 0h. (near Tortosa), 2h. (near Mineral), 3h. (Tinemaha and Tucson), 8h. (Fresno, Lick, Shasta Dam, near Mount Wilson, Pasadena, Palomar, Riverside, Tucson, Boulder City, Overton, and Pierce Ferry), 10h. (near Tortosa, near Obi-garm, Samarkand, and Stalinabad), 11h. (near Basle and Zürich), 12h. (Tucson, Pierce Ferry, near Boulder City, and Overton), 21h. (near Mineral), 22h. (near Bogota and near Obi-garm), 23h. (Brisbane, Riverview, Wellington, Helwan, and Ksara).

April 7d. Readings at 0h. (New Delhi), 1h. (Helwan, Ksara, and near Mizusawa), 2h. (Riverview and Shasta Dam), 7h. (Andijan, Samarkand, near Obi-garm, and Stalinabad), 9h. (Wellington), 13h. (Mizusawa), 14h. (Arapuni), 21h. (Boulder City and Pierce Ferry), 22h. (Kodaikanal), 23h. (near Fresno).

April 8d. 0h. 6m. 8s. Epicentre 41°·8N. 71°·7E. (as on 1947, February 24d.).

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

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Andijan		1·2	155	i 0 18?	− 6	—	—	—	—	—
Tchimkent		1·6	288	e 0 32?	+ 2	—	—	—	—	—
Tashkent		1·9	255	e 0 42?	+ 8	e 1 9?	+10	—	—	—
Frunse		2·4	63	i 0 35	− 6	i 1 3	− 9	—	—	—
Obi-garm		3·5	207	i 0 59	+ 2	i 1 46	+ 6	—	—	—
Stalinabad		3·9	216	i 1 6	+ 4	i 2 0	+10	—	—	—
Almata		4·2	67	i 1 2	− 5	1 49	− 8	—	—	—
Samarkand		4·2	241	i 1 12?	+ 5	i 2 6	+ 9	—	—	—
Baku		16·5	272	—	—	e 7 14	+16	—	—	—
Sverdlovsk		16·6	338	i 3 54	− 2	i 6 52	− 8	—	—	—
Grozny		19·1	283	e 4 36	+ 9	—	—	—	—	—
Erevan		20·6	274	e 5 3?	+20	—	—	—	—	—
Leninakan		20·9	277	e 5 0	+14	—	—	e 5 34	PPP	—
Piatigorsk		21·0	286	e 4 49	+ 2	—	—	—	—	—
Irkutsk		24·4	53	5 15	− 6	—	—	—	—	—
Hyderabad	N.	25·0	165	—	—	9 50	+ 1	—	—	—
Moscow		26·1	314	e 6 3	+26	—	—	—	—	—
Copenhagen		40·2	312	7 40	0	e 14 42	+54	—	—	20·9
Stuttgart	Z.	43·4	301	e 8 7	+ 1	—	—	—	—	—
Strasbourg		44·4	302	e 8 15	+ 1	—	—	—	—	—

Long waves were also recorded at Warsaw, De Bilt, Kew, and Istanbul.

April 8d. Readings also at 3h. (Pierce Ferry, Tucson, Copenhagen, near Strasbourg, Stuttgart, Basle, Chur, Neuchatel, and Zürich), 5h. (near Mizusawa), 7h. (Jena), 10h. (Bombay, New Delhi, and near Alicante (3)), 13h. (near Andijan, Obi-garm, Samarkand, and Stalinabad), 17h. (near Almata (2), Andijan (3), Frunse (2), Obi-garm (3), Samarkand, Stalinabad (2), Tashkent (2), and Tchimkent), 19h. (Scoresby Sund), 22h. (Shasta Dam).

April 9d. 0h. 20m. 15s. Epicentre 36°·7N. 70°·5E. Depth of focus 0·020.
(as on 1947, February 4d.).

A = +·2683, B = +·7576, C = +·5951 ; δ = +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.	
Obi-garm		2·1	342	i 0 37	0	i 1 7	+ 1	—	—
Stalinabad		2·3	323	i 0 42	+ 2	i 1 13	+ 3	—	—
Samarkand		4·1	319	i 1 5	+ 2	i 1 55	+ 4	—	—
Andijan		4·3	20	1 4	− 1	i 1 55	0	—	—
Tashkent		4·7	349	e 1 11	+ 1	i 2 7	+ 2	—	—
Tchimkent		5·6	354	i 1 24	+ 2	i 2 27	+ 1	—	—
Frunse		6·9	26	e 1 37	− 3	e 2 53	− 4	—	—
Almata		8·2	35	i 1 53	− 4	3 25	− 3	—	—
New Delhi	N.	9·8	143	e 2 8	−10	e 3 43	−23	—	—
Semipalatinsk		15·4	24	e 3 31	+ 1	—	—	—	—
Bombay		17·8	172	e 3 57	− 2	e 7 13	+ 4	—	—
Grozny		20·0	297	4 30	+ 8	8 17	+24	i 5 0	PPP
Leninakan		21·1	290	e 4 53?	+20	—	—	—	—
Sverdlovsk		21·2	345	i 4 38	+ 4	i 8 38	+23	—	—

Additional readings :—
New Delhi iN = 3m.48s.
Bombay eP?N = 3m.5s., eN = 4m.29s.

April 9d. 21h. 14m. 4s. Epicentre 41°·8N. 71°·7E. (as on 8d.).

		Δ	Az.	P.	O−C.	S.	O−C.	L.
		°	°	m. s.	s.	m. s.	s.	m.
Andijan		1·2	155	i 0 20	− 4	i 0 36	− 5	—
Tchimkent		1·6	288	i 0 36	+ 6	i 1 4	+13	—
Tashkent		1·9	255	e 0 37	+ 3	e 1 6	+ 7	—
Frunse		2·4	63	i 0 32	− 9	i 0 57	−15	—
Obi-garm		3·5	207	i 0 55	− 2	—	—	—
Stalinabad		3·9	216	i 1 3	+ 1	i 1 50	0	—
Almata		4·2	67	i 0 57	−10	1 41	−16	—
Samarkand		4·2	241	i 1 9	+ 2	i 2 6	+ 9	—
Semipalatinsk		10·5	31	e 2 8	−27	4 5	−30	—
New Delhi		13·9	160	e 3 16	− 5	—	—	i 7·4
Sverdlovsk		16·6	338	e 3 51	− 5	e 6 53	− 7	—
Grozny		19·1	283	e 4 33	+ 6	e 8 9	+12	—
Leninakan		20·9	277	e 4 57	+11	—	—	—
Bombay		22·8	177	e 5 7	+ 2	e 9 13	+ 2	e 12·1
Irkutsk		24·4	53	e 5 11	−10	—	—	—
Hyderabad	N.	25·0	165	e 5 16	−11	9 45	− 4	—
Warsaw		35·4	304	—	—	13 56?	?	e 16·9
Copenhagen		40·2	312	7 37	− 3	—	—	19·9
Stuttgart	Z.	43·4	301	e 8 4	− 2	—	—	—
Strasbourg		44·4	302	e 8 13	− 1	—	—	e 24·2

Additional readings :—
New Delhi eN = 5m.29s.
Long waves were also recorded at De Bilt.

April 9d. Readings also at 3h. (near Mizusawa), 4h. (La Paz), 8h. (Boulder City), 9h. (Riverview, Strasbourg, Stuttgart, and La Paz), 10h. (near Tchimkent and near Irkutsk), 12h. (Nanking and Riverview), 13h. (near Semipalatinsk), 14h. (Nanking, Copenhagen, Stuttgart, and near Granada), 15h. (Clermont-Ferrand, Paris, De Bilt, Strasbourg, Kew, and Rome), 19h. (Shasta Dam), 21h. (Almata, Obi-garm, near Andijan, Frunse, and Stalinabad), 22h. (Andijan, Samarkand, near Frunse, and Tchimkent), 23h. (La Paz, La Plata, Mount Wilson, Riverside, Tinemaha, Tucson, Shasta Dam, and near Pierce Ferry).

April 10d. 15h. 45m. 55s. Epicentre 30°·5S. 180°. Depth of focus 0·040.
(as on 1942, June 15d.).

Intensity IV in the Kermadec Isles. Seismo. Reports for 1947. Department of Scientific and Industrial Research. Dominion Observatory, Wellington, New Zealand (p. 8).

A = −·8631, B = ·0000, C = −·5050 ; δ = −3 ; h = +1 ;
D = ·000, E = +1·000 ; G = +·505, H = ·000, K = −·863.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Auckland		7·7	213	1 40	−10	3 11	− 6	—	—	—
Tuai		8·6	195	1 43	−19	3 15	−22	—	—	—
Wellington		11·6	200	2 43	+ 4	4 23	−21	—	—	—
Brisbane		23·8	272	i 4 57	+ 8	i 9 47	+66	—	—	e 12·8
Riverview		24·6	254	e 5 22	+26	—	—	—	—	e 11·9
Pasadena	z.	86·8	48	i 12 12	− 1	—	—	—	—	—
Mount Wilson	z.	86·9	48	e 12 13	− 1	—	—	—	—	—
Palomar	z.	87·1	49	i 12 13k	− 2	—	—	—	—	—
Riverside	z.	87·2	48	i 12 14	− 1	—	—	—	—	—
Shasta Dam		88·7	40	i 12 20	− 2	—	—	—	—	—
Tinemaha	z.	88·7	45	e 12 21	− 1	—	—	—	—	—
Boulder City		90·1	48	i 12 27	− 2	—	—	—	—	—
Tucson		90·5	52	i 12 29k	− 1	—	—	—	—	—
Overton		90·7	47	i 12 31	0	—	—	—	—	—
Pierce Ferry		90·7	48	i 12 31	0	—	—	—	—	—
Helwan	z.	152·9	275	e 19 47	[+32]	—	—	—	—	—
Copenhagen		153·3	344	19 25	[+ 9]	—	—	—	—	—
Istanbul		154·3	303	e 19 55	PKP_2	—	—	—	—	—
Stuttgart	z.	160·5	341	e 19 30	[+ 5]	—	—	e 20 14	PKP_2	—
Paris		161·6	357	i 19 34	[+ 8]	—	—	i 20 18?	PKP_2	—

Additional readings :—
Auckland i = 2m.0s., 2m.29s., 3m.36s., 5m.10s., 5m.50s., and 8m.37s., S_cP = 9m.0s., S_cS = 12m.42s.
Tuai i = 2m.3s., 3m.51s., and 4m.45s.
Wellington i = 4m.27s.
Pasadena iZ = 12m.28s.
Mount Wilson iZ = 12m.33s.
Palomar iZ = 12m.27s. and 12m.30s.
Riverside iZ = 12m.31s.
Tinemaha iZ = 12m.39s.

April 10d. 15h. 58m. 4s. Epicentre 35°·0N. 116°·5W.

Intensity VII in Afton Canyon, Amboy, Cronise, Daggett, Midway, Manix, Newberry, Victorville, and Yermo ; VI at Acton, Baker, Barstow, Claremont, El Monte, Glendale, Hollywood, Lancaster, Long Beach, Los Angeles, Mojave, Mount Wilson, Needles, Pasadena, Riverside, San Bernardino, Las Vegas, and Phoenix. Macroseismic area 75,000 square miles.

L. M. Murphy.
United States Earthquakes, 1947, Serial No. 730, Washington 1950, pp. 17-20, with macroseismic chart. Epicentre 34°58′N. 116°32′W.

C. F. Richter.
" The Manix (California) Earthquake of April, 1947," Bull. Seismo. Soc. Amer., Vol. 37, No. 3, July, 1947, pp. 171-179. Map of epicentral region p. 176.

C. F. Richter and J. M. Nordquist.
" Instrumental Study of the Manix Earthquake," Bull. Seismo. Soc. Amer., Vol. 41, No. 4, October, 1951, pp. 347-388, ten tables and five figures.
" After shocks of the Manix Earthquake," Bull. Geolog. Soc. Amer., Vol. 59, No. 12, 1948, Part 2, p. 1395.

J. P. Buwalda and C. F. Richter.
" Movement on the Manix fault on April 10, 1947 " (Abstract). Bull. Geolog. Soc. Amer., Vol. 59, 1948, p. 1367.

A = −·3663, B = −·7347, C = +·5710 ; δ = 0 ; h = 0 ;
D = −·895, E = +·446 ; G = −·255, H = −·511, K = −·821.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Riverside	1·2	216	i 0 23k	− 1	—	—	—	—	—
Mount Wilson	1·5	238	i 0 27k	− 1	—	—	—	—	—
Haiwee	1·6	314	i 0 29a	− 1	—	—	—	—	—
Pasadena	1·6	238	i 0 28k	− 2	e 0 55	+ 4	—	—	—
Boulder City	1·7	54	i 0 30	− 1	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Palomar		1·7	190	i 0 30k	− 1	—	—	—	—	—
La Jolla		2·2	196	i 0 37k	− 1	—	—	—	—	—
Pierce Ferry		2·3	61	0 40	0	—	—	—	—	—
Tinemaha		2·5	326	i 0 42a	− 1	—	—	—	—	—
Santa Barbara	Z.	2·7	258	i 0 43a	− 2	—	—	—	—	—
Fresno	N.	3·2	303	i 0 52	0	—	—	—	—	—
Lick		4·8	301	e 1 8	− 7	i 2 19	+ 7	—	—	—
Santa Clara		5·0	229	e 1 15	− 3	i 1 30	P*	—	—	—
Branner		5·2	299	e 0 56?	−25	—	—	—	—	—
Berkeley		5·5	303	i 1 22	− 3	i 2 32	+ 2	—	—	—
San Francisco	E.	5·5	302	i 1 23	− 2	i 2 46	+16	—	—	—
Tucson		5·5	118	i 1 22a	− 3	i 2 24	− 6	—	—	i 3·0
Mineral	E.	6·7	324	e 1 44	+ 2	i 3 29	+29	i 2 7	P*	—
Salt Lake City		6·8	31	i 2 4	+20	i 2 28	−35	—	—	i 3·4
Shasta Dam		7·3	322	e 1 51	+ 1	i 3 22	+ 7	i 2 21	P_g	e 3·9
Ferndale		8·3	314	e 2 18	+14	e 3 58	+18	e 4 3	S*	i 4·4
Bozeman		11·4	20	i 2 53	+ 6	i 4 22	−34	—	—	i 5·2
Butte		11·4	14	i 2 47	0	e 4 42	−14	—	—	e 5·0
Grand Coulee		13·0	352	e 3 11	+ 2	—	—	—	—	—
Rapid City		13·7	44	i 3 17	− 1	i 5 46	− 6	—	—	—
Victoria		14·4	341	3 35	+ 8	6 37	+28	—	—	7·3
Lincoln		16·7	64	i 3 48	− 9	i 7 15	+12	—	—	i 8·6
Saskatoon		18·5	18	4 21	+ 2	7 59	+15	e 5 16	PP	9·9
Florissant		21·2	71	i 4 52	+ 3	i 8 48	+ 7	i 4 57	PP	—
St. Louis		21·3	71	i 4 51	+ 1	i 8 49	+ 6	i 5 26	PPP	i 11·1
Chicago		23·6	62	i 5 13	0	i 9 30	+ 5	e 5 53	PP	e 11·0
Cincinnati		25·8	70	e 5 28	− 6	i 10 23	+21	—	—	e 13·3
Sitka		25·9	336	i 5 32	− 3	i 10 6	+ 2	—	—	i 12·0
Columbia		29·2	80	—	—	e 11 2	+ 4	—	—	e 12·4
New Kensington		29·5	67	e 6 6	− 2	e 10 59	− 3	—	—	i 15·2
Pensylvania	E.	30·9	66	i 6 20	0	i 11 16	− 8	—	—	—
Ottawa		32·5	58	6 33	− 1	11 51	+ 2	7 56	PPP	15·9
Philadelphia		33·0	68	e 6 39	0	e 11 58	+ 1	i 7 48	PP	e 13·8
Fordham		33·9	66	e 6 45	− 2	e 12 13	+ 2	—	—	—
Shawinigan Falls		34·7	56	6 47	− 7	12 13	−11	8 6	PPP	16·9
College		35·3	337	e 7 2	+ 3	e 12 30	− 3	—	—	e 15·4
Harvard		35·5	63	i 7 0	0	e 12 41	+ 5	e 8 25	PPP	e 18·6
Weston		35·7	63	e 7 6	+ 4	i 12 52	+13	—	—	e 15·2
Seven Falls		36·0	55	7 7	+ 2	16 11	SSS	8 25	PP	17·9
Honolulu		38·6	260	—	—	e 13 55	+32	—	—	e 16·3
Halifax		41·1	59	—	—	e 14 6	+ 5	e 17 4	SS	19·9
Bermuda		42·8	78	e 8 6	+ 5	e 14 24	− 2	e 9 40	PP	e 17·4
San Juan		47·5	96	e 8 42	+ 4	e 15 26	− 8	e 10 35	PP	e 19·5
Bogota		49·5	117	e 8 58	+ 4	e 16 7	+ 5	e 11 15	PP	—
Ivigtut		49·7	36	—	—	—	—	19 56?	SS	25·9
Fort de France		53·4	97	e 9 25	+ 1	—	—	—	—	—
Scoresby Sund		58·9	23	10 3	0	18 14	+ 6	22 8	SS	27·9
Huancayo		60·9	132	i 10 21	+ 4	e 18 30	− 4	i 23 6	SS	e 28·0
La Paz		68·8	129	11 11	+ 3	e 20 36	+25	—	—	30·9
Aberdeen		72·9	31	—	—	e 25 22	SS	—	—	38·4
Edinburgh		73·2	32	—	—	e 24 44	?	e 25 43	SS	—
Bergen	E.	73·7	25	—	—	e 20 30	−38	—	—	e 34·8
Durham		74·6	33	i 13 15	?	—	—	i 29 57	SSS	—
Kew		77·4	35	i 11 59a	+ 1	i 21 55	+ 6	e 30 38?	SSS	e 38·9
Upsala		78·2	22	e 12 28	+25	e 21 56?	− 1	e 22 44	PS	e 37·9
De Bilt		79·4	32	i 12 13a	+ 4	i 22 21	+11	e 15 31	PP	e 36·9
Copenhagen		79·7	26	i 12 13a	+ 2	i 22 20	+ 7	15 13	PP	35·9
Helsinki		80·0	18	e 12 12	− 1	e 22 16	− 1	e 23 19	PS	e 33·9
Uccle		80·0	33	—	—	e 22 21	+ 4	—	—	e 39·9
Paris		80·5	36	e 12 16	+ 1	e 22 38	+16	e 30 42?	SSS	37·9
Lisbon		80·5	49	12 13	− 2	22 32	+10	23 10	PS	36·1
Santa Lucia	N.	80·5	142	—	—	(21 30)	−52	—	—	21·5
Clermont-Ferrand		82·9	38	e 12 29	+ 1	e 22 59	+13	—	—	39·9
Toledo	Z.	82·9	46	e 12 28	0	—	—	e 15 40	PP	—
Strasbourg		83·1	33	e 12 31	+ 2	e 22 56	+ 8	e 28 39	SS	e 41·9

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Stuttgart		83·6	32	e 12 33	+ 2	e 23 7	+14	e 31 56	SSS	e 40·9
Basle		83·8	34	e 12 31	− 1	e 23 34	+39	—	—	e 43·7
Neuchatel		83·9	34	—	—	—	—	e 28 53	SS	—
Cheb		84·0	30	e 13 9	+36	e 23 5	+ 8	e 32 26	SSS	e 41·9
Zürich		84·4	34	e 12 36a	0	—	—	—	—	—
Malaga	z.	84·7	48	i 12 38	+ 1	e 23 6	+ 2	12 49	pP	41·1
Prague		84·8	29	e 12 42	+ 5	e 23 10	+ 5	e 15 8	PP	e 31·9
Granada		84·9	47	i 12 41k	+ 3	i 23 17	+11	15 53	PP	40·1
Tortosa		84·9	43	c 17 58	PPP	e 23 5	− 1	—	—	e 39·9
Barcelona		85·4	41	—	—	e 23 19	+ 8	29 34	SS	e 41·6
Warsaw		85·5	25	12 43	+ 2	23 6	[+ 2]	15 45	PP	e 40·9
Almeria		85·8	47	e 12 45	+ 3	23 13	− 2	16 12	PP	42·9
Alicante		86·0	45	12 18	−25	e 23 22	+ 5	24 26	PS	e 37·9
Irkutsk		86·1	336	12 45	+ 1	e 23 15	− 3	—	—	—
Moscow		87·0	14	12 49	+ 1	23 18	[+ 4]	—	—	—
Sverdlovsk		88·5	2	e 12 56	0	23 43	+ 2	16 27	PP	—
La Plata		88·5	135	13 50	− 6	29 0	SS	34 2	SSS	47·0
Budapest		88·7	28	—	—	e 23 56?	+13	e 24 26	PS	e 46·9
Rome		90·3	36	—	—	e 24 6	+ 9	e 25 17	PS	—
Belgrade		91·5	29	e 14 38	+88	—	—	e 17 49	PP	e 37·9
Istanbul		98·0	26	13 42	+ 3	25 21	+17	—	—	—
Andijan		104·2	353	i 18 9	PKP	e 26 11	+16	e 18 32	PP	—
Obi-garm		106·5	354	e 18 40	PP	—	—	—	—	—
Stalinabad		106·6	355	e 18 6	PKP	e 26 22	+ 7	e 18 34	PP	—
Helwan		108·7	30	i 18 59k	PP	29 26	PPS	21 20	PPP	—
Riverview	E.	110·1	243	e 14 8	P	(e 35 14)	SS	—	—	e 35·2
New Delhi	N.	115·4	347	e 19 48	PP	—	—	—	—	e 66·0
Bombay		125·7	350	e 20 59	PP	—	—	e 38 44	SSP	—
Hyderabad	N.	126·0	343	e 17 21	?	—	—	—	—	—
Kodaikanal	E.	133·1	342	e 36 21	?	—	—	—	—	—

Additional readings:—
Lick eE =1m.12s., iPN =1m.15s., iN =1m.38s. and 2m.26s., iE =2m.34s.
Berkeley iEN =1m.26s., iN =1m.30s., iZ =3m.0s.
San Francisco iE =1m.34s.
Tucson i =1m.46s. and 2m.2s.
Mineral iSE =3m.33s.
Butte i =3m.45s.
Rapid City i =4m.18s. and 5m.6s.
Lincoln i =5m.14s.
St. Louis PcP?Z =8m.55s., iZ =9m.7s.
Chicago e =6m.8s., eS =9m.16s.
Cincinnati i =5m.44s.
Ottawa SSN =13m.32s., SSS =14m.14s.
Philadelphia e =6m.50s., ePPP =8m.2s.
Fordham iP =6m.49s., iS =12m.22s.
Shawinigan Falls SS =14m.8s.
Harvard iPEZ =7m.5s., eSN =12m.47s., ePcS?N =13m.1s., eSSN =15m.13s.
San Juan ePPP? =11m.10s.
Bogota eN =10m.8s., ePPPN =12m.12s., iN =15m.9s., eScSN =18m.20s., eSSN =21m.9s.
Durham iEN =4m.22s. and 18m.19s.
Upsala eN =29m.42s., eE =30m.56s.
De Bilt eZ =12m.41s., eSS =27m.26s., eSSS =31m.26s.
Copenhagen SS =27m.32s., SSS =31m.32s.
Helsinki SS =27m.24s., e =30m.56s.
Uccle eSN =22m.24s.
Paris eQ =35·9m.
Strasbourg e =16m.39s., eSSS =31m.56s. and 32m.14s.
Stuttgart e =25m.49s. and 38m.56s.
Malaga PPZ =15m.58s., PPPZ =18m.24s., sSZ =23m.58s., PSZ =24m.4s.
Granada PS =24m.9s., SS =29m.8s., SSS =32m.8s.
Warsaw SN =23m.9s., eZ =23m.45s., PSN =24m.10s., PSE =24m.18s., eE =27m.22s., eN =27m.50s., eE =28m.5s., eSSN =28m.47s., eSS?Z =29m.0s., eSSS?E =31m.27s., eN =33m.6s.
Almeria PPP =18m.12s., S =23m.31s., SS =29m.19s., SSS =32m.48s.
Alicante SS =28m.54s., SSS =33m.12s.
Sverdlovsk eSKS =23m.24s., iPS =24m.52s., iSS =29m.47s.
La Plata Q?E =40m.20s.
Rome e =34m.16s.
Stalinabad eSKKS =25m.48s.
Helwan PPZ =19m.52s.
Long waves were also recorded at Reykjavik, Potsdam, Besançon, Zagreb, Bucharest, Arapuni, Auckland, Wellington, and Colombo.

April 10d. 17h. 18m. 20s. Epicentre 35·°0N. 116·°5W. (as at 15h. 58m.).

		△	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Riverside		1·2	216	i 0 23	− 1	i 0 38	− 3	—	—
Mount Wilson		1·5	238	i 0 28	0	—	—	—	—
Haiwee	z.	1·6	314	i 0 30	0	—	—	—	—
Pasadena		1·6	238	i 0 30	0	i 0 52	+ 1	—	—
Palomar	z.	1·7	190	i 0 28	− 3	—	—	—	—
La Jolla	z.	2·2	196	i 0 40	+ 2	—	—	—	—
Tinemaha		2·5	326	i 0 43	0	—	—	—	—
Fresno	N.	3·2	303	i 0 56	+ 4	i 1 46	S_g	i 1 4	P_g
Lick		4·8	301	—	—	e 2 16	+ 4	—	—
Santa Clara	E.	5·0	299	e 1 40	P_g	e 2 53	S_g	—	—
Branner		5·2	299	e 1 40?	P_g	—	—	—	—
Berkeley		5·5	303	i 1 25	0	i 2 54	S*	i 1 41	P*
San Francisco		5·5	302	e 1 28	+ 3	e 2 57	S_g	—	—
Tucson		5·5	118	e 1 24	− 1	i 2 47	S*	i 1 48	P_g
Mineral		6·7	324	—	—	e 2 49	−11	i 4 23?	—

Berkeley gives also iZ = 1m.30s.
San Francisco eN = 1m.31s.

April 10d. Readings also at 0h. (near Mineral (3)), 2h. (Shasta Dam), 4h. (Haiwee, Mount Wilson, Pasadena, Riverside, Tinemaha, Tucson, Shasta Dam, Paris, and near Mizusawa), 7h. (near Mizusawa), 8h. (near Stalinabad), 13h. (Istanbul), 16h. (Haiwee, Mount Wilson, Pasadena and Riverside,), 17h. (St. Louis, Mineral, Berkeley, Branner, Lick (2), Boulder City (2), Pierce Ferry, and near Fresno), 18h. (Mineral, Pierce Ferry, near Tucson, near Fresno, and near Mizusawa), 19h. (Mizusawa), 20h. (Bergen), 22h. (Mineral, Tucson, Pierce Ferry, Berkeley, and near Lick), 23h. (Prague and Wellington).

April 11d. 0h. 1m. 36s. Epicentre 36°·0S. 53°·0E. Rough.

A = +·4880, B = +·6476, C = −·5852; δ = −1; h = 0;
D = +·799, E = −·602; G = −·352, H = −·467, K = −·811.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m.	s.	m.
Tananarive		17·7	342	4 7	− 3	7 31	+ 5	i 4 14	PP	—
Kodaikanal	E.	51·4	31	—	—	e 16 37	PS	—	—	—
Bombay		57·7	22	e 9 57	+ 2	e 18 5	PS	—	—	—
Hyderabad	N.	58·4	29	e 10 2	+ 2	—	—	—	—	—
Helwan		68·6	340	e 11 9	+ 2	20 9	0	—	—	—
Stalinabad		75·6	14	i 11 45	− 3	i 21 28	− 1	—	—	—
Obi-garm		75·9	14	i 11 49	− 1	—	—	—	—	—
Samarkand		76·4	12	e 11 54	+ 1	—	—	—	—	—
Andijan		78·4	15	e 12 10	+ 6	e 22 10	+10	—	—	—
Tashkent		78·4	12	e 12 4	0	—	—	—	—	—
Grozny		79·2	355	e 12 16	+ 8	—	—	—	—	—
Istanbul		79·8	342	e 12 12	0	—	—	—	—	46·4
Almeria		88·9	319	—	—	e 23 57	+13	—	—	47·8
Alicante		89·0	321	—	—	e 23 50	+ 5	—	—	e 44·2
Granada		89·8	318	i 12 46a	−16	i 24 57	+64	—	—	45·2
Tortosa	N.	90·4	323	—	—	e 24 1	+ 3	e 29 54	SS	e 47·4
Warsaw		92·2	341	—	—	e 24 24	+10	e 23 24	SKS	—
Sverdlovsk		92·7	4	e 13 12	− 3	e 23 50	[+ 2]	e 25 32	PS	—
Cheb		92·9	336	e 28 24	?	—	—	—	—	e 53·4
Clermont-Ferrand		93·0	328	—	—	e 24 33	+12	—	—	—
Stuttgart		93·0	333	e 13 26	+ 9	e 24 24	+ 3	e 30 54	SSP	e 52·4
Strasbourg		93·3	333	e 30 58	SSP	e 24 28	+ 4	e 30 49	SS	e 45·4
Uccle		96·4	331	—	—	e 31 33	SS	e 26 30	PS	e 47·4
De Bilt		97·2	333	—	—	e 31 24?	SS	—	—	e 48·4
Copenhagen		97·7	338	—	—	e 26 42	PS	e 32 0	SSP	46·4
Tucson		166·1	259	e 20 7	[0]	—	—	—	—	—
Riverside	z.	171·9	259	e 20 20	[+10]	—	—	—	—	—

Additional readings:—
Granada PS = 26m.3s., SS = 31m.0s., SSS = 33m.57s.
Sverdlovsk eS = 24m.20s., eSS = 30m.27s.
Long waves were also recorded at Weston, Durham, Malaga, Triest, and Kew,

April 11d. 7h. 47m. 7s. Epicentre 35°·0N. 116°·5W. (as on 10d.).

A = −·3663, B = −·7347, C = +·5710; δ = 0; h = 0.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Riverside		1·2	216	i 0 24k	0	i 0 39	− 2	—	—	—
Mount Wilson		1·5	238	i 0 28k	0	—	—	—	—	—
Haiwee	z.	1·6	314	i 0 30a	0	—	—	—	—	—
Pasadena		1·6	238	i 0 29k	− 1	i 0 50	− 1	—	—	—
Boulder City		1·7	54	i 0 31	0	—	—	—	—	—
Palomar	z.	1·7	190	i 0 30k	− 1	—	—	—	—	—
La Jolla		2·2	196	e 0 40	+ 2	i 1 8	+ 2	—	—	—
Overton		2·3	47	i 0 39	− 1	—	—	—	—	—
Pierce Ferry		2·3	61	i 0 40	0	—	—	—	—	—
Tinemaha		2·5	326	i 0 43	0	i 1 25	S_g	—	—	—
Fresno	N.	3·2	303	i 0 53	+ 1	i 1 42	S*	i 0 58	P*	—
Lick		4·8	301	i 1 14	− 1	i 2 26	S*	—	—	—
Branner		5·2	299	e 0 53?	−28	—	—	—	—	—
Berkeley		5·5	303	i 1 23	− 2	i 2 50	S*	i 3 2	S_g	—
San Francisco		5·5	302	e 1 27	+ 2	i 2 47	S*	e 1 31	P*	—
Tucson		5·5	118	i 1 22	− 3	i 2 37	+ 7	e 1 35	P*	e 2·7
Salt Lake City		6·8	31	e 2 31	P_g	—	—	—	—	e 4·0
Shasta Dam		7·3	322	e 1 57	+ 7	—	—	—	—	i 3·8

Additional readings:—
Fresno iN = 1m.1s.
Lick iE = 1m.30s., iN = 2m.20s., eSE = 2m.23s., iE = 2m.33s.
Berkeley i = 1m.29s., iZ = 2m.55s.
Tucson i = 1m.50s., eS? = 2m.6s.
Long waves were also recorded at Mineral and Grand Coulee.

April 11d. 10h. 31m. 42s. Epicentre 33°·7N. 135°·8E. (as on 1946 Dec. 21d.).

Intensity V at Sionomisaki and Owase; IV at Sumoto and Kashiwara; II-III at Tu, Tokusima, Kobe, Takamatsu, Hikone, Nagoya, and Turuga. Macroseismic radius between 200 and 300 km.
Epicentre 33°·5N. 135°·7E. Shallow.

The Seismological Bulletin of the Central Meteorological Observatory, Japan, for the year 1947; Tokyo 1950, pp. 20-21, macroseismic chart p. 20.

A = −·5977, B = +·5812, C = +·5523; δ = +7; h = +1;
D = +·697, E = +·717; G = −·396, H = +·385, K = −·834.

	△	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Siomisaki	0·3	186	0 6	− 5	0 9	− 9
Owasi	0·5	36	0 14k	0	0 24	+ 1
Osaka	1·0	344	0 20k	− 1	0 34	− 2
Sumoto	1·0	310	0 18k	− 3	0 30	− 6
Kobi	1·1	328	0 20	− 2	—	—
Kameyama	1·3	26	0 25	0	0 46	+ 2
Kyoto	1·3	357	0 25	0	0 54	+10
Nagoya	1·8	33	0 34	+ 2	1 1	S_g
Hikone	1·9	13	0 30k	− 4	1 2	S_g
Kôti	1·9	268	0 26	− 8	0 41	−18
Toyooka	2·0	336	1 33k	+58	1 57	+56
Omaesaki	2·2	66	0 51	P_g	1 22	S_g
Shizuoka	2·5	57	0 52	P_g	1 25	S_g
Hirosima	2·9	283	0 33	−15	1 11	−13
Hunatu	3·0	53	0 54	P*	1 30	+ 3
Misima	3·0	61	1 0	P_g	1 53	S_g
Osima	3·1	69	0 55	P*	1 28	− 1
Toyama	3·2	21	0 57	P*	1 52	S_g
Hamada	3·3	298	0 57	P*	1 40	+ 5
Mera	3·5	69	1 23	+26	—	—

Continued on next page.

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		△	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Nagano		3·6	33	1 2	+ 4	1 41	− 1
Yokohama		3·6	61	1 29	+31	2 5	S_g
Kumagaya		3·8	48	1 17	P_g	1 59	S*
Tokyo		3·8	58	1 16	P_g	2 10	S_g
Miyazaki		4·1	245	1 30	+25	2 32	+37
Izuka		4·2	271	1 17	P*	2 6	S*
Tukubasan		4·3	53	2 6	+58	—	—
Kakioka		4·4	53	1 15	P*	—	—
Kumamoto		4·4	260	1 19	P*	2 20	S_g
Utunomiya		4·4	48	1 27	P_g	2 29	S_g
Hukuoka		4·5	272	1 2a	− 9	2 17	S*
Mito		4·7	54	1 59	?	2 42	S_g
Kagosima		4·9	246	1 44	P_g	—	—
Sendai		6·1	41	1 49	P*	3 22	S_g
Mizusawa	E.	6·9	37	—	—	e 3 55	S_g
Boulder City		84·3	51	i 13 5	+30	—	—
Stuttgart	Z.	85·1	328	e 12 33	− 6	—	—

April 11d. 14h. 29m. 32s. Epicentre 20°·1N. 121°·1E.

$A = -·4855$, $B = +·8047$, $C = +·3416$; $\delta = -6$; $h = +5$;
$D = +·856$, $E = +·517$; $G = -·177$, $H = +·293$, $K = -·940$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Nanking		12·1	350	e 2 44	−13	e 5 24	SS	—	—	—
Hukuoka		15·8	30	e 3 43	− 2	e 6 38	− 4	—	—	e 7·1
Yokohama		22·4	43	e 5 7	+ 5	e 9 18	+14	—	—	—
Tokyo		22·6	42	5 9	+ 6	5 42	PP	—	—	10·1
Mizusawa		25·6	38	e 5 30	− 2	10 4	+ 5	e 10 12	S	e 13·7
Mori	N.	27·4	32	e 5 48	− 1	—	—	—	—	—
Sapporo		28·5	31	e 6 3	+ 4	—	—	—	—	—
Calcutta	N.	30·6	280	e 6 13	− 5	—	—	i 9 20	P_cP	i 14·7
Irkutsk		34·7	342	e 6 50	− 4	e 12 15?	− 9	e 14 28?	SS	—
Hyderabad		40·4	273	7 46	+ 5	13 52	+ 2	9 49	P_cP	19·7
New Delhi	N.	40·7	291	e 8 30	?	i 13 45	−10	16 52	SS	21·5
Colombo	E.	42·1	257	7 55	0	14 22	+ 6	—	—	23·5
Kodaikanal		43·1	264	7 51	−13	e 14 29	− 1	17 28	SS	21·4
Almata		43·5	313	—	—	e 14 35	− 1	—	—	—
Frunse		45·0	311	e 8 20	+ 1	e 15 2	+ 4	—	—	—
Bombay	N.	45·4	277	e 8 23	+ 1	i 15 5	+ 1	—	—	—
Andijan		46·1	307	e 8 30	+ 2	e 15 16	+ 2	—	—	—
Obi-garm		47·8	305	i 8 41	0	—	—	—	—	—
Stalinabad		48·5	305	i 8 46	0	—	—	i 10 43	PP	—
Tashkent		48·5	308	e 8 46	0	e 15 46	− 2	—	—	—
Samarkand		50·0	305	e 9 0	+ 2	—	—	—	—	—
Sverdlovsk		57·3	325	e 9 50	− 2	i 17 43	− 4	—	—	—
Riverview		60·8	152	i 10 15a	− 1	i 18 37	+ 4	i 18 59	PPS	e 25·9
Grozny		66·0	309	e 10 52	+ 2	19 36	− 2	—	—	—
Erevan		67·3	306	e 11 13	+14	—	—	—	—	—
Leninakan		67·7	307	e 11 14	+13	—	—	—	—	—
Moscow		70·0	324	11 15	0	20 20	− 6	—	—	—
Sotchi		70·3	311	11 20	+ 3	—	—	—	—	—
College		72·5	27	—	—	e 20 44	−10	—	—	e 36·9
Ksara		75·3	301	e 12 3	P_cP	e 21 27	+ 1	—	—	—
Istanbul		78·6	310	e 12 10	+ 5	e 21 57	− 5	—	—	—
Upsala		79·4	331	e 11 57	−12	22 2	− 8	e 27 0	SS	e 36·5
Helwan		80·1	298	i 12 12k	− 1	i 22 16	− 2	12 19	P_cP	—
Warsaw		80·3	322	12 5k	− 9	22 15	− 5	15 33	PP	e 42·5
Budapest		83·2	318	12 37	+ 8	e 22 44	− 5	12 44	P_cP	e 46·5
Belgrade		83·3	315	e 12 28	− 2	e 22 54	+ 4	e 27 16	SS	e 37·5
Copenhagen		83·6	328	e 12 29	− 2	i 22 49	− 4	e 15 51	PP	39·5
Kalocsa		83·6	318	e 12 46	+15	—	—	e 12 49	P_cP	—
Potsdam		84·7	325	e 12 43	+ 6	i 22 58	− 6	e 12 46	P_cP	e 43·5
Prague		85·0	322	e 12 47	+ 9	22 55	−12	e 16 2	PP	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.
Zagreb		85·8	317	e 12 36a	− 6	e 23 1	−14	e 12 55	PcP	e 49·5
Scoresby Sund		86·0	349	12 43	0	23 1	−16	16 10	PP	39·5
Cheb		86·2	323	—	—	e 23 4	−15	e 33 28	SSS	e 49·0
Jena	N.	86·2	324	e 12 44	0	e 23 5	−14	e 12 57	PcP	—
Trieste		87·3	318	—	—	i 23 25	− 4	e 23 8	SKS	—
Stuttgart		88·6	322	e 12 54	− 2	e 23 18	[− 6]	i 13 8k	PcP	e 43·5
De Bilt		89·1	327	e 12 58	0	e 23 25	[− 2]	e 24 40	PS	e 40·5
Strasbourg		89·5	323	e 12 58	− 2	i 23 46	− 4	e 16 46	PP	e 44·3
Aberdeen	N.	89·7	334	—	—	i 23 43	{+ 2}	—	—	e 42·7
Zürich		89·7	322	e 12 58	− 3	e 23 42	{+ 1}	—	—	—
Rome		89·8	315	e 13 10	+ 8	23 42	{+ 1}	23 27	SKS	44·2
Florence		89·9	317	—	—	i 22 46	{−55}	—	—	—
Basle		90·2	322	e 13 2	− 2	e 23 52	− 4	e 23 22	SKS	—
Uccle		90·3	326	e 13 4	0	e 23 29	[− 6]	e 24 54	PS	e 45·5
Durham		90·9	331	—	—	i 23 58	− 5	i 23 35	SKS	—
Edinburgh		90·9	332	—	—	e 23 28	[−10]	—	—	—
Kew		92·3	328	e 13 5	− 8	e 23 39	[− 7]	e 17 6	PP	e 44·5
Paris		92·4	325	i 13 11	− 3	e 23 41	[− 6]	e 17 5	PP	48·5
Clermont-Ferrand		93·7	322	e 13 41	+21	i 23 54	[0]	e 30 51	SS	46·5
Shasta Dam		95·6	44	i 13 24	− 4	—	—	—	—	—
Tortosa		98·1	319	27 6	PPS	e 24 3	[−15]	31 58	SS	e 50·5
Alicante		100·1	318	e 19 28	?	e 29 24	?	—	—	e 43·8
Toledo	z.	101·4	320	e 18 17	PP	—	—	—	—	—
Mount Wilson	z.	102·0	47	e 18 2	PP	—	—	—	—	—
Almeria		102·3	318	e 13 50	− 9	24 59	{−12}	18 14	PP	47·2
Granada		102·8	318	i 18 29k	PP	25 4	{−11}	28 27	PPS	50·8
Boulder City		103·1	44	i 13 19	−43	—	—	—	—	—
Palomar	z.	103·3	47	e 18 25	PP	—	—	—	→	—
Malaga	z.	103·6	318	i 18 29	PP	—	—	—	—	53·6
Lisbon		105·2	322	—	—	24 48	[− 3]	—	—	53·9
Tucson		108·0	45	e 18 54	PP	—	—	—	—	e 52·0
Weston		116·8	10	—	—	e 29 26	PS	—	—	e 58·6
Bogota	z.	151·3	32	e 19 55	[+ 6]	—	—	—	—	—
La Paz		170·5	69	i 20 14k	[+ 4]	32 10	{+ 4}	i 29 28	PPP	80·5

Additional readings and notes :—
Hyderabad PN =7m.53s., PPE =9m.2s., SSN =16m.57s.
Kodaikanal PPE =9m.35s.
Riverview eE =18m.48s., ePPSE =19m.9s., eQ?E =24m.16s.
Upsala P?E =12m.19s., eN =22m.23s., eE =31m.28s.
Helwan PSNZ =22m.59s.
Warsaw PPP?Z =17m.29s., ePSZ =22m.51s., ePPSN =23m.8s., ePPSZ =23m.13s., eSS?Z =27m.34s.
Budapest PN =12m.44s.
Zagreb e =23m.13s.
Copenhagen 23m.15s., iZ =28m.13s., 28m.28s., and 28m.46s.
Scoresby Sund 28m.40s.
Stuttgart ePPZ =16m.33s., eScS? =23m.37s., ePPS? =24m.36s.
De Bilt eSS =29m.38s., eSSS =33m.48s.
Strasbourg iP =13m.12s., ePPP =18m.34s., eSKS =23m.21s., ePS =24m.48s., and 24m.55s., eSS =29m.52s., e =30m.57s., eSSS =33m.10s., e =34m.28s.
Rome S =24m.5s., eSS =30m.8s.
Kew eSEZ =23m.58s.?, iPSZ =25m.14s., iPSEN =25m.19s., ePPS =25m.38s., eSSS? =35m.28s.
Paris iP =13m.23s., eS =24m.14s., ePS =25m.20s., e =26m.21s. and 27m.26s., iSS =30m.10s., e =32m.21s., eQ =45m.28s.
Clermont-Ferrand iPP =17m.18s., iPS =25m.35s.
Alicante PP =20m.40s., PPP =24m.44s., PS =30m.12s., SS =35m.14s., SSS =38m.14s., readings wrongly identified.
Almeria PPP =20m.32s., PKS =21m.58s., PS =27m.16s., SSS =36m.43s.
Granada iS =30m.32s., PS =31m.39s., iSS =36m.43s., SSS =40m.44s., readings wrongly identified.
Malaga PPZ =21m.25s., PPPZ =24m.37s., SKSZ =28m.30s., iSZ =28m.57s., PSZ =30m.35s., SSZ =35m.17s., readings wrongly identified.
La Paz PSKSZ =35m.52s., SSE =45m.44s.
Long waves were also recorded at Wellington, Huancayo, Tananarive, and at other European and American stations.

April 11d. Readings also at 2h. (Shasta Dam, Tinemaha, Haiwee, Mount Wilson, Pasadena, Riverside, Pierce Ferry (2), Palomar, Tucson (2), Boulder City (2), Stuttgart, Paris, Copenhagen, and Mizusawa), 3h. (Boulder City (2), Overton, Tucson, Lick, Berkeley, Mineral, Stalinabad, Samarkand, near Andijan, Frunse, Tashkent, and Obigarm), 4h. (Boulder City), 5h. (Lick), 7h. (Shasta Dam), 8h. (Port au Prince and near Apia), 10h. (Grozny near Leninakan and Erevan), 11h. (Tucson, Pierce Ferry, Overton, Boulder City (2), and Ksara), 13h. (Boulder City), 15h. (Boulder City, San Francisco, and near Lick (2)), 18h. (Bogota, Bermuda, Fresno, and Boulder City), 19h. (Riverview, Boulder City (2), Pierce Ferry, and near Lick), 21h. (Boulder City, Helwan, and Tashkent), 22h. (Boulder City, Pierce Ferry, and near Mineral), 23h. (Boulder City and near Andijan).

April 12d. 14h. 5m. 9s. Epicentre 40°·2N. 25°·6E.

Felt at Lemnos (according to Malaga.)
Epicentre as adopted (Strasbourg).
Epicentre: Bayramic, Turkey 39°48′N. 26°39′E. (Istanbul).

$A = +\cdot6907$, $B = +\cdot3309$, $C = +\cdot6429$; $\delta = -12$; $h = -2$;
$D = +\cdot432$, $E = -\cdot902$; $G = +\cdot580$, $H = +\cdot278$, $K = -\cdot766$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Istanbul		2·8	72	0 54	P_g	1 29	S_g	—	—	—
Bucharest		4·2	5	e 1 22	P_g	i 2 16	S_g	—	—	—
Campulung		5·1	356	e 1 25	+ 5	—	—	—	—	3·0
Belgrade		6·0	322	i 1 53	P*	i 3 16	S_g	—	—	e 3·6
Kalossa		7·9	325	e 2 18	P*	e 4 21	S_g	—	—	e 4·6
Budapest		8·7	329	2 10	0	3 57	+ 7	2 17	PP	4·7
Zagreb		9·0	312	2 20	PP	e 3 48	−10	e 4 59	S_g	—
Rome		10·0	284	e 2 30	+ 3	e 4 24	+ 2	i 5 8	SSS	5·7
Triest		10·2	305	e 2 33	+ 2	e 4 15	−12	—	—	i 5·5
Ksara		10·4	124	e 2 33	− 1	e 4 43	SS	—	—	—
Florence		11·2	293	2 28	−16	e 4 4	−48	—	—	—
Helwan		11·4	154	i 2 37	−10	4 36	−20	6 0	S_g	6·0)
Warsaw		12·5	347	3 6a	+ 4	e 5 43	SS	3 14	PP	6·8
Prague		12·6	325	e 3 15	+12	e 5 35	+ 9	—	—	e 6·0
Chur		13·4	305	e 3 13a	− 1	—	—	—	—	e 7·7
Cheb		13·6	321	e 4 57	?	e 6 8	+18	—	—	e 7·0
Zürich		14·2	306	e 3 21	− 3	e 6 1	− 3	—	—	—
Jena		14·5	322	e 3 37	PP	e 6 31	SS	e 6 35	SSS	e 7·8
Stuttgart		14·5	312	e 3 26	− 2	e 6 8	− 3	e 3 36	PP	e 7·3
Basle		14·9	306	e 3 31	− 3	—	—	—	—	e 7·4
Neuchatel		15·1	303	e 3 34	− 2	—	—	—	—	e 7·8
Strasbourg		15·3	308	e 3 41	+ 2	e 6 44	SS	e 3 58	PP	e 7·7
Besançon		15·8	303	e 3 41	− 4	—	—	—	—	—
Clermont-Ferrand		17·4	296	i 4 2	− 4	e 7 30	+11	—	—	9·6
Moscow		17·5	23	4 6	− 1	7 34	+13	—	—	—
Barcelona		17·8	282	4 6	− 5	7 31	+ 3	—	—	10·4
Copenhagen		17·8	335	3 39	−32	e 7 35	+ 7	—	—	9·3
Uccle		18·2	312	e 4 21	+ 5	e 7 49	+12	e 4 33	PP	e 9·0
De Bilt		18·4	317	i 4 21	+ 3	i 7 57	SS	—	—	e 9·3
Paris		18·6	304	i 4 19	− 2	i 7 54	+ 8	i 4 28	PP	i 9·3
Tortosa		19·1	279	i 4 21	− 6	7 56	− 1	4 36	PP	i 9·3
Helsinki		20·0	358	i 4 39	+ 2	e 8 27	+10	—	—	e 10·8
Alicante		20·3	273	i 4 39	− 1	i 8 29	+ 6	5 3	PP	10·5
Upsala		20·3	347	i 4 41k	+ 1	8 27	+ 4	5 1	PP	e 10·8
Kew		21·2	310	i 4 53	+ 4	e 8 49	+ 8	—	—	e 10·8
Almeria		22·2	270	i 4 52	− 8	i 8 48	−12	5 18	PP	13·0
Toledo	z.	22·7	278	i 5 3	− 1	e 8 47	−24	5 27	PP	—
Granada		22·9	271	i 5 3k	− 3	i 9 15	+ 2	5 19	pP	i 11·2
Durham		23·3	318	—	—	i 9 29	+ 9	—	—	—
Malaga	z.	23·7	271	i 5 11	− 3	i 9 59	+32	5 23	pP	13·8
Edinburgh		24·6	319	—	—	e 9 51	+ 9	—	—	—
Aberdeen		24·7	323	—	—	i 9 59	+15	—	—	—
Lisbon		26·8	278	—	—	10 16	− 3	—	—	12·4
Sverdlovsk		28·1	42	e 6 1	+ 6	e 10 45	+ 5	—	—	—
Tashkent		32·9	73	e 6 44	+ 6	e 12 6	+10	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Stalinabad		33·2	77	e 6 44	+ 4	e 12 5	+ 5	—	—	—
Andijan		35·2	74	e 7 8	+10	—	—	—	—	—
Irkutsk		53·2	49	e 9 17	− 5	e 17 10	+18	—	—	—

Additional readings :—
Bucharest iP*N = 1m.36s., iP*E = 1m.40s., iP$_g$EN = 1m.51s., iE = 2m.10s., iS?N = 2m.29s., iS?E = 2m.34s., iS*EN = 2m.58s., iS$_g$E* = 3m.14s.
Belgrade i = 2m.9s., e = 2m.33s.
Kalossa eS?E = 4m.13s., iN = 4m.16s., eE = 4m.26s., eN = 4m.29s.
Budapest SE = 4m.3s., iE = 4m.28s.
Zagreb eNE = 2m.25s., e = 2m.37s., eNE = 4m.31s., e = 4m.50s., iZ = 5m.3s.
Warsaw eSSE = 6m.4s.
Strasbourg iP = 3m.44s., eS = 6m.49s., eSS? = 7m.2s.
Uccle iE = 7m.54s.
Tortosa PPPN = 4m.46s.
Alicante PPP = 5m.9s., SS = 8m.49s., SSS = 9m.13s., P$_c$S = 11m.46s.
Upsala SSE = 9m.23s.
Almeria PPP = 5m.32s., P$_c$S = 12m.26s.
Granada PP = 5m.35s., PPP = 5m.54s., sS = 9m.36s., SS = 10m.6s., SSS = 10m.34s.
Malaga PPZ = 6m.13s., P$_c$PZ = 8m.11s., S$_c$PZ = 11m.7s.
Long waves were also recorded at Bergen and Potsdam.

April 12d. 16h. 10m. 42s. Epicentre 40°·2N. 25°·6E. (as at 14h.).

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Istanbul		2·8	72	0 44	− 3	1 20	− 2	—	—	—
Bucharest		4·2	5	e 1 12	+ 5	i 2 4	+ 5	—	—	—
Belgrade		6·0	322	i 1 54	P*	i 3 14	S$_g$	e 2 6	P$_g$	—
Kalossa	E.	7·9	325	—	—	e 4 9	S$_g$	—	—	e 4·5
Budapest		8·7	329	—	—	4 20	S*	4 25	?	e 5·0
Zagreb		9·0	312	(e 2 13)	0	(e 3 56)	− 2	(e 2 29)	PPP	—
Zürich		14·2	306	—	—	e 5 32	−32	—	—	—
Stuttgart		14·5	312	e 3 28	0	—	—	—	—	e 7·3
Strasbourg		15·3	308	e 3 40	+ 1	—	—	—	—	e 8·3
Paris		18·6	304	e 3 18	−63	—	—	—	—	e 9·3

Additional readings and note :—
Bucharest eE = 1m.42s., iEN = 2m.34s., iE = 2m.45s. and 3m.15s.
Belgrade iSS = 3m.45s.
Zagreb readings reduced by 1m.
Long waves were also recorded at other European stations.

April 12d. Readings also at 2h. (near Leninakan), 4h. (near Reykjavik), 8h. (near Mizusawa), 9h. (Istanbul and Bucharest), 12h. (Weston), 16h. (Bucharest, Warsaw, Belgrade, Triest, Prague, Cheb, De Bilt, Copenhagen, Kew, and near Istanbul), 20h. (Bucharest and near La Paz), 22h. (Belgrade, Mineral, and near Boulder City), 23h. (Calcutta, near Tucson, and near Shasta Dam (2), Branner, Berkeley (2), Mineral, Lick (2), San Francisco, and near Fresno (2)).

April 13d. 3h. 46m. 46s. Epicentre 30°·9S. 72°·0W. (as on 1943, June 23d.).

Intensity VII between latitudes 29°S. and 30°S. Macroseismic radius 300km.

F. Greve.
" Lista de sismos sensibles al hombre obtenidos par el servicio de postales informativas. Año 1947." Instituto sismológico de la Universidad de Chile, p. 6.

A = + ·2656, B = − ·8175, C = − ·5110 ; δ = − 3 ; h = + 2 ;
D = − ·951, E = − ·309 ; G = − ·158, H = + ·486, K = − ·860.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Santa Lucia	E.	2·8	152	0 56	P$_g$	1 12	−10	1 38	S$_g$	1·0
Montezuma		8·7	19	—	—	e 3 27	−23	—	—	e 3·8
La Plata	E.	12·5	112	3 6	+ 4	5 8	−15	—	—	5·7
	N.	12·5	112	3 14	+12	i 5 15	− 8	—	—	5·8
	Z.	12·5	112	3 9	+ 7	—	—	—	—	5·6

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
La Paz		14·8	15	i 3 27a	− 5	i 6 6	−12	i 3 42	pP	7·6
Huancayo		19·0	351	i 4 20	− 6	e 7 39	−16	—	—	i 8·1
Bogota		35·4	358	i 6 58	− 2	e 12 15	−19	—	—	e 18·0
San Juan		49·3	9	e 8 58	+ 5	e 15 41	−18	—	—	e 18·6
St. Louis		71·2	346	i 11 8	−15	i 20 18	−22	i 11 21	pP	—
Tucson		72·8	327	i 11 30	− 2	—	—	—	—	—
Weston		72·9	1	e 11 31	− 2	—	—	—	—	e 38·6
Harvard	z.	73·0	1	i 11 30	− 3	—	—	i 11 49	pP	—
La Jolla	z.	76·5	323	e 11 54	0	—	—	—	—	—
Boulder City		77·7	326	i 12 0	0	—	—	—	—	—
Overton		78·0	327	i 11 59	− 3	—	—	—	—	—
Mount Wilson	z.	78·0	323	i 12 2	0	—	—	i 12 16	pP	—
Pasadena	z.	78·1	323	i 12 2	0	—	—	—	—	—
Santa Barbara	z.	79·1	322	i 12 8	0	—	—	—	—	—
Haiwee		79·5	325	i 12 10	0	—	—	—	—	—
Tinemaha		80·3	325	i 12 15a	+ 1	—	—	i 12 31	pP	—
Lick		82·2	323	e 12 14?	−10	—	—	e 16 14?	PP	—
Berkeley		83·0	323	i 12 28	0	e 22 44	− 3	—	—	e 39·4
Shasta Dam		85·1	325	i 12 37	− 2	—	—	—	—	—
Grand Coulee		89·1	331	e 12 57	− 1	—	—	—	—	—
Granada		93·2	48	—	—	i 24 42	+19	i 39 45	Q	46·9
Stuttgart	z.	107·2	44	e 18 39?	PP	—	—	—	—	e 52·2
Helwan	z.	115·2	70	e 18 6	[−37]	—	—	—	—	—

Additional readings :—
La Paz iZ =4m.26s.
Bogota iN =7m.8s.
St. Louis isSN? =20m.47s.
Long waves were also recorded at other European stations.

April 13d. 17h. 32m. 5s. Epicentre 37°·1N. 138°·1E.

Intensity VII-VIII at Kamihayakawa (Niigata prefecture); VI at No, Sunaba, Akakura (Niigata pref.); V at Takada; IV at Husiki, Nagano, Toyama, Wazima; II-III at Hukui, Takayama, Matsumoto, Maebasi, and Hikone. Landslides.
Epicentre as adopted. Shallow. Macroseismic radius 200-300km.

Seismo. Bull. Cent. Met. Obs., Japan for 1947, Tokyo, 1950, pp. 21, 22 with macroseismic chart.

$A = -\cdot5951$, $B = +\cdot5339$, $C = +\cdot6006$; $\delta = -9$; $h = -1$;
$D = +\cdot668$, $E = +\cdot744$; $G = -\cdot447$, $H = +\cdot401$, $K = -\cdot800$.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Nagano	0·4	170	0 9a	− 4	0 13	− 8	—	—	—
Toyama	0·9	240	0 18k	− 2	0 30	− 4	—	—	—
Wazima	1·0	285	0 21k	0	0 32	− 4	—	—	—
Maebasi	1·1	138	0 0a	−22	0 11	−28	—	—	—
Kumagaya	1·4	133	0 26	− 1	0 53	+ 7	—	—	—
Utunomiya	1·5	111	0 30k	+ 2	0 50	+ 1	—	—	—
Hunatu	1·7	161	0 31	0	0 52	− 2	—	—	—
Tukubasan	1·8	119	0 32	0	0 56	0	—	—	—
Kakioka	1·9	117	0 33	− 1	0 55	− 4	—	—	—
Tokyo	2·0	137	0 40	+ 5	1 6	+ 4	—	—	—
Gihu	2·0	212	0 36a	+ 1	1 3	+ 1	—	—	—
Hukusima	2·0	71	0 39k	+ 4	1 6	+ 4	—	—	—
Mito	2·0	111	0 38k	+ 3	1 3	+ 1	—	—	—
Misima	2·1	161	0 38	+ 1	1 5	+ 1	—	—	—
Nagoya	2·1	205	0 37a	0	1 14	S_g	—	—	—
Shizuoka	2·1	174	0 37a	0	1 8	S_g	—	—	—
Yokohama	2·1	143	0 37	0	1 9	S_g	—	—	—
Onahama	2·2	94	0 42	+ 4	1 13	S_g	—	—	—
Hikone	2·4	219	0 41	0	1 16	+ 4	—	—	—
Omaesaki	2·5	178	0 35k	− 8	1 5	− 9	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Sendai		2·5	62	0 43	0	1 16	+ 2	—	—	—
Mera		2·6	147	0 45	+ 1	1 19	+ 2	—	—	—
Osima		2·6	156	0 46	+ 2	—	—	—	—	—
Kyoto		2·8	223	0 53	+ 6	1 22	0	—	—	—
Akita		3·0	31	0 53	+ 3	1 28	+ 1	—	—	—
Mizusawa		3·1	50	0 59	P_g	1 43	S_g	—	—	—
Kobe		3·4	226	1 3	P*	1 37	0	—	—	—
Owase		3·4	208	0 53	− 2	1 48	S*	—	—	—
Morioka		3·5	42	1 2	P*	1 52	S*	—	—	—
Sumoto		3·8	224	1 3	+ 2	1 55	+ 8	—	—	—
Siomisaki		4·1	208	1 8	+ 3	2 4	+ 9	—	—	—
Hirosima		5·3	241	1 38	P*	2 59	S_g	—	—	—
Hamada		5·4	248	1 24	0	3 5	S_g	—	—	—
Mori		5·4	20	1 24	0	—	—	—	—	—
Sapporo		6·4	22	1 45	+ 7	3 5	+12	—	—	—
Kumamoto		7·4	237	1 55	+ 3	—	—	—	—	—
Kagosima		8·3	231	1 53	−11	—	—	—	—	—
Grand Coulee		71·1	43	e 11 20	− 2	—	—	—	—	—
Shasta Dam		73·2	51	i 11 33	− 2	—	—	—	—	—
Tinemaha	z.	77·9	52	i 12 0	− 1	—	—	—	—	—
Santa Barbara	z.	78·5	55	i 12 4	0	—	—	—	—	—
Haiwee	z.	78·7	53	i 12 3	− 3	—	—	—	—	—
Pasadena	z.	79·7	54	i 12 10	− 1	—	—	—	—	—
Mount Wilson	z.	79·8	54	i 12 11	− 1	—	—	—	—	—
Overton		80·6	50	i 12 15	− 1	—	—	—	—	—
Jena		80·6	328	e 12 14	− 2	—	—	—	—	—
Boulder City		80·7	51	i 12 16	0	—	—	—	—	—
Pierce Ferry		81·2	50	i 12 18	− 1	—	—	i 15 18	PP	—
Stuttgart		83·2	329	e 12 28a	− 1	—	—	—	—	e 46·9
Strasbourg		83·9	329	e 12 32	− 1	—	—	—	—	e 47·7
Tucson		85·7	52	i 12 41	− 1	—	—	—	—	—
Paris		85·8	332	e 12 41	− 1	—	—	i 17 31	PPP	e 50·9

Tucson gives also e = 13m.4s.
Long waves were also recorded at other European stations.

April 13d. Readings also at 2h. (Haiwee, Mount Wilson, Pasadena, Palomar, Tinemaha, Shasta Dam, Tucson, Berkeley, and Mizusawa), 9h. (Upsala, Branner, near Berkeley and Lick), 10h. (near Granada (5)), 12h. (Strasbourg and Stuttagrt), 13h. (Pasadena, Palomar, Santa Barbara, Tinemaha, Tucson, Pierce Ferry, and Shasta Dam), 16h. (near Almeria, Malaga, and Toledo), 18h. (Pierce Ferry and near Boulder City), 19h. (La Paz and near Fort de France), 22h. (near Pierce Ferry).

April 14d. 3h. Undetermined shock.

Wellington S? = 7m., LZ = 12m.
Riverview iPZ = 7m.45s.s, iPPPZ = 8m.23s., eQE = 12m.8s., iSSN = 12m.21s., eLZ = 12·9m.
Hyderabad ePN = 19m.23s., eSN = 29m.30s., LN = 45m.24s.
Huancayo e = 19m.55s. and 35m.56s., eL = 45m.35s.
La Paz eP?E = 20m.40s., S?N = 30m.10s., LN = 49m.36s.
Weston e = 23m.20s., 35m.20s. and 64m.10s.
Rome ePKP? = 23m.42s., eE = 34m.34s., eSS? = 46m.14s.
Stuttgart eP?Z = 24m.8s.?, eL? = 87m.
Helwan eZ = 25m.15s. and 27m.6s.
Bermuda e = 26m.20s. and 33m.18s., eL = 63m.19s.
Strasbourg e = 26m.24s., 29m.36s., 48m.36s., 54m.0s., and 62m.30s., eL = 70·5m.
La Plata N = 26m.30s. and 32m.18s., E = 38m.0s., LE = 42·1m.
Bombay eEN = 26m.43s.
Cheb e = 31m.,34m.17s., 36m.53s., 44m.50s., and 54m., eL = 91m.
Paris e = 31m. and 59m., eL = 87m.
Alicante eP? = 35m.19s., PP = 39m.27s., PPP = 41m.43s., SKS = 46m.15s., eS = 47m.39s., SS = 54m.15s., SSS = 58m.7s., eL = 68m.7s.
Helsinki e = 36·2m., eL = 48m. readings given at 4h.
De Bilt e = 39m.
Santa Lucia N = 42m.
Granada S = 47m.44s., SS = 53m.41s., SSS = 58m.5s., L = 77·5m.
Almeria S? = 47m.49s., L = 73m.
Uccle eSSE = 48m.52s., eL = 71m.
Tortosa eSSS?N = 54m.33s., eLE = 69m.
Berkeley eEN = 57m.48s.
Long waves were also recorded at Arapuni, Auckland, Tananarive, Colombo, Harvard, Philadelphia, San Juan, and at other European stations.

April 14d. 7h. 15m. 29s. Epicentre 43°·6N. 148°·9E. (as on 1947, Jan. 20d.).

Intensity V at Keinebetsu, Shibetsu, Atsutoko, and Hokkaido; IV at Nemuro and Kushiro; II-III at Urakawa.
Epicentre 41°·2N. 149°·2E. Shallow. Macroseismic radius greater than 300km. (This determination appears to be in error).

Seismo. Bull. Cent. Met. Obs., Japan, 1947, Tokyo, 1950, pp. 22, 23.

$A = -·6221$, $B = +·3753$, $C = +·6872$; $\delta = +10$; $h = -3$;
$D = +·517$, $E = +·856$; $G = -·588$, $H = +·355$, $K = -·726$.

		△	Az.	P.	O − C.	S.	O − C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Nemuro		2·4	264	0 40	− 1	1 19	+ 7	—	—	—
Sapporo		5·5	267	1 27	+ 2	2 43	+13	—	—	—
Hatinohe		6·3	243	1 32	− 4	2 42	− 8	—	—	—
Mori		6·3	259	1 37a	+ 1	3 1	+11	—	—	—
Miyako		6·5	235	1 39	0	2 53	− 2	—	—	—
Morioka		7·0	238	1 45	− 1	2 57	−11	—	—	—
Mizusawa	E.	7·4	235	1 55	+ 3	3 21	+ 3	—	—	—
Akita		7·7	242	1 47	− 9	3 30	+ 5	—	—	—
Sendai		8·0	231	2 2	+ 2	3 40	+ 7	—	—	—
Hukusima		8·7	230	2 9	− 1	2 42	P_g	—	—	—
Onahama		9·0	225	3 5	+52	5 4	+66	—	—	—
Mito		9·7	224	2 35	+13	4 6	− 9	—	—	—
Kakioka		9·9	225	2 28	+ 3	4 12	− 8	—	—	—
Utunomiya		9·9	227	2 28	+ 3	3 17	− 3	—	—	—
Tukubasan		10·0	225	2 32	+ 5	3 37	−45	—	—	—
Maebasi		10·4	229	2 34	0	3 41	−51	—	—	—
Tokyo		10·6	224	2 41	+ 5	4 29	− 8	—	—	—
Yokohama		10·8	224	2 47	+ 8	4 44	+ 2	—	—	—
Wazima		11·0	240	2 42	0	4 45	− 2	—	—	—
Mera		11·2	222	3 14	+30	4 23	−29	—	—	—
Toyama		11·3	236	2 40	− 6	—	—	—	—	—
Misima		11·4	225	2 54	+ 7	—	—	—	—	—
Shizuoka		11·9	227	2 55	+ 1	5 10	+ 1	—	—	—
Omaesaki		12·2	226	3 22	+24	5 51	+35	—	—	—
Gihu		12·4	233	3 2	+ 1	—	—	—	—	—
Nagoya		12·5	231	2 45	−17	5 25	+ 2	—	—	—
Hikone		12·8	234	2 55	−11	5 41	+11	—	—	—
Kyoto		13·3	234	3 12	− 1	6 21	+39	—	—	—
Toyooka		13·5	238	3 16k	+ 1	—	—	—	—	—
Osaka		13·7	233	3 14	− 4	5 54	+ 2	—	—	—
Owase		13·7	230	3 29	+11	—	—	—	—	—
Kobe		13·9	234	3 20	− 1	6 20	+23	—	—	—
Sumoto		14·3	234	3 22	− 4	6 24	+18	—	—	—
Hamada		15·6	242	3 44	+ 1	7 1	+24	—	—	—
Hirosima		15·7	239	3 58a	+14	7 27	+48	—	—	—
Matuyama		15·9	237	3 49	+ 2	7 7	+23	—	—	—
Izuka		17·3	239	4 13	+ 9	—	—	—	—	—
Hukuoka		17·5	239	4 6	− 1	7 43	+22	—	—	—
Kumamoto		17·9	237	4 14k	+ 2	7 56	+26	—	—	—
Miyazaki		18·0	233	4 20	+ 7	7 46	+14	—	—	—
Unzendake		18·2	239	4 12	− 4	7 59	+22	—	—	—
Kagosima		18·8	236	4 27	+ 4	8 5	+15	—	—	—
Nanking		26·3	253	5 35	− 4	10 13	+ 2	—	—	13·0
Irkutsk		30·7	302	e 6 20	+ 1	i 11 34	+13	—	—	—
College		40·5	35	e 7 45	+ 3	e 13 43	− 9	e 8 40	?	e 16·4
Sitka		47·5	45	e 8 36	− 2	i 15 39	+ 5	i 11 51	PPP	e 20·9
Honolulu		49·2	98	e 9 24	+32	i 16 7	+ 9	i 18 58	S_eS	e 22·6
Almata		50·7	296	e 9 1	− 2	16 19	+ 1	—	—	—
Frunse		52·4	296	i 9 14	− 2	—	—	—	—	—
Calcutta	N.	53·7	267	e 8 59	−27	i 16 18	−41	16 52	PS	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Sverdlovsk		54·1	317	i 9 26	− 3	i 17 6	+ 1	—	—	—
Andijan		54·9	295	e 9 32	− 3	—	—	—	—	—
Dehra Dun	N.	56·5	282	—	—	e 18 0	+23	e 25 36	Q	e 32·2
Tashkent		56·6	297	9 44	− 3	e 17 36	− 2	—	—	—
Victoria		57·8	52	10 6	+11	18 2	+ 8	21 45	SS	27·5
New Delhi	N.	58·1	281	e 9 56	− 2	e 18 0	+ 2	19 55	SeS	—
Stalinabad		58·4	295	i 9 56	− 4	i 17 58	− 4	—	—	—
Samarkand		58·9	296	i 10 1	− 2	18 7	− 1	—	—	—
Grand Coulee		60·6	50	e 10 15	0	—	—	—	—	—
Ferndale		61·6	60	e 10 55	+33	e 18 53	+10	—	—	e 30·1
Shasta Dam		62·7	58	i 10 30	+ 1	e 18 54	− 3	e 39 31	P′P′	—
Mineral	E.	63·4	58	e 10 37	+ 3	e 19 9	+ 3	—	—	—
Hyderabad	E.	64·1	269	10 44	+ 6	20 44	?	23 37	SS	32·2
	N.	64·1	269	e 10 39	+ 1	19 33	PS	13 9	PP	—
Berkeley		64·4	61	i 10 42	+ 2	e 19 19	+ 1	—	—	e 26·7
San Francisco		64·4	61	e 11 4	+24	e 19 21	+ 3	—	—	e 34·5
Saskatoon		64·6	41	10 37	− 4	19 13	− 8	23 35	SS	31·5
Branner		64·7	61	e 10 31?	−11	e 19 31?	+ 9	—	—	e 29·5
Santa Clara		64·9	61	e 10 47	+ 4	e 19 54	PS	—	—	e 30·0
Lick	E.	65·1	61	e 10 50	+ 5	e 19 34	+ 7	—	—	e 29·6
	N.	65·1	61	e 10 47	+ 2	e 19 21	− 6	—	—	e 27·7
Butte		65·3	48	e 10 56	+10	e 19 31	+ 2	e 13 33	PP	e 26·4
Scoresby Sund		66·0	357	10 53	+ 3	19 39	+ 1	20 0	PS	27·5
Bozeman		66·4	48	e 10 53	0	i 19 40	− 3	e 13 33	PP	e 27·3
Fresno	N.	66·7	60	e 11 1	+ 6	e 20 7	+21	—	—	e 32·5
Helinski		66·9	334	i 10 59	+ 3	e 19 45	− 4	e 12 46	PP	e 30·5
Bombay		67·3	274	e 10 56	− 3	e 20 9	+15	24 34	SS	32·9
Tinemaha		67·4	59	i 11 2a	+ 3	e 20 3	+ 8	e 39 20	P′P′	—
Haiwee		68·2	60	i 11 6	+ 2	—	—	e 39 28	P′P′	—
Salt Lake City		69·0	53	e 11 34	+25	e 20 33	+19	i 21 40	SeS	e 28·0
Baku		69·1	306	11 14	+ 4	—	—	—	—	—
Mount Wilson	Z.	69·3	61	i 11 13a	+ 2	—	—	e 39 19	P′P′	—
Pasadena		69·3	61	i 11 11a	0	e 20 9	− 8	e 39 20	P′P′	e 27·9
Upsala		69·4	336	11 12a	0	i 20 14	− 4	15 16	PPP	e 31·5
Grozny		69·6	310	i 11 13	0	20 21	0	e 21 13	PPS	—
Kodaikanal	E.	69·6	265	e 11 15	+ 2	e 20 25	+ 4	13 45	PP	34·2
Riverside	N.	69·9	61	e 11 34	+19	—	—	—	—	—
Colombo	E.	70·1	260	11 23	+ 7	20 26	− 1	—	—	34·8
Overton		70·2	58	i 11 17	0	—	—	e 39 13	P′P′	—
Boulder City		70·3	58	i 11 17	0	e 20 31	+ 2	—	—	—
Piatigorsk		70·5	313	—	—	e 21 24	PPS	—	—	—
La Jolla		70·7	62	e 11 22	+ 2	—	—	—	—	—
Palomar		70·7	62	i 11 21a	+ 1	i 20 36	+ 2	e 39 15	P′P′	—
Pierce Ferry		70·7	58	i 11 21	+ 1	e 20 33	− 1	—	—	—
Rapid City		71·6	45	e 11 25	0	e 20 39	− 5	e 14 36	PP	e 29·1
Erevan		72·3	308	e 11 29	0	22 5	PPS	—	—	—
Leninakan		72·3	309	11 31	+ 2	e 20 55	+ 3	i 12 9	PeP	—
Denver		73·6	50	e 11 45	+ 8	—	—	14 49	pPP	33·5
Copenhagen		74·4	336	i 11 37	− 5	e 21 13	− 3	21 58	PS	35·5
Simferopol		74·5	318	e 11 43	+ 1	—	—	—	—	—
Warsaw	E.	74·5	330	11 46	+ 4	21 16	− 1	16 33	PPP	e 36·5
	N.	74·5	330	11 49	+ 7	21 11	− 6	14 13	PP	e 37·5
	Z.	74·5	330	11 40a	− 2	21 32	PS	14 28	PP	e 37·5
Ivigtut		74·6	9	11 43	0	21 20	+ 2	—	—	32·5
Yalta		75·0	317	e 11 43	− 2	e 21 23	0	—	—	—
Tucson		75·2	59	i 11 47	+ 1	e 21 36	+11	i 14 46	PP	e 31·3
Aberdeen		76·7	344	i 11 56	+ 1	i 21 38	− 3	i 27 6	SS	42·9
Potsdam	E.	77·1	334	i 11 57	0	i 21 41	− 5	—	—	e 34·5
	N.	77·1	334	e 12 0	+ 3	i 21 45	− 1	i 12 4	pP	e 36·5
Riverview		77·2	178	i 12 7a	+10	i 22 3	+16	i 12 26	pP	e 37·3
Lincoln		77·3	45	—	—	e 21 44	− 4	e 27 0	SS	e 31·6
Edinburgh		78·1	344	—	—	21 59	+ 3	e 21 35	SKS	—
Bucharest		78·6	322	e 12 15	+10	e 22 4	+ 2	—	—	34·5
Prague		78·6	332	e 12 7	+ 2	e 21 59	− 3	e 28 7	SS	e 35·5

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		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Durham		78·8	343	—	—	i 22 4	0	—	—	—
Jena		78·8	334	e 12 3	− 3	e 21 56	− 8	e 22 19	PS	—
Budapest		79·1	328	e 12 6	− 2	22 2	− 5	e 15 8	PP	e 35·5
Cheb		79·3	334	e 12 17	+ 8	i 22 21	+12	e 15 21	PP	e 37·5
De Bilt		79·7	339	i 12 10a	− 1	i 22 0	−13	e 22 48	PS	e 35·5
Istanbul		79·8	318	e 12 6	− 6	e 21 54	−20	—	—	—
Kalossa	N.	79·9	328	e 12 16	+ 4	—	—	e 14 45	PP	—
Belgrade		80·7	325	i 12 11	− 5	i 22 25	+ 1	16 15	PPP	e 32·5
Chicago		81·0	39	e 12 16	− 2	e 22 24	− 3	e 15 41	PP	e 32·7
Uccle		81·2	339	e 12 16a	− 3	i 22 27	− 2	i 12 25	pP	e 38·5
Stuttgart		81·4	334	i 12 18a	− 2	i 22 35	+ 4	i 15 35	PP	e 37·5
Kew		81·6	341	i 12 23k	+ 2	i 22 36	+ 3	e 15 33	PP	e 39·5
Zagreb		81·7	329	e 12 15	− 7	e 22 31	− 3	e 12 22	PcP	e 38·2
Ksara		81·7	309	e 12 28	+ 6	22 49?	+15	—	—	—
Florissant		82·0	42	i 12 25	+ 2	i 22 33	− 4	i 12 40	pP	—
Strasbourg		82·1	335	i 12 21a	− 3	e 22 37	− 1	e 15 22	PP	e 37·2
Triest		82·6	330	e 12 30	+ 4	e 22 37	− 6	e 15 46	PP	e 39·5
Ottawa		82·9	29	12 27	− 1	22 49	+ 3	15 31	PP	40·5
Zürich		82·9	334	e 12 24a	− 4	e 22 39	− 7	—	—	—
Basle		83·0	334	e 12 26a	− 2	e 22 48	+ 1	—	—	—
Chur		83·0	333	e 12 26a	− 2	e 22 47	0	—	—	—
Shawinigan Falls		83·0	27	12 30	+ 2	23 3	+16	—	—	43·5
Seven Falls		83·1	25	12 21	− 8	22 44	− 4	e 34 37	Q	40·5
Paris		83·4	338	i 12 29a	− 1	(i 23 1)	+10	e 15 34	PP	e 41·5
Auckland		83·5	158	23 8	ScS	23 34	PS	27 37	SS	39·0
Neuchatel		83·7	334	e 12 31a	− 1	e 22 43	−11	—	—	—
Arapuni		84·8	158	—	—	36 19	?	—	—	41·1
Florence		85·1	330	i 12 39	0	i 23 11	+ 3	i 32 38	SSS	—
Clermont-Ferrand		86·0	336	i 12 43	0	i 23 25	+ 8	e 16 13	PP	39·0
Pennsylvania		86·0	34	e 12 41	− 2	e 23 9	[+ 2]	e 16 9	PP	—
Rome		86·3	328	i 12 41a	− 4	23 15	− 5	i 12 53	PcP	40·7
Harvard		86·9	29	e 12 49	+ 1	e 23 33	+ 7	e 23 18	SKS	e 46·5
Weston		87·1	29	i 12 49	0	i 23 23	− 5	e 29 13	SS	e 39·2
Helwan		87·2	309	e 20 19	?	23 13	[− 2]	—	—	—
Fordham		87·5	30	e 12 51	0	i 23 30	− 1	e 16 37	PP	—
Halifax		87·5	22	—	—	e 23 30	− 1	e 28 49	SS	42·5
Philadelphia		87·8	32	e 12 59	+ 7	e 23 21	[+ 2]	e 16 13	PP	e 38·8
Georgetown		87·9	34	e 12 54	+ 1	e 23 55	ScS	e 29 30	SS	—
Mobile		89·5	46	13 20	+20	—	—	—	—	—
Barcelona		90·2	336	e 12 11	−53	23 59	+ 3	18 26	PPP	e 41·1
Columbia		90·3	40	e 13 0	− 4	e 23 54	− 3	e 16 48	PP	e 37·0
Tortosa		91·3	335	13 8	− 1	23 55	−11	13 13	PcP	41·4
Toledo	Z.	93·4	339	i 13 12	− 6	30 23	SS	16 47	PP	—
Alicante		93·8	336	e 13 28	+ 8	23 50	[− 5]	19 30	PPP	i 40·8
Lisbon		95·7	343	13 36	+ 7	24 24	{+ 1}	17 26	PP	45·9
Almeria		95·8	337	i 13 31	+ 2	i 24 37	− 8	i 24 1	SKS	43·5
Granada		95·8	338	i 14 28	+59	24 22	[+17]	i 35 5	SSS	i 46·8
Malaga	Z.	96·4	339	13 36	+ 4	23 59	[−10]	17 13	PP	50·0
Bermuda		98·4	28	e 13 36	− 5	i 25 11	+ 4	e 17 49	PP	e 40·7
San Juan		110·5	35	e 19 15	PP	e 26 54	S	e 28 56	PS	e 45·4
Fort de France		115·8	33	—	—	—	—	e 36 15	SS	—
Bogota		118·4	50	e 18 53	[+ 3]	i 29 33	PS	i 20 25	PP	—
Huancayo		130·7	63	e 22 13	?	e 22 59	PKS	39 7	SS	e 54·7
La Paz		138·6	60	i 19 38	[+10]	26 23	[−14]	23 15	PKS	65·0
Santa Lucia		147·7	86	20 2	[+18]	43 56	SSP	—	—	68·8
La Plata	E.	157·6	74	25 1	PP	30 43	{−17}	42 49	SS	73·7
	N.	157·6	74	24 55	PP	43 55	SS	53 55	?	73·9

Additional readings :—
Sitka iSS = 18m.52s.
Honolulu eSS = 20m.17s.
Calcutta iSS = 19m.46s., SSS = 21m.11s.
Victoria i = 24m.23s.
New Delhi SSN = 22m.8s.
Ferndale eSN = 18m.56s., eN = 27m.37s.
Shasta Dam i = 10m.45s. and 10m.59s.

Continued on next page.

Hyderabad SSN =23m.20s.
Berkeley iEZ =10m.54s., eE =10m.57s., iN =11m.3s., iZ =18m.26s., iSN =19m.24s.
San Francisco eE =20m.8s.
Saskatoon SSS =25m.49s.
Butte eSS =23m.39s.
Scoresby Sund 20m.25s. and 21m.2s.
Bozeman eSS? =23m.46s.
Helsinki ePPP =14m.59s., eP$_c$S =15m.33s., eSS =24m.32s., eSSS =26m.52s.
Bombay SSE =24m.37s.
Tinemaha iZ =11m.13s.
Haiwee iZ =11m.19s.
Salt Lake City e =14m.55s., eSS? =24m.30s.
Pasadena iZ =11m.24s.
Upsala iS$_c$SE =21m,2s., eN =21m.30s., eSSE =24m.55s., SSN =25m.2s., eSSS = 27m.31s.
Kodaikanal SSE =24m.50s.
La Jolla eZ =11m.36s.
Palomar iNZ =11m.34s., iZ =12m.38s.
Rapid City ePPP? =16m.21s., eSS =25m.9s.
Warsaw PPP?Z =16m.41s., PPSN =21m.52s., SSN =26m.20s., SSE =26m.24s., SSSE = 28m.52s., eE =30m.16s., eN =30m.36s.
Tucson ePPP =16m.40s., i =19m.45s., eS$_c$S =22m.25s., iSS =26m.35s., eSSS =29m.53s
Aberdeen iE =32m.22s.
Potsdam isSN =22m.5s., iPSN =22m.20s.
Riverview iP$_c$PNZ =12m.17s., iS$_c$SEN =22m.20s., eE =22m.23s., iE =26m.20s., iSSN =27m.10s., eE =29m.55s., iSSSN =30m.28s., eQE =32m.25s.
Lincoln eSSS =30m.7s.
Prague e =12m.11s., eSSS =31m.13s.
Durham iEN =22m.12s.
Jena eSE =22m.1s., ePSN =22m.41s. and 27m.19s.
Budapest iE =12m.15s., ePPE =15m.13s., SSE =27m.31s., SSN =28m.31s.?
Cheb e =14m.5s. and 16m.37s., ePPP =19m.13s., ePS =22m.51s., ePPS =24m.25s., e =26m.51s., eSS =28m.21s., eSSS =31m.48s.
De Bilt eSS =27m.31s.?
Kalossa eE =12m.19s. and 12m.47s.
Belgrade S$_c$S? =23m.13s., eSS =26m.58s., eSSS =29m.49s.
Chicago ePPP? =17m.32s., eSS =27m.39s.
Uccle iN =16m.27s., eN =18m.50s.
Stuttgart i =12m.24s., ipP?Z =14m.1s., iPPP =17m.7s., iSS =27m.55s.
Kew eZ =14m.5s., ePPPN =17m.13s.?, iPS =23m.32s., iPPS =23m.51s., eSSNZ = 28m.13s., eSSSNZ =32m.1s.?, eQ =35·5m.
Zagreb eP$_c$P =12m.29s., e =28m.25s., eNE =32m.7s.
Florissant isSN =22m.55s.
Strasbourg iP =12m.26s., e =13m.28s. and 14m.0s., ePP =15m.31s. and 15m.39s., ePPP =17m.26s., ePPPP =18m.57s., and 19m.0s., i =23m.0s., eSS =28m.28s.
Triest i =22m.58s., eSS =28m.58s., iSSS =32m.43s.
Ottawa SS =28m.39s., SSS =31m.49s.
Paris iP =12m.34s., i =12m.39s. and 12m.45s., e =14m.0s., iS =23m.12s., iPS? =23m.11s. iPPS? =24m.12s., iSS =28m.30s., Q =36·5m., the reading entered as S is given as S$_c$S?.
Auckland SSS? =31m.19s., Q =35m.31s.
Clermont-Ferrand i =12m.53s., ePPP =21m.58s., iS =23m.46s., iPS? =26m.22s., eSS =29m.43s., eSSS =33m.1s.
Pennsylvania iE =24m.29s., eSSE =28m.59s.
Rome i =13m.23s., and 23m.23s., PS =24m.7s., eSS =29m.3s.
Harvard iZ =12m.58s. and 13m.20s., eE =23m.42s. and 24m.12s., ePSZ =24m.23s., eZ =24m.45s.
Weston i =12m.59s., iS =23m.31s.
Helwan eZ =20m.31s.
Fordham iP =13m.0s.
Halifax e =34m.37s.
Philadelphia i =13m.13s., iS =23m.28s., eSS =29m.5s., eSSS =32m.42s.
Georgetown eSKS =23m.27s.
Barcelona PS =24m.19s.
Columbia ePS? =25m.10s., eSS? =30m.21s., eSSS =33m.32s.
Tortosa PPEN =16m.54s., PPPN =18m.44s., SKSEN =23m.45s., S$_c$SEN =24m.9s., PSN =25m.27s., PPSEN? =25m.44s., SS?N =29m.34s., SSSEN =34m.16s.
Alicante PPP =22m.10s., S? =25m.26s.
Lisbon E =24m.8s., PSN =26m.13s., SSEN =31m.7s., QE =38m.19s.
Almeria PP =17m.21s., PPP =19m.23s., SKKS =24m.19s., PS =25m.57s., PPS = 26m.31s., SS =30m.59s., SSS =34m.35s.
Malaga PP =14m.29s., PPSZ =25m.21s., QZ =44m.57s.
Bermuda ePS =26m.32s., ePPS? =27m.43s., eSS =32m.2s., eSSS =35m.50s.
San Juan eSS =34m.35s., eSSS =38m.53s.
Huancayo eSKSP =31m.56s.
La Paz iZ =19m.53s., iPP =22m.37s., PPPZ =25m.57s., SKKSE =29m.7s., iPPSZ = 34m.53s., iSSE =40m.47s., iSSS =45m.51s., Q =59m.3s.
La Plata SKSPE =34m.43s., SSS?E =53m.43s.
Long waves were also recorded at Wellington and Tananarive.

April 14d. 14h. Eastern Europe.

Rome P =54m.14s., P_g? =54m.22s., eN =54m.42s., eS =54m.54s., S_g =55m.8s., iN = 55m.34s.
Zagreb P =54m.33s., eS =56m.13s., e =56m.28s.
Belgrade iP =54m.53s., i =55m.21s. and 55m.48s., eS =56m.15s., e =57m.18s.
Chur eP? =55m.23s., e =58m.43s.
Florence i =55m.41s.
Stuttgart eP =55m.41s.?, eS? =59m.0s.
Triest e =55m.52s., eQ? =56m.47s.
Budapest eE =56m.40s., eN =57m.36s., LE =57m.45s.
Bucharest EN =57m. and 66m.
Zürich e =57m.14s.
Strasbourg eS? =57m.14s., e =58m.12s., eL =59m.33s.
Jena eN =58m.4s. and 59m.8s.
Basle e =58m.17s.
Istanbul e =59m.40s.
Potsdam eE =59m.54s., LE =60m.48s.

April 14d. 21h. 30m. 41s. Epicentre 48°·2N. 9°·0E. (as on 1944 May 25d.).

Intensity V-VI near Ebingen, Onstmettingen. Macroseismic area 30,000 sq. km. Epicentre 48° 15'N. 9°3'E. depth 15km.

W. Hiller: Die Erdbebentätigkeit in Sudwestdeutschland im Jahre 1947. Statistische Monatshefte, Württemberg-Baden, Heft 6, June 1949.

$A = +·6609$, $B = +·1046$, $C = +·7432$; $\delta = +8$; $h = -5$;
$D = +·156$, $E = -·988$; $G = +·734$, $H = +·116$, $K = -·670$.

	△	Az.	P.	O−C.	S.	O−C.	Supp.	
	°	°	m. s.	s.	m. s.	s.	m. s.	
Ebingen	0·0	—	i 0 3a	− 4	i 0 7	− 4	—	—
Stuttgart	0·6	13	i 0 10a	− 5	i 0 17	− 9	—	—
Strasbourg	0·9	295	i 0 18k	− 2	i 0 29	− 5	—	—
Zürich	0·9	198	e 0 18$_p$	− 2	e 0 32	− 1	—	—
Basle	1·2	235	e 0 22	− 2	e 0 38	− 3	—	—
Chur	1·4	165	i 0 27	0	i 0 48	+ 2	—	—
Neuchatel	1·8	229	e 0 31	− 1	e 0 59	+ 3	i 0 36	P_g
Besançon	2·2	243	e 0 43	+ 5	e 1 11	+ 5	—	—
Jena	3·2	32	i 0 58	+ 6	i 1 38	+ 6	i 1 7	P_g
Uccle	4·0	311	e 2 1?	S*	—	—	—	—
Clermont-Ferrand	4·7	236	e 1 31	P_g	—	—	—	—
Zagreb	5·3	113	e 1 48	P_g	e 2 57	S_g	—	—

Jena gives also i =1m.2s., iS_g =1m.41s.
Longwaves were recorded at Budapest and Potsdam.

April 14d. Readings also at 0h. (near Stalinabad), 2h. (Samarkand, Tashkent, near Andijan (2), Stalinabad, near Granada and near Lick), 6h. (Boulder City, Pierce Ferry, and Shasta Dam), 7h. (Mount Wilson, Pasadena, Palomar, Tinemaha, Tucson, Overton, Pierce Ferry, and near Mizusawa (2)), 8h. (Overton, Shasta Dam, and near Mizusawa), 9h. (Fresno), 10h. (Helsinki, Pierce Ferry, and near Mizusawa (2)), 11h. (Andijan, Samarkand, near Obi-garm, Stalinabad, and near Mizusawa), 13h. (Pierce Ferry, Stuttgart, and near Mizusawa), 14h. (Bogota and Istanbul), 15h. (Bombay), 16h. (Pierce Ferry, Shasta Dam, Fresno, Branner, near Berkeley, Lick, San Francisco, and Santa Clara), 18h. (near Mizusawa), 19h. (near Granada), 22h. (near Obi-garm, Samarkand, and Stalinabad), 23h. (Fort de France, near Bogota, and near Apia).

April 15d. Readings at 0h. (near Mizusawa), 2h. (near Boulder City and Pierce Ferry), 3h. (Pierce Ferry and near Apia), 5h. (near Mizusawa), 8h. (near Mineral), 11h. (Andijan and near Obi-garm, Stalinabad, and Samarkand), 12h. (Mizusawa and near Triest), 13h. (Tucson, Overton, Tinemaha, Pasadena, Palomar, Haiwee, Pierce Ferry, and near Andijan), 15h. (Granada and near Apia), 16h. (Strasbourg, Stuttgart, Shasta Dam, Tuscon, Boulder City, Haiwee, Palomar, Pasadena, Tinemaha, and near Mizusawa), 17h. (Cheb, Rome, and New Delhi), 18h. (Santa Lucia and La Plata), 21h. (near Almata, Frunse, and Andijan), 22h. (Shasta Dam, Grand Coulee, Pierce Ferry, Haiwee, Palomar, Pasadena, and Tucson.).

April 16d. 13h. 22m. 6s. Epicentre 38°·2N. 21°·5E.

Intensity VII at Antirrion and Rion; VI-VII at Patras and Missolonghi; weaker at Aighion, Amalada, Gastouni, Léhaina, and Pyrgos. (Letter from the French Consul at Patras).

Epicentre as adopted (Strasbourg).

$A = +\cdot7330$, $B = +\cdot2887$, $C = +\cdot6159$; $\delta = -3$; $h = -1$;
$D = +\cdot367$, $E = -\cdot930$; $G = +\cdot573$, $H = +\cdot226$, $K = -\cdot788$.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Istanbul	6·5	61	e 1 29	−10	e 3 32	S_g	—	—	
Belgrade	6·6	354	i 1 37	− 4	i 3 1	+ 3	i 2 13	P_g	i 3·4
Bucharest	7·1	28	e 1 48	0	e 3 8	− 2	i 3 51	S_g	e 3·4
Rome	7·8	301	e 1 52	− 6	e 3 36	+ 8	e 3 58	S*	e 3·8
Kalossa	8·5	348	e 2 9	+ 2	i 4 8	S*	e 2 24	PPP	e 6·0
Zagreb	8·6	333	e 2 9	0	e 4 3	+15	e 4 40	S_g	e 4·4
Budapest	9·4	350	2 19	+ 1	—	—	i 2 29	PP	6·0
Triest	9·4	325	e 2 23	+ 5	e 3 57	−10	—	—	e 5·2
Florence	9·6	308	i 2 28	+ 7	i 5 21	+69	—	—	—
Helwan	11·7	133	e 2 58	+ 7	e 5 0	− 4	—	—	—
Chur	12·3	318	e 2 54	− 5	e 5 9	− 9	—	—	—
Prague	12·9	340	e 3 6	− 1	e 5 32	− 1	—	—	e 6·4
Zürich	13·2	318	e 3 5	− 6	e 5 32	− 8	—	—	i 6·3
Basle	13·8	317	e 3 20	+ 1	e 6 12	SS	—	—	—
Neuchatel	13·8	314	e 3 16	− 3	—	—	—	—	e 7·9
Stuttgart	13·8	324	e 3 11	− 8	e 5 39	−15	—	—	e 8·0
Warsaw	14·0	359	e 3 25	+ 3	e 5 50	− 9	—	—	e 8·4
Strasbourg	14·4	321	i 3 32	+ 5	e 6 30	SS	e 6 38	SSS	—
Besançon	14·5	313	e 3 31	+ 3	e 6 2	− 9	—	—	—
Jena	14·5	334	e 3 42	PP	—	—	e 4 12	?	e 8·2
Clermont-Ferrand N.	15·6	305	e 3 44	+ 1	—	—	—	—	—

Additional readings :—
Bucharest eE = 2m.22s. and 3m.4s., iE = 4m.2s.
Kalossa eS?N = 5m.3s.
Zagreb e = 2m.51s. and 4m.31s.
Budapest PN = 2m.22s., iN = 5m.21s.
Warsaw eN = 6m.55s., eZ = 7m.4s., eE = 7m.9s., eZ = 7m.51s., cE = 7m.54s., eN = 7m.58s.
Strasbourg e = 3m.56s. and 8m.10s.
Long waves were also recorded at other European stations.

April 16d. Readings also at 6h. (Shasta Dam, Tinemaha, Haiwee, Pasadena, Overton, Palomar, Boulder City, Pierce Ferry, Tucson, and Mizusawa), 10h. (La Jolla, Pasadena, Palomar, Shasta Dam, Haiwee, Tinemaha, Boulder City, Overton, Pierce Ferry and Tucson), 11h. (Grand Coulee, Stuttgart, and Strasbourg), 14h. (near Andijan), 15h. (Almeria, Alicante, Zürich, and near Neuchatel), 17h. (near Apia and near Johannesburg), 18h. (Scoresby Sund), 20h. (Rome and Branner), 23h. (Brisbane).

April 17d. Readings at 0h. (Bucharest and Pierce Ferry), 2h. (Tortosa, Granada, Toledo, Rome, Triest, Bucharest, and La Paz), 3h. (Rome and Mizusawa), 5h. (Bucharest, Tucson, and Palomar), 6h. (Tchimkent, near Andijan, Stalinabad (2), Obi-garm (2), and Samarkand (2)), 7h. (Shasta Dam), 8h. (near Malaga and Toledo), 10h. (Belgrade, Santa Lucia, and near Obi-garm (2)), 11h. (near Tchimkent), 12h. (Istanbul, Rome, and Triest), 16h. (Tucson (2), Tinemaha (2), Pasadena, Palomar, Shasta Dam, and La Paz), 17h. (Almata, Stalinabad, Fresno, near Tashkent, Andijan, Obi-garm, and Tchimkent), 18h. (Branner), 19h. (near St. Louis and Florissant), 20h. (Strasbourg), 21h. (Pierce Ferry), 23h. (Fresno and near Lick).

April 18d. 10h. Heligoland Explosion.

A quantity of 3200 tons of high explosives were detonated on the Island of Heligoland under carefully controlled conditions. The time of the blast was 10h. 59m. 58s., and the geographical position 54°11′N. 7°53′E. All seismological recording stations and many provisional stations were ready to observe the ensuing earth waves.

The following references are to papers dealing with the results of the experiment.

J. P. Rothé.
L'inscription de l'explosion d'Heligoland dans les stations françaises. Comptes rendus de l'Academie des Sciences de Paris t. 224. 1947, pp. 1572-1574.

P. Willmore.
Seismic Experiments on the North German Explosions 1946-1947. Phil. Trans. Roy. Soc., London, Series A, No. 843, vol. 242, 1949, pp. 123-151.

Seismic Aspects of the Heligoland Explosion. Nature, London, 13 Sept. 1947, vol. 160, pp. 350, 351, with figure.

Fr. Gerecke.
Jenaer Beiträge zur Sprengung von Helgoland am 18. April 1947. Veröffentlichungen des Zentralinstitutes für Erdbebenforschung im Jena. Heft 51, pp. 57-60.

H. Reich, O. Foertsch, G. A. Schulze.
Results of Seismic Observations in Germany on the Heligoland Explosion of April 18 1947. J. Geophys. Res. U.S.A., 1951, vol. 56, No. 2, pp. 147-156.

P. Foertsch, G. A. Schulze.
Die seismischen Beobachtungen bei der Sprengung auf Helgoland am 18. April 1947, zur Erforschung des tieferen Untergrundes. Geol. Jahrbuch Deutschlands, 1943-1948, vol. 64, pp. 205-242, with 14 figures and three tables.

Observations are available from twelve regular seismolcgical stations in Europe. The known position of the focus 54°11′N. 7°53′E. (A = + ·5822, B = + ·0806, C = + ·8090) and time of blast 10h. 59m. 58s. are quoted.

The stations in order of distance from the focus, with their readings referred to the time 10h. 59m. 58s., are as below :—

De Bilt $\triangle = 2°·6$:
$iP_g = 52s.$, $iPP_g = 58s.$

Potsdam $\triangle = 3°·6$:
$eE = 1m.14s.$ (P_g), $eN = 1m.50s?$ (S^*).

Jena $\triangle = 4°·0$ $eE = 1m.0s.$

Uccle $\triangle = 4°·0$ $eP = 1m.3s.$

Cheb $\triangle = 5°·0$:
$eN = 1m.18s.$ (P), 1m.22s., 1m.30s. (P^*), $eE = 1m.35s.$ (P_g), $eN = 1m.48s.$, $eSE = 2m.13s.$, $eN = 2m.25s.$, $eE = 2m.50s.$ (S_g), $eN = 2m.55s.$, $eE = 3m.8s.$

Stuttgart $\triangle = 5°·5$:
$ePZ = 1m.22s.$, $eP^*? = 1m.29s.$, $eP_g? = 1m.39s.$ (P^*), $eZ = 1m.52s.$ (P_g), $eS? = 2m.14s.$ $eS^*? = 2m.36s.$ (S), $eS_g? = 2m.49s.$ (S^*).

Strasbourg $\triangle = 5°·6$:
$eP = 1m.24s.$, $e = 1m.37s.$ (P^*), $eS = 2m.27s.$, $e = 3m.11s.$ (P_g).

Prague $\triangle = 5°·8$:
$eZ = 1m.38s.$ (P^*), $e = 3m.32s.$, and 4m.26s.

Paris $\triangle = 6°·3$:
$eP = 1m.34s.$, $eP? = 1m.41s.$, $P_g = 2m.20s.$, $e = 2m.54s.$

Basle $\triangle = 6°·6$:
$eP = 1m.46s.$, $e = 3m.50s.$

Zürich $\triangle = 6°·8$:
$eP? = 1m.41s.$

Besançon $\triangle = 7°·1$:
$eL = 3m.58s.$

Neuchatel $\triangle = 7°·2$:
$eP? = 1m.45s.$

Chur $\triangle = 7°·4$:
$eP = 1m.49s.$

Clermont-Ferrand $\triangle = 9°·0$:
$eP = 2m,10s.$, $eS = 3m.50s.$, $e = 4m,3s.$, $eS_g = 4m,26s.$, $L = 4m,47s.$

April 18d. 14h. Probably New Hebrides or Loyalty Islands.

Wellington P? =28m.30s., PP =29m.29s., i =29m.51s., P_cP =31m.30s., S =33m.20s., L =35m.20s., ScS =39m.20s.
Brisbane iPE =28m.42s., eS?E =32m.0s.
Tuai PP? =29m.8s.
Riverview iPEZ =29m.37s.a, iSN =33m.35s., eQE =34m.12s., eSSN =34m.16s., eSSSN =34m.28s., eRN =34·7m.
Arapuni e =32m.12s., S? =34m.24s.
Auckland e =34m.
Shasta Dam eP =37m.47s.
Palomar iPZ =37m.49s.
Tinemaha iPZ =37m.54s., iZ =38m.12s.
Boulder City eP =38m.1s.
Tucson eP =38m.9s.
Jena eE =44m.35s., eN =45m.5s.
Zagreb e =44m.41s.
Stuttgart eZ =44m.43s.a, and 44m.52s.
Strasbourg i =44m.45s. and 44m.54s., e =45m.26s.
Basle e =44m.47s.
Zürich e =44m.50s.

April 18d. Readings also at 0h. (near Bogota), 1h. (Tucson), 2h. (Istanbul), 6h. (Shasta Dam), 9h. (Huancayo and Rome), 11h. (Boulder City and Tucson (2)), 12h. (Pasadena, Palomar, Tinemaha, Tucson, Pierce Ferry, Shasta Dam, and Wairiri), 13h. (near Andijan, Obi-garm, and Stalinabad), 14h. (near Andijan (2), Obi-garm (2), and Stalinabad (2)), 17h. (La Paz), 20h. (Auckland, Brisbane, Riverview, Strasbourg, and Stuttgart).

April 19d. 17h. 39m. 6s. Epicentre 37°·7N. 43°·5E., given by stations of U.S.S.R.

A = +·5754, B = +·5460, C = +·6090; δ = +8; h = −1;
D = +·688, E = −·725; G = +·442, H = +·419, K = −·793.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Erevan		2·6	17	0 46	+ 2	1 31	S_g	c 0 56	P_g	—
Leninakan		3·1	5	e 0 53	+ 2	1 54	S_g	i 1 3	P_g	—
Baku		5·7	60	1 33	+ 5	—	—	—	—	—
Grozny		5·9	16	1 38	+ 7	—	—	—	—	—
Sotchi		6·5	335	e 1 40	+ 1	—	—	—	—	—
Ksara		7·3	240	e 1 54	+ 4	3 23?	+ 8	—	—	—
Simferopol		10·1	319	e 2 28	0	—	—	—	—	—
Istanbul		11·6	291	e 2 47	− 3	i 6 23	SS_g	—	—	—
Helwan		12·8	236	i 3 6k	0	e 5 18	−12	3 22	PPP	—
Bucharest		14·7	303	2 54?	−37	—	—	—	—	—
Moscow		18·5	350	i 4 16	− 3	i 7 38	− 6	—	—	—
Belgrade		18·7	300	i 5 14	+52	e 8 7	+19	—	—	—
Stalinabad		19·9	79	i 4 38	+ 2	i 8 34	+19	—	—	—
Kalossa	E.	20·1	306	e 4 41	+ 3	—	—	—	—	—
Tashkent		20·2	71	4 38	− 1	e 8 30	+ 9	—	—	—
Budapest	E.	20·4	307	4 46	+ 5	e 8 54?	+29	—	—	13·4
Obi-garm		20·6	77	4 34	− 9	—	—	—	—	—
Warsaw		21·4	319	e 4 56	+ 5	8 56	+11	5 15	PP	e 12·9
Zagreb		22·0	301	e 4 55	− 3	—	—	—	—	—
Sverdlovsk		22·3	25	i 5 3	+ 2	i 9 9	+ 7	—	—	—
Andijan		22·5	74	e 5 6	+ 4	—	—	—	—	—
Triest		23·5	301	i 5 22	+10	i 9 28	+ 5	i 5 30	pP	—
Prague		24·1	311	e 5 19	+ 1	e 9 46	+12	—	—	—
Rome		24·1	291	i 5 16	− 2	9 41	+ 7	e 6 7	PPP	e 12·1
Frunse		24·2	67	i 5 24	+ 5	—	—	—	—	—
Florence		25·1	295	i 5 28	0	i 10 2	+11	—	—	—
Cheb		25·4	310	e 5 36	+ 5	i 10 18	+22	e 12 14	SS	e 14·9
Helsinki		25·4	339	(e 6 5)	PP	(e 9 24)	−32	—	—	e 9·4
Jena	N.	26·2	311	e 5 37	− 1	—	—	—	—	—
Chur		26·4	301	e 5 43	+ 3	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m. s.			m.
Stuttgart		27·1	306	e 5 44	− 2	e 10 46	+22	e 6 4	PP		e 15·9
Zürich		27·3	302	e 5 46k	− 2	—	—	—	—		—
Copenhagen		27·5	322	—	—	e 10 57	+27	—	—		15·9
Basle		28·0	302	e 5 57	+ 2	—	—	—	—		—
Strasbourg		28·0	305	e 6 30	PP	e 11 2	+24	—	—		e 17·9
Neuchatel		28·3	302	e 5 55	− 2	—	—	—	—		—
Alicante		34·4	286	6 47	− 4	12 46	+27	7 36	PP		e 14·4
Almeria		36·3	284	i 6 53	−14	12 23	−25	8 16	PP		—
Toledo	Z	36·8	289	i 7 9	− 2	i 12 11	−45	—	—		—
Granada		37·1	284	i 7 9	− 5	e 13 18	+17	8 45	PP		21·2
Malaga	Z	37·8	285	i 7 9	−11	i 11 54	−77	—	—		15·9

Additional readings :—
Erevan e P_gP_g =1m.0s.
Belgrade i =5m.54s. and 7m.22s., eSS =11m.31s., e =12m.18s.
Kalossa eN =4m.46s.
Budapest PN =4m.49s.
Warsaw eN =5m.34s., eE =8m.50s., SS?E =9m.59s.
Triest i =9m.38s., isS? =10m.17s.
Rome eSSE =10m.47s., iZ =11m.36s.
Helsinki readings are given as eS and eL respectively.
Jena eN =7m.0s., eE =7m.6s., eN =7m.19s.
Alicante eS =11m.30s.
Almeria PPP =8m.34s., PcS =13m.5s., PPS =15m.5s.
Granada SS =15m.40s.
Long waves were also recorded at De Bilt, Uccle, Kew, Upsala, and Clermont-Ferrand.

April 19d. 20h. 29m. 35s. Epicentre 38°·8N. 23°·2E.

A = +·7182, B = +·3078, C = +·6240; δ = −7; h = −1;
D = +·394, E = −·919; G = +·574, H = +·246, K = −·781.

		△	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m. s.			m.
Istanbul		5·1	62	e 1 5	−15	i 2 7	−13	—	—		—
Bucharest		6·0	21	e 1 27	− 5	i 3 3	S*	e 2 5	P_g		—
Belgrade		6·3	342	i 1 57	P*	i 2 22	−28	i 2 2	P_g		—
Kalossa		8·3	340	e 2 45	P_g	e 4 17	S*	e 4 41	S_g		5·4
Rome		8·8	294	e 2 15	+ 4	i 4 2	+ 9	3 43	?		4·8
Zagreb		8·8	325	e 2 8a	− 3	e 4 4	+11	e 2 18	PP		—
Budapest		9·2	342	2 36	PPP	5 6	S_g	e 4 53	SSS		5·4
Triest		9·8	317	e 2 42	PPP	i 4 18	+ 1	—	—		—
Simferopol		10·2	49	—	—	4 23	− 4	—	—		—
Florence		10·3	302	e 3 2	PPP	i 4 45	SS	—	—		—
Helwan		11·2	141	2 43	− 1	e 4 43	− 9	e 2 57	PPP		i 6·4
Ksara		11·4	112	e 2 50	+ 3	e 5 20	SSS	—	—		—
Chur		12·8	313	e 3 6	0	—	—	—	—		e 6·7
Prague		12·9	334	e 3 7	0	e 5 33	0	—	—		e 6·4
Warsaw		13·5	354	e 4 22	+67	e 6 3	SS	e 6 8	SSS		e 7·4
Cheb		13·7	329	—	—	e 5 59	+ 7	—	—		e 6·4
Zürich		13·7	313	e 3 19	+ 1	e 6 7	SS	—	—		—
Stuttgart		14·2	319	e 3 23	− 1	e 5 25	−39	—	—		e 7·3
Basle		14·3	312	e 3 35	PP	—	—	—	—		e 7·7
Neuchatel		14·4	310	e 3 23	− 4	—	—	—	—		e 8·1
Jena	N.	14·7	329	e 3 28	− 3	e 6 27	+11	—	—		e 7·8
Strasbourg		14·8	316	i 3 41	PP	—	—	i 3 53	PPP		—
Potsdam	N.	15·3	336	e 2 49?	−50	—	—	—	—		e 8·4
Barcelona		16·3	286	—	—	e 7 48	SSS	—	—		e 10·0
Clermont-Ferrand		16·4	301	i 3 58	+ 5	—	—	—	—		—
Erevan		16·5	78	e 4 5	PP	—	—	—	—		—
Grozny		17·6	68	e 4 7	− 1	—	—	—	—		—
Tortosa		17·6	284	4 9	+ 1	e 7 39	SS	4 25	PP		e 10·4
De Bilt		18·3	324	e 4 15	− 2	e 7 45	+ 6	—	—		e 9·4
Copenhagen		18·4	341	—	—	e 7 36	− 5	7 45	SS		9·6
Alicante		18·5	278	i 4 20	+ 1	i 7 50	+ 6	4 25	pP		e 10·0
Moscow		19·5	25	e 4 28	− 3	e 7 51	−15	—	—		—
Almeria		20·3	274	i 4 48	+ 8	8 40	+17	4 59	pP		11·7
Baku		20·6	77	4 49	+ 6	8 36	+ 7	—	—		—
Kew		20·8	317	i 3 31	?	i 8 37	+ 4	i 8 47	SS		—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Toledo	z.	21·1	282	i 4 51	+ 3	e 8 38	− 1	5 28	PPP	—
Granada		21·2	276	i 4 57a	+ 8	i 8 55	SS	5 34	PPP	i 10·5
Helsinki		21·4	2	e 4 49	− 2	e 8 47	+ 2	—	—	e 11·4
Upsala		21·4	353	e 5 8	+17	e 8 48	+ 3	e 8 52?	SS	e 11·4
Malaga	z.	21·9	275	i 4 56	− 1	i 9 47	SSS	—	—	14·4
Sverdlovsk		30·4	41	e 6 14	− 2	e 11 12	− 4	—	—	—
Stalinabad		35·3	75	e 6 58	− 1	—	—	—	—	—
Obi-garm		36·0	75	e 7 1	− 4	—	—	—	—	—

Additional readings :—
Bucharest eP*EN =1m.55s., iE =3m.0s., iS*EN =3m.22s.
Belgrade i =2m.6s. and 3m.41s.
Kalossa eE =4m.47s., eN =4m.54s., iE =5m.1s., eN =5m.7s.
Zagreb eZ =2m.35s., eNE =2m.42s., and 3m.1s., e =3m.8s., eSNE =4m.25s.
Budapest ePN =2m.46s.
Helwan iZ =5m.49s.
Warsaw eN =5m.14s.
Clermont-Ferrand i =4m.40s., 5m.25s., and 6m.11s.
Tortosa PPPN =5m.28s.
Alicante PP =4m.34s., PPP =5m.2s., PcP =8m.2s., SS =8m.30s., SSS =8m.46s.
Almeria PPP =5m.26s., sS =8m.56s., SS =9m.15s., SSS =9m.32s.
Kew eSEZ =7m.18s.
Granada PcP =8m.42s., SS =9m.33s.
Malaga PPZ =6m.4s., PcPZ =7m.58s., ScPZ =10m.24s.
Long waves were also recorded at Uccle, Durham, Aberdeen, Weston and Berkeley.

April 19d. Readings also at 1h. (Riverview, Pierce Ferry, and Nanking), 2h. (Pierce Ferry, Tucson, Shasta Dam, near Boulder City, Lick, and near Fresno), 5h. (Tucson, and near Granada), 7h. (Bogota and near La Paz), 9h. (Tchimkent, near Stalinabad, and Obi-garm), 10h. (Tucson, Shasta Dam, Tinemaha, Haiwee, Palomar, and Pasadena), 11h. (Strasbourg), 12h. (near Mineral), 14h. (Helwan and Ksara), 15h. (Stalinabad and near Obi-garm), 17h. (Pierce Ferry, Tucson, Stuttgart, Istanbul, and Mizusawa (2)), 18h. (Ksara, Samarkand, near Obi-garm, and Stalinabad, Chur, Zürich, Basle, Strasbourg, Rome, near Florence, Triest, and near Stuttgart), 19h. (Strasbourg and near Harvard), 20h. (near Tananarive), 21h. (Santa Lucia, Bucharest (2), and near Istanbul), 23h. (Ksara, Stuttgart, near Neuchatel, Zürich, and Basle).

April 20d. Readings at 4h. (Santa Lucia, La Plata, near Obi-garm, Samarkand, Stalinabad, and Tashkent), 5h. (Pasadena, Palomar, Tucson, Pierce Ferry, Shasta Dam, Tinemaha, and St. Louis), 6h. (Pasadena, Palomar, Tucson, Tinemaha, Pierce Ferry, and Shasta Dam), 8h. (Tashkent, near Obi-barm, Samarkand, and Stalinabad), 12h. (Santa Lucia), 14h. (near Tchimkent), 17h. (near Pierce Ferry), 20h. (near Almata, Frunse, Andijan, and Tashkent), 21h. (near Florence).

April 21d. 3h. 22m. 59s. Epicentre 0°·6S. 122°·3E.

A = −·5343, B = +·8452, C = −·0104; δ = −5; h = +7;
D = +·845, E = +534; G = +·006, H = −·009, K = −1·000.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Riverview		42·7	143	i 8 0a	0	i 14 24	0	e 9 40	PP	e 20·5
Colombo	E.	43·0	280	—	—	e 17 1?	SS	—	—	—
Kodaikanal	E.	45·9	285	e 8 26	0	—	—	—	—	—
New Delhi	N.	52·0	308	e 9 10	− 3	i 16 33	− 3	—	—	—
Irkutsk		54·8	346	9 34	0	17 14	0	—	—	—
Andijan		61·2	318	e 10 20	+ 1	e 18 38	0	—	—	—
Obi-garm		62·1	315	i 10 25	0	—	—	—	—	—
Stalinabad		62·6	315	i 10 29	+ 1	18 55	− 1	—	—	—
Tashkent		63·5	318	e 10 35	+ 1	e 19 9	+ 2	—	—	—
Sverdlovsk		75·4	330	11 46	− 1	—	—	—	—	—
Grozny		80·6	313	e 12 47	P_cP	—	—	—	—	—
Helwan		91·1	300	16 48	PP	e 24 11	+ 7	—	—	—
Stuttgart	z.	105·5	320	e 18 21?	PP	—	—	—	—	—

Additional readings :—
Riverview iP_cPZ =9m.46s., eSS?EN =17m.43s., iS_cSE =17m.59s.
New Delhi iN =17m.20s.
Long waves were also recorded at Wellington, Arapuni, Hyderabad, Copenhagen, Upsala, and Granada.

April 21d. 20h. 20m. 59s. Epicentre 0°·6S. 122°·3E. (as at 3h.).

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Riverview		42·7	143	—	—	e 14 21	− 3	e 17 32	SS	—
Kodaikanal	E.	45·9	285	e 8 28	+ 2	—	—	—	—	—
Hyderabad	N.	46·7	294	e 8 1	−31	15 19	− 3	19 6	SS	24·8
New Delhi	N.	52·0	308	—	—	i 16 24	−12	e 20 35	SS	—
Bombay		52·3	294	e 9 9	− 6	—	—	—	—	—
Irkutsk		54·8	346	9 28	− 6	17 12	− 2	—	—	—
Andijan		61·2	318	e 10 28	+ 9	—	—	—	—	—
Obi-garm		62·1	315	e 10 29	+ 4	—	—	—	—	—
Stalinabad		62·6	315	e 10 23	− 5	i 18 58	+ 2	—	—	—
Tashkent		63·5	318	—	—	e 18 56?	−11	—	—	—
Sverdlovsk		75·4	320	11 42	− 5	—	—	—	—	—

April 21d. Readings also at 0h., 1h. (2), and 2h. (near Granada), 6h. (Boulder City), 8h. (Stalinabad and near Obi-garm), 9h. (near Almeria), 10h. (Shasta Dam, near Lick, near Obi-garm, and Stalinabad), 15h. (Palomar, Tinemaha, and Tucson), 19h. (Bermuda, Shasta Dam, Overton, Tucson, Berkeley, near Fresno, and Lick), 23h. (Bunnythorp, near Kaimata, New Plymouth, and Wellington).

April 22d. Readings at 0h. (Tashkent, near Obi-garm, and Stalinabad), 1h. (Andijan, Tchimkent, near Stalinabad, and Obi-garm), 2h. (Branner, near Berkeley, San Francisco, and Lick), 3h. (near Pierce Ferry, near Obi-garm, and near Mizusawa), 4h. (Boulder City, Grand Coulee, Tucson, and Pierce Ferry), 5h. (Hyderabad, New Delhi, and Riverview), 6h. (Arapuni and Wellington), 8h. (near Tortosa), 9h. (Boulder City (2), Overton and Pierce Ferry), 10h. (Tashkent, Almata, near Frunse, Obi-garm (3), Stalinabad (2), Tchimkent, and Andijan (2)), 11h. (near Pierce Ferry), 13h. (near Tchimkent), 14h. (near Obi-garm, Stalinabad, Andijan, and Tchimkent), 15h. (Zagreb, near Granada, Branner, near Lick, and Berkeley), 18h. (near Andijan), 19h. (Paris, Rome, Uccle, Strasbourg, Stuttgart, Sverdlovsk, Kew, De Bilt, Cheb, and Weston), 20h. (near Grozny), 22h. (Ksara and Ferndale), 23h. (Bermuda).

April 23d. 4h. 48m. 49s. Epicentre 19°·0N. 70°·0W. (as on 1944 May 24d.).

A = +·3236, B = −·8891, C = +·3236; δ = −7; h = +5;
D = −·940, E = −·342; G = +·111, H = −·304, K = −·946.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
San Juan		3·7	92	e 0 54	− 6	—	—	—	—	i 1·5
Fort de France		9·5	115	e 2 26	+ 6	—	—	—	—	—
Weston		23·3	359	e 5 13	+ 3	e 9 21	+ 1	—	—	—
Harvard		23·5	359	e 5 12	0	e 9 18	− 5	—	—	—
St. Louis		26·3	325	e 5 42	+ 3	e 10 4	− 7	e 11 3	SS	e 12·8
Tucson		38·9	300	e 7 29	0	—	—	—	—	—
Riverside	Z.	44·6	301	i 8 15	− 1	—	—	—	—	—
Mount Wilson	Z.	45·2	301	i 8 20	0	—	—	—	—	—
Pasadena	Z.	45·2	301	i 8 20	0	—	—	—	—	—
Tinemaha		45·7	304	i 8 25	+ 1	—	—	—	—	—
Shasta Dam		49·5	309	i 8 51	− 3	—	—	—	—	—

St. Louis gives also eE = 10m.24s. and eP?Z = 10m.45s.
Long waves were also recorded at Bermuda and Philadelphia.

April 23d. Readings also at 2h. (Tucson and Tinemaha), 8h. (Kew), 10h. (La Paz), 11h. (near Florence), 13h. (Nanking, near Andijan and Obi-garm), 16h. (near Andijan, Tchimkent, Tashkent, Frunse, Obi-garm, Stalinabad, and Almata), 17h. (Tucson), 19h. (Branner), 21h. (Auckland), 23h. (near Mizusawa).

April 24d. 4h. Alaska.

Sitka iP = 44m.19s., i = 44m.35s., iL = 44m.49s.
Shasta Dam eP = 47m.30s.
Tinemaha iPZ = 48m.23s.
Haiwee ePZ = 48m.40s.
Rapid City eP? = 48m.46s., eL = 55m.33s.
Mount Wilson ePZ = 48m.55s.
Pasadena iPZ = 48m.58s.
Riverside ePZ = 48m.58s.
Palomar ePZ = 49m.5s.
Tucson ePP? = 49m.29s., eL = 60m.35s.
Butte eS? = 51m.4s., iL = 51m.28s.
Berkeley iEN = 51m.46s., eE = 55m.6s.
Salt Lake City eS? = 52m.20s., eL = 55m.12s.
Long waves were also recorded at College and at other American stations.

April 24d. 19h. 35m. 9s. Epicentre 7°·9N. 38°·4W. (as on 1943 Oct. 1d.).

L. Marcelli and G. Pannocchia :
Terremoto della cresta mediano Atlantica del 24 Aprile 1947. (Annali di Geofisica, vol. I, No. 4, 1948, pp. 570-580).

P. Caloi, L. Marcelli and G, Pannocchia :
Sulla velocita de propagazione della onde superficiali in correspondenza dell' Atlantico. (Annali de Geofisica, vol. II, No. 3, 1949, pp. 347-356, 11fig.).

J. P. Rothé :
La structure de l'Atlantique (Annali di Geofisica, vol. IV, No. 1, 1951, pp. 27-39, 2 fig.).
Epicentre 8°02′N. 38°24′W. To 19h. 35m. 8s.

A = +·7764, B = −·6153, C = +·1366 ; δ = +5 ; h = +7 ;
D = −·621, E = −·784 ; G = +·107, H = −·085, K = −·991.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Fort de France		23·3	288	i 5 9	− 1	i 9 22	+ 2	5 49	PPP	—
San Juan		28·9	295	i 6 2	− 1	i 10 51	− 2	i 6 43	PP	i 11·9
Bermuda		34·5	318	i 6 49	− 3	i 12 19	− 1	i 8 1	PP	i 14·2
Bogota		35·6	267	e 7 59	+58	e 13 45	+67	—	—	19·9
La Paz		38·1	230	i 7 23a	+ 1	i 13 19	+ 3	i 7 46	pP	20·1
Lisbon		40·4	37	7 41k	0	13 51	+ 1	9 14	PP	18·2
Balboa Heights		40·7	275	e 7 46	+ 2	—	—	—	—	—
Huancayo		41·7	241	i 7 51	− 1	i 14 13	+ 3	i 9 34	PP	i 16·9
Malaga	Z.	42·2	42	7 57	+ 1	i 14 22	+ 5	8 8	pP	20·6
Halifax		42·6	334	8 1	+ 2	14 16	− 7	10 3	PPP	19·9
Granada		43·0	42	i 8 2k	− 1	i 14 29	0	8 20	pP	20·4
Almeria		43·5	43	i 8 7	0	i 14 40	+ 4	8 17	pP	22·0
Toledo	Z.	44·2	39	i 8 11	− 1	i 14 42	− 4	9 47	PP	18·5
Weston		44·9	326	i 8 17	− 1	i 14 53	− 3	e 18 12	SS	i 20·2
Harvard		45·2	326	i 8 20a	0	i 14 57	− 4	e 18 51	Q	e 20·5
Fordham		45·5	322	i 8 22	− 1	i 15 3	− 2	—	—	—
Alicante		45·7	42	i 8 27	+ 3	i 15 7	− 1	8 37	pP	e 21·9
Philadelphia		45·8	321	i 8 25	0	i 15 5	− 4	i 10 6	PP	e 20·5
La Plata	E.	46·4	202	i 7 54	?	15 2	−16	10 27	PP	23·4
	N.	46·4	202	i 8 26	− 4	15 19	+ 1	10 19	PP	22·1
	Z.	46·4	202	8 30	0	15 9	− 9	10 51	PPP	24·1
Columbia		47·0	311	e 8 35	0	e 15 25	− 1	e 10 24	PP	e 18·7
Tortosa		47·6	40	i 8 41	+ 2	i 15 37	+ 2	10 8	PcP	21·1
Seven Falls		47·9	331	8 41	− 1	15 38	− 1	—	—	20·9
Pennsylvania	N.	48·0	320	i 8 19	−24	i 15 22	−19	e 10 12	PP	—
Shawinigan Falls		48·5	330	8 45	− 1	15 43	− 5	10 33	PP	20·9
Barcelona		49·0	40	8 53	+ 3	i 15 55	0	19 52	SS	21·5
New Kensington		49·0	319	i 8 53	+ 3	i 15 57	+ 2	e 10 41	PP	e 23·8
Ottawa		49·3	326	8 53	0	15 56	− 3	10 33	PP	22·9
Santa Lucia	N.	51·3	214	8 41	−27	15 56	−30	—	—	26·5
Mobile		51·6	303	9 8	− 2	16 29	− 2	20 11	SS	24·1
Clermont-Ferrand		51·9	36	i 9 14	+ 2	i 16 39	+ 4	i 12 18	PPP	23·9
Paris		53·3	33	e 9 22	− 1	i 16 54	0	i 9 43	pP	e 23·9
Kew		53·5	28	i 9 28k	+ 4	i 16 57	0	e 20 31?	SS	e 24·9
Ivigtut		54·2	354	9 25	− 4	16 55	−11	—	—	21·9
Besançon		54·4	36	e 9 33	+ 2	e 17 12	+ 3	—	—	24·9

Continued on next page,

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Neuchatel		54·8	37	e 9 33	− 1	e 17 14	0	—	—	—
Chicago		54·9	317	i 9 34	− 1	e 17 13	− 3	e 20 46	SS	e 21·8
Durham		55·2	25	i 9 42	+ 5	i 17 19	− 1	—	—	i 24·4
Edinburgh		55·4	24	—	—	17 23	+ 1	19 20	S_cS	—
Uccle		55·4	31	e 9 37k	− 1	i 17 25	+ 3	e 22 55	SSS	e 25·9
Basle		55·5	36	e 9 37a	− 2	e 17 26	+ 2	—	—	—
St. Louis		55·6	312	e 9 37	− 3	i 17 27	+ 2	i 20 57	SS	—
Florence		56·0	42	i 9 43	0	i 17 37	+ 7	i 21 26	SS	—
Zürich		56·0	37	e 9 43a	0	e 17 33	+ 3	e 9 49	?	—
Rome		56·1	44	i 9 43a	0	i 17 38	+ 6	9 48	pP	27·3
Strasbourg		56·1	35	i 9 43a	0	e 17 33	+ 1	e 11 50	PP	i 25·3
Chur		56·3	38	e 9 43a	− 2	e 17 34	0	—	—	e 26·2
De Bilt		56·6	31	i 9 51k	+ 4	i 17 43	+ 5	—	—	e 24·9
Aberdeen		56·7	22	i 9 51	+ 3	i 17 38	− 2	i 13 1	PPP	23·3
Stuttgart		57·0	36	e 9 48	− 2	i 17 46	+ 3	i 11 58	PP	e 25·9
Reykjavik		57·4	8	e 15 21	?	—	—	e 19 3	?	e 28·1
Triest		58·4	40	e 9 59?	− 1	i 17 59	− 3	i 10 21	pP	—
Jena	N.	59·4	35	e 10 6	0	e 18 19	+ 4	e 10 34	P_cP	e 26·9
Cheb		59·5	35	e 10 8	+ 1	i 18 19	+ 3	e 14 4	PPP	e 27·2
Zagreb		59·9	41	10 11?	+ 1	e 18 11?	−10	e 20 11?	S_cS	—
Prague		60·6	36	e 10 11	− 4	e 18 25	− 5	e 22 33	SS	e 23·9
Potsdam		60·9	33	e 10 21	+ 4	i 18 41	+ 7	e 24 51	Q	e 27·9
Lincoln		61·0	313	e 10 15	− 3	e 18 33	− 2	—	—	e 29·2
Kalossa		62·1	40	e 10 28	+ 3	e 19 15	+26	e 12 33	PP	—
Copenhagen		62·2	30	i 10 26	0	i 18 53	+ 2	12 26	PP	27·9
Budapest		62·5	40	10 31	+ 3	18 58	+ 4	e 12 36	PP	28·9
Belgrade		62·6	44	i 10 27	− 1	i 18 55	− 1	i 12 48	PP	e 30·8
Scoresby Sund		63·4	6	10 32	− 2	19 6	0	20 12	S_cS	25·9
Warsaw		65·3	36	10 44a	− 2	19 38	+ 9	13 1	PP	30·4
Bucharest	N.	66·4	45	e 10 57	+ 4	e 19 48	+ 5	e 11 4	P_cP	30·9
Rapid City		66·5	315	i 10 53	− 1	e 19 36	− 8	e 20 40	S_cS	e 26·6
Upsala		66·6	27	i 11 1a	+ 7	e 19 41	− 4	e 23 53	SS	e 28·9
Denver		67·1	310	e 10 58	+ 1	20 22	PPS	13 26	PP	—
Istanbul		67·9	48	10 59	− 3	—	—	15 12	PPP	—
Helwan		68·6	61	i 11 9a	+ 2	20 14	+ 5	11 34	P_cP	—
Helsinki		70·1	28	e 11 19	+ 3	e 20 26	− 1	e 11 42	P_cP	e 31·9
Saskatoon		70·5	323	11 16	− 2	20 25	− 7	24 51?	SS	30·9
Tucson		71·0	301	e 11 20	− 2	e 20 36	− 1	i 14 3	PP	e 28·7
Simferopol		72·1	45	e 11 24	− 4	21 40	PPS	—	—	—
Yalta		72·1	46	e 11 30	+ 2	20 54	+ 4	—	—	—
Bozeman		72·3	316	e 11 31	+ 2	i 20 51	− 1	e 14 8	PP	e 29·2
Logan		72·4	312	i 11 28	− 2	e 20 48	− 5	i 14 20	PP	e 34·4
Salt Lake City		72·4	311	e 11 52	P_cP	i 21 13	PS	e 25 37	SS	e 32·3
Ksara		72·6	58	e 11 35	+ 4	e 21 5	+ 9	—	—	—
Butte		73·4	316	e 11 45	P_cP	e 21 6	+ 1	e 25 51	SS	e 32·7
Overton		74·1	306	e 11 40	0	—	—	—	—	—
Boulder City		74·4	305	i 11 43	+ 1	e 21 50	S_cS	—	—	—
Moscow		75·6	34	i 11 49	+ 1	i 21 32	+ 3	—	—	—
Sotchi		76·0	47	e 11 57?	+ 6	e 21 40?	+ 6	—	—	—
Palomar	Z	76·1	303	i 11 53	+ 2	—	—	—	—	—
La Jolla		76·4	302	e 11 57	+ 4	—	—	—	—	—
Riverside		76·5	303	i 11 53	− 1	—	—	—	—	—
Mount Wilson	Z.	77·1	303	i 11 55	− 2	—	—	—	—	—
Pasadena		77·2	303	i 11 56	− 1	i 21 43	− 4	e 14 48	PP	e 30·7
Grand Coulee		77·9	318	e 12 0	− 1	—	—	—	—	—
Fresno	N.	78·4	306	e 12 8	+ 4	—	—	—	—	—
Piatigorsk		78·4	46	e 12 24	P_cP	e 22 14	+14	—	—	—
Leninakan		79·0	50	e 12 34	P_cP	—	—	—	—	—
Erevan		79·5	50	e 12 18	P_cP	—	—	—	—	—
Lick		79·9	307	e 12 14	+ 2	e 22 21	+ 5	—	—	e 41·3

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Santa Clara		80·1	307	i 12 17	+ 4	e 22 22	+ 4	—	—	e 35·8
Berkeley		80·4	307	i 12 17	+ 2	i 22 22	+ 1	—	—	e 39·2
Grozny		80·4	47	e 12 19	+ 4	22 55	S_eS	—	—	—
Shasta Dam		80·4	310	e 12 12	− 3	—	—	—	—	—
Victoria		80·8	318	12 21	+ 4	22 31	+ 6	23 7	PS	37·9
Ukiah		81·1	309	e 12 24	+ 6	e 22 27	− 1	e 31 20	SSS	e 33·5
Baku		83·6	50	12 41	P_eP	23 25	S_eS	—	—	—
Sitka		87·1	328	i 12 51	+ 2	i 23 24	− 4	i 16 16	PP	e 35·6
Sverdlovsk		88·4	33	i 12 58	+ 3	i 23 26	[+ 3]	16 23	PP	—
Tananarive		88·7	109	—	—	e 24 7	+24	30 1	SS	42·4
College		91·0	337	e 16 45	PP	e 24 11	+ 8	e 30 4	SS	e 37·0
Tashkent		97·9	47	e 13 42	+ 3	24 15	[− 1]	e 17 43	PP	—
Stalinabad		98·3	49	i 13 47	+ 6	i 25 4	− 2	i 26 35	PS	—
Obi-garm		99·0	49	13 48	+ 4	—	—	—	—	—
Bombay		107·2	67	e 18 52	PP	e 28 9	PS	—	—	48·9
New Delhi	N.	108·4	58	i 19 5	PP	26 6	(+12)	28 14	PS	—
Irkutsk		112·1	23	19 22	PP	34 48	SS	28 48	PS	—
Hyderabad		112·7	68	19 9	PP	34 43	SS	29 10	SS	46·0
Kodaikanal	E.	113·7	76	19 39	PP	i 29 14	PS	—	—	44·6
Calcutta	N.	119·7	59	e 23 4	?	—	—	—	—	—
Colombo	E.	116·7	79	19 44	PP	56 14	L	—	—	(56·2)
Wairiri		135·8	214	20 32	[+69]	45 9	SSS	33 53	PPS	64·3
Auckland		138·3	223	e 23 21	PP	—	—	—	—	—
Riverview		152·7	198	e 19 59	[+ 8]	—	—	e 63 45	Q	e 74·4

Additional readings :—
La Paz isPEZ = 8m.1s., iPPE = 8m.47s., P_ePE = 9m.45s., sPPE = 10m.44s., SS = 15m.51s., S_eS = 17m.46s.
Lisbon iZ = 7m.44s., iE = 13m.55s., Q = 16m.35s.
Huancayo iPPP = 10m.4s.
Malaga P_ePZ = 9m.22s., PPPZ = 10m.43s., S_ePZ = 13m.1s., S_eSZ = 17m.35s.
Halifax SSS = 17m.33s.
Granada P_eP = 9m.36s., iPP = 10m.1s., P_eS = 13m.2s., pP_eS = 13m.53s., sS = 15m.1s., SS = 17m.44s., S_eS = 18m.20s.
Almeria PP = 9m.49s., P_eP = 9m.57s., PPP = 10m.33s., P_eS = 13m.49s., SS = 17m.45s., S_eS = 18m.2s., SSS = 18m.39s.
Weston i = 10m.31s. and 19m.9s.
Alicante P_eP = 10m.3s., PP = 10m.13s., PPP = 10m.47s., PS = 15m.15s., PPS = 15m.31s., SS = 17m.55s., S_eS = 18m.27s., SSS = 19m.7s.
Philadelphia i = 10m.42s., eS_eS = 18m.16s.
La Plata N = 13m.35s., E = 17m.43s., N = 18m.45s., E = 21m.33s.
Tortosa PPEN = 10m.30s., PPPEN = 11m.39s., P_eSE = 13m.58s., PSN = 15m.41s., PPSN = 15m.46s., S_eS?N = 18m.45s., SSN = 19m.5s., SSS = 20m.42s.
Pennsylvania eSN = 15m.14s.
New Kensington eS_eS? = 19m.2s.
Ottawa PPP = 11m.23s., SS = 19m.21s., SSSN = 20m.35s., e = 21m.15s.
Mobile i = 17m.49s. and 22m.53s.
Clermont-Ferrand iPP = 11m.1s. a.
Paris i = 10m.15s., iP_eP = 10m.30s., i = 11m.18s., iPP = 11m.24s., i = 11m.54s. and 16m.35s., iPS? = 16m.58s., i = 18m.21s., iS_eS = 18m.35s.
Kew iE = 9m.49s., eP_ePEN = 10m.16s., ePPN = 11m.11s.?, ePPP = 12m.17s., iP_eSE = 14m.14s., e = 15m.15s., eQNZ = 22·8m.
Chicago ePP? = 12m.29s.
Durham iE = 6m.49s. and 17m.25s.
Edinburgh SS = 20m.57s.
Uccle i = 9m.43s., eEN = 11m.41s., iPSE = 18m.15s.
St. Louis iSN = 17m.9s.
Rome PP = 11m.42s., PS = 18m.6s., e = 19m.42s., S_eS? = 21m.16s., SS = 22m.3s., SSS? = 23m.36s., Q = 25m.56s.
Strasbourg iP = 9m.49s., ePP = 12m.44s., ePPP = 12m.51s., e = 13m.25s., eS = 17m.28s., iS = 17m.36s., iPS? = 17m.45s., e = 18m.38s., eS_eS = 19m.44s., and 20m.1s., iS_eS = 20m.10s., eSS = 21m.2s., iSS = 21m.16s., eSSS = 23m.37s.
Aberdeen iN = 20m.52s., iSSE = 21m.7s.
Stuttgart iP = 9m.53s. k.
Triest iPP = 12m.7s., ePPP = 13m.20s.
Cheb e = 10m.51s., ePP = 11m.38s., e = 18m.0s., eSS = 20m.8s., e = 22m.10s.
Prague ePP = 12m.46s., ePPP = 14m.27s.
Potsdam iN = 20m.57s.
Kalossa eN = 10m.34s., eE = 13m.18s., eN = 13m.23s. and 13m.34s.
Copenhagen i = 20m.14s.

Continued on next page.

Budapest PN =10m.34s., ePPPE =14m.13s., PPPN =14m.23s., SN =19m.1s., ePSN = 19m.11s., PSE =19m.21s., SSSN =25m.56s.
Belgrade i =12m.1s., eSS =24m.29s., eSSS =27m.1s.?
Warsaw PE =10m.55s., PN =11m.4s., PPZ =13m.27s., PPPE =14m.54s., PPPZ = 14m.58s., PPPN =15m.3s., SZ =19m.43s., SSE =23m.32s., SSN =23m.49s., SSSE =26m.27s., SSSZ =26m.33s., SSSN =26m.54s., iZ =29m.1s.
Rapid City eSS? =23m.52s.
Upsala eSE =19m.31s., S_cS? =20m.32s., eSS =26m.27s.
Denver SS =24m.4s.
Helwan PPE =13m.44s., PSE =20m.39s., SSEN =24m.45s.
Helsinki ePS =20m.48s., eSS =24m.46s.
Tucson iPPP =15m.35s., i =16m.51s., eS_cS =21m.27s., eSS =25m.12s., e =26m.59s.
Bozeman ePPP =16m.13s., eSS =25m.31s.
Logan i =12m.1s. and 13m.46s., ePPP? =16m.35s., eSS =25m.36s.
Salt Lake City ePPP? =16m.14s.
Pasadena iZ =22m.22s.
Berkeley iE =18m.43s., eEN =21m.14s., iSN =22m.28s., iE =23m.17s., eN =33m.9s. and 37m.57s.
Ukiah e =16m.45s., and 23m.15s., eSS? =26m.59s.
Sitka eSS =29m.5s.
Sverdlovsk PPP =18m.35s., ePS =24m.43s., iSS =29m.21s.
Tashkent SKKS =24m.40s., PS =26m.25s.
Stalinabad iSS =31m.37s.
New Delhi PPP =21m.12s., S =26m.46s.
Hyderabad PPE =19m.29s.
Wairiri PPZ =23m.2s., SKPZ =24m.59s., EN =36m.59s., SS =41m.5s., E =48m.21s., NZ =51m.51s., QEN =56m.21s.

April 24d. Readings also at 0h. (near Obi-garm), 1h. (Shasta Dam), 3h. (Santa Lucia and La Paz), 6h. (Ksara, Tashkent, Obi-garm, Grozny, near Erevan, Baku, and Leninakan), 11h. (Samarkand, near Obi-garm and Stalinabad), 12h. (near Mizusawa), 13h. (New Delhi, Calcutta, Hyderabad, Obi-garm, Andijan, and Stalinabad), 14h. (Mizusawa), 16h. (Shasta Dam), 17h. (near Mizusawa), 23h. (Wellington and Auckland).

April 25d. Readings at 3h. (Tucson), 4h. (Bermuda and near Tchimkent), 5h. (Bermuda, Samarkand, near Stalinabad and Obi-garm), 9h. (Wairiri, Auckland, Tucson, Overton, Shasta Dam, Palomar, Mount Wilson, Pasadena, Riverside, and Tinemaha). 10h. (Riverview), 11h. (near Obi-garm and Stalinabad), 12h. (near Lick), 17h. (Balboa Heights, Samarkand, near Stalinabad and Obi-garm), 18h. (Mizusawa), 19h. (Wellington), 20h. (Scoresby Sund), 21h. (Shasta Dam), 22h. (near Stalinabad, Obi-garm, and Samarkand).

April 26d. 12h. 44m. 13s. I) Epicentre 6°·0N. 124°·3E.
17h. 25m. 48s. II)

A = −·5605, B = +·8216, C = +·1038 ; δ = −4 ; h = +7 ;
D = +·826, E = +·564 ; G = −·058, H = +·086, K = −·995.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
I Mizusawa	E.	36·3	22	(7 13)	+ 6	7 13	P	—	—	—
I Calcutta	N.	38·4	299	—	—	i 13 27	+ 7	—	—	—
I Brisbane	E.	43·4	142	i 8 3	− 3	e 14 27	− 8	—	—	—
II	E.	43·4	142	i 8 3	− 3	—	—	—	—	e 17·8
I Colombo	E.	44·2	274	8 10	− 2	—	—	—	—	—
II	E.	44·2	274	8 17	+ 5	14 45	− 1	—	—	—
I Kodaikanal	E.	46·5	279	e 8 36	+ 5	e 15 19	0	18 24	SS	24·4
II	E.	46·5	279	e 8 35	+ 4	e 15 18	− 1	18 23	SS	24·4
I Riverview		47·1	149	i 8 35a	0	e 15 27	− 1	i 10 24	PP	—
II		47·1	149	i 8 36a	+ 1	e 15 27	− 1	i 10 25	PP	—
I Irkutsk		49·0	344	8 49	− 1	15 53	− 2	—	—	—
II		49·0	344	8 50	0	15 55	0	—	—	—
I New Delhi	N.	49·6	303	e 9 0	+ 5	i 16 1	− 2	—	—	—
II	N.	49·6	303	—	—	i 16 2	− 1	—	—	—
I Bombay		51·7	289	e 9 13	+ 2	e 16 31	− 1	—	—	24·3
II		51·7	289	e 9 12	+ 1	e 16 27	− 5	—	—	28·1
I Frunse		57·1	318	e 10 1	+11	—	—	—	—	—
II		57·1	318	e 10 9	+19	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m.	s.	m.
I	Andijan	57·8	315	e 9 49	− 6	17 51	− 3	—	—	—
II		57·8	315	e 9 42	− 3	17 54	0	—	—	—
I	Obi-garm	59·0	312	e 10 2	− 2	e 18 8	− 2	—	—	—
II		59·0	312	i 10 2	− 2	e 18 8	− 2	—	—	—
II	Stalinabad	59·6	312	i 10 7	− 1	i 18 19	+ 2	—	—	—
I	Tashkent	60·1	315	e 10 7	− 4	e 18 21	− 3	—	—	—
II		60·1	315	e 10 10	− 1	e 18 24	0	—	—	—
I	Sverdlovsk	70·8	329	i 11 20	0	i 20 32	− 3	—	—	—
II		70·8	329	i 11 20	0	i 20 31	− 4	—	—	—
I	Baku	74·3	311	e 11 51	+10	e 21 20?	+ 5	—	—	—
II		74·3	311	e 11 44	+ 3	e 21 16	+ 1	—	—	—
I	Leninakan	78·9	311	e 12 17	+10	—	—	—	—	—
II		78·9	311	e 12 6	− 1	—	—	—	—	—
I	Moscow	83·2	326	12 26	− 3	e 22 39	−10	—	—	—
II		83·2	326	12 28	− 1	e 22 40	− 9	—	—	—
I	Ksara	85·4	304	e 12 3	−37	e 23 14	+ 3	—	—	—
II		85·4	304	e 12 41	+ 1	e 23 15	+ 4	—	—	—
I	Helwan	89·6	300	i 12 56k	− 5	23 29	[− 1]	16 37	PP	—
II		89·6	300	i 12 59	− 2	23 29	[− 1]	16 32	PP	—
I	Rome	101·9	316	i 18 14k	PP	e 24 32	[− 4]	32 40	SS	—
II		101·9	316	e 18 7	PP	e 24 29	[− 7]	e 28 29	PPS	e 52·4
I	Stuttgart	102·2	323	e 18 5?	PP	—	—	e 55 47?	Q	e 60·8
II		102·2	323	e 18 1	PP	—	—	e 55 56?	Q	60·9
II	Shasta Dam	103·4	46	e 14 2	− 2	—	—	—	—	—
I	Berkeley E.	104·5	49	—	—	e 26 29	+31	e 46 29	Q	—
II	Mount Wilson Z.	108·9	51	e 18 26	[− 5]	—	—	e 18 58	PP	—
II	Palomar Z.	110·2	52	e 19 2	PP	—	—	—	—	—
I	Boulder City	110·7	48	e 18 55	PP	—	—	—	—	—
I	Alicante	112·5	316	e 15 13	P	—	—	—	—	—
I	La Paz	163·9	133	e 21 10	PKP_2	—	—	—	—	—

Additional readings :—
Riverview I iN =8m.38s., iP_cPZ =10m.4s., iPPPZ =11m.15s., eSSZ =18m.57s., iEN = 19m.0s., iE =19m.9s. and 19m.15s. II eSSZ =18m.59s., iE =19m.1s. and 19m.9s.
Helwan I, epP_cZ =13m.51s. ; II, iP_cZ =13m.5s.
Rome II, ePPS? =32m.23s., eSS? =36m.53s.
Long waves were also recorded for these two shocks at Auckland (Shock II), Wellington (I and II), and other European stations.

April 26d. 13h. Probably off Coast of Mexico.

Tucson eP =23m.32s., eS =26m.56s., eL =28m.9s.
Palomar ePZ =24m.19s.
Pierce Ferry iP =24m.24s., e =30m.51s.
Riverside iPZ =24m.27s.
Boulder City eP =24m.28s., e =31m.18s.
Overton iP =24m.31s., e =31m.23s.
Mount Wilson ePZ =24m.33s.
Pasadena ePZ =24m.33s., eLEZ =32·4m.
St. Louis ePZ =24m.42s., eSN =28m.55s., eE =29m.15s., eLN =31m.43s.
Tinemaha ePZ =24m.56s.
Salt Lake City e =32m.14s., eL =35m.24s.
Rapid City iS? =33m.48s., e =36m.16s.
Weston e =43m.0s.
Long waves were also recorded at Bozeman, Butte, Sitka, and College.

April 26d. Readings also at 1h. (near La Paz, near Andijan, Obi-garm, Samarkand, Stalinabad, and Tashkent), 8h. (Haiwee, La Jolla, Mount Wilson, Pasadena, Palomar, Riverside, Santa Barbara, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Shasta Dam, Berkeley, Grand Coulee, Pennsylvania, Santa Lucia, and Riverview), 10h. (Overton and near Alicante), 11h. (Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Pierce Ferry, Branner, near Berkeley, Fresno, and Lick, not all one shock), 16h. (Mizusawa and Santa Lucia), 17h. (Shasta Dam, Berkeley, and Uccle), 21h. (Branner, La Paz, and near Mizusawa (3)).

April 27d. 8h. 0m. 33s. Epicentre 56°·0N. 140°·5W.

$A = -·4335$, $B = -·3573$, $C = +·8273$; $\delta = +1$; $h = -8$;
$D = -·636$, $E = +·772$; $G = -·638$, $H = -·526$, $K = -·562$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Sitka		3·3	61	i 0 53	0	—	—	—	—	i 1·2
Grand Coulee		15·5	112	e 3 23	−19	e 6 45	+10	—	—	—
Shasta Dam		19·4	133	e 4 25	− 5	—	—	—	—	—
Butte		20·1	106	—	—	e 7 45	−34	—	—	e 9·4
Saskatoon		20·1	87	—	—	e 7 43	−36	—	—	9·0
Ukiah		20·4	137	e 4 32	− 9	e 8 11	−14	—	—	e 10·8
Santa Clara		22·5	137	—	—	e 9 7	+ 2	—	—	—
Logan		23·4	114	e 5 5	− 6	e 9 6	−15	i 5 32	PP	e 11·2
Fresno	N.	23·8	133	e 5 22	+ 7	—	—	—	—	—
Tinemaha	Z.	24·1	131	i 5 18	0	—	—	—	—	—
Haiwee	Z.	25·1	132	e 5 28	0	—	—	—	—	—
Overton		26·3	126	e 5 37	− 2	—	—	—	—	—
Rapid City		26·4	100	e 5 41	+ 1	—	—	—	—	i 12·8
Boulder City		26·6	127	e 5 41	− 1	—	—	—	—	—
Pasadena	Z.	26·7	134	e 5 35	− 8	—	—	—	—	e 14·0
Pierce Ferry		26·8	125	e 5 41	− 3	—	—	—	—	—
Riverside	Z.	27·2	134	e 5 47	0	—	—	—	—	—
Palomar	Z.	27·9	133	i 5 55	+ 1	—	—	—	—	—
Tucson		31·5	126	e 6 25	− 1	—	—	—	—	e 15·1
St. Louis		37·3	96	e 7 22	+ 6	e 11 35	−89	—	—	—

Additional readings :—
Grand Coulee i = 6m.52s.
Palomar iZ = 6m.3s., eZ = 6m.31s.
Long waves were also recorded at other American stations.

April 27d. 11h. 8m. 41s. Epicentre 56°·0N. 140°·5W. (as at 8h.).

		△	Az.	P.	O−C.	L.
		°	°	m. s.	s.	m.
Sitka		3·3	61	i 0 53	0	i 1·2
Shasta Dam		19·4	133	e 4 25	− 5	—
Tinemaha	Z.	24·1	131	i 5 17	− 1	—
Haiwee	Z.	25·1	132	e 5 28	0	—
Rapid City		26·4	100	e 5 42	+ 2	e 12·7
Boulder City		26·6	127	e 5 46	+ 4	—
Pasadena	Z.	26·7	134	i 5 52	+ 9	—
Pierce Ferry		26·8	125	e 5 41	− 3	—
Riverside	Z.	27·2	134	i 5 47	0	—
Palomar	Z.	27·9	133	e 5 59	+ 5	—
Tucson		31·5	126	e 6 21	− 5	—

Tinemaha gives also iZ = 5m.24s.
Long waves were recorded at other American stations.

April 27d. 12h. 21m. 10s. Epicentre 13°·7S. 167°·2E. (as on 1946, Sept. 23d.).

$A = -·9478$, $B = +·2153$, $C = -·2354$; $\delta = +9$; $h = +6$;
$D = +·222$, $E = +·975$; $G = +·230$, $H = -·052$, $K = -·972$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	E.	19·0	222	e 4 20	− 6	e 8 0	+ 5	i 4 44	PP	—
Auckland		24·0	166	5 16	− 1	9 27	− 5	12 56	PeS	—
Riverview		24·8	213	i 5 37a	+12	i 9 42	− 4	i 5 43	pP	—
Wellington		28·3	168	5 59	+ 2	11 1	+18	—	—	14·5
Shasta Dam		84·6	46	i 12 33	− 3	—	—	—	—	—
Pasadena	Z.	85·3	53	i 12 37	− 3	—	—	—	—	—
La Jolla	Z.	85·6	55	e 12 51	+10	—	—	—	—	—
Riverside	Z.	85·9	53	i 12 40	− 3	—	—	—	—	—
Palomar		86·0	54	i 12 40a	− 3	—	—	—	—	—
Haiwee	Z.	86·1	51	e 12 42	− 2	—	—	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tinemaha		86·2	50	i 12 42	− 2	—	—	—	—	—
Boulder City		88·5	52	i 12 52	− 4	—	—	—	—	—
Overton		88·9	52	i 12 55	− 3	—	—	i 13 8	pP	—
Pierce Ferry		89·2	52	i 12 55	− 4	—	—	—	—	—
Tucson		90·6	57	e 13 2	− 3	—	—	—	—	—
Stuttgart	Z.	140·6	338	e 19 30	[− 2]	—	—	—	—	—
Strasbourg		141·3	339	e 19 28	[− 5]	—	—	—	—	—
Florence		143·6	331	e 19 35	[− 2]	—	—	—	—	—
Rome		144·4	327	i 19 36a	[− 2]	i 19 48	?	—	—	—
Clermont-Ferrand		145·4	341	e 19 42	[+ 2]	—	—	—	—	—

Additional readings and notes :—
Auckland i = 9m.58s.
Riverview iE = 5m.59s., isSE = 9m.58s., eQEN = 10m.8s., iSSE = 10m,23s., iSSN = 10m.26s.
Pasadena iZ = 12m.50s.
Riverside iZ = 12m.53s.
Palomar iZ = 12m.47s. and 12m.53s.
Clermont-Ferrand ePKP$_2$ = 19m.54s.
Rome and Florence give readings as for a local shock for which P$_g$ coincides with PKP for this.
Long waves were recorded at Bermuda, Arapuni, and Wairiri.

April 27d. 20h. Undetermined shock.

Bombay ePEN = 48m.9s.
Stalinabad iP = 49m.2s., iS = 52m.25s.
Obi-garm iP = 49m.7s., eS = 52m.41s.
Tashkent eP = 49m.33s.
Colombo eE = 50m.
Kodaikanal ePE = 50m.20s., eSE = 53m.55s., LE = 55m.37s.
New Delhi eN = 51m.5s., iN = 52m.7s. and 54m.52s.
Sverdlovsk eP = 52m.2s., eS = 57m.28s.
Calcutta eN = 54m.55s. and 58m.15s.
Helwan eN = 56m.42s., eZ = 59m.19s.
Overton iP = 61m.36s., i = 61m.42s.
Pierce Ferry iP = 61m.36s., i = 61m.42s., 61m.49s., and 62m.2s., iS = 62m.15s.
Long waves were also recorded at Cheb and Rome.

Aprtl 27d. Readings also at 3h. (near Grozny), 6h. (near Almata, Andijan, and Frunse), 7h. (Shasta Dam, Mizusawa, Stuttgart, Sverdlovsk, Warsaw, Grozny, Obi-garm, Andijan, Stalinabad, and Tashkent), 8h. (Almeria), 11h. (Tucson), 16h. (Bombay, New Delhi, near Obi-garm, and Stalinabad (2)), 17h. (Calcutta), 20h. (Istanbul), 22h. (Palomar, Riverside, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Berkeley, St. Louis, Strasbourg, Istanbul, and Stuttgart), 23h. (Auckland, Wellington, Andijan, Samarkand, near Obi-garm and Stalinabad).

April 28d. Readings at 7h. (Rome, Toledo, near Almeria, Alicante, Granada, Malaga, and Tortosa), 9h. (Santa Lucia), 13h. (Lick, Haiwee, La Jolla, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Grand Coulee, Rapid City, Ivigtut, Scoresby Sund, and Stuttgart), 14h. (Bozeman, Butte, Berkeley, Grand Coulee, Salt Lake City, Chicago, Philadelphia, and Sverdlovsk), 17h. (near Obi-garm), 19h. (near Triest and near Mineral), 21h. (Andijan, Samarkand, near Obi-garm and Stalinabad).

April 29d. 5h. 34m. 39s. Epicentre 32°·9N. 133°·9E. (as on 1947, Feb. 21d.).

$A = -\cdot5833$, $B = +\cdot6062$, $C = +\cdot5406$; $\delta = -3$; $h = +1$;
$D = +\cdot721$, $E = +\cdot693$; $G = -\cdot375$, $H = +\cdot390$, $K = -\cdot841$.

		Δ	Az.	P.	O−C.	S.	O−C.	L.
		°	°	m. s.	s.	m. s.	s.	m.
Irkutsk		28·8	321	e 6 8	+ 6	e 10 58	+ 7	—
New Delhi	N.	48·4	281	—	—	e 19 55	SS	e 28·2
Tashkent		51·2	299	e 9 8	+ 1	—	—	—
Obi-garm		51·5	296	i 9 9	0	e 16 29?	0	—
Stalinabad		52·2	296	i 9 17	+ 2	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.		L.
		°	°	m. s.	s.	m. s.	s.		m.
Sverdlovsk		54·2	320	9 19	−10	—	—		—
Bombay		56·0	272	—	—	e 25 31	Q		—
Shasta Dam		78·5	49	e 12 1	− 3	—	—		—
Istanbul		79·0	312	e 12 5	− 2	—	—		e 49·4
Berkeley	z.	80·1	51	i 12 16	+ 3	—	—		—
Tinemaha	z.	83·2	50	e 12 26	− 3	—	—		—
Helwan	z.	83·7	301	i 12 30	− 2	—	—		—
Haiwee	z.	84·0	50	i 12 34	+ 1	—	—		—
Stuttgart		84·9	326	e 12 37	− 1	—	—		e 47·4
Mount Wilson	z.	85·0	52	i 12 42	+ 4	—	—		—
Pasadena	z.	85·0	52	i 12 41	+ 3	—	—		—
Riverside	z.	85·6	52	e 12 37	− 4	—	—		—
Overton		86·0	48	e 12 41	− 2	—	—		—
Boulder City		86·1	49	e 12 42	− 2	—	—		—
Palomar	z.	86·3	52	e 12 48	+ 3	—	—		—
Pierce Ferry		86·5	48	e 12 40	− 6	—	—		—
Tucson		91·0	50	e 13 9	+ 2	—	—		—

Additional readings :—
Shasta Dam iP = 12m.6s.
Tinemaha iZ = 12m.35s.
Helwan eZ = 12m.48s.
Pierce Ferry iP = 12m.49s.
Long waves were also recorded at other European stations.

April 29d. 7h. 40m. 12s. Epicentre 15°·6S. 173°·6W. (as on 1943, June 3d.).

A = −·9576, B = −·1074, C = −·2673 ; δ = −2 ; h = +6 ;
D = −·111, E = +·994 ; G = +·266, H = +·030, K = −·964.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		2·5	45	i 0 41	− 2	i 1 3	−11	—	—	—
Auckland		23·6	204	5 17	+ 4	9 34	+ 9	10 12	SS	—
Wairiri		30·4	200	7 56	PPP	11 26	+10	—	—	14·3
Riverview		36·5	235	e 7 30	+21	e 9 30	?	—	—	e 17·9
Berkeley		71·8	42	i 11 26	0	—	—	e 29 36	SSS	e 32·6
La Jolla	z.	72·2	48	i 11 28	− 1	—	—	—	—	—
Pasadena	z.	72·3	46	i 11 29	0	—	—	—	—	—
Mount Wilson	z.	72·4	46	i 11 30	0	—	—	i 11 50	pP	—
Palomar	z.	72·8	48	i 11 32k	0	—	—	i 11 49	pP	—
Riverside	z.	72·8	46	i 11 32	0	—	—	—	—	—
Shasta Dam		73·4	38	i 11 37	+ 1	—	—	—	—	—
Haiwee	z.	73·5	45	i 11 37	+ 1	—	—	—	—	—
Tinemaha	z.	73·9	44	i 11 39	0	—	—	i 11 57	pP	—
Boulder City		75·6	46	i 11 49	+ 1	—	—	—	—	—
Overton		76·1	45	i 11 53	+ 2	—	—	—	—	—
Pierce Ferry		76·2	46	i 11 53	+ 1	—	—	—	—	—
Tucson		76·6	51	i 11 54	0	—	—	i 12 11	pP	—
Grand Coulee		79·8	34	i 12 14	+ 2	—	—	—	—	—
Ivigtut		120·3	27	—	—	32 48?	PPS	—	—	—
Scoresby Sund		122·5	11	—	—	25 48?	[−10]	—	—	—
Stuttgart	z.	146·8	357	e 19 51	[+ 9]	—	—	—	—	—
Istanbul		147·9	329	e 19 50	[+ 6]	—	—	—	—	—
Helwan	z.	153·0	307	e 20 9	[+17]	—	—	—	—	—

Additional readings ;—
Auckland i = 14m.0s., S_cS = 15m.41s., sS_cS = 16m.32s.
Palomar iZ = 11m.43s.
Tucson e = 12m.27s.
Helwan iZ = 20m.23s.
Long waves were also recorded at Wellington and Butte.

April 29d. Readings also at 6h. (Granada and near Alicante), 7h. (Riverview, Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Boulder City, Overton, Tucson, Pierce Ferry, Shasta Dam, Fresno, and near Berkeley), 8h. (Haiwee, Mount Wilson, Pasadena, Riverside, Palomar, Tinemaha, Tucson, Butte, Boulder City, Overton, Pierce Ferry, Shasta Dam, Grand Coulee, Rapid City, and near Mizusawa), 9h. (Berkeley, Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Shasta Dam, Grand Coulee, Stuttgart, Basle, Zürich, Auckland, Arapuni, Wairiri, Wellington (2), Riverview, and near Apia), 10h. (Helwan, Ksara, and Strasbourg), 11h. (Overton), 13h. (Fresno, San Francisco, near Berkeley, Lick, and near Andijan), 15h. (near Andijan, Obi-garm, Samarkand, and Stalinabad), 18h. (Shasta Dam), 19h. (Branner, Ferndale, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Shasta Dam, near Apia, near Andijan, Frunse, Obi-garm, Stalinabad, Tashkent, and Tchimkent), 20h. (near Obi-garm and Stalinabad), 21h. (Chur, Zürich, Stuttgart, near Florence and Rome).

April 30d. 4h. 49m. 46s. Epicentre 59°·0N. 139°·0W. (as on 1945, Oct. 15d.).

$A = -\cdot3906$, $B = -\cdot3396$, $C = +\cdot8556$; $\delta = -5$; $h = -9$;
$D = -\cdot656$, $E = +\cdot755$; $G = -\cdot646$, $H = -\cdot561$, $K = -\cdot518$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Sitka		2·4	127	i 0 47	+ 6	i 1 4	− 8	—	—	i 1·3
College		7·2	329	e 1 49	0	e 2 47	−26	—	—	e 3·6
Grand Coulee		16·2	124	e 3 53	+ 3	—	—	—	—	e 8·4
Butte		20·5	117	e 4 42	0	—	—	—	—	e 9·6
Shasta Dam		21·1	143	e 4 49	+ 1	—	—	—	—	—
Bozeman		21·5	116	—	—	i 9 2	+15	—	—	e 11·4
Ukiah		22·3	146	e 5 22	+21	e 9 17	+15	—	—	e 10·1
Berkeley		23·8	145	e 4 57	−18	i 9 50	+22	—	—	—
Logan		24·2	124	e 5 20	+ 1	—	—	—	—	e 12·6
Santa Clara		24·3	145	i 5 25	+ 5	e 10 0	+23	—	—	—
Salt Lake City		25·0	125	e 5 52	+25	e 10 26	+37	—	—	e 13·0
Fresno	N.	25·5	142	e 5 38	+ 6	—	—	—	—	—
Tinemaha	Z.	25·7	139	e 5 35	+ 2	—	—	—	—	—
Rapid City		26·4	109	e 5 42	+ 2	—	—	—	—	e 13·9
Haiwee	Z.	26·7	139	i 5 44	+ 1	—	—	—	—	—
Overton		27·6	134	e 5 51	0	—	—	—	—	—
Boulder City		27·9	135	e 5 55	+ 1	—	—	—	—	—
Pierce Ferry		28·1	133	i 5 56	+ 1	—	—	—	—	e 14·9
Mount Wilson	Z.	28·4	141	i 5 58	0	—	—	—	—	—
Pasadena		28·4	141	i 5 58	0	—	—	—	—	e 14·0
Riverside	Z.	28·8	141	e 6 2	0	—	—	—	—	—
Palomar		29·6	140	i 6 9	0	—	—	—	—	—
Tucson		32·8	132	i 6 37	0	—	—	—	—	e 16·5
St. Louis		36·9	101	e 7 23	+11	—	—	—	—	e 18·0
Bermuda		54·9	85	e 9 39	+ 4	e 17 30	+14	e 19 31	S_eS	e 27·7
Irkutsk		57·9	320	e 9 54	− 2	e 17 56	+ 1	—	—	—
Copenhagen		63·4	18	10 29	− 5	e 19 20	+14	23 20	SS	36·2
Sverdlovsk		63·5	349	10 32	− 2	e 19 15?	+ 8	23 26	SS	—
Moscow		65·6	3	e 10 47	− 1	e 19 39	+ 6	—	—	—
Strasbourg		69·4	23	e 11 1	−11	—	—	e 11 12	P_eP	34·2
Stuttgart		69·5	22	e 11 9	− 3	—	—	—	—	e 37·2
Bogota	Z.	73·3	110	e 11 33	− 2	—	—	—	—	—
Rome		76·7	22	e 11 46	− 9	—	—	—	—	e 33·3
Granada		77·2	36	i 11 11	−46	—	—	13 14	PP	30·8
Tashkent		77·3	340	e 11 56	− 2	e 21 49	+ 1	—	—	—
Obi-garm		79·8	339	e 12 9	− 3	—	—	—	—	—

Additional readings :—
Berkeley iPNZ = 5m.17s., eE = 5m.21s.
Logan e = 6m.34s.
Rapid City e = 7m.30s.
Pasadena iZ = 6m.23s.
Tucson e = 7m.1s. and 9m.21s.
Long waves were also recorded at Honolulu, Wairiri, San Juan, and other American and European stations.

April 30d. 17h. Atlantic.

Malaga iPZ = 19m.42s., PPZ = 19m.57s., SZ = 24m.10s., LZ = 26m.0s.
Granada iP = 19m.43s.a, PP = 19m.58s., S = 23m.35s., L = 25·3m.
Almeria P = 19m.48s., PP = 20m.18s., iS = 23m.52s., L = 26m.32s.
Clermont-Ferrand eP = 20m.3s., L = 27m.
Tortosa ePE = 20m.6s., PPEN = 20m.46s., eSE? = 24m.28s.
Strasbourg eP = 20m.34s., L = 27m.
Stuttgart ePZ = 20m.41s., eL = 28·4m.
Alicante eS = 22m.47s., eL = 25m.52s.
St. Louis ePZ = 23m.29s., eL?N = 40m.41s.
Pierce Ferry eP? = 25m.36s.
Tucson eP = 25m.38s.
Tinemaha ePZ = 25m.49s.
Long waves were also recorded at Weston and other European stations.

April 30d. Readings also at 3h. (Chicago and near Apia), 6h. (near Lisbon), 7h. (Shasta Dam, Nanking, Samarkand, near Obi-garm, and Stalinabad), 10h. (Stuttgart), 13h. (Granada, Shasta Dam, and Santa Lucia), 14h. (Huancayo, La Paz, Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Boulder City, Pierce Ferry, Shasta Dam, Tucson, and Wairiri), 18h. (Zürich and near Malaga), 19h. (near New Delhi), 20h. (Rome), 21h. (Alicante, Almeria, Granada, and near Bogota), 22h. (near Leninakan), 23h. (Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, Santa Barbara, Tinemaha, Tucson, Boulder City, Pierce Ferry, Shasta Dam, Granada, Rome, Strasbourg, Stuttgart, Wairiri, and near Apia. At least two separate shocks).

May 1d. Readings at 0h. (Branner, Helwan, Ksara, Basle, Strasbourg, Stuttgart, and Paris), 1h. (Branner, Butte, Bermuda, Granada, and Istanbul), 3h. (Santa Lucia), 7h. (Andijan, Samarkand, near Obi-garm, and Stalinabad), 9h. (Andijan, near Obi-garm, Stalinabad, and near Bogota), 11h. (Bergen and Upsala), 14h. (Montezuma), 16h. (near Andijan, Obi-garm, and Stalinabad), 18h. (Samarkand, near Obi-garm, and Stalinabad).

May 2d. 1h. 30m. 46s. Epicentre 14°·4N. 93°·7W. (as on 1946 May 27d.).

A = −·0625, B = −·9670, C = +·2471; δ = +5; h = +6;
D = −·998, E = +·065; G = −·016, H = −·247, K = −·969.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bogota	z.	21·6	114	e 5 9	+15	—	—	—	—	—
Tucson		23·7	322	e 5 13	− 1	e 9 29	+ 2	i 5 49	PP	e 10·9
St. Louis		24·3	7	e 5 20	0	e 9 35	− 2	e 10 18	SS	14·2
Pierce Ferry		28·2	324	e 5 55	− 1	—	—	—	—	e 15·0
Palomar		28·2	316	i 5 53	− 3	—	—	—	—	—
Boulder City		28·6	323	i 5 59	− 1	—	—	—	—	—
Overton		28·8	324	e 6 0	− 2	—	—	—	—	—
Riverside		29·0	316	e 6 1	− 3	—	—	—	—	—
Mount Wilson		29·6	316	i 6 8	− 1	—	—	—	—	—
Pasadena		29·6	316	e 6 7	− 2	—	—	—	—	—
Haiwee		30·7	319	e 6 16	− 3	—	—	—	—	—
Tinemaha		31·5	320	e 6 24	− 2	—	—	—	—	—
Grand Coulee		39·5	334	e 7 38	+ 4	—	—	—	—	—
Alicante		83·7	52	(e 12 14)	−18	e 12 14	P	—	—	e 30·9
Strasbourg		86·7	40	e 12 52	+ 5	—	—	—	—	—
Stuttgart	z.	87·6	40	e 12 55	+ 4	—	—	—	—	—
Florence		90·6	44	—	—	i 22 42	?	—	—	i 55·4
Triest		91·6	42	—	—	e 24 18	+ 9	—	—	—

Additional readings :—
Bogota iZ = 5m.12s.
St. Louis iPZ = 5m.23s.
Strasbourg e = 13m.0s.
Long waves were also recorded at Berkeley, Columbia, Weston, and San Juan.

May 2d. 2h. 18m. 57s. Epicentre 54°·2N. 164°·5W. (as on 1946, Oct. 30d.).

$A = -\cdot5662$, $B = -\cdot1570$, $C = +\cdot8092$; $\delta = +4$; $h = -7$;
$D = -\cdot267$, $E = +\cdot964$; $G = -\cdot780$, $H = -\cdot216$, $K = -\cdot588$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
College		13·6	31	e 3 25	+ 8	e 6 0	+10	—	—	e 6·2
Sitka		16·6	66	e 3 55	− 1	i 7 9	+ 9	—	—	e 7·6
Victoria		26·0	86	5 37	+ 1	10 11	+ 5	—	—	13·0
Seattle		27·1	87	e 5 59	+13	e 10 3	−21	—	—	—
Grand Coulee		28·9	83	e 6 1	− 2	e 10 48	− 5	—	—	—
Shasta Dam		31·0	98	e 6 19	− 2	i 12 54	SS	i 9 14	P_eP	—
Ukiah		31·6	101	—	—	e 10 31	−64	(e 12 38)	SS	e 12·6
Berkeley		33·0	102	i 6 43	+ 4	i 11 55	− 2	—	—	e 14·2
Santa Clara		33·5	102	e 6 50	+ 7	e 11 53	−12	—	—	e 15·5
Butte		33·6	81	e 7 25	+41	e 12 19	+13	e 8 27	PPP	—
Saskatoon		33·9	69	e 7 15	+28	e 12 39	+28	—	—	16·0
Bozeman		34·7	81	e 7 16	+22	e 12 15	− 9	—	—	e 14·8
Fresno	N.	35·2	100	e 7 3	+ 5	e 10 41	?	—	—	—
Tinemaha		35·8	99	—	—	e 12 39	− 2	—	—	—
Haiwee		36·7	99	e 7 9	− 1	—	—	—	—	—
Salt Lake City		37·1	88	e 7 27	+13	e 12 57	− 4	—	—	e 15·8
Pasadena		37·9	101	i 7 29	+ 9	i 13 8	− 5	—	—	e 16·1
Mount Wilson		38·0	101	i 7 32	+11	e 13 9	− 5	—	—	—
Overton		38·4	96	i 7 23	− 2	e 13 12	− 8	—	—	—
Riverside		38·5	101	i 7 44	+18	e 13 15	− 7	—	—	—
Boulder City		38·6	97	i 7 24	− 2	—	—	—	—	—
Pierce Ferry		39·0	96	i 7 27	− 3	i 13 10	−19	—	—	—
Palomar		39·3	102	i 7 30	− 2	e 13 28	− 6	—	—	—
La Jolla		39·4	103	i 7 34	+ 1	—	—	—	—	—
Vladivostok		42·1	282	i 7 54	− 1	e 9 37	PP	i 17 51	S_eS	—
Tucson		43·6	96	e 8 5	− 3	e 14 33	− 5	e 9 39	PP	e 17·7
Chicago		50·4	71	—	—	e 16 6	− 8	e 19 45	SS	e 20·7
Irkutsk		50·9	307	9 6	+ 1	—	—	e 19 33	SS	—
St. Louis		51·1	75	i 9 4	− 2	i 16 16	− 8	i 9 16	pP	24·4
Ottawa		54·3	60	9 24	− 6	17 1	− 6	21 3	SS	27·0
Ivigtut		54·4	32	6 22	?	—	—	—	—	27·0
Fordham		58·5	62	e 9 58	− 2	i 17 58	− 5	—	—	—
Harvard		58·5	59	i 9 57	− 3	—	—	—	—	e 31·0
Philadelphia		58·5	64	e 12 55	?	e 17 56	− 7	e 21 40	SS	e 24·2
Weston		58·7	59	i 10 0k	− 2	e 18 3	− 3	e 21 59	SS	—
Columbia		59·6	72	e 14 10	PPP	e 18 6	−11	—	—	e 25·3
Sverdlovsk		63·4	334	i 10 34	0	19 7	+ 1	—	—	—
Bergen		65·5	6	e 10 47	0	e 19 35	+ 3	—	—	e 34·0
Helsinki		65·7	355	e 10 48a	0	e 19 28	− 6	—	—	e 32·0
Upsala		66·3	359	10 52a	0	e 19 37	− 5	20 42	S_eS	e 30·0
Aberdeen		68·1	10	—	—	i 20 7	+ 4	—	—	—
Moscow		68·9	347	i 11 11	+ 2	e 20 12	− 1	—	—	—
Almata		69·7	317	e 11 15	+ 1	—	—	—	—	—
Bermuda		69·7	62	e 11 9	− 5	i 20 13	− 9	e 24 43	SS	e 28·4
Copenhagen		70·4	3	i 11 18a	0	20 29	− 1	24 15	SS	33·0
Tchimkent		73·3	322	e 11 36	+ 1	—	—	—	—	—
Andijan		73·6	318	e 11 39	+ 2	21 11	+ 4	—	—	—
De Bilt		73·7	7	i 11 38a	0	e 21 11	+ 3	e 26 3?	SS	e 35·0
Warsaw		73·8	357	i 11 39a	+ 1	e 21 9	0	11 51	P_eP	e 33·0
Kew		73·9	11	e 11 38	− 1	(e 21 10)	0	e 30 13?	SSS	e 35·0
Tashkent		74·3	321	e 11 42	+ 1	e 22 7?	PS	—	—	—
Uccle		75·0	9	e 11 44a	− 1	e 22 9	PS	—	—	e 35·0
Cheb		76·1	3	e 11 3?	−48	e 22 3?	PS	e 33 3?	Q	e 39·0
Prague		76·1	1	—	—	e 25 39	SS	—	—	e 34·0
Obi-garm		76·4	320	i 11 55	+ 2	—	—	—	—	—
Samarkand		76·6	322	e 11 57	+ 3	—	—	—	—	—
Paris		76·8	10	i 11 54k	− 1	—	—	—	—	e 40·0
Stallnabad		76·9	320	i 11 57	+ 1	i 21 46	+ 3	—	—	—
Stuttgart		77·3	5	e 11 59	+ 1	i 21 46	− 2	i 12 19	P_eP	e 36·0
Strasbourg		77·4	6	e 11 57	− 1	e 21 53	+ 4	e 17 13	PPP	e 32·6

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Basle		78·4	7	i 12 7	+ 3	—	—	—	—	—
Zürich		78·6	6	e 12 5a	0	—	—	—	—	—
Grozny		79·5	339	e 12 15	+ 5	—	—	—	—	—
Clermont-Ferrand		79·9	10	i 12 13	+ 1	—	—	—	—	37·0
Simferopol		80·0	348	e 12 16	+ 3	—	—	—	—	—
San Juan		80·1	73	e 12 39	+26	e 22 10	− 8	e 15 58	PP	e 31·7
Zagreb		80·4	359	e 12 16k	+ 1	e 22 13	− 8	—	—	—
Triest		80·5	1	—	—	22 19	− 3	—	—	31·5
Belgrade		81·3	357	10 53	?	e 19 44	?	—	—	—
Bucharest	N.	81·3	353	e 12 22	+ 2	e 22 27	− 3	—	—	—
New Delhi	N.	81·9	308	—	—	i 22 32	− 4	i 22 57	SKS	—
Leninakan		82·3	339	e 12 30	+ 5	—	—	12 53	PcP	—
Florence		82·3	4	i 12 34	+ 9	i 22 44	+ 4	e 34 38	Q	e 38·6
Rome		84·2	2	i 12 34	0	e 23 0	+ 1	—	—	—
Toledo	Z.	84·8	15	i 12 39	+ 2	—	—	12 44	PcP	—
Alicante		86·8	13	12 23	−24	(23 35)	+10	13 11	pP	e 41·6
Almeria		88·0	15	e 12 35	−18	e 23 0	[−20]	12 53	pP	40·6
Hyderabad		90·8	302	13 6	0	23 53	− 9	—	—	42·9
Bombay		92·3	307	e 13 13	0	e 24 1	[+15]	—	—	—
Auckland		92·4	196	—	—	i 24 4	[+18]	i 24 13	S	e 45·4
Helwan	Z.	95·2	346	13 26	− 1	e 21 8	?	17 15	PP	—
Riverview	E.	95·7	215	—	—	e 24 38	− 6	i 25 9	sS	e 44·8
La Paz		106·9	93	e 13 32	−48	i 24 55	[− 4]	—	—	53·0

Additional readings :
College e = 3m.36s.
Sitka i = 4m.15s. and 7m.27s.
Grand Coulee iP = 6m.11s., e = 12m.47s.
Berkeley eE = 6m.50s. and 6m.55s., iN = 9m.39s.
Salt Lake City e = 11m.3s. and 13m.17s.
Palomar iNZ = 7m.43s., i = 7m.52s.
Vladivostok ePcP = 9m.45s., iPPP = 10m.6s., iSSS = 18m.15s.
Tucson iP = 8m.17s., iPcP = 9m.25s., i = 9m.54s., e = 11m.55s., eScP = 13m.41s.
Chicago e = 16m.27s.
St. Louis iZ = 9m.26s., isSN = 16m.36s., eN = 17m.45s., iScS?N = 18m.49s., eSSN = 20m.3s.?
Weston i = 18m.21s., eScS = 19m.57s.
Columbia e = 16m.35s.
Upsala iScSE = 20m.46s., eSSSE = 27m.3s.?
Aberdeen eN = 28m.33s., eE = 29m.23s.
Bermuda i = 20m.35s.
Copenhagen 21m.15s.
De Bilt eSSS = 30m.3s.?
Warsaw PSE = 21m.35s., PSZ = 21m.39s., PPSE = 21m.49s., PPSZ = 21m.56s., PPSN = 22m.0s., eSSN = 25m.59s., eSSSN = 28m.29s., eSSSE = 28m.27s.
Kew eSEZ = 20m.54s., true S is given as PS.
Paris i = 12m.6s., 12m.17s., 12m.26s., and 17m.28s.
Strasbourg eP = 12m.0s., e = 12m.20s., eSS = 26m.53s., e = 27m.3s.
San Juan ePPP = 17m.37s., e = 23m.33s.
New Delhi iN = 24m.22s.
Alicante PP = 16m.15s., PPP = 18m.3s., SKS = 22m.3s., eS = 22m.37s., SS = 28m.39s. true S is given as PS.
Almeria PP = 15m.52s., PPP = 17m.57s., PPS = 24m.42s., SSS = 32m.14s.
Riverview iSE = 24m.45s.
Long waves were also recorded at Honolulu and Scoresby Sund.

May 2d. 7h. Local European shock.

Florence iP = 1m.53s., iS = 2m.22s.
Pavia ePZ = 1m.59s., eS = 2m.29s.
Chur eP = 2m.4s.
Rome eP_g = 2m.13s., eS_g = 2m.18s.
Clermont-Ferrand e = 2m.25s., i = 4m.17s.
Zürich eP = 2m.26s., eS_g? = 3m.23s.
Basle eP = 2m.32s., eS_g = 3m.23s.
Stuttgart ePZ = 2m.40s., e = 2m.45s., eZ = 2m.52s., 3m.5s., and 3m.26s., eS? = 3m.50s. eQ? = 5m.
Strasbourg e = 2m.45s., 3m.44s., and 4m.17s.
Paris e = 2m.51s., i = 3m.8s., eL = 5m.47s.
Besançon e = 3m.32s.
Triest eS? = 4m.0s.
Prague e = 5m.5s.? and 6m.0s.
Alicante e = 5m.23s.
Ksara e = 8m.13s. and 11m.23s.
Warsaw eZ = 9m.3s., eEN = 9m.8s., eE = 9m.46s., eN = 9m.51s., eZ = 10m.11s., eE = 10m.14s.

May 2d. 8h. 27m. 50s. Epicentre 54°·2N. 164°·5W. (as at 2h.).

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
College		13·6	31	e 3 19	+ 2	—	—	—	—	e 6·9
Shasta Dam		31·0	98	e 6 20	− 1	—	—	—	—	—
Tinemaha		35·8	99	i 7 4	+ 1	i 13 10	+29	—	—	—
Haiwee		36·7	99	i 7 11	+ 1	—	—	i 9 35	P_cP	—
Santa Barbara		36·8	103	i 7 13	+ 2	—	—	—	—	—
Pasadena	z.	37·9	101	i 7 21	+ 1	—	—	—	—	—
Mount Wilson	z.	38·0	101	i 7 22	+ 1	—	—	—	—	—
Overton		38·4	96	i 7 25	0	i 12 20	−60	—	—	—
Riverside	z.	38·5	101	i 7 25	− 1	—	—	—	—	—
Boulder City		38·6	97	i 7 26	0	—	—	—	—	—
Pierce Ferry		39·0	96	i 7 29	− 1	—	—	—	—	—
Palomar		39·3	102	i 7 32	0	—	—	—	—	—
La Jolla		39·4	103	i 7 34	+ 1	—	—	—	—	—
Tucson		43·6	97	e 8 7	− 1	—	—	e 9 57	P_cP	—
St. Louis		51·1	75	i 9 5	− 1	i 16 10	−14	—	—	—

May 2d. Readings also at 0h. (Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Overton, Pierce Ferry, and Shasta Dam (2)), 2h. (Wairiri and near Bogota), 4h. (Budapest and Santa Lucia), 7h. (Palomar, Tinemaha, Tucson, La Paz, Andijan, Obi-garm, Samarkand, Stalinabad, Tashkent, Tchimkent, and near Harvard), 12h. (Saskatoon), 13h. (Berkeley, Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, Tucson, Boulder City, Overton, Pierce Ferry, Bozeman, Butte, and Salt Lake City), 14h. (Tinemaha, Tucson, Kew, Paris, Strasbourg, Stuttgart, Rome, and Ksara), 15h. (Copenhagen), 18h. (near Andijan, Obi-garm, Samarkand, Stalinabad, Tashkent, Tchimkent, Bermuda, and near San Juan), 21h. (Branner, Samarkand, near Obi-garm and Stalinabad), 22h. (near Obi-garm, Samarkand, and Stalinabad).

May 3d. 4h. Eastern Europe.

Istanbul P =15m.13s., S_g =16m.20s.
Helwan ePZ =16m.24s., Z =16m.40s. and 18m.27s.
Ksara e =16m.35s.? and 18m.44s.
Belgrade eP? =16m.48s., ePP? =17m.42s., e =18m.10s. eS =18m.27s., e =19m.34s.
Zagreb eP =16m.52s., eNE =20m.17s., eNW =20m.47s.
Bucharest eP?E =17m.9s., eE =18m.10s. and 18m.35s., L?E =19m.12s.
Prague eP? =17m.21s., e =22m.26s.
Stuttgart eP =18m.5s., eQ? =23m.
Jena eN =18m.15s., eE =18m.26s.
Strasbourg eP =18m.23s., e =18m.41s. and 21m.40s., eL =23·3m.
Copenhagen eP =18m.48s., S =22m.41s., L =25m.
Cheb e =19m.25s. and 21m.26s., eL =23m.
Rome e =20m.5s. and 20m.57s.
Florence iPN? =20m.32s., iSN? =21m.40s.
Warsaw eN =22m.55s., eZ =23m.13s. and 23m.47s., eN =23m.50s., eLNZ =24m.
Long waves were also recorded at Upsala, De Bilt, Paris, and Kew.

May 3d. 9h. 35m. 31s. Epicentre 36°·4N. 141°·1E. (as on 1946, Oct. 3d.).

Intensity V at Onahama, Mito, and Shirakawa; IV at Kakioka, Tokyo, Titibu, Maebasi, Hukusima; II-III at Sendai, Osima, and Yokohama. Epicentre as adopted, macroseismic radius 200-300km.

Seismo. Bull. Cent. Met. Obs., Japan, 1947. Tokyo 1950, pp. 23, 24, with macroseismic chart.

A = −·6279, B = +·5067, C = +·5908; δ = +5; h = 0;
D = +·628, E = +·778; G = −·460, H = +·371, K = −·807.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Mito	0·5	268	0 14	0	0 24	+ 1	—	—	—
Onahama	0·6	343	0 16k	+ 1	0 29	+ 3	—	—	—
Kakioka	0·8	257	0 19	+ 1	0 29	− 2	—	—	—
Tukubasan	0·8	257	0 20	+ 2	0 29	− 2	—	—	—
Utunomiya	1·0	279	0 23k	+ 2	0 37	+ 1	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tokyo		1·3	237	0 27k	+ 2	0 42	− 2	—	—	—
Hukusima		1·4	339	0 43	S	1 1	?	—	—	—
Kumagaya		1·4	260	0 29	+ 2	—	—	—	—	—
Maebasi		1·6	270	0 33	+ 3	0 51	0	—	—	—
Mera		1·8	215	0 42	P_g	1 2	S_g	—	—	—
Sendai		1·9	355	0 35k	+ 1	0 57	− 2	—	—	—
Hunatu		2·1	245	0 38	+ 1	1 5	+ 1	—	—	—
Osima		2·1	221	0 37	0	0 58	− 6	—	—	—
Misima		2·2	234	0 41	+ 3	1 9	+ 3	—	—	—
Nagano		2·3	277	0 33k	− 7	1 23	S_g	—	—	—
Shizuoka		2·6	237	1 4	?	1 39	?	—	—	—
Mizusawa		2·9	0	0 48	0	1 13	−11	—	—	—
Omaesaki		3·0	232	0 57	+ 7	1 28	+ 1	—	—	—
Toyama		3·2	275	0 54	+ 2	1 38	+ 6	—	—	—
Morioka		3·3	1	0 56a	+ 3	1 33	− 2	—	—	—
Akita		3·4	346	0 52k	− 3	1 39	+ 2	—	—	—
Nagoya		3·5	250	1 2	+ 5	1 44	+ 4	—	—	—
Wazima		3·5	289	0 58	+ 1	1 48	S*	—	—	—
Gihu		3·7	256	1 5	+ 5	1 56	S*	—	—	—
Hatinohe		4·1	4	0 56	− 9	1 15	P*	—	—	—
Hikone		4·1	255	1 11a	+ 6	1 42	−13	—	—	—
Owase		4·6	242	1 16	+ 4	1 49	−18	—	—	—
Sumoto		5·5	250	1 29	+ 4	2 42	S*	—	—	—
Mori		5·7	356	1 30	+ 2	2 44	+ 9	—	—	—
Tokusima		5·8	249	1 46	P*	3 21	S_g	—	—	—
Sapporo		6·7	1	1 49	+ 7	2 56	− 4	—	—	—
Koti		6·8	248	1 48	+ 4	3 10	+ 7	—	—	—
Hamada		7·5	260	1 57	+ 4	4 0	S*	—	—	—
Hukuoka		9·2	256	1 52	−24	4 25	+22	—	—	—
Kumamoto		9·3	250	2 13	− 4	4 53	S_g	—	—	—
Vladivostok		9·8	316	i 2 25	+ 1	i 4 24	+ 7	—	—	—
Kagosima		10·0	244	2 26	− 1	—	—	—	—	—
Irkutsk		30·3	314	6 13	− 2	11 12	− 3	—	—	—
Almata		48·7	300	e 8 47	− 1	—	—	—	—	—
College		49·8	32	—	—	e 16 4	− 2	—	—	—
Frunse		50·4	300	i 9 0	− 1	—	—	—	—	—
Andijan		52·7	298	9 18	0	e 16 46	0	—	—	—
New Delhi	N.	53·6	281	i 5 56	?	—	—	—	—	e 29·2
Tashkent		54·7	299	i 9 32	− 1	e 17 8	− 5	—	—	—
Sverdlovsk		55·5	319	i 9 37	− 2	17 18	− 6	—	—	—
Stalinabad		56·0	296	i 9 41	− 2	—	—	—	—	—
Samarkand		56·9	298	e 9 47	− 2	—	—	—	—	—
Hyderabad		58·0	269	9 56	− 1	e 17 54	− 3	—	—	30·2
Bombay		61·8	274	e 10 18	− 5	—	—	—	—	—
Kodaikanal	E.	62·8	264	—	—	e 18 2	−56	—	—	—
Colombo	E.	62·9	259	e 4 29?	?	—	—	—	—	—
Brisbane	E.	64·5	168	—	—	(e 19 38)	+19	—	—	e 19·6
Moscow		67·6	323	i 10 57	− 4	e 19 49	− 8	—	—	—
Grozny		69·8	310	e 11 9	− 5	—	—	—	—	—
Grand Coulee		69·9	45	e 11 13	− 2	—	—	i 11 27	pP	—
Riverview		70·5	172	e 11 33	P_cP	i 20 28	− 4	i 20 49	PS	e 32·9
Shasta Dam		71·7	52	i 11 24	− 2	—	—	i 11 37	pP	—
Leninakan		72·1	308	e 11 26	− 2	—	—	—	—	—
Berkeley		73·3	56	i 11 33	− 2	e 20 59	− 5	i 11 46	pP	e 34·5
Tinemaha		76·4	54	i 11 52	− 1	—	—	i 12 4	pP	—
Santa Barbara	z.	76·9	57	e 11 55	− 1	—	—	i 12 7	pP	—
Haiwee	z.	77·1	55	e 12 2	+ 5	—	—	—	—	—
Warsaw		77·5	326	11 57a	− 2	e 22 11	+21	e 27 9	SS	e 39·5
Pasadena	z.	78·1	56	e 12 0	− 2	—	—	i 12 9	pP	e 35·8
Mount Wilson	z.	78·2	56	i 12 1	− 2	—	—	i 12 9	pP	—

Continued on next page,

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Copenhagen		78·4	335	i 12 4	0	i 21 54	− 6	—	—	36·5
Riverside	z.	78·8	56	i 12 4	− 2	—	—	i 12 17	pP	—
Overton		79·2	52	i 12 7	− 1	e 21 49	−19	i 12 20	pP	—
Boulder City		79·3	53	i 12 7	− 2	—	—	i 12 19	pP	—
Palomar	z.	79·5	56	e 12 7	− 3	—	—	i 12 18	pP	—
Pierce Ferry		79·7	52	i 12 10	− 1	—	—	—	—	—
Istanbul		80·9	316	i 12 10	− 7	e 19 41	?	—	—	—
Ksara		81·3	306	i 12 18	− 2	e 22 53	+23	—	—	44·0
Tucson		84·2	54	e 12 33	− 1	e 22 47	−12	i 12 46	pP	—
Stuttgart		85·0	330	i 12 37a	− 1	e 23 27	+20	i 12 50	pP	e 43·5
Triest		85·5	326	—	—	i 23 27	+15	—	—	e 43·9
Strasbourg		85·8	331	e 12 42	0	e 23 31	+16	e 15 59	PP	45·5
Kew		86·2	338	—	—	e 23 36	+17	—	—	e 42·5
Helwan		86·8	305	i 12 44k	− 3	e 23 31	+ 6	i 12 57	pP	—
Paris		87·5	334	i 12 49	− 2	—	—	e 30 25	8S	e 47·5
Florence		88·1	326	i 12 47	− 7	e 23 42	+ 5	—	—	—
Rome		89·0	323	e 12 54	− 4	e 23 28	[+ 1]	e 16 26	PP	—
St. Louis		91·6	38	i 13 12	+ 2	e 23 40	[− 2]	i 13 25	pP	e 45·6
Bogota	z.	127·6	46	e 23 22	PPP	—	—	—	—	—
La Paz		147·4	59	i 19 48k	[+ 5]	—	—	—	—	71·5

Additional readings :—
Hyderabad eN = 18m.30s.
Riverview iSN = 20m.31s., ePSE = 20m.54s., iS_cSE = 21m.22s., eN = 21m.30s.
Berkeley eN = 30m.5s., iE = 32m.59s.
Warsaw eS?Z = 22m.20s.
Pasadena iZ = 12m.12s.
Mount Wilson i = 12m.14s.
Copenhagen 22m.21s.
Riverside iZ = 12m.11s.
Tucson ePP = 15m.49s., ePPP? = 18m.0s.
Strasbourg i = 12m.54s., e = 13m.10s., 13m.31s., and 14m.6s., ePPP = 17m.58s.
Helwan PPZ = 16m.9s.
St. Louis ePPE = 16m.55s., iSKKSE = 24m.11s., eSE = 24m.33s., eE = 24m.39s., eSPE = 25m.42s., ePKKP?E = 30m.21s.
La Paz iN = 20m.25s.
Long waves were also recorded at Bermuda and other European stations.

May 3d. Readings also at 0h. (Santa Lucia), 1h. (Overton, Pierce Ferry, Tucson, and Tinemaha), 4h. (Pierce Ferry, Almata, Tashkent, near Andijan, Obi-garm, Samarkand, and Stalinabad), 5h. (near Lick), 6h. (San Francisco, near Berkeley, Lick, and near La Paz), 13h. (near Granada), 21h. (Boulder City (2), Pierce Ferry (2), and Tucson (2)).

May 4d. 0h. 49m. 55s. } 22h. 34m. 2s. } Epicentre 26°·3N. 55°·4E. (as on 1945, Jan. 15d.).

A = +·5098, B = +·7389, C = +·4407 ; δ = + 9 ; h = +3 ;
D = +·823, E = −·568 ; G = +·250, H = +·363, K = −·898.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
I	Baku	14·8	343	e 3 35	+ 3	e 6 20	+ 2	—	—	—
II		14·8	343	e 3 17	−15	—	—	—	—	—
II	Erevan	16·5	330	e 4 14	+20	—	—	—	—	—
I	Samarkand	16·5	33	e 3 45	− 9	—	—	—	—	—
II		16·5	33	i 3 50	− 4	—	—	—	—	—
I	Stalinabad	16·6	39	e 3 23	−33	e 6 18	−42	—	—	—
II		16·6	39	i 3 58	+ 2	i 6 58	− 2	—	—	—
I	Leninakan	17·3	330	e 4 16	+12	—	—	—	—	—
II		17·3	330	e 4 5	+ 1	—	—	—	—	—
II	Bombay	17·7	111	e 4 11	+ 1	—	—	—	—	—
I	Ksara	18·5	296	i 4 15	− 4	e 8 2	+18	—	—	—
II		18·5	296	e 4 16	− 3	e 7 53	+ 9	—	—	—
I	Grozny	18·7	338	4 18	− 4	7 41	− 7	—	—	—
II		18·7	338	4 20	− 2	i 7 46	− 2	—	—	—
I	Tashkent	18·9	34	e 4 27	+ 3	e 7 39?	−14	—	—	—
II		18·9	34	e 4 26	+ 2	e 7 46	− 7	—	—	—

Continued on next page.

			Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
			°	°	m. s.	s.	m. s.	s.	m. s.		m.
I	New Delhi	N.	19·5	79	—	—	i 8 19	+13	—	—	—
II		N.	19·5	79	—	—	e 8 4	− 2	—	—	e 11·0
II	Tchimkent		19·8	33	e 4 34	− 1	—	—	—	—	—
I	Andijan		20·1	41	e 4 29	− 9	e 7 56	−23	—	—	—
II			20·1	41	e 4 39	+ 1	e 8 18	− 1	—	—	—
I	Sotchi		21·4	328	e 5 15	+24	—	—	—	—	—
II			21·4	328	e 5 2	+11	—	—	e 9 10	PcP	—
I	Helwan	Z.	21·5	285	i 5 14a	+22	9 41	+54	5 53	PP	—
II			21·5	285	i 5 1a	+ 9	9 7	+20	8 55	PcP	—
II	Hyderabad		23·1	109	—	—	9 24	+ 8	—	—	—
I	Almata		24·4	40	e 5 29	+ 8	—	—	—	—	—
II			24·4	40	e 5 30	+ 9	—	—	—	—	—
I	Simferopol		25·3	323	e 5 48	+18	—	—	—	—	—
II			25·3	323	—	—	e 9 52	− 2	—	—	—
I	Istanbul		26·3	311	—	—	e 10 5	− 6	—	—	—
II			26·3	311	5 28	−11	10 3	− 8	—	—	—
II	Kodaikanal	E.	26·3	124	—	—	e 9 54	−17	—	—	—
II	Calcutta	N.	30·2	90	—	—	e 11 13	0	—	—	e 16·8
II	Warsaw		36·6	325	—	—	e 12 39	−14	e 15 29	SS	e 18·4
II	Triest		38·3	312	—	—	e 12 16	−63	—	—	—
II	Florence		39·6	308	e 10 1	?	—	—	—	—	i 19·3
II	Stuttgart		42·1	315	e 8 35?	+40	—	—	—	—	e 25·0
I	Copenhagen		42·7	326	i 8 25k	+25	—	—	—	—	—
II			42·7	326	—	—	e 14 15	− 9	—	—	22·0
II	Irkutsk		44·8	42	—	—	e 14 48	− 7	—	—	—

Additional readings :—
New Delhi II iN =8m.24s.
Helwan II SSZ =9m.54s.
Warsaw II eZ =12m.46s., eE =12m.49s., eZ =13m.48s., eN =15m.34s., eE =16m.25s., eZ =16m.36s.
Long waves were also recorded at Strasbourg and Stuttgart (Shock I); Kew, De Bilt, Rome, Cheb, Strasbourg, and Helsinki (Shock II).

May 4d. Readings also at 2h. (Rome), 3h. (Ksara and Tucson), 5h. (Harvard, Stuttgart, Bucharest, and near Istanbul), 6h. (Brisbane, Riverview, Stuttgart, and Shasta Dam), 8h. (La Paz, Branner, near Berkeley, Lick, Fresno, and San Francisco), 9h. (Shasta Dam, and near Triest), 10h. (Samarkand, Stalinabad, Tashkent, near Andijan and Tchimkent), 11h. (Stuttgart and Tucson), 12h. (near Bogota), 14h. (Mount Wilson, Pasadena, Riverside, Palomar, Tinemaha, Tucson, Pierce Ferry, Shasta Dam, near Triest, and near Guam), 17h. (near Grozny, Leninakan, and Piatigorsk), 18h. (Santa Lucia), 23h. (near Basle, Neuchatel, and Zürich).

May 5d. 2h. 5m. 29s. Epicentre 39°·5S. 175°·3E.

Intensity V near the epicentre.

R. C. Hayes.
"Earthquakes in New Zealand during the year 1947." N.Z. Journal of Science and Technology, Vol. 30, No. 2, Sect. B., 1948, p. 103. Map of epicentre, p. 105.

Epicentre given as adopted.

$$A = -\cdot7711,\ B = +\cdot0634,\ C = -\cdot6335;\quad \delta = -6;\quad h = -1;$$
$$D = +\cdot082,\ E = +\cdot997;\quad G = +\cdot631,\ H = -\cdot052,\ K = -\cdot774.$$

	Δ	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Bunnythorp	0·8	164	0 22	+ 4	0 35	+ 4
New Plymouth	1·0	294	0 22	+ 1	0 37	+ 1
Arapuni	1·5	11	—	—	0 55	+ 6
Tuai	1·6	64	0 31?	+ 1	0 50?	− 1
Wellington	1·8	193	0 33	+ 1	0 56	0
Auckland	2·7	352	—	—	1 7?	−12
Kaimata	4·2	223	1 4?	− 3	1 46?	−11
Wairiri	4·8	211	1 8	− 7	1 57	−15

May 5d. Readings also at 4h. (Apia, Riverview (3), Mount Wilson, Riverside, Tinemaha, Tucson, Boulder City, Overton, and Pierce Ferry), 5h. (Palomar, Tucson, St. Louis, Chicago, Ottawa, Philadelphia, Weston, Bermuda, San Juan, and La Paz), 10h. (Tortosa, Helwan, Ksara, and near Andijan), 11h. (near Andijan (2), Frunse, Samarkand (2), Stalinabad (2), and Tashkent (2)), 12h. (Palomar, Riverside, Tinemaha, and Tucson), 13h. (Almata, near Andijan (4), Samarkand (3), Stalinabad (3), and Tashkent (2)), 15h. (Ksara and La Paz), 16h. (Ksara and Pierce Ferry), 17h. (La Paz, Stalinabad, and near Obi-garm (2)), 19h. (near Andijan and Obi-garm), 21h. (Tucson, Samarkand, near Andijan, and Stalinabad), 23h. (near Obi-garm).

May 6d. 1h. 1m. 15s. Epicentre 31°·5S. 68°·6W. Depth of focus 0·010.
(as on 1946, Nov. 10d.).

$A = +·3117$, $B = -·7953$, $C = -·5199$; $\delta = -5$; $h = +1$;
$D = -·931$, $E = -·365$; $G = -·190$, $H = +·484$, $K = -·854$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Santa Lucia		2·2	223	0 40	+ 4	—	—	—	—	1·2
La Plata	N.	9·6	114	2 16	− 1	3 56	− 8	—	—	4·8
La Paz		15·0	4	3 31 a	+ 3	i 6 23	+11	—	—	7·8
Bogota	Z.	36·3	351	i 6 59	+ 3	—	—	—	—	—
San Juan		49·7	4	e 8 9	−35	—	—	e 11 16	PPP	e 19·2
St. Louis		72·6	342	i 10 50	−29	e 20 6	−28	e 11 19	pP	—
Tucson		74·9	324	e 11 31	− 1	—	—	e 11 57	pP	—
La Jolla	Z.	78·8	320	e 11 53	− 1	—	—	—	—	—
Palomar	Z.	79·0	321	i 11 54	− 1	—	—	e 12 25	pP	—
Pierce Ferry		79·6	323	i 11 57	− 1	—	—	i 12 27	pP	—
Riverside	Z.	79·7	320	i 11 58	− 1	—	—	e 12 31	pP	—
Boulder City		79·9	323	e 11 59	− 1	—	—	—	—	—
Mount Wilson	Z.	80·3	320	i 12 1k	− 1	—	—	i 12 30	pP	—
Pasadena	Z.	80·3	320	i 12 0	− 2	—	—	e 12 30	pP	—
Tinemaha	Z.	82·5	322	e 12 13	0	—	—	e 12 42	pP	—
Shasta Dam		87·4	321	i 12 35	− 2	—	—	—	—	—

Additional readings :—
La Plata PEZ = 2m.20s.
La Paz iPZ = 3m.35s., iE = 4m.21s.
St. Louis eZ = 11m.33s., and 11m.46s., eSSN = 24m.42s.
Tucson i = 12m.5s.

May 6d. 20h. 30m. 32s. Epicentre 6°·6S. 148°·8E.

$A = -·8498$, $B = +·5146$, $C = -·1142$; $\delta = +1$; $h = +7$;
$D = +·518$, $E = +·855$; $G = +·098$, $H = -·059$, $K = -·993$.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Guam	20·4	349	i 4 55	+14	—	—	—	—	—
Brisbane	21·2	169	i 4 44	− 5	i 8 47	+ 6	i 5 9	PP	—
Riverview	27·2	175	i 5 50	+ 3	i 10 25	0	i 5 58	pP	13·2
Auckland	38·3	145	7 8	−16	13 3	−16	7 38	sP	17·5
Apia	39·4	103	e 7 33	0	e 13 41	+ 6	e 16 38	SS	—
New Plymouth	39·5	148	7 40	+ 6	—	—	i 12 44	?	—
Arapuni	39·7	145	7 28	− 8	13 28	−12	9 10	PP	18·1
Perth	39·8	226	7 46	+10	13 43	+ 1	i 9 18	PP	—
Wellington	41·6	149	7 52	+ 1	14 6	− 2	8 16	sP	i 20·6
Kôti	42·5	341	7 58	− 1	14 13	− 9	—	—	—
Yokohama	42·7	349	7 58	− 2	14 22	− 2	(17 31)	SS	17·5
Hunatu	42·9	348	7 58	− 4	14 25	− 2	—	—	—
Osaka	42·9	344	8 2	0	14 16	−11	8 32	pP	17·7
Kobe	43·0	344	8 1	− 2	14 25	− 4	—	—	20·4
Nagoya	43·0	347	8 1	− 2	14 31	+ 2	—	—	—
Kyoto	43·2	346	8 8	+ 4	14 32	0	—	—	—
Hukuoka	43·6	338	8 4	− 4	14 31	− 7	—	—	—
Hiroshima	43·6	340	7 57	−11	14 38	0	—	—	—
Maebasi	43·7	349	8 8	0	14 40	+ 1	—	—	—
Hamada	44·2	340	8 18	+ 6	14 47	+ 1	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Toyama		44·4	348	8 12	− 2	15 2	+13	—	—	—
Ituhara		44·6	338	8 18	+ 2	14 42	−10	—	—	—
Mizusawa	E.	46·1	352	8 33	+ 5	e 15 14	0	—	—	23·7
	N.	46·1	352	8 26	− 2	15 3	−11	—	—	23·8
Miyako		46·4	354	8 32	+ 2	15 4	−14	—	—	—
Morioka		46·6	352	8 45	+13	15 44	+23	—	—	—
Nanking		47·9	325	e 7 48	−54	e 14 37	−62	—	—	—
Mori		49·1	353	8 50	− 1	15 57	+ 1	—	—	—
Sapporo		49·9	354	9 2	+ 5	16 6	− 1	—	—	—
Honolulu		59·2	60	i 10 1	− 4	e 18 11	− 1	e 11 52	PP	e 24·9
Calcutta	N.	65·8	299	e 10 48	− 1	i 19 31	− 4	e 14 30	PPP	31·5
Irkutsk		69·8	333	i 11 13	− 1	i 20 20	− 3	—	—	—
Colombo	E.	70·1	279	11 21	+ 5	21 5	+38	—	—	—
Kodaikanal	E.	73·0	283	i 11 35	+ 2	i 21 1	+ 1	21 26	PS	35·4
Hyderabad	N.	73·4	290	11 37	+ 1	21 0	− 5	—	—	35·2
Dehra Dun	N.	77·0	303	e 13 38	?	e 24 26	?	—	—	e 42·3
New Delhi		77·2	301	e 11 52	− 5	i 21 42	− 5	e 15 45	PP	i 33·4
Bombay		79·0	290	e 12 6	− 1	i 22 5	− 1	27 28	SS	38·8
Almata		81·5	316	12 26	+ 5	22 32	0	—	—	—
Frunse		83·0	314	e 12 28	0	—	—	—	—	—
Andijan		84·1	312	e 12 35	+ 1	22 58	0	—	—	—
College		85·0	23	e 12 44	+ 6	e 23 2	− 5	e 24 4	PS	e 35·1
Obi-garm		85·7	310	i 12 44	+ 2	—	—	—	—	—
Stalinabad		86·3	310	i 12 45	0	i 23 26	+ 6	i 16 10	PP	—
Tashkent		86·5	312	e 12 44	− 2	e 22 58	[−13]	e 15 44	PP	—
Samarkand		87·9	310	e 12 56	+ 3	e 23 20	[0]	—	—	—
Sitka		88·0	32	e 12 49	− 4	i 23 20	[− 1]	e 16 1	PP	e 35·8
Ferndale		91·9	49	—	—	e 24 11	0	e 25 46	PS	e 46·7
Ukiah		92·6	51	e 22 52	?	e 24 44	+26	e 29 44	SS	—
Berkeley		93·2	53	i 13 23	+ 6	e 23 51	[0]	e 18 3	PP	e 40·7
Branner		93·2	53	—	—	e 24 28?	+ 5	e 42 28?	Q	e 46·5
Shasta Dam		93·3	50	e 13 19	+ 1	—	—	e 30 30	PKKP	—
Santa Clara		93·4	53	e 13 28	+10	e 23 46	[− 6]	e 25 40	PS	e 42·8
Victoria		93·4	42	13 22	+ 4	23 55	[+ 3]	17 10	PP	43·5
Lick		93·6	53	e 13 33	+14	e 23 52	[− 1]	—	—	e 42·3
Sverdlovsk		94·5	327	i 13 20	− 3	i 24 29	− 5	i 17 11	PP	—
Santa Barbara		94·9	56	e 13 27	+ 2	e 23 59	[− 2]	—	—	—
Pasadena		96·2	56	i 13 31	0	i 24 45	− 3	e 17 24	PP	39·1
Mount Wilson		96·3	56	i 13 33	+ 1	e 24 3	[− 5]	—	—	—
Grand Coulee		96·3	42	e 13 42	+10	—	—	—	—	—
Tinemaha		96·3	54	i 13 33	+ 1	e 23 52	[−16]	—	—	—
Haiwee	E.	96·5	54	e 13 39	+ 7	—	—	—	—	—
La Jolla	Z.	96·8	58	i 13 44	+10	—	—	—	—	—
Riverside	Z.	96·8	56	i 13 36	+ 2	—	—	—	—	—
Palomar		97·2	57	i 13 37	+ 1	e 24 14	[+ 1]	—	—	—
Tananarive		98·4	250	e 21 51	?	25 14	+ 7	24 24	SKS	46·2
Boulder City		99·0	54	i 13 50	+ 6	e 24 30	[+ 8]	—	—	—
Overton		99·3	54	e 13 45	0	—	—	—	—	—
Pierce Ferry		99·7	54	i 13 46	− 1	e 24 26	[0]	—	—	—
Butte		100·7	44	e 16 36	?	e 24 30	[0]	e 19 53	PPP	e 41·8
Baku		101·0	310	e 13 56	+ 3	24 30	[− 2]	—	—	—
Salt Lake City		101·4	50	e 18 2	PP	e 24 46	[+12]	e 27 22	PS	e 41·5
Bozeman		101·8	45	e 13 55	− 1	e 24 36	[0]	e 18 8	PP	e 39·8
Tucson		102·2	58	e 14 0	+ 2	e 24 42	[+ 4]	e 18 8	PP	e 42·7
Grozny		104·0	313	—	—	24 46	[0]	—	—	—
Saskatoon		104·1	38	18 28	PP	24 45	[− 1]	27 34	PS	48·0
Erevan		105·4	310	18 34	PP	—	—	—	—	—
Moscow		107·3	327	e 14 26	P	24 59	[− 2]	18 56	PP	—
Rapid City		107·5	46	e 18 35	PP	e 25 8	[+ 6]	e 21 2	PPP	e 45·8
Sotchi		108·3	314	18 56	PP	—	—	—	—	—
Punta Arenas		111·7	156	28 18	?	35 28?	?	41 28?	?	54·5
Simferopol		112·0	317	19 21	PP	—	—	—	—	—
Yalta		112·1	316	19 28	PP	—	—	—	—	—
Helsinki		112·1	335	e 19 25	PP	e 25 21	[0]	e 21 50	PPP	e 46·5
Ksara		112·7	303	e 14 43	P	29 17	PS	19 30	PP	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m. s.			m.
Upsala		115·4	336	e 19 28	PP	e 26 28	{−15}	e 22 12	PPP		—
Scoresby Sund		115·9	357	15 4	P	25 38	[+ 3]	18 52	PKP		—
Istanbul		116·6	313	e 15 0	P	29 23	PS	—	—		—
Helwan		117·0	300	e 16 31	P	25 40	[+ 1]	e 18 52	PKP		—
Bucharest		117·7	317	e 20 40	PP	e 25 45	[+ 3]	e 29 46	PS		41·5
Warsaw		117·7	327	e 15 13	P	25 46	[+ 4]	i 20 12	PP		e 52·5
St. Louis		118·1	49	e 18 49	[0]	i 25 51	[+ 8]	i 22 27	PPP		—
Chicago		119·1	45	e 15 20	P	e 29 34	PS	e 20 15	PP		e 48·3
Bergen		119·7	341	20 22	PP	27 12	{ 0}	e 23 3	PPP		45·0
Copenhagen		120·1	334	e 19 0	[+ 7]	i 29 59	PS	20 17	PP		59·5
Budapest		121·0	323	19 36	[+41]	30 8	PS	e 20 24	PP		48·5
Belgrade		121·3	319	i 18 59	[+ 4]	e 25 57	[+ 3]	i 20 47	PP		e 60·8
Kalossa		121·5	322	e 20 39	PP	—	—	——	—		e 81·5
Potsdam		121·8	330	e 20 28?	PP	e 25 58	[+ 2]	e 22 16	PKS		e 53·5
Prague		122·3	327	e 20 53	PP	e 26 4	[+ 6]	e 23 22	PPP		e 50·5
Cheb		123·4	328	e 20 19	PP	e 26 10	[+ 9]	e 23 35	PPP		e 59·5
Jena		123·4	329	e 19 9	[+10]	e 29 36	PS	e 38 0	SS		e 51·5
Zagreb		123·6	322	e 19 3	[+ 3]	30 40	PS	e 21 19	PP		e 54·5
Ivigtut		124·1	11	20 45	?	26 20	[+17]	30 42	PS		—
Aberdeen		124·7	342	i 21 2	?	i 30 42	PS	i 38 22	SS		53·0
Triest		125·1	324	e 20 36	PP	i 26 6	[0]	e 23 5	PPP		—
Santa Lucia	N.	125·3	140	20 28?	PP	—	—	38 0	SS		62·5
Ottawa		125·5	37	19 3	[0]	22 18	PKS	20 52	PP		52·5
De Bilt		125·7	334	e 19 10	[+ 6]	e 27 48	{− 4}	i 21 5	PP		e 55·5
Stuttgart		125·9	328	e 19 5	[+ 1]	e 27 50	{− 3}	e 20 56	PP		e 60·5
Edinburgh		126·0	341	21 18	PP	26 27	[+18]	22 52	PKS		—
Durham		126·4	339	i 21 9	PP	i 22 29	PKS	i 38 31	SS		64·3
Columbia		126·6	52	e 22 33	PKS	e 26 32	[+21]	e 28 3	SKKS		e 53·5
Shawinigan Falls		126·6	34	19 5	[0]	—	—	—	—		55·5
Strasbourg		126·8	329	e 19 7	[+ 1]	i 26 14	[+ 3]	e 21 9	PP		e 60·4
Chur		126·9	326	e 19 7	[+ 1]	—	—	(e 39 10)	SS		e 39·2
Uccle		127·0	333	e 19 20	[+14]	e 27 55	{− 5}	e 21 12	PP		e 58·5
Zürich		127·1	328	e 19 7	[+ 1]	e 31 6	PS	e 21 23	PP		—
Seven Falls		127·3	33	19 10	[+ 3]	22 22	PKS	31 34	PS		55·5
Basle		127·5	328	e 19 16	[+ 9]	e 31 17	PS	—	—		—
Florence		127·6	322	i 21 58	PP	i 26 20	[+ 7]	i 31 17	PS		—
Rome		127·8	319	e 19 8	[0]	e 22 26	PS	e 20 58	PP		—
Pavia		128·0	325	e 19 8	[0]	—	—	—	—		e 61·1
Neuchatel		128·2	328	e 19 10	[+ 1]	—	—	—	—		—
Besançon		128·5	328	e 22 28	PKS	e 32 46	PPS	e 38 34	SS		60·0
Philadelphia		128·5	43	e 20 3	[+54]	e 27 29	{−41}	e 21 9	PP		e 51·6
Kew		128·5	336	i 19 20	[+11]	e 27 46?	{−24}	i 21 22	PP		e 60·5
Fordham		128·9	41	e 19 11	[+ 1]	e 39 34	SS	e 21 24	PP		54·6
Paris		129·2	332	e 19 13	[+ 3]	i 22 38	PKS	i 21 30	PP		60·5
Weston		129·8	38	i 19 14	[+ 2]	i 22 52	PKS	i 21 21	PP		i 55·6
Clermont Ferrand		131·0	329	e 19 23	[+ 9]	i 22 40	PKS	i 21 42	PP		56·5
La Plata	E.	131·6	150	19 23	[+ 8]	26 34	[+10]	22 52	PKS		53·7
	N.	131·6	150	19 26	[+11]	27 28	?	22 4	PP		54·6
Balboa Heights		132·1	84	e 19 21	[+ 5]	e 22 43	PKS	—	—		—
Halifax		132·8	31	22 56	PKS	31 46	PS	39 28?	SS		54·5
Barcelona		134·4	325	e 22 56	PKS	40 48	SS	45 18	SSS		59·7
Tortosa		135·7	325	19 38	[+15]	26 40	[+ 8]	22 15	PP		e 58·5
La Paz		136·8	123	19 21a	[− 4]	27 28	[+54]	i 23 5	PKS		63·5
Bogota	Z.	137·3	90	e 19 20	[− 6]	e 27 47	?	i 23 3	PKS		—
Alicante		137·9	324	19 42	[+15]	26 32	[− 4]	22 17	PP		e 65·5
Toledo	Z.	138·9	328	19 29	[0]	27 34	[+57]	23 27	PKS		—
Bermuda		139·6	46	e 19 26	[− 4]	i 40 58	SS	i 22 23	PP		i 57·3
Almeria		140·1	324	i 19 29	[− 2]	26 33	[− 6]	i 22 37	PP		68·1
Granada		140·5	325	i 19 35k	[+ 4]	i 26 14	[−26]	20 5	pPKP		i 67·3
Lisbon		142·3	332	19 37	[+ 2]	41 10	PS	22 48	PP		63·4
San Juan		144·4	68	e 19 34	[− 4]	e 26 54	[+ 8]	e 22 55	PP		e 58·5
Fort de France		149·5	73	i 19 50	[+ 3]	—	—	—	—		—

For Notes see next page.

NOTES TO MAY 6d. 20h. 30m. 32s.

Additional readings :—
Riverview iN =6m.23s., iPPNZ =6m.38s., iN =6m.52s., iPcPN =9m.6s., isSE =10m.39s., iN =10m.51s., iZ =10m.56s., iN =11m.21s., iZ =11m.25s., eQN =12m.4s.
Auckland i =8m.26s., sPP =9m.5s., PcP =9m.18s., sPcP =9m.48s., i =10m.1s., 10m.31s., and 11m.24s., sS? =13m.28s., i =14m.20s., SS =16m.4s.
Apia eSSSE =17m.4s.
Arapuni SS =16m.28s.
Perth i =15m.28s., SSS =16m.33s.
Wellington i =8m.53s., iZ =9m.13s., PP? =9m.37s., sPcP =10m.8s., iZ =10m.42s., 11m.11s., i =11m.53s., PcS =13m.32s., SS? =17m.32s.
Osaka PP =9m.58s.
Honolulu e =13m.38s. and 20m.6s., eSS =21m.58s.
Calcutta iSSN =23m.55s.
Kodaikanal SSE =25m.33s.
New Delhi eE =11m.55s., iN =15m.49s., iPSN =22m.6s., iE =22m.25s., SSN =26m.25s.
Bombay ePN =12m.10s., SSN =27m.39s.
College e =26m.15s. and 26m.56s., eSS =28m.30s., eSSS =32m.34s.
Stalinabad iPPP =18m.10s., iPS =24m.34s., iSS =29m.16s., iSSS =32m.58s.
Tashkent PS =24m.8s., PPS =24m.38s.
Sitka e =13m.57s., ePPP =18m.0s., iPS =24m.29s., iSS =29m.0s., iSSS =32m.59s.
Ferndale eN =45m.28s.
Ukiah e =32m.37s.
Berkeley eEN =13m.27s., iSKSN =23m.55s., iSKSE =23m.58s., iSKKSN =24m.46s., iSE =25m.42s., iQN =38m.34s.
Branner eE =25m.28s.?
Victoria SKKS =24m.28s., PS =25m.40s., PPS =26m.22s., SS =31m.4s., SSS =34m.52s., eN =38m.40s.
Lick eSN =23m.56s.
Sverdlovsk iPPP =19m.19s., iSKS =23m.53s., iPS =25m.46s., SS =30m.52s.
Pasadena eSKSE =24m.2s., eSSZ =31m.10s., eSSSZ =34m.52s.
Tinemaha eE =24m.16s.
Tananarive PS =26m.35s., SS =32m.11s.
Overton i =13m.52s.
Pierce Ferry i =13m.52s.
Butte e =24m.50s., ePPS? =28m.8s., eSS? =33m.38s., eSSS? =37m.44s.
Salt Lake City eS? =24m.53s., ePPS? =28m.15s., eSS =32m.53s., eSSS =36m.25s.
Bozeman iSKS =24m.42s., iPS =27m.14s., ePPS =28m.0s., iSS =32m.37s., iSSS = 36m.18s.
Tucson ePKP =17m.47s., i =19m.4s., e =23m.48s., eS =26m.4s., ePS =26m.56s., ePPS =28m.1s., ePKKP =30m.10s., iPKKP? =30m.32s., eSS =32m.56s., eSSS = 36m.48s., ePKP,PKP =38m.12s.
Saskatoon SS =32m.58s., SSS =36m.52s., e =43m.34s.
Moscow S =26m.19s., PS =27m.51s.
Rapid City eS =25m.50s., ePS =28m.6s., ePPS =29m.3s., eSS =34m.16s., eSSS = 37m.56s.
Helsinki ePPPP =23m.28s., eSKKS =26m.23s., ePS =28m.55s., ePPS =29m.51s., eSS =34m.50s., eSSS =39m.3s.
Upsala ePPN =19m.38s.
Scoresby Sund 19m.56s., SKKS =26m.52s., PS =29m.32s., 30m.41s., SS =35m.37s.
Helwan PPEZ =20m.6s., SKPEZ =21m.34s., PPP =22m.43s., PSEZ =29m.46s.
Bucharest eN =24m.30s.
Warsaw SKKSE =27m.8s., eSKKSZ =27m.11s., iPSZ =29m.46s., iPSE =29m.51s., iPKKSZ =32m.27s., iSSZ =36m.17s., SSE =36m.31s., iE =36m.53s., iZ =36m.59s. and 39m.5s., iE =39m.15s., eN =39m.57s., eE =40m.3s., iZ =40m.17s., iSSSEN = 40m.54s.
St. Louis iZ =20m.4s., eN =23m.54s., iSKKSE =27m.10s., iPSE =29m.29s., eSSN = 35m.10s., eSSSN =40m.10s.
Chicago eSS =35m.41s., eSSS =40m.54s.
Bergen eN =25m.0s., and 29m.10s., PSN =29m.39s., SKKSN =35m.41s., SSN = 36m.55s., eN =40m.19s.
Copenhagen 22m.58s., iPPS =31m.35s., 37m.19s.
Budapest PKPE =23m.4s., ePPE =24m.34s., ePPPN =25m.51s., PPPE =27m.31s., SN =30m.24s., PSN =30m.44s., eSKKSE =31m.36s., SKSPE =34m.44s., SSN = 35m.31s., eE =37m.44s., eSSSN =37m.58s., eSSE =41m.34s.
Belgrade e =19m.39s., iPPP =23m.27s., iPKKP =29m.7s.
Kalossa eE =21m.21s.
Potsdam ePSE =30m.16s., ePSN =30m.28s., eSSN =37m.22s., eN =37m.58s., eE = 38m.4s., eSSSE =41m.52s., eN =42m.16s.
Prague ePS =30m.28s., eSS =37m.16s., eSSS =41m.52s.
Cheb ePP =20m.52s., e =22m.13s., eSKKS =27m.48s., ePS =30m.39s., e =33m.14s., iSS =38m.21s., iSSS =42m.24s.
Jena ePP =20m.48s., eE =38m.8s., and 42m.12s., eN =42m.28s.
Zagreb ePS? =36m.28s., ePPS?NE =38m.40s., eSSNE =41m.40s.
Ivigtut 30m.2s., SS =37m.40s.
Aberdeen iPSE =33m.12s., iSSEN =42m.33s., iN =49m.46s.
Triest eSKKS =27m.46s., iPS =30m.29s.

Continued on next page.

Ottawa PS =30m.54s., PPS =32m.40s., SS =38m.10s., SSS =42m.52s., e =46m.46s.
De Bilt eZ =20m.48s., ePKS =22m.25s., iPPP =23m.50s., ePS =30m.28s.?, iPPS = 32m.28s., eSS =37m.28s.?, eSSS =42m.28s.?
Stuttgart ePZ =15m.47s., ePKPZ =19m.13s., iPP =21m.8s., iSKP =22m.14s., ePPP = 23m.42s., ePS =30m.58s., ePPS =33m.28s.?, eSS =38m.28s.?, eQ? =54·5m.
Edinburgh PPP =24m.2s., PS =30m.58s., PPS =32m.52s., SS =38m.27s., SSP = 38m.46s., SSS =43m.7s.
Durham iEN =22m.23s. and 38m.39s.
Columbia ePPS =33m.22s., eSS =38m.0s.
Strasbourg eP =15m.54s.k, iPP =21m.13s., eSKP =22m.27s., ePPP =23m.53s., eSKKS =28m.2s., iPS =31m.14s., iPPS =32m.36s., i =32m.47s., eSS =38m.3s. and 38m.31s. iSSS =43m.12s., e =44m.38s., e =52m.48s., Q =55·5m.
Chur e =19m.15s.
Uccle eSKPE =22m.29s., ePPPZ =24m.0s., ePSZ =31m.11s., ePPSN =32m.43s., eSSEN =38m.52s., eSSSEN =44m.16s.
Zürich e =19m.11s.
Seven Falls PPS =32m.52s., SS =38m.28s.
Florence iSKKS =27m.59s.
Rome ePZ =15m.44s., ePPSE =31m.8s., eSSE =34m.53s.
Besançon eSSS =43m.28s.?
Philadelphia iPKS =22m.36s., e =34m.12s., eSS =38m.39s., eSSS =43m.40s.
Kew ePZ =16m.2s.k, iPKS?NZ =22m.32s., ePPPNZ =24m.10s., ePSEN =31m.6s.?, ePPS =32m.51s., eSSN =38m.28s.?, eSSSEN =43m.28s.?
Fordham iSKP =22m.42s., i =22m.51s.
Paris iPKP =19m.18s. and 19m.21s., iPPP =24m.18s., iPPS =33m.12s., eSS =38m.28s.?, eSSS =43m.58s., Q =56·5m.
Weston eSKSP =31m.22s., iPSPS =39m.28s., iSSS =43m.34s.
Clermont-Ferrand eSKP =22m.56s., iPPS =33m.21s., e =34m.51s., eSS =39m.31s., eSSS =44m.30s.
La Plata E =20m.6s. and 23m.40s., PPPE =24m.40s., E =30m.46s., PS?E =32m.40s., PPSN =33m.34s., SSN =39m.16s., SSE =39m.20s., N =41m.4s.
Balboa Heights e =19m.30s.
Halifax PPS =33m.46s., SSS =43m.28s.?, e =48m.28s.?
Tortosa SKPEN =22m.58s., PPPN =25m.8s., SKKSE =29m.6s., PSE =32m.16s., PPSEN =34m.2s., SS =35m.54s., SSPE =41m.6s., iE =42m.32s., SSSE =44m.46s., eQE =56·5m.
La Paz iPKPZ =19m.28s., iN =19m.44s., iSKP =23m.45s., iPPPN =24m.56s., iZ = 26m.16s., SKKS =29m.32s., iE =31m.20s., iPPSE =34m.38s., SSN =40m.28s., SSSE =45m.16s., iN =58m.16s.
Bogota iPKP$_2$ =19m.27s.
Alicante SKP =23m.10s., PPP =25m.20s., SKKS =29m.19s., eS =30m.20s., PS = 32m.26s., PPS =34m.19s., SS =40m.34s., SSP =41m.14s., SSS =45m.26s., Q =56m.20s.
Bermuda iSKSP =32m.28s., iPSPS =41m.28s., iSSS =45m.26s.
Almeria PKS =23m.7s., PPP =25m.38s., SKKS =29m.23s., PS =32m.58s., PPS = 34m.55s., SS =40m.53s., SSP =41m.19s., SSS =46m.3s., Q =59m.5s.
Granada PP =22m.41s., pPP =23m.17s., sPP =23m.50s., sSKS =27m.26s., SKSP = 32m.47s., PPS =35m.5s., iSS =41m.8s., sSS =42m.2s., SSS =46m.35s., Q =63m.22s.
Lisbon E =24m.52s., PPSN =35m.19s., SSSEN =47m.10s.
San Juan iPKP =19m.47s., e =27m.48s., eSKKS =29m.55s., e =32m.33s., ePPS = 35m.30s., e =37m.0s., eSS =41m.17s., eSSS =47m.16s.
Fort de France e =25m.38s. and 28m.9s.
Long waves were also recorded at Johannesburg.

May 6d. Readings also at 0h. (near Obi-garm and Stalinabad), 1h. (Boulder City), 2h. (Boulder City, Pierce Ferry, Tucson, and near Obi-garm), 3h. (Bogota, near Andijan, Obi-garm, Tashkent, Frunse, and Tchimkent), 4h. (La Paz), 6h. (near Ebingen and Stuttgart), 10h. (near Mineral), 11h. (Brisbane, Riverview, Mount Wilson, Pasadena, Palomar, and Riverside), 12h. (Riverview, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Boulder City, Pierce Ferry, Weston, Bermuda, and De Bilt), 13h. (near Andijan (2)), 14h. (Samarkand, near Obi-garm, Stalinabad, and near Leninakan), 20h. (Branner, Mount Wilson, Pasadena, Riverside, Tinemaha, Lisbon, and Stuttgart), 21h. (St. Louis and Tucson).

May 7d. 14h. South West Pacific.

Brisbane iPN =13m.10s., iPPN =13m.26s., iSN =17m.16s., iE =17m.35s., iSSE = 17m.57s.
Vladivostok eP =17m.13s.
Riverview eSE =19m.15s., eN =19m.24s., eLE =22m.6s.
Frunse eP =21m.4s.
Pasadena iPZ =21m.15s., epPZ =21m.43s.
Mount Wilson iPZ =21m.16s., epPZ =21m.40s.
Tinemaha iPZ =21m.17s., epPZ =21m.48s.
Riverside iPZ =21m.19s., epPZ =21m.52s.
Palomar ePZ =21m.20s., epPZ =21m.50s.
Tashkent eP =21m.23s., eS =31m.45s.
Boulder City eP =21m.28s., e =22m.1s., ePP =25m.17s.
Samarkand eP =21m.30s.
Pierce Ferry iP =21m.31s.
Sverdlovsk iP =21m.32s., S =32m.6s.
Wairiri S?EN =25m.25s., LEN =26m.8s.
Stuttgart eP?Z =27m.12s., eL =80m.0s.
Strasbourg iPKP =27m.14s., eL? =70m.0s.
Ksara ePKP? =28m.5s., e =31m.1s.
Long waves were recorded also at Auckland, De Bilt, Copenhagen, Rome, Weston, and Bermuda.

May 7d. Readings also at 0h. (Branner), 4h. (Almata, near Andijan, and Tashkent), 5h. (Tucson and near Balboa Heights), 6h. (Tucson, Palomar, and St. Louis), 7h. (Riverview), 8h. (Brisbane and Riverview), 10h. (near Alicante), 11h. (Copenhagen, Tashkent, Samarkand, Andijan, near Stalinabad, Obi-garm, and near Johannesburg), 12h. (Stuttgart, near Boulder City, Pierce Ferry, and Lick), 13h. (Copenhagen, Alicante, Almeria, and Toledo), 15h. (Riverview, Branner, Fresno, and near Lick), 17h. (Tucson), 20h. (Boulder City).

May 8d. 6h. 58m. 22s. Epicentre 41°·9N. 143°·6E. (as on 1946, Jan. 6d.).

Intensity V at Urakawa ; IV at Hatinohe, Kusiro ; II-III at Sapporo, Aomori, Miyako, and Morioka.
Epicentre 41°·9N. 143°·3E. Macroseismic radius >300km.. Shallow.
Seismo. Bull. Cent. Met. Obs., Japan, 1947, Tokyo, 1950, p.p. 24, 25, with macroseismic chart.

$A = -\cdot6009$, $B = +\cdot4430$, $C = +\cdot6653$; $\delta = -5$; $h = -2$;
$D = +\cdot593$, $E = +\cdot805$; $G = -\cdot536$, $H = +\cdot395$, $K = -\cdot747$.

	△	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Urakawa	0·7	292	0 14k	− 3	0 24	− 4
Nemuro	2·0	46	0 40	+ 5	1 4	+ 2
Sapporo	2·0	305	0 36a	+ 1	1 1	− 1
Hatinohe	2·1	229	0 34k	− 3	0 57	− 7
Mori	2·3	275	0 40k	0	1 6	− 3
Aomori	2·4	243	0 40	− 1	—	—
Miyako	2·6	208	0 40	− 4	1 5	−12
Morioka	2·9	220	0 47k	− 1	1 18	− 6
Mizusawa	3·4	216	0 47	− 8	1 24	−13
Sendai	4·2	211	1 7	0	1 57	0
Hukusima	4·8	212	1 16	+ 1	—	—
Onahama	5·4	204	1 25	+ 1	2 15	−13
Mito	6·0	205	1 42	+10	2 29	−14
Utunomiya	6·1	210	1 31	− 3	2 33	−12
Kakioka	6·3	207	1 30	− 6	2 35	−15
Maebasi	6·5	214	1 47	+ 8	2 47	− 8
Kumagaya	6·6	211	1 52	+11	2 51	− 7
Hunatu	7·4	213	1 59	+ 7	—	—
Shizuoka	8·0	212	2 13	+13	3 21	−12
Gihu	8·4	222	2 1	− 5	—	—
Omaesaki	8·4	212	2 36	+30	4 9	+26
Vladivostok	8·7	282	i 2 8	− 2	i 3 45	− 5
Irkutsk	28·4	306	e 5 55	− 3	P0 38	− 7
Andijan	52·0	295	e 9 10	− 3	—	—
Sverdlovsk	52·7	317	i 9 24	+ 6	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tashkent		53·9	297	e 9 22	− 5	—	—	—		—
Shasta Dam		66·9	56	e 10 53	− 3	—	—	—		—
Tinemaha	Z.	71·6	57	i 11 23	− 2	—	—	—		—
Mount Wilson	Z.	73·6	59	i 11 33	− 4	—	—	—		—
Riverside	Z.	74·2	59	e 11 43	+ 3	—	—	—		—
Boulder City		74·5	56	e 11 39	− 3	—	—	—		—
Pierce Ferry		74·9	55	i 11 36	− 8	—	—	—		—
Tucson		79·4	56	e 12 4	− 5	—	—	—		—
Stuttgart	Z.	81·2	332	e 12 15a	− 4	—	—	—		—

Additional readings :—
Boulder City e = 11m.57s.
Tucson e = 12m.11s. and 12m.27s.
Long waves were recorded at Riverview.

May 8d. 7h. Undetermined shock.

Victoria e = 18m.48s., L = 19m.18s.
Grand Coulee iP = 19m.24s., e = 19m.28s., eS = 20m.29s., e = 20m.35s.
Shasta Dam iP = 20m.40s.
Tinemaha eP?Z = 21m.38s., iP?Z = 21m.46s.
Rapid City eP = 21m.56s., e = 22m.42s.
Pierce Ferry iP = 21m.58s.
Boulder City eP? = 22m.2s.
Mount Wilson ePZ = 22m.16s.
Riverside ePZ = 22m.20s.
Tucson eP = 22m.57s., i = 23m.2s.
Long waves were also recorded at North American stations.

May 8d. 18h. South Pacific.

Brisbane iPN = 31m.19s., iSEN = 34m.58s., iSSE = 35m.33s.
Riverview iP?Z = 32m.33s.a, eSS?E = 38m.24s., eLZ = 40m.30s.
Mizusawa P?E = 35m.5s.
Santa Lucia PN = 38m.26s., N = 38m.48s.
Sverdlovsk eP = 40m.34s., eS = 48m.12s.
La Plata P?E = 40m.36s., LN = 43m.54s.
Shasta Dam iP? = 43m.1s.
Stuttgart eP?Z = 43m.40s.?
Tashkent eP = 47m.46s., eSS = 50m.30s.

May 8d. 18h. 44m. 57s. Epicentre 23°·8N. 94°·8E.

A = −·0766, B = +·9127, C = +·4013 ; δ = −7 ; h = +4 ;
D = +·996, E = +·084 ; G = −·034, H = +·400, K = −·916.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Calcutta	N.	6·1	259	e 1 38	+ 4	i 2 28	−17	—	—	—
Dehra Dun	N.	16·3	297	e 3 41	−11	i 6 25	−28	—	—	—
New Delhi		16·5	290	i 3 46	− 8	i 6 59	+ 1	4 1	PP	—
Hyderabad	N.	16·6	251	3 51	− 5	6 58	− 2	7 25	SS	—
Bombay		21·1	261	i 4 46	− 2	i 8 33	− 6	—	—	10·2
Kodaikanal	E.	21·3	236	i 4 57	+ 7	i 8 47	+ 4	—	—	10·9
Colombo	E.	22·1	223	4 59	0	—	—	—	—	—
Almata		24·4	328	e 5 26	+ 5	—	—	—	—	—
Andijan		25·3	317	e 5 34	+ 4	10 0	+ 6	—	—	—
Obi-garm		26·0	312	i 5 35	− 1	i 10 11	+ 5	—	—	—
Stalinabad		26·6	311	i 5 43	+ 1	i 10 19	+ 3	—	—	—
Tchimkent		27·9	318	i 6 8	+14	—	—	—	—	—
Samarkand		28·3	311	i 6 0	+ 3	—	—	—	—	—
Baku		41·0	305	7 54	+ 8	—	—	9 31	PP	—
Sverdlovsk		41·3	332	i 7 51	+ 2	i 13 33	−31	i 8 7	pP	—
Grozny		44·6	308	8 18	+ 2	14 43	− 9	—	—	—
Leninakan		45·6	305	e 8 23	− 1	—	—	—	—	—
Ksara		52·0	295	i 9 13	0	e 16 31	− 5	9 31	pP	—
Moscow		52·3	323	9 14	− 1	16 57	+17	i 9 32	pP	—
Yalta		53·0	308	e 9 19	− 2	16 39	−11	i 9 36	pP	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m. s.			m.
Simferopol		53·1	309	e 9 25	+ 4	—	—	—		—	—
Helwan		56·3	291	i 9 45a	0	17 26	− 8	10 11		pP	—
Istanbul		56·8	305	e 9 29	−19	e 17 26	−15	—		—	—
Helsinki		59·6	328	e 9 54	−14	e 18 5	−12	—		—	e 30·0
Warsaw		61·7	318	e 10 20	− 2	18 45	+ 1	12 51		PP	e 27·1
Belgrade		62·8	309	i 10 27	− 3	e 18 52	− 6	23 3?		SS	e 32·1
Upsala		63·3	327	10 48a	+15	18 54	−10	(e 26 3?)		SSS	e 26·0
Zagreb		65·7	311	e 10 48	0	e 19 22	−12	—		—	—
Prague		66·1	316	e 10 32?	−19	e 19 25	−14	e 13 39		PPP	e 27·1
Copenhagen		66·4	323	i 10 52	− 1	—	—	i 11 10		P_cP	—
Potsdam	E.	66·4	319	e 11 11	+18	e 19 37	− 6	—		—	—
Triest		67·3	312	e 10 57	− 2	e 19 42	−12	e 11 16		pP	—
Cheb		67·4	306	e 15 3?	PPP	e 20 3	+ 8	e 24 3?		SS	e 32·6
Jena		67·7	307	e 11 1	0	—	—	e 11 24		P_cP	—
Rome		69·0	308	e 11 7	− 2	e 19 56	−18	e 11 25		P_cP	e 32·1
Florence		69·4	310	i 11 28	P_cP	e 19 35	−43	—		—	—
Bergen		69·6	329	e 11 30	P_cP	—	—	e 17 35		?	—
Stuttgart		69·7	316	e 11 13k	− 1	e 20 11	−11	e 11 30		P_cP	e 36·0
Chur		69·9	313	e 11 13	− 2	—	—	—		—	—
Zürich		70·4	315	e 11 16	− 2	e 21 16	PPS	—		—	—
Pavia		70·5	311	e 11 42	P_cP	—	—	—		—	—
Strasbourg		70·6	316	i 11 19	0	e 20 42	+ 9	e 15 56		PPP	—
Basle		71·0	315	e 11 21	− 1	—	—	—		—	—
De Bilt		71·4	320	i 11 40a	P_cP	e 20 33	− 9	e 25 9		SS	e 32·1
Uccle		72·2	319	e 11 31?	+ 2	e 21 3?	+12	e 25 3?		SSS	e 36·1
Paris		73·9	317	i 11 38	− 1	e 21 29	PS	i 11 55		pP	e 38·1
Clermont-Ferraud		74·5	313	i 11 42	0	—	—	—		—	—
Kew		74·8	320	e 11 47	+ 3	(e 21 3?)	−17	—		—	e 21·1
Scoresby Sund		76·1	342	—	—	21 45	+10	—		—	39·0
Tortosa		77·9	309	12 1	0	21 44	−10	14 56		PP	e 42·0
Riverview		78·5	135	e 12 26	P_cP	i 22 3	+ 2	—		—	e 38·1
Alicante		79·5	307	e 12 11	+ 1	21 59	−12	12 29		pP	e 38·5
Toledo	Z.	81·5	309	e 12 31	+10	—	—	12 39		P_cP	—
Almeria		81·6	306	i 12 20	− 1	i 22 43	+10	12 36		pP	40·8
Granada		82·3	307	i 12 23a	− 2	i 22 55	+15	12 55		pP	40·0
Shasta Dam		107·1	29	e 18 28	[+ 1]	—	—	—		—	—
Mount Wilson	Z.	114·4	29	i 18 48	[+ 6]	—	—	—		—	—
Pasadena	Z.	114·4	29	i 18 46	[+ 4]	—	—	—		—	—
Riverside	Z.	114·9	29	i 18 47	[+ 4]	—	—	—		—	—
St. Louis	Z.	117·7	4	e 18 53	[+ 5]	—	—	—		—	—
Tucson		119·1	25	i 18 26	[−25]	—	—	e 29 7		PKKP	—
La Paz	N.	162·4	291	i 19 58	[− 5]	—	—	i 20 51		?	—

Additional readings :—
New Delhi PPPN =4m.11s., iSN =6m.29s., SSN =6m.38s., SSE =6m.41s., iN =6m.56s.
Hyderabad iN =6m.30s.
Sverdlovsk isP =8m.19s., isS =14m.32s.
Helwan PPPZ =13m.15s.
Warsaw ePZ =10m.38s., PN =10m.42s., PPPZ =14m.22s., SEN =18m.36s., PSEN = 19m.3s., PSZ =19m.10s., SSE =22m.38s., SSSZ =25m.26s., SSSE =25m.36s.
Belgrade i =11m.43s., ePP =12m.12s., SSS? =26m.33s.
Zagreb e =11m.0s., eNE =19m.58s.
Potsdam eSE =19m.58s., eSN =20m.3s.
Triest ePP =13m.41s., ePPP =15m.4s.
Jena eN =11m.4s., eE =11m.21s.
Rome eSSE =24m.3s.?, eSSSE =32m.3s.?
Stuttgart ePP? =14m.9s., ePS =20m.37s., eSS =24m.47s.
Paris i =12m.11s. and 12m.49s.
Tortosa P_cPE =12m.8s., PPPE =16m.54s., S_cSE =22m.9s., PSE =22m.25s., PPSN = 22m.50s., SSE =26m.48s.
Alicante PP =15m.21s., eS =22m.27s., PS =23m.31s., PPS =23m.55s., SS =28m.3s., SSS =31m.19s., Q =36m.3s.
Toledo PP?Z =15m.9s.
Almeria sP =12m.46s., PP =15m.40s., PPP =17m.40s., PS =23m.21s., SS =28m.9s., SSS =31m.18s.
Granada P_cP =12m.37s.. sP =13m.13s., iPP =16m.0s., pPP =16m.16s., PS =23m.58s., SSS =32m.25s.

May 8d. 23h. 52m. 52s. Epicentre 2°·3N. 95°·2W.

A = −·0906, B = −·9951, C = +·0398 ; δ = +2 ; h = +7 ;
D = −·996, E = +·091 ; G = −·003, H = −·040, K = −·999.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Balboa Heights		16·9	67	e 4 0	+ 1	—	—	—	—	—
Bogota	z.	21·2	82	e 4 52	+ 3	—	—	—	—	e 10·5
La Paz		32·6	125	i 6 40	+ 5	11 57	+ 6	13 37	SS	15·9
San Juan		32·7	58	e 6 34	− 2	e 11 51	− 1	e 7 47	PP	e 13·8
Tucson		33·2	336	e 6 40	0	e 12 4	+ 4	i 7 15	?	e 14·2
Columbia		34·2	21	—	—	e 12 16	0	—	—	—
St. Louis		36·5	6	i 7 8	− 1	i 12 49	− 2	e 8 35	PP	i 17·7
Florissant		36·6	6	e 7 19	+ 9	e 13 3	+10	e 15 5	SS	—
Riverside	z.	37·7	330	i 7 20	+ 1	—	—	—	—	—
Pierce Ferry		37·9	335	e 7 17	− 3	—	—	—	—	—
Boulder City		38·1	334	e 7 21	− 1	—	—	—	—	e 20·9
Mount Wilson	z.	38·3	330	i 7 24	0	—	—	—	—	—
Pasadena	z.	38·3	330	i 7 24	0	—	—	—	—	e 18·6
Chicago		39·9	7	e 7 34	− 3	e 13 40	− 3	e 14 54	Q	e 16·5
Tinemaha	z.	40·6	332	e 7 43	0	—	—	—	—	—
Salt Lake City		41·1	342	e 7 57	+10	e 14 20	+19	e 9 28	PP	e 17·7
Bermuda		41·4	41	e 7 50	0	i 14 9	+ 4	e 10 11	PPP	e 17·2
Philadelphia		41·7	24	e 7 57	+ 5	e 14 10	0	e 9 37	PP	i 17·3
Logan		42·0	342	e 7 57	+ 3	e 14 15	+ 1	e 14 44	PPS	e 21·6
Rapid City		42·1	352	e 8 0	+ 5	—	—	e 13 22	P_eS	—
Fordham		42·9	24	e 8 1	− 1	e 14 29	+ 2	e 9 45	PP	—
Berkeley		43·2	329	—	—	i 14 38	+ 6	—	—	e 20·7
Shasta Dam		45·4	331	e 8 21	− 1	—	—	—	—	—
Weston		45·8	25	—	—	e 15 0	− 9	—	—	—
Butte		46·1	344	e 10 27	PP	e 15 22	+ 8	e 15 59	?	e 25·5
Ottawa		46·2	19	—	—	e 15 14	− 1	—	—	19·1
Grand Coulee		49·9	340	e 10 5	P_eP	—	—	—	—	—
Victoria		52·0	337	—	—	e 16 38	+ 2	—	—	26·1
Scoresby Sund		82·3	20	—	—	22 43	+ 3	—	—	34·1
Granada		89·9	53	i 13 4k	+ 2	24 2	+ 8	13 21	P_eP	42·6
Almeria		90·8	53	12 47	−19	e 22 25	?	22 51	sS	37·1
Kew		91·7	39	—	—	i 24 8	− 2	—	—	e 39·1
Alicante		92·3	52	e 12 46	−27	e 22 26	?	—	—	e 38·2
Strasbourg		96·8	41	—	—	e 7 32?	?	—	—	e 51·1
Rome		101·5	47	—	—	e 27 3	PS	e 32 48	SSP	—
Ksara		121·6	47	e 15 14	P	—	—	—	—	—

Additional readings and note :—
San Juan eP_eP? =8m.59s.
St. Louis iZ =7m.15s., iSSE =14m.55s.
Florissant eSSSE =15m.30s., eE =15m.53s.
Salt Lake City eS_eS? =17m.50s.
Bermuda e =8m.50s. and 9m.48s.
Rapid City 14m.44s.
Fordham eSS =17m.57s.
Granada SS =30m.21s.
Almeria PP =15m.34s., SSS =30m.29s.
Alicante PP =15m.32s., PPP =17m.36s.
Ksara e =11m.58s.
Long waves were also recorded at Santa Lucia, Honolulu, College, Harvard, Ukiah, Riverview, and at other European stations.

May 8d. Readings also at 1h. (Brisbane), 4h. (Strasbourg, Shasta Dam, Tashkent, Riverview, and near La Paz), 5h. (near Johannesburg), 8h. (near Tashkent), 10h. (Ksara and near Balboa Heights (2)), 11h. (Riverview), 12h. (Riverview near Andijan), 13h. (Riverview and near Johannesburg), 15h. (Helwan, Samarkand, near Obi-garm and Stalinabad), 16h. (Alicante), 17h. (near Obi-garm, Stalinabad, Andijan, and Samarkand), 18h. (Vladivostok, near Semipalatinsk, Almata, Stalinabad, and Obi-garm), 19h. (Shasta Dam), 21h. (Almata, Frunse, Tashkent, near Andijan, Samarkand, and Tchimkent), 23h. (Paris, Uccle, De Bilt, Stuttgart, Strasbourg, Cheb, and Kew).

May 9d. 13h. 32m. 32s. Epicentre 15°·3N. 89°·4W. (as on 1941, February 15d.).

$A = +·0101$, $B = -·9650$, $C = +·2622$; $\delta = +8$; $h = +6$;
$D = -1·000$, $E = -·010$; $G = +·003$, $H = -·262$, $K = -·965$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Mobile		15·4	4	i 6 5	?	—	—	—	—	—
Bogota	z.	18·4	122	e 4 56	PPP	—	—	—	—	—
San Juan		22·5	78	e 5 19	PP	e 8 58	− 7	e 5 38	PPP	e 9·7
St. Louis		23·3	358	i 5 6	− 4	i 9 13	− 7	i 5 25	PP	e 10·6
Florissant		23·4	358	e 5 12	+ 1	e 9 20	− 1	e 9 30	?	e 10·6
Tucson		25·8	316	i 5 35	+ 1	e 10 7	+ 5	e 17 12	S_eS	e 13·0
Chicago		26·6	3	e 5 41	− 1	e 10 18	+ 2	e 8 45	P_eP	e 11·6
Pierce Ferry		30·2	319	i 6 14	0	e 16 43	S_eS	e 17 20	?	—
Boulder City		30·7	318	i 6 19	0	—	—	—	—	—
Riverside	z.	31·4	312	i 6 25	0	—	—	—	—	—
Pasadena	z.	31·9	312	i 6 31	+ 2	—	—	—	—	—
Tinemaha	z.	33·6	316	e 6 45	+ 1	—	—	—	—	—
La Paz		37·9	145	i 7 56	+36	—	—	—	—	20·5
Shasta Dam		38·2	319	e 7 22	− 1	—	—	—	—	—
Strasbourg		83·3	42	(e 12 48)	+18	e 12 48	P	—	—	—
Stuttgart	z.	84·2	42	e 12 48	P_eP	—	—	—	—	—

Additional readings :—
Mobile i = 8m.42s., 9m.52s., 13m.28s., and 15m.56s.
St. Louis iZ = 5m.10s.
Tucson i = 5m.41s.
Long waves were also recorded at Bermuda, Weston, Salt Lake City, Kew, Copenhagen, and Helsinki.

May 9d. 14h. 5m. 38s. Epicentre 33°·3N. 131°·1E.

Intensity V at Izuka and Kumamoto; IV at Shimonisaki, Hukuoka, and Izuhara; II-III at Matsuyama, Hiroshima, and Yonago. Macroseismic radius greater than 300km. Slight damage: cracks in walls and damage to roads.

Epicentre as adopted. Very shallow.
The Seismological Bulletin of the Central Meteorological Observatory, Japan, for the year 1947, Tokyo 1950, p.p. 25-26, macroseismic chart p. 25.

$A = -·5506$, $B = +·6311$, $C = +·5464$; $\delta = 0$; $h = +1$;
$D = +·754$, $E = +·657$; $G = -·359$, $H = +·412$, $K = -·838$.

	△	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Izuka	0·5	316	0 6a	− 8	0 12	−11
Hukuoka	0·6	297	0 10a	− 5	0 18	− 8
Kumamoto	0·6	213	0 10a	− 5	0 17	− 9
Miyazaki	1·4	168	0 28a	+ 1	0 49	+ 3
Hiroshima	1·5	46	0 25a	− 3	0 45	− 4
Matuyama	1·5	69	0 34	+ 6	0 56	+ 7
Hamada	1·8	27	0 31a	− 1	0 54	− 2
Kagosima	1·8	195	0 34k	+ 2	1 1	+ 5
Tomie	2·1	251	0 36	− 1	1 0	− 4
Sumoto	3·3	72	0 58	+ 5	1 36	+ 1
Kobe	3·7	67	1 0	0	1 49	+ 4
Toyooka	3·8	54	1 9	P*	1 56	S*
Osaka	3·9	69	1 1	− 1	1 35	−15
Owase	4·3	79	1 16	P*	2 13	S*
Hikone	4·7	64	1 29	P_g	2 16	+ 6
Nagoya	5·2	68	1 26	+ 5	2 45	S*
Omaesaki	6·0	76	1 56	P_g	3 21	S_g
Hunatu	6·7	69	2 1	P*	—	—
Nagano	6·7	58	1 56	P*	3 40	S_g

Long waves also were recorded at Nanking, Kew, Paris, Rome, Strasbourg, De Bilt, Warsaw, and Stuttgart.

May 9d. Readings also at 4h. (Brisbane, Riverview, and near Reykjavik (2)), 6h. (Riverview, Samarkand, near Obi-garm, and Stalinabad), 9h. (New Delhi), 10h. (Warsaw, Ksara, Sverdlovsk, Andijan, Samarkand, and Tashkent), 11h. (Riverview, Wairiri, Auckland, and Wellington), 12h. (Kew and near Andijan), 13h. (Brisbane and Riverview), 15h. (Nanking, Boulder City and near Pierce Ferry), 18h. (Brisbane and Riverview), 19h. (Shasta Dam), 20h. (Istanbul, Ksara, Andijan, Tashkent, near Stalinabad, Obi-garm, Samarkand, and Tchimkent), 21h. (near Santa Lucia), 22h. (Belgrade, Istanbul, Rome, Florence, Bucharest, Zagreb, Triest, Stuttgart, Warsaw, De Bilt, Copenhagen, Helsinki. and near Lick).

May 10d. 0h. 7m. 11s. Epicentre 57°·8N. 142°·2E.

$A = -\cdot4231$, $B = +\cdot3282$, $C = -\cdot8446$; $\delta = +8$; $h = -8$;
$D = +\cdot613$, $E = +\cdot790$; $G = -\cdot667$, $H = +\cdot518$, $K = -\cdot535$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m.	s.	m.
Vladivostok		16·1	208	e 3 50	+ 1	i 7 1	+17	—	—	—
Irkutsk		22·2	273	4 59	− 1	9 8	+ 8	—	—	—
Sverdlovsk		41·5	305	i 7 51	+ 1	e 14 13	+ 6	—	—	—
Andijan		46·4	280	e 8 40	+10	e 18 49	SS	—	—	—
Tashkent		47·6	283	e 8 25	−14	e 18 49	SS	—	—	—
Obi-garm		49·3	281	e 8 51	− 2	—	—	—	—	—
Stalinabad		49·9	282	i 8 57	0	—	—	—	—	—
Samarkand		50·0	284	e 8 57	− 1	—	—	—	—	—
Moscow		51·7	316	e 9 9	− 2	e 16 29	− 3	—	—	—
Shasta Dam		59·3	62	i 10 6	0	—	—	—	—	—
Copenhagen		59·9	330	e 10 12	+ 2	18 25	+ 4	—	—	28·8
Bombay		63·2	264	—	—	e 21 3	?	e 26 51	SSS	—
Boulder City		66·6	60	e 10 55	+ 1	—	—	—	—	—
Pasadena	z.	66·6	63	i 10 54	0	—	—	—	—	—
Mount Wilson	z.	66·6	63	i 10 54	0	—	—	—	—	—
Istanbul		66·8	311	e 10 49	− 7	—	—	e 14 11	PP	—
Pierce Ferry		66·9	60	i 10 44	−12	—	—	—	—	—
Stuttgart		66·9	329	e 10 54	− 2	—	—	—	—	e 37·8
Riverside	z	67·1	63	i 10 57	0	—	—	—	—	—
Strasbourg		67·5	330	e 11 1	+ 1	—	—	—	—	e 33·2
Triest		68·4	324	e 27 23	SSS	e 34 3	L	—	—	— (e 34·0)
Ksara		70·0	302	e 11 13	− 2	e 21 35	+69	—	—	—
Tucson		71·6	59	i 11 26	+ 1	—	—	e 13 55	PP	—
Helwan	z.	75·4	303	e 11 46	− 1	—	—	—	—	—

Additional readings :—
Pierce Ferry i = 10m.57s.
Strasbourg e = 12m.31s.
Tucson i = 11m.38s.
Long waves were also recorded at New Delhi, Bermuda, and other American and European stations.

May 10d. Readings also at 2h. (Almeria, Granada, Jena, and Kew), 3h. (Alicante, Strasbourg, Stuttgart, De Bilt, and Uccle), 5h. (Santa Lucia), 8h. (Branner, near Berkeley, Fresno, Lick, San Francisco, and Mineral), 10h. (near Triest), 11h. (near Pierce Ferry), 19h. (Mizusawa), 21h. (Shasta Dam and near Lick).

May 11d. 5h. 6m. 19s. Epicentre 34°·1N. 116°·3W. (as on 1945, March 20d.).

$A = -\cdot3677$, $B = -\cdot7439$, $C = +\cdot5580$; $\delta = -5$; $h = 0$;
$D = -\cdot896$, $E = +\cdot443$; $G = -\cdot247$, $H = -\cdot500$, $K = -\cdot830$.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m.	s.	m.
Riverside	0·9	263	i 0 21a	+ 1	i 0 34	0	—	—	—
La Jolla	1·5	213	i 0 31	+ 3	i 0 52	+ 3	—	—	—
Mount Wilson	1·5	275	i 0 29	+ 1	i 0 51	+ 2	—	—	—
Pasadena	1·6	275	i 0 30	0	i 0 52	+ 1	—	—	—
Boulder City	2·2	47	i 0 36	− 2	i 1 5	− 1	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Haiwee	N.	2·4	326	e 0 40	− 1	i 1 14	+ 2	—	—	—
Santa Barbara		2·8	277	e 0 49	+ 2	i 1 30	S_g	—	—	—
Tinemaha		3·4	332	i 0 53a	− 2	i 1 48	P*	—	—	—
Fresno	N.	3·9	314	e 1 2	0	i 2 2	S*	i 1 12	P*	—
Tucson		4·9	110	e 1 13	− 4	—	—	—	—	i 2·6
Lick		5·4	308	e 1 21	− 3	i 2 56	S_g	—	—	—
Branner		5·8	306	e 1 41?	P*	—	—	—	—	—
Berkeley		6·1	309	i 1 30	− 4	e 3 29	S_g	—	—	i 3·7
Mineral	E.	7·5	328	e 1 58	+ 5	e 3 53	S*	—	—	—
Shasta Dam		8·2	326	e 2 3	0	—	—	—	—	—
Granada		85·4	48	—	—	—	—	(18 23)	PPP	18·4

Additional readings :—
Boulder City i = 40s.
Berkeley eEN = 1m.33s.
Long waves were also recorded at Bozeman, Salt Lake City, Florissant, St. Louis, and Weston.

May 11d. 6h. 32m. 17s. Epicentre 38°·7N. 16°·8E.

Destructive in Calabria. Damage at Ischia, Ionia, Badolato, and Santa Caterina. Felt very strongly at Catanzaro and Isca.

P. E. Valle.
Contributo allo studio delle carateristiche sismiche del Mediterraneo centro-orientale. Annali di Geofisica, vol. 1, 1948, pp. 266-278. Macroseismic, fig. 1, p. 266.
Epicentre 38°41′·4. ±7′·6N. 16°47′·7 ±2′·2E.

A = ·+7490, B = +·2262, C = +·6227 ; $\delta = -8$; $h = -1$;
D = +·289, E = −·957 ; G = +·596, H = +·180, K = −·782.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Rome		4·6	315	i 1 9	− 3	e 2 5	− 2	e 1 27	P_g	e 2·8
Florence	N.	6·6	322	i 1 44	+ 3	i 3 2	+ 4	—	—	—
Belgrade		6·7	23	i 1 39	− 3	i 3 2	+ 2	2 15	P_g	e 4·0
Zagreb		7·1	355	e 1 46	− 2	e 3 10	0	e 2 5	P*	i 3·8
Triest	N.	7·3	343	e 1 50	0	i 3 17	+ 2	i 3 59	SS	i 4·3
Kalossa	E.	8·0	11	2 23	P*	4 23	S_g	—	—	e 5·0
	N.	8·0	11	2 20	P*	4 30	S_g	e 2 56	P_g	5·2
Pavia		8·6	321	e 2 12	+ 3	e 4 2	+14	—	—	—
Budapest	E.	8·9	10	2 19	+ 7	e 3 52	− 3	4 21	S*	5·0
	N.	8·9	10	2 16	+ 4	e 4 8	+13	4 24	S*	—
Chur		9·7	329	e 2 26a	+ 4	e 5 0	S*	—	—	—
Istanbul		9·7	72	2 16	− 6	5 36	S_g	—	—	—
Zürich		10·5	328	e 2 40	+ 5	e 4 40	+ 5	—	—	—
Neuchatel		11·0	322	e 2 40	− 2	—	—	—	—	—
Basle		11·1	325	e 2 45	+ 2	—	—	—	—	e 6·0
Prague		11·5	352	2 48	0	e 5 23	+24	—	—	e 5·7
Stuttgart		11·5	334	e 2 48	0	e 5 8	+ 9	e 5 30	SS	i 6·6
Besançon		11·6	321	e 2 49	− 1	e 5 3	+ 2	—	—	e 5·5
Barcelona		11·6	288	e 2 52	+ 2	5 14	+13	—	—	—
Strasbourg		11·8	329	e 2 53	0	e 5 9	+ 3	i 5 31	SS	i 6·2
Clermont-Ferrand		12·4	309	e 2 59	− 2	e 5 24	+ 3	i 3 6	PP	6·6
Tortosa		12·7	284	i 3 5	0	5 45	+17	3 18	PP	6·4
Jena		12·8	345	e 3 14	+ 8	e 5 49	+19	—	—	e 6·4
Alicante		13·6	274	i 3 17	0	i 5 58	+ 8	4 41	PP	e 7·1
Potsdam	N.	13·9	350	e 3 21	0	i 6 29	+32	—	—	i 7·5
Warsaw		13·9	11	e 3 21k	0	e 6 0	+ 3	3 29	PP	e 6·7
Paris		14·4	319	e 3 25	− 2	i 6 22	+13	i 3 34	PP	e 7·2
Helwan		14·9	122	3 28	− 6	6 16	− 4	3 41	PP	—
Uccle		14·9	328	e 3 35k	+ 1	e 6 26	+ 6	—	—	e 7·3
Almeria		15·3	269	i 3 36	− 3	i 6 34	+ 4	i 3 43	pP	7·9
De Bilt		15·7	332	i 3 46	+ 2	i 6 53	+14	—	—	e 8·2

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ksara		16·2	102	e 3 50	0	e 7 0	+ 9	—	—	—
Granada		16·2	271	i 3 51	+ 1	i 7 3	+12	4 1	pP	8·4
Toledo	z.	16·2	281	i 3 50	0	6 57	+ 6	—	—	—
Copenhagen		17·3	352	i 4 4	0	i 7 19	+ 3	4 12	pP	—
Kew		17·5	323	i 4 12	+ 5	e 7 25	+ 4	e 4 45	PP	e 9·1
Lisbon		20·2	279	4 33	− 6	8 31	+10	4 47	PP	11·0
Durham	E.	20·3	329	e 4 55	+15	i 8 35	+12	—	—	—
Upsala		21·2	2	4 47k	− 2	e 8 38	− 3	i 5 11	PP	—
Erevan		21·4	78	e 4 51	0	—	—	—	—	—
Edinburgh		21·8	329	e 5 2	+ 6	8 47	P_cP	12 24	P_cS	—
Moscow		22·0	33	e 5 1	+ 3	e 8 57	+ 1	—	—	—
Helsinki		22·1	11	e 4 58a	− 1	e 8 55	− 3	—	—	e 11·7
Aberdeen		22·3	333	i 4 54	− 7	i 8 55	− 7	—	—	11·8
Bergen		22·9	346	e 5 4	− 2	e 9 7	− 6	10 13	SS	e 11·0
Baku		25·5	76	e 5 36	+ 4	—	—	—	—	—
Sverdlovsk		33·9	44	i 7 25	+38	—	—	—	—	—
Scoresby Sund		37·7	340	8 53	PP	14 3	+51	—	—	20·7
Tashkent		39·8	69	e 7 33	− 3	e 12 35	− 7	—	—	—
Stalinabad		40·1	73	i 7 39	0	i 13 48	+ 2	—	—	—
Obi-garm		40·8	72	e 7 45	0	13 51	− 5	—	—	—
Andijan		42·2	70	e 8 1	+ 5	—	—	—	—	—
Frunse		43·2	66	e 8 2	− 2	—	—	—	—	—
Irkutsk		59·2	46	e 10 3	− 2	e 18 5	− 7	—	—	—
St. Louis	z.	78·0	310	e 12 7	+ 5	—	—	—	—	—
Vladivostok		79·6	43	e 11 48	−22	—	—	—	—	—
La Paz		96·3	254	e 13 35	+ 3	—	—	—	—	51·7

Additional readings :—
Rome P* = 1m.18s., eS_g = 2m.37s.
Belgrade P* = 1m.51s., S_g? = 3m.31s.
Zagreb e = 1m.49s., eNE = 1m.59s., eZ = 2m.41s., ePPS = 2m.46s., eSNW = 3m.21s., eNE = 3m.24s., eSS = 3m.39s.
Kalossa eE = 3m.33s., eN = 4m.15s.
Budapest eN = 3m.43s.
Stuttgart e = 3m.55s. and 4m.48s.
Besançon e = 4m.30s.
Strasbourg e = 4m.29s.
Tortosa PPPN? = 3m.31s., SS = 6m.12s.
Alicante sP = 4m.45s., SS = 6m.13s., SSS = 6m.29s., P_cP = 7m.49s., P_cS = 11m.27s., S_cS = 15m.37s.
Warsaw ePN = 3m.24s., SSZ = 6m.22s., eSSN = 6m.30s.
Paris i = 3m.55s. and 5m.21s., e = 5m.28s., i = 5m.51s., eSS = 6m.37s.
Helwan PPPZ = 3m.49s., iEZ = 6m.1s., SS?Z = 6m.37s.
Almeria PP = 3m.56s., PPP = 4m.5s., SS = 6m.55s., SSS = 7m.7s.
Granada iPP = 4m.11s., sS = 7m.37s.
Kew eP = 3m.6s., e = 7m.33s., eSSSNZ = 8m.7s.
Lisbon PPPZ = 5m.12s.
Durham E = 8m.18s. and 8m.29s.
Upsala SN = 8m.42s.
Long waves were also recorded at Bermuda, Philadelphia, Weston, and Chicago.

May 11d. 7h. 50m. 50s. Epicentre 34°·5S. 178°·5E. (suggested by New Zealand).

A = −·8256, B = +·0216, C = −·5638 ; δ = −5 ; h = 0 ;
D = +·026, E = +1·000 ; G = +·564, H = −·015, K = −·826.

	△	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Auckland	3·8	231	1 4	+ 3	2 4	+17
Tuai	4·4	194	1 10	0	2 11	+ 9
New Plymouth	5·8	217	1 30	+ 1	2 56	+18
Wellington	7·4	202	1 46	− 6	3 14	− 4
Kaimata	9·7	213	—	—	4 8	− 7
Wairiri	10·4	208	—	—	4 22	−10

May 11d. 18h. 39m. 56s. Epicentre 9°·28. 106°·7E. (as on 1940, May 10d.).

$A = -\cdot2837$, $B = +\cdot9457$, $C = -\cdot1589$; $\delta = +8$; $h = +7$;
$D = +\cdot958$, $E = +\cdot287$; $G = +\cdot046$, $H = -\cdot152$ $K = -\cdot987$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Perth		24·2	160	5 59	+40	9 50	+15	—	—	—
Kodaikanal	E.	34·9	304	e 8 3	PP	e 13 38	+71	9 18	PP	18·8
Calcutta	N.	36·3	331	e 7 14	+ 7	i 12 55	+ 7	i 16 35	SS	23·4
Hyderabad	N.	38·5	314	7 24	− 2	13 23	+ 1	9 5	PP	—
Bombay		43·5	310	e 8 10	+ 3	e 14 40	+ 4	—	—	21·2
New Delhi	N.	47·1	325	i 8 33	− 2	i 15 18	−10	11 8	PPP	21·7
Brisbane	N.	47·3	118	—	—	i 16 59	?	i 18 33	SS	—
Riverview		47·6	128	e 8 48	+ 9	e 15 48	+13	i 11 36	PPP	e 23·1
Vladivostok		56·9	22	e 9 21	−28	e 17 21	−21	—	—	—
Almata		58·8	366	e 10 19	+17	—	—	—	—	—
Obi-garm		58·8	328	e 9 59	− 3	e 18 4	− 3	—	—	—
Andijan		58·9	330	e 10 2	− 1	18 8	0	—	—	—
Stalinabad		59·2	327	i 10 2	− 3	i 18 5	− 7	—	—	—
Tashkent		60·9	328	e 10 13	− 4	e 18 26	− 8	—	—	—
Irkutsk		61·3	358	e 10 22	+ 2	18 40	+ 1	—	—	—
Baku		71·9	317	—	—	i 20 53	+ 5	—	—	—
Sverdlovsk		75·9	336	e 11 49	− 1	i 21 31	− 1	—	—	—
Leninakan		76·2	317	e 11 54	+ 2	—	—	—	—	—
Ksara		79·5	306	i 12 15	+ 5	e 22 23	+12	—	—	—
Helwan	z.	82·1	302	e 12 21	− 3	—	—	—	—	—
Istanbul		86·8	313	e 12 44	− 3	e 23 36	+11	—	—	—
Bucharest		89·7	316	—	—	23 4?	[−27]	—	—	—
Helsinki		93·8	331	—	—	e 23 55	[+ 1]	e 45 7	Q	e 50·1
Warsaw		94·6	322	e 13 31	+ 7	24 0	[+ 1]	e 17 8	PP	e 53·1
Upsala		97·4	330	—	—	e 24 4	[−10]	—	—	e 51·1
Rome		99·2	310	e 13 51	+ 6	e 24 17	[− 6]	e 17 53	PP	—
Copenhagen		99·9	326	18 4	PP	24 30	[+ 3]	32 3	SS	46·1
Florence		100·2	313	i 17 48	PP	—	—	—	—	—
Stuttgart		101·8	318	e 18 6	PP	e 24 35	[− 1]	e 31 22	SS	e 55·1
Strasbourg		102·7	318	e 14 16	+16	e 24 40	[0]	e 18 14	PP	e 44·1
Bergen	N.	103·6	330	—	—	e 28 4?	PPS	—	—	—
De Bilt		104·3	322	—	—	i 24 50	[+ 3]	—	—	e 53·1
Clermont-Ferrand		106·0	315	e 18 42	PP	e 27 45	PS	e 28 45	PPS	60·1
Paris		106·2	318	e 18 27	PP	e 27 4?	PS	e 33 34	SS	e 59·1
Kew		107·7	322	(e 14 4?)	P	—	—	—	—	e 14·1
Aberdeen		107·9	328	e 23 48	?	e 24 18	?	—	—	e 57·6
Scoresby Sund		110·9	344	19 10	PP	25 21	[+ 5]	—	—	56·1
Victoria		122·7	37	—	—	e 26 4?	[+ 5]	—	—	64·1
Ottawa		143·9	3	—	—	e 28 4?	?	—	—	73·1
Florissant	z.	146·8	24	e 19 43	[+ 1]	—	—	—	—	—
Harvard	z.	146·8	356	e 19 44	[+ 2]	—	—	—	—	—
Weston		146·9	356	e 19 48	[+ 6]	—	—	—	—	—
St. Louis	z.	147·0	24	e 19 45	[+ 2]	—	—	—	—	—
Philadelphia		149·3	2	e 26 43	SKS	(e 26 43)	[−10]	—	—	e 39·1
La Paz		154·0	191	e 23 38	PP	—	—	—	—	77·1
San Juan		168·5	323	e 21 11	PKP_2	—	—	(e 25 43)	PP	e 25·7

Additional readings :—
Calcutta iSSSN = 18m.9s.
Bombay eSE = 14m.45s.
New Delhi SSN = 18m.11s., SSSN = 19m.12s.
Riverview ePcPZ = 10m.3s., iSE = 15m.56s., iSSEN = 19m.35s., iZ = 19m.42s., iSSSE = 20m.36s.
Helwan eZ = 13m.10s. and 14m.31s.
Warsaw eE = 18m.33s., ePPPZ = 19m.40s., ePPP?E = 19m.44s., eSE = 23m.23s., eSZ = 23m.36s., PSNZ = 24m.20s., iZ = 25m.45s., eN = 27m.26s', SSE = 28m.17s., eE = 30m.29s., eSSS?E = 31m.40s.
Rome eSS = 32m.8s.
Copenhagen SSS = 35m.46s.
Strasbourg ePP = 18m.20s. and 18m.32s., ePPP = 20m.40s., eSKP? = 21m.38s., eS = 25m.53s., ePS = 27m.12s., ePPS = 28m.10s., e = 28m.48s., eSS = 32m.50s., e = 33m.24s
La Paz PPZ = 24m.54s.
San Juan e = 22m.27s., eS = 23m.57s.
Long waves were also recorded at Uccle, Cheb, Almeria, Alicante, Granada, Tortosa, and Bermuda.

May 11d. 22h. 3m. 16s. Epicentre 1°·0S. 138°·2E. (as on 1947, April 2d.).

$A = -·7453$, $B = +·6664$, $C = -·0173$; $\delta = -14$; $h = +7$;
$D = +·667$, $E = +·745$; $G = +·013$, $H = -·012$, $K = -1·000$.

		△	Az.	P.	O−C.	S.	O−C.	L.
		°	°	m. s.	s.	m. s.	s.	m.
Brisbane	N.	29·9	152	—	—	i 11 12	+ 3	—
Riverview		34·9	161	e 6 54	− 1	—	—	e 18·8
Vladivostok		44·3	355	i 8 14	+ 1	e 14 47	− 1	—
Irkutsk		60·2	338	e 10 12	0	e 18 28	+ 3	—
Stalinabad		74·6	311	i 11 44	+ 1	i 21 19	+ 1	—
Tashkent		74·9	314	e 11 42	− 2	e 21 17	− 5	—
Sverdlovsk		84·0	328	i 12 34	+ 1	i 23 24	+27	—
Ksara		100·8	304	e 12 39	?	e 23 28	[−63]	—
Rome		116·6	317	—	—	e 35 44?	SS	—
La Paz	Z.	148·7	125	i 19 52	[+ 7]	—	—	—

Long waves were also recorded at Bermuda, Berkeley, Weston, Auckland, Wellington, and other European stations.

May 11d. Readings also at 1h. (Pierce Ferry and Rome (2)), 8h. (Rome, Florence, near Andijan, and Obi-garm), 9h. (near Obi-garm), 11h. (Riverside, Tinemaha, and near Johannesburg), 14h. (near Mineral), 15h. (near Andijan, Obi-garm, Samarkand, Stalinabad, Tashkent, and Tchimkent), 16h. (Bogota, Balboa Heights, near Mineral, and near Shasta Dam), 18h. (La Paz), 19h. (Andijan, near Frunse, Obi-garm, Samarkand, Stalinabad, Tashkent, and Tchimkent), 20h. (Stuttgart, near Chur, and Zürich), 21h. (Boulder City and near Pierce Ferry).

May 12d. Readings at 0h. (Riverview), 2h. (Branner), 3h. (Andijan, near Obi-garm, Stalinabad, and near Mineral), 4h. (Branner and near Berkeley), 5h. (Bogota), 8h. (Samarkand, near Andijan, Obi-garm (2), and Stalinabad), 10h. (Auckland, Wellington, Brisbane, Riverview, Berkeley, Strasbourg, and near Obi-garm), 11h. (De Bilt, Paris, Kew, Weston, Samarkand, near Obi-garm and Stalinabad), 12h. (Samarkand, near Obi-garm, and Stalinabad), 13h. (Mount Wilson, Pasadena, Riverside, Tinemaha, Tucson, Stuttgart, and Ksara), 14h. (Berkeley, Riverview, and Kew), 15h. (near Florence), 17h. (near Obi-garm (2), near Sotchi, and near Mineral), 18h. (Auckland), 21h. (Andijan, near Obi-garm, Samarkand, and Stalinabad).

May 13d. Readings at 0h. (Tashkent and near Frunse), 1h. (near Mizusawa), 2h. (Fresno, near Berkeley, and Lick), 7h. (Triest, and Zagreb), 8h. (near Obi-garm), 11h. (Tucson, near Bogota, and near Andijan), 12h. (Helwan and Ksara), 13h. (Almeria, Florence, and near Obi-garm), 14h. (Rome, Triest, Zagreb, Strasbourg, Stuttgart, De Bilt, and Copenhagen), 22h. (near Grozny, and Leninakan).

May 14d. 2h. 7m. 41s. Epicentre 21°·4S. 169°·3E. (as on 1945, April 19d.).

$A = -·9157$, $B = +·1730$, $C = -·3628$; $\delta = +6$; $h = +4$;
$D = +·186$, $E = +·983$; $G = +·356$, $H = -·067$, $K = -·932$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane		16·0	244	i 3 46	− 2	e 6 56	+10	i 4 3	PP	—
Auckland		16·1	164	4 4	+15	6 56	+ 7	—	—	10·6
Apia		19·5	72	e 4 33	+ 2	e 8 51	+45	e 9 27	Q	e 11·4
Riverview		20·2	229	i 4 39k	0	i 8 27	+ 6	i 8 41	P_cP	e 10·3
Wellington		20·4	169	4 29	−12	8 33	+ 8	9 24	SS	12·5
Wairiri		22·1	175	6 1	?	8 41	−17	—	—	11·6
Berkeley		87·2	48	—	—	i 23 37	+ 9	e 41 13	Q	e 44·0
Pasadena	Z.	88·3	52	i 12 54	− 1	—	—	—	—	e 45·5
Mount Wilson	Z.	88·4	52	i 12 55	0	—	—	—	—	—
Shasta Dam		88·5	46	e 12 54	− 2	—	—	—	—	—
Riverside	Z.	88·8	52	i 12 57	0	—	—	—	—	—
Tinemaha	Z.	89·6	50	i 13 0	− 1	—	—	—	—	—
Boulder City		91·6	51	i 13 9	− 1	—	—	—	—	—
Victoria		91·8	38	—	—	e 23 19?	[−24]	—	—	57·3
Overton		92·1	52	e 13 11	− 1	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Pierce Ferry		92·3	53	i 13 12	− 1	—	—	—	—	—
Tucson		93·1	57	e 13 17	0	—	—	—	—	—
Scoresby Sund		130·5	5	22 41	PKS	—	—	—	—	—
Bermuda		131·1	65	e 22 39	PKS	e 28 34	(+ 7)	e 33 31	PPS	e 70·0
Ksara		137·2	297	e 19 25	[0]	—	—	23 5	PKS	—
Helwan	z.	141·3	291	e 23 4	PKS	i 27 43	[+62]	—	—	—
Copenhagen		141·7	339	e 19 52	[+18]	26 5	[−37]	22 57	PKS	70·3
Jena	E.	145·7	334	e 20 8	[+28]	—	—	—	—	—
De Bilt		147·0	342	i 19 46k	[+ 3]	—	—	—	—	—
Stuttgart	z.	148·4	335	e 19 48	[+ 3]	—	—	—	—	—
Kew		148·9	347	(e 20 19?)	[+33]	—	—	—	—	e 20·3
Strasbourg		149·1	336	e 19 47	[+ 1]	e 42 41	SS	e 23 45	PP	e 83·3
Paris		150·7	342	e 19 48	[0]	e 27 13	PPP	e 23 42	PP	e 82·3

Additional readings :—
Auckland i = 6m.29s., S = 8m.15s., i = 8m.40s.
Riverview iZ = 5m.7s. and 8m.30s.
Wellington i = 5m.55s., SSS = 10m.11s., i = 10m.50s. and 11m.13s., S_cP = 11m.54s., pP_cS = 12m.8s.
Berkeley iE = 26m.53s.
Tinemaha iZ = 13m.11s.
Bermuda e = 41m.27s.
Jena eN = 20m.13s.
Strasbourg e = 20m.47s., ePPP = 26m.39s.
Paris e = 24m.49s.
Long waves were also recorded at Weston and Uccle.

May 14d. Readings also at 0h. (Stalinabad, near Andijan, Almata, and Frunse), 2h. (Andijan, near Obi-garm, Samarkand, and Stalinabad), 4h. (Stuttgart and Philadelphia), 5h. (Florissant, St. Louis, Ksara, and near Leninakan), 6h. (Grand Coulee and Tucson), 7h. (Brisbane and Riverview), 8h. (Riverview), 9h. (Triest (2)), 14h. (near Granada), 18h. (near Leninakan), 20h. (Almeria).

May 15d. 21h. Probably Southern Italy, but the observations are inconsistent.

Florence iPN = 3m.34s., iSN = 4m.39s.
Pavia e = 3m.52s., eS = 5m.22s.
Zagreb iZ = 3m.54s., eNE = 5m.2s., e = 5m.12s.
Chur eP = 4m.2s., eS = 5m.28s.
Zürich eP = 4m.9s., eS = 5m.40s.
Neuchatel eP = 4m.11s., eS = 5m.44s.
Basle iP = 4m.14s., eS = 5m.48s.
Stuttgart eP? = 4m.22s.s, and 4m.26s., epP? = 6m.6s.
Clermont-Ferrand iP = 4m.23s.
Strasbourg iP? = 4m.23s.k, e = 4m.58s. and 6m.12s., ePP? = 6m.27s.
Paris iP = 4m.31s., i = 6m.47s.
Jena eN = 4m.42s., and 4m.52s.
Toledo eP_gZ = 5m.2s., eSZ = 5m.57s.
Copenhagen iP = 5m.29s.

May 15d. 22h. North West Pacific.

Mizusawa PE = 13m.30s., SE = 15m.44s.
Vladivostok iP = 14m.22s., iS = 17m.21s.
Andijan eP = 19m.41s., iS = 26m.57s.
Shasta Dam eP = 21m.47s.
Tinemaha iPZ = 22m.10s.k.
Haiwee iPZ = 22m.15s.
Mount Wilson iPZ = 22m.17s.k.
Pasadena iPZ = 22m.17s.k.
Sverdlovsk ePP = 22m.18s.?, eS = 28m.3s.
Irkutsk iS = 22m.23s.
Palomar iPZ = 22m.24s.
Pierce Ferry iP = 22m.27s., i = 25m.55s.
Tucson eP = 22m.48s.
Tchimkent iS = 27m.19s.
Tashkent eS = 27m.24s.
Stalinabad eS = 27m.37s.
Moscow eS = 30m.24s.
La Paz eP?E = 31m.22s.

May 15d. Readings also at 0h. (near Berkeley), 1h. (Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Branner, near Berkeley, Lick, near Auckland, Tuai, and Wellington), 2h. (Uccle, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, and Shasta Dam), 3h. and 5h. (near Obi-garm), 7h. (Jena), 8h. (Andijan, near Obi-garm and Samarkand), 9h. (near Mizusawa and near Grozny), 10h. (Tucson, Bermuda, Ksara, Leninakan, near Erevan, and near Bucharest), 12h. (Andijan, Samarkand, near Obi-garm and Stalinabad), 17h. (Riverview, near Obi-garm and Stalinabad), 19h. (La Plata), 20h. (St. Louis).

May 16d. Readings at 2h. (Andijan, Tashkent, Tchimkent, near Obi-garm, Samarkand, and Stalinabad), 4h. (Kew, Stalinabad, and near Bogota), 5h. (Boulder City, Overton, Pierce Ferry, Pasadena, and near Tucson), 6h. (Boulder City, Overton, Pierce Ferry, College, Berkeley (2), and near Tucson), 7h. (Mizusawa, Boulder City, Overton, Pierce Ferry, Berkeley, and near Tucson), 9h. (Ksara, Stuttgart, near Chur and Zürich), 10h. (Boulder City, Pierce Ferry, Berkeley, Uccle, and near Tucson), 11h. (Boulder City, Overton, Pierce Ferry, and near Tucson), 12h. (near La Paz), 17h. (Mount Wilson, Palomar, Pasadena, Tinemaha, Tucson (2), Shasta Dam, Bermuda, and Granada), 18h. (Kew and De Bilt), 19h. (near Stalinabad and near Tananarive), 20h. (Stalinabad and near Obi-garm), 22h. (Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Boulder City, Pierce Ferry, Shasta Dam, Bermuda, De Bilt, Uccle, Cheb, Strasbourg, Paris, Stuttgart (2), Florence, Rome, Triest, Warsaw, Bucharest, Ksara, near Fort de France, and San Juan).

May 17d. 7h. 6m. 24s. Epicentre 39°·48. 178°·9E.

Intensity VI in the epicentral area.
Epicentre as adopted.

R. C. Hayes.
Earthquakes in New Zealand during the year 1947 New Zealand Journal of Science and Technology, vol. 30, No. 2 (section B), 1948, p. 103. Epicentral chart p. 105.

$A = -\cdot7747$, $B = +\cdot0149$, $C = -\cdot6322$; $\delta = +6$; $h = -1$;
$D = +\cdot019$, $E = +1\cdot000$; $G = +\cdot632$, $H = -\cdot012$, $K = -\cdot775$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m.	s.	m.
Tuai		1·5	294	0 24	− 4	0 42	− 7	—	—	—
Bunnythorp		2·7	251	—	—	1 23?	+ 4	—	—	—
Arapuni		2·9	297	0 42	− 6	1 6?	−18	—	—	—
Wellington		3·7	237	1 9	P*	1 51	+ 6	—	—	—
Auckland		4·1	307	1 1?	− 4	—	—	—	—	—
Kaimata		6·4	239	2 17?	P_g	2 57	+ 4	—	—	—
Wairiri		6·7	230	2 14?	P_g	3 2	+ 2	—	—	—
Riverview		22·9	276	i 5 8	+ 2	i 9 7	− 6	i 9 48	SS	—
Apia		26·8	22	i 5 5	−39	i 10 26	+ 7	i 6 6	PP	i 12·9
Perth		50·9	258	i 14 49	?	i 19 26	SS	—	—	i 23·2
Honolulu		64·2	25	e 10 41	+ 2	e 19 9	− 7	e 12 48	PP	e 25·1
Punta Arenas	N.	69·9	143	—	—	21 36?	PPS	—	—	31·4
Santa Lucia	N.	83·0	128	—	—	23 33	PPS	—	—	39·4
La Plata	E.	89·3	137	25 12	PS	24 0	+12	29 24	SS	42·1
	N.	89·3	137	—	—	24 6	+18	40 38	Q	42·8
Vladivostok		92·5	328	e 12 55	−19	i 23 46	[− 1]	i 16 47	PP	—
La Jolla	Z.	93·1	50	e 13 27	+10	—	—	—	—	—
Pasadena		93·5	48	e 13 29	+10	e 23 46	[− 7]	e 26 19	PPS	38·8
Mount Wilson	Z.	93·6	48	e 13 20	+ 1	—	—	i 13 31	P_eP	—
Palomar	Z.	93·7	50	e 13 25	+ 5	e 24 17	{+ 8}	i 13 31	P_eP	—
Santa Clara		93·7	44	e 13 50	+30	e 24 52	+25	e 39 17	Q	e 45·1
Riverside	Z.	93·8	48	e 13 32	+12	—	—	—	—	—
Lick	N.	93·9	44	e 13 54	+33	e 24 44	+15	—	—	e 45·7
Berkeley		94·0	44	i 13 30	+ 9	i 24 22	− 8	—	—	e 45·6
Ukiah		94·4	42	e 23 26	?	e 23 50	[− 8]	e 35 2	SSS	e 38·5
Haiwee	Z.	95·0	47	e 13 36	+10	—	—	—	—	—
La Paz		96·4	118	13 52	+20	i 24 32	{+ 4}	i 17 46	PP	45·6
Tucson		96·5	54	e 13 59	+27	e 24 17	{−12}	e 17 39	PP	e 39·9
Boulder City		96·7	49	e 13 43	+10	—	—	e 17 51	PP	—
Colombo	E.	101·3	270	18 30	PP	24 37	[+ 4]	—	—	51·9

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m. s.			m.
Victoria		101·3	36	18 19	PP	25 0	{− 3}	33 8	SSP		49·6
Salt Lake City		101·7	47	e 18 46	PP	e 25 12	{+ 6}	e 27 40	PPS		e 40·8
Logan		102·4	46	e 17 51	PKP	e 25 7	{− 5}	e 27 43	PPS		e 43·1
Sitka		104·0	24	e 18 46	PP	i 26 18	+22	e 33 24	SS		e 42·9
Calcutta	N.	104·4	288	e 19 4	PP	e 25 0	[+12]	—	—		47·2
Butte		104·8	42	e 18 43	PP	e 33 50	SSP	e 37 2	SSS		—
Denver		105·0	52	e 18 52	PP	e 25 16	[+25]	34 10	SSP		46·9
Kodaikanal	E.	105·2	272	e 18 3	PKP	e 27 53	PS	—	—		43·6
Bozeman		105·4	44	e 14 52	P	e 25 15	[+23]	e 18 59	PP		e 43·2
Bogota	Z.	106·1	98	e 18 17	PKP	—	—	—	—		e 53·6
Tananarive		106·3	229	28 5	PS	e 25 26	{−13}	38 10	SSS		45·6
College		107·2	14	e 19 14	PP	e 26 0	{+14}	e 39 8	SSS		e 44·8
Rapid City		108·7	49	e 18 42	PP	e 25 31	[+24]	e 28 56	PPS		e 46·8
Hyderabad	N.	108·8	278	e 14 53	P	25 7	[0]	18 36	PKP		—
Mobile		110·8	67	—	—	i 25 44	[+29]	35 24	SSP		44·0
Saskatoon		111·7	40	19 30	PP	39 24	SSS	29 0	PS		52·6
Irkutsk		111·8	321	17 59?	PKP	e 25 41	[+21]	34 42	SS		—
Florissant		113·7	59	e 19 48	PP	e 25 52	[+25]	e 29 32	PS		—
St. Louis		113·7	59	e 19 32	PP	e 25 54	[+27]	e 29 28	PS		—
Bombay		114·0	276	e 18 28	[−13]	e 36 43	SS	e 29 54	PS		48·2
New Delhi	N.	116·0	287	e 20 6	PP	i 25 55	[+19]	i 29 51	PS		—
Dehra Dun	N.	116·3	289	—	—	e 26 29	{−20}	e 40 4	SSS		e 64·8
Chicago		117·1	57	e 20 4	PP	e 26 4	[+24]	e 29 48	PS		e 49·1
Columbia		117·7	67	e 30 13	PS	e 25 56	[+14]	e 36 17	SS		e 48·8
San Juan		120·6	91	e 20 36	PP	e 27 14	{− 4}	e 30 32	PS		e 47·1
Almata		123·3	303	e 19 31	[+32]	—	—	—	—		—
Philadelphia		124·6	64	e 20 58	PP	e 25 51	[−13]	e 30 44	PS		e 48·8
Frunse		124·7	301	e 19 31	[+29]	—	—	—	—		—
Andijan		125·4	297	e 19 17	[+14]	26 34	[+27]	32 32	PPS		—
Fordham		125·9	64	e 19 35	[+31]	e 26 53	?	e 21 25	PP		54·4
Obi-garm		126·4	294	e 19 25	[+20]	—	—	i 21 29	PP		—
Ottawa		126·4	57	19 20	[+15]	26 36?	[+26]	21 6	PP		53·6
Stalinabad		127·0	294	i 19 37	[+31]	26 15	[+ 3]	31 11	PS		—
Tashkent		127·7	297	19 35	[+27]	26 53	[+39]	21 31	PP		—
Harvard		128·1	62	e 19 39	[+31]	e 22 46	PKS	e 21 40	PP		e 61·6
Weston		128·1	62	e 19 35	[+27]	e 26 46	[+31]	e 23 8	PKS		e 53·7
Bermuda		128·9	77	e 21 34	PP	e 26 47	[+30]	e 23 3	PKS		e 52·0
Seven Falls		130·2	57	19 24	[+12]	22 38	SKP	39 42	SSP		67·6
Halifax		134·3	62	22 36	PP	40 36?	SSP	e 56 36?	Q		64·6
Sverdlovsk		136·9	316	i 19 41	[+16]	i 26 5	[−29]	i 22 27	PP		—
Baku		141·3	289	20 11	[+38]	23 41	PKS	—	—		—
Ivigtut		144·0	38	—	—	42 6	SS	—	—		76·6
Grozny		144·7	293	19 49	[+10]	23 26	PKS	i 21 41	?		—
Erevan		145·3	288	20 3	[+23]	—	—	—	—		—
Scoresby Sund		147·0	13	19 47	[+ 4]	33 48	PS	42 36	SSP		—
Sotchi		149·4	293	20 3	[+17]	—	—	i 20 40	?		—
Moscow		149·7	316	i 18 49	[−58]	30 7	{− 9}	23 41	PP		—
Ksara		149·9	272	e 19 54	[+ 7]	36 52	PPS	23 34	PP		—
Helwan	Z.	151·8	261	e 19 53	[+ 3]	26 51	[− 5]	23 23	SKP		—
Yalta		153·4	294	20 17	[+25]	—	—	—	—		—
Helsinki		153·6	333	e 20 10	[+17]	e 30 42	{+ 4}	e 23 33	PKS		64·6
Upsala		156·4	337	20 18	[+22]	e 49 36?	SSS	e 24 51	PP		e 61·6
Istanbul		157·0	285	20 1	[+ 4]	37 39	PPS	—	—		—
Bergen		158·6	353	20 25	[+25]	e 45 19	SSP	—	—		e 65·6
Bucharest		159·2	294	e 20 6	[+ 6]	e 31 31	{+23}	—	—		41·6
Warsaw		160·0	317	e 20 13k	[+12]	e 31 15	{+ 3}	24 44	PP		e 72·6
Copenhagen		161·4	337	20 14	[+12]	31 22	{+ 2}	—	—		—
Aberdeen	N.	162·2	2	i 22 13	?	i 31 0	{−24}	i 46 11	SSP		84·9
Belgrade		163·1	296	e 20 24	[+20]	e 46 33	SSP	—	—		—
Budapest	E.	163·3	306	e 20 31	[+27]	(e 46 36?)	SSP	—	—		e 46·6

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Edinburgh		163·3	4	38 14	PPS	e 27 24	[+17]	e 45 1	SS	—
Durham	N.	164·6	1	i 25 19	PP	i 52 34	SSS	—	—	90·1
Prague		164·7	319	e 21 30	[+85]	e 32 0	{+24}	e 50 24	SSS	e 58·6
Jena		165·4	326	e 20 18	[+12]	e 31 46	{+ 6}	—	—	—
Cheb		165·7	323	e 20 36?	[+30]	e 32 9	{+28}	e 25 19	PP	e 86·6
De Bilt		166·6	343	e 20 17	[+10]	e 31 36	{−10}	e 25 16	PP	e 78·6
Triest		167·4	305	e 20 41	[+33]	e 32 1	{+11}	e 25 31	PP	—
Kew		167·9	358	e 20 18?a	[+10]	e 32 13?	{+20}	e 25 23	PP	e 80·6
Uccle		168·0	343	e 20 39?	[+31]	e 27 16	[+ 6]	e 25 17	PP	e 83·6
Stuttgart		168·1	325	e 20 22?	[+14]	e 32 12	{+18}	e 25 30	PP	e 71·6
Strasbourg		168·8	328	e 21 48	?	e 32 33	{+36}	e 25 28	PP	87·1
Rome		169·4	288	e 20 17	[+ 8]	e 46 26	SS	i 25 46	PP	—
Zürich		169·4	322	e 20 32	[+23]	—	—	e 22 4	?	—
Basle		169·7	325	e 20 34	[+25]	—	—	e 37 5	?	—
Florence		169·8	299	e 20 54	[+45]	i 36 18	?	i 25 51	PP	—
Paris		170·2	346	e 20 28	[+19]	e 31 36?	{−28}	e 28 36?	PPP	—
Neuchatel		170·4	325	—	—	e 43 33	?	—	—	—
Clermont-Ferrand		172·9	335	e 20 27	[+16]	—	—	i 25 58	PP	75·6
Lisbon		173·7	93	20 30	[+19]	32 54	{+33}	26 44	PP	80·9
Barcelona		176·8	311	e 30 43	PPP	46 36	SS	—	—	86·7
Granada		177·0	137	i 20 31a	[+19]	46 45	SS	20 48	pPKP	83·9
Almeria		177·2	—	i 20 42	[+30]	27 39	[+26]	i 26 15	PP	70·3
Toledo	Z.	177·7	—	e 20 18	[+ 6]	27 2	[−11]	25 55	PP	55·0
Tortosa	N.	178·1	—	20 52	[+40]	33 2	{+21}	26 41	PP	83·8
Alicante		178·8	—	20 46	[+34]	27 27	[+14]	26 15	PP	e 85·0

Additional readings and notes :—
Riverview i = 5m.30s., iSSSE = 10m.5s., iN = 10m.15s., iEN = 10m.28s.
Apia iE = 7m.6s., iN = 9m.18s., iSSE = 11m.36s.
Honolulu e = 12m.9s., eSS = 22m.49s.
La Plata SSN = 30m.43s., SSE = 32m.8s., SSSN = 34m.10s., Q?E = 38m.30s.
Vladivostok SS = 29m.48s.
Pasadena iZ = = 13m.46s., iPPZ = 17m.26s., eSE = 24m.14s., iZ = 24m.59s., eSSN = 30m.42s., eSSSN = 34m.48s.
Lick eE = 25m.3s. and 45m.24s.
Berkeley iPPE = 17m.58s., iN = 22m.36s., eSEN = 24m.55s., iSEN = 25m.18s., iN = 31m.58s,. iE = 32m.6s., iN = 39m.24s.
Ukiah eSS = 30m.29s.
La Paz iSKKS = 24m.56s., SE = 25m.30s., iPS = 26m.52s., iPPS = 27m.32s., SSE = 32m.6s., SSSZ = 35m.46s.
Tucson e = 17m.54s., eS = 24m.39s., ePPS? = 26m.32s., eSS = 30m.57s.
Victoria SKKS = 25m.54s., SE = 26m.19s., PSN = 27m.48s., SSS = 38m.24s., eE = 40m.54s.
Salt Lake City eS = 26m.12s., ePS = 26m.30s., eSS = 33m.12s., e = 38m.46s.
Logan e = 19m.49s., eS = 26m.12s., e = 26m.33s., eSS = 33m.18s., eSSS = 38m.25s.
Sitka ePS = 27m.12s., eSSS = 38m.9s.
Calcutta iN = 25m.22s., 31m.12s., and 34m.32s.
Butte e = 22m.46s., ePS? = 26m.36s., e = 29m.58s. and 40m.56s.
Bozeman eS? = 26m.51s., ePPS = 28m.17s., e = 29m.59s., ePSPS = 33m.47s., eSSS = 37m.36s.
Tananarive SS = 34m.5s.
College e = 26m.56s., ePPS? = 29m.36s., e = 31m.40s., eSS = 34m.22s.
Rapid City eS = 26m.28s.
Hyderabad PPN = 19m.35s., PSN = 28m.49s., SSN = 35m.21s.
Saskatoon SNW = 27m.11s., SS = 35m.24s.
Irkutsk SKS = 24m.41s., PPS = 29m.17s.
Florissant ePPZ = 20m.2s., eSKKSE = 26m.52s., eSPZ = 29m.36s., eSSZ = 35m.56s., eSSSEN = 40m.18s.
St. Louis eN = 19m.41s., ePPZ = 19m.59s., eN = 22m.54s., eSKKSE = 26m.54s., eSE = 27m.50s., eSPZ = 29m.40s., eSSE = 35m.46s., eSSS?N = 40m.59s.
Bombay SSN = 36m.56s.
New Delhi eE = 30m.12s., iN = 32m.44s. and 40m.41s.
Dehra Dun eN = 54m.48s.
Chicago eS = 28m.19s., ePPS = 30m.58s., eSS = 36m.26s., eSSS = 39m.53s.
Columbia eS = 28m.28s.
San Juan eSKS = 26m.12s., e = 29m.59s., eSS = 37m.31s.
Philadelphia eSKS = 26m.43s., eSKKS = 27m.56s., ePPS? = 31m.27s., eSS = 37m.45s., eSSS = 41m.55s.
Fordham i = 38m.24s. and 39m.26s.
Ottawa SKP = 22m.36s., SN = 29m.36s.?, PS = 31m.36s.?, SS = 38m.36s.?
Stalinabad iPP = 21m.31s., PKS = 22m.59s., SKKS = 28m.15s., PPS = 33m.13s., SS = 38m.18s.

Continued on next page.

Tashkent PKS =22m.51s., SKKS =28m.27s., SKSP =32m.30s.
Harvard eZ =30m.43s., eSSPN =38m.56s., eN =41m.22s.
Weston ePP =21m.48s., ePPS =33m.23s., iSS =38m.52s., iPSPS =39m.42s., eSSS = 47m.12s.
Bermuda ePS =31m.39s., eSS =39m.8s., iPSPS? =39m.39s., i =41m.53s.
Sverdlovsk iPKS =23m.21s., iSKKS =29m.17s., PS =32m.42s., PPS =34m.42s., SS = 40m.36s.
Scoresby Sund 19m.58s., i =20m.12s., iE =20m.21s.
Moscow SKS =27m.27s., SS =42m.48s.
Helwan PKP_2 =20m.6s., PSKSZ =33m.54s.
Helsinki eSKSP =34m.27s., eSKKS =35m.7s., eSKSP =39m.7s., e =48m.42s., 54m.1s., 55m.52s., and 60m.27s.
Upsala eE =20m.36s.?, eN =34m.36s., eE =37m.36s. and 51m.36s., eN =53m.36s.?
Bergen PKPN =20m.35s.?, eN =21m.52s., SKKKSN =31m.35s.?, eN =34m.4s., SSN = 43m.13s.
Warsaw PKP =20m.28s., PKP_2Z =21m.6s., ePPN =24m.58s., PPPZ =27m.58s., ePPPE =28m.5s., PKKPZ =28m.36s., ePKKPN =28m.55s., iPKKPE =29m.1s., $SKKS_2E$ =34m.38s., $SKKS_2N$ =35m.4s., SSZ =43m.59s., eSSE =44m.9s., and numerous other readings without phase.
Copenhagen 24m.59s. and 29m.19s., SKSP =36m.1s., PPS =38m.54s., 41m.1s., SS = 45m.48s., SSS =53m.0s.
Aberdeen iN =71m.20s.
Belgrade e =21m.11s., ePP? =25m.48s., ePSKS? =36m.16s.
Edinburgh SKKS =31m.13s., eSSP =45m.59s., SSS =51m.15s.
Durham iN =34m.44s., 34m.4s., 35m.44s., and 39m.18s.
Prague eSKP =25m.19s., eSKS =29m.6s., ePPS =35m.0s., eSSS =56m.18s.; readings wrongly identified.
Cheb eSKKS ($\triangle$ >180°) =34m.36s., eSKSP =35m.48s., e =48m.1s., eSSS =52m.19s.
De Bilt iP_cPPKP =29m.17s., eSKSP =35m.36s., ePPS =38m.6s.
Triest $ePKP_2$ =21m.56s., eSKP =24m.4s., ePPP =30m.26s., iPSKS =36m.7s., eSSS = 52m.8s.
Kew $iPKP_2Z$ =21m.23s., ePKSZ =23m.53s.?, eE =28m.33s.?, ePPPNZ =29m.13s., ePPSZ =39m.3s., eSSEN =46m.36s.?, eSSSNZ =52m.6s.?
Uccle $ePKP_2Z$ =21m.43s., ePPP =29m.24s., ePKKP?E =31m.47s., eSKKS =32m.4s., eSKSPEN =35m.47s., eZ =36m.33s., eSSE =46m.11s., eSSSN =52m.5s.
Stuttgart iPKPZ =20m.36s.a, $iPKP_2Z$ =21m.36s., e =26m.21s., eSKS =27m.42s., ePSKS =35m.42s., eSS =46m.18s., e =50m.36s.
Strasbourg $ePKP_2$ =21m.50s., e =25m.0s., ePPP =29m.27s., e =36m.10s., ePPS = 38m.11s., eSS =46m.8s., iSSS? =50m.57s., i =58m.6s., 58m.16s., and 61m.38s.
Rome $ePKP_2$ =21m.55s., ePSKS =36m.11s.
Paris $ePKP_2$ =21m.34s., eL =46m.36s.
Clermont-Ferrand i =20m.42s., $iPKP_2$ =22m.5s., eSKKS =30m.42s., e =36m.50s., eSS =44m.17s., e =49m.38s.
Lisbon PKPNZ =20m.4s., PKP_2?EZ =22m.12s., eZ =30m.19s., SSEN =46m.42s., E = 51m.18s. and 54m.54s.
Granada $iPKP_2$ =22m.6s., $pPKP_2$ =22m.30s., iPP =26m.9s., pPP =26m.30s., PPP = 30m.36s., SKKS =33m.9s., SKSP =36m.51s., sSS =47m.42s., SSS =55m.21s., Q =75·8m.
Almeria PKP_2 =22m.26s., PPP =30m.35s., SKKS =33m.5s., SKSP =36m.51s., PPS = 40m.32s., SS =47m.46s., SSS =54m.52s.
Tortosa PKP_2N =22m.53s., SKPE =24m.26s., SKSE =28m.8s., iN =29m.46s., PPPN = 30m.38s., SKSPEN =37m.11s., PPSN =40m.39s., SSN =47m.28s., SSP =50m.11s., SSSEN =55m.14s., QE =75m.44s.
Alicante PKP_2 =22m.29s., PPP =30m.28s., SKKS =33m.3s., SS =47m.22s., SSS = 54m.36s.
Long waves were also recorded at Ferndale, Potsdam, and Besançon.

May 17d. Readings also at 1h. (near Mizusawa), 2h. (near Mizusawa, Stuttgart, Almata, near Frunse, Andijan, Obi-garm, Stalinabad, and Tashkent), 3h. (Ksara, Helwan, Rome, Stuttgart, Granada, and Toledo), 4h. (Granada, Alicante (2), Almeria (2), Tortosa, Cheb, Uccle, De Bilt, Strasbourg, Samarkand, Andijan, near Obi-garm, and Stalinabad), 7h. (Aberdeen, Pasadena, Mount Wilson, Riverside, Palomar, Tinemaha, Haiwee, Shasta Dam, Boulder City, Overton, Pierce Ferry, and Tucson), 9h. (Pierce Ferry), 10h. (Pierce Ferry (2), Boulder City (2), Triest, Zürich (2), Stuttgart, Pavia, near Rome, and Florence (2)), 13h. and 16h. (Pierce Ferry), 17h. (Stuttgart), 21h. (Pierce Ferry, Boulder City, near Berkeley, and near Obi-garm).

May 18d. 4h. 55m. 0s. Epicentre 36°·9N. 141°·3E. (as on 1940, January 7d.).

Intensity V at Mito, Tukubasan, and Shirakawa; IV at Kakioka, Hukusima, and Kumagaya; II-III at Yokohama, Titibu, Tokyo, and Miyako. Macroseismic radius more than 300km.
Epicentre 36°·9N. 141°·1E. Shallow.
The Seismological Bulletin of the Central Meteorological Observatory, Japan, for the year 1947, Tokyo, 1950, pp. 26-27; macroseismic chart, p. 26.

$A = -·6256$, $B = +·5012$, $C = +·5978$; $\delta = -6$; $h = -1$;
$D = +·625$, $E = +·780$; $G = -·467$, $H = +·374$, $K = -·802$.

		△	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Onahama		0·3	276	0 14 a	+ 3	0 19	+ 1
Mito		0·8	232	0 18	0	0 27	− 4
Shirakawa		0·9	284	0 15 a	− 5	—	—
Hukusima		1·1	322	0 22	0	0 34	− 5
Kakioka		1·1	233	0 21	− 1	0 30	− 9
Tukubasan		1·2	235	0 22	− 2	0 34	− 7
Utunomiya		1·2	253	0 23	− 1	0 36	− 5
Sendai		1·4	347	0 28 a	+ 1	0 45	− 1
Kumagaya		1·7	244	0 31	0	0 39	−15
Tokyo		1·7	225	0 34	+ 3	0 54	0
Maebasi		1·8	254	0 32	0	0 47	− 9
Yokohama		2·0	222	0 35	0	0 58	− 4
Mizusawa		2·2	357	0 42	+ 4	1 7	+ 1
Mera		2·4	216	0 45	+ 4	1 5	− 7
Hunatu		2·5	236	0 43	0	1 9	− 5
Nagano		2·5	265	0 42	− 1	0 59	−15
Misima		2·6	227	0 45	+ 1	1 12	− 5
Aikawa		2·7	295	0 43	− 2	—	—
Miyako		2·8	11	0 48	+ 1	1 19	− 3
Morioka		2·8	358	0 48	+ 1	1 19	− 3
Shizuoka		3·0	232	0 49	− 1	1 21	− 6
Osima		3·2	216	1 12	P_g	1 40	S*
Toyama		3·3	268	0 54	+ 1	1 26	− 9
Omaesaki		3·4	228	1 3	P*	1 46	S*
Wazima		3·5	281	0 52	− 5	1 16	−24
Hatinohe		3·7	3	1 0	0	1 49	+ 4
Aomori		3·9	354	1 6	+ 4	1 56	+ 6
Nagoya		3·9	244	1 2	0	1 34	−16
Hikone		4·4	250	1 9	− 1	—	—
Kameyama		4·4	246	1 16	P*	—	—
Kyoto		4·9	249	1 18	+ 1	1 58	?
Owase		5·0	238	1 47	P_g	—	—
Mori		5·2	354	1 23	+ 2	2 42	+20
Toyooka		5·4	258	1 23	− 1	2 22	− 6
Shasta Dam		71·3	52	i 11 20	− 3	—	—
Tinemaha	z.	75·9	54	i 11 48	− 2	—	—
Haiwee	z.	76·7	55	i 11 52	− 3	—	—
Pasadena	z.	77·7	56	i 11 57	− 3	—	—
Mount Wilson	z.	77·8	56	i 11 57	− 4	—	—
Riverside	z.	78·4	56	e 12 0	− 4	—	—
Overton		78·7	52	i 12 4	− 2	—	—
Boulder City		78·8	53	i 12 4	− 2	—	—
Palomar	z.	79·1	56	i 12 4	− 4	—	—
Pierce Ferry		79·3	52	i 12 6	− 3	—	—
Tucson		83·7	54	i 12 29	− 3	—	—
Stuttgart	z.	84·7	330	e 12 31	− 6	—	—

May 18d. Readings also at 0h. (Boulder City, Pierce Ferry, and near Grozny), 1h. (Berkeley, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson (2), Boulder City (2), Overton (2), Pierce Ferry (2), Shasta Dam, Salt Lake City, Florissant, St. Louis, Philadelphia, Copenhagen, and Stuttgart), 2h. (Weston), 3h. (Mount Wilson, Tucson, Pasadena, Riverside, Tinemaha, and La Paz), 4h. and 5h. (near Grozny), 10h. (Stuttgart), 12h. (Boulder City, near Overton, and Pierece Ferry), 15h. (near Mizusawa), 19h. (near Antarctica), 20h. (near Mizusawa), 22h. (2) and 23h. (near Reykjavik).

May 19d. Readings at 1h. and 2h. (2) (near Reykjavik), 3h. (Antarctica and La Paz), 4h. (Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, and Shasta Dam), 5h. (near Boulder City, Overton, and Pierce Ferry), 6h. (near Reykjavik), 7h. (Scoresby Sund, near Overton, and Pierce Ferry), 8h. (Istanbul and near Reykjavik (2)), 10h. (Reykjavik, near Obi-garm, and near Grozny), 11h. (Scoresby Sund and near Reykjavik (2), 12h. (Boulder City, Overton, and Pierce Ferry), 15h. (Reykjavik and Uccle), 17h. (Mount Wilson, Palomar, Tinemaha, Tucson, La Paz, La Plata, Stuttgart, Copenhagen, Ksara, near Zürich, Andijan, Tashkent, Baku, near Erevan, Grozny, and Leninakan), 18h. (La Paz and La Plata), 19h. (Erevan and near Grozny), 21h. (Haiwee, Mount Wilson, Palomar, Riverside, Tinemaha, Tucson, Boulder City, Pierce Ferry, and Shasta Dam), 22h. (Stuttgart).

May 20d. Readings at 0h. (Belgrade and Lick), 3h. (La Paz, near Andijan and Tashkent), 12h. (La Paz), 13h. (Sverdlovsk), 17h. (La Paz and La Plata), 19h. (Belgrade, Branner, and near Mizusawa), 20h. (Mount Wilson (2), Pasadena, Palomar (2), Riverside (2), Tinemaha (2), Tucson (2), Boulder City (2), Pierce Ferry (2), Shasta Dam (2), and near Istanbul), 21h. (Ksara).

May 21d. Readings at 3h. (Bucharest, Theodosia, near Yalta, and Simferopol), 5h. (La Paz), 8h. (Mount Wilson, Palomar, and Tucson), 10h. (Rome and near Alicante), 13h. (near Frunse), 17h. (Weston), 18h. (Obi-garm, Stalinabad, and Ksara), 22h. (Kodaikanal).

May 22d. Readings at 3h. and 4h. (Antarctica), 6h. (Tucson, Mount Wilson, and Stuttgart), 7h. (Riverview), 8h. (Copenhagen, Warsaw, Ksara, Pasadena, Mount Wilson, Riverside, Tucson, Shasta Dam, Auckland, Wellington, and Riverview), 9h. (Berkeley and Weston), 10h. (Stuttgart, Warsaw, Paris, Strasbourg, Belgrade, Bucharest, Triest, near Istanbul, Mount Wilson, Riverside, Tucson, and near Mineral), 11h. (Pasadena, Mount Wilson, Riverside, Palomar, Pierce Ferry, Tucson, St. Louis, and near Mineral), 12h. (Stuttgart, near Tashkent, and near Balboa Heights), 13h. (Mount Wilson, Riverside, Tinemaha, Tucson, Brisbane, and Riverview), 14h. (Stuttgart, Strasbourg, De Bilt, near Stalinabad, Mount Wilson, Pasadena, Riverside, Tinemaha, Brisbane, and Riverview), 15h. (Riverview), 17h. (Copenhagen, Stuttgart, Mount Wilson, Pasadena, Riverside, Tinemaha, Palomar, Hafwee, Tucson, Pierce Ferry, Shasta Dam, and Boulder City), 18h. (Samarkand, near Stalinabad, Andijan, Tchimkent, and Obi-garm), 20h. (Tucson), 22h. (Mount Wilson, Pasadena, Riverside, Tucson, Boulder City, Pierce Ferry, Shasta Dam, and near Andijan,).

May 23d. 5h. 1m. 48s. Epicentre 16°·4S., 71°·0W. (as on 1941, April 15d.).

$A = +·3125$, $B = -·9075$, $C = -·2806$; $\delta = -5$; $h = +5$;
$D = -·946$, $E = -·326$; $G = -·091$, $H = +·265$, $K = -·960$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
La Paz		2·8	92	e 0 45a	− 2	i 1 22	0	—	—	1·7
Bogota	z.	21·1	352	e 5 4	PP	e 9 25	SSS	e 13 3	?	—
St. Louis		58·3	343	e 9 58	− 1	e 18 5	+ 4	e 10 29	pP	—
Harvard	z.	58·6	0	i 10 0	− 1	—	—	i 10 45	PcP	—
Tucson		61·6	322	e 10 23	+ 1	—	—	e 10 55	pP	—
Palomar	N.	66·1	319	e 10 52	+ 1	—	—	—	—	—
Pierce Ferry		66·2	323	e 10 52	0	—	—	—	—	—
Boulder City		66·6	323	i 10 56	+ 2	—	—	—	—	—
Riverside	z.	66·8	319	i 10 56k	0	—	—	i 11 25	pP	—
Mount Wilson	z.	67·4	319	i 11 1k	+ 2	—	—	i 11 30	pP	—
Pasadena	z.	67·4	319	i 11 0	+ 1	—	—	e 11 30	pP	—
Tinemaha		69·4	321	i 11 12	0	—	—	e 11 42	pP	—

Additional readings :—
St. Louis eSZ = 18m.9s.
Harvard iZ = 10m.30s.
Mount Wilson iZ = 11m.42s.

May 23d. Readings also at 2h. (Tucson, Pasadena, Mount Wilson, Palomar, Tinemaha, Riverside, Santa Lucia, and La Plata), 5h. (near Yalta), 11h. (near Boulder City, Pierce Ferry, near Triest, and near Tashkent), 12h. (Riverview), 13h. (near Obi-garm), 14h. (Uccle), 18h. (Ksara, Uccle, and near Tananarive), 19h. (Riverview, and near Obi-garm), 20h. (near Harvard), 21h. (near Bogota)

May 24d. 0h. 10m. 23s. Epicentre 12°·1N. 48°·7E.

A = +·6455, B = +·7348, C = +·2083 ; δ = −1 ; h = +6 ;
D = +·751, E = −·660 ; G = +·137, H = +·156, K = −·978.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Helwan		23·9	320	e 5 17	+ 1	9 40	+10	10 34	SSS	—
Bombay		24·2	70	i 5 23	+ 4	e 9 40	+ 5	e 9 44	S	12·0
Ksara		24·6	332	e 5 24	+ 1	9 53	+11	—	—	—
Baku		28·2	1	6 5	+ 9	10 55	+14	—	—	—
Erevan		28·2	353	e 5 57	+ 1	—	—	—	—	—
Leninakan		28·9	352	e 6 4	+ 1	—	—	—	—	—
Hyderabad		29·2	76	e 6 4	− 1	e 10 58	0	12 13	SS	15·1
Grozny		31·2	356	e 6 24	+ 1	—	—	—	—	—
New Delhi	N.	31·2	53	e 6 23	0	e 11 28	− 1	e 7 23	PP	—
Stalinabad		31·8	30	i 6 28	0	i 11 42	+ 4	—	—	—
Piatigorsk		32·2	351	e 6 26	− 6	—	—	—	—	—
Obi-garm		32·4	31	i 6 31	− 3	—	—	—	—	—
Istanbul		33·6	332	i 6 44	0	e 12 8	+ 2	—	—	—
Tashkent		34·2	27	e 6 46	− 3	e 12 5	−11	—	—	—
Tchimkent		35·2	27	e 7 1	+ 3	—	—	—	—	—
Andijan		35·3	31	e 6 59	0	e 12 32	− 1	—	—	—
Almata		39·5	32	e 7 32	− 2	—	—	—	—	—
Belgrade		40·6	328	8 13	+30	e 14 55	+61	—	—	—
Rome		43·3	319	i 8 5	0	e 14 33	0	i 9 37	PP	—
Moscow		44·4	351	8 11	− 3	14 44	− 5	—	—	—
Triest		44·7	324	e 8 18	+ 2	i 15 6	+12	e 10 6	PP	—
Florence		45·1	320	e 8 4	−16	i 14 57	− 2	i 19 53	?	e 25·8
Sverdlovsk		45·6	8	e 8 20	− 4	15 0	− 6	—	—	—
Warsaw		45·8	337	e 8 23	− 2	e 15 9	0	10 10	PP	e 22·6
Pavia		47·1	322	e 8 31	− 4	—	—	—	—	—
Zürich		48·6	324	e 8 45	− 2	e 15 45	− 4	—	—	—
Stuttgart		49·0	326	e 8 49	− 1	e 15 50	− 5	—	—	e 27·4
Strasbourg		49·7	325	e 8 54	− 2	e 15 55	− 9	e 10 54	PP	e 26·5
Alicante		50·9	310	e 9 13	+ 8	e 16 38	PPS	10 6	P_cP	e 27·1
Tortosa		50·9	313	9 6	+ 1	16 9	−12	10 19	P_cP	e 31·6
Clermont-Ferrand		51·1	319	e 9 3	− 3	—	—	e 10 54	PP	e 26·6
Helsinki		51·1	345	e 9 5k	− 1	e 16 19	− 5	e 20 3	SS	e 27·6
Copenhagen		51·8	334	i 9 13	+ 1	e 16 33	0	11 12	PP	25·6
Almeria		51·9	307	9 18	+ 6	16 38	+ 3	9 32	pP	29·6
Uccle		52·8	325	e 9 19	0	e 16 44	− 3	—	—	e 24·6
Granada		52·9	307	i 9 21k	+ 1	i 16 52	+ 4	9 49	pP	27·0
Paris		52·9	323	i 9 17	− 3	—	—	i 9 30	P	e 29·6
De Bilt		53·0	328	—	—	e 16 47	− 3	e 20 15	SS	e 25·6
Toledo	z.	53·9	311	i 9 28	+ 1	17 8	+ 6	—	—	—
Irkutsk		59·7	36	e 10 8	− 1	e 18 16	− 3	—	—	—
Pierce Ferry		129·3	341	i 19 15	[+ 4]	—	—	—	—	—
Tucson		131·8	336	e 19 19	[+ 4]	—	—	—	—	—
Mount Wilson	z.	132·2	345	e 19 21	[+ 5]	—	—	—	—	—
Palomar	z.	132·8	344	e 19 24	[+ 7]	—	—	—	—	—

Additional readings :—
Rome eZ = 10m.33s., eSS = 19m.31s.
Triest eSS = 18m.13s.
Warsaw ePEN = 8m.27s., P_cPZ = 9m.58s., ePP?N = 10m.15s., ePPPZ = 10m.49s., eZ = 14m.24s., SZ = 15m.4s., eE = 18m.14s., SSN = 18m.45s.
Strasbourg ePP = 10m.59s., ePPP = 11m.52s., eSS = 19m.25s.
Tortosa PPE = 11m.4s., PPPEN = 12m.4s., PSN = 16m.20s., PPSE = 16m.25s., S_cSEN = 19m.0s., SSE = 20m.1s.
Copenhagen 20m.19s.
Almeria P_cP = 10m.32s., PP = 11m.20s., PPP = 12m.23s., P_cS = 14m.22s., sS = 17m.0s., S_cS = 19m.2s., SSS = 22m.6s.
Granada P_cP = 10m.30s., iPP = 11m.22s., S_cS = 19m.16s., SS = 20m.34s., SSS = 22m.28s.
Long waves were also recorded at Kew.

May 24d. 15h. 11m. 40s. Epicentre 12°·1N. 48°·7E. (as at 0h.).

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Helwan	23·9	320	i 5 17a	+ 1	e 9 35	+ 5	—	—	—
Bombay	24·2	70	i 5 22	+ 3	—	—	—	—	—
Ksara	24·6	332	e 5 23	0	e 9 59	+17	—	—	—
Stalinabad	31·8	30	i 6 36	+ 8	—	—	—	—	—
Istanbul	33·6	332	—	—	e 12 14	+ 8	—	—	e 18·4
Andijan	35·3	31	e 6 58	− 1	e 12 34	+ 1	—	—	—
Moscow	44·4	351	e 8 12	− 2	—	—	9 55	PP	—
Sverdlovsk	45·6	8	—	—	15 0	− 6	—	—	—
Warsaw	45·8	337	e 7 25	−60	e 14 21	−48	e 17 45	SS	e 24·3
Alicante	50·9	310	—	—	e 18 47	S_eS	—	—	e 28·5
Copenhagen	51·8	334	e 9 15	+ 3	e 16 38	+ 5	—	—	25·3
Almeria	51·9	307	9 34	+22	e 16 44	+ 9	11 28	PP	29·3
Granada	52·9	307	e 11 12	PP	i 19 3	?	20 6	SS	27·3

Additional readings and note :—
Warsaw eZ =13m.38s., eN =13m.56s., eZ =21m.36s.
Long waves were also recorded at Stuttgart and Tortosa.

May 24d. Readings also at 2h. (Paris and Stuttgart), 4h. (Stuttgart, Granada, and Antarctic), 5h. (Alicante, Uccle, Ksara, De Bilt, Strasbourg, and Clermont-Ferrand), 7h. (Ksara), 8h. (Tucson and Wellington), 9h. (Stuttgart and Santa Lucia), 10h. (Stuttgart), 11h. (Tucson, Pasadena, Mount Wilson, and Palomar), 12h. (Ksara and Istanbul), 13h. (Wellington, Auckland, Arapuni, Brisbane, Riverview, and Jena), 18h. (Palomar, Mount Wilson, Pasadena, Tinemaha, Riverside, Tucson, Pierce Ferry, Boulder City, Bozeman, Salt Lake City, St. Louis, Florissant, and Weston), 19h. (Mizusawa and near Andijan), 21h. (near La Paz).

May 25d. 5h. 29m. 12s. Epicentre 0°·5S. 120°·0E.

A = −·5000, B = +·8660, C = −·0087 ; δ = +3 ; h = +7 ;
D = +·866, E = +·500 ; G = +·004, H = −·008, K = −1·000.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	N.	41·5	133	i 9 16	PP	e 15 18	+71	—	—	—
Kodaikanal	E.	43·6	286	—	—	e 13 47	−51	—	—	—
Riverview	N.	44·2	142	—	—	e 14 45	− 1	—	—	—
Vladivostok		44·7	13	—	—	e 14 57	+ 3	—	—	—
New Delhi	N.	50·1	309	—	—	e 16 8	− 2	—	—	e 32·7
Bombay		50·2	295	e 9 3	+ 3	i 16 6	− 5	—	—	—
Irkutsk		54·2	348	e 9 34	+ 5	17 17	+11	—	—	—
Andijan		59·6	320	e 10 12	+ 4	e 18 23	+ 6	—	—	—
Stalinabad		60·9	316	i 10 24	+ 7	—	—	—	—	—
Tashkent		61·9	319	e 10 39	+15	—	—	—	—	—
Tchimkent		62·2	320	e 10 24	− 2	e 18 53	+ 2	—	—	—
Sverdlovsk		74·2	331	i 11 39	− 1	i 21 15	+ 1	—	—	—
Ksara		85·4	303	e 12 40	0	e 23 18	+ 7	—	—	—
Moscow		86·1	326	e 12 43	− 1	e 23 18	0	—	—	—
Helwan		89·1	300	e 12 58	0	e 23 46	0	e 24 51	PS	—

Brisbane gives also iN =9m.21s.

May 25d. 11h. 42m. 41s. Epicentre 5°·5N. 128°·0E. (as on 1945, Jan. 6d.).

A = −·6129, B = +·7844, C = +·0952 ; δ = −1 ; h = +7 ;
D = +·788, E = +·616 ; G = −·059, H = +·075, K = −·995.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Vladivostok		37·6	5	e 7 20	+ 2	—	—	—	—	—
Brisbane	N.	40·7	145	i 11 25	?	i 16 17	SS	—	—	—
Riverview		44·8	153	e 11 0	PPP	e 17 37	SS	—	—	e 23·5
New Delhi	N.	53·2	302	—	—	e 16 53	+ 1	e 20 22	SS	—
Bombay		55·3	288	e 9 32	− 6	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Andijan		60·7	314	e 10 18	+ 3	—	—	—	—	—
Stalinabad		62·7	311	i 10 27	− 2	—	—	—	—	—
Tchimkent		63·2	315	e 10 26	− 6	—	—	—	—	—
Samarkand		64·4	311	e 10 25	−15	—	—	—	—	—
Sverdlovsk		73·1	329	11 34	0	21 2	+ 1	—	—	—
Tananarive	N.	82·8	250	—	—	e 28 50	SS	e 32 17	?	—
Moscow		85·7	35	e 12 40	− 2	e 23 15	+ 1	—	—	—
Ksara		88·7	303	e 12 48	− 9	23 38	− 5	16 19	PP	—
Helwan	Z.	93·0	300	e 19 0	PPP	—	—	e 20 31	?	—
Scoresby Sund		101·5	350	—	—	28 0	PPS	—	—	—
Rome		104·9	316	e 22 1	PKS	—	—	—	—	—

Additional readings :—
Riverview iPSEN =17m.57s., eN =19m.15s., phases wrongly identified.
Long waves also recorded at Wellington and other European stations.

May 25d. 15h. 54m. 48s. Epicentre 51°·5N. 169°·0W. (as on 1944, Sept. 29d.).

A = −·6136, B = −·1193, C = +·7806 ; δ = +7 ; h = −6 ;
D = −·191, E = +·982 ; G = −·766, H = −·149, K = −·625.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
College		17·3	31	e 4 6	+ 2	e 9 14	+118	—	—	e 10·3
Sitka		20·3	61	e 4 40	0	e 8 22	− 1	—	—	e 9·4
Tinemaha		38·3	93	e 7 28	+ 4	—	—	—	—	—
Vladivostok		40·0	282	e 7 39	+ 1	e 13 44	0	—	—	—
Pasadena	Z.	40·2	95	e 7 41	+ 1	—	—	—	—	—
Riverside	Z.	40·8	95	e 7 46	+ 1	—	—	—	—	—
Boulder City		41·1	91	e 7 50	+ 3	—	—	—	—	—
Pierce Ferry		41·5	90	e 7 53	+ 3	—	—	—	—	—
Palomar		41·6	95	i 7 53	+ 2	e 14 11	+ 3	—	—	—
Tucson		46·1	91	e 8 28	0	—	—	—	—	—
Florissant		54·3	71	e 9 29	− 1	—	—	e 9 42	pP	—
St. Louis	Z.	54·5	71	e 9 30	− 2	—	—	e 9 43	pP	—
Weston		62·5	56	e 10 24	− 4	—	—	—	—	e 30·1
Sverdlovsk		64·6	333	10 38	− 3	e 19 27	+ 6	—	—	—
Copenhagen		73·2	359	e 11 31	− 4	i 21 53	+51	—	—	38·2
Tashkent		74·6	319	e 11 41	− 2	—	—	—	—	—
Obi-garm		76·6	317	i 11 57	+ 3	—	—	—	—	—
Paris		79·8	7	i 12 10	− 2	—	—	—	—	—
Stuttgart	Z.	80·1	2	e 12 13	0	—	—	—	—	—
Strasbourg		80·3	3	e 12 14	0	—	—	—	—	51·2
Leninakan		83·7	336	e 12 39	+ 7	—	—	—	—	—
Ksara		92·3	340	e 13 50	+37	—	—	—	—	—

Additional readings :—
Riverside eZ =8m.3s.
Palomar iZ =8m.1s. and 8m.10s.
Tucson e =8m.40s. and 8m.47s.
Ksara PKP =11m.1s.
Long waves were also recorded at Harvard and Granada.

May 25d. 22h. 59m. 57s. Epicentre 22°·5N. 122°·5E. (as on 1946, Dec. 22d.).

A = −·4969, B = +·7800, C = +·3805 ; δ = +9 ; h = +4 ;
D = +·843, E = +·537 ; G = −·204, H = +·321, K = −·925.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Nanking		10·1	341	e 2 11	−·17	4 22	− 3	—	—	—
Vladivostok		22·0	19	e 4 49	− 9	—	—	—	—	—
Irkutsk		32·9	338	e 6 32	− 6	e 11 52	− 4	—	—	—
New Delhi	N.	41·1	288	—	—	e 14 0	− 1	—	—	e 22·2
Almata		42·9	311	e 8 5	+ 3	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Andijan		45·8	305	e 8 27	+ 2	—	—	—	—	—
Bombay		46·4	275	e 8 36	+ 6	—	—	—	—	—
Obi-garm		47·6	303	i 8 39	0	—	—	—	—	—
Tashkent		48·1	306	e 8 41	− 2	—	—	—	—	—
Stalinabad		48·3	302	i 8 49	+ 4	e 15 42	− 3	—	—	—
Samarkand		49·7	304	e 8 56	0	—	—	—	—	—
Sverdlovsk		56·1	325	9 39	− 4	e 17 21	−11	—	—	—
Grozny		65·5	309	e 10 50	+ 3	—	—	—	—	—
Leninakan		67·3	307	e 11 4	+ 5	—	—	—	—	—
Moscow		68·9	323	e 11 8	− 1	—	—	—	—	—
Ksara		75·1	301	i 11 50	+ 4	22 12	PPS	e 16 28	PPP	—
Upsala		78·0	330	—	—	e 33 38	?	—	—	e 41·0
Warsaw		79·2	323	e 12 5	− 3	—	—	—	—	e 41·0
Helwan	z.	80·1	298	e 12 14	+ 1	—	—	—	—	—
Copenhagen		82·3	328	e 12 25	0	22 39	− 1	—	—	38·0
Scoresby Sund		83·9	350	—	—	23 3	+ 7	—	—	43·0
Cheb		85·1	323	—	—	e 35 3?	?	—	—	e 47·0
Stuttgart		87·5	323	e 12 52	+ 1	—	—	—	—	e 45·0
De Bilt		87·8	327	—	—	e 23 23	[+ 4]	—	—	e 43·0
Strasbourg		88·4	323	e 12 51	− 4	—	—	—	—	e 45·6
Rome		89·0	316	e 13 49	+51	e 23 53	+ 8	e 16 21	PP	—
Shasta Dam		92·9	44	e 13 18	+ 2	—	—	—	—	—

Warsaw gives also ePZ = 12m.11s.
Helwan eZ = 12m.33s.
Long waves were also recorded at Calcutta, Harvard, Weston and other European stations.

May 25d. Readings also at 0h. (Brisbane, Almata, Frunse, Samarkand, near Andijan, Obi-garm, Stalinabad, Tashkent, and Tchimkent), 2h. (Grozny, Leninakan, and near Erevan), 3h. (Palomar, Riverside, Tinemaha, Tucson, and Pierce Ferry), 4h. (Helwan, Ksara, Istanbul, Scoresby Sund, and near Reykjavik), 5h. (Samarkand, Tashkent, Tchimkent, near Andijan, Obi-garm, Stalinabad, and near Mizusawa), 7h. (Uccle and near Mineral), 8h. (near Mineral), 9h. (Ksara), 11h. (Samarkand, Tchimkent, near Andijan, Obi-garm, and Stalinabad), 13h. (Kodaikanal), 14h. (Shasta Dam), 16h. (Palomar, Pasadena, Riverside, and Tucson), 19h. (Palomar, Pasadena, Riverside, Tinemaha, and Tucson).

May 26d. 0h. 6m. 40s. Epicentre 15°·5N. 91°·7W. (as on 1946, Nov. 30d.).

A = −·0286, B = −·9637, C = +·2656; δ = +8; h = +6;
D = −1·000, E = +·030; G = −·008, H = −·265, K = −·964.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Mobile		15·4	11	3 51	+11	6 46	+14	7 11	SS	7·8
Bogota	z.	20·4	119	e 4 38	− 3	—	—	—	—	—
Columbia		20·8	26	e 4 49	+ 4	e 8 54	+21	—	—	—
St. Louis		23·1	3	i 5 9	+ 1	e 9 25	+ 9	i 5 25	pP	—
Florissant		23·2	3	e 5 12	+ 3	e 9 26	+ 8	e 5 28	pP	—
Tucson		24·1	318	i 5 17	− 1	e 9 43	+ 9	i 5 33	pP	e 10·6
San Juan		24·6	79	e 5 24	+ 1	—	—	6 28	PPP	e 10·4
Chicago		26·4	5	e 6 15	+35	e 10 7	− 5	e 10 59	SS	e 20·5
Philadelphia		28·3	28	e 6 14	+17	(e 10 46)	+ 3	—	—	e 10·8
Pierce Ferry		28·6	320	i 5 59	− 1	—	—	i 6 14	pP	—
La Jolla	z.	28·9	312	e 6 15	+12	—	—	—	—	—
Palomar		28·9	314	i 6 1	− 2	—	—	i 6 16	pP	—
Boulder City		29·0	319	i 6 3	− 1	—	—	i 6 18	pP	—
Riverside	z.	29·6	314	i 6 6	− 3	—	—	i 6 22	pP	—
Bermuda		29·7	50	e 5 3	−67	—	—	—	—	e 9·7
Mount Wilson	z.	30·2	314	i 6 12	− 2	—	—	i 6 27	pP	—
Pasadena	z.	30·2	314	i 6 11	− 3	—	—	i 6 27	pP	—
Salt Lake City		30·7	331	(e 6 58)	+39	—	—	—	—	e 7·0
Haiwee		31·2	317	e 6 25	+ 2	—	—	—	—	—
Tinemaha	z.	31·9	318	i 6 28	− 1	—	—	e 6 42	pP	—

Continued on next page,

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ottawa		32·7	21	6 36	0	11 40	−12	—	—	15·3
Shasta Dam		36·6	320	e 7 5	− 5	—	—	i 9 26	PcP	—
Grand Coulee		39·4	331	e 7 33	0	—	—	i 8 7	pP	—
La Paz	z.	39·4	143	7 36	+ 3	—	—	—	—	16·1
Strasbourg		84·6	41	e 12 32	− 4	—	—	—	—	—
Stuttgart	z.	85·5	41	e 12 36	− 5	—	—	—	—	—

Additional readings :—
St. Louis isPZ = 5m.33s., iPPZ = 5m.45s., esSZ = 9m.53s.
Florissant esSZ = 9m.54s., eSSZ = 10m.22s.
Tucson i = 5m.41s., 5m.53s., and 6m.25s., iPcP? = 9m.14s., iS = 9m.54s., e = 10m.13s.
Chicago e = 8m.46s. and 15m.44s.
Philadelphia e = 8m.56s.
Pierce Ferry i = 6m.29s.
Palomar iEN = 6m.35s.
Boulder City i = 6m.37s.
Riverside iZ = 6m.41s., iPcPZ = 9m.7s., iZ = 9m.25s. and 9m.43s.
Mount Wilson iZ = 6m.38s. and 6m.47s.
Pasadena iZ = 6m.47s., iPcPZ = 9m.9s., ipPcPZ = 9m.27s. iZ = 9m.44s.
Tinemaha iZ = 7m.4s., iPcPZ = 9m.14s., eZ = 9m.31s.
Long waves were also recorded at Copenhagen and Kew.

May 26d. 11h. South Atlantic.

Helwan ePZ = 2m.49s., iZ = 3m.14s., eE = 12m.42s.
Ksara eP = 3m.15s., PP = 6m.33s., S = 13m.43s.
Bombay eEN = 3m.23s.
La Paz iPZ = 3m.31s., iS?N = 14m.4s., LZ = 34m.0s.
Rome eP = 4m.42s., eS = 14m.32s., ePS?N = 15m.12s.
Riverview ePP?N = 6m.37s., eS?E = 13m.36s., eRZ = 30m.
Wellington PKP = 7m.46s., pPKP = 8m.4s., PP?Z = 8m.35s., pPPZ = 9m.0s., PPPZ = 10m.34s., SKS = 14m.10s., SKKS = 14m.57s., S? = 16m.6s., sP? = 17m.30s., sSS = 25m.21s., Q = 32m.30s., RZ = 36m.42s.
Stuttgart ePZ = 8m.32s., eS? = 17m.30s., eSS? = 22m.42s., eQ? = 41m.
Strasbourg ePP = 8m.42s., eSS = 22m.48s., eL = 39m.
Kodaikanal eE = 10m.18s.
Tucson eP = 10m.38s., i = 11m.10s.
Pierce Ferry eP = 10m.46s.
Boulder City eP = 10m.48s.
Riverside ePZ = 10m.50s., iZ = 10m.57s.
Tinemaha ePZ = 10m.54s.
Pasadena ePZ = 10m.57s.
Mount Wilson ePZ = 10m.58s.
Palomar ePN = 10m.59s.
Wairiri PEN = 13m.45s., SEN = 21m.50s., QEN = 26m.30s., RN = 30m.15s.
Granada e = 15m.1s. and 24m.29s., L = 38m.0s.
Copenhagen i = 18m.31s., L = 44m.
Almeria e = 29m.43s., eL = 38m.55s.
Long waves were also recorded at Brisbane, Arapuni, New Delhi, Weston, and other European stations.

May 26d. 13h. 0m. 55s. Epicentre 46°·2N. 151°·2E. Depth of focus 0·030
(as on 1942, Oct. 26d.).

$A = -·6087$, $B = +·3346$, $C = +·7194$; $\delta = +1$; $h = -4$;
$D = +·482$, $E = +·876$; $G = -·630$, $H = +·347$, $K = -·695$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Mizusawa	E.	10·2	230	e 2 27	+ 5	e 4 13	− 1	—	—	—
	N.	10·2	230	e 2 24	+ 2	e 4 16	+ 2	—	—	—
Vladivostok		14·1	264	i 3 7	− 4	—	—	—	—	—
Irkutsk		30·8	299	e 6 35	+38	—	—	—	—	—
Almata		51·0	296	e 8 41	0	—	—	—	—	—
Sverdlovsk		53·3	317	i 8 54	− 4	i 16 4	− 6	i 9 39	pP	—
Andijan		55·3	295	9 12	0	—	—	—	—	—
Tashkent		56·9	307	e 9 22	− 2	—	—	—	—	—
Stalinabad		58·8	294	i 9 38	+ 1	i 17 23	0	—	—	—
Samarkand		59·2	297	e 9 38	− 2	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Shasta Dam		60·0	61	i 9 45	0	—	—	—	—	—
Moscow		64·1	325	10 8	− 4	—	—	e 10 54	pP	—
Tinemaha		64·7	62	e 10 18k	+ 2	—	—	—	—	—
Mount Wilson	Z.	66·7	65	i 10 30k	+ 1	—	—	—	—	—
Pasadena	Z.	66·7	65	i 10 30	+ 1	—	—	—	—	—
Riverside	Z.	67·3	65	i 10 33	+ 1	—	—	—	—	—
Boulder City		67·6	61	i 10 36	+ 2	—	—	—	—	—
Palomar		68·0	64	e 10 40	+ 3	—	—	—	—	—
Pierce Ferry		68·0	60	i 10 38	+ 1	—	—	—	—	—
Leninakan		71·9	311	e 11 12?	+12	—	—	—	—	—
Tucson		72·5	61	i 11 6	+ 2	—	—	—	—	—
Copenhagen		72·7	337	i 11 1	− 4	—	—	—	—	—
Jena		77·2	335	e 11 28	− 3	—	—	—	—	—
Florissant	N.	79·0	45	e 11 41	+ 1	—	—	—	—	—
St. Louis		79·2	45	i 11 48	+ 6	e 21 29	+ 8	—	—	—
Stuttgart		79·8	335	e 11 43a	− 2	—	—	—	—	—
Strasbourg		80·4	336	i 11 47	− 1	—	—	e 12 37	pP	—
Zurich		81·2	335	e 11 51	− 1	—	—	—	—	—
Ksara		81·3	310	i 11 53	0	e 20 45	−58	e 14 48	PP	—
Basle		81·4	336	e 11 51	− 2	—	—	—	—	—
Paris		81·5	340	i 11 52	− 2	—	—	e 12 39	pP	—
Helwan	Z.	86·8	311	i 12 20k	0	—	—	—	—	—

Additional readings :—
Stuttgart e = 11m.47s.
Paris i = 11m.56s.

May 26d. 19h. 40m. 56s. Epicentre 9°·2S. 159°·5E. Depth of focus 0·070.
(as on 1944, July 24d.).

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

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane		19·2	198	i 3 52	− 1	i 7 6	+ 6	i 7 21	SS	i 8·6
Riverview		25·7	196	i 4 52a	0	i 8 48	+ 1	—	—	e 9·1
Auckland		30·8	156	5 43	+ 6	15 14	ScS	7 9	PP	—
New Plymouth		32·5	158	6 0	+ 9	10 44	+11	—	—	—
Tuai		33·5	155	6 5	+ 5	10 51	+ 3	—	—	—
Wellington		34·7	160	6 14	+ 4	11 9	+ 3	i 7 25	pP	—
Vladivostok		57·8	338	e 8 55	−11	i 16 7	−21	—	—	—
Berkeley		86·4	52	i 13 46	pP	—	—	—	—	—
Branner	N.	86·4	52	i 20 4?	?	—	—	—	—	—
Shasta Dam		87·0	49	i 11 54	− 1	—	—	i 13 48	pP	—
Santa Barbara	Z.	87·6	55	i 11 59	+ 2	—	—	i 13 57	pP	—
New Delhi	N.	87·7	300	i 21 38	?	—	—	—	—	—
Pasadena		88·8	56	i 12 0	− 3	e 21 43	[− 3]	i 17 22	PPP	—
Mount Wilson	Z.	88·9	56	i 12 1	− 3	—	—	i 17 19	PPP	—
Haiwee	E.	89·4	54	e 12 7	+ 1	—	—	—	—	—
Riverside	Z.	89·4	56	e 12 2	− 4	—	—	e 17 24	PPP	—
Tinemaha		89·4	53	i 12 6	0	e 21 46	[− 3]	—	—	—
Palomar		89·7	57	e 12 11	+ 4	i 21 50	[− 1]	i 17 27	PPP	—
Bombay		89·8	291	—	—	e 21 59	[+ 7]	—	—	—
Almata		90·9	315	12 16	+ 3	—	—	—	—	—
Pierce Ferry		92·5	54	i 12 20	0	i 22 7	[0]	—	—	—
Andijan		93·8	310	12 21	− 5	—	—	—	—	—
Tucson		94·6	58	e 12 30	0	—	—	i 14 26	pP	—
Obi-garm		95·5	309	e 12 36	+ 2	—	—	—	—	—
Stalinabad		96·2	308	i 12 30	− 7	i 23 0	−12	—	—	—
Tashkent		96·2	311	e 12 23	−14	e 22 53	−19	—	—	—
Sverdlovsk		102·5	326	18 54	PPP	23 21	[+23]	30 34	SS	—
Florissant		111·3	52	—	—	e 23 24	[−12]	e 27 19	PS	—
St. Louis		111·5	52	e 20 14	?	e 25 26	S	e 28 31	PS	—
Scoresby Sund		118·8	2	28 14	PS	—	—	29 46	PPS	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m. s.			m.
Ottawa		120·6	42	—	—	e 25 34	SKKS	—		—	31·1
Ksara		122·9	304	e 17 59	[− 2]	e 30 19	PS	i 19 43	PP		—
Warsaw		125·4	330	e 20 42	PP	e 36 4	SS	e 29 3	PS	e 63·1	
Istanbul		126·0	316	e 18 1	[− 6]	—	—	e 20 1	PP		—
La Paz	z.	126·4	118	20 40	PP	—	—	—		—	—
Copenhagen		126·8	338	i 18 3	[− 6]	29 8	PS	21 57	PP		55·1
Helwan	z.	127·5	302	e 18 4	[− 6]	—	—	i 20 10	pPKP		—
Jena		130·7	334	e 20 45	PP	—	—	—		—	—
De Bilt		132·4	340	i 20 52a	PP	e 37 24	SS	—		—	e 59·1
Stuttgart		133·4	333	e 18 15	[− 6]	e 30 14	PS	e 20 27	pPKP		e 62·1
Uccle		133·7	340	e 21 0	PP	—	—	—		—	e 40·1
Strasbourg		134·1	335	e 20 59	PP	e 24 42	[− 4]	e 29 58	PS		e 45·2
Kew	z.	134·7	343	i 20 34	PP	e 24 34	[−13]	e 32 3?	PPS		e 54·1
Paris		136·1	339	e 21 5	PP	—	—	—		—	—
Rome		136·4	324	e 18 19	[− 8]	e 24 49	[− 1]	e 31 31	PS		—
Tortosa	N.	143·4	333	18 33	[− 7]	24 19	[−42]	21 40	PP		—
Toledo	z.	146·1	338	i 18 40	[− 4]	27 51	?	—		—	—
Almeria		148·0	333	e 18 34	[−13]	25 39	[+31]	22 8	PP		—
Granada		148·2	335	i 18 44k	[− 3]	—	—	40 2	SS		65·7

Additional readings :—
Brisbane iN = 2m.11s. and 6m.12s.
Riverview iZ = 7m.20s., iS_eSE = 14m.48s.
Auckland P_eP = 8m.26s., S_eP = 11m.13s., sS_eS = 18m.0s.
Wellington iZ = 6m.28s., 6m.38s., and 6m.49s., sPZ = 8m.11s., iZ = 8m.49s., and 10m.3s. sP_ePZ = 11m.0s., iZ = 11m.16s., S_ePZ = 11m.35s., iZ = 11m.41s., iEN = 11m.49s., i = 12m.24s., iZ = 12m.38s., sS = 13m.18s., sSS = 15m.20s., 15m.25s., and 17m.52s.
Pasadena eSE = 22m.11s.
Pierce Ferry i = 12m.30s. and 22m.37s.
Tucson i = 14m.38s.
Sverdlovsk iS = 23m.47s., PPS = 25m.33s.
Florissant iEN = 24m.37s.
St. Louis eE = 24m.38s.
Ksara e = 22m.21s.
Warsaw eE = 21m.12s., eZ = 21m.30s., 22m.32s., 28m.44s., ePPP?N = 29m.9s., eE = 30m.34s., eN = 31m.35s., eEZ = 31m.38s., eN = 33m.22s., eE = 35m.34s. and 36m.8s., eN = 39m.6s., eE = 39m.15s.
Copenhagen 26m.8s. and 36m.22s.
Stuttgart iZ = 20m.56s., e = 31m.50s. and 41m.4s.
Strasbourg ePPS = 32m.0s. and 32m.4s., e = 33m.20s., eSSS = 41m.14s.
Kew iZ = 21m.0s., eZ = 34m.34s.?
Rome eZ = 35m.29s.
Almeria PPS = 34m.39s., SS = 41m.5s.
Granada i = 15m.59s.

May 26d. Readings also at 0h. (Pierce Ferry), 3h. (Branner, Lick, near Berkeley, San Francisco, and near Mizusawa), 6h. (Tucson (2), Boulder City (2), Pierce Ferry (2), St. Louis (2), Florissant (2), and Bogota), 7h. and 10h. (near Alicante), 13h. (near Lick), 14h. (Riverview and near Stalinabad), 15h. (De Bilt), 17h. (Brisbane, Riverview, Auckland, Wellington, Mount Wilson, Pasadena, Riverside, Tinemaha, Tucson, Branner, Pierce Ferry, and Shasta Dam), 18h. (Tucson).

May 27d. 3h. 34m. 57s. Epicentre 8°·7S. 124°·1E. Depth of focus 0·015.

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.
Perth		24·7	197	5 5	− 5	9 53	+33	5 51	PP		—
Brisbane	N.	33·1	128	i 6 25	− 1	i 11 36	+ 2	i 13 8	SS		i 13·6
Riverview		35·7	139	i 6 48k	0	i 12 13	− 1	i 7 12	pP		—
Mizusawa	E.	50·2	17	e 8 48	+ 3	e 15 50	+ 5	—		—	—
Hyderabad	E.	52·1	300	8 59	0	16 10	− 1	—		—	—
Vladivostok		52·1	7	i 8 58	− 1	i 16 10	− 1	i 9 19	pP		—
Auckland		53·7	129	12 31	PPP	16 40	+ 7	26 23	Q		29·5
New Plymouth		53·9	132	9 16	+ 4	16 51	+15	—		—	—
Wairiri		54·1	138	9 21	+ 7	16 11	−28	20 53	Q		24·3
Wellington		55·2	135	9 23	+ 1	16 57	+ 4	10 25	pP		31·0

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m. s.			m.
Bombay		57·5	298	e 9 40	+ 2	i 17 24	+ 1	10 9	pP		25·1
New Delhi	N.	58·5	311	i 9 42	− 3	i 17 35	− 1	19 20	S_cS		—
Irkutsk		63·1	347	10 20	+ 4	18 37	+ 2	—	—		—
Obi-garm		69·1	317	i 10 56	+ 2	—	—	—	—		—
Stalinabad		69·7	317	i 11 3	+ 5	i 19 59	+ 4	—	—		—
Tashkent		70·7	319	i 11 7	+ 3	e 20 11	+ 5	—	—		—
Tchimkent		71·0	320	e 11 9	+ 3	e 20 7	− 3	—	—		—
Samarkand		71·4	317	e 11 37	pP	—	—	—	—		—
Tananarive	N.	74·6	253	—	—	e 20 58	+ 8	21 36	PS		e 31·8
Sverdlovsk		83·3	330	i 12 16	+ 2	22 20	− 2	—	—		—
Baku		83·8	312	12 30	P_cP	22 33	+ 6	—	—		—
Grozny		87·5	314	e 12 39	+ 5	e 23 8	+ 5	—	—		—
Ksara		93·3	303	e 13 8	+ 7	25 17	PS	13 37	pP		—
Moscow		95·1	326	e 13 13	+ 3	e 24 13	+ 3	e 13 36	pP		—
Helwan		96·7	299	e 13 45	pP	i 23 45	[+ 5]	e 17 13	PP		—
Istanbul		99·4	311	e 13 2	−27	—	—	—	—		—
Bucharest		101·7	314	18 3?	PP	—	—	—	—		37·1
Helsinki		102·0	330	e 16 57	PKP	e 24 9	[+ 2]	e 18 38	pPP		—
Warsaw		105·0	322	18 15	PP	e 24 24	[+ 4]	e 27 19	PS		e 57·0
Prague		109·2	321	e 19 21	PP	e 28 27	PS	—	—		—
Copenhagen		109·3	327	e 18 44	pPKP	28 26	PS	34 19	SSP		55·0
Rome		111·7	312	e 18 58	PP	e 28 28	PS	e 21 36	PPP		e 54·1
Stuttgart		112·8	319	e 18 55?	pPKP	(e 28 39)	PS	e 19 18	PP		e 28·7
Shasta Dam		113·4	49	e 18 47	pPKP	—	—	e 19 12	PP		—
Strasbourg		113·8	320	e 19 28	PP	e 28 43	PS	e 34 50	SS		e 58·0
De Bilt		114·4	324	e 19 33	PP	e 28 43	PS	e 19 58	pPP		e 55·1
Scoresby Sund		114·7	348	20 9	pPP	28 57	PS	—	—		—
Uccle		115·3	323	e 19 39	PP	(e 29 3?)	PS	—	—		e 29·1
Paris		117·1	321	e 18 34	[+ 4]	—	—	e 20 15	PP		—
Clermont-Ferrand		117·6	317	e 19 49	PP	e 29 24	PS	e 30 26	PPS		60·0
Pasadena	z.	117·7	56	i 18 38	[+ 7]	—	—	e 19 18	PP		—
Kew		117·8	325	i 19 54a	PP	e 26 38	SKKS	i 29 24	PS		e 60·0
Mount Wilson	z.	117·8	56	i 18 38	[+ 7]	—	—	e 19 21	PP		—
Riverside	z.	118·4	56	e 18 40	[+ 7]	—	—	—	—		—
Palomar	z.	118·9	57	i 18 38	[+ 4]	—	—	e 19 38	PP		—
Boulder City		120·1	53	e 18 43	[+ 8]	—	—	—	—		—
Tortosa		120·9	313	20 34	PP	—	—	21 18	?		e 73·0
Tucson		124·1	57	i 18 51	[+ 8]	—	—	e 19 19	pPKP		—
Granada		125·0	309	15 8	P	—	—	i 21 13	pPP		e 69·6
Florissant	z.	136·9	40	e 19 28	[+20]	e 22 34	SKP	e 19 41	pPKP		—
St. Louis	z.	137·1	40	e 19 31	[+23]	i 22 34	SKP	e 19 41	pPKP		—
Harvard	z.	143·6	19	i 19 23	[+ 4]	—	—	—	—		—
Weston		143·8	19	i 19 23	[+ 3]	—	—	e 22 33	PP		—
La Paz		152·2	155	e 19 43	[+10]	i 26 23	[− 3]	23 29	PP		81·0
Bermuda		155·1	18	e 20 35	pPKP	29 33	SKKS	—	—		e 63·2
Bogota	z.	161·5	101	e 19 55	[+ 9]	e 31 44	SKKS	i 20 37	pPKP		—

Additional readings and note :—
Brisbane iS_cSN =16m.43s.
Riverview iPPZ =8m.9s., iN =8m.13s., isPPEZ =8m.34s., isS?N =12m.56s., iE =13m.2s., iSSS?Z =15m.4s.
Vladivostok isS =16m.55s.
Wairiri eZ =11m.43s.
Wellington iZ =9m.51s. and 10m.3s., P_cPZ =10m.10s., sPZ =10m.48s., pP_cPZ =11m.18s., sP_cPZ =11m.49s., pPP =12m.23s., iZ =12m.52s., iEN =13m.22s., S_cPZ =13m.33s., iZ =13m.54s., P_cSEN =14m.3s., iZ =14m.18s., iEN =14m.50s., pP_cSEN =15m.19s., i =16m.8s., SP =17m.22s., i =17m.43s., pS_cS =20m.2s., i =22m.59s., SSS =24m.4s.
Bombay sP =10m.24s., eSN =17m.35s., SSN =18m.20s.
New Delhi P_cPN =10m.25s.
Ksara sP =13m.52s.
Moscow esP =13m.50s.
Helwan eZ =14m.48s., 15m.30s., and 25m.39s.
Helsinki ePP =18m.1s., ePKS =20m.50s., ePS =26m.47s., ePPS =28m.3s., eSS =32m.33s.
Warsaw ePPE =18m.25s., iZ =18m.46s. and 19m.0s., eZ =21m.14s., eEN =25m.14s., eN =28m.1s., ePPS?E =28m.30s., ePKKP?Z =29m.4s., eE =29m.38s., eZ =30m.19s., eN =30m.33s., eSS?N =33m.5s., ePKKS?Z =33m.15s.; ePKKS?E =33m.22s.

Continued on next page.

Copenhagen i =18m.55s., 19m.20s., and 19m.34s., PPS =29m.24s.
De Bilt epPPP =22m.38s., ePPS =30m.0s.
Clermont-Ferrand e =20m.29s.
Kew iNZ =20m.18s.?, iZ =23m.6s.
Palomar e =19m.13s.
Florissant eZ =21m.52s., esSKPE =23m.15s.
St. Louis esSKPN =23m.16s.
La Paz iPKPZ =19m.49s., iN =20m.9s., SKKSN =30m.8s., SSZ =43m.39s.
Long waves were also recorded at Arapuni.

May 27d. 5h. 58m. 52s. Epicentre 1°·8S. 135°·5E.

$A = -\cdot7129$, $B = +\cdot7006$, $C = -\cdot0312$; $\delta = +4$; $h = +7$;
$D = +\cdot701$, $E = +\cdot713$; $G = +\cdot022$, $H = -\cdot022$, $K = -1\cdot000$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	N.	30·6	148	i 6 14	− 4	i 10 45	−35	i 7 5	PP	—
Kagosima		33·5	352	6 46	+ 3	12 18	+13	—	—	15·6
Miyazaki		33·7	354	e 6 48	+ 3	12 21	+13	—	—	e 14·5
Kumamoto		34·7	353	e 6 33	−21	12 22	− 2	—	—	15·2
Riverview		35·1	157	i 6 58k	+ 1	i 12 29	− 1	i 7 8	pP	e 16·5
Perth		35·3	209	7 3	+ 4	12 35	+ 2	14 43	SSS	—
Hukuoka		35·5	353	e 6 59	− 1	12 33	− 3	8 6	PP	e 14·5
Owase		35·7	2	e 7 2	0	12 54	+15	—	—	—
Sumoto		36·0	359	i 7 5	0	12 40	− 4	8 36	PP	16·6
Hirosima		36·1	357	6 27	−38	12 16	−29	—	—	—
Shizuoka		36·7	5	7 14	+ 4	13 5	+11	8 38	PP	15·9
Hamada		36·8	355	7 12	+ 1	12 52	− 4	15 38	SSS	16·7
Misima		36·9	5	e 7 1	−11	12 21	−37	—	—	—
Toyooka		37·1	359	7 13	− 1	13 4	+ 3	—	—	15·9
Nanking		37·2	336	i 7 14	− 1	i 12 53	− 9	i 8 43	PP	—
Tokyo		37·5	6	e 7 31	+14	12 48	−19	—	—	17·8
Wazima		39·0	2	e 7 31	+ 1	13 35	+ 6	—	—	—
Sendai		40·2	8	e 7 39	− 1	13 51?	+ 3	—	—	19·1
Mizusawa		41·1	8	e 7 49	+ 2	14 0	− 1	e 14 9	PPS	—
Mori		43·9	6	8 15	+ 5	14 58	+16	—	—	21·2
Vladivostok		44·8	356	i 8 17	0	i 14 54	− 1	—	—	—
Sapporo		45·0	7	8 21	+ 2	14 58	0	—	—	22·0
Auckland		50·3	139	9 3	+ 3	16 12	− 1	9 33	pP	22·6
New Plymouth		51·1	141	9 9	+ 3	16 29	+ 5	—	—	—
Arapuni		51·5	140	e 10 20	P_cP	16 38	+ 9	e 18 44	S_cS	24·1
Calcutta	N.	51·9	301	e 8 44	−28	i 16 0	−35	—	—	—
Wairiri		52·6	148	9 19	+ 1	16 22	−22	12 25	PPP	23·8
Tuai		52·9	140	9 22	+ 2	16 45	− 3	—	—	21·1
Wellington		52·9	143	9 17	− 3	16 34	−14	10 45	pP_cP	23·1
Apia		53·5	105	e 9 27	+ 3	i 17 8	+11	i 10 13	P_cP	e 23·6
Colombo		56·2	279	9 41	− 3	17 14	−19	12 57	PPP	26·7
Kodaikanal	E.	59·0	283	i 10 0	− 4	18 0	−10	12 4	PP	27·5
Hyderabad		59·3	291	10 4	− 2	18 9	− 5	12 39	PPP	28·9
Irkutsk		59·9	338	i 10 11	+ 1	i 18 23	+ 2	—	—	—
Dehra Dun	N.	63·3	306	e 12 4	?	e 20 16	S_cS	—	—	e 27·7
New Delhi		63·4	303	i 10 33	− 1	i 19 3	− 3	12 54	PP	29·6
Bombay		64·9	292	i 10 43	0	i 19 21	− 3	24 8	SS	28·9
Almata		68·9	319	11 11	+ 2	—	—	—	—	—
Honolulu		69·7	66	e 11 27	+13	i 20 28	+ 6	i 11 46	P_cP	e 27·9
Frunse		70·4	317	i 11 18	0	i 20 46	+16	—	—	—
Obi-garm		72·5	312	i 11 31	+ 1	—	—	—	—	—
Stalinabad		73·1	312	i 11 36	+ 2	i 21 4	+ 3	—	—	—
Tashkent		73·6	314	i 11 38	+ 1	e 21 12	+ 5	—	—	—
Tchimkent		73·6	315	i 11 37	0	i 21 11	+ 4	—	—	—
Samarkand		74·8	312	i 11 45	+ 1	—	—	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Sverdlovsk		83·3	328	i 12 27	− 3	i 22 45	− 5	—	—	—
College		86·0	25	e 12 42	− 1	e 23 14	− 3	e 24 6	PS	e 36·1
Tananarive		87·5	252	e 12 52	+ 1	e 23 10	[− 7]	e 23 25	S	43·6
Baku		87·8	310	i 12 57	+ 5	i 23 43	+ 9	—	—	—
Grozny		91·0	313	e 13 8	+ 1	23 51	−12	—	—	—
Sitka		91·1	33	e 13 11	+ 3	e 23 41	[+ 2]	e 16 47	PP	e 35·0
Leninakan		92·4	310	e 13 23	+ 9	24 1	{+ 2}	—	—	—
Moscow		95·9	326	i 13 29	− 1	24 4	[− 2]	17 10	PP	—
Victoria		98·7	41	14 8	+26	24 38	{− 7}	17 56	PP	44·1
Ferndale		98·9	49	—	—	e 26 44	PS	—	—	e 46·7
Ksara		99·2	303	e 13 46	+ 1	27 21	PPS	17 38	PP	—
Ukiah		99·9	50	e 23 58	SKS	e 26 51	PS	e 27 48	PPS	e 38·4
Shasta Dam		100·3	48	e 13 50	0	—	—	—	—	—
Berkeley		100·8	52	i 13 52	0	i 24 44	[+13]	i 18 4	PP	e 42·5
Branner	N.	100·9	52	—	—	e 33 8?	SSP	—	—	—
Mineral	E.	101·0	49	e 18 7	PP	e 26 37	PS	—	—	e 52·8
Santa Clara		101·1	52	e 14 8	+15	e 25 8	{+ 6}	—	—	—
Lick		101·3	52	e 14 12	+18	e 24 38	[+ 5]	e 18 24	PP	e 42·2
Helsinki		101·7	332	e 14 0	+ 4	e 24 46	[+11]	e 18 13	PP	e 45·1
Fresno	N.	102·9	52	e 19 12	?	e 26 3	+18	—	—	e 43·9
Helwan		103·2	300	i 14 2k	− 1	24 54	[+12]	18 20	PP	—
Santa Barbara	Z.	103·2	55	e 14 12	+ 9	—	—	—	—	—
Tinemaha	Z.	104·0	52	e 14 15	+ 9	—	—	—	—	—
Haiwee	E.	104·4	53	e 14 17	+ 9	—	—	—	—	—
Pasadena		104·5	55	e 14 8	0	e 26 1	+ 3	e 18 30	PP	e 42·3
Mount Wilson	Z.	104·6	55	e 14 9	0	—	—	—	—	—
Bucharest		105·1	316	e 17 38	PKP	e 26 18	+15	e 18 38	PP	33·1
Riverside	Z.	105·2	55	e 14 11	0	—	—	—	—	—
Upsala		105·2	332	e 14 18	+ 7	25 1	[+10]	i 18 33	PP	e 43·1
Palomar	Z.	105·7	56	e 14 14	P	—	—	i 30 9	PKKP	—
Warsaw		106·2	324	e 14 12	P	e 25 6	[+10]	e 18 33	PP	e 45·1
Butte		106·4	41	e 18 16	PKP	e 25 16	[+19]	e 37 46	SSS	—
Boulder City		106·9	53	e 14 22	P	—	—	e 18 50	PP	—
Bozeman		107·5	42	e 17 21	?	e 25 36	{−12}	e 18 33	PP	e 43·4
Pierce Ferry		107·6	53	e 14 23	P	—	—	i 18 58	PP	—
Logan		108·0	46	e 19 3	PP	e 24 43	[−21]	i 21 8	PPP	e 44·5
Salt Lake City		108·2	47	e 18 54	[+25]	e 25 36	{−16}	e 34 44	SSP	e 47·9
Saskatoon		108·2	35	19 0	PP	26 20	{+28}	34 26	SSP	47·1
Antarctica		108·4	170	e 15 13	P	e 25 8	[+ 3]	18 57	PP	e 47·3
Belgrade		108·8	317	e 20 0	?	e 21 56	PKS	e 20 9	?	e 57·3
Budapest	E.	108·9	320	e 14 35	P	e 25 8?	[0]	e 18 18	PKP	e 56·1
Kalossa		109·3	320	e 17 46	PKP	—	—	e 19 10	PP	e 54·1
Copenhagen		109·5	330	e 18 56	PP	e 28 34	PS	—	—	—
Scoresby Sund		109·9	351	19 14	PP	34 52	SS	21 4	PPP	—
Bergen		110·3	336	19 12	PP	28 31	PS	21 33	PPP	46·5
Potsdam	E.	110·7	327	i 19 24	PP	e 28 50	PS	—	—	e 47·1
Prague		110·9	324	e 18 15	[−20]	e 25 26	[+10]	e 19 25	PP	e 45·1
Tucson		110·9	55	e 14 43	P	e 34 49	SS	e 19 22	PP	e 44·5
Zagreb		111·5	319	e 19 4	PP	e 28 58	PS	—	—	e 51·1
Cheb		112·1	324	e 18 41	[+ 4]	e 26 13	{− 7}	e 19 26	PP	e 56·1
Jena		112·2	324	e 14 44	P	e 29 4	PS	e 19 26	PP	—
Triest		113·0	320	e 14 59	P	e 25 32	[+ 8]	e 19 34	PP	e 51·1
Rapid City		113·3	41	e 19 34	PP	e 26 43	{+15}	e 29 32	PS	e 48·0
Denver		113·5	47	e 19 4	PP	e 29 20	PS	—	—	e 48·9
Stuttgart		114·5	323	e 17 8	?	e 25 50	[+20]	i 19 40k	PP	e 54·1
De Bilt		115·1	329	e 16 8	?	—	—	e 19 43	PP	e 51·1
Chur		115·2	322	e 18 42	[− 1]	—	—	—	—	e 55·7
Rome		115·3	316	e 14 57	P	35 45	SS	e 18 27	PKP	—
Aberdeen		115·4	336	e 19 8	[+24]	i 30 33	PPS	i 20 23	PP	50·3
Florence		115·4	318	e 18 41	[− 3]	—	—	i 22 46	PPP	i 51·5

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Strasbourg		115·4	325	e 19 39	PP	e 25 20	[− 13]	i 29 28	PS	i 57·8
Zürich		115·5	323	e 19 5	[+21]	—	—	e 19 51	PP	—
Basle		116·0	323	e 19 46	PP	e 27 57	?	—	—	—
Uccle		116·2	329	e 19 56	PP	e 26 44	{− 4}	e 29 53	PS	e 51·1
Pavia		116·2	321	e 19 38?	PP	—	—	—	—	—
Durham	N.	116·3	333	i 20 18	PP	25 51	[+14]	34 55	SS	—
Edinburgh		116·5	335	—	—	25 57	[+19]	29 53	PS	—
Neuchatel		116·7	323	e 19 23	PP	—	—	—	—	—
Besançon		117·1	324	e 20 1	PP	—	—	—	—	e 58·1
Kew		118·2	330	i 15 18?	P	e 27 19	{+18}	e 20 9	PP	e 55·1
Paris		118·3	327	e 20 6	PP	e 26 0	[+16]	e 36 8?	SS	e 50·1
Clermont-Ferrand		119·6	324	e 18 52	[0]	i 37 0	SS	i 20 17	PP	60·5
Ivigtut		120·7	2	20 17	PP	26 20	[+28]	30 2	PS	49·1
Punta Arenas	N.	121·0	162	25 38	SKS	(25 38)	[−15]	38 48	SSP	52·6
Barcelona		122·5	320	e 20 38	PP	37 23	SS	—	—	57·5
Tortosa		123·8	319	i 19 14	[+14]	26 16	[+13]	31 38	PPS	61·9
Florissant	Z.	124·3	42	e 19 13	[+12]	i 21 55	SKP	e 20 45	PP	—
Chicago		124·5	38	e 20 47	PP	e 25 35	[−29]	e 37 39	SS	e 51·9
St. Louis	Z.	124·5	42	e 18 57	[− 4]	i 21 57	SKP	i 20 52	PP	—
Alicante		125·8	318	19 13	[+ 9]	26 35	[+27]	21 9	PP	e 60·3
Toledo	Z.	127·2	321	19 9	[+ 2]	38 25	SS	21 5	PP	—
Almeria		127·9	317	i 19 7	[− 1]	26 7	[− 7]	i 21 13	PP	63·1
Granada		128·5	318	i 19 32k	[+23]	i 27 46	{−24}	20 1	pPKP	62·5
Ottawa		128·6	27	19 10	[+ 1]	22 44	SKP	21 20	PP	56·1
Shawinigan Falls		129·1	23	e 21 33	PP	—	—	—	—	e 52·1
Seven Falls		129·4	21	19 52	[+41]	—	—	—	—	55·1
New Kensington		130·0	34	e 20 23	PKP_2	e 31 40	PS	e 21 33	PP	e 58·2
Pennsylvania	E.	130·9	33	e 19 36	[+22]	e 26 26	[+ 4]	e 21 35	PP	—
Lisbon		131·1	323	22 22	PKS	—	—	25 27	PPP	61·8
Harvard	Z.	132·8	26	i 19 20	[+ 2]	e 26 37	[+10]	i 21 51	PP	e 60·1
Fordham		132·9	29	e 19 19	[+ 1]	e 40 11	SSP	i 21 53	PP	66·9
Philadelphia		132·9	31	e 19 32	[+14]	e 26 36	[+ 9]	e 21 49	PP	e 54·3
Weston		133·0	26	i 19 20k	[+ 2]	e 40 16	SS	e 21 52	PP	e 58·4
Columbia		133·2	41	e 21 55	PP	e 23 28	PKS	e 38 56	SS	e 53·7
Halifax		134·1	18	22 2	PP	28 38	{− 8}	40 2	SS	59·1
Santa Lucia	N.	137·1	147	22 18	PP	35 8	PPS	—	—	58·1
La Plata	E.	141·4	162	19 50	[+17]	30 8	{+39}	46 22	SSS	67·9
	N.	141·4	162	22 38	PP	29 32	{+ 3}	41 2	SS	70·2
	Z.	141·4	162	19 40	[+ 7]	—	—	22 41	PP	74·0
Bermuda		144·1	29	e 19 38	[0]	e 41 36	SS	e 22 57	PP	i 59·4
Balboa Heights		144·4	76	e 19 46	[+ 8]	—	—	—	—	—
Bogota	Z.	150·4	83	e 19 50	[+ 2]	e 26 10	[−44]	e 29 17	SKKS	—
La Paz		150·4	129	e 19 53	[+ 5]	i 26 26	[−28]	i 23 4	PP	69·1
San Juan		153·1	49	e 20 4	[+12]	e 27 14	[+16]	e 23 26	PP	e 49·2
Fort de France		159·1	50	e 20 4	[+ 4]	—	—	—	—	—

Additional readings and notes :—
Brisbane iN =8m.42s., iSSN =11m.41s.
Riverview iEN =7m.37s., iPPE =8m.19s., iPPPE =8m.31s., iN =8m.59s., and 9m.22s., iE =9m.26s., eE =12m.48s., iSSE =14m.40s., iSSSE =15m.17s., iS_cSE =17m.7s., iS_cSN =17m.13s.
Hukuoka PPP =8m.31s.
Auckland PP =11m.12s., i =13m.51s., S_cS? =19m.16s.
Wairiri P_cP =10m.2s., P_cS =14m.18s., SS?Z =20m.53s., Q =20m.38s.
Wellington PPZ =11m.16s., sPPZ =11m.42s., PPP =12m.15s., iZ =14m.5s., EN =14m.15s., P_cS =14m.23s., pS_cP =14m.49s., i =15m.21s., 15m.50s., 16m.6s., 16m.23s., 18m.44s., and 19m.16s., SS =19m.59s., i =21m.4s., sSS =21m.59s., SSS =22m.18s.
Apia iEN =18m.19s., eQE =22·6m.
Kodaikanal SSE =21m.32s.
Hyderabad PSN =18m.26s., SSN =22m.6s.
New Delhi iPN =10m.36s., iN =12m.25s., iSE =19m.7s., PSN =19m.17s., iE =19m.44s., S_cSE =20m.9s., SSE =22m.35s., SSN =22m.47s., iN =24m.45s., SSSN =25m.50s., iN =26m.40s., iE =27m.2s.
Bombay SSN =24m.15s.
Honolulu ePP =12m.50s., e =14m.27s., 16m.57s., 18m.49s. and 22m.41s., eSS =24m.36s.
College e =13m.43s., ePPS =24m.55s., eSS =29m.4s., eSSS =32m.30s.
Tananarive eN =17m.42s., iSN =23m.31s., N =23m.52s., and 24m.12s., PS =24m.45s., N =25m.49s., SS =29m.22s., E =35m.43s.

Continued on next page.

Sitka iPP =16m.52s., e =21m.48s. and 27m.30s., eSS =29m.10s.
Moscow PS =25m.54s.
Victoria SKKS =25m.20s., SE =26m.2s., PPS =28m.2s., SS =32m.26s.
Ukiah e =30m.28s., eSS =31m.22s.
Berkeley iEN =18m.14s., iPPPE =20m.42s., iE =22m.58s. and 25m.10s., iZ =25m.23s., iS_cSN =25m.38s., eS_cSN =25m.41s., iSN =26m.30s., eN =27m.35s., iSSN =32m.40s.
Lick eE =14m.26s., eN =18m.39s., eSKSE =24m.54s.
Helsinki e =15m.26s., ePKP =17m.17s., ePPP =20m.19s., ePKS =21m.39s., eSKKS =25m.16s., eSS =32m.41s., ePKKS =33m.43s.
Helwan iZ =19m.50s., PPPZ =20m.38s., PPSE =27m.24s., iE =29m.41s.
Pasadena eZ =17m.48s,. eSKSE =25m.3s.,iN =26m.51s., eN =32m.48s., eSSN =33m.31s.
Bucharest iE =22m.47s.
Upsala ePN =14m.45s., iPPPE =20m.55s., PPPPN =21m.35s., ePPPPE =21m.41s., e =22m.46s., ePSE =27m.39s., eN =29m.41s., eSSN =33m.25s., eSSE =33m.46s.
Warsaw ePPZ =18m.37s., ePPP?E =20m.28s., ePPP?N =20m.35s., ePPPZ =20m.55s., SKPZ =21m.41s., eSKS?N =25m.12s., eSKKSZ =25m.30s., iPSZ =28m.2s., ePPS?E =28m.26s., PPSZ =29m.4s., ePKKPZ =29m.42s., ePKKPE =29m.52s., iSSN =33m.36s., eSSZ =33m.50s., SSSZ =38m.8s., SSSN =38m.34s., and many other readings given without phase.
Butte ePP? =19m.18s., ePS? =27m.8s., eSS? =32m.4s., eSS =34m.6s.
Bozeman ePPP =21m,17s., eSKS =25m.11s., ePS =28m.22s., iPPS =29m.14s., iSS =34m.18s., eSSS =38m.25s., iSSS =38m.31s.
Pierce Ferry ePP =18m.42s.
Logan eS =26m.59s., iPS =28m.42s., iPPS =29m.23s., i =30m.23s., eSS =32m.49s., i =35m.11s.
Salt Lake City ePP =19m.40s., eS =27m.14s., ePS =28m.52s.
Saskatoon iNW =20m.52s., S =26m.44s., PS =28m.26s., SSS =38m.44s.
Antarctica eSKS =26m.31s., eSS =34m.19s.
Budapest eE =28m.27s.
Scoresby Sund 21m.56s., 26m.6s., 27m.7s., 28m.40s., 29m.45s., 32m.20s., and 33m.32s.
Bergen PKKSEN =33m.12s.?, SSN =34m.44s., PKP,SKS =44m.56s.
Prague e =21m.31s., ePPP =22m.8s., ePS =28m.38s., ePPS =29m.44s., eSS =34m.50s., eSSS =39m.26s.
Tucson ePPP =21m.19s., ePS =28m.33s., ePKKP =29m.45s., ePPS =29m.56s.
Zagreb eP_cP =19m.15s., eZ =20m.17s.
Cheb e =20m.43s., eSKS =25m.8s., e =27m.42s., ePS =29m.3s., eSS =34m.52s., eSSS =40m.54s., e =47m.6s.
Jena eN =27m.18s. and 28m. 39s.
Triest ePPP =21m.59s., iPS =29m.4s., eSS =35m.31s.
Rapid City eS =27m.44s., ePPS =30m.41s., eSS =35m.36s., eSSS =40m.4s.
Stuttgart i =20m.57s.a, e =27m.32s., 29m.36s., 35m.30s., 39m.20s., and 43m.8s.
De Bilt iPP =21m.4s.
Rome iPPZ =19m.43s., ePSE =29m.21s.
Aberdeen iE =27m.23s., iEN =39m.23s., ans 46m.46s.
Florence iPPP =24m.20s., iSKS =29m.21s., iSKKS =30m.14s., iS =30m.55s., iPS =32m.46s., iSS =37m.55s., iSSS =41m.43s., readings wrongly identified.
Strasbourg iPP =19m.46s. and 19m.51s., e =20m.59s., eSKP? =21m.32s., ePPP? =22m.30s., e =23m.11s., eSKKS? =26m.19s., ePPS =30m.49s., ePKKS? =33m.8s., eSS? =34m.40s., 34m.45s., and 34m.53s., $iSKKS_2$ =36m.9s., eSSS? =40m.35s.
Uccle eSSN =36m.7s.
Durham PPN =23m.28s., iN =29m.0s. and 29m.12s., SN =31m.20s., readings wrongly identified.
Edinburgh SKKS =27m.30s., PPS =31m.36s., SS =36m.52s., SSS =41m.16s.
Kew ePPPEN =22m.23s.?, eSKS =26m.11s., ePSE =29m.43s.?, eSSEN =36m.13s.?, eSSSZ =40m.38s.?, eQEN =49·1m.
Paris i =20m.9s.?, e =21m.39s. and 27m.33s.
Clermont-Ferrand i =21m.15s., iSKP =21m.54s., iPPP =22m.55s., e =24m.25s., iSKKS =27m.39s., iS =28m.22s., iPPS =31m.39s., i =34m.24s., iSS =37m.0s., iSSS =41m.49s., i =48m.28s.
Ivigtut ? =27m.56s., and 30m.50s., SS =36m.8s.?
Tortosa PPN =21m,35s., SKPE =22m.44s., iN =29m.22s., PPSEN =32m.32s., SKKSE =35m.46s., SSN =38m.44s., SSPEN =39m.5s., SSSE =43m.58s., QE =52m.57s.
Florissant iZ =21m.0s., 21m.12s., and 21m.30s., ePPZ =23m.6s., eSE =28m.41s., ePSZ =30m.46s., eE =31m.20s., ePPPSE =32m.54s., eSSE =37m.10s., ePPSSN =37m.42s., iZ =38m.22s., eSSSE =42m.30s.
Chicago e =21m.41s., 26m.43s., and 29m.31s., ePS =30m.11s., ePPS =32m.17s., eSSS =42m.15s.
St. Louis ePKPZ =19m.3s., iZ =21m.10s., 21m.31s., and 21m.17s., iPPP?N =22m.49s., eSN =28m.43s., ePSN =30m.55s., eN =31m.21s., iSSN =37m.7s., iN =40m.46s., eSSSN =41m.36s.
Alicante PKS =22m.43s., PPP =24m.55s., PKSP =30m.51s., SS =32m.23s., SSS =37m.59s., SPS =38m.23s., SSS =41m.39s., Q =51m.59s.
Granada sPKP =20m.19s., iPP =21m.17s., pPP =21m.28s., sPP =22m.12s., PPP =23m.57s., sSKKS =28m.56s., sPS =32m.5s., SS =37m.52s., sSS =38m.49s., SSS =42m.15s.
Almeria PKS =22m.39s., PPP =23m.55s., SKKS =27m.59s., PS =31m.7s., PPS =32m.43s., SS =38m.19s., SSP =38m.43s., SSS =43m.3s.

Continued on next page.

Ottawa PPS =34m.15s., SS =39m.8s.
New Kensington e =23m.24s., ePPS =33m.48s., eSS =39m.9s., eSSS =44m.29s.
Pennsylvania ePKSE =22m.44s.
Lisbon iEN =23m.24s.
Harvard iZ =22m.4s., ePKS =22m.54s., eZ =24m.0s. and 27m.55s., eSKKSZ =28m.36s., eNZ =31m.42s., ePKKSZ =32m.14s., eEN =32m.48s., ePPSZ =34m.2s., eZ =35m.20s., eZ =37m.15s., eSSN =39m.36s., eSSPZ =40m.4s., eE =40m.20s., eN =42m.31s., eZ =42m.42s., eSSSE =44m.24s.
Fordham Q =55m.13s.
Philadelphia ePKS =22m.54s., eSKKS =28m.2s., eSKSP =31m.12s., iPS =32m.25s., iPPS =33m.18s., i =35m.16s., eSS =38m.3s., e =39m.33s., eSSS =44m.3s.
Weston iSKP =23m.26s., eSKSP =32m.6s., i =42m.58s., eSSS =49m.12s.
Columbia e =28m.52s., eSSS =44m.40s.
Halifax SKP =22m.57s., PPS =35m.2s., SSS =46m.20s.
La Plata E. PP? =23m.8s., 28m.44s., PPS =36m.26s., SSE =41m.15s., SSS =46m.22s., Q? =59m.20s., N. SKS =26m.50s., PPS =35m.8s., SSS? =45m.8s., SSS =47m.32s., Q? =56m.14s.
Bermuda ePKS =23m.38s., eSKSP =32m.56s., iSS =41m.41s., iSSS =47m.26s.
Bogota iPKP$_2$?Z =19m.55s., iZ =20m.3s.
La Paz iPKPZ =19m.58s., i =20m.20s., iZ =21m.0s., iSKPN =23m.18s., SKKS =29m.44s., PSKSZ =33m.16s., iPPS =36m.8s., iSS =42m.58s., SSS =47m.40s.
San Juan e =20m.11s. and 21m.8s., ePP? =22m.38s., ePKS =24m.8s., e =25m.13s., 28m.19s., and 32m.13s., eSKSP? =34m.39s., eSS =42m.28s.

May 27d. 16h. 58m. 2s. Epicentre 45°·7N. 5°·8E.

Intensity V-VI at Lucey and Jonquieux; IV at Yenna and Albeno; III at Chindrieux; II-III at Chambèry. Macroseismic area 500 sq. km.
Epicentre as adopted.

J. P. Rothé and N. Dechevoy: La séismicité de la France de 1940 á 1950. Annales de l'Institut de Physique du Globe de Strasbourg, 3éme partie, Géophysique, tome VII, 1954.

$A = +\cdot6972$, $B = +\cdot0708$, $C = +\cdot7133$; $\delta = -10$; $h = -4$;
$D = +\cdot101$, $E = -\cdot995$; $G = +\cdot710$, $H = +\cdot072$, $K = -\cdot701$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
	°	°	m. s.	s.	m. s.	s.	m. s.	
Neuchatel	1·5	31	i 0 27	− 1	i 0 47	− 2	—	—
Besançon	1·6	5	i 0 48	+18	e 1 23	+32	—	—
Clermont-Ferrand	1·9	272	i 0 34	0	i 1 4	S_g	—	—
Basle	2·2	33	i 0 40	P*	i 1 9	S*	—	—
Zürich	2·5	49	e 0 40	− 3	e 1 22	S_g	e 0 47	P*
Chur	2·9	66	e 0 53	P*	e 1 31	S*	—	—
Strasbourg	3·2	24	e 1 4	P_g	e 1 39	S*	—	—
Paris	3·8	325	—	—	e 1 37	−10	e 1 58	S*
Stuttgart	3·8	36	e 1 12?	P*	e 2 4	S_g	e 2 1	S*

May 27d. 20h. 58m. 41s. Epicentre 40°·6N. 124°·6W. (as on 1947, March 30d.).

Intensity VI at Honeydew and Upper Mattole; V at Cape Mendocino, Eureka, Ferndale, Fort Bragg, etc. Macroseismic area 2400 sq. m.
Epicentre 40°·4N. 123°·7W.

L. M. Murphy: United States Earthquakes, 1947, serial no. 730, Washington, 1950, p. 21.

$A = -\cdot4324$, $B = -\cdot6268$, $C = +\cdot6482$; $\delta = +1$; $h = -2$;
$D = -\cdot823$, $E = +\cdot568$; $G = -\cdot368$, $H = -\cdot534$, $K = -\cdot762$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m.	s.	m.
Ferndale		0·2	98	i 0 10	0	i 0 16	0	—	—	—
Shasta Dam		1·7	87	i 0 31	0	—	—	—	—	—
Mineral	E.	2·3	96	i 0 40	0	—	—	—	—	—
Berkeley		3·3	145	i 0 51	− 2	i 1 24	−11	i 0 56	P*	—
San Francisco		3·3	147	i 0 19?	−34	—	—	—	—	—
Branner	N.	3·7	148	e 1 19?	P_g	—	—	—	—	—
Santa Clara		3·8	147	e 1 1	0	i 2 3	S_g	—	—	—
Lick		4·0	143	i 1 1	− 3	i 1 45	− 7	i 2 4	S*	—
Fresno	N.	5·4	134	e 1 22	− 2	i 2 25	− 3	—	—	i 3·0
Tinemaha		6·0	125	e 1 33	+ 1	i 2 59	S*	i 1 36	PP	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Haiwee		6·9	128	e 1 46	+ 1	—	—	—	—	—
Santa Barbara	z.	7·2	146	i 1 45	− 4	—	—	—	—	—
Victoria		8·0	5	e 1 43	−17	—	—	—	—	4·3
Mount Wilson	z.	8·2	138	i 2 0	− 3	—	—	—	—	—
Pasadena		8·2	138	e 2 0	− 3	i 3 31	− 7	—	—	e 3·9
Grand Coulee		8·4	27	e 2 16	+10	—	—	—	—	—
Riverside		8·7	136	i 2 8	− 2	—	—	—	—	—
Boulder City		9·0	118	e 2 15	+ 2	—	—	—	—	e 5·0
Pierce Ferry		9·4	115	i 2 20	+ 2	—	—	—	—	—
Palomar		9·5	137	i 2 19	− 1	—	—	i 2 28	PP	—
Logan		9·7	79	i 2 26	+ 4	—	—	i 2 32	PP	i 5·2
Salt Lake City		9·7	85	e 2 26	+ 4	e 4 51	S•	—	—	e 5·5
Butte		10·3	54	e 2 33	+ 1	e 4 51	SSS	—	—	e 5·2
Tucson		13·9	123	i 3 21	0	e 6 10	SS	i 3 27	PP	e 6·2
Rapid City		16·2	71	i 3 49	− 1	e 6 59	+ 8	—	—	e 7·8
Saskatoon		16·9	41	—	—	e 7 7	0	—	—	e 9·3
Florissant	E.	26·3	83	e 5 39	0	e 10 9	− 2	—	—	—
St. Louis		26·5	83	e 5 40	− 1	e 10 7	− 7	e 6 15	PP	—
Weston		39·4	69	i 7 33	0	—	—	—	—	e 18·8
Ksara		103·8	17	e 15 6	+61	e 27 20	PS	—	—	—

Additional readings :—
Berkeley iZ = 1m.17s., iE = 1m.22s.
Lick iEN = 1m.8s., iEN = 2m.21s.
Logan i = 2m.41s.
St. Louis eSS?N = 11m.40s.
Long waves were also recorded at Bozeman, Bermuda, Kew, De Bilt, Paris, Strasbourg, and Stuttgart.

May 27d. Readings also at 1h. (Istanbul, Helwan, and Ksara), 6h. (Strasbourg and Paris), 13h. (near Stalinabad), 16h. (Stuttgart, near Neuchatel, Basle, and Zürich), 17h. (Saskatoon, Palomar, Riverside, Pasadena, Mount Wilson, Tinemaha, Shasta Dam, Philadelphia, Grand Coulee, Bozeman, Butte, Florissant, St. Louis, and Weston), 18h. (Brisbane, Riverview, and Copenhagen), 21h. (Salt Lake City).

May 28d. 14h. Undetermined shock in the South-West Pacific. New Zealand suggests depth 110km.

Wairiri e?Z = 47m.29s. and 49m.23s., Q?EN = 51m.33s., R = 52m.44s.
Auckland P = 47m.53s., i = 50m.29s., S = 50m.38s., i = 52m.22s. and 52m.35s., P_cP = 53m.16s., S_cP = 56m.6s., P_cS = 56m.51s., S_cS = 59m.54s., e = 60m.50s.
Wellington P? = 50m.29s., i = 51m.7s and 51m.16s., S = 53m.26s., i = 53m.34s., LZ = 54m.17s.
Arapuni S? = 52m.48s.
Brisbane iPN = 53m.22s., eS?N = 58m.35s.
Riverview iPEZ = 53m.35s.s, ipPZ = 53m.45s., iEZ = 53m.56s. iPPZ = 54m.15s., iPPPE = 54m.26s., iEZ = 54m.40s., iE = 54m.51s., eE = 57m.14s., iSSN = 58m.59s., iSSSEN = 59m.23s., eREZ = 60m.12s.,
Antarctica iP = 59m.3s., e = 68m.19s., eS = 69m.11s.
Santa Barbara iPZ = 60m.15s., eZ = 60m.33s.
La Jolla ePZ = 60m.18s., epPNZ = 60m.34s.
Pasadena iPZ = 60m.18s., ipPZ = 60m.36s.
Berkeley iPZ = 60m.19s., ipPZ = 60m.34s., eSKSN = 70m.44s., iSKSE = 70m.49s., eS_cSN = 71m.23s., eLEN = 86m.18s.
Mount Wilson iPZ = 60m.19s., ipPZ = 60m.37s.
Riverside iPZ = 60m.20s., ipPZ = 60m.34s.
Palomar iP = 60m.21s., i = 60m.37s., iZ = 60m.58s.
Haiwee ePEN = 60m.23s.
Vladivostok iP = 60m.23s., i = 60m.38s., PP = 64m.0s., SKS = 70m.43s., i = 71m.20s., PS = 72m.8s.
Shasta Dam iP = 60m.28s.
Tinemaha iP = 60m.29s., iZ = 60m.47s.
Boulder City iP = 60m.35s., i = 60m.45s.
Tucson iP = 60m.38s., ipP = 60m.55s., ePP = 64m.19s., eS = 71m.23s., eSS = 76m.25s., eSSS = 80m.27s., eL = 81m.33s.
Pierce Ferry iP = 60m.38s., ipP = 60m.56s., i = 63m.33s.
Branner eN = 61m. and 71m.
La Paz eP = 61m.28s., iSKS?EN = 72m.6s., iPPS?Z = 74m.18s., LZ = 94m.
Florissant eN = 63m.51s., ePP?Z = 66m.10s., epPP?E = 66m.34s., esSKS?EN = 72m.52s.
St. Louis eE = 65m.29s., epPPZ? = 66m.34s.
Andijan PKP = 66m.43s.

Continued on next page.

Stalinabad iPKP =66m.49s., PP =68m.38s.
Sverdlovsk PKP =66m.57s., PP =69m.5s., PKS =70m.20s., PS =79m.49s.
Grozny PKP =67m.8s.
Baku PKP =67m.22s., PKS =70m.57s.
Erevan PKP =67m.25s.
Moscow PKP =67m.26s., PP =70m.30s.
Sotchi PKP =67m.31s.
Leninakan PKP =67m.32s.
Copenhagen iP =67m.36s., i =67m.41s. and 71m.13s.
Ksara ePKP =67m.36s., PP =71m.21s., PSKS =81m.41s., PPS =84m.47s.
Helwan iPKPZ =67m.37s.k, ipPKPZ =68m.4s., PPZ =71m.23s., iZ =71m.38s.
Istanbul iP =67m.39s., eS? =81m.8s.
De Bilt ePKP =67m.42s., epPKP =68m.22s., eL =128m.
Kew iPKP?Z =67m.43s., ePP?Z =71m.47s., eSSS?Z =100m.30s.?, eR =129m.
Stuttgart iZ =67m.44s.a, eZ =68m.23s. and 72m.1s., eL =125m.
Zagreb ePKP =67m.45s.
Jena eN =67m.45s. and 68m.13s.
Paris iPKP =67m.45s., ePKP$_2$ =68m.26s., ePP =72m.4s., ePPP =75m.54s., e =77m.54s., 79m.44s., eL =127m.
Strasbourg ePKP =67m.46s., ePKP$_2$ =68m.22s., ePP =72m.4s., 72m.16s., and 72m.22s., ePPP? =75m.18s., eSS =92m.18s., eSSS =98m., eL =126m.
Tashkent e =67m.47s. and 69m.25s.
Almeria iPKP =67m.50s., PKP$_2$ =69m.6s., PKS =71m.16s., PP =72m.54s., SKS =74m.48s., PPP =76m.58s., SKKS =79m.35s., PPS =86m.31s., SS =93m.38s., L =135m.
Rome ePKP =67m.50s., PKP$_2$ =69m.44s., ePPZ =72m.30s., eN =77m.20s., and 83m.26s. eSSN =93m.24s.
Clermont-Ferrand ePKP =67m.50s., L =133m.
Granada iPKP =67m.52s.a, pPKP =68m.12s., iPKP$_2$ =69m.14s., pPKP$_2$ =69m.28s., iPP =73m.0s., pPP =73m.18s., PPP =77m.19s., pPPP =77m.33s., SKKS =80m.12s., SS =94m.24s., L =130m.24s.
Toledo PKPZ =67m.54s., PPZ =73m.6s.
Tortosa PKPN =68m.0s., SKPN =71m.15s., SKKS =79m.27s.
Zürich e =68m.18s.
Basle e =68m.29s.
Scoresby Sund 70m.43s., L =114m.
Irkutsk SKS =72m.32s., PS =75m.0s.
Bermuda e =78m.19s., eL =104m.43s.
Warsaw eN =81m.3s., eZ =82m.1s., eN =82m.14s., eE =82m.29s. and 86m.34s., eLZ =126m.
Weston e =93m.30s.
Long waves were also recorded at Philadelphia, Alicante, Cheb, Uccle, and Helsinki.

May 28d. Readings also at 3h. (Scoresby Sund), 4h. (St. Louis), 6h. (Erevan (2), and Uccle), 7h. (Toledo), 9h. (Branner), 13h. (Grand Coulee), 14h. (Branner and near Berkeley), 15h. (La Paz, Leninakan, near Grozny and Piatigorsk), 16h. (Kodaikanal and near Pierce Ferry), 17h. (La Plata, Santa Lucia, and Shasta Dam), 18h. (New Delhi, and Tashkent), 19h. (Brisbane, Riverview, and Strasbourg), 21h. (Mount Wilson, Riverside, Tinemaha, Pierce Ferry, and Shasta Dam), 23h. (Auckland and Balboa Heights).

May 29d. 3h. 36m. 18s. Epicentre 3°·0S. 105°·0E. (as on 1944, Nov. 1d.). Rough.

Doubtful Identification.

$A = -\cdot2585$, $B = +\cdot9646$, $C = -\cdot0520$; $\delta = -2$; $h = +7$;
$D = +\cdot966$, $E = +\cdot259$; $G = +\cdot013$, $H = -\cdot050$, $K = -\cdot999$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Kodaikanal	E.	30·4	297	—	—	e 11 9	− 7	—	—
Andijan		52·8	329	e 9 19	0	16 58	+11	—	—
Stalinabad		53·2	325	e 9 21	− 1	e 16 58	+ 6	—	—
Tashkent		54·8	328	e 9 32	− 2	e 17 23	+ 9	—	—
Baku		66·2	316	—	—	e 19 47	+ 7	—	—
Sverdlovsk		69·6	336	i 11 12	− 1	i 20 30	+ 9	—	—
Ksara		74·5	306	e 11 49	+ 7	e 21 57	PS	—	—
Helwan	z.	77·4	301	e 11 59	+ 1	—	—	—	—
Boulder City		130·7	43	e 22 32	PKS	—	—	—	—
Pierce Ferry		131·2	42	e 19 7	[− 7]	—	—	—	—
Tucson		135·5	45	e 19 9	[−13]	—	—	e 22 47	PKS
Florissant		141·7	19	e 19 25	[− 8]	—	—	e 19 39	pPKP
St. Louis		141·9	19	i 19 24	[−10]	—	—	i 19 38	pPKP

Continued on next page.

NOTES TO MAY 29d. 3h. 36m. 18s.

Additional readings :—
Helwan eZ = 13m.0s.
St. Louis esSKP = 23m.18s.
Long waves were recorded at Strasbourg and Stuttgart.

May 29d. Readings also at 0h. (Mount Wilson, Pasadena, Palomar, Riverside, Tucson, Boulder City, Pierce Ferry, and near Bucharest), 1h. (Mount Wilson, Palomar, Riverside, Tucson, Pierce Ferry, Shasta Dam, Strasbourg, and Stuttgart), 3h. (Haiwee, Mount Wilson, Pasadena, Riverside, Tinemaha, Tucson, Pierce Ferry, Shasta Dam, Bermuda, and La Paz), 6h. (Shasta Dam, Tucson, near Almata and near Stuttgart), 7h. (Tucson), 10h. (near Bogota), 11h. (Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Boulder City, Pierce Ferry, Shasta Dam, and Balboa Heights), 12h. (Auckland, Rome, and near Tashkent), 14h. and 16h. (Istanbul), 17h. (near Santa Lucia), 18h. (Grand Coulee and Harvard), 21h. (Palomar, Pasadena, Riverside, Tucson, Harvard, La Paz, La Plata, and Santa Lucia), 22h. (near Toledo), 23h. (Tucson (2), Philadelphia, Weston, Bermuda, San Juan, Strasbourg, and Rome).

May 30d. 22h. 25m. 44s. Epicentre 36°·8N. 2°·3W. Given by Almeria.

A = +·8020, B = −·0322, C = +·5964 ; δ = −7 ; h = 0 ;
D = −·040, E = −·999 ; G = +·596, H = −·024, K = −·803.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Almeria		0·1	—	0 15	+ 7	i 0 19	+ 6	—	—	—
Granada		1·1	290	i 0 19$_a$	— 3	0 47	+ 8	—	—	—
Alicante		2·1	43	0 38	+ 1	1 16	P_g	0 47	P_g	2·3
Toledo	z.	3·4	336	1 0	P*	2 18	S_g	—	—	—
Tortosa		4·6	27	1 7	− 5	2 47	S_g	1 30	P_g	c 3·3
Stuttgart	z.	14·6	31	e 3 26?	− 4	—	—	—	—	—

Additional readings :—
Almeria PS = 32s. and 39s., S_g = 49s., P_gS_g = 55s., S_g = 1m.5s. and 1m.14s.
Granada S = 50s., S_g = 1m.8s. and 1m.23s.
Alicante S_g = 1m.34s., SS = 1m.46s.
Tortosa P_gS_gN = 2m.18s. and 2m.22s., S_gN = 2m.58s.
Long waves were also recorded at Strasbourg, Paris, De Bilt, Uccle, and Kew.

May 30d. Readings also at 0h. (Kew), 3h. (Tortosa and Warsaw), 8h. (Stuttgart), 11h. (Berkeley), 12h. (Tchimkent, near Andijan, Stalinabad, and Tashkent), 13h. (Antarctica, Wellington, Arapuni, Wairiri, Riverview, La Paz, La Plata, Santa Lucia, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Weston, Rome, Stuttgart, Helwan, and Ksara), 14h. (Kew, De Bilt, and near Basle), 17h. (Tchimkent, near Andijan, Obi-garm, and Stalinabad), 20h. (Stuttgart).

May 31d. Readings at 1h. (Brisbane, Riverview, Wairiri, La Paz, Ksara, Rome, and Stuttgart), 2h. (Shasta Dam, Stalinabad, near Andijan and Tchimkent), 3h. (Copenhagen, Granada, Almata, near Andijan, Obi-garm, Stalinabad, Tashkent, Tchimkent, and near Berkeley), 15h. (near Ottawa), 17h. and 19h. (near Mizusawa), 20h. (Sotchi, near Leninakan, and near Tananarive), 22h. (Florissant and St. Louis).

June 1d. 11h. 18m. 35s. Epicentre 36°·6N. 21°·5E.

$A = +\cdot7487$, $B = +\cdot2949$, $C = +\cdot5936$; $\delta = -12$; $h = 0$;
$D = +\cdot367$, $E = -\cdot930$; $G = +\cdot552$, $H = +\cdot218$, $K = -\cdot805$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Istanbul		7·4	50	i 1 51	− 1	i 3 22	+ 4	—	—	—
Belgrade		8·3	354	i 2 5	+ 1	i 3 52	+12	i 2 43	PP	—
Bucharest		8·6	22	e 2 7	− 2	i 4 3	+15	e 2 38	P*	—
Rome		8·8	310	e 2 11	0	e 3 38	−15	—	—	e 4·3
Kalossa	E.	10·1	350	e 3 6	+38	e 5 18	S_g	—	—	5·9
	N.	10·1	350	e 3 9	+41	—	—	—	—	(e 6·2)
Zagreb		10·1	337	e 2 26	− 2	e 4 23	− 2	e 2 33	PP	e 5·0
Florence		10·6	316	e 2 44	+ 8	i 4 42	+ 5	—	—	—
Helwan		10·6	126	e 2 31	− 5	4 19	−18	2 46	PP	—
Triest		10·8	329	e 2 41	+ 2	i 4 30	−12	—	—	i 6·3
Budapest		11·0	351	3 2	+20	i 5 13	SS	—	—	e 6·0
Ksara		12·1	99	e 3 2?	+ 5	e 5 17?	+ 3	—	—	—
Pavia		12·6	316	e 3 12	+ 9	e 5 6	−20	e 3 19	PP	e 6·4
Chur		13·6	323	e 3 19	+ 2	e 5 37	−13	—	—	—
Prague		14·4	341	e 3 25	− 2	e 6 12?	+ 3	—	—	e 6·9
Zürich		14·4	322	e 3 34	+ 7	e 6 4	− 5	—	—	—
Basle		15·0	321	e 3 44	+ 9	e 6 20	− 3	—	—	—
Cheb		15·0	337	e 3 25?	−10	(e 6 25?)	+ 2	—	—	e 6·4
Neuchatel		15·0	318	e 3 40	+ 5	—	—	—	—	e 7·2
Stuttgart		15·1	327	e 3 36	0	e 6 11	−14	e 3 44	PP	e 6·6
Sotchi		15·6	58	e 3 37	− 6	—	—	—	—	—
Warsaw		15·6	359	e 3 40a	− 3	6 43	+ 6	3 56	PP	e 8·9
Strasbourg		15·7	324	e 3 48	+ 4	e 6 37	− 2	e 4 9	PP	e 8·7
Jena		16·0	337	e 3 51	+ 3	—	—	—	—	e 8·0
Clermont-Ferrand		16·6	309	e 3 58	+ 2	i 7 2	+ 2	i 4 17	PP	7·9
Potsdam		16·9	342	e 3 40	−19	—	—	i 7 13	SS	e 9·4
Tortosa		16·9	291	3 41	−18	7 16	+ 9	4 3	PP	9·3
Alicante		17·5	285	3 37	−30	i 7 24	+ 3	4 9	PP	e 9·6
Paris		18·5	319	e 4 19	0	e 7 46	+ 2	e 4 33	PP	e 10·4
Uccle		18·8	326	e 4 24k	+ 1	e 7 53	+ 3	e 8 28	SSS	e 9·0
Almeria		19·2	280	e 4 25	− 3	i 8 4	+ 5	i 4 49	PP	12·0
De Bilt		19·3	331	i 4 29a	0	e 8 3	+ 1	i 4 54	PP	e 9·4
Grozny		19·7	62	e 4 34	0	8 20	+10	—	—	—
Copenhagen		20·1	347	i 4 34	− 4	e 8 12	− 7	4 52	PP	9·7
Granada		20·1	281	i 4 37	− 1	i 8 22	+ 3	4 57	PP	10·3
Toledo	Z.	20·3	289	e 4 38	− 2	8 22	− 1	e 5 17	PP	—
Malaga	Z.	20·8	280	i 4 42k	− 3	i 8 44	+11	i 4 54	pP	10·4
Jersey		21·3	316	e 4 48	− 2	e 7 52	−51	—	—	—
Kew		21·5	323	e 5 4	+12	e 8 52?	+ 5	i 5 40	PP	e 10·4
Moscow		22·1	25	i 4 50	− 9	8 44	−14	—	—	—
Baku		22·5	71	e 5 12	+10	e 9 17	+12	—	—	—
Upsala	E.	23·4	356	e 5 16	+ 5	e 9 13	− 8	—	—	e 11·4
	N.	23·4	356	5 7a	− 4	i 9 18	− 3	—	—	—
Helsinki		23·7	5	e 5 11	− 3	e 9 19	− 8	e 11 22	SS	e 11·9
Aberdeen		25·9	332	—	—	1 9 29	−35	—	—	14·1
Bergen		26·0	344	e 4 43	−53	8 31?	?	—	—	e 10·8
Ashkabad		29·2	75	e 6 5	0	—	—	—	—	—
Sverdlovsk		33·0	39	i 6 35	− 4	—	—	—	—	—
Tashkent		37·1	67	e 7 9	− 5	—	—	—	—	—
Stalinabad		37·2	72	i 7 16	+ 1	—	—	i 8 21	PP	—
Tchimkent		37·2	65	—	—	15 37	SS	—	—	—
Andijan		39·5	68	e 7 34	0	—	—	—	—	—
Frunse		40·7	64	e 7 42	− 2	—	—	—	—	—
Scoresby Sund		40·9	340	9 43	PP	14 1	+ 3	17 7	SSS	—
Almata		42·4	63	e 7 42	−16	—	—	—	—	—
Bombay		48·1	97	e 8 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.
Hyderabad	N.	53·4	95	e 8 56	−28	e 17 1	+ 6	—	—	—
Irkutsk		58·0	46	e 9 53	− 4	e 17 47	−10	—	—	—
Weston		68·3	308	i 11 5a	0	e 20 17	+11	e 27 45	SSS	—
Harvard	Z.	68·4	308	e 11 10	+ 4	—	—	—	—	e 40·4
Ottawa		69·5	313	11 17	+ 5	20 19	− 1	28 25?	SSS	35·4
Vladivostok		78·5	45	—	—	—	—	e 27 7	SS	—
St. Louis		82·2	313	e 12 19	− 5	e 22 30	− 9	—	—	—
Tucson		98·3	321	—	—	e 27 3	PPS	—	—	—
La Paz		99·4	257	e 14 9	+23	—	—	—	—	54·4

Additional readings :—
Belgrade i = 2m.17s., iSS = = 4m.54s.
Rome eN = 3m.21s.
Kalossa eS? = 6m.23s.
Zagreb ePNE = 2m.29s., eNE = 3m.12s., eNWZ = 3m.23s., eNE = 4m.9s.
Helwan iE = 4m.40s.
Budapest PN = 3m.9s., SN = 6m.18s.
Warsaw PN = 3m.44s., PE = 3m.48s., PPZ = 4m.0s., SSN = 7m.15s.?, SSE = 7m.18s.
Strasbourg e = 4m.45s., eS = 6m.25s., 6m.31s., and 6m.43s., i = 6m.50s.
Potsdam ePE = 3m.43s., eSSE = 7m.17s.
Alicante PPP = 4m.15s., P_cP = 7m.29s., SS = 8m.9s.
Paris ePPP = 4m.45s., eSSS? = 8m.16s., eQ = 9.4m.
Almeria iPPP = 5m.3s., P_cP = 8m.37s., P_cS = 12m.13s., S_cS = 15m.53s.
Copenhagen i = 8m.20s.
Granada PP = 5m.5s., SS = 8m.50s.
Malaga PPZ = 5m.45s., P_cPZ = 8m.1s.
Kew iPPPZ = 5m.52s.
Helsinki e = 5m.28s. and 9m.33s.
Long waves were also recorded at Berkeley and Bozeman.

June 1d. 18h. 56m. 51s. Epicentre 41°·1N. 72°·0E. (as on 1942, Feb. 14d.).

$A = +·2336$, $B = +·7188$, $C = +·6548$; $\delta = +1$; $h = -3$;
$D = +·951$, $E = -·309$; $G = +·202$, $H = +·623$, $K = -·756$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Andijan		0·5	142	i 0 6	P_g	—	—	—	—	—
Tashkent		2·0	276	0 40	+ 5	1 6	+ 4	—	—	—
Tchimkent		2·2	304	i 0 41	+ 3	i 1 9	+ 3	—	—	—
Frunse		2·7	47	i 0 43	− 2	1 16	− 3	—	—	—
Stalinabad		3·5	226	i 0 59	+ 2	i 1 41	+ 1	—	—	—
Almata		4·3	58	i 1 5	− 3	e 1 53	− 7	—	—	—
Ashkabad		11·0	258	e 2 46	+ 4	4 58	+11	—	—	—
New Delhi	N.	13·2	160	e 3 9	− 2	e 5 27	−13	—	—	—
Baku		16·8	276	e 4 1	+ 3	—	—	—	—	—
Sverdlovsk		17·4	339	e 4 1	− 5	—	—	—	—	—
Grozny		19·5	285	e 4 32	+ 1	—	—	—	—	—
Leninakan		21·2	279	e 5 1	+12	—	—	—	—	—
Bombay		22·1	178	e 7 44	?	—	—	—	—	—
Irkutsk		24·0	52	e 5 17	0	—	—	—	—	—
Hyderabad	N.	24·2	167	e 5 19	0	9 36	+ 1	—	—	—
Moscow		26·8	315	e 5 34	−10	e 10 12	− 7	—	—	—
Ksara		29·4	268	e 7 6	PP	e 12 48	SS	—	—	—
Kodaikanal	E.	31·1	171	e 6 39	+17	—	—	—	—	—
Warsaw		36·0	304	e 14 30	SS	—	—	—	—	e 18·1
Upsala	N.	38·0	319	—	—	—	—	i 16 39	SSS	i 20·6
Stuttgart		44·0	302	e 8 8	− 3	—	—	—	—	e 24·2
Strasbourg		44·9	303	e 8 15	− 3	—	—	—	—	e 23·2

Long waves were also recorded at other European stations.

June 1d. 22h. Eastern Turkestan, Mongolia. Though there are numerous Russian data they do not offer a determination of the epicentre. The suggested position is 39°N. 90°E. but this does not fit the observations.

Almata eP =18m.22s.
Frunse eP =18m.57s.
Andijan eP =19m.16s.
Tashkent eP =19m.20s., eS =22m.5s.
Irkutsk eP =19m.53s., S =22m.50s.
Stalinabad iP =19m.58s.
New Delhi eN =20m.20s.
Sverdlovsk iP =21m.17s., S =25m.46s.
Ashkabad eP =21m.27s.
Grozny eP =22m.37s.
Moscow eP =23m.3s., pP =23m.15s., eS =28m.45s.
Leninakan eP =23m.10s.
Bombay eEN =24m.0s.
Warsaw eP?Z =24m.33s., eZ =24m.46s. and 26m.2s., eN =35m.7s., eE =35m.35s., eN =37m.53s., eLZ =38m.
Jena eN =25m.20s.
Stuttgart eP?Z =25m.37s., eZ =25m.50s., also eP?Z =33m.27s., e =44m.0s.
Strasbourg e =26m.0s., 42m.0s., 44m.25s., and 45m.0s.
Baku eS =26m.52s.
Tucson iP =29m.40s., i =30m.16s.
Palomar iPZ =30m.13s.
Pierce Ferry iP =30m.13s.
Boulder City iP =30m.16s.
Riverside iPZ =30m.18s., eZ =30m.53s., iZ =31m.5s.
Pasadena ePZ =30m.22s., eZ =30m.55s. and 31m.3s.
Mount Wilson iPZ =30m.22s., iZ =31m.2s.
Tinemaha iPZ =30m.35s., iZ =30m.52s. and 31m.15s.
Copenhagen eS =32m.3s., L =40m.
Upsala eN =35m.30s., e =39m.33s., eN =40m.18s.
Helsinki e =37m.
Prague e =38m.24s.
Long waves were also recorded at Potsdam, De Bilt, Paris, Uccle, Triest, and Fort de France.

June 1d. Readings also at 1h. (Belgrade), 2h. (Tortosa), 3h. (Mount Wilson, Palomar, Riverside, Tinemaha, Tucson, Boulder City, Pierce Ferry, and Shasta Dam), 4h. (Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Boulder City (2), Pierce Ferry (2), and Shasta Dam (2)), 6h. (Tucson), 7h. (Mount Wilson, Palomar, Tinemaha, Tucson, Boulder City, Pierce Ferry, and near Andijan), 9h. (Stuttgart, Kodaikanal, Grozny, Sotchi, and near Piatigorsk), 10h. (Andijan, New Delhi, and near Stalinabad), 13h. (Strasbourg), 15h. (Strasbourg, Uccle, and near Bogota), 16h. (De Bilt (2), and New Delhi), 17h. (Harvard), 18h. (Mount Wilson, Riverside, Tinemaha, Tucson, and Uccle), 21h. (La Paz, Ksara, and near Andijan), 22h. (Mount Wilson, Tinemaha, Salt Lake City, Bogota, La Paz, near Huancayo, near Basle, Chur, Neuchatel, and Zürich), 23h. (Tucson).

June 2d. 6h. 40m. 33s. Epicentre 41°·1N. 72°·0E. (as on 1d.).

		Δ	Az.	P	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Andijan		0·5	142	i 0 5	P_g	—	—	—	—	—
Tashkent		2·0	276	i 0 42	+ 7	e 1 6?	+ 4	—	—	—
Tchimkent		2·2	304	i 0 41	+ 3	—	—	—	—	—
Stalinabad		3·5	226	i 1 0	+ 3	—	—	i 1 6	P*	—
Almata		4·3	58	i 1 6	− 2	i 1 54	− 6	i 1 21	P_g	—
Ashkabad		11·0	258	2 40	− 2	e 4 37	−10	—	—	—
New Delhi	N.	13·2	160	e 3 6	− 5	i 5 25	−15	5 18	S	i 6·6
Sverdlovsk		17·4	339	i 4 3	− 3	i 7 21	+ 2	—	—	—
Grozny		19·5	285	i 4 36	+ 5	—	—	—	—	—
Erevan		20·9	276	e 4 50	+ 4	—	—	9 3	SS	—
Leninakan		21·2	279	4 52	+ 3	—	—	i 5 12	PP	—
Bombay		22·1	178	e 4 59	0	e 8 58	0	—	—	10·6
Calcutta	E.	23·1	139	e 3 33	?	i 7 53	?	—	—	—
Sotchi		23·9	287	i 5 17	+ 1	—	—	—	—	—
Irkutsk		24·0	52	5 19	+ 2	i 9 51	+19	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Hyderabad		24·2	167	e 5 15	− 4	9 30	− 5	—	—	—
Moscow		26·8	315	i 5 38	− 6	10 13	− 6	—	—	—
Theodosia		26·9	291	5 43	− 2	—	—	i 6 12	PP	—
Simferopol		27·8	291	e 5 58	+ 5	10 50	+15	—	—	—
Yalta		27·8	290	5 52	− 1	e 10 33	− 2	—	—	—
Ksara		29·4	268	i 6 7	0	e 11 8	+ 7	—	—	—
Kodaikanal	E.	31·1	171	e 9 7	PcP	e 13 7	SS	—	—	e 15·1
Istanbul		32·1	285	i 6 33	+ 2	e 11 27	−16	—	—	—
Bucharest		33·5	292	e 6 46	+ 3	e 12 1	− 4	—	—	23·4
Helsinki		34·4	321	e 6 51	0	e 12 21	+ 2	—	—	e 18·0
Helwan		34·7	264	i 6 51k	− 3	12 39	+15	8 15	PP	—
Colombo	E.	34·8	166	—	—	13 27	+62	—	—	—
Warsaw		36·0	304	7 4a	− 1	12 46	+ 2	8 28	PP	e 19·4
Belgrade		37·4	294	i 7 15	− 1	e 13 10	+ 5	e 7 55	PP	e 19·6
Budapest		37·8	299	7 19	− 1	e 16 7	SS	—	—	e 21·4
Kalossa	E.	38·0	297	e 7 24	+ 3	—	—	—	—	—
Upsala		38·0	319	i 7 20a	− 1	e 13 2	−12	i 8 45	PP	e 19·4
Zagreb		40·2	297	e 7 40	0	e 16 59	SS	e 9 24	PP	e 23·5
Prague		40·4	304	e 7 48	+ 7	e 13 51	+ 1	e 9 11	PP	—
Copenhagen		40·8	312	i 7 45a	0	i 13 57	+ 1	9 26	PP	20·4
Potsdam		40·8	308	i 7 46	+ 1	e 13 57	+ 1	i 9 21	PP	e 18·4
Triest		41·8	297	i 7 50	− 3	i 14 11	0	i 17 57	SSS	—
Jena		42·0	305	e 7 54	0	e 17 25	SS	e 9 35	PP	—
Vladivostok		43·7	67	i 8 11	+ 3	—	—	—	—	—
Rome		43·8	292	i 8 7a	− 2	i 14 38	− 2	—	—	e 19·9
Florence		44·0	295	i 8 14	+ 3	i 14 47	+ 4	—	—	—
Stuttgart		44·0	302	e 8 9	− 2	e 14 41	− 2	e 9 53	PP	e 24·8
Bergen	Z.	44·2	321	8 11	− 1	e 17 55	SS	9 57	PP	20·7
Chur		44·3	299	e 8 11	− 2	—	—	—	—	—
Zürich		44·8	301	e 8 16	− 1	e 14 45	−10	—	—	—
Strasbourg		44·9	303	i 8 18a	0	e 14 53	− 3	e 10 0	PP	i 23·7
Pavia		45·0	298	e 8 28	+ 9	e 14 23	−35	—	—	—
Basle		45·4	301	e 8 21a	− 1	—	—	e 17 33	SS	—
De Bilt		45·7	308	i 8 24a	0	e 15 12	+ 4	i 10 1	PP	e 25·4
Neuchatel		45·9	301	e 8 23	− 3	—	—	—	—	—
Uccle		46·5	307	e 8 30a	− 1	e 15 19	0	e 10 20	PP	e 27·4
Paris		48·2	304	i 8 53a	+ 9	e 15 47	+ 4	i 10 35	PP	27·4
Aberdeen	E.	48·6	316	i 10 38	PP	i 16 2	+13	i 19 31	SS	28·7
Clermont-Ferrand		48·8	300	i 8 48	− 1	e 15 57	+ 5	i 9 52	PcP	27·1
Kew		49·1	309	—	—	e 15 57	+ 1	—	—	—
Jersey		50·9	307	e 9 12	+ 7	e 14 17	PcS	—	—	—
Scoresby Sund		53·2	336	i 9 21a	− 1	17 0	+ 8	11 21	PP	—
Alicante		54·3	293	9 45	+15	17 23	+16	10 45	?	e 31·3
Almeria		56·4	292	i 9 39	− 6	i 17 33	− 3	11 50	PP	33·4
Granada		57·0	293	e 10 13	+23	17 43	0	—	—	32·4
Malaga	Z.	57·8	293	i 9 51k	− 4	i 17 45	− 9	e 12 0	PP	—
Lisbon		60·1	297	10 30	+19	18 9	−15	12 21	PP	—
Ivigtut		67·1	333	i 10 32	−25	—	—	—	—	36·4
Sitka		79·1	15	e 12 7	− 1	e 22 23	+16	e 16 53	PPP	e 34·3
Seven Falls		86·2	336	12 37	− 7	23 26	+ 7	—	—	43·4
Ottawa		89·2	338	12 55	− 4	23 37	−10	—	—	40·4
Harvard	Z.	90·5	334	e 13 4	− 1	—	—	—	—	e 51·4
Weston		90·5	334	—	—	e 25 19	PS	e 30 57	SS	—
Philadelphia		94·0	335	—	—	e 23 46	[−10]	e 30 24	SS	e 38·3
Tinemaha	Z.	101·6	9	e 18 5	PP	—	—	—	—	—
Boulder City		103·1	6	e 13 54	− 8	—	—	—	—	—
Mount Wilson	Z.	104·5	9	i 18 20	PP	—	—	—	—	—
Pasadena	Z.	104·5	9	e 18 29	PP	—	—	—	—	—
Riverside	Z.	104·8	9	e 18 28	PP	—	—	—	—	—
Palomar	Z.	105·5	8	e 18 27	PP	—	—	—	—	—
Tucson		107·0	3	e 18 36	PP	e 25 36	{− 8}	—	—	e 58·4
La Paz	Z.	137·8	293	e 19 27	[0]	—	—	—	—	87·4

For Notes see next page.

NOTES TO JUNE 2d. 6h. 40m. 33s.

Additional readings :—
Tchimkent i =49s. and 56s.
Stalinabad i =1m.21s. and 1m.26s.
Almata i =1m.26s.
Hyderabad iPN =5m.19s.
Bucharest eN =12m.18s., eE =16m.38s., iE =18m.4s.
Helwan P_cPZ =9m.8s.
Warsaw eP_cPZ =9m.20s., SZ =12m.34s., P_cSZ =13m.26s., eN =14m.34s., SSZ = 14m.45s., SSN =15m.1s., SSSZ =15m.21s., SSSN =15m.32s., eZ =15m.39s., eS_cS?N =17m.25s.
Belgrade eSS? =17m.53s.
Budapest eS =15m.27s.
Upsala i =8m.9s., SS =15m.13s., iSSSN =15m.41s., eE =16m.13s., iN =17m.4s.
Zagreb eNW =17m.42s.
Prague ePPP =10m.12s., eSS =16m.27s.
Copenhagen 16m.51s., 17m.49s., and 18m.15s.
Potsdam iSSN =16m.56s.
Jena eN =9m.28s.
Stuttgart eS? =14m.56s., eSS? =18m.4s.
Bergen eZ =10m.57s. and 19m.47s.
Strasbourg eP =8m.22s., ePP =10m.3s., ePPP =10m.37s., eS =15m.0s., eSS =18m.21s., iSS =18m.26s. and 18m.29s., eSSS =19m.29s.
De Bilt eSS =18m.37s.
Uccle eSSN =18m.55s.
Paris eSS =19m.27s., eSSS =20m.47s., eQ =26·4m.
Aberdeen iE =26m.2s.
Scoresby Sund 12m.17s. and 12m.45s.
Alicante PPS =17m.37s., S_cS =18m.1s., SS =22m.21s., SSS =25m.11s., Q =26m.41s.
Almeria P_cP =10m.35s., PPP =13m.6s., P_cS =14m.31s., S_cS =19m.27s.
Malaga P_cPZ =10m.33s., ePPPZ =13m.31s., sSZ =18m.15s., SSZ =21m.49s.
Lisbon Z =10m.55s.
Sitka e =13m.40s. and 23m.13s.
Weston e =34m.29s.
Philadelphia e =24m.5s., ePSPS =31m.12s.
Boulder City e =14m.0s.
Tucson i =18m.45s.
Long waves were also recorded at Edinburgh, Bermuda, and other American stations.

June 2d. Repetitions from the neighbourhood of the epicentre of 1d. 18h. and 2d. 6h. were recorded from local stations as below. The earliest phase recorded being given in each case.

Almata.

h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
2	5	58	8	32	10	9	37	18?	15	13	36	17	9	28
7	24	18	8	52	27	15	6	55	15	56	32	19	24	2

Andijan.

h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
0	31	36	7	41	33	9	35	45	10	40	49	19	22	3
2	3	54	7	52	14	9	36	8	10	44	15	20	9	0
2	12	23	7	55	39	9	37	44	15	2	42	20	48	44
2	51	35	7	57	3	9	39	58	15	4	52	20	49	25
6	7	52	8	17	38	9	41	55	15	35	2	20	57	17
7	21	5	8	24	50	9	43	46	16	0	18	21	55	6
7	22	17	8	31	12	9	48	48	16	49	59	22	11	36
7	29	52	8	44	10	9	57	42	16	56	17	22	53	52
7	34	2	8	50	0	10	0	12	17	7	25	23	0	16
7	34	57	8	51	35	10	24	53	18	32	14	23	5	29
7	35	53	9	3	2	10	40	8	18	56	42	23	22	4
7	40	22												

Frunse.

h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
2	4	47	7	22	55	8	18	47	9	37	21	17	8	6
7	13	8	7	30	10	8	31	49	9	42	38	19	23	14
7	17	8?	7	42	9	8	52	16	15	12	10	22	12	16

Samarkand.

h.	m.	s.
7	30	56

Continued on next page.

Stalinabad.

h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
2	5	2	7	42	34	9	5	11	13	37	4	19	23	8
7	13	28	8	32	2	9	37	6	15	13	34	20	51	25
7	23	14	8	52	36	9	42	49	17	8	30	21	12	39

Tashkent.

h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
7	13	4	8	18	19	9	36	47	15	35	40	19	22	39
7	17	4	8	31	46?	9	42	17	15	55	25	20	50	34
7	22	56	8	52	16	15	5	35	17	8	2	22	12	12
7	42	10	9	3	43?	15	12	5						

Tchimkent

h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
2	4	38	9	36	46	15	5	32	15	55	23	19	22	40
8	31	52	9	42	35	15	12	12	17	8	6	20	50	7
8	52	16	12	38	52	15	35	43						

June 2d. Readings also at 0h. (Upsala), 1h. (Mount Wilson, Pasadena, Palomar, Riverside, Tucson, Boulder City, Pierce Ferry (2), and Tortosa), 3h. (near Bogota), 4h. (Harvard and near Mizusawa), 5h. (near Mizusawa), 8h. (Stuttgart), 12h. (Istanbul and Ksara), 13h. (Bombay, Calcutta, Colombo, Kodaikanal, Tashkent, Sverdlovsk, Ksara, Stuttgart, Palomar, Pasadena, Riverside, Tinemaha, and Tucson), 14h. (Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Pierce Ferry, Stuttgart, and near Apia), 15h. (Ashkabad), 22h. (Wellington, Auckland, Brisbane, and Riverview), 23h. (near San Francisco).

June 3d. Continuation of list of Asiatic shocks of June 2d.

Almata.

h.	m.	s.	h.	m.	s.	h.	m.	s.
0	58	11	9	11	56	18	23	29

Andijan.

h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
0	11	46?	2	7	13	9	9	52	11	40	35	13	38	24
0	25	1	2	19	17	9	32	18	11	42	13	18	1	57
0	54	54	3	27	6	9	33	48	11	43	36	18	17	39
0	56	12	5	32	24	9	53	46	11	48	10	18	21	27
1	29	42	5	55	40	10	43	59	11	48	40	22	19	16

Frunse.

h.	m.	s.	h.	m.	s.	h.	m.	s.
0	12	54	9	11	3	18	22	6

Stalinabad.

h.	m.	s.	h.	m.	s.	h.	m.	s.
0	13	35	0	57	0	18	22	25

Tashkent.

h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
0	12	19	0	57	24	9	0	28	18	22	1

Tchimkent.

h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
0	12	18	6	40	57	9	10	32	18	18	51	18	22	8
0	56	52												

June 3d. Readings also at 0h. (Stuttgart, Zürich, and near Neuchatel), 2h. (Kew), 3h. (Prague, Rome, Strasbourg, Stuttgart (2), Triest, Warsaw, Istanbul, Helwan, and near Ksara), 4h. (Brisbane, Riverview, Strasbourg (2), De Bilt (2), Kew, Uccle, Bermuda, Philadelphia, Weston, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson (2), Boulder City, Pierce Ferry, Huancayo, La Paz, and near Fort de France; several shocks), 5h. (De Bilt (2), Strasbourg, Uccle, Stuttgart, Bombay, Weston, Berkeley, Arapuni, Auckland, Wellington, and Perth), 6h. (Sitka, Tucson, Kew, Rome, and near Erevan (2)), 9h. (Arapuni, Wellington, Auckland, Brisbane, and Riverview), 12h. (near Ashkabad), 14h. and 15h. (Ksara), 16h. (Bombay), 23h. (La Paz).

June 4d. 0h. 29m. 48s. Epicentre 39°·6N. 23°·7E.

$A = +\cdot7075$, $B = +\cdot3106$, $C = +\cdot6349$; $\delta = +13$; $h = -2$;
$D = +\cdot402$, $E = -\cdot916$; $G = +\cdot581$, $H = +\cdot255$, $K = -\cdot773$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Istanbul		4·4	68	0 0	?	2 5	+ 3	—	—	—
Bucharest		5·1	20	e 1 15	− 5	i 2 19	− 1	i 1 40	P_g	—
Belgrade		5·7	336	i 1 27	− 1	i 2 30	− 5	i 1 45	P^*	—
Campulung		5·7	10	e 1 14	−14	—	—	—	—	—
Kalossa		7·7	335	e 2 7	+11	i 3 17	− 8	i 2 46	P_g	4·2
Zagreb		8·4	320	e 2 4	− 2	i 3 42	− 1	i 2 39	P_g	—
Budapest		8·6	339	2 10	+ 1	3 52	+ 4	i 2 55?	P_g	4·5
Rome		8·8	289	i 2 12k	+ 1	i 3 59	+ 6	—	—	i 5·3
Yalta		9·2	55	2 9	− 7	—	—	—	—	—
Simferopol		9·4	52	e 2 20	+ 2	4 18	+11	—	—	—
Triest		9·5	313	e 2 19	− 1	e 3 52	−18	i 2 57	PP	i 5·0
Florence	N.	10·2	298	i 2 39	+ 8	i 4 55	+28	—	—	—
Theodosia		10·2	54	2 27	− 4	—	—	—	—	—
Ksara		11·3	117	e 2 47	+ 1	e 5 10	+16	—	—	—
Helwan	z.	11·6	145	i 2 48a	− 2	4 57	− 4	—	—	i 6·0
Pavia		12·1	302	e 2 53	− 4	e 5 28	+14	—	—	e 6·7
Prague		12·4	331	2 55	− 6	e 5 18	− 3	—	—	e 6·0
Chur		12·6	310	e 3 1	− 2	e 5 24	− 2	—	—	e 6·8
Warsaw		12·8	353	e 3 5k	− 1	i 5 34	+ 4	3 15	PP	e 7·2
Cheb		13·2	327	e 2 12?	−59	—	—	—	—	e 6·2
Zürich		13·4	310	e 3 15	+ 1	e 5 52	+ 7	—	—	—
Stuttgart		13·9	316	i 3 17k	− 4	i 6 8	+11	i 3 27	PP	i 7·0
Basle		14·1	310	e 3 22	− 1	e 6 37	SS	e 3 41	PP	—
Jena		14·1	327	e 3 22	− 1	i 6 23	+21	i 3 47	PP	e 7·1
Neuchatel		14·2	307	e 3 24	0	—	—	—	—	e 7·5
Strasbourg		14·5	314	e 3 28	0	e 6 17	+ 6	i 3 56	PPP	i 7·5
Potsdam		14·7	334	e 3 32	+ 1	i 6 16	0	e 6 24	SS	e 7·2
Besançon		15·0	307	e 3 45	+10	e 6 44	+21	—	—	e 8·3
Piatigorsk		15·1	67	e 3 48	+12	—	—	—	—	—
Leninakan		15·4	79	3 46	+ 6	—	—	—	—	—
Erevan		16·0	81	e 3 54	+ 6	—	—	—	—	—
Clermont-Ferrand		16·3	299	i 3 53	+ 1	e 6 46	− 7	i 3 58	PP	8·5
Barcelona		16·5	285	i 3 55	+ 1	7 2	+ 4	i 5 7	PP	—
Grozny		16·9	70	e 3 57	− 2	6 55	−12	—	—	—
Uccle		17·6	316	e 4 7k	− 1	e 7 34	+11	e 4 25	pP	e 9·0
Copenhagen		17·7	340	e 4 7	− 3	i 7 32	+ 6	—	—	9·6
Paris		17·7	310	i 4 9k	− 1	e 7 30	+ 4	i 7 37	SS	e 9·2
Tortosa		17·8	282	i 4 13	+ 2	i 7 46	SS	4 36	PP	e 9·2
De Bilt		17·9	322	e 4 12k	0	i 7 39	+ 9	i 7 50	SS	e 8·7
Moscow		18·6	25	4 11	−10	7 36	−10	4 26	pP	—
Alicante		18·8	276	i 4 29	+ 6	i 8 3	+13	4 37	pP	e 9·9
Baku		20·1	79	4 40	+ 2	—	—	—	—	—
Kew		20·5	315	i 4 41k	− 1	i 8 38	+11	i 4 58	PP	e 9·2
Helsinki		20·6	2	i 4 38	− 5	e 8 19	−10	e 4 53	PP	e 10·7
Upsala		20·6	351	i 4 38a	− 5	e 8 12?	−17	—	—	e 10·2
Almeria		20·7	272	i 4 46	+ 2	i 8 42	+11	5 19	PP	13·8
Jersey		20·7	308	e 4 44	0	e 7 42	−49	—	—	—
Toledo	z.	21·3	280	e 4 53	+ 3	8 56	+13	—	—	—
Granada		21·5	274	i 4 54	+ 2	i 8 56	+ 9	5 30	PP	11·9
Malaga	z.	22·3	274	i 5 1a	0	i 9 13	+11	5 56	PP	11·4
Durham	N.	22·7	321	i 5 4	0	i 9 9	0	—	—	i 12·5
Bergen	N.	23·8	338	i 5 14?	− 1	9 32	+ 4	—	—	11·2
Edinburgh		24·1	322	5 15	− 3	9 42	+ 8	7 48	?	—
Aberdeen		24·3	326	i 5 14	− 6	i 9 38	+ 1	i 10 35	SS	e 12·7
Lisbon		25·4	280	5 32k	+ 1	11 11	SS	5 47	pP	14·4
Ashkabad		27·0	82	e 5 42	− 3	—	—	—	—	—
Sverdlovsk		29·6	42	i 6 6	− 3	i 10 55	− 9	—	—	—
Tashkent		34·4	72	e 6 49	− 2	e 12 5	−14	—	—	—
Stalinabad		34·7	76	i 6 56	+ 2	—	—	—	—	—
Andijan		36·8	72	e 7 12	+ 1	—	—	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m. s.			m.
Scoresby Sund		38·5	338	7 28	+ 2	13 25	+ 3	9 0	PP		19·2
Almata		39·5	66	e 7 31	− 3	—	—	—	—		—
Bombay		46·9	101	e 8 27	− 7	e 15 27	+ 2	—	—		—
Irkutsk		54·7	48	9 28	− 5	—	—	—	—		—
Ottawa		68·8	312	11 6	− 2	20 12	+ 1	—	—		31·2
Bermuda		69·1	295	e 11 16	+ 6	e 20 17	+ 2	—	—		e 34·2
Vladivostok		75·2	47	e 11 40	− 6	—	—	—	—		—
St. Louis	z.	81·4	314	e 12 28	+ 8	—	—	—	—		—
Tucson		97·0	323	e 13 35	0	—	—	—	—		e 56·8

Additional readings :—
Bucharest eE =1m.18s., iP*N =1m.28s., iP$_g$?N =1m.35s., iE =1m.51s., and 2m.37s., iN =2m.47s., iE =3m.1s.
Belgrade iPP =2m.11s., iPPP =2m.20s., i =2m.59s.
Kalossa eN =3m.29s., iE =3m.41s., iN =3m.53s., eE =3m.59s.
Zagreb eZ =2m.25s., i =2m.49s., iNE =2m.55s., i =3m.21s., 4m.14s., and 4m.21s., iS$_g$NE =4m.37s., iNE =4m.44s., i =4m.51s., iNE =4m.55s., i =5m.4s.
Helwan iZ =3m.6s.
Pavia e =3m.2s.
Warsaw PPZ =3m.19s.?, SSZ =5m.49s.
Stuttgart i =3m.46s., 6m.19s., and 6m.40s.
Jena iPN =3m.32s.
Strasbourg iP =3m.38s., eS =6m.23s., iS? =6m.32s. and 6m.36s., i =6m.59s. and 7m.7s.
Clermont-Ferrand iPPP =4m.11s., e =7m.15s.
Uccle eSSN =8m.8s.
Paris e =8m.30s.
Tortosa PPPEN =4m.43s., SSN =7m.37s.
Alicante PP =4m.43s., PPP =5m.1s., P$_c$P =8m.11s. eS =8m.22s., SS =8m.39s., SSS =8m.47s.
Kew ePPP =5m.14s.
Helsinki e =8m.28s., eSS =9m.42s.
Almeria PPP =5m.29s., SS =9m.39s., P$_c$S =12m.15s.
Granada SS =10m.17s.
Malaga P$_c$PZ =8m.20s.
Lisbon PPZ =6m.15s., PPP?Z =6m.34s.
Scoresby Sund 9m.28s., SS =16m.16s.
Bermuda e =20m.40s.
St. Louis iZ =12m.34s.
Long waves were also recorded at Weston, Chicago, and Berkeley.

June 4d. Continuation of list of aftershocks from the neighbourhood of that at 2d. 6h.

Almata.

h.	m.	s.	h.	m.	s.
0	4	58	10	9	24

Andijan.

h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
0	3	39	9	6	38	11	9	58	18	10	27	21	23	54
2	9	36	10	8	14	12	32	52	18	21	10	21	29	41
3	30	53	10	35	7	13	18	3	19	44	58	21	49	2
8	17	43	11	0	50	16	22	36						

Frunse.

h.	m.	s.	h.	m.	s.
0	4	28	10	8	51

Obi-garm.

h.	m.	s.	h.	m.	s.
17	30	34	21	28	42

Stalinabad.

h.	m.	s.	h.	m.	s.	h.	m.	s.
0	3	30	10	9	5	21	28	41

Tchimkent.

h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
0	3	59	3	22	36	9	6	52	10	8	51	18	32	21

Tashkent.

h.	m.	s.	h.	m.	s.	h.	m.	s.
0	3	49	10	8	47	21	30	13

June 4d. Readings also at 1h. (Sitka and near San Juan), 2h. (Ksara), 4h. (Palomar, Riverside, and Tucson), 6h. (Kew), 7h. (near Lick and Ashkabad), 10h. (De Bilt, Kew, Stuttgart, Istanbul, and Ashkabad), 12h. (Tucson), 13h. (La Paz), 14h. (Haiwee, Pasadena, Palomar, Riverside, Tinemaha, Boulder City, Pierce Ferry, Shasta Dam, Berkeley, Bermuda, Huancayo, La Paz, Ksara, Istanbul, Brisbane, Riverview, Arapuni, Auckland, and Wellington), 15h. (Strasbourg, Stuttgart, Kew, and Sitka), 16h. (near Piatigorsk (4)), 17h. (Brisbane, Sverdlovsk, Leninakan, Andijan, Tashkent, and Strasbourg), 18h. (near Piatigorsk), 22h. (near Pierce Ferry), 23h. (Bucharest and Shasta Dam).

June 5d. 12h. Undetermined shock. Probably in neighbourhood of Solomon Islands.

Brisbane iPN =0m.1s., iPPN =0m.12s., iSN =3m.20s., iSSN =3m.31s., iLN =4m.45s.
Riverview iPZ =1m.6s.k, ipPZ =1m.22s., iSNZ =5m.20s., iN =6m.34s., iE =6m.48s., eLN =7·3m.
Wellington S? =1m.37s., LZ =7m.?
Auckland P =2m.50s., i =3m.57s. and 5m.4s., S? =7m.6s.
Shasta Dam eP? =8m.45s., e =8m.48s.
Mount Wilson ePZ =8m.45s., iZ =9m.0s.
Pasadena ePZ =8m.46s., eZ =8m.55s.
Riverside ePZ =8m.47s., eZ =9m.1s.
Palomar ePZ =8m.49s., iZ =9m.1s. and 9m.4s.
Tinemaha ePZ =8m.52s., eZ =9m.3s., iZ =9m.7s.
Boulder City eP =9m.0s., e =9m.14s.
Pierce Ferry eP =9m.4s., e =9m.18s.
Tucson eP? =9m.9s., i =9m.25s.
Arapuni e =12m.5s.?
Stuttgart eP?Z =15m.35s.
Zürich eP =15m.36s.
Ksara ePKP? =15m.36s., PP =18m.48s., pPP =19m.14s.
Neuchatel eP =15m.38s.
Istanbul e =18m.
Weston e =58m.30s.
Long waves were also recorded at Malaga, Rome, and Warsaw.

June 5d. 22h. 58m. 11s. Epicentre 14°·0N. 90°·1W. (as on 1944, Oct. 2d.).

A = −·0017, B = −·9707, C = +·2404; δ = +5; h = +6;
D = −1·000, E = +·002; G =000, H = −·240, K = −·971.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Balboa Heights		11·4	115	e 2 51	+ 4	e 5 2	+ 6	— —	—
Bogota	z.	18·3	119	i 5 19	+62	e 8 46	+67	— —	—
Columbia		21·5	20	e 4 56	+ 4	e 8 51	+ 4	— —	e 10·2
St. Louis		24·5	0	e 5 23	+ 1	e 9 47	+ 7	i 5 43 PP	—
Tucson		26·3	318	e 5 39	0	e 10 37	+26	— —	i 12·6
Chicago		27·8	3	e 5 51	− 2	e 10 28	− 7	e 8 40 PcP	e 12·0
Denver		28·9	336	—	—	e 9 58	−55	e 11 59 SS	—
Philadelphia		29·0	24	e 6 3	− 1	e 10 34	−20	e 6 46 pP	e 11·9
Bermuda		29·5	48	e 6 9	+ 1	e 11 26	+24	— —	e 12·9
Huancayo		29·7	150	e 6 12	+ 2	i 11 3	− 3	— —	e 13·7
Fordham		30·2	25	e 6 14	0	e 11 13	0	e 7 29 PP	—
Pierce Ferry		30·7	320	e 6 19	0	—	—	i 9 12 PcP	i 12·9
La Jolla	z.	31·1	312	i 6 23	+ 1	—	—	e 9 16 PcP	—
Palomar		31·1	313	i 6 23a	+ 1	i 12 53	ScP	i 9 16 PcP	—
Boulder City		31·2	320	e 6 23	0	—	—	i 9 15 PcP	i 12·9
Riverside	z.	31·8	313	i 6 28a	0	i 12 55	ScP	i 9 17 PcP	—
Rapid City		32·0	342	e 6 32	+ 2	e 11 23	−19	e 7 52 PP	e 11·9
Mount Wilson		32·4	313	i 6 34a	0	i 12 57	ScP	i 9 19 PcP	—
Pasadena		32·4	313	i 6 33a	− 1	i 12 57	ScP	i 9 20 PcP	e 15·9
Harvard	z.	32·6	27	i 6 34	− 1	—	—	— —	e 13·8
Weston		32·6	27	i 6 34a	− 1	i 11 48	− 3	— —	—
Salt Lake City		32·8	329	e 6 37	0	e 11 55	+ 1	e 7 57 PP	e 13·6
Ottawa		33·6	18	6 43	− 1	12 3	− 3	8 5 PP	17·3
Santa Barbara		33·7	312	i 6 46	+ 1	e 13 2	ScP	i 9 23 PcP	—
Tinemaha	z.	34·1	318	i 6 49	+ 1	i 13 2	ScP	i 9 22 PcP	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Fresno	N.	34·9	316	e 7 5	+10	—	—	—	—	—
Shawinigan Falls		35·5	21	7 0	0	12 30	− 6	8 27	PP	15·8
Lick		36·4	315	e 7 11	+ 3	—	—	—	—	—
Seven Falls		36·7	22	e 8 43	PP	(12 49?)	− 5	—	—	12·8
Berkeley	E.	37·1	315	—	—	i 13 3	+ 2	—	—	e 18·3
La Paz	N.	37·2	143	7 15	0	13 1	− 1	—	—	18·3
Shasta Dam		38·7	320	e 7 27	0	e 13 16	− 9	—	—	—
Victoria		44·1	328	8 14	+ 2	14 53	+ 8	17 41	SS	21·8
Scoresby Sund		69·6	19	11 12	− 1	20 13	− 8	—	—	32·8
Toledo	Z.	78·2	51	12 1	− 2	21 57	0	—	—	32·3
Malaga	Z.	78·3	55	e 12 2	− 1	15 56	S_cP	23 10	PPS	43·3
Granada		78·9	54	i 12 7	0	i 22 22	+17	12 32	P_cP	38·3
Almeria		79·9	54	i 12 7	− 5	22 8	− 8	15 11	PP	44·8
Alicante		81·2	52	—	—	22 31	+ 2	—	—	e 37·1
Paris		81·3	42	e 11 49?	−31	—	—	—	—	e 38·8
Strasbourg		84·7	41	e 12 37	0	e 24 13	PPS	e 16 1	PP	e 40·3
Stuttgart	Z.	85·6	41	e 12 38	− 3	—	—	—	—	e 39·8
Triest		89·5	43	—	—	e 23 18	[−12]	—	—	—
Rome	Z.	89·9	47	e 13 3	+ 1	—	—	—	—	—
Istanbul		101·6	43	e 17 49?	PP	—	—	—	—	48·8
Ksara		109·9	46	e 15 13	P	e 28 43	PS	—	—	—

Additional readings :—
St. Louis iSN =9m.57s., isSN =10m.28s.
Tucson i =5m.58s., 6m.52s., and 9m.4s.
Philadelphia e =7m.11s. and 10m.47s.
Huancayo i =11m.36s.
Palomar iZ =6m.44s. and 7m.1s.
Boulder City iP =6m.26s.
Rapid City P_cP =8m.31s.
Harvard iZ =6m.53s.
Salt Lake City e =11m.17s.
Ottawa SS =14m.19s.
Berkeley eN =13m.7s.
Malaga QZ =36m.58s.
Granada SS =27m.46s.
Almeria PPP =16m.57s., SS =27m.29s.
Long waves were also recorded at College, Tortosa, Kew, Warsaw, and Bombay.

June 5d. Continuation of list of Central Asian aftershocks.

Andijan.

h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
0	27	44	7	47	1	14	3	27	15	22	39	18	38	21
6	17	6	13	53	59	15	5	10	17	55	58	23	36	6

Obi-garm.

h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
0	48	46	6	16	7	10	38	0	15	58	18	23	36	49
2	32	30	8	14	26	11	56	42	17	24	30			

Stalinabad.

h.	m.	s.	h.	m.	s.	h.	m.	s.	h.	m.	s.
6	16	20	10	38	30	11	57	12	23	37	48

Tashkent.

h.	m.	s.	h.	m.	s.
6	16	30	23	36	33

Tchimkent.

h.	m.	s.	h.	m.	s.
6	18	6	7	48	9

June 5d. Readings also at 1h. (near Antarctica), 2h. (Boulder City, Pierce Ferry, Shasta Dam, Grand Coulee, near Logan and Salt Lake City), 5h. (La Paz and Shasta Dam), 7h. (La Paz), 8h. (Mount Wilson, Pasadena, Palomar, Tinemaha, Tucson, and Shasta Dam), 13h. (Zürich, Palomar, Tinemaha, and Tucson), 14h. (Upsala), 16h, (Stuttgart), 19h. (Malaga), 20h. (near Ottawa), 21h. (Santa Lucia (2)).

June 6d. 0h. 12m. 50s. Epicentre 19°·2N. 121°·2E. (as on 1941, Feb. 14d.).

$A = -·4896$, $B = +·8084$, $C = +·3269$; $\delta = +8$; $h = +5$;
$D = +·855$, $E = +·518$; $G = -·169$, $H = +·280$, $K = -·945$.

	Δ	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Vladivostok	25·5	19	e 5 28	− 4	—	—
Irkutsk	35·6	343	e 7 5	+ 4	—	—
Tashkent	49·1	309	e 8 52	+ 1	e 15 57	+ 1
Stalinabad	49·1	306	i 9 0	+ 9	—	—
Sverdlovsk	58·1	327	9 55	− 3	17 54	− 4
Ksara	75·8	300	e 11 54	+ 4	e 25 48	SS
Shasta Dam	96·2	43	i 13 28	− 3	—	—

Long waves were also recorded at European stations.

June 6d. Continuation of list of Central Asian aftershocks.

Almata 18h. 36m. 2s.

Andijan 7h. 14m. 23s., 11h. 41m. 2s., 12h. 51m. 30s., 14h. 41m. 12s., 16h. 45m. 20s., 18h. 3m. 59s., 18h. 33m. 53s., 19h. 24m. 29s., 21h. 50m.23s.

Obi-garm 18h. 34m. 53s.

Tashkent 18h. 34m. 36s.

Tchimkent 18h. 34m. 36s.

June 6d. Readings also at 0h. (Bombay), 1h. (Malaga and near Branner), 3h. (near Berkeley and Lick (2)), 4h. (Auckland, Wellington, Brisbane, Riverview, Mount Wilson, Pasadena, Riverside, Tinemaha, and Shasta Dam), 8h. (San Juan and Stuttgart), 9h. (Shasta Dam), 11h. (near Alicante), 17h. (near Mineral), 20h. (Malaga), 23h. (Piatigorsk).

June 7d. 5h. 4m. 58s. Epicentre 26°·8N., 102°·7E.

$A = -·1965$, $B = +·8719$, $C = +·4485$; $\delta = -3$; $h = +3$;
$D = +·976$, $E = +·220$; $G = -·099$, $H = +·438$, $K = -·894$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Nanking		15·0	66	—	—	e 6 39	SS	—	—	—
New Delhi	N.	22·6	281	e 5 11	+ 8	i 9 0	− 7	9 26	SS	11·1
Hyderabad		24·3	253	5 19	− 1	9 33	− 4	10 16	SS	—
Irkutsk		25·5	2	5 33	+ 1	10 2	+ 5	—	—	—
Frunse		27·9	312	e 5 59	+ 5	—	—	—	—	—
Andijan		28·6	307	e 5 54	− 6	—	—	—	—	—
Bombay		28·6	290	e 6 1	+ 1	—	—	—	—	—
Vladivostok		28·7	48	e 6 1	0	e 11 2	+12	—	—	—
Kodaikanal	E.	29·0	241	—	—	e 10 42	−12	—	—	—
Obi-garm		30·0	303	e 6 9	− 3	—	—	—	—	—
Stalinabad		30·7	312	i 6 21	+ 2	—	—	—	—	—
Tashkent		31·0	307	e 6 20	− 1	—	—	—	—	—
Ashkabad		38·7	299	e 7 36	+ 9	—	—	—	—	—
Sverdlovsk		42·3	327	e 7 56	− 1	14 15	− 4	—	—	—
Ksara		57·3	295	e 9 50	− 2	e 17 51	+ 4	—	—	—
Istanbul		61·1	304	e 10 40	+22	—	—	—	—	e 40·0
Helwan		61·9	291	e 10 23	− 1	e 18 46	− 1	—	—	—
Stuttgart		72·5	316	e 11 27	− 3	—	—	—	—	e 40·0
Bogota	Z.	148·6	2	e 20 48†	[+63]	—	—	—	—	—

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

June 7d. 18h. 47m. 48s. Epicentre 11°·3N., 124°·7E.

A = −·5584, B = +·8064, C = +·1946; δ = −4; h = +6;
D = +·822, E = +·569; G = −·111, H = +·160, K = −·981.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Kagosima		20·9	14	4 46	0	8 43	+ 8	—	—	10·6
Nanking		21·4	345	i 4 55	+ 4	8 57	+12	i 9 0	S	—
Kumamoto		22·1	13	e 5 2	+ 3	9 12	+14	—	—	12·3
Hukuoka		22·8	12	e 5 7	+ 2	8 7	−64	—	—	e 11·0
Koti		23·6	18	e 5 14	+ 1	9 33	+ 8	—	—	—
Hamada		24·4	15	e 5 22	+ 1	9 36	− 3	—	—	11·4
Kobe		25·2	21	e 5 32	+ 3	10 3	+11	—	—	e 13·2
Shizuoka		26·7	25	5 43	0	10 59	+42	—	—	—
Nagano		28·0	22	e 5 54	− 1	—	—	—	—	—
Sendai		30·5	26	e 6 13	− 4	10 55	−23	—	—	13·3
Mizusawa	N.	31·4	25	6 37	+12	11 33	+ 1	—	—	—
Vladivostok		32·3	10	e 6 31	− 2	i 11 44	− 2	—	—	—
Sapporo		34·8	21	e 7 3	+ 9	—	—	—	—	e 12·4
Calcutta	E.	36·4	293	e 8 14	PP	i 14 1	?	—	—	—
Perth		43·8	190	—	—	i 14 40	0	—	—	i 21·9
Irkutsk		44·1	342	8 11	− 1	i 14 46	+ 1	—	—	—
Colombo	E.	44·5	268	8 14	− 1	14 40	−11	18 17	SS	26·9
Hyderabad	N.	45·1	283	8 23	+ 3	14 58	− 1	18 14	S_eS	—
Kodaikanal	E.	46·4	274	i 8 32	+ 2	e 15 12	− 6	—	—	22·5
Brisbane	N.	47·3	145	i 8 28	− 9	e 14 12	−79	e 17 4	?	—
New Delhi		47·5	299	e 8 37	− 1	e 15 33	− 1	10 32	PP	25·0
Bombay		50·5	285	i 9 3	+ 1	i 16 17	+ 1	i 11 3	PP	22·7
Riverview		51·5	152	i 9 9k	0	i 16 33	+ 4	i 11 8	PP	e 24·6
Frunse		53·5	316	e 9 25	+ 1	e 17 3	+ 6	—	—	—
Andijan		54·4	312	e 9 34	+ 3	—	—	—	—	—
Obi-garm		55·9	310	i 9 40	− 2	—	—	—	—	—
Stalinabad		56·5	310	i 9 48	+ 2	—	—	—	—	—
Tashkent		56·8	312	e 9 43	− 5	e 17 42	+ 1	—	—	—
Tchimkent		56·9	314	i 9 45	− 4	—	—	—	—	—
Ashkabad		64·5	307	i 10 40	− 1	19 22	+ 3	—	—	—
Sverdlovsk		66·5	328	i 10 53	− 1	i 19 42	− 2	—	—	—
Auckland		67·1	138	10 48	− 9	i 19 55	+ 4	—	—	28·7
Arapuni		68·4	139	10 42	−24	20 24	+17	—	—	—
Wellington		69·7	142	11 12	− 2	20 12	−10	13 54	pPP	31·8
Baku		71·2	309	e 11 25	+ 2	e 20 44	+ 4	—	—	—
Grozny		74·3	312	11 42	+ 1	21 18	+ 3	—	—	—
Honolulu		74·4	70	—	—	e 21 57	PS	—	—	e 31·3
Erevan		75·3	309	e 11 50	+ 3	21 30	+ 4	—	—	—
Leninakan		75·9	310	11 54	+ 4	—	—	—	—	—
Piatigorsk		76·2	313	e 11 50	− 2	—	—	—	—	—
College		78·8	25	e 13 6	+60	e 22 4	0	e 15 7	PP	e 33·3
Moscow		79·1	325	12 4	− 4	22 3	− 4	—	—	—
Tananarive		81·6	249	—	—	e 22 30	− 3	22 50	PS	e 42·5
Theodosia		81·6	314	12 25	+ 4	—	—	—	—	—
Ksara		82·8	303	e 12 28	+ 1	e 22 48	+ 3	—	—	—
Helsinki		85·1	331	e 12 37	− 2	e 23 1	− 7	e 23 44	PS	e 38·2
Sitka		85·9	32	e 12 46	+ 3	i 23 22	+ 6	e 28 52	SS	e 35·7
Istanbul		86·9	311	12 47	− 1	—	—	e 17 17	?	—
Helwan		87·3	300	i 12 48a	− 2	i 23 28	− 1	16 14	PP	—
Bucharest		88·2	315	e 12 42	−12	e 23 38	0	e 20 14	?	36·2
Upsala		88·7	331	i 12 58	+ 1	23 40	− 3	i 18 48	PPP	e 40·2
Warsaw		89·4	323	13 0a	0	23 47	− 2	18 24	PPP	e 46·2
Belgrade		92·0	316	e 14 3	+51	e 24 12	0	e 16 55	PP	e 49·2
Copenhagen		92·9	328	17 1	PP	24 26	+ 6	25 31	PS	45·2
Potsdam		93·9	326	i 18 12	PKP	—	—	—	—	e 42·2
Bergen		94·0	335	—	—	23 46	[−10]	24 42	S	37·6
Prague		94·0	323	e 17 23	PP	e 24 24	− 6	e 30 52	SS	e 42·2
Zagreb		94·7	319	e 13 24	0	—	—	e 17 15	PP	e 47·2
Cheb		95·2	323	e 17 22	PP	e 25 6	+26	—	—	e 50·2
Jena	N.	95·3	324	e 13 31	+ 4	e 24 42	+ 1	e 17 4	PP	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Scoresby Sund		95·3	350	18 12	?	24 38	− 3	22 10	PKS	—
Victoria		95·6	39	17 34	PP	24 42	− 1	26 30	PPS	47·2
Triest		96·2	319	e 17 30	PP	—	—	—	—	—
Stuttgart		97·7	323	i 13 37 a	− 1	e 25 6	+ 5	e 19 52	PPP	49·2
Chur		98·3	321	e 13 41	0	e 25 3	− 3	—	—	—
De Bilt		98·3	327	i 17 43 k	PP	e 25 12	+ 6	e 27 19	PPS	e 47·2
Florence		98·5	318	e 17 28	PP	—	—	—	—	—
Rome		98·5	316	e 14 41	+59	e 25 18	+10	18 52	PP	e 46·6
Strasbourg		98·6	323	e 13 46	+ 4	i 25 16	+ 7	e 17 46	PP	46·7
Zürich		98·7	322	e 13 38	− 4	e 24 48	{+ 3}	e 17 38	PP	—
Aberdeen	E.	99·0	334	i 21 23	PKS	i 25 22	+10	—	—	e 44·7
Basle		99·2	323	e 13 43	− 2	e 26 26	PS	e 17 47	PP	—
Shasta Dam		99·4	45	e 13 45	− 1	—	—	—	—	—
Uccle	N.	99·4	327	—	—	e 25 23	+ 8	—	—	e 46·2
Ukiah		99·5	47	—	—	e 24 33	[+ 8]	e 34 42	?	e 46·4
Durham	N.	100·2	331	i 23 32	PKS	i 32 50	SS	—	—	—
Berkeley	E.	100·6	48	—	—	i 24 32	[+ 2]	i 25 14	S	—
Santa Clara		101·1	48	e 18 47	PP	—	—	—	—	e 45·7
Kew		101·5	328	i 19 12 k	PP	e 25 36	+ 3	i 28 4	PPS	e 42·2
Paris		101·5	325	i 14 8	+13	e 25 2	{− 3}	i 18 1	PP	e 44·2
Clermont-Ferrand		102·8	322	e 18 12	PP	i 25 47	+ 3	e 23 37	?	47·9
Saskatoon		103·0	30	—	—	e 26 28	PS	—	—	35·2
Butte		103·3	37	—	—	e 24 41	[− 2]	e 27 39	PS	e 43·6
Jersey		103·8	328	e 15 32	?	e 17 2	?	—	—	—
Tinemaha	Z.	103·9	48	e 18 7	PP	—	—	—	—	—
Bozeman		104·4	37	e 18 44	PP	e 24 47	[− 1]	e 32 32	SS	e 42·8
Pasadena	Z.	105·2	50	e 18 36	PP	—	—	—	—	e 48·3
Mount Wilson	Z.	105·3	50	e 18 37	PP	—	—	—	—	—
Barcelona		105·6	319	e 23 58	?	e 26 50	+43	—	—	e 50·7
Riverside	Z.	105·9	50	e 17 14	?	—	—	—	—	—
Logan		106·0	41	e 19 37	PP	e 24 59	[+ 4]	e 25 22	SKKS	e 44·3
Palomar	Z.	106·5	50	e 17 32	?	—	—	—	—	—
Salt Lake City		106·5	42	e 18 46	PP	e 25 42	{+ 2}	e 25 0	SKS	—
Boulder City		106·8	47	e 17 32	?	—	—	—	—	—
Tortosa		107·0	318	19 19	PP	26 2	−17	28 32	PS	e 48·2
Pierce Ferry		107·4	46	e 17 36	?	—	—	i 18 47	PP	—
Ivigtut		107·5	356	—	—	25 48	{ 0}	33 12	SS	54·2
Alicante		108·9	317	15 2	P	25 8	[0]	19 8	PP	e 53·8
Rapid City		109·8	34	—	—	e 25 38	[+26]	e 34 59	SS	e 45·2
Toledo	Z.	110·4	320	19 8	PP	—	—	28 38	PS	—
Almeria		111·0	316	19 3	PP	26 5	{− 7}	19 17	pPP	54·2
Tucson		111·5	49	e 17 38	[−58]	e 25 52	{−24}	e 19 16	PP	e 46·4
Granada		111·6	317	i 14 33	P	26 19	{+ 3}	i 19 13	PP	55·8
Malaga	Z.	112·4	317	19 22	[+44]	e 26 30	{+ 8}	20 36	PP	56·8
Chicago		119·4	27	e 22 14	PKS	e 36 38	SS	e 41 54	SSS	e 54·1
Ottawa		120·6	17	18 53	[− 1]	30 12	PS	20 22	PP	57·2
St. Louis	Z.	120·6	31	e 18 51	[− 3]	—	—	e 20 18	PP	—
Antarctica		122·6	174	e 21 12	PP	—	—	—	—	e 60·2
Pennsylvania	E.	124·1	21	e 20 46	PP	—	—	—	—	—
Harvard	Z.	124·4	14	e 20 50	PP	e 26 1	[− 3]	e 22 37	PKS	e 57·2
Weston		124·6	14	e 32 20	PPS	e 37 40	SS	e 38 16	SSP	—
Fordham		125·3	16	e 20 54	PP	e 31 15	PS	—	—	—
Philadelphia		125·8	18	e 20 55	PP	e 27 49	{− 4}	e 22 39	PKS	e 53·7
Columbia		128·7	28	e 23 25	PKS	e 39 13	SSP	e 43 39	SSS	e 52·0
Bermuda		135·7	11	e 22 8	PP	e 39 46	SS	e 32 12	SKSP	e 63·8
La Plata	E.	156·4	176	36 0	PS	—	—	—	—	77·0
	N.	156·4	176	36 24	PS	—	—	77 18	Q	79·9
Huancayo		160·3	95	e 20 6	[+ 5]	e 45 44	SSP	e 24 2	PP	e 66·8
La Paz		166·5	114	i 20 15 a	[+ 8]	27 10	[0]	23 36	SKP	78·6

For Notes see next page.

NOTES TO JUNE 7d. 18h. 47m. 48s.

Additional readings and notes :—
New Delhi iSN =15m.29s., SSN =18m.27s., SSSN =19m.27s.
Bombay iSSE =20m.19s.
Riverview iZ =9m.29s., iP$_c$PZ =10m.16s., iZ =11m.26s., eE =16m.5s.,iPPSN =16m.55s., iE =17m.8s. and 17m.45s., iSSE =20m.11s., iSSZ =20m.32s., iE =20m.57s., iN =21m.7s., iE =22m.16s., QE =22m.36s.
Auckland i =11m.47s., S =19m.28s., i =21m.41s.
Wellington iZ =12m.42s., PPP =15m.28s., S$_c$S =21m.12s., SS? =24m.34s., SSS = 27m.56s., Q =29m.0s.
College ePPP =16m.52s., eS$_c$S? =22m.48s., eSS =27m.20s.
Tananarive N =26m.57s.
Helsinki ePPS =23m.59s., e =26m.11s., eSS =29m.14s.
Sitka e =13m.58s., ePP? =17m.37s., eS =22m.52s., i =23m.47s.
Helwan iZ =15m.11s., PS?Z =24m.27s., PPSEN =24m.42s.
Upsala iPPE =15m.37s., iPPPE =17m.38s., SE =22m.46s., PSE =23m.20s., eSSSN = 31m.12s., eN =36m.20s., readings wrongly identified.
Warsaw eZ =14m.7s., PPZ =15m.56s., SKSZ =23m.27s., SKSN =23m.34s., SE = 23m.52s., PSN =24m.45s., PSZ =24m.52s., PPSE =25m.17s., PPSNZ =25m.20s., iZ =26m.7s., SSN =29m.56s., eE =30m.33s., eEN =34m.32s.
Belgrade ePP? =18m.22s., ePS? =27m.30s., eSS =31m.40s.
Prague eSSS =34m.42s.
Cheb ePPP =20m.39s., e =29m.51s.
Scoresby Sund 25m.12s. and 31m.42s.
Victoria SKSE =24m.7s., SN =25m.15s., SS =31m.12s.?, SSS =36m.12s.?
Stuttgart e =18m.42s., eZ =20m.42s., e =26m.22s., and 27m.30s., eQ? =44m.12s.
Rome iZ =17m.43s., iSZ =26m.32s., iPSZ =27m.51s., eSSE =32m.18s., eSSSE = 36m.34s.
Strasbourg e =18m.56s. and 20m.52s., eS =25m.22s., ePS =26m.32s., iPPS =27m.41s., ePPS =27m.46s., e =28m.56s., eSS =32m.6s., e =33m.41s., PKKS =33m.58s., eSSS =36m.24s. and 36m.42s.
Berkeley iS$_c$SN =25m.32s., iSEN =26m.14s., iN =31m.56s., iE =32m.0s.
Paris iS =25m.23s., ePS =26m.45s., i =28m.14s.
Butte e =26m.40s., eSSS? =37m.29s.
Salt Lake City e =20m.50s.
Tortosa PPPN =21m.29s., SN =26m.59s., PPSN =29m.13s., SSN =34m.0s., SSSN = 38m.21s.
Alicante PPP =21m.58s., SKKS =26m.14s., PS =28m.50s., SS =35m.28s., PSS = 35m.32s., SSS =39m.16s., Q =47m.38s.
Rapid City ePS? =28m.56s., ePPS =29m.37s., eSSS =38m.20s.
Almeria sPKP =19m.26s., PP =20m.7s., pPP =20m.18s., SKKS =26m.46s., PS = 29m.56s., PPS =30m.50s., SSS =39m.46s., Q =46m.12s.
Tucson e =20m.23s. and 27m.57s., ePS? =29m.14s., ePPS =29m.33s., eSS? =35m.44s., eSSS? =40m.31s.
Granada PPP =21m.38s., S =27m.13s., PS =29m.10s., PPS =30m.15s., SS =35m.2s., SSS =39m.31s.
Malaga PPPZ =23m.0s., PSZ =31m.10s., PKP,PKSZ =41m.50s., QZ =48m.28s.
Ottawa SS =36m.50s., SSS =41m.0s.
Harvard eZ =24m.50s., ePKKPZ =28m.50s., ePSZ =30m.44s.
Fordham eSKP =21m.56s., eS =28m.50s., eSS? =38m.44s.
Philadelphia e =28m.25s., ePS? =31m.44s., e =33m.57s., eSS =37m.31s., eSSS = 42m.42s., e =46m.45s.
Bermuda ePKS =22m.57s., e =41m.48s.
La Plata E. PPP? =44m.0s., PPS =53m.30s., SSS =68m.30s.
N. =39m.6s., SKKS =46m.42s., SKSP =50m.30s., SSS =65m.30s.
Readings wrongly identified.
Huancayo e =21m.0s. and 33m.10s., eSKSP? =36m.9s., eSSS =51m.30s.
La Paz iPKP,Z =21m.8s., PPZ =24m.42s., iZ =26m.40s., SKKSZ =31m.36s., iN = 33m.52s., PSKSN =35m.38s., iN =42m.38s., SSN =44m.40s., SSSE =51m.34s.
Long waves were also recorded at Edinburgh, Neuchatel, and Lisbon.

June 7d. Continuation of list of Central Asian aftershocks.

Andijan 4h. 34m.37s., 7h.24m.48s., 15h.54m.53s., 18h.18m.12s., 18h. 45m.33s.,22h.0m.1s., 22h.3m.56s., 22h.27m.31s.

Tchimkent 12h.31m.35s., 22h.4m.19s.

June 7d. Readings also at 0h. (Piatigorsk), 1h. (near Mizusawa), 2h. (Santa Lucia, La Plata, and near Malaga), 3h. (near Balboa Heights), 4h. (near Branner), 5h. (Malaga), 8h. (Sitka), 11h. (Theodosia, near Antarctica, and near Balboa Heights), 12h. (Balboa Heights), 14h. (Pierce Ferry and Boulder City), 15h. (Santa Lucia and near Almeria), 17h. (near Mizusawa (2)), 23h. (Bombay and Tashkent).

June 8d. Continuation of list of Central Asian aftershocks.

Andijan 4h.59m.4s., 18h.56m.34s., 21h.9m.7s., 21h.19m.59s., 22h.14m.57s., 23h.30m.33s.

Frunse 4h.59m.47s.

Obi-garm 5h.0m.12s., 23h.29m.23s.

Stalinabad 22h.14m.14s., 23h.30m.34s.

Tashkent 4h.59m.16s., 22h.14m.19s.

Tchimkent 4h.59m.13s.

June 8d. Readings also at 0h. (Copenhagen, De Bilt, Uccle, and Strasbourg), 5h. (Ksara, and near Erevan), 11h. (Theodosia), 12h. (Wellington and Riverview), 13h. (Theodosia), 19h. (Belgrade), 21h. (Helsinki), 22h. (Helwan, Istanbul, and Ksara), 23h. (Shasta Dam).

June 9d. 6h. Undetermined shock.

La Paz P =17m.26s., iS =23m.6s., LZ =32m.0s.
Huancayo eP? =17m.40s., eL =32m.22s.
St. Louis ePZ =19m.21s., eZ =19m.35s., eLN =30m.29s.
Tucson eP? =20m.53s., e =21m.6s.
Boulder City eP? =21m.3s.
Palomar iPZ =21m.6s., iZ =21m.29s.
Pierce Ferry eP? =21m.10s.
Riverside iZ =21m.37s.
Pasadena eZ =21m.58s.
Long waves were also recorded at Weston, Bermuda, Fort de France, and Philadelphia.

June 9d. 17h. 14m. 18s. Epicentre 37°·0N. 2°·7W.

Intensity V at Almeria and on the Rio Nacimiento fault. Epicentre as adopted.
Resumen de las Observaciones solares, meteorológicas y sismológicas efectuadas durante el año 1947, vol. 35, serie A, Tortosa, 1950, p. 223.

A. G. Riutort.
Movimentos sísmicos en España durante, 1947 (Boletín de la Real Sociedad española de Historia Natural, Tomo 47, 1949, p. 487).

$A = +\cdot7997$, $B = -\cdot0377$, $C = +\cdot5992$; $\delta = -2$; $h = -1$;
$D = -\cdot047$, $E = -\cdot999$; $G = +\cdot599$, $H = -\cdot028$, $K = -\cdot801$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Almeria		0·2	129	i 0 0	P_g	i 0 4	S*	—	—
Granada		0·7	284	i 0 13	− 4	i 0 25	− 3	0 18	P
Malaga	z.	1·4	259	0 19	− 8	0 48	+ 2	—	—
Alicante		2·2	53	0 41	+ 3	i 1 8	+ 2	0 44	P_g
Toledo	z.	3·1	342	0 59	P_g	1 45	S_g	—	—

Additional readings :—
Almeria P_g =0m.10s., S_g =0m.16s., P_{g3} =0m.19s., S_{g3} =0m.23s., P_{g4} =0m.30s., $P_{g4}S_g$ = 0m.46s., $P_{g3}S_{g3}$ =0m.54s., S_{g4} =0m.57s., P_gS_{g4} =1m.6s.
Granada P_gS_g =0m.29s., P =0m.35s., S =0m.42s., PS =0m.58s., S =1m.3s., PS = 1m.11s., S =1m.16s.
Malaga SPPZ =0m.24s., iSZ =0m.36s., iS_gZ =0m.39s.
Alicante P_gS_g =1m.0s., S_g =1m.14s. and 1m.17s.

June 9d. Continuation of list of Central Asian aftershocks.

Andijan 5h.33m.7s., 18h.42m.15s., 22h.55m.43s.
Ashkabad 5h.36m.20s.
Obi-garm 5h.32m.29s.?
Stalinabad 5h.32m.44s.
Tashkent 5h.33m.16s., 14h.22m.43s.
Tchimkent 23h.26m.20s.

June 9d. Readings also at 0h. (Tucson), 4h. (Zagreb, Istanbul, and Bucharest), 7h. (near Alicante), 8h. (La Paz), 10h. (Mount Wilson, Tinemaha, Pasadena, Riverside, and Shasta Dam), 11h. (Riverview and near Harvard), 13h. (near Triest), 14h. (near Belgrade), 19h. (Basle), 20h. (Malaga, New Delhi, Calcutta, Bombay, and near Branner), 22h. (La Plata and near Branner).

June 10d. 8h. 36m. 16s. Epicentre 42°·7N. 147°·3E. (as on 1944, Dec. 19d.).

Intensity V at Nemuro; IV at Kushiro; II-III at Hatinohe and Urakawa. Macroseismic radius more than 300 km. Epicentre 42°·5N. 146°·5E. Very shallow.

The Sesismological Bulletin of the Central Meteorological Observatory, Japan, for the year 1947, Tokyo, 1950, pp. 27-28; Macroseismic chart p. 27.

$A = -\cdot6204$, $B = +\cdot3982$, $C = +\cdot6757$; $\delta = +3$; $h = -3$;
$D = +\cdot540$, $E = +\cdot842$; $G = -\cdot569$, $H = +\cdot365$, $K = -\cdot737$.

	Δ	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Nemuro	1·4	297	0 22k	− 5	—	—
Urakawa	3·4	262	0 54	− 1	1 32	− 5
Sapporo	4·4	277	1 6a	− 4	1 46	−16
Mori	5·0	265	0 44	−34	1 35	−43
Aomori	5·2	253	1 26	+ 5	2 19	− 3
Mizusawa	5·8	237	1 31	+ 2	2 31	− 7
Akita	6·2	243	1 40	+ 5	2 27	−21
Sendai	6·6	230	1 40	− 1	2 48	−10
Utunomiya	8·4	225	2 8	+ 2	3 37	− 6
Kakioka	8·5	223	2 5	− 2	—	—
Kumagaya	9·0	226	2 16	+ 3	3 48	−10
Wazima	9·6	240	2 20	− 1	—	—
Hunatu	9·8	225	2 21	− 3	—	—
Toyama	9·8	236	2 22	− 2	—	—
Nagoya	11·0	230	2 55	+13	—	—

June 10d. 11h. 12m. 37s. Epicentre 11°·3N. 124°·7E. (as on 7d.).

$A = -\cdot5584$, $B = +\cdot8064$, $C = +\cdot1946$; $\delta = -4$; $h = +6$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Vladivostok		32·3	10	e 6 29	− 4	11 56	+10	—	—	—
Calcutta	E.	36·4	293	—	—	i 12 32	−18	—	—	e 16·7
Irkutsk		44·1	342	e 8 10	− 2	14 51	+ 6	—	—	—
Colombo	E.	44·5	268	e 8 30	+15	e 14 58	+ 7	—	—	—
Hyderabad	E.	45·1	283	e 8 18	− 2	15 6	+ 7	18 44	SSS	—
Kodaikanal	E.	46·4	274	e 9 23?	+53	—	—	—	—	—
Brisbane	N.	47·3	145	i 8 34	− 3	e 15 46	+15	e 10 29	PP	—
New Delhi	N.	47·5	299	e 13 45	PcS	e 19 23	SS	—	—	—
Bombay		50·5	285	e 9 11	+ 9	e 16 18	+ 2	—	—	—
Riverview		51·5	152	i 9 15k	+ 6	i 16 39	+10	i 11 42	PPP	e 20·3
Almata		52·0	317	e 9 19	+ 6	—	—	—	—	—
Frunse		53·5	316	e 8 28	−56	—	—	—	—	—
Andijan		54·4	312	e 9 32	+ 1	—	—	—	—	—
Stalinabad		56·5	310	i 9 46	0	—	—	—	—	—
Tashkent		56·8	312	—	—	e 17 37	− 4	—	—	—
Tchimkent		56·9	314	i 9 47	− 2	—	—	—	—	—
Ashkabad		64·5	307	e 10 46	+ 5	—	—	—	—	—
Sverdlovsk		66·5	328	i 10 51	PcP	e 19 40	− 4	—	—	—
Auckland		67·1	138	—	—	24 8	SS	—	—	29·9
Baku		71·2	309	—	—	e 20 41	+ 1	—	—	—
Grozny		74·3	312	e 11 39	− 2	—	—	—	—	—
Leninakan		75·9	310	12 4	PcP	—	—	—	—	—
College		78·8	25	—	—	e 22 0	− 4	e 27 23	SS	e 36·6
Moscow		79·1	325	12 6	− 2	22 2	− 5	—	—	—
Theodosia		81·6	314	e 12 23	+ 2	e 22 30	− 3	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ksara		82·8	303	e 12 38	+11	e 23 8	+23	—	—	—
Helsinki		85·1	331	e 17 53	PPP	e 23 43	PS	—	—	e 41·4
Istanbul		86·9	311	e 12 23	−25	e 24 22	PS	—	—	—
Helwan		87·3	300	e 12 51	+ 1	23 29	0	24 31	PS	—
Upsala		88·7	331	—	—	e 23 35	− 8	—	—	e 45·4
Warsaw		89·4	323	e 12 59	− 1	23 47	− 2	e 16 39	PP	e 48·4
Copenhagen		92·9	328	—	—	24 49	+29	—	—	45·4
Prague		94·0	323	—	—	35 35	SSS	—	—	e 42·4
Cheb		95·2	323	—	—	e 24 23?	−17	e 34 23?	SSS	e 50·4
Triest		96·2	319	e 17 44	PP	—	—	—	—	—
Stuttgart		97·7	323	e 13 37	− 1	e 22 23	PKS	e 27 32	PPS	e 48·4
De Bilt		98·3	327	—	—	e 25 23?	+17	—	—	e 47·4
Florence		98·5	318	e 17 59	PP	—	—	—	—	—
Rome	z.	98·5	316	e 17 32	PP	—	—	—	—	—
Strasbourg		98·6	323	e 18 48	?	e 24 32	[+12]	e 26 34	PS	e 50·4
Aberdeen		99·0	334	e 36 23	SSS	—	—	—	—	e 49·0
Shasta Dam		99·4	45	e 13 46	0	—	—	—	—	—
Durham	N.	100·2	331	—	—	e 36 36	SSS	—	—	e 46·8
Kew		101·5	328	(e 18 23?)	PP	—	—	—	—	e 18·4
Paris		101·5	325	e 13 55	0	e 26 23	+50	—	—	e 53·4
Clermont-Ferrand		102·8	322	e 18 18	PP	e 28 22	PPS	—	—	50·4
Tinemaha	z.	103·9	48	e 18 15	PP	—	—	—	—	—
Palomar	z.	106·5	50	e 18 11	PP	—	—	—	—	—
Alicante		108·9	317	—	—	e 36 32	?	—	—	e 56·5
Almeria		111·0	316	—	—	e 34 8	SSP	—	—	64·1
Tucson		111·5	49	e 18 0	?	—	—	e 18 57	PKP	e 51·1
Granada		111·6	317	—	—	36 34	?	—	—	56·1
Malaga	z.	112·4	317	i 28 59k	PS	e 39 21	SSS	—	—	59·3
Ottawa		120·6	17	e 18 47	[− 7]	e 30 47	PS	e 36 23	SS	51·4
Philadelphia		125·8	18	e 25 32	?	e 29 7	?	e 37 6	SS	e 54·7
Bermuda		135·7	11	e 23 28	PKS	—	—	—	—	e 64·9
Huancayo		160·3	95	e 20 5	[+ 4]	—	—	—	—	e 77·9

Additional readings :—
Brisbane iSSN =19m.1s.
Helsinki e =22m.29s., and 25m.2s.
Warsaw PZ =13m.33s., eZ =17m.42s., PPPZ =18m.47s., SKSZ =23m.55s., SZ =24m.13s.
PSZ =24m.51s., PSN =24m.56s., SSE =29m.16s.
Strasbourg e =18m.51s., and 22m.52s., ePPS =27m.59s., e =28m.18s., eSS =32m.25s.
Malaga PPZ =32m.17s., ePPZ =34m.23s., SSZ =44m.54s, readings wrongly identified.
Long waves were also recorded at Arapuni, Wellington, Scoresby Sund, and at other American and European stations.

June 10d. 19h. 40m. 29s. Epicentre 38°·0N. 29°·5W. (as on 1942, October 15d.).

A = +·6876, B = −·3890, C = +·6131 ; δ = + 1 ; h = −1 ;
D = −·492, E = −·870 ; G = +·534, H = −·302, K = −·790.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Lisbon		16·0	81	i 3 48	0	6 41	− 5	4 10	PPP	6·8
Toledo	z.	19·9	76	e 4 37	+ 1	8 32	+17	5 19	PPP	10·1
Malaga	z.	20·0	85	i 4 38a	+ 1	i 9 24	SSS	i 4 46	pP	10·9
Granada		20·5	85	i 4 44	+ 2	i 8 36	+ 9	5 10	pP	10·2
Almeria		21·5	86	4 50	− 2	i 8 58	+11	5 26	PPP	13·6
Jersey		22·7	49	e 5 1	− 3	9 14	+ 5	—	—	—
Alicante		22·8	79	5 9	+ 4	9 19	+ 8	5 13	pP	e 11·9
Tortosa		23·3	73	i 5 9	− 1	9 28	+ 8	5 47	PP	11·4
Barcelona		24·5	70	5 23	+ 1	9 56	+16	—	—	11·5
Kew		24·5	47	i 5 22a	0	e 9 46	+ 6	i 5 49	PP	e 11·5
Durham	N.	25·3	39	—	—	e 10 5	+11	—	—	—
Clermont-Ferrand		25·4	61	e 5 31	0	e 10 6	+10	—	—	12·5
Paris		25·5	54	i 5 32a	0	i 10 3	+ 6	e 6 3	PP	e 12·5
Aberdeen		26·3	33	—	—	e 9 38	−33	—	—	—
Uccle		27·1	50	e 5 46a	0	e 10 15	− 9	—	—	e 12·5

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
De Bilt		28·0	48	e 5 53	− 2	e 10 36	− 2	—	—	e 12·5
Basle		28·6	57	e 5 59a	− 1	e 11 5	+17	—	—	—
Strasbourg		28·9	55	e 6 2	− 1	e 10 48	− 5	e 6 56	PP	e 12·8
Bermuda		29·2	270	—	—	e 10 51	− 7	—	—	e 12·2
Zürich		29·3	58	e 6 5a	− 1	e 11 31	+32	—	—	—
Pavia		29·6	62	e 6 11	+ 2	—	—	—	—	—
Stuttgart		29·8	57	e 6 10a	− 1	e 11 11	+ 4	—	—	e 13·0
Florence		31·1	65	e 9 59	PcP	—	—	—	—	—
Seven Falls		31·5	301	6 25	− 1	11 40	+ 6	—	—	17·5
Jena	E.	31·6	52	e 6 26	0	—	—	—	—	—
Cheb		32·0	53	e 7 34	PP	e 11 46	+ 4	—	—	e 15·5
Rome		32·2	68	i 6 31a	− 1	e 12 22	+37	e 11 19	?	e 13·8
Scoresby Sund		32·8	3	7 54	PP	11 55	+ 1	—	—	14·5
Triest		32·8	62	e 6 35	− 2	e 11 51	− 3	—	—	—
Copenhagen		33·1	43	e 6 38	− 2	11 54	− 5	13 51	SS	15·5
Prague		33·3	53	e 7 58	PP	e 12 24	+22	—	—	e 13·5
Ottawa		34·9	297	6 56	+ 1	12 34	+ 7	—	—	16·5
Zagreb		35·0	62	e 6 54	− 2	e 12 24	− 4	—	—	e 18·5
Philadelphia		35·3	288	e 10 21	?	e 12 23	−10	—	—	e 15·2
Upsala		36·8	38	e 8 31	PP	e 12 31	−25	—	—	e 17·5
Warsaw		37·6	51	e 7 20	+ 2	13 7	− 1	8 40	PP	e 18·5
Istanbul		44·5	66	e 8 31	+16	—	—	10 8	PP	—
St. Louis		46·9	291	i 8 35	+ 1	e 15 29	+ 4	e 10 25	PP	—
Moscow		47·2	45	e 8 36	0	e 15 24	− 5	—	—	—
Helwan		50·3	80	9 4	+ 4	e 16 19	+ 6	—	—	—
Ksara		52·1	74	e 9 17	+ 3	e 16 54	+16	—	—	—
Leninakan		55·2	62	e 9 54	+17	—	—	—	—	—
Sverdlovsk		59·5	40	10 4	− 3	e 18 1	−15	—	—	—
Baku		59·6	60	—	—	e 18 32	+15	—	—	—
Tucson		64·8	293	i 10 46	+ 3	—	—	i 10 57	PcP	—
Pierce Ferry		65·1	297	i 10 47	+ 2	—	—	—	—	—
Huancayo		65·7	231	e 10 55	+ 7	—	—	—	—	—
Boulder City		65·8	298	i 10 51	+ 2	—	—	—	—	—
Tinemaha		67·6	300	i 11 3k	+ 2	—	—	i 11 25	PcP	—
Haiwee		67·8	299	i 11 5	+ 3	—	—	—	—	—
Shasta Dam		68·4	306	i 11 5	− 1	—	—	—	—	—
Palomar		68·5	296	i 11 4	− 2	—	—	—	—	—
Riverside	Z.	68·6	297	i 11 9	+ 2	—	—	—	—	—
Mount Wilson	Z.	68·9	297	i 11 11	+ 2	—	—	—	—	—
Pasadena	Z.	69·0	297	e 11 10	+ 1	—	—	—	—	—
Tashkent		71·9	51	e 10 52?	−35	—	—	—	—	—

Malaga PPZ =5m.18s., S_cPZ =11m.40s., S_cSZ =15m.40s.
Granada PP =5m.33s.
Almeria PPP =5m.36s., P_cP =8m.44s., SS =9m.54s., P_cS =12m.24s.
Alicante PP =5m.29s., PPP =5m.55s., P_cP =8m.49s., i =9m.31s., SS =10m.21s., SSS =10m.51s.
Tortosa iN =5m.19s., iE =5m.37s., P_cP?N =8m.55s., SSN =10m.27s., SSSN =10m.56s.
Kew eSSEN =10m.12s.
Paris e =5m.45s., iS =10m.9s.
Strasbourg eSS =11m.57s.
Warsaw SZ =13m.20s., SSN =15m.51s., SSE =16m.8s., eN =17m.53s., eE =18m.5s.
St. Louis iZ =8m.39s., eZ =10m.9s., eN =18m.55s.
Long waves were also recorded at Ivigtut, College, Bozeman, Weston, Helsinki, Potsdam, and Besançon.

June 10d. Continuation of list of Central Asian aftershocks.

Andijan 9h.42m.44s.

Ashkabad 10h.33m.59s.

Frunse 10h.33m.16s.

June 10d. Readings also at 5h. (Riverview), 7h. (Shasta Dam, Boulder City, Pierce Ferry, Tucson, Tinemaha, Haiwee, Palomar, Riverside, Mount Wilson, and Pasadena), 8h. (Vladivostok and Stuttgart), 9h. (Theodosia, near Antarctica), 23h. (Tananarive).

June 11d. 2h. 26m. 12s. Epicentre 23°·7S. 65°·7W. (as on 1944, July 23d.).

A = +·3772, B = −·8355, C = −·3996 ; δ = +2 ; h = +4 ;
D = −·911, E = −·412 ; G = −·164, H = +·364, K = −·917.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Montezuma		3·1	290	e 0 45	− 6	i 1 1	P_g	—	—	e 1·1
La Paz	z.	7·5	341	i 1 53k	0	i 3 22	+ 2	—	—	e 4·1
Huancayo		14·8	320	e 3 22	−10	—	—	—	—	—
St. Louis	z.	66·1	340	e 10 57	+ 6	—	—	—	—	—
Tucson		70·4	321	i 11 17	− 1	—	—	—	—	—
Palomar	z.	74·8	318	i 11 45	+ 1	—	—	—	—	—
Pierce Ferry		75·0	321	i 11 46	+ 1	—	—	i 12 14	pP	—
Boulder City		75·4	321	i 11 48	+ 1	—	—	i 12 16	pP	—
Riverside	z.	75·5	318	i 11 48k	0	—	—	i 12 17	pP	—
Mount Wilson	z.	76·1	318	i 11 52k	+ 1	—	—	—	—	—
Pasadena	z.	76·1	318	i 11 52	+ 1	—	—	—	—	—
Tinemaha		78·1	320	e 12 4	+ 2	—	—	—	—	—
Shasta Dam		82·9	320	i 12 28	0	—	—	—	—	—

St. Louis also gives eZ =10m.28s.

June 11d. 22h. 44m. 0s. Epicentre 45°·0N. 9°·6E.

Strasbourg attributes this shock probably to the same origin as that of the larger earthquake on May 15th, 1951, for which the above epicentre has been determined.

A = +·6996, B = +·1183, C = +·7047 ; δ = +4 ; h = −4 ;
D = +·167, E = −·986 ; G = +·695, H = +·118, K = −·710.

		△	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Pavia		0·3	301	i 0 7	P_g	i 0 10	S_g	—	—
Florence	N.	1·7	136	i 0 31	0	i 1 9	+15	—	—
Triest		3·0	77	e 1 30	S	(e 1 30)	+ 3	e 1 51	S_g
Besançon		3·4	313	—	—	e 1 44	+ 7	—	—
Strasbourg		3·8	341	e 1 0	− 1	i 1 45	− 2	e 1 22	P_g
Stuttgart		3·8	356	e 1 6?	+ 5	e 1 44	− 3	e 1 15	P_g
Clermont-Ferrand		4·6	282	e 1 47	P_g	i 2 17	+10	i 2 32	S_g
Zagreb		4·6	77	1 46	P_g	2 41	S_g	—	—
Jena	N.	6·1	12	e 2 5	P_g	e 3 25	S_g	—	—
Paris		6·2	311	i 1 40	+ 5	—	—	—	—

Additional readings :—
Pavia i =15ms.
Strasbourg iS_g =2m.7s., i =2m.14s.
Stuttgart i =1m.49s., iS_g? =2m.6s.
Jena eN =2m.32s.
Long waves were recorded at Kew.

June 11d. Continuation of list of Central Asian aftershocks.

Almata 6h.5m.52s.

Andijan 6h.6m.13s., 11h.33m.21s., 12h.27m.35s., 17h.39m.19s., 18h.20m.4s., 18h.36m.49s.

Frunse 6h.5m.35s., 9h.36m.32s.

Obi-garm 7h.51m.10s., 8h.51m.36s., 12h.26m.16s., 21h.9m.28s.

Stalinabad 12h.26m.16s.

Tashkent 6h.7m.10s.

June 11d. Readings also at 10h. (near Brisbane), 12h. (near Balboa Heights), 14h. (near Alicante), 15h. (near Grozny), 16h. (Pavia and Stuttgart), 18h. (Malaga, near Alicante and near Grozny), 19h. (College, Riverside, Tinemaha, and Tucson), 21h. (Shasta Dam), 22h. (Malaga).

June 12d. 9h. 2m. 30s. Epicentre 1°·1N. 126°·4E. Focus at Base of Superficial Layers.

$A = -\cdot5933$, $B = +\cdot8047$, $C = +\cdot0190$; $\delta = -9$; $h = +7$;
$D = +\cdot805$, $E = +\cdot593$; $G = -\cdot011$, $H = +\cdot015$, $K = -1\cdot000$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Kagosima		30·6	6	6 10	− 3	11 13	+ 1	—	—	14·4
Miyazaki		31·0	8	e 6 14	− 3	11 21	+ 3	—	—	—
Nanking		31·6	347	6 19	− 3	11 15	−12	—	—	e 15·0
Kumamoto		31·8	6	e 6 4	−20	11 38	+ 8	—	—	—
Koti		33·0	10	e 6 33	− 1	11 28	−21	—	—	—
Hamada		34·0	8	6 41	− 2	12 7	+ 2	8 5	PPP	17·2
Perth		34·4	195	6 50	+ 4	i 12 25	+14	i 8 10	PPP	—
Toyooka		35·1	11	i 6 51	− 1	12 15	− 7	—	—	—
Shizuoka		35·5	17	6 53	− 3	12 29	+ 1	—	—	15·0
Utunomiya		37·4	17	e 7 11	− 1	12 52	− 5	—	—	—
Wazima		37·4	13	e 7 10	− 2	12 55	− 2	—	—	—
Mito		37·5	18	e 7 14	+ 2	12 57	− 2	—	—	—
Brisbane	N.	38·3	140	i 7 14	− 5	i 12 58	−13	—	—	—
Sendai		39·3	18	7 27	0	13 26	0	—	—	18·7
Mizusawa	E.	40·2	18	7 34	− 1	13 41	+ 2	—	—	—
Morioka		40·7	17	e 7 39	0	13 44	− 3	—	—	e 17·1
Riverview		41·8	148	i 7 49a	+ 1	i 14 6	+ 3	i 9 22	PP	e 19·7
Vladivostok		42·1	6	i 7 51	+ 1	i 14 7	− 1	—	—	—
Mori		42·8	15	7 56	0	14 21	+ 3	—	—	—
Sapporo		43·9	15	8 6	+ 1	14 34	0	—	—	e 20·5
Colombo	E.	46·8	278	8 24	− 4	15 4	−11	—	—	26·9
Kodaikanal	E.	49·5	283	i 9 50	+61	e 16 49	+56	11 50	PPP	23·7
Hyderabad	N.	49·8	292	e 8 47	− 5	15 53	− 5	10 17	P_cP	—
Dehra Dun	N.	54·3	307	e 6 10	?	e 14 7	?	—	—	e 27·3
New Delhi	E.	54·3	305	e 9 23	− 2	i 16 50	− 9	11 18	PP	—
	N.	54·3	305	i 9 27	+ 2	i 16 53	− 6	11 12	PP	25·9
Irkutsk		54·3	343	9 25	0	16 53	− 6	—	—	—
Bombay	E.	55·4	292	i 9 32	− 1	i 17 6	− 8	i 11 46	PP	27·4
Arapuni		59·8	136	e 14 0	?	e 18 48	+36	19 42	S_cS	23·5
Almata		60·8	321	10 9	− 2	18 14?	−10	—	—	—
Wellington		60·8	140	10 0	−11	18 23	− 1	10 22	sP	24·5
Frunse		62·1	318	i 10 19	− 1	e 18 36?	− 5	i 10 57	P_cP	—
Andijan		62·7	315	10 23	− 1	e 18 51	+ 2	—	—	—
Semipalatinsk		62·8	328	9 50?	−34	—	—	—	—	—
Apia		63·0	105	e 10 27	+ 1	e 19 3	+11	—	—	—
Obi-garm		63·8	313	e 10 34	+ 3	i 18 58	− 4	12 58	PP	—
Stalinabad		64·4	313	i 10 36	+ 1	i 19 7	− 3	—	—	—
Tashkent		65·1	315	i 10 37	− 3	e 19 8	−10	—	—	—
Tchimkent		65·2	316	i 10 39	− 1	i 19 21	+ 1	—	—	—
Samarkand		66·1	313	11 18	+32	—	—	—	—	—
Sverdlovsk		76·0	329	i 11 44	− 2	i 21 14	−11	—	—	—
Honolulu		76·4	68	i 11 48	0	e 21 20	− 9	—	—	e 31·3
Baku		79·0	311	i 12 6	+ 4	i 21 59?	+ 2	—	—	—
Tananarive		79·8	250	12 4	− 2	22 4	− 2	12 30	pP	38·8
Grozny		82·4	313	i 12 25	+ 5	22 32	− 1	12 55	P_cP	—
Erevan		83·1	310	e 12 28	+ 4	22 36	− 4	—	—	—
Leninakan		83·7	310	e 12 30	+ 3	22 47	+ 1	i 12 53	P_cP	—
Piatigorsk		84·4	314	12 31	+ 1	22 48	− 5	12 43	P_cP	—
Sotchi		86·8	313	12 40	− 2	23 5	[+ 2]	—	—	—
College		87·2	25	e 12 45	+ 1	e 23 12	[+ 6]	e 16 4	PP	e 36·3
Moscow		88·4	326	i 12 47	− 3	i 23 12	[− 2]	—	—	—
Ksara		89·8	303	i 12 57	+ 1	i 23 52	+ 8	16 31	PP	—
Yalta		90·8	314	13 0	− 1	23 31	[+ 3]	—	—	—
Simferopol		90·9	314	e 12 7	−55	—	—	—	—	—
Sitka		93·5	32	e 13 15	+ 1	i 24 31	+14	e 17 10	PP	e 38·9
Helwan		93·9	300	i 13 15k	0	24 24	+ 4	23 42	SKS	—
Helsinki		94·7	331	e 13 17	− 2	e 24 23	− 4	e 17 10	PP	e 41·5
Istanbul		94·8	311	i 13 21	+ 1	e 24 54	+26	—	—	—
Bucharest		96·6	315	e 13 31	+ 3	i 24 2	[+ 1]	e 16 56	PP	40·5
Upsala		98·4	331	e 13 29?	− 7	24 52	− 6	e 17 5	PP	e 43·5
Warsaw		98·5	323	13 34a	− 2	24 57	− 2	17 35	PP	e 39·5

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Belgrade		100·5	316	e 13 38	− 7	e 24 17	[− 3]	e 18 34	PP	e 51·6
Budapest		100·8	319	13 45	− 2	i 24 20	[− 2]	i 25 20	S	41·5
Kalossa	E.	101·1	318	e 13 51	+ 3	e 24 27	[+ 4]	e 25 29	S	—
Copenhagen		102·4	328	i 13 53	− 1	24 59	[+30]	17 57	PP	46·5
Victoria		102·4	40	14 0	+ 6	24 42	[+13]	18 24	PP	46·5
Prague		103·1	322	e 14 0	+ 3	(e 25 35)	− 2	e 18 37	PP	e 41·5
Potsdam	E.	103·2	325	e 14 0	+ 3	i 25 42	+ 4	i 18 16	PP	e 39·5
Zagreb		103·3	318	e 14 0	+ 2	e 24 35	[+ 2]	e 18 21	PP	e 52·5
Bergen		103·9	334	e 13 59	− 1	e 25 44	0	17 49	PP	42·0
Ferndale	E.	103·9	48	e 18 13	PP	—	—	—	—	e 47·8
Cheb		104·3	323	e 14 30	+28	i 24 40	[+ 2]	i 18 45	PP	e 52·5
Jena	N.	104·5	323	e 14 4	+ 1	e 25 50	+ 1	e 24 40	SKS	—
Triest		104·9	318	e 14 9	+ 4	i 24 39	[− 1]	e 18 12	PP	—
Ukiah		105·0	49	17 37	PKP	e 24 37	[− 4]	e 18 39	PP	e 41·6
Shasta Dam		105·2	47	e 14 5	− 1	—	—	i 18 30	PP	—
Grand Coulee		105·4	39	e 14 9	P	—	—	—	—	—
Scoresby Sund		105·6	350	e 14 7	P	24 48	[+ 4]	18 31	PP	45·5
Berkeley		106·0	50	i 14 10	P	i 24 53	[+ 7]	i 18 33	PP	e 48·0
Santa Clara		106·4	50	i 18 39	PP	e 34 31	SS	—	—	e 48·8
Stuttgart		106·7	322	e 14 12a	P	i 24 48	[− 1]	e 18 36	PP	e 49·5
Rome		106·9	315	i 14 11a	P	i 24 59	[+10]	i 18 48	PP	e 51·2
Florence		107·1	316	e 14 17	P	i 24 50	[0]	—	—	—
Chur		107·2	320	e 14 14	P	e 24 51	[0]	e 17 41	PKP	—
De Bilt		107·7	327	e 14 16	P	i 24 52	[− 1]	e 17 55k	PKP	e 50·5
Strasbourg		107·7	323	e 14 16	P	i 24 54	[+ 1]	e 17 41	PKP	52·9
Zürich		107·7	321	e 14 22	P	e 24 55	[+ 2]	e 17 40	PKP	—
Pavia	Z.	108·1	319	e 14 12?	P	—	—	—	—	—
Basle		108·2	322	e 14 20	P	e 26 24	S	e 17 40	PKP	—
Fresno		108·2	50	e 8 53	?	e 30 14	?	—	—	—
Neuchatel		108·8	321	e 14 30	P	e 24 59	[+ 1]	e 18 57	PP	—
Uccle		108·8	326	e 14 23	P	e 25 0	[+ 2]	e 17 50	PKP	e 54·5
Aberdeen		108·9	334	i 18 9	[−17]	i 24 59	[+ 1]	28 9	PS	43·6
Santa Barbara	Z.	108·9	53	i 14 26	P	—	—	e 18 30	PP	—
Tinemaha	Z.	109·3	50	e 14 24	P	e 29 45	?	i 19 33	PP	—
Besançon		109·3	321	e 19 1	PP	e 26 35	S	e 34 44	SS	e 53·5
Haiwee	Z.	109·8	51	e 18 42	[+14]	—	—	—	—	—
Durham	N.	109·9	331	e 18 58	PP	i 25 12	[+10]	—	—	—
Edinburgh		110·1	332	e 18 29	[+ 1]	25 0	[− 3]	e 19 12	PP	—
Butte		110·2	39	e 19 14	PP	e 26 53	S	e 29 38	PPS	e 44·2
Pasadena		110·2	53	e 14 28	P	e 26 7	?	i 18 30	PKP	44·7
Mount Wilson		110·3	53	i 14 32	P	e 26 7	?	i 18 30	PKP	—
Saskatoon		110·8	32	20 42	PPP	22 4	SKP	37 48	SSS	—
Paris		110·8	324	14 31	P	25 7	[+ 1]	e 17 52	PKP	e 45·5
Riverside		110·9	53	e 14 31	P	e 26 11	[+65]	i 18 30	PKP	—
Kew		111·0	328	i 14 36k	P	e 25 8	[+ 1]	e 19 17	PP	e 50·5
Bozeman		111·3	39	e 19 10	PP	e 25 15	[+ 7]	e 28 35	PS	e 45·8
Palomar		111·5	53	e 14 34	P	i 26 17	[+68]	i 18 14	PKP	—
Clermont-Ferrand		111·8	321	e 14 37	P	i 22 5	SKP	i 19 15	PP	56·5
Boulder City		112·3	50	e 14 37	P	i 29 23	PKKP	i 18 23	PKP	—
Antarctica		112·4	174	e 18 10	[−22]	e 27 2	S	i 19 22	PP	48·9
Logan		112·4	43	e 18 33	[+ 1]	e 25 1	[−11]	e 19 14	PP	e 46·1
Salt Lake City		112·8	44	e 18 52	[+19]	e 24 56	[−18]	e 28 58	PS	—
Pierce Ferry		112·9	50	e 14 39	P	i 29 23	PKKP	i 18 35	PKP	—
Jersey		113·2	327	e 14 15	P	e 28 51	PS	—	—	—
Barcelona		114·3	318	19 40	PP	e 26 27	?	e 22 44	SKP	37·2
Tortosa		115·6	317	e 18 46	[+ 7]	i 25 28	[+ 3]	19 44	PP	46·7
Tucson		116·6	53	e 15 5	P	e 27 28	S	i 18 43	PKP	e 46·5
Alicante		117·4	315	i 18 51	[+ 9]	25 41	[+10]	20 13	PP	e 53·5
Ivigtut		117·7	357	18 30	[−13]	27 40	S	29 27	PS	—
Toledo	Z.	119·1	318	i 18 46	[0]	25 38	[0]	i 19 58	PP	—
Almeria		119·5	314	i 18 42	[− 5]	25 39	[− 1]	20 7	PP	62·2
Granada		120·1	315	e 16 5	P	25 38	[− 3]	i 19 1	PKP	60·0
Malaga	Z.	120·9	315	e 18 47	[− 2]	25 35	[− 9]	20 25	PP	72·2
Lisbon		123·1	319	18 53a	[0]	25 52	[+ 1]	20 36	PP	60·7
Chicago		127·4	32	e 19 10	[+ 8]	e 26 58	[+54]	e 20 59	PP	e 51·7

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m. s.			m.
Florissant		127·9	36	e 19 1	[− 2]	e 29 18	S	i 19 12	pPKP		—
St. Louis		128·1	36	i 19 0	[− 3]	28 2	SKKS	i 19 16	pPKP		—
Shawinigan Falls		129·6	17	19 5	[− 1]	26 12	[+ 2]	21 14	PP		—
Seven Falls		129·7	15	19 10	[+ 4]	31 18	PS	21 18	PP		56·5
Ottawa		129·7	20	19 6	[0]	28 0	SKKS	21 14	PP		53·5
Vermont		131·4	19	e 19 11	[+ 2]	i 22 32	PKS	i 21 30	PP	e	54·6
Halifax		133·6	10	19 12	[− 1]	28 30	SKKS	22 47	PKS		59·5
Harvard		133·7	18	e 19 13	[− 1]	e 22 47	PKS	e 21 42	PP	e	46·5
Weston		133·9	18	19 1	[−13]	i 39 29	SS	i 22 43	PKS		—
Fordham		134·3	21	e 19 3	[−12]	i 22 46	PKS	e 21 55	pPP		—
Philadelphia		134·6	23	e 19 17	[+ 2]	e 27 55	SKKS	e 21 39	PP	e	55·8
Columbia		136·6	33	e 19 36	[+17]	i 22 58	PKS	e 21 58	PP	e	58·6
Santa Lucia	E.	144·0	156	19 30?	[− 2]	—	—	—	—		—
Bermuda		145·1	17	i 19 36	[+ 2]	e 35 49	PPS	i 23 20	PP	e	59·7
La Plata	E.	146·1	174	19 36	[0]	39 6	SKSP	21 55	PP		76·7
	N.	146·1	174	19 37	[+ 1]	30 6	SKKS	23 3	PP		72·6
Balboa Heights		152·3	68	e 19 55	[+10]	—	—	—	—		—
Huancayo		155·8	117	i 19 53	[+ 3]	e 30 22	SKKS	i 23 58	PP	e	66·0
La Paz		159·0	138	i 19 58	[+ 4]	i 31 4	SKKS	i 20 36	PKP_2		75·5
Fort de France		162·6	25	i 20 0	[+ 2]	—	—	e 24 30	PP		—

Additional readings and notes :—
Perth i =14m.45s.
Brisbane iN =7m.42s. and 13m.50s.
Riverview i =7m.52s., iZ =8m.3s., iEZ =8m.6s., iZ =8m.19s., eN =13m.57s., eZ = 14m.6s., iSN =14m.9s., eEN =14m.18s., iSSZ =17m.10s., iEZ =17m.26s., eQEN = 18m.18s.
Kodaikanal SSE =19m.40s.
Hyderabad iPN =8m.51s. PP =10m.48s., iN =20m.56s.
New Delhi PPPN =12m.13s., iE =17m.34s., iS_cSN =19m.5s., SSE =20m.28s., SSN = 20m.32s., SSSN =22m.7s.
Bombay iSSE =21m.40s., SSN =21m.53s.
Wellington pP_cP =10m.50s., e =11m.51s., PPP =13m.55s., P_cS? =14m.30s., i =16m.4s., S_cS? =20m.4s., e =21m.5s.
Tananarive sP =12m.41s., PP =15m.31s., PPP =17m.2s., sS =22m.49s., SS =27m.16s., SSS =30m.30s.
College iS =23m.26s., iPS =24m.16s., eSS =29m.5s.
Ksara PS =24m.48s.
Sitka eSKS =23m.52s., eSS =30m.11s., eSSS =33m.32s.
Helwan PSN =25m.42s., PPSN =26m.18s.
Helsinki eSKS =23m.48s., ePS =25m.39s., ePPS =26m.7s., e =29m.34s., eSS =30m.38s.
Bucharest eE =13m.34s., iE =13m.44s., ePPPE =18m.32s., eSKSN =23m.40s., iSN = 24m.5s., iPSE =24m.42s., iPS?N =24m.50s., eSSE =29m.31s.
Upsala eE =16m.42s., SKSN =24m.1s., eSKSE =24m.5s., SE =24m.57s., ePSN = 26m.16s., iPSE =26m.20s., eSSE =31m.30s.?, eSSS?E =34m.30s.?
Warsaw iPZ =13m.37s., PN =13m.53s., eZ =14m.0s. and 17m.7s.?, eN =18m.37s., eZ =18m.54s., PPPN =19m.34s., PPPZ =19m.40s., SKSN =24m.15s., SZ = 24m.45s., PSZ =26m.7s.?, ePSN =26m.14s., ePPS =27m.7s.?, SSZ =31m.7s.?, SSN =31m.22s., SSSN =34m.59s., SSSZ =35m.7s.?
Belgrade e =16m.11s., ePPP =20m.18s., ePS =26m.0s.,
Budapest PN =13m.48s., eN =23m.30s.?, PPSE =25m.29s., eSSN =29m.45s., SSE = 30m.15s., eSSSE =33m.9s.
Kalossa eN =18m.32s. and 25m.33s.
Copenhagen i =24m.30s., PS =26m.56s., SS =32m.42s.
Victoria S =25m.48s., PS =27m.12s., PPS =27m.42s., SS =32m.42s., SSS =36m.42s.
Prague ePKP =17m.59s., eSKS =19m.0s., ePS =24m.31s., e =27m.6s., and 28m.0s., eSS =32m.36s., eSSS =37m.0s., SKS is given as PS and other phases wrongly identified.
Potsdam iE =18m.32s., iSKSE =24m.32s., iSKKSE =25m.16s., iPSE =27m.11s.
Zagreb eP_cPNE =14m.23s., eSKSNE =24m.32s.?, eSKKS =25m.7s., iPS =25m.42s.,
Bergen eZ =20m.45s., SKSEN =24m.37s., SKKSEN =25m.17s., PPSZ =27m.23s., eEZ =27m.31s., eN =31m.4s., eE =31m.12s., eN =36m.24s.?
Cheb ePKP =18m.15s., ePPP =20m.56s., iSKKS =25m.43s., ePS =27m.30s., ePPS = 28m.29s., eSS =34m.16s., eSSS =37m.50s.
Jena ePNZ =14m.9s., eN =17m.47s.
Triest iS =25m.52s.
Ukiah ePS =27m.29s., eSS =36m.58s.
Shasta Dam iP =14m.10s.
Scoresby Sund 17m.34s., SKKS =25m.33s. and 25m.58s., PS =27m.36s., eN =31m.36s., SS =33m.34s.
Berkeley iS_cSN =26m.19s., iPPSE =28m.54s., eZ =30m.0s., iZ =30m.3s., eQN = 43m.30s.

Continued on next page.

Stuttgart eP =14m.37s.a, iPP =19m.5s., ePPP =21m.4s., iS =26m.12s., iPS =27m.44s., iPPS =28m.53s., eZ =29m.42s.?, ePKKP =30m.42s., eSS =33m.30s., eSSS = 37m.12s., eSSSS =42m.30s.
Rome iPPPN =20m.49s., iSKSN =26m.20s., iSN =26m.27s., iPSN =28m.32s., iPPSN = 29m.29s., iSSN =33m.51s., iSSSN =38m.25s.
De Bilt ePP =18m.46s., iPS =27m.58s., eSS =34m.0s.
Strasbourg iP =14m.20s., ePKP =17m.45s., iPP =18m.47s. and 18m.54s., ePP = 19m.8s., i =19m.28s., iPPP =21m.52s., eSKS =24m.38s., iSKKS =26m.16s., iS = 26m.21s., iPS =27m.53s., i =27m.56s., iPPS =28m.48s., i =29m.38s., iSS =34m.36s. and 34m.51s.
Zürich ePP =18m.46s.
Basle ePP =18m.54s.
Neuchatel e =27m.26s.
Uccle ePP? =19m.22s., ePPPE =21m.42s., eSKKSZ =25m.47s., eSKKSEN =25m.54s., eSN =26m.29s., iPS =28m.5s., eSSEN =34m.48s.
Aberdeen iE =23m.57s., E =38m.47s.
Tinemaha iZ =14m.42s.
Durham iN =19m.41s., 24m.28s., and 26m.38s.
Edinburgh PPP =21m.33s., eSKKS =26m.6s., PS =28m.22s., PPS =29m.47s., eSS = 34m.41s.
Butte eSSS =38m.49s.
Pasadena iEN =26m.37s., iPPSZ =28m.29s., iZ =28m.56s., ePKKPZ =29m.44s., eSSZ =33m.39s., eSSSZ =38m.30s.
Mount Wilson eZ =29m.29s.
Saskatoon PS =31m.0s.
Paris ePKP? =18m.43s., PP =19m.8s., PPP =21m.56s., SKKS? =25m.58s., iS = 26m.43s. and 26m.46s., iPS =28m.28s. and 28m.31s., i =29m.31s., iPPS =30m.1s., SS =34m.30s.?, SSS =38m.30s.?
Riverside eZ =29m.26s.
Kew i =20m.11s., ePPPE =21m.23s.?, eEZ =23m.29s., eSKKSEN =26m.3s.?, eSZ = 26m.23s.?, eN =26m.43s., iPSZ =28m.29s., iPPSZ =29m.35s., eSSE =34m.33s.?, eSSSE =39m.3s.?, eQN =45·5m.
Bozeman eS =26m.54s., eSS =34m.54s., eSSS =39m.34s.
Palomar iPPZ =18m.42s., iZ =29m.7s. and 29m.40s.
Clermont-Ferrand i =20m.25s., iPS =28m.37s., iSS =35m.25s., iSSS =40m.45s., i = 46m.5s.
Boulder City i =18m.35s.
Antarctica PS =28m.54s.
Logan iPKP =18m.51s., iPP =19m.19s., i =24m.1s., eSKKS =26m.1s., eS =27m.5s., iPS =28m.53s., iPPS =29m.49s., eSS =35m.0s.
Salt Lake City eS? =27m.15s., ePPS =30m.6s., eSSS =39m.10s.
Tortosa PPPEN =22m.13s., iN =23m.13s., SKSEN =25m.58s., SKKSEN =26m.36s., iN =27m.24s. and 28m.10s., PSEN =29m.15s., PPSN =30m.28s., iN =32m.23s., SSEN =35m.28s., SSP?E =36m.19s., PKP,PKP?E =37m.54s., SSSEN =40m.2s.
Tucson iPP =19m.50s., i =20m.13s., ePKS =21m.39s., eSKKS =27m.0s., iPKKP = 29m.15s., iPS =29m.20s., ePPS? =31m.23s., eSS =35m.40s., eSSS =39m.56s.
Alicante PPP =22m.49s., SKS =25m.57s., SKKS =26m.8s., PS =29m.49s., PPS = 30m.49s., PKKP =32m.49s., SS =35m.49s., SSP =37m.13s., SSS =40m.17s., Q = 49m.21s.
Ivigtut 19m.54s. and 26m.51s.
Almeria PKS =22m.15s., PPP =22m.41s., SKKS =26m.52s., PS =29m.47s., PPS = 31m.15s., SS =36m.27s., SSS =40m.53s., Q =50m.11s.
Granada iPP =20m.14s., SKP =22m.6s., PPP =22m.50s., SKKS =27m.3s., PS = 29m.59s., SS =37m.24s., SSS =41m.23s., Q =56m.18s.
Malaga iZ =20m.49s., eZ =24m.27s., SKKS?Z =26m.49s., iPSZ =29m.56s., QZ = 63m.55s.
Lisbon PKPZ =18m.56s., PPPZ =23m.10s., E =30m.5s., PSEZ =30m.15s., SSS = 41m.42s.
Chicago ePS =30m.56s., ePPS? =32m.2s., eSS =38m.1s.
Florissant iPKPZ =19m.5s., iPPZ =21m.0s., ipPPZ =21m.25s., iSKPE =22m.25s., iE =22m.36s., ipSKPE =22m.45s., ePPPE =23m.21s., iZ =24m.22s. and 24m.39s., eZ =25m.26s., eE =29m.40s., isSE =29m.56s., ePSE =31m.3s., iE =31m.33s., iPPS?Z =32m.24s., iZ =33m.24s., iPPPSZ =34m.4s., iZ =34m.27s.
St. Louis iZ =19m.54s., iPPZ =21m.4s., ipPPZ =21m.24s., iSKPN =22m.22s., ipSKPN =22m.47s., ePPPN =23m.24s., eS?N =28m.34s., esS?N =29m.2s., iPS?E = 31m.26s., ipPS?Z =32m.18s., ePPSE =32m.35s., ipPPSN =32m.58s., ePPPSE = 33m.52s., eSSE =36m.45s., esSS?E =37m.27s.
Shawinigan Falls SKP =22m.26s., SKKS =28m.12s., PS =31m.30s.
Seven Falls SKP =22m.36s., S =29m.6s., SS =38m.42s.
Ottawa SKP =22m.30s., PPP =23m.42s., PS =31m.42s., SS =38m.30s.
Vermont ePPS =33m.40s., iSS =38m.46s.
Halifax PPS =33m.42s., SS =39m.30s., SSS =44m.42s.
Harvard eZ =19m.30s., eNZ =22m.30s., eN =22m.58s., and 23m.39s., eZ =23m.53s., ePPPZ =24m.57s., ePPSZ =33m.43s., eZ =34m.41s., eSSE =39m.30s.
Fordham i =19m.14s., eSS =40m.54s.
Philadelphia iPP =21m.48s., iPKS =22m.52s., ePPS =33m.50s., eSS =43m.53s., eSSS =43m.58s.
Columbia eSS =40m.0s.
Bermuda eSS =41m.40s.

Continued on next page.

La Plata N =19m.53s., Z =19m.58s., N =20m.42s., and 21m.58s., PKSN =24m.0s., E = 24m.54s. and 25m.53s., PPPEN =26m.18s., N =28m.0s., PSN =35m.18s., PPSE = 36m.6s., PSSN =43m.29s., PSSE =44m.30s., SSSN =47m.36s., QE =64m.12s., QN =66m.36s.
Huancayo i =21m.36s., iSKKS =30m.55s., eSS =44m.47s.
La Paz pPKP$_2$Z =21m.28s., sPKP =22m.22s., SKPZ =23m.38s., iPPZ =24m.24s., SKS?Z =26m.42s., PPPZ =27m.44s., SSE =44m.4s., SSSZ =48m.30s., iN = 53m.54s.
Fort de France iPKP$_2$ =20m.50s.

June 12d. 18h. 56m. 54s. Epicentre 1°·1N. 126°·4E. Focus at base of superficial layers. (as at 9h.).

		Δ	Az.	P.	O−C.	S.	O−C.	
		°	°	m. s.	s.	m. s.	s.	
Vladivostok		42·1	6	—	—	e 17 39	SS	
Irkutsk		54·3	343	e 9 29	+ 4	16 58	− 1	
Obi-garm		63·8	313	e 10 37	+ 6	—	—	
Stalinabad		64·4	313	e 10 36	+ 1	—	—	
Tashkent		65·1	315	e 10 38	− 2	e 19 25	+ 7	
Sverdlovsk		76·0	329	11 42	− 4	21 18	− 7	
Grozny		82·4	313	e 12 19	− 1	e 22 37	+ 4	
Erevan		83·1	310	e 12 24	0	e 22 50	+10	
Moscow		88·4	326	e 12 48	− 2	e 23 28	− 3	
Ksara		89·8	303	e 13 15	+19	e 23 52	+ 8	

Long waves were recorded at Riverview and Kew.

June 12d. Continuation of list of Central Asian aftershocks.

Almata 7h.32m.49s., 15h.1m.21s.

Andijan 7h.30m.48s., 12h.39m.1s., 14h.10m.57s., 15h.0m.19s., 18h.0m.5s., 23h.10m.45s.

Frunse 7h.31m.32s., 15h.1m.6s.

Obi-garm 2h.41m.34s., 7h.27m.8s., 7h.31m.37s., 14h.10m.32s., 15h.1m.11s.

Stalinabad 7h.31m.53s., 14h.10m.25s.

Tashkent 7h.31m.25s.?

Tchimkent 15h.1m.1s.

June 12d. Readings also at 1h. (near Grozny), 6h. (De Bilt and Kew), 9h. (Malaga and near Mizusawa), 10h. (Shasta Dam and near Mizusawa), 11h. (Mount Wilson, Pasadena, Riverside, Tinemaha, and Stuttgart), 18h. (near Ottawa), 19h. (near Branner), 21h. (Sverdlovsk, Brisbane, Riverview, and near Mineral), 23h. (Riverview, Stuttgart, and near Ottawa).

June 13d. 15h. 7m. 2s. Epicentre 1·°1N. 126°·4E. (as on 12d.).

		Δ	Az.	P.	O−C.	S.	O−C.	L.
		°	°	m. s.	s.	m. s.	s.	m.
Brisbane		38·3	140	e 7 24	0	1 8 55	PP	—
Riverview	E.	41·8	148	—	—	15 36	SS	e 22·2
Vladivostok		42·1	6	e 8 0	+ 5	e 14 7	− 9	—
Irkutsk		54·3	343	e 9 24	− 6	17 1?	− 6	—
Andijan		62·7	315	—	—	e 19 0	+ 3	—
Obi-garm		63·8	313	e 10 38	+ 2	—	—	—
Stalinabad		64·4	313	e 10 35	− 5	e 19 17	− 1	—
Tashkent		65·1	315	e 10 38	− 7	e 19 23	− 4	—
Sverdlovsk		76·0	329	i 11 43	− 8	e 21 21	−13	—
Grozny		82·4	313	e 12 26	+ 1	—	—	—
Leninakan		83·7	310	e 12 37	+ 5	—	—	—
Sotchi		86·8	313	e 12 52	+ 5	—	—	—
Moscow		88·4	326	12 58	+ 3	23 32	− 8	—
Ksara		89·8	303	e 12 59?	− 3	e 23 55?	+ 2	—
Helwan	Z.	93·9	300	e 13 26	+ 5	—	—	—

Long waves were also recorded at Kew, Malaga, Wellington, and Arapuni,

June 13d. 20h. 24m. 49s. Epicentre 21°·6N. 145°·7E.

A = −·7688, B = +·5244, C = +·3660; δ = 0; h = +4;
D = +·564, E = +·826; G = −·302, H = +·206, K = −·931.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Shizuoka		14·8	336	3 34	+ 2	5 41	−37	—	—	8·2
Yokohama		14·8	340	3 13	−19	6 29	+11	3 24	P	7·4
Owase		15·0	328	e 3 42	+ 7	6 30	+ 7	—	—	—
Nagoya		15·5	332	e 3 41	− 1	6 23	−12	—	—	6·9
Osaka		15·8	328	e 3 45	0	6 51	+ 9	—	—	—
Kobe		16·0	327	e 3 49	+ 1	7 15	+29	—	—	—
Kôti		16·1	321	e 3 51	+ 2	6 55	+ 6	—	—	—
Miyazaki		16·3	312	e 3 58	+ 6	e 7 2	+ 9	—	—	8·3
Nagano		16·4	338	i 3 53	0	6 51	− 5	—	—	—
Kagosima		16·8	310	4 1	+ 3	7 32	+27	—	—	9·3
Sendai		17·1	349	3 57	− 5	6 57	−15	—	—	e 8·1
Hamada		17·9	321	e 4 10	− 2	7 37	+ 7	—	—	8·5
Mizusawa	N.	17·9	349	4 13	+ 1	7 43	+13	—	—	—
Morioka		18·4	349	e 4 18	0	7 29	−12	—	—	e 9·1
Mori		20·9	350	4 48	+ 2	8 43	+ 8	—	—	—
Sapporo		21·7	352	e 4 56	+ 1	8 56	+ 5	—	—	—
Vladivostok		24·4	335	i 5 20	− 1	i 9 46	+ 7	—	—	—
Nanking		26·1	300	5 29	− 8	9 59	− 8	—	—	12·0
Irkutsk		44·1	325	e 8 14	+ 2	14 51	+ 6	—	—	—
Brisbane	N.	49·3	171	e 8 52	− 1	e 15 34	−25	—	—	—
Honolulu		52·3	79	e 9 11	− 4	e 16 46	+ 6	—	—	e 24·2
Calcutta	E.	52·9	283	e 9 42	+22	i 19 22	SS	—	—	i 27·3
Apia		54·6	125	e 9 31	− 1	i 17 23	+12	i 12 43	PPP	e 23·2
Riverview		55·4	174	i 9 44 a	+ 6	i 17 21	− 1	i 9 57	pP	e 22·9
Semipalatinsk		58·1	318	e 9 51	− 7	—	—	—	—	—
Almata		60·3	309	10 11	− 2	18 26	0	—	—	—
College		60·7	27	e 10 18	+ 3	e 18 33	+ 1	e 12 42	PP	e 25·8
Dehra Dun	N.	60·7	294	e 4 36	?	e 21 48	SS	e 12 15	PP	—
Frunse		62·0	308	e 10 23	− 1	e 18 51	+ 3	—	—	—
Hyderabad	N.	63·1	280	10 34	+ 2	18 58	− 4	12 39	PP	—
Andijan		63·8	306	e 10 42	+ 6	—	—	—	—	—
Auckland		64·3	154	10 48	+ 9	19 26	+ 9	13 10	PP	28·2
Colombo	E.	65·0	268	10 47	+ 3	19 25	− 1	—	—	33·7
Arapuni		65·7	154	—	—	20 11	+37	24 53	SS	27·3
Tchimkent		65·7	308	i 10 51	+ 3	i 19 38	+ 4	—	—	—
Tashkent		66·1	307	e 10 49	− 2	i 19 38	− 1	—	—	—
Obi-garm		66·2	305	i 10 51	− 1	i 19 42	+ 2	—	—	—
Kodaikanal	E.	66·2	273	i 13 11	PP	i 21 51	?	—	—	34·2
Sitka		66·2	36	—	—	i 19 55	+15	—	—	e 27·9
Stalinabad		66·9	304	10 54	− 2	i 19 48	− 1	—	—	—
Bombay		67·8	283	i 11 14	+12	i 19 59	− 1	13 54	PP	34·6
Wellington		68·1	157	10 57	− 7	19 55	− 8	11 20	P_cP	29·2
Sverdlovsk		69·5	325	i 11 9	− 3	i 20 15	− 5	—	—	—
Victoria		74·7	43	11 53	+10	21 31	+12	26 35	SS	35·2
Ferndale		76·3	51	e 15 15	PP	—	—	e 33 23	Q	e 34·6
Ukiah		77·5	53	e 11 55	− 4	e 21 49	− 1	e 15 13	PP	e 32·5
Shasta Dam		77·6	51	e 12 0	0	e 21 45	− 6	e 22 21	S_cS	—
Grand Coulee		77·7	43	e 11 59	− 1	—	—	—	—	—
Mineral	E.	78·3	51	e 12 27	+24	e 21 55	− 4	—	—	e 36·7
Berkeley		78·6	54	i 12 5	0	i 22 5	+ 3	i 14 56	PP	e 35·6
Branner		78·8	54	e 12 8	+ 2	i 22 3	− 1	—	—	e 35·7
Santa Clara		79·0	54	i 12 12	+ 5	i 22 21	+15	—	—	e 36·0
Lick		79·2	54	e 12 13	+ 5	e 22 14	+ 6	—	—	e 36·2
Fresno	N.	80·8	54	i 12 23	+ 6	i 22 26	+ 1	—	—	—
Santa Barbara	Z.	81·7	56	i 12 22	0	—	—	—	—	—
Tinemaha		81·9	54	i 12 23	0	e 22 35	− 1	c 42 20	SKPP′	—
Moscow		82·0	327	i 12 21	− 2	i 22 34	− 3	—	—	—
Haiwee		82·4	54	i 12 26	+ 1	e 22 43	+ 2	—	—	—
Grozny		82·4	314	i 12 24	− 1	22 32	− 9	—	—	—
Butte		82·5	43	e 12 30	+ 4	e 22 44	+ 2	e 28 31	SS	34·5

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m. s.			m.
Mount Wilson		83·0	56	i 12 29k	+ 1	e 22 48	+ 1	e 15 44	PP		—
Pasadena		83·0	56	i 12 27k	− 1	i 22 48	+ 1	i 15 46	PP		e 37·3
Saskatoon		83·4	36	12 38	+ 8	22 53	+ 2	23 53	PS		40·2
Bozeman		83·6	43	e 12 33	+ 2	e 22 51	− 2	e 15 44	PP		e 37·5
Riverside		83·7	56	i 12 30k	− 2	e 22 53	− 1	e 42 14	SKPP′		—
La Jolla		84·2	57	e 12 35	+ 1	e 23 0	+ 1	—	—		—
Palomar		84·3	56	i 12 35	0	e 22 58	− 2	i 15 57	PP		—
Erevan		84·4	311	e 12 37	+ 1	23 5	+ 4	—	—		—
Leninakan		84·7	312	e 12 40	+ 3	e 23 6	+ 2	—	—		—
Logan		84·7	47	i 12 38	+ 1	i 23 13	+ 9	e 15 43	PP		e 35·3
Boulder City		84·8	53	i 12 38	+ 1	e 23 3	− 2	e 42 11	SKPP′		—
Salt Lake City		85·1	48	e 12 41	+ 2	e 23 3	[+ 2]	e 15 44	PP		—
Pierce Ferry		85·4	53	i 13 1	+21	e 23 3	[0]	i 17 6	PP		—
Helsinki		85·5	335	e 12 43	+ 2	e 23 26	+14	e 16 0	PP		e 40·2
Sotchi		86·3	316	12 50	+ 5	23 15	− 5	—	—		—
Scoresby Sund		87·8	356	12 54	+ 2	23 35	+ 1	16 29	PP		—
Upsala		88·5	337	13 1a	+ 5	23 43	+ 2	i 16 27	PP		e 42·2
Simferopol		89·2	319	—	—	23 27	[− 1]	—	—		—
Tucson		89·4	55	i 13 0	0	i 23 53	+ 4	e 16 31	PP		e 36·3
Yalta		89·4	318	e 12 57	− 3	e 23 30	[+ 1]	—	—		—
Warsaw		92·1	329	e 13 9	− 3	e 24 14	+ 1	e 16 55	PP		e 43·2
Bergen	z.	92·2	341	13 15	+ 2	24 30	+16	16 47	PP		43·2
Copenhagen		93·4	336	i 13 20	+ 2	24 33	+ 9	i 17 8	PP		45·2
Ksara		93·4	308	e 13 21	+ 3	25 56	PS	17 12	PP		—
Bucharest		94·3	321	e 13 29	+ 6	e 24 2	[+ 5]	—	—		45·2
Budapest		96·2	326	13 36	+ 5	24 6	[− 2]	e 17 24	PP		48·2
Prague		96·6	331	e 13 37	+ 4	e 24 56	+ 4	e 17 28	PP		e 44·2
Ivigtut		96·7	6	13 38	+ 5	24 54	+ 1	17 28	PP		—
Kalossa		96·9	326	e 13 40	+ 6	—	—	e 19 6	PPP		e 30·2
Aberdeen		97·0	343	i 13 50	+15	i 24 11	[− 1]	i 17 34	PP		43·7
Belgrade		97·2	324	e 13 39	+ 3	e 24 17	[+ 4]	e 17 55	PP		e 53·2
Jena		97·3	332	e 13 32	− 4	e 24 14	[+ 1]	e 17 33	PP		—
Cheb		97·6	331	e 13 41	+ 3	e 24 36	{− 1}	e 17 38	PP		e 47·2
Edinburgh		98·4	342	17 48	PP	25 18	+11	26 43	PS		—
Helwan		98·7	307	13 44	+ 2	25 20	+10	17 53	PP		—
De Bilt		98·9	336	i 13 49a	+ 6	e 25 19	+ 8	i 17 50	PP		e 47·2
Durham	N.	98·9	341	e 17 44	PP	e 24 18	[− 4]	i 26 51	PS		—
Zagreb		98·9	327	e 13 58	+15	e 24 26	[+ 4]	e 17 18	PP		39·2
Stuttgart		99·9	332	e 13 46	− 2	i 25 23	+ 3	e 17 39	PP		e 47·2
Chicago		100·0	38	e 17 58	PP	i 25 31	+11	i 26 58	PS		e 41·8
Triest		100·1	328	e 17 57	PP	i 24 29	[+ 2]	i 25 35	S		—
Florissant		100·2	41	i 13 51	+ 2	i 24 27	[− 1]	i 18 3	PP		—
Uccle		100·3	336	e 13 55	+ 5	25 22	− 1	e 18 0	PP		e 49·2
St. Louis		100·4	41	e 13 47	− 3	e 24 30	[+ 1]	i 18 3	PP		—
Strasbourg		100·7	333	e 13 49	− 3	i 25 29	+ 3	e 18 2	PP		i 48·6
Chur		101·2	330	e 13 54	0	e 24 39	[+ 6]	e 18 7	PP		e 48·2
Zürich		101·3	332	e 13 56	+ 2	e 24 24	[− 9]	e 18 7	PP		—
Kew		101·4	338	i 13 55k	0	e 24 48?	[+14]	i 18 7	PP		e 47·2
Neuchatel		102·2	332	e 17 12	PP	—	—	—	—		—
Besançon		102·5	332	—	—	e 24 31	[− 8]	e 27 22	PS		e 50·2
Paris		102·6	335	e 14 6	+ 6	24 43	[+ 3]	18 6	PP		80·2
Pavia		102·6	330	e 14 51	+51	—	—	—	—		—
Florence		102·7	327	e 14 23	+23	i 24 51	[+11]	—	—		—
Rome		103·4	326	e 14 4	0	i 24 40	[− 3]	i 18 22	PP		i 51·2
Ottawa		103·4	28	14 23	+19	24 41	[− 2]	18 31	PP		48·2
Shawinigan Falls		103·8	25	e 17 52	PKP	e 24 51	[+ 6]	e 27 29	PS		—
Jersey		103·9	339	—	—	e 26 5	+12	e 33 11?	SS		—
Seven Falls		104·1	24	18 36	PP	24 57	[+11]	27 42	PS		52·2
Tananarive		104·1	255	—	—	e 24 54	[+ 8]	27 18	PS		44·2
Clermont-Ferrand		104·8	333	e 14 15	+ 5	i 26 6	+ 6	i 18 35	PP		50·2

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m. s.			m.
Vermont		105·2	27	e 18 29	PP	i 24 41	[−10]	i 27 33	PS		e 48·8
Harvard		107·5	27	e 14 29	P	e 25 6	[+ 4]	e 18 44	PP		e 52·7
Weston		107·7	27	e 14 31a	P	i 24 33	[−29]	e 29 47	PKKP		—
Fordham		107·8	29	e 14 20	P	i 25 4	[+ 1]	i 18 55	PP		—
Philadelphia		107·9	31	e 19 3	PP	e 25 8	[+ 5]	i 28 15	PS		e 48·8
Barcelona		108·8	331	19 2	PP	—	—	—	—		e 52·0
Halifax		108·9	21	19 7	PP	25 19	[+11]	28 31	PS		47·2
Columbia		109·0	39	—	—	e 25 15	[+ 7]	e 28 31	PS		e 47·4
Tortosa		110·0	332	i 19 18	PP	25 15	[+ 3]	28 40	PS		e 53·2
Alicante		112·4	332	19 34	PP	26 26	{+ 4}	30 34	PPS		e 59·3
Toledo	z.	112·6	335	19 29	PP	—	—	—	—		—
Almeria		114·6	332	18 39	[− 3]	25 27	[− 3]	19 51	PP		52·8
Granada		114·8	333	e 17 31	[−72]	i 27 40	S	i 20 9	PP		57·2
Lisbon		115·5	338	19 42k	PP	29 21	PS	22 30	PPP		48·9
Malaga	z.	115·5	333	e 18 37	[− 7]	i 24 37	[−57]	i 29 33	PS		48·9
Bermuda		119·0	29	e 15 23	P	e 30 1	PS	e 20 13	PP		e 49·2
Antarctica		129·2	164	i 19 19	[+ 9]	26 27	[+ 9]	22 38	PKS		e 66·2
Bogota	z.	133·1	60	i 19 26	[+ 8]	—	—	e 22 45	PKS		—
Fort de France		135·3	38	e 19 10	[−12]	e 32 11	PS	e 23 3	PKS		—
Huancayo		139·7	83	e 19 31	[+ 1]	e 29 23	{+ 4}	e 22 34	PP		e 58·0
Santa Lucia	E.	145·8	118	19 41	[0]	—	—	—	—		67·2
La Paz		147·7	86	i 19 51k	[+ 7]	i 30 17	{+11}	23 13	PP		69·2
La Plata	E.	155·4	127	20 23	PKP_2	34 23	PS	43 59	SS		69·6
	N.	155·4	127	20 29	PKP_2	38 53	PPS	44 4	SS		72·2
	Z.	155·4	127	20 23	PKP_2	49 5	SSS	—	—		80·5

Additional readings :—
Calcutta iE =19m.57s. and 24m.12s.
Apia iPEN =9m.38s.
Riverview iP$_c$PE =10m.45s., iPPPN =12m.57s., iPPPZ =13m.2s., iN =18m.2s., iS$_c$SN =19m.33s., iS$_c$SE =19m.37s.
College ePPP? =14m.40s., eSS =22m.48s.
Hyderabad S$_c$SN =20m.19s.
Auckland i =11m.1s. and 11m.47s., S$_c$P =15m.25s., i =18m.29s., SP =19m.57s., i =20m.16s., S$_c$S =20m.36s., i =20m.47s., 22m.37s., and 23m.0s.
Bombay SSE =23m.43s.
Wellington Z =13m.22s., S$_c$S =20m.56s., i =21m.52s., SS =24m.25s., SSS =27m.35s.
Ukiah eSS =26m.54s., eSSS =30m.22s.
Shasta Dam i =12m.58s.
Berkeley iN =12m.9s., iE =12m.13s., iN =12m.18s., eE =15m.13s., iN =21m.17s., eE =22m.8s., iSSN =26m.37s.
Branner iN =12m.14s., eE =22m.7s.
Tinemaha iZ =12m.40s.
Butte eSSS =31m.54s.
Mount Wilson i =12m.32s., eSKP,PKPZ =42m.15s.
Pasadena iE =23m.12s., eSSE =27m.41s., eQN =33m.35s., eSKP,PKP =42m.18s.
Saskatoon SS =28m.29s.
Bozeman ePS =23m.53s., eSS =28m.15s., eSSS =31m.53s.
Riverside iZ =12m.50s. and 15m.45s.
Palomar iZ =12m.58s.
Logan i =13m.29s. and 14m.1s., ePPP =18m.21s., ePS =24m.19s., eSS =28m.34s.
Boulder City i =17m.29s.
Salt Lake City iS =23m.15s., ePS =24m.16s., eSS =28m.31s., eSSS =32m.19s.
Pierce Ferry iSKP,PKP =42m.10s.
Helsinki e =13m.0s. and 17m.23s., ePPP =17m.54s., eSKS =23m.3s., ePS =23m.48s., ePPS =24m.13s., e =27m.8s., eSS =28m.24s., e =35m.47s.
Scoresby Sund i =12m.59s., SKS =23m.19s., PS =24m.43s., SS =29m.29s., eE =36m.24s.
Upsala iN =13m.33s., 13m.48s., and 14m.0s., iE =15m.6s., eN =22m.57s., eSKS?E =23m.10s.?, iPSN =24m.44s., eSS?N =28m.41s., eSS?E =29m.11s., eSSSE =33m.11s.?
Tucson i =13m.8s. and 13m.26s., iPP =16m.37s., ePPP =18m.12s., eSKS =23m.25s., ePS =24m.49s., iPPS =26m.1s., eSS =29m.52s., ePKKP =30m.38s., eSSS =33m.28s., ePKP,PKP =38m.49s.
Warsaw PZ =13m.13s.k, iPZ =13m.17s.k, ePPE =16m.59s., ePPPE =18m.53s., ePPPN =18m.58s., SKSN =23m.42s., PSZ =25m.28s., PSN =25m.36s., PPSEZ =26m.0s., PPSN =26m.8s., SSZ =30m.28s., SSE =30m.31s., SSN =30m.34s., SSSZ =33m.40s., SSSN =34m.4s., SSSE =34m.8s.
Bergen PSZ =25m.30s., SSZ =30m.45s.
Copenhagen i =13m.24s., 23m.55s., PS =25m.42s., 30m.50s., and 34m.23s.
Budapest PN =13m.48s., eE =18m.32s., ePPPE =19m.1s., PPPN =19m.15s., SEN =24m.11s., PSE =25m.1s., PPSN =25m.4s., eE =31m.36s.
Prague ePPP =19m.29s., eSS =31m.11s., eSSS =35m.11s.?
Ivigtut 23m.59s., PS =26m.29s.

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Kalossa eE =13m.43s. and 18m.47s., eN =18m.51s., eE =21m.48s.
Aberdeen iE =18m.33s., 26m.0s., and 32m.26s.
Belgrade e =17m.8s., ePPP =20m.11s., eSS? =32m.10s.
Jena ePZ =13m.37s., eN =16m.56s., and 26m.25s., eE =31m.37s., eN =31m.41s.
Cheb ePPP =19m.49s., iSKKS =25m.14s., ePS =26m.39s., eSS =31m.49s., eSSS = 38m.26s.
Edinburgh SS =32m.11s.
Helwan iZ =14m.3s. and 17m.40s., SKSEN =24m.23s., SSN =32m.14s.
De Bilt ePS =26m.47s., eSS =32m.1s.
Durham iN =17m.52s., 24m.24s., and 25m.15s.
Zagreb ePS =23m.12s., eSSSE =32m.48s.
Stuttgart iP =13m.54s.a, iPP =18m.0s., ePPP =20m.7s., ePS =26m.57s., iSS =32m.11s., e =37m.55s., and 39m.39s.
Chicago eSKS =24m.23s., eSS =32m.25s.
Triest iSS =32m.18s.
Florissant iZ =14m.3s., iSE =24m.41s., iPSE =26m.59s.
Uccle eN =22m.2s., eSKKSE =25m.26s., eSSE =32m.16s., eSSN =32m.21s.
St. Louis eZ =13m.51s., iZ =14m.8s and 14m.14s., iSE =24m.44s., iPSE =27m.6s.
Strasbourg iP =13m.58s., iPP =18m.5s., e =19m.25s. and 20m.21s., ePPP =20m.27s., eSKKS =24m.6s., iPS =27m.1s. and 27m.7s., ePS =27m.13s., iPPS =27m.44s., iSS =32m.27s., eSS =32m.32s., iSSS =36m.30s. and 36m.33s.
Zürich ePKP =17m.10s.
Kew ePPPZ =20m.8s.?, iSKKSE =25m.23s., eSEN =25m.43s.?, ePSNZ =27m.13s., ePPS =27m.48s., eSSEN =32m.23s.?
Besançon eSS =32m.33s.
Paris PPP? =19m.48s., i =23m.38s., SKS =25m.31s., SKKS =25m.44s., S =25m.58s., e =26m.44s., ePS =27m.11s., SS =32m.41s.
Rome ePPPN =20m.32s., eSE =26m.34s., eSSN =33m.12s.
Ottawa eZ =17m.17s., SE =25m.59s., PS =27m.35s., SS =33m.31s., SSSN =37m.11s.?, SSSS =41m.11s.?
Seven Falls SS =33m.40s., SSSS =42m.11s.?
Tananarive SSS =33m.26s., readings wrongly identified.
Clermont-Ferrand iPS =27m.49s., iSS =33m.25s., iSSS =37m.22s.
Vermont iSS =33m.33s., iSSS? =37m.39s.
Harvard iPPZ =18m.54s., iZ =20m.26s., ePPPZ =21m.6s., eSKSN =25m.18s., ePSZ = 28m.3s., ePSE =28m.8s., ePSN =28m.13s., ePPSZ =29m.10s., ePPSN =29m.18s., eSSPE =34m.11s., eN =34m.29s., eZ =34m.44s.
Fordham iPPP =21m.18s., iPS =28m.16s.
Philadelphia eSS =34m.18s., eSSS =38m.20s.
Halifax PPP =21m.35s., SS =34m.34s.
Columbia eSS =34m.20s.
Tortosa PPPN =21m.34s., SKPN =22m.20s., SKKSN =26m.5s., PPSEN =29m.46s., SSE =34m.17s., SSPN =34m.51s., SSSEN =38m.31s.
Alicante PP =21m.18s., PPP =22m.54s., SKS =26m.38s., PPPS =31m.46s., SS = 37m.18s., SSS =41m.20s., Q =51m.14s.
Toledo PPZ =20m.34s.
Almeria PKS =22m.7s., PPP =22m.23s., PS =29m.27s., PPS =30m.43s., SS =35m.43s., SSS =40m.7s.
Granada iPKP =19m.30s., pPP =20m.31s., SKP =22m.13s., PPP =22m.30s., PS = 29m.26s., PPS =30m.48s., iSS =35m.44s., SSS =39m.52s.
Malaga ePPZ =19m.40s., iPPZ =19m.53s.k, iPPPZ =22m.33s., PPSZ =30m.26s., ePKKS?Z =33m.49s., SSZ =34m.53s.
Bermuda eSS =37m.5s.
Antarctica iPP =21m.27s., ePPP =24m.11s., SKKS =28m.15s., eS =29m.39s., ePS = 31m.52s., eSS =38m.37s.
Bogota iZ =19m.40s.
Huancayo ePKS =23m.21s., ePS =32m.23s., eSS? =41m.11s.
La Paz SKP =23m.26s., iPSKSEZ =33m.31s., iZ =35m.55s., iSSE =42m.39s.
La Plata Z =21m.59s., E =22m.41s., 24m.23s., 39m.4s., and 48m.5s., N =57m.33s., QE =58·8m., QN =66m.5s.
Long waves were also recorded at Montezuma.

June 13d. 21h. 0m. 32s. Epicentre 21°·6N. 145°·7E. (as at 20h.).

	△	Az.	P.	O−C.	S.	O−C.		Supp.
	°	°	m. s.	s.	m. s.	s.	m.	s.
Shizuoka	14·8	336	e 3 42	+10	—	—	—	—
Gihu	15·8	332	e 3 55	+10	—	—	—	—
Osaka	15·8	328	e 4 1	+16	—	—	—	—
Miyasaki	16·3	312	e 3 59	+ 7	—	—	—	—
Hukusima	16·7	346	e 3 55	− 2	6 58	− 5	—	—
Kagosima	16·8	310	3 51	− 7	—	—	—	—
Sendai	17·1	349	e 4 0	− 2	—	—	—	—
Kumamoto	17·4	314	e 4 7	+ 1	—	—	—	—
Wazima	17·5	337	e 4 9	+ 2	7 27	+ 6	—	—
Hamada	17·9	321	e 4 11	− 1	—	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Misuzawa	E.	17·9	349	e 4 20	+ 8	5 4	?	—	—
Hukuoka		18·0	316	e 4 13	0	7 39	+ 7	—	—
Sapporo		21·7	352	e 5 8	+13	—	—	—	—
Shasta Dam		77·6	51	i 11 59	− 1	—	—	—	—
Grand Coulee		77·7	43	i 11 59	− 1	—	—	—	—
Berkeley	Z.	78·6	54	i 12 5	0	—	—	—	—
Santa Barbara	Z.	81·7	56	i 12 22	0	—	—	—	—
Tinemaha		81·9	54	i 12 22	− 1	—	—	—	—
Haiwee	Z.	82·4	54	i 12 25	0	—	—	—	—
Mount Wilson	Z.	83·0	56	i 12 28	0	—	—	—	—
Pasadena	Z.	83·0	56	i 12 28	0	—	—	—	—
Riverside	Z.	83·7	56	i 12 31	− 1	—	—	—	—
Palomar		84·3	56	i 12 34	− 1	—	—	—	—
Boulder City		84·8	53	i 12 38	+ 1	e 23 35	+30	—	—
Pierce Ferry		85·4	53	i 12 40	0	e 23 42	+31	—	—
Tucson		89·4	55	i 13 0	0	—	—	—	—
Copenhagen		93·4	336	13 16	− 2	—	—	—	—
Stuttgart	Z.	99·9	332	e 13 46	− 2	—	—	e 17 53	PP
Antarctica		129·2	164	e 19 17	[+ 7]	i 22 36	PKS	e 21 18	PP

Additional readings :—
Tucson i = 13m.30s.
Antarctica i = 20m.25s.

June 13d. 23h. 50m.19s. Epicentre 21°·6N. 145°·7E. (as at 21h.).

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Guam		8·1	186	i 1 15	?	i 2 58	?	—	—	—
Mera		14·2	340	e 3 31	+ 7	7 16	L	—	—	(7·3)
Shizuoka		14·8	336	3 28	− 4	6 28	+10	—	—	—
Tokyo		15·0	341	e 3 37	+ 2	6 57	+34	4 6	PP	—
Mito		15·4	344	e 3 43	+ 3	6 53	+21	—	—	10·8
Nagoya		15·5	332	3 38	− 4	7 0	+25	—	—	—
Maebasi		15·8	340	e 3 44	− 1	6 55	+13	—	—	e 10·1
Osaka		15·8	328	e 3 42	− 3	7 7	+25	—	—	—
Kobe		16·0	327	e 3 48	0	7 22	+36	—	—	10·3
Kôti		16·1	321	e 3 45	− 4	6 49	0	—	—	—
Miyazaki		16·3	312	e 3 56	+ 4	7 8	+15	—	—	8·8
Sendai		17·1	349	4 1	− 1	7 26	+14	—	—	9·3
Kumamoto		17·4	314	e 4 5	− 1	7 27	+ 8	—	—	e 11·8
Wazima		17·5	337	e 4 2	− 5	7 29	+ 8	4 27	PP	9·9
Hamada		17·9	321	4 8	− 4	7 37	+ 7	—	—	8·8
Mizusawa		17·9	349	4 13	+ 1	7 16	−14	—	—	—
Hukuoka		18·0	316	e 4 11	− 2	7 39	+ 7	—	—	e 9·1
Morioka		18·4	349	e 4 16	− 2	7 43	+ 2	—	—	—
Mori		20·9	350	4 48	+ 2	8 28	− 7	—	—	—
Nemuro		21·7	0	e 5 2	+ 7	—	—	—	—	—
Sapporo		21·7	352	4 54	− 1	8 54	+ 3	—	—	13·4
Vladivostok		24·4	335	i 5 18	− 3	i 9 36	− 3	—	—	—
Nanking		26·1	300	5 36	− 1	10 15	+ 8	—	—	—
Irkutsk		44·1	325	8 10	− 2	14 41	− 4	—	—	—
Brisbane		49·3	171	—	—	e 15 46	−13	—	—	—
Calcutta	E.	52·9	283	—	—	i 20 27	SS	—	—	i 28·2
Riverview	E.	55·4	174	—	—	i 17 27	+ 5	i 19 32	S_eS	—
Semipalatinsk		58·1	318	—	—	e 17 41	−17	—	—	—
Almata		60·3	309	10 12	− 1	—	—	—	—	—
College		60·7	27	e 10 16	+ 1	e 18 13	−19	e 12 37	PP	e 25·4
Dehra Dun	N.	60·7	294	e 11 17	+62	—	—	—	—	—
Frunse		62·0	308	e 10 22	− 2	18 46	− 2	—	—	—
Andijan		63·8	306	e 10 33	− 3	19 7	− 4	—	—	—
Auckland		64·3	154	—	—	19 16	− 1	—	—	24·7
Colombo	E.	65·0	268	12 46	PP	19 19	− 7	—	—	34·4

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Arapuni		65·7	154	—	—	19 41	+ 7	—	—	27·2
Tchimkent		65·7	308	i 10 46	− 2	i 19 31	− 3	—	—	—
Tashkent		66·1	307	10 49?	− 2	e 19 37?	− 2	—	—	—
Kodaikanal	E.	66·2	273	e 9 1	?	e 18 41	−59	—	—	—
Obi-garm		66·2	305	i 10 50	− 2	19 36	− 4	—	—	—
Stalinabad		66·9	304	i 10 55	− 1	19 46	− 3	—	—	—
Bombay		67·8	283	e 11 19	+17	i 19 55	− 5	—	—	33·0
Wellington		68·1	157	e 11 41?	+37	19 50	−13	—	—	25·2
Sverdlovsk		69·5	325	i 11 9	− 3	i 20 40	PS	e 13 54	PP	—
Victoria		74·7	43	11 23	−20	21 13	− 6	22 5	PPS	34·7
Ukiah		77·5	53	e 12 6	+ 7	e 22 0	+10	e 16 56	PPP	e 34·1
Shasta Dam		77·6	51	i 11 57	− 3	—	—	—	—	—
Grand Coulee		77·7	43	e 12 0	0	—	—	—	—	—
Berkeley		78·6	54	i 12 6	+ 1	i 22 9	+ 7	—	—	e 34·1
Baku		80·5	310	e 12 22	+ 7	i 22 25	+ 3	—	—	—
Fresno	N.	80·8	54	e 12 22	+ 5	—	—	—	—	—
Santa Barbara	Z.	81·7	56	e 12 22	0	—	—	—	—	—
Tinemaha	Z.	81·9	54	i 12 22	− 1	—	—	—	—	—
Moscow		82·0	327	12 21	− 2	22 28	− 9	—	—	—
Grozny		82·4	314	12 23	− 2	22 35	− 6	—	—	—
Haiwee	Z.	82·4	54	e 12 27	+ 2	—	—	—	—	—
Butte		82·5	43	—	—	e 22 45	+ 3	e 28 49	SS	e 34·4
Mount Wilson	Z.	83·0	56	i 12 27	− 1	—	—	—	—	—
Pasadena	Z.	83·0	56	e 12 27	− 1	—	—	—	—	—
Saskatoon		83·4	36	12 31	+ 1	22 53	+ 2	28 35	SS	38·7
Bozeman		83·6	43	—	—	e 22 45	− 8	—	—	e 40·4
Riverside		83·7	56	i 12 35	+ 3	i 23 4	+10	—	—	—
La Jolla	Z.	84·2	57	e 12 34	0	—	—	—	—	—
Erevan		84·4	311	e 12 37	+ 1	22 59	− 2	—	—	—
Leninakan		84·7	312	e 12 40	+ 3	e 23 1	− 3	—	—	—
Logan		84·7	47	i 12 38	+ 1	e 23 0	− 4	—	—	e 39·8
Boulder City		84·8	53	e 12 36	− 1	e 23 3	− 2	—	—	—
Salt Lake City		85·1	48	e 12 41	+ 2	e 22 58	[− 3]	e 32 10	SSS	e 35·0
Pierce Ferry		85·4	53	e 12 38	− 2	e 23 8	− 3	—	—	—
Helsinki		85·5	335	e 12 48	+ 7	e 23 16	+ 4	e 23 2	SKS	e 37·7
Sotchi		86·3	316	12 47	+ 2	23 13	[+ 4]	—	—	—
Scoresby Sund		87·8	356	12 54	+ 2	23 43	+ 9	16 19	PP	—
Upsala	E.	88·5	337	e 12 52	− 4	i 23 12	[−12]	e 16 22	PP	e 44·7
	N.	88·5	337	e 12 55	− 1	e 23 15	[− 9]	i 16 30	PP	e 35·7
Tucson		89·4	55	e 12 59	− 1	e 23 45	− 4	—	—	e 39·8
Warsaw		92·1	329	e 13 13	+ 1	24 10	− 3	16 56	PP	e 47·7
Copenhagen		93·4	336	e 13 18	0	24 22	− 2	25 11	PS	45·7
Ksara		93·4	308	e 13 18?	0	e 23 58?	[+ 6]	—	—	—
Budapest		96·2	326	e 13 41	+10	e 24 1	[− 7]	e 24 41	S	47·7
Prague		96·6	331	e 17 26	PP	e 24 2	[− 8]	e 31 26	SS	e 45·7
Ivigtut		96·7	6	—	—	24 18	[+ 8]	24 47	S	—
Aberdeen		97·0	343	i 17 41	PP	e 24 11	[− 1]	—	—	48·2
Belgrade		97·2	324	12 23?	−73	e 24 4	[− 9]	—	—	—
Jena	N.	97·3	332	e 13 36	0	e 24 4	[− 9]	—	—	—
Cheb		97·6	331	e 17 36	PP	e 24 16	[+ 1]	e 31 43	SS	e 51·7
Edinburgh		98·4	342	—	—	—	—	e 31 21	SS	—
Helwan		98·7	307	e 13 41	− 1	45 11	L	17 46	PP	(45·2)
De Bilt		98·9	336	e 17 48	PP	e 25 9	− 2	e 26 41	PS	e 47·7
Durham	N.	98·9	341	i 19 46	PPP	i 24 17	[− 5]	i 26 44	PS	—
Zagreb		98·9	327	e 14 42	+59	e 24 17	[− 5]	—	—	e 49·7
Stuttgart		99·9	332	e 13 48	0	e 25 17	− 3	e 17 51	PP	e 48·7
Chicago		100·0	38	—	—	e 24 19	[− 8]	e 26 47	PS	e 44·3
Triest		100·1	328	e 17 50	PP	e 24 20	[− 7]	i 32 22	SS	—
Florissant	E.	100·2	41	—	—	e 24 23	[− 5]	e 26 57	PS	—
Uccle		100·3	336	e 13 41?	− 9	e 24 38	[+10]	e 17 56?	PP	e 49·7
St. Louis		100·4	41	e 13 51	+ 1	e 24 20	[− 9]	e 17 29	PP	—
Strasbourg		100·7	333	e 13 55	+ 3	e 25 27	+ 1	e 17 59	PP	e 49·0
Zürich		101·3	332	e 14 44	+50	—	—	e 18 1	PP	—
Kew		101·4	338	e 18 5	PP	e 24 29	[− 5]	e 25 37	S	e 48·2
Basle		101·5	332	e 13 55	0	—	—	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Neuchatel		102·2	332	e 17 37	PP	—	—	—	—	—
Paris		102·6	335	18 13	PP	20 26	PPP	49 41?	Q	52·7
Florence		102·7	327	e 19 23	PP	i 29 56	?	—	—	—
Ottawa		103·4	28	18 18	PP	24 41	[− 2]	27 41?	PS	42·7
Rome		103·4	326	e 18 33	PP	e 32 53	SS	e 23 30	?	—
Jersey		103·9	339	—	—	—	—	29 41?	PPS	—
Seven Falls		104·1	24	18 32	PP	24 57	[+11]	27 41	PS	50·7
Clermont-Ferrand		104·8	333	e 14 16	+ 6	e 26 1	+ 1	e 18 26	PP	50·2
Vermont		105·2	27	e 18 23	[0]	e 24 40	[−11]	e 27 41	PS	e 49·8
Harvard		107·5	27	e 18 52	PP	e 28 55	PS	—	—	e 54·7
Weston		107·7	27	e 18 50k	PP	i 24 59	[− 3]	—	—	e 54·8
Philadelphia		107·9	31	e 18 49	PP	e 25 0	[− 3]	e 28 15	PS	e 47·7
Barcelona		108·8	331	—	—	e 28 22	PS	—	—	56·5
Columbia		109·0	39	—	—	e 25 8	[0]	e 28 24	PS	e 50·1
Tortosa		110·0	332	19 11	PP	25 55	{−10}	21 49	PPP	e 57·7
Alicante		112·4	332	20 16	PP	27 32	S	21 12	PPP	e 59·7
Toledo	z.	112·6	335	19 31	PP	26 37	{+14}	—	—	—
Almeria		114·6	332	19 38	PP	26 25	{−12}	30 25	PPS	60·3
Granada		114·8	333	i 19 45	PP	27 28	{+49}	22 22	SKP	59·8
Lisbon		115·5	338	19 49?	PP	—	—	—	—	47·4
Malaga		115·5	333	i 19 46k	PP	30 13	PPS	35 47	SS	60·4
Bermuda		119·0	29	e 20 16	PP	e 30 5	PS	36 41	SS	e 55·0
Antarctica		129·2	164	e 19 27	[+17]	e 28 16	{+ 2}	22 45	SKP	—
Bogota	z.	133·1	60	e 19 22	[+ 4]	—	—	—	—	—
Fort de France		135·3	38	e 19 22	[0]	—	—	—	—	—
La Paz	z.	147·7	86	i 19 49a	[+ 5]	32 23	?	23 17	PP	70·4

Additional readings :—
Tokyo PPP =4m.53s.
Wazima SS =8m.2s.
Calcutta iSS?E =25m.23s.
Riverview iN =19m.45s.
College eS$_c$S =20m.9s.
Sverdlovsk ePPP =15m.29s., PPS =21m.19s.
Victoria SS =26m.29s.
Shasta Dam i =12m.4s.
Grand Coulee iP =12m.3s.
Berkeley iEN =12m.10s., iE =21m.59s., eE =22m.39s.
Butte eSSS? =31m.25s.
Riverside iZ =13m.15s.
Salt Lake City ePPS? =27m.5s.
Pierce Ferry iP =12m.50s.
Helsinki eSS =28m.56s.
Scoresby Sund 23m.17s., PS =24m.38s., eE =36m.23s.
Upsala SN =23m.40s.?, eE =24m.8s., eSSN =28m.53s., eSSE =29m.11s.
Tucson i =13m.11s.
Warsaw eZ =17m.42s., PPPZ =19m.2s., SKSN =23m.34s., PSZ =25m.26s., PSEN =25m.30s., PPSEN =26m.7s., PPS?Z =26m.31s., SSE =30m.24s., SSZ =30m.37s., SSSE =34m.2s.
Copenhagen 17m.1s. and 30m.46s.
Budapest PE =13m.49s.
Prague ePPS =26m.17s., eSSS =34m.41s.?, ePPP(Δ >180°) =38m.35s.
Cheb e =21m.37s.
Helwan iZ =17m.20s.
De Bilt eSS =31m.41s.?
Stuttgart eSS =32m.5s.
Chicago eSSS? =37m.3s.
Uccle ePPPEZ =20m.27s., ePPPN =20m.33s., eSKKSEN =25m.20s., ePSE =26m.33s., ePSN =26m.36s., eSSEN =32m.11s.
St. Louis ePSE =26m.54s.
Strasbourg ePP =18m.3s., ePS =26m.56s., eSS =32m.18s.
Kew eZ =19m.53s., ePPP =20m.17s., ePS =27m.8s., eSSEN =32m.13s.?
Ottawa e =33m.11s.
Seven Falls SS =31m.29s.
Clermont-Ferrand eSS =33m.15s.
Vermont eSS =33m.21s.
Philadelphia eSS =34m.6s., eSSS =38m.9s.
Tortosa PPN =19m.56s., SKKSN =26m.41s., PSE =28m.53s., PPSN =30m.21s., iE =34m.21s., SSEN =35m.0s., SSSE =38m.59s.
Alicante PPP =23m.43s., PS =31m.12s.
Toledo PPZ =20m.31s.

Continued on next page.

Almeria PP = 20m.53s., PPP = 23m.21s., SKKS = 27m.37s., PPS = 31m.41s., SS = 36m.53s.
Granada PP = 20m.34s., pPP = 21m.3s., PPP = 23m.19s., PS = 29m.45s., PPS = 30m.57s., SS = 35m.14s., SSS = 39m.46s.
Malaga PPP = 22m.37s.
La Paz iZ = 20m.29s. and 21m.15s., SKPZ = 23m.33s., SSZ = 52m.23s.
Long waves were also recorded at Ferndale, Santa Clara, Bergen, Besançon, Huancayo, and La Plata.

June 13d. Readings also at 0h. (Helwan and Ksara), 5h. (Riverview), 12h. (Malaga, near Prague, and near Stuttgart), 13h. (Shasta Dam and near Tananarive), 15h. (Berkeley and near Antarctica), 16h. (Berkeley, Fresno, Mineral, and Fort de France), 20h. (Malaga), 21h. (St. Louis (2)), 22h. (Colombo and near Andijan), 23h. (Perth and Shasta Dam).

June 14d. 0h. 30m. 45s. Epicentre 21°·6N. 145°·7E. (as on 13d.).

$A = -·7688$, $B = +·5244$, $C = +·3660$; $\delta = 0$; $h = +4$;
$D = +·564$, $E = +·826$; $G = -·302$, $H = +·206$, $K = -·931$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Misima		14·7	338	e 3 34	+ 3	6 34	+18	—	—	—
Shizuoka		14·8	336	e 3 41	+ 9	7 34	L	—	—	8·8
Nagoya		15·5	332	e 3 41	− 1	—	—	—	—	—
Osaka		15·8	328	e 3 46	+ 1	8 2	L	4 7	PP	10·5
Kôti		16·1	321	e 3 48	− 1	6 55	+ 6	—	—	e 7·6
Miyazaki		16·3	312	e 3 58	+ 6	7 9	+16	—	—	—
Nagano		16·4	338	e 3 54	+ 1	—	—	—	—	—
Sendai		17·1	349	e 4 2	0	—	—	—	—	—
Wazima		17·5	337	e 4 9	+ 2	7 23	+ 2	—	—	9·7
Hamada		17·9	321	4 12	0	7 41	+11	—	—	—
Mizusawa		17·9	349	4 16	+ 4	e 7 0	−30	e 7 3	S	—
Morioka		18·4	349	e 4 20	+ 2	7 37	− 4	—	—	—
Mori		20·9	350	e 4 50	+ 4	8 45	+10	—	—	—
Sapporo		21·7	352	4 56	+ 1	9 0	+ 9	—	—	—
Riverview	z.	55·4	174	i 8 57	−41	—	—	—	—	—
Frunse		62·0	308	e 10 24	0	—	—	—	—	—
Auckland		64·3	154	9 29	−70	17 10	−127	14 45	PPP	31·2
Tchimkent		65·7	308	i 10 46	− 2	i 19 34	0	—	—	—
Stalinabad		66·9	304	10 55	− 1	—	—	—	—	—
Wellington		68·1	157	11 7	+ 3	19 41	−22	23 11	SS	28·3
Sverdlovsk		69·5	325	i 11 11	− 1	—	—	—	—	—
Shasta Dam		77·6	51	i 11 59	− 1	—	—	—	—	—
Grand Coulee		77·7	43	e 11 59	− 1	—	—	—	—	—
Berkeley	z.	78·6	54	i 12 5	0	—	—	—	—	—
Fresno	N.	80·8	54	e 12 19	+ 2	—	—	—	—	—
Santa Barbara	z.	81·7	56	i 12 23	+ 1	—	—	—	—	—
Tinemaha		81·9	54	i 12 24	+ 1	e 22 35	− 1	—	—	—
Moscow		82·0	327	12 21	− 2	22 34	− 3	—	—	—
Haiwee	z.	82·4	54	i 12 27	+ 2	—	—	—	—	—
Grozny		82·4	314	12 24	− 1	22 35	− 6	—	—	—
Mount Wilson		83·0	56	i 12 28	0	i 22 46	− 1	—	—	—
Pasadena		83·0	56	i 12 27	− 1	e 22 41	− 6	—	—	—
La Jolla	z.	84·2	57	e 12 34	0	—	—	—	—	—
Palomar		84·3	56	i 12 35k	0	i 22 59	− 1	—	—	—
Erevan		84·4	311	e 12 37	+ 1	—	—	—	—	—
Leninakan		84·7	312	e 12 39	+ 2	23 2	− 2	—	—	—
Boulder City		84·8	53	i 12 38	+ 1	—	—	—	—	—
Pierce Ferry		85·4	53	i 12 40	0	e 22 59	[− 4]	—	—	—
Sotchi		86·3	316	e 12 41	− 4	e 23 17	− 3	—	—	—
Scoresby Sund		87·8	356	i 12 52	0	23 15?	[− 4]	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tucson		89·4	55	e 13 0	0	—	—	e 24 58	PS	—
Ksara		93·4	308	e 13 18	0	—	—	17 2	PP	—
Belgrade		97·2	324	e 12 27	−69	—	—	e 19 55	PPP	—
Helwan		98·7	307	13 41	− 1	e 24 24	[+ 3]	17 43	PP	—
Stuttgart	z.	99·9	332	e 13 46	− 2	—	—	e 17 45	PP	—
St. Louis	z.	100·4	41	e 13 48	− 2	—	—	e 17 53	PP	—
Tortosa	N.	110·0	332	19 30	PP	26 30	{+25}	30 2	PPS	—
Toledo		112·6	335	19 26	PP	—	—	—	—	—
Almeria		114·6	332	e 19 11	[+29]	—	—	20 21	PP	—
Granada		114·8	333	i 19 32	PP	—	—	22 33	PPP	—
Antarctica		129·2	164	e 19 35	[+25]	e 28 17	{+ 3}	e 21 35	PP	—
Bogota	z.	133·1	60	e 19 19	[+ 1]	—	—	—	—	—
La Paz		147·7	86	i 19 55k	[+11]	—	—	—	—	77·9

Additional readings :—
Auckland S_eS? = 19m.17s., SS = 20m.13s., SSS = 21m.4s.
Almeria PPP = 23m.10s.
Granada PP = 20m.12s., pPP = 20m.32s., SKP = 21m.48s.
Antarctica eSKP = 22m.31s.
Long waves were also recorded at Arapuni, Colombo, and Upsala.

June 14d. 2h. 0m. 43s. Epicentre 21°·6N. 145°·7E. (as at 0h.).

		Δ	Az.	P.	O−C.	S.	O−C.	L.
		°	°	m. s.	s.	m. s.	s.	m.
Misima		14·7	338	e 3 59	+28	6 14	− 2	7·0
Nagano		16·4	338	e 3 58	+ 5	—	—	—
Hukusima		16·7	346	e 3 58	+ 1	6 54	− 9	—
Hukuoka		18·0	316	e 4 11	− 2	7 29	− 3	—
Mori		20·9	350	e 4 57	+11	—	—	—
Vladivostok		24·4	335	e 5 19	− 2	i 9 45	+ 6	—
Sverdlovsk		69·5	325	11 13	+ 1	—	—	—
Shasta Dam		77·6	51	e 11 58	− 2	—	—	—
Haiwee	z.	82·4	54	i 12 28	+ 3	—	—	—
Grozny		82·4	314	e 12 26	+ 1	—	—	—
Mount Wilson	z.	83·0	56	i 12 27	− 1	—	—	—
Pasadena	z.	83·0	56	i 12 26	− 2	—	—	—
Boulder City		84·8	53	i 12 37	0	—	—	—
Pierce Ferry		85·4	53	i 12 40	0	—	—	—
Tucson		89·4	55	e 13 0	0	—	—	—

June 14d. 7h. 22m. 12s. Epicentre 21°·6N. 145°·7E. (as at 2h.).

		Δ	Az.	P.	O−C.	S.	O−C.	L.
		°	°	m. s.	s.	m. s.	s.	m.
Vladivostok		24·4	335	e 5 20	− 1	e 9 43	+ 4	—
Irkutsk		44·1	325	e 8 29	+17	—	—	—
Riverview		55·4	174	—	—	(e 17 42)	+20	e 17·7
Tashkent		66·1	307	—	—	e 19 35	− 4	—
Obi-garm		66·2	305	e 10 50	− 2	e 19 34	− 6	—
Stalinabad		66·9	304	e 10 55	− 1	e 19 45	− 4	—
Sverdlovsk		69·5	325	11 14	+ 2	20 26	+ 6	—
Shasta Dam		77·6	51	i 12 1	+ 1	—	—	—
Tinemaha	z.	81·9	54	i 12 25	+ 2	—	—	—
Moscow		82·0	327	e 12 21	− 2	e 22 29	− 8	—
Grozny		82·4	314	e 12 22	− 3	—	—	—
Mount Wilson	z.	83·0	56	i 12 32	+ 4	—	—	—
Boulder City		84·8	53	e 12 36	− 1	—	—	—
Pierce Ferry		85·4	53	i 12 42	+ 2	i 15 41	PP	—
Tucson		89·4	55	e 13 2	+ 2	—	—	—
Warsaw		92·1	329	—	—	(e 23 48?)	[+ 3]	e 23·8
Ksara		93·4	308	e 18 52	PPP	e 29 51	SS	—
La Paz		147·7	86	19 58	[+14]	—	—	—

Boulder City also gives iP = 12m.39s.
Long waves were also recorded at Berkeley, De Bilt, Kew, Strasbourg, Stuttgart, and Malaga.

June 14d. 11h. 1m. 45s. Epicentre 21°·6N. 145°·7E. (as at 7h.).

		△	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Vladivostok		24·4	335	e 5 22	+ 1	i 9 48	+ 9
Tashkent		66·1	307	e 10 51	0	—	—
Sverdlovsk		69·5	325	i 11 11	− 1	—	—
Shasta Dam		77·6	51	e 11 59	− 1	—	—
Tinemaha	z.	81·9	54	i 12 24	+ 1	—	—
Haiwee	z.	82·4	54	i 12 27	+ 2	—	—
Grozny		82·4	314	e 12 25	0	—	—
Mount Wilson	z.	83·0	56	i 12 29	+ 1	—	—
Pasadena	z.	83·0	56	i 12 27	− 1	—	—
Boulder City		84·8	53	i 12 38	+ 1	—	—
Tucson		89·4	55	e 13 1	+ 1	—	—
La Paz		147·7	86	19 33	[−11]	—	—

Long waves were also recorded at Warsaw.

June 14d. 14h. 29m. 55s. Epicentre 21°·6N. 145°·7E. (as at 11h.).

		△	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Vladivostok		24·4	335	e 5 22	+ 1	i 9 47	+ 8
Sverdlovsk		69·5	325	i 10 38	−34	—	—
Shasta Dam		77·6	51	e 12 0	0	—	—
Tinemaha	z.	81·9	54	i 12 23	0	—	—
Haiwee	z.	82·4	54	i 12 27	+ 2	—	—
Mount Wilson	z.	83·0	56	i 12 28	0	—	—
Pasadena	z.	83·0	56	i 12 28	0	—	—
Riverside	z.	83·7	56	i 12 32	0	—	—
Boulder City		84·8	53	i 12 38	+ 1	—	—
Pierce Ferry		85·4	53	i 12 41	+ 1	—	—
Tucson		89·4	55	e 13 0	0	—	—
La Paz		147·7	86	e 19 28	[−16]	—	—

Long waves were recorded at Riverview.

June 14d. 16h. 30m. 6s. Epicentre 21°·6N. 145°·7E. (as at 14h.).

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Omaesaki		14·5	335	e 3 30	+ 2	7 9	L	—	—	e 9·8
Misima		14·7	338	e 3 26	− 5	6 26	+10	e 3 39	PP	7·7
Tokyo		15·0	341	e 3 39	+ 4	7 22	L	5 5	?	(7·4)
Nagoya		15·5	332	e 3 43	+ 1	—	—	—	—	—
Osaka		15·8	328	e 3 49	+ 4	7 32	+50	—	—	—
Kôti		16·1	321	e 3 48	− 1	—	—	—	—	—
Miyazaki		16·3	312	e 4 10	+18	7 13	+20	—	—	—
Nagano		16·4	338	e 4 8	+15	—	—	—	—	—
Sendai		17·1	349	4 0	− 2	7 10	− 2	—	—	—
Hamada		17·9	321	e 4 13	+ 1	7 36	+ 6	—	—	—
Mizusawa	E.	17·9	349	4 14	+ 2	e 7 41	+11	—	—	—
Hukuoka		18·0	316	e 4 15	+ 2	7 39	+ 7	—	—	—
Mori		20·9	350	e 4 48	+ 2	8 45	+10	—	—	—
Sapporo		21·7	352	e 4 56	+ 1	—	—	—	—	—
Vladivostok		24·4	335	i 5 19	− 2	i 9 48	+ 9	—	—	—
Irkutsk		44·1	325	8 12	0	17 54	SS	10 0	PP	—
Brisbane		49·3	171	e 10 24	PP	—	—	—	—	—
Riverview		55·4	174	i 9 35a	− 3	e 17 15	− 7	i 19 34	S_cS	—
Almata		60·3	309	—	—	e 18 23	− 3	—	—	—
College		60·7	27	—	—	e 19 4	+32	—	—	e 25·7
Frunse		62·0	308	e 10 24	0	—	—	—	—	—
Hyderabad		63·1	280	e 10 37	+ 5	18 58	− 4	—	—	—
Andijan		63·8	306	e 10 35	− 1	e 19 9	− 2	—	—	—
Tashkent		66·1	307	e 10 48	− 3	e 19 37	− 2	—	—	—
Obi-garm		66·2	305	10 51	− 1	19 40	0	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Kodaikanal	E.	66·2	273	—	—	e 19 24	−16	—	—	—
Stalinabad		66·9	304	e 10 45	−11	19 32?	−17	—	—	—
Bombay		67·8	283	—	—	e 19 58	− 2	—	—	—
Sverdlovsk		69·5	325	i 11 9	− 3	i 20 16	− 4	—	—	—
Victoria		74·7	43	—	—	e 22 6	+47	—	—	34·9
Shasta Dam		77·6	51	i 11 58	− 2	—	—	—	—	—
Berkeley		78·6	54	i 12 4	− 1	—	—	—	—	e 35·3
Baku		80·5	310	e 12 22	+ 7	—	—	—	—	—
Santa Barbara	z.	81·7	56	i 12 21	− 1	—	—	—	—	—
Tinemaha	z.	81·9	54	i 12 23	0	—	—	—	—	—
Moscow		82·0	327	i 12 21	− 2	i 22 31	− 6	—	—	—
Grozny		82·4	314	12 26	+ 1	e 22 36	− 5	—	—	—
Haiwee	z.	82·4	54	i 12 25	0	—	—	—	—	—
Mount Wilson	z.	83·0	56	i 12 27	− 1	—	—	—	—	—
Pasadena	z.	83·0	56	i 12 27	− 1	—	—	—	—	—
Riverside	z.	83·7	56	i 12 31	− 1	—	—	—	—	—
La Jolla	z.	84·2	57	i 12 36	+ 2	—	—	—	—	—
Erevan		84·4	311	e 12 36	0	—	—	—	—	—
Leninakan		84·7	312	e 12 39	+ 2	e 23 7	+ 3	—	—	—
Boulder City		84·8	53	i 12 37	0	—	—	—	—	—
Salt Lake City		85·1	48	e 12 38	− 1	e 23 8	0	—	—	e 37·1
Pierce Ferry		85·4	53	i 12 40	0	e 23 5	[+ 2]	—	—	—
Helsinki		85·5	335	—	—	e 23 1	−11	e 36 0	Q	e 44·9
Sotchi		86·3	316	—	—	e 23 20	[+11]	—	—	—
Scoresby Sund		87·8	356	12 51a	− 1	23 36	+ 2	—	—	—
Upsala		88·5	337	e 16 22	PP	e 23 25	[+ 1]	—	—	e 36·9
Tucson		89·4	55	i 13 0	0	—	—	e 16 29	PP	e 42·0
Warsaw		92·1	329	e 13 10	− 2	23 47	[+ 2]	16 47	PP	e 50·9
Copenhagen		93·4	336	e 13 15	− 3	—	—	17 50	PP	47·9
Ksara		93·4	308	e 13 19	+ 1	—	—	e 25 33	PS	—
Prague		96·6	331	e 17 14?	PP	—	—	e 19 36	PPP	—
Cheb		97·6	331	e 17 40	PP	e 24 28	{− 9}	e 31 26	SS	e 50·9
Helwan		98·7	307	i 13 42a	0	e 24 46	{+ 1}	17 48	PP	—
De Bilt		98·9	336	e 13 42	− 1	e 25 9	− 2	e 17 39	PP	e 49·9
Stuttgart		99·9	332	e 13 45	− 3	—	—	e 17 52	PP	e 53·9
Triest		100·1	328	—	—	e 24 59	−22	—	—	—
St. Louis		100·4	41	e 17 50	PP	e 24 1	[−28]	—	—	—
Strasbourg		100·7	333	e 17 52	PP	—	—	e 27 12	PS	e 53·7
Kew		101·4	338	(e 17 54?)	PP	—	—	—	—	e 17·9
Paris		102·6	335	18 10	PP	—	—	—	—	e 55·9
Rome		103·4	326	e 16 25	?	—	—	—	—	—
Clermont-Ferrand		104·8	333	e 18 19	PP	—	—	—	—	60·9
Alicante		112·4	332	e 21 20	PPP	—	—	—	—	—
Toledo	z.	112·6	335	18 45	[+ 7]	25 53	{−30}	—	—	—
Almeria		114·6	332	19 43	PP	26 38	{+ 1}	30 39	PPS	55·9
Granada		114·8	333	20 12	PP	28 27	PS	—	—	62·3
Malaga	z.	115·5	333	i 19 46a	PP	23 13	?	e 22 14	PPP	61·4
La Paz		147·7	86	19 49	[+ 5]	—	—	i 20 50	PKP_2	76·9

Additional readings :—
Mizusawa eSN =7m.46s.
Irkutsk P_cP =9m.43s.
Berkeley iZ =12m.10s.
Upsala eE =27m.27s.
Warsaw PPZ =16m.52s., eN =17m.51s., PPPZ =18m.48s., PPPN =18m.55s., eZ = 19m.36s., SKSN =23m.41s., SN =24m.17s., PSZ =25m.19s., PPSE =25m.52s., PPSZ =26m.4s., eZ =27m.51s., eSS?N =30m.43s., eE =30m.54s., eZ =32m.8s., eE =32m.36s. and 33m.37s.
Cheb e =18m.50s., 27m.26s., and 37m.38s.
Strasbourg e =18m.54s. and 19m.0s.
Almeria PP =20m.57s.
Malaga PKP,PKPZ =38m.12s., PKP,SKSZ =43m.50s.
Long waves were also recorded at Sitka, Bozeman, Philadelphia, Weston, Potsdam, and Uccle.

June 14d. Continuation of list of Asian after-shocks.

Andijan 0h.37m.48s., 6h.15m.6s., 19h.27m.29s., 21h.48m.41s.

Obi-garm 19h.25m.46s., 21h.48m.50s.

Samarkand 21h.50m.15s.

Stalinabad 19h.25m.49s., 21h.49m.41s.

June 14d. Readings also at 0h. (Pierce Ferry and Shasta Dam), 1h. (Zürich and near Chur), 4h. (Sverdlovsk, Obi-garm, Vladivostok, Mount Wilson, Pasadena, Tinemaha, Tucson, Boulder City, Pierce Ferry, and Shasta Dam), 5h. (Sverdlovsk, Vladivostok, Mount Wilson, Pasadena, Tinemaha, Tucson, Boulder City, Pierce Ferry, Shasta Dam, La Plata, and Santa Lucia), 6h. (Grozny, Sverdlovsk, Vladivostok, Haiwee, Mount Wilson, Tinemaha, Boulder City, Pierce Ferry, and Shasta Dam), 7h. (Leninakan, Tinemaha, Tucson, Pierce Ferry, and Shasta Dam), 9h. (Vladivostok, Sverdlovsk, Grozny, Mount Wilson, Tinemaha, Tucson, Boulder City, Pierce Ferry, and Shasta Dam), 11h. (Pierce Ferry, Boulder City, and Vladivostok), 13h. (Vladivostok, Sverdlovsk, Haiwee, Mount Wilson, Pasadena, Tinemaha, Tucson, Boulder City, Pierce Ferry, Shasta Dam, and La Paz), 14h. (Tinemaha, La Plata, and near Santa Lucia), 16h. (Alicante (2), 22h. (Stuttgart (2)), 23h. (Lick).

June 15d. 20h. 21m. 33s. Epicentre 21°·6N. 145°·7E. (as on 14d.).

		Δ	Az.	P.	O−C.	S.	O−C.	L.
		°	°	m. s.	s.	m. s.	s.	m.
Vladivostok		24·4	335	i 5 18	− 3	i 9 44	+ 5	—
Almata		60·3	309	e 10 12	− 1	—	—	—
Tashkent		66·1	307	e 10 57	+ 6	—	—	—
Obi-garm		66·2	305	e 10 50	− 2	e 19 35	− 5	—
Stalinabad		66·9	304	e 10 53	− 3	—	—	—
Sverdlovsk		69·5	325	i 11 9	− 3	—	—	—
Shasta Dam		77·6	51	e 11 59	− 1	—	—	—
Tinemaha	z.	81·9	54	i 12 23	0	—	—	—
Moscow		82·0	327	e 12 20	− 3	—	—	—
Grozny		82·4	314	e 12 26	+ 1	—	—	—
Pasadena	z.	83·0	56	i 12 29	+ 1	—	—	—
Riverside	z.	83·7	56	e 12 32	0	—	—	—
Palomar	z.	84·3	56	i 12 36	+ 1	—	—	—
Boulder City		84·8	53	e 12 38	+ 1	—	—	—
Pierce Ferry		85·4	53	e 12 40	0	e 17 13	?	—
Tucson		89·4	55	e 13 1	+ 1	e 16 39	PP	—
Stuttgart		99·9	332	e 13 44?	− 4	—	—	e 59·4
La Paz		147·7	86	19 48	[+ 4]	—	—	—

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

June 15d. Continuation of list of shocks recorded at Central Asian stations.

Almata 12h.53m.54s., 17h.6m.1s., 18h.12m.50s.
Andijan 12h.53m.46s., 17h.4m.28s., 18h.11m.17s.
Frunse 12h.55m.14s., 17h.4m.46s., 18h.11m.33s.
Obi-garm 17h.5m.16s., 18h.11m.56s.
Samarkand 17h.6m.32s.
Stalinabad 18h.12m.12s.
Tashkent 17h.4m.52s.?, 18h.11m.32s.
Tchimkent 17h.4m.52s., 18h.11m.29s.

June 15d. Readings also at 1h. (Stuttgart), 2h. (near Bogota), 5h. (Florissant, St. Louis, Tinemaha, Tucson, and Pierce Ferry), 6h. (Santa Lucia), 8h. (Scoresby Sund and near Grozny), 11h. (Haiwee, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Boulder City, Pierce Ferry, Grand Coulee, Berkeley, Fresno, Lick, Ukiah, Bozeman, Butte, Salt Lake City, Weston, and Philadelphia), 13h. (Haiwee, Pasadena, Palomar, Tinemaha, Tucson, and Vladivostok), 14h. (Copenhagen and Kodaikanal), 20h. (Malaga, Pierce Ferry, and Shasta Dam), 21h. (Shasta Dam), 23h. (Ksara).

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June 16d. 0h. 18m. 6s. Epicentre 13°·9N. 56°·7E.

A = +·5332, B = +·8117, C = +·2385; δ = +4; h = +6;
D = +·836, E = −·549; G = +·131, H = +·199, K = −·971.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bombay		16·2	70	e 3 48	− 2	—	—	—	—	—
Kodaikanal	E.	20·6	98	e 4 24	−19	—	—	—	—	—
New Delhi	N.	24·0	49	i 5 18	+ 1	e 9 48	+16	—	—	e 12·8
Stalinabad		26·8	21	e 5 39	− 5	—	—	—	—	—
Baku		27·1	348	e 5 48	+ 2	—	—	—	—	—
Obi-garm		27·3	22	e 5 45	− 3	—	—	—	—	—
Ksara		27·4	319	e 5 51	+ 2	e 10 47	+19	—	—	—
Helwan	Z.	28·3	308	e 5 54	− 3	e 11 5	+22	e 8 6	?	—
Leninakan		29·1	339	e 6 22	+18	—	—	—	—	—
Tashkent		29·5	19	e 6 8	0	e 10 57	− 5	—	—	—
Andijan		30·1	24	e 6 14	+ 1	—	—	—	—	—
Grozny		30·8	344	e 6 24	+ 4	—	—	—	—	—
Almata		34·1	26	e 6 48	0	—	—	—	—	—
Sverdlovsk		43·0	3	i 7 59	− 4	e 14 19	−10	—	—	—
Moscow		44·3	345	8 9	− 4	14 44	− 4	—	—	—
Rome		47·3	316	e 8 33	− 4	—	—	—	—	—
Warsaw		47·7	331	e 8 37	− 3	e 15 34	− 2	10 27	PP	e 23·9
Helsinki		51·7	341	—	—	e 16 29	− 3	—	—	e 28·9
Stuttgart		52·2	322	e 9 14?	− 1	—	—	—	—	e 30·9
Strasbourg		53·0	322	e 9 20	− 1	e 16 50	0	e 11 36	PP	e 27·4
Copenhagen		53·8	331	—	—	e 16 57	− 4	—	—	23·9
Clermont-Ferrand		55·0	317	e 9 25	−10	e 17 30	+13	—	—	e 33·9
De Bilt		55·9	325	e 9 44	+ 2	e 17 29	0	—	—	—
Paris		56·3	320	e 9 46	+ 1	—	—	—	—	e 33·9
Almeria		57·2	305	10 3	+12	17 45	− 1	13 32	PPP	32·9
Malaga	Z.	58·7	305	i 9 58k	− 4	e 18 5	− 1	13 45	PPP	31·5
Toledo	Z.	58·8	308	i 9 59	− 3	18 1	− 6	—	—	—
Kew		58·9	323	(e 11 54?)	PP	—	—	—	—	e 11·9
Jersey		59·3	320	11 54?	PP	—	—	—	—	—
Vladivostok		69·9	49	e 11 11	− 4	e 20 24	PS	—	—	—
Scoresby Sund		73·2	340	—	—	21 6	+ 4	—	—	41·9
Pierce Ferry		129·5	351	e 18 51	[−20]	—	—	e 19 5	PKP	—
Palomar	Z.	132·6	352	e 19 18	[+ 1]	—	—	—	—	—
Tucson		132·6	346	e 19 18	[+ 1]	—	—	e 21 41	PP	—

Additional readings :—
Warsaw ePN = 8m.43s., ePE = 8m.47s., eSSEN = 18m.30s.
Strasbourg ePPP = 12m.39s., e = 23m.32s.

June 16d. 10h. 32m. 28s. Epicentre 39°·6N. 143°·5E. (as on 1941, March 19d.).

A = −·6211, B = +·4596, C = +·6349; δ = +10; h = −2;
D = +·595, E = +·804; G = −·510, H = +·378, K = −·773.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Mizusawa	N.	1·9	256	e 0 34	0	0 59	0	—	—	—
Vladivostok		9·4	296	i 2 19	+ 1	i 4 24	SS	—	—	—
Irkutsk		29·7	309	e 6 9	− 1	e 11 2?	− 4	—	—	—
Sverdlovsk		54·3	319	i 9 30	0	e 17 12	+ 5	—	—	—
Tashkent		54·8	298	e 9 31	− 3	e 16 8?	−66	—	—	—
Mount Wilson	Z.	74·8	58	e 11 45	+ 1	—	—	—	—	—
Tucson		80·8	56	e 12 26	P_cP	—	—	—	—	—
Stuttgart		83·2	331	e 12 29	0	—	—	e 43 17	Q	e 47·5
La Paz		144·1	59	e 19 42	[+ 4]	—	—	—	—	—

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

June 16d. 10h. 55m. 35s. Epicentre 38°·4S. 178°·8E. (as on 1946, March 4d.).

Felt in the north-east of North Island with maximum intensity VII.
Suggested epicentre 38°·4S. 178°·4E.

R. C. Hayes.
Earthquakes in New Zealand during the year 1947, New Zealand Journal of Science and Technology, vol. 30, No. 2 (sect. B.), p. 103, 1948. Isoseismal chart p. 105.

$A = -\cdot7855$, $B = +\cdot0165$, $C = -\cdot6186$; $\delta = -5$; $h = -1$;
$D = +\cdot021$, $E = +\cdot1000$; $G = +\cdot618$, $H = -\cdot013$, $K = -\cdot786$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Arapuni		2·5	277	0 49	P_g	—	—	—	—	—
Auckland		3·5	294	0 55	− 2	1 35	− 5	—	—	—
New Plymouth		3·8	257	1 2	+ 1	1 47	0	—	—	—
Wellington		4·2	226	1 5	− 2	1 53	− 4	—	—	—
Kaimata		6·9	231	—	—	2 56	− 9	—	—	—
Riverview		22·8	274	i 5 8	+ 3	i 9 42	SS	i 10 26	SSS	e 10·5
Brisbane		24·1	289	i 5 17	− 1	e 9 53	+19	—	—	—
Pasadena	z.	92·9	48	i 13 22	+ 6	—	—	—	—	—
Mount Wilson	z.	93·0	48	i 13 23	+ 6	—	—	—	—	—
Palomar		93·1	49	i 13 24	+ 7	—	—	—	—	—
Riverside	z.	93·2	48	i 13 24	+ 7	—	—	—	—	—
Shasta Dam		95·3	41	e 13 32	+ 5	—	—	—	—	—
Tucson		96·0	53	e 13 37	+ 7	—	—	—	—	—
Ksara		149·8	273	e 19 56	[+ 9]	e 35 52	PPS	—	—	—

Riverview gives also iSS?E = 9m.42s.

June 16d. 21h. Undetermined shock.

La Paz iPZ = 15m.42s.k, iS = 24m.14s., L = 38m.0s.
Huancayo iP = 16m.29s., eL = 40m.50s.
Bombay eEN = 17m.
Helwan iPZ = 18m.11s., iZ = 18m.18s., eN = 29m.18s.
Almeria P = 18m.16s., e = 24m.39s., S? = 31m.49s.
Granada iP = 18m.23s., eS = 30m.36s., L = 55·6m.
Toledo PKP?Z = 18m.34s., PPZ = 19m.17s.
Ksara eP = 18m.37s., PP = 22m.25s., e = 29m.32s.
Rome eP? = 22m.44s., eN = 37m.6s., eL? = 51m.46s.
Stuttgart eP?Z = 23m.36s., eL = 60m.
St. Louis eP?Z = 24m.6s.
Tucson eP = 24m.13s., i = 24m.20s.
Boulder City eP = 24m.16s., e = 24m.22s.
Shasta Dam eP = 24m.20s., e = 24m.35s.
Pierce Ferry eP = 24m.22s., i = 24m.29s.
Pasadena ePZ = 24m.23s., iZ = 24m.31s.
Palomar eZ = 24m.29s.
Mount Wilson iZ = 24m.30s.
Alicante eS = 30m.0s., eL = 61m.20s.
Bermuda eSKS = 38m.0s., eL = 54m.38s.
Kodaikanal eE = 46m.40s.
Long waves were also recorded at Weston, Kew, Paris, De Bilt, and Uccle.

June 16d. Continuation of list of aftershocks from Central Asian epicentre.

Andijan 13h.36m.36s., 18h.4m.4s., 22h.44m.32s.

Frunse 11h.48m.43s.

Obi-garm 13h.37m.11s.

Tashkent 13h.36m.48s.

Tchimkent 3h.59m.21s.

June 16d. Readings also at 1h. (Jena), 3h. (Granada), 4h. (Mizusawa), 5h. (Malaga and Granada), 10h. (Tucson and near Lisbon), 11h. (near Antarctica), 13h. (near Leninakan), 14h. (Brisbane, Stuttgart, Rome, Mount Wilson, Riverside, Tinemaha, Tucson, and Honolulu), 17h. (Tucson, Palomar, La Plata, near Balboa Heights, and near Seven Falls), 18h. (Brisbane, Tucson, Pierce Ferry, Boulder City, Shasta Dam, Palomar, Pasadena, and Mount Wilson), 21h. (Shasta Dam, Tucson, Pasadena, Mount Wilson, and Tinemaha).

June 17d. 0h. 59m. 10s. Epicentre 23°·3S. 170°·9E. (as on 1946, April 17d.).

$A = -\cdot 9078$, $B = +\cdot 1454$, $C = -\cdot 3933$; $\delta = -7$; $h = +4$;
$D = +\cdot 158$, $E = +\cdot 987$; $G = +\cdot 388$, $H = -\cdot 062$, $K = -\cdot 919$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	N.	16·7	252	i 3 50	− 7	i 6 55	− 8	i 7 7	SS	—
Wellington		18·2	172	4 20	+ 4	7 43	+ 6	4 48	PPP	9·2
Riverview		20·2	234	i 4 41k	+ 2	i 8 25	+ 4	i 4 51	pP	e 9·4
Vladivostok		75·2	332	e 11 43	− 3	i 21 23	− 2	—	—	—
Berkeley		87·6	48	i 12 54	+ 3	i 23 44	+12	—	—	e 40·8
Pasadena	z.	88·3	52	i 12 57	+ 2	—	—	—	—	—
Mount Wilson	z.	88·4	52	i 12 57	+ 2	—	—	—	—	—
Shasta Dam		88·8	44	e 12 57	0	—	—	—	—	—
Palomar	z.	88·9	53	i 12 59	+ 1	—	—	i 13 7	P_cP	—
Tinemaha	z.	89·7	49	i 13 2	+ 1	—	—	i 13 12	P_cP	—
Boulder City		91·6	51	e 13 6	− 4	—	—	e 13 11	P_cP	—
Pierce Ferry		92·3	52	e 13 10	− 3	—	—	e 13 14	P_cP	—
Tucson		92·9	56	e 13 16	0	—	—	—	—	—
Ksara		139·4	294	e 19 31	[+ 2]	e 32 39	PS	—	—	—
Warsaw	z.	143·1	329	19 32	[− 4]	—	—	22 46	PP	—
Helwan	z.	143·4	289	e 19 34	[− 2]	—	—	e 22 50	PP	—
Copenhagen		143·9	340	e 19 24	[−13]	—	—	—	—	—
Stuttgart		150·7	335	e 19 53	[+ 4]	—	—	e 20 10	?	e 67·8
Strasbourg		151·4	337	e 19 48	[− 1]	—	—	—	—	e 84·8
Basle		152·4	335	e 19 52	[+ 1]	—	—	—	—	—
Paris		152·9	344	e 19 52	[0]	—	—	—	—	e 80·8
Rome		154·1	320	e 19 42	[−11]	—	—	e 23 48	PP	e 75·1

Additional readings :—
Wellington iZ = 5m.20s.
Riverview iPPEN = 5m.5s., iZ = 8m.28s., $iP_cP?N$ = 8m.45s., eQN = 8m.50s.
Warsaw eZ = 20m.1s., 21m.8s., and 21m.51s.
Helwan eZ = 20m.0s.
Strasbourg e = 21m.12s., ePP? = 24m.52s.
Long waves were also recorded at Arapuni, Auckland, Kodaikanal, Weston, Granada, Clermont-Ferrand, De Bilt, and Uccle.

June 17d. 12h. Undetermined shock, probably deep focus.

La Jolla ePZ = 33m.58s.
Mount Wilson iPZ = 34m.0s., ipPZ = 34m.26s.
Pasadena iPZ = 34m.0s., ipPZ = 34m.27s.
Riverside iPZ = 34m.1s., ipPZ = 34m.28s.
Palomar iP = 34m.2s.a, ipPZ = 34m.29s.
Haiwee iPZ = 34m.5s., ipPZ = 34m.33s.
Tinemaha iPZ = 34m.9s., iZ = 34m.26s., ipPZ = 34m.35s.
Boulder City iP = 34m.17s., ipP = 34m.45s.
Pierce Ferry iP = 34m.21s., ipP = 34m.49s.
Tucson iP = 34m.22s., ipP = 34m.50s.
Stuttgart eP?Z = 41m.46s.
Ksara eP? = 41m.57s., e = 49m.5s.

June 17d. 13h. 45m. 54s. Epicentre 6°·1S. 150°·5E. (as on 1946, Oct. 10d.).

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

		Δ	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 47	− 4	i 8 44	− 1	—	—	—
Riverview		27·6	178	i 5 54	+ 3	i 10 15	−17	i 10 52	?	e 12·5
Vladivostok		51·8	343	e 9 10	− 2	—	—	—	—	—
Irkutsk		70·1	332	e 11 36	PcP	e 20 22	− 5	—	—	—
Andijan		85·0	312	e 12 43	+ 5	e 22 58	− 9	—	—	—
Stalinabad		87·3	309	e 12 50	0	e 23 13	[− 3]	—	—	—
Berkeley	E.	91·5	52	—	—	i 23 44	[+ 2]	—	—	e 42·3
Shasta Dam		91·7	49	e 13 10	0	—	—	—	—	—
Pasadena		94·5	56	i 13 23	0	e 23 58	[0]	i 24 11	SKKS	e 44·1
Mount Wilson	Z.	94·6	56	i 13 24	0	—	—	—	—	—
Tinemaha	Z.	94·6	54	i 13 25	+ 1	—	—	—	—	—
Riverside	Z.	95·1	56	i 13 26	0	—	—	—	—	—
La Jolla	Z.	95·2	57	e 13 27	0	—	—	—	—	—
Palomar		95·5	57	i 13 29a	+ 1	i 24 5	[+ 1]	i 24 21	SKKS	—
Pierce Ferry		98·0	54	e 13 39	0	—	—	—	—	—
Tucson		100·6	58	e 13 51	0	—	—	—	—	—
Ksara		113·8	303	e 17 25	?	e 28 47	PS	—	—	—
Stuttgart		126·4	329	e 19 5	[0]	—	—	—	—	e 61·1
Weston		128·3	38	i 24 9	PPP	—	—	—	—	e 64·1
Huancayo		131·0	111	e 19 18	[+ 4]	e 22 42	PKS	—	—	—
La Paz	Z.	135·7	121	e 19 24	[+ 1]	—	—	—	—	—
Fort de France		147·7	72	e 19 47	[+ 3]	—	—	—	—	—

Brisbane also gives eSE = 8m.47s.
Long waves were also recorded at Chicago, Bozeman, and at other European stations.

June 17d. Continuation of list of aftershocks from Central Asian epicentre.

Almata 3h.58m.15s., 13h.5m.35s.

Andijan 1h.5m.46s., 13h.4m.3s., 16h.6m.2s.

Frunse 13h.5m.3s.

Obi-garm 1h.4m.12s., 13h.5m.14s.?, 15h.32m.41s.

Stalinabad 1h.4m.9s.

Tchimkent 3h.57m.24s.

June 17d. Readings also at 0h. (near Apia and near Branner), 3h. (near Mizusawa), 5h. (near Irkutsk), 8h. (near Lick), 12h. (Stuttgart), 17h. (Rome), 20h. (Pasadena, Mount Wilson, Haiwee, Tinemaha, Tucson, Pierce Ferry, and Shasta Dam), 21h. (Ksara and near Logan), 22h. (La Paz and Grand Coulee), 23h. (Mount Wilson, Tinemaha, Shasta Dam, near Boulder City (2), Tucson, Pierce Ferry (2), Wellington, Arapuni, and Auckland).

June 18d. 16h. 24m. 5s. Epicentre 47°·7N. 8°·5E. (as on 1944, April 25d.),

Epicentre 47°50′N. 8°41′E. (Hegau).

Dr. W. Hiller.
Die Erdbebentätigkeit in Südwestdeutschland im Jahre, 1947, Statistische Monatshefte Württemberg-Baden, Heft. 6, June, 1949.

A = +·6681, B = +·0998, C = +·7374; δ = +8; h = −5;
D = +·148, E = −·989; G = +·729, H = +·109, K = −·676.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Zürich	0·3	171	e 0 10	− 1	i 0 16	− 2	—	—	—
Basle	0·7	255	e 0 17	0	0 30	+ 2	—	—	—
Strasbourg	1·0	331	—	—	i 0 33	S_g	—	—	—
Stuttgart	1·2	24	—	—	i 0 37	S^*	—	—	0·6

June 18d. Continuation of list of aftershocks from Central Asian epicentre.

Andijan 3h.2m.51s., 8h.32m.29s., 13h.10m.24s., 20h.21m.27s.

Frunse 10h.57m.12s.

Obi-garm 3h.2m.35s., 8h.30m.53s., 13h.9m.54s., 22h.20m.34s.

Stalinabad 3h.2m.51s., 8h.30m.57s.?, 22h.20m.31s.

Tashkent 22h.20m.56s.

Tchimkent 13h.10m.38s.

June 18d. Readings also at 0h. (Ksara, Riverview, Weston, and near Branner), 1h. (Rome and near Granada (2)), 2h. (Arapuni and Auckland), 3h. (Pasadena, Mount Wilson, Palomar (2), Tucson (2), Shasta Dam, Berkeley, Weston, Huancayo, Warsaw, Rome, Ksara, Strasbourg, Stuttgart, Riverview, and Wellington), 4h. (Malaga, Granada, and Uccle), 5h. (Ksara), 10h. (La Plata and Mizusawa), 11h. (Shasta Dam, Boulder City, Pierce Ferry, Mount Wilson, Pasadena, Palomar, Tucson, St. Louis, and Ksara), 18h. (Mount Wilson, Riverside, Palomar, Tucson, Auckland, Arapuni, Wellington, Brisbane, and Riverview).

June 19d. 2h. 14m. 28s. Epicentre 21°·6N. 145°·7E. (as on 15d.).

$A = -\cdot7688$, $B = +\cdot5244$, $C = +\cdot3660$; $\delta = 0$; $h = +4$;

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tokyo		15·0	341	e 2 40	−55	6 34	+11	7 32	SSS	9·9
Nagoya		15·5	332	3 41	− 1	—	—	—	—	—
Nagano		16·4	338	e 3 56	+ 3	—	—	—	—	—
Sendai		17·1	349	e 3 58	− 4	7 19	+ 7	—	—	8·8
Hamada		17·9	321	e 4 0	−12	7 27	− 3	—	—	—
Mizusawa		17·9	349	e 4 13	+ 1	e 7 37	+ 7	—	—	—
Hukuoka		18·0	316	e 4 11	− 2	7 39	+ 7	—	—	—
Mori		20·9	350	e 4 46	0	8 48	+13	—	—	—
Sapporo		21·7	352	e 5 4	+ 9	—	—	—	—	—
Vladivostok		24·4	335	i 5 21	0	i 9 46	+ 7	—	—	—
Irkutsk		44·1	325	8 11	− 1	14 42	− 3	—	—	—
Almata		60·3	309	10 15	+ 2	—	—	—	—	—
College		60·7	27	—	—	e 18 15	−17	—	—	e 25·2
New Delhi	N	61·7	292	—	—	i 18 38	− 6	—	—	e 33·9
Hyderabad	E.	63·1	280	—	—	18 51	−11	—	—	—
Tashkent		66·1	307	e 10 49	− 2	e 19 33	− 6	—	—	—
Kodaikanal	E.	66·2	273	—	—	e 22 32?	?	—	—	—
Obi-garm		66·2	305	i 10 51	− 1	19 37	− 3	—	—	—
Stalinabad		66·9	304	i 10 56	0	19 44	− 5	—	—	—
Sverdlovsk		69·5	325	i 11 12	0	i 20 16	− 4	—	—	—
Victoria		74·7	43	—	—	e 21 26	+ 7	—	—	31·5
Ukiah		77·5	53	—	—	e 21 36	−14	—	—	e 32·8
Shasta Dam		77·6	51	i 11 59	− 1	—	—	—	—	—
Berkeley		78·6	54	—	—	i 22 4	+ 2	i 22 28	PS	e 25·3
Tinemaha	Z.	81·9	54	i 12 17	− 6	—	—	i 12 27	P_cP	—
Moscow		82·0	327	12 21	− 2	22 32	− 5	—	—	—
Grozny		82·4	314	12 28	+ 3	e 22 40	− 1	—	—	—
Haiwee	Z.	82·4	54	e 12 29	+ 4	—	—	i 12 35	P_cP	—
Mount Wilson	Z.	83·0	56	i 12 29	+ 1	—	—	i 12 36	P_cP	—
Pasadena	Z.	83·0	56	e 12 30	+ 2	—	—	i 12 39	P_cP	—
Bozeman		83·6	43	—	—	e 22 52	− 1	—	—	e 34·3
Palomar	Z.	84·3	56	e 12 35	0	—	—	i 12 42	P_cP	—
Leninakan		84·7	312	e 12 43	+ 6	—	—	—	—	—
Boulder City		84·8	53	e 12 39	+ 2	—	—	—	—	—
Salt Lake City		85·1	48	—	—	e 23 9	+ 1	—	—	e 35·8
Pierce Ferry		85·4	53	e 12 40	0	—	—	—	—	—
Helsinki		85·5	335	—	—	e 22 56	[− 8]	—	—	e 43·5
Scoresby Sund		87·8	356	—	—	23 20	[+ 1]	23 36	S	45·5
Upsala		88·5	337	—	—	e 24 30	+49	e 24 45	PS	e 49·5
Tucson		89·4	55	e 13 2	+ 2	—	—	i 13 8	P_cP	—

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Warsaw	92·1	329	e 13 13	+ 1	e 23 44	[− 1]	e 16 45	PP	e 47·5
Copenhagen	93·4	336	e 17 1	PP	23 52	[0]	24 10	SKKS	46·5
Ksara	93·4	308	e 13 25	+ 7	e 24 10	{+ 3}	—	—	—
Prague	96·6	331	—	—	e 24 50	− 2	e 31 32	SS	—
Cheb	97·6	331	e 17 51	PP	e 24 35	{− 2}	e 31 41	SS	e 51·5
De Bilt	98·9	336	—	—	e 24 42	{− 4}	—	—	e 50·5
Stuttgart	99·9	332	e 13 47	− 1	e 24 32	[+ 5]	e 17 57	PP	e 50·5
Triest	100·1	328	—	—	e 24 38	[+11]	e 32 19	SS	e 51·4
Uccle	100·3	336	—	—	e 24 26	[− 2]	e 32 8	SS	e 51·5
St. Louis	100·4	41	e 18 3	PP	e 32 15	SS	—	—	e 41·2
Strasbourg	100·7	333	e 18 2	PP	e 32 4	SS	e 20 26	PPP	e 45·9
Kew	101·4	338	(e 18 32)	PP	—	—	—	—	e 18·5
Paris	102·6	335	—	—	e 25 32	−10	—	—	e 56·5
Florence	102·7	327	—	—	1 41 2	?	—	—	i 52·3
Ottawa	103·4	28	e 10 50	?	—	—	—	—	42·5
Rome	103·4	326	e 18 37	PP	e 29 17	?	—	—	—
Clermont-Ferrand	104·8	333	—	—	e 25 12	{−17}	—	—	51·5
Alicante	112·4	332	e 41 25	?	—	—	—	—	e 65·2
Almeria	114·6	332	—	—	e 30 58	PPS	—	—	62·5
Granada	114·8	333	—	—	e 40 53	?	e 43 38	?	i 60·2
Malaga z.	115·5	333	—	—	e 29 18	PS	e 31 11	PPS	e 62·3
La Paz	147·7	86	19 54	[+10]	—	—	22 52	PP	—

Additional readings and note :—
Mizusawa eSN =7m.40s.,
Upsala eN =35m.47s., eQ =47m.8s.
Warsaw PPPZ =18m.48s., eSKSE =23m.48s., eSN =24m.15s., eSE =24m.26s., ePSZ = 25m.25s., ePSN =25m.48s., eSSZ =30m.12s., eZ =32m.13s., eSSSN =34m.13s., eSSSZ =34m.19s.
Prague e =38m.32s.
Stuttgart e =22m.17s., eSS? =32m.20s.
St. Louis eN =29m.55s. and 35m.26s.,
Strasbourg ePS =26m.59s.
Long waves were also recorded at Arapuni, Wellington, Riverview, Tortosa, Bermuda, Weston, Philadelphia, Chicago, and Vermont.

June 19d. 7h. 34m.35s. Epicentre 21°·6N. 145°·7E. (as at 2h.).

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Guam	8·1	186	i 1 59	− 3	—	—	—	—	—
Tokyo	15·0	341	3 33	− 2	7 33	+70	8 32	L	11·3
Nagoya	15·5	332	3 40	− 2	6 46	+11	7 4	Q	8·6
Kobe	16·0	327	e 3 45	− 3	6 49	+ 3	—	—	10·5
Koti	16·1	321	i 3 47	− 2	6 44	− 5	—	—	7·2
Nagano	16·4	338	i 3 47	− 6	6 52	− 4	—	—	—
Sendai	17·1	349	e 3 53	− 9	6 56	−16	—	—	8·2
Hamada	17·9	321	4 9	− 3	7 30	0	—	—	—
Mizusawa	17·9	349	4 11	− 1	7 37	+ 7	—	—	—
Hukuoka	18·0	316	i 4 3	−10	7 25	− 7	—	—	9·0
Sapporo	21·7	352	4 58	+ 3	8 13	−38	—	—	10·3
Vladivostok	24·4	335	i 5 20	− 1	i 9 37	− 2	—	—	—
Nanking	26·1	300	5 46	+ 9	10 11	+ 4	—	—	i 12·5
Irkutsk	44·1	325	8 11	− 1	14 42	− 3	—	—	—
Brisbane	49·3	171	e 8 48	− 5	e 15 47	−12	i 10 41	PP	—
Honolulu	52·3	79	i 9 13	− 2	e 16 40	0	—	—	e 21·8
Apia	54·6	125	—	—	e 17 25?	PPS	—	—	—
Riverview	55·4	174	i 9 38a	0	i 17 20	− 2	i 17 42	PPS	e 25·2
Almata	60·3	309	10 11	− 2	18 21	− 5	—	—	—
College	60·7	27	e 9 59	−16	e 18 13	−19	e 12 14	PP	e 24·6
New Delhi N.	61·7	292	—	—	i 18 39	− 5	i 18 49	PS	—
Frunse	62·0	308	i 10 23	− 1	i 18 44	− 4	—	—	—
Hyderabad	63·1	280	10 24	− 8	18 51	−11	12 50	PP	30·3
Andijan	63·8	306	10 33	− 3	i 19 8	− 3	—	—	—
Auckland	64·3	154	—	—	19 20	+ 3	20 37	S_cS	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Colombo	E.	65·0	268	10 25?	−19	19 17	− 9	—	—	34·5
Arapuni		65·7	154	—	—	19 37	+ 3	—	—	—
Tashkent		66·1	307	10 59?	+ 8	21 3?	S_cS	e 11 27?	P_cP	—
Kodaikanal	E.	66·2	273	i 10 55	+ 3	i 19 35	− 5	—	—	—
Obi-garm		66·2	305	i 10 52	0	i 19 33	− 7	—	—	—
Sitka		66·2	36	e 10 35	−17	i 19 40	0	e 13 31	PP	e 27·8
Stalinabad		66·9	304	i 10 54	− 2	i 19 44	− 5	—	—	—
Bombay	E.	67·8	283	i 11 2	0	i 19 52	− 8	—	—	31·6
Wellington		68·1	157	11 5	+ 1	19 56	− 7	13 51	sPP	29·9
Wairiri		69·1	160	11 17	+ 7	20 12	− 3	24 37	SS	31·7
Sverdlovsk		69·5	325	i 11 10	− 2	i 20 12	− 8	—	—	—
Victoria		74·7	43	11 45	+ 2	21 21	+ 2	14 31	PP	34·4
Ferndale	E.	76·3	51	e 12 6	+14	e 21 41	+ 4	—	—	e 34·5
Ukiah		77·5	53	e 12 1	+ 2	e 21 31	−19	e 14 39	PP	e 33·3
Shasta Dam		77·6	51	i 11 59	− 1	e 21 48	− 3	e 22 19	S_cS	—
Grand Coulee		77·7	43	e 12 0	0	—	—	—	—	—
Berkeley		78·6	54	e 12 4	− 1	e 21 59	− 3	i 12 13	P_cP	e 35·4
Branner		78·8	54	i 12 9	+ 3	i 21 45	−19	—	—	e 37·4
Santa Clara		79·0	54	i 12 7	0	e 21 4	−62	—	—	e 36·5
Lick		79·2	54	e 12 12	+ 4	e 22 3	− 5	e 22 17	S_cS	e 35·7
Fresno	N.	80·8	54	e 12 22	+ 5	e 21 47	−38	—	—	—
Santa Barbara		81·7	56	i 12 25	+ 3	—	—	—	—	—
Tinemaha		81·9	54	e 12 23	0	—	—	—	—	—
Moscow		82·0	327	i 12 21	− 2	i 22 29	− 8	—	—	—
Grozny		82·4	314	12 28	+ 3	22 34	− 7	—	—	—
Haiwee		82·4	54	i 12 26k	+ 1	—	—	—	—	—
Butte		82·5	43	e 12 28	+ 2	i 22 39	− 3	e 15 37	PP	e 34·4
Mount Wilson		83·0	56	i 12 29k	+ 1	—	—	—	—	—
Pasadena		83·0	56	i 12 28k	0	i 22 44	− 6	i 12 36	P_cP	33·7
Saskatoon		83·4	36	12 12	−18	22 28	−23	23 37	PS	40·4
Bozeman		83·6	43	e 12 28	− 3	i 22 46	− 7	e 15 45	PP	e 33·6
Riverside	E.	83·7	56	e 12 31	− 1	—	—	—	—	—
La Jolla		84·2	57	e 12 34	0	—	—	—	—	—
Palomar		84·3	56	i 12 35k	0	i 22 55	− 2	i 15 50	PP	—
Erevan		84·4	311	e 12 37	+ 1	22 54	− 7	—	—	—
Leninakan		84·7	312	i 12 40	+ 3	e 22 59	− 5	—	—	—
Boulder City		84·8	53	i 12 38	+ 1	e 22 58	− 7	—	—	—
Salt Lake City		85·1	48	e 12 40	+ 1	e 22 58	[− 3]	e 15 56	PP	e 35·2
Pierce Ferry		85·4	53	i 12 41	+ 1	e 22 59	[− 4]	—	—	—
Helsinki		85·5	335	e 12 39	− 2	e 23 2	[− 2]	—	—	e 40·4
Sotchi		86·3	316	e 12 41	− 4	e 23 11	[+ 2	—	—	—
Scoresby Sund		87·8	356	i 12 52k	0	23 33	− 1	16 27	PP	—
Theodosia		88·3	318	e 12 54	− 1	e 23 18	[− 4]	—	—	—
Upsala		88·5	337	e 12 51	− 5	e 29 33	SS	e 16 25	PP	e 43·4
Tucson		89·4	55	i 13 1	+ 1	e 23 30	[+ 1]	i 16 31	PP	e 36·4
Yalta		89·4	318	e 13 0	0	—	—	—	—	—
Denver		90·2	47	e 13 6	+ 2	23 38	[+ 4]	e 16 49	PP	44·1
Warsaw		92·1	329	e 13 10k	− 2	e 24 11	− 2	16 51	PP	e 44·4
Bergen	z.	92·2	341	—	—	e 34 45	SSS	—	—	—
Copenhagen		93·4	336	i 13 16	− 2	24 20	− 4	25 46	PS	45·4
Ksara		93·4	308	i 13 16	− 2	24 26?	+ 2	16 59	PP	—
Bucharest		94·3	321	e 13 19	− 4	e 24 14	{+ 1}	—	—	e 44·4
Istanbul		94·4	317	e 13 20	− 3	e 25 47	PS	—	—	—
Potsdam	E.	95·6	333	e 17 20	PP	e 24 57	+14	e 26 25	PS	e 46·4
Budapest		96·2	326	12 59	−32	e 24 16	[+ 8]	e 17 25	PP	48·4
Prague		96·6	331	e 13 49	+16	e 24 27?	{− 3}	e 17 4	PP	e 43·3
Ivigtut		96·7	6	17 25	PP	24 6	[− 4]	—	—	—
Kalossa	N.	96·9	326	e 13 48	+14	—	—	e 14 4	?	—
Aberdeen		97·0	343	i 17 18	PP	i 24 6	[− 6]	i 26 22	PS	—
Belgrade		97·2	324	e 13 31	− 5	e 24 51	− 6	e 17 25	PP	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m. s.			m.
Jena	N.	97·3	332	e 13 35	− 1	e 24 8	[− 5]	e 17 33	PP		—
Cheb		97·6	331	e 17 36	PP	e 24 6	[− 9]	i 31 51	SS		e 51·4
Edinburgh		98·4	342	e 31 25	?	e 31 47	SS	e 35 37	SSS		—
Helwan	Z.	98·7	307	i 13 40	− 2	25 1	− 9	14 7	pP		—
De Bilt		98·9	336	e 17 57k	PP	i 24 20	[− 2]	i 26 35	PS		e 45·4
Durham	N.	98·9	341	e 17 56	PP	i 25 18	+ 7	i 26 48	PS		—
Zagreb		98·9	327	e 13 43	0	e 24 17	[− 5]	e 17 59	PP		e 47·4
Stuttgart		99·9	332	e 13 46	− 2	e 24 37	[+10]	i 17 58 a	PP		e 47·4
Chicago		100·0	38	e 17 45	PP	i 25 10	−10	e 26 50	PS		e 43·2
Triest		100·1	328	e 13 52?	+ 3	i 24 22?	[− 5]	e 17 52	PP		—
Uccle		100·3	336	e 13 49	− 1	e 24 24	[− 4]	e 17 51	PP		e 48·4
St. Louis		100·4	41	e 13 50	0	i 24 26	[− 3]	e 17 55	PP		—
Strasbourg		100·7	333	e 13 50	− 2	i 25 21	− 5	e 17 58	PP		e 47·6
Chur		101·2	330	e 17 32	PP	e 24 26	[− 7]	—	—		e 48·7
Zürich		101·3	332	e 13 52	− 2	e 24 27	[− 6]	e 18 1	PP		—
Kew		101·4	338	i 14 6k	+11	e 25 31	− 1	e 18 9?	PP		e 49·4
Basle		101·6	332	e 13 54	− 2	e 27 32	PS	e 17 0	PKP		—
Paris		102·6	335	14 12	+12	24 35	[− 5]	18 17	PP		e 49·4
Pavia		102·6	330	e 13 25?	−35	—	—	—	—		—
Florence		102·7	327	i 19 5	PP	—	—	—	—		—
Ottawa		103·4	28	18 10	PP	24 34	[− 9]	27 31	PS		46·4
Rome		103·4	326	e 14 0	− 4	25 38	−11	27 43	PS		—
Shawinigan Falls		103·8	25	e 18 16	PP	—	—	—	—		52·4
Jersey		103·9	339	e 13 41	−25	e 24 55	[+ 9]	—	—		—
Seven Falls		104·1	24	18 28	PP	24 43	[− 3]	27 37	PS		48·4
Clermont-Ferrand		104·8	333	e 14 20	+10	i 24 49	[− 1]	e 18 29	PP		48·4
Vermont		105·2	27	e 18 41	PP	e 24 40	[−11]	e 27 42	PS		e 47·7
Harvard		107·5	27	e 18 48	PP	e 24 58	[− 4]	e 29 9	PPS		e 54·4
Georgetown		107·7	33	e 14 28	P	i 25 0	[− 2]	18 50	PP		—
Weston		107·7	27	e 18 31	[+ 3]	—	—	i 29 45	PKKP		—
Fordham		107·8	29	e 14 24	P	e 25 1	[− 2]	i 28 21	PS		—
Philadelphia		107·9	31	e 18 47	PP	e 24 59	[− 4]	e 28 13	PS		e 44·6
Barcelona		108·8	331	18 57	PP	31 14	?	—	—		53·2
Halifax		108·9	21	—	—	24 37	[−31]	e 28 4	PS		50·4
Columbia		109·0	39	e 18 59	PP	e 25 7	[− 1]	e 28 30	PS		e 48·7
Tortosa		110·0	332	19 4	PP	26 13	{+ 8}	28 48	PS		e 49·4
Alicante		112·4	332	19 26	PP	24 54	[−28]	22 22	PPP		e 53·1
Toledo	Z.	112·6	335	19 30	PP	26 13	{−10}	20 35	?		49·4
Almeria		114·6	332	e 19 42	PP	27 14	{+37}	30 26	PPS		55·0
Granada		114·8	333	e 19 41	PP	—	—	—	—		55·4
Malaga	Z.	115·5	333	i 19 42k	PP	i 27 0	{+16}	22 48	PP		49·9
Bermuda		119·0	29	e 20 7	PP	e 30 10	PS	e 36 45	SSP		e 48·7
Antarctica		129·2	164	e 19 15	[+ 5]	i 28 12	{− 2}	e 21 27	PP		e 62·4
Bogota	Z.	133·1	60	e 19 22	[+ 4]	e 22 43	SKP	e 19 35	?		—
Fort de France		135·3	38	e 19 25	[+ 3]	—	—	—	—		—
Huancayo		139·7	83	e 19 25	[− 5]	e 29 49	{+30}	e 22 29	PP		e 57·8
Santa Lucia	E.	145·8	118	21 45	?	—	—	—	—		68·1
La Paz		147·7	86	i 19 53a	[+ 9]	30 5	{− 1}	20 35	pPKP		70·4
La Plata	E.	155·4	127	—	—	56 13	?	75 7	Q		81·8
	N.	155·4	127	20 37	[+42]	56 7	?	24 55	PP		87·2

Additional readings :—
Brisbane iP_cPEN =9m.59s., iSSEN =18m.40s.
Riverview iZ =10m.13s., iS_cSE =19m.28s., iS_cSN =19m.31s., eQE =23m.25s.
College ePPP? =13m.59s., eSS =22m.13s.
New Delhi PPSN =18m.59s., iN =20m.14s.
Hyderabad S_cSE =20m.7s., SSE =23m.24s.,
Auckland SS =27m.15s., SSS =31m.35s.
Sitka i =20m.15s.
Wellington Z =12m.39s., i =13m.5s., sPPP?Z =15m.49s., i =18m.16s., S_cS =21m.0s., SS =24m.25s., i =25m.50s., SSS? =28m.1s.
Wairiri Z =12m.56s., eZ =15m.51s., EN =21m.11s., SSS?E =27m.10s.
Victoria SS =26m.25s.?, SSS =29m.25s.?
Ukiah eS_cS =22m.14s., eSS =26m.33s., eSSS? =30m.32s.
Berkeley eN =12m.8s., iSE =21m.14s., iSKSN =22m.18s.
Butte eSS? =26m.52s.
Pasadena iZ =12m.32s., iPPZ =16m.39s., iN =22m.56s., eSSE =28m.13s., eSKP,PKPZ =42m.11s.

Continued on next page.

Bozeman eSS? =28m.37s.
Palomar iZ =12m.45s.
Salt Lake City ePS =23m.41s., ePPS =24m.13s., eSS =28m.32s., eSSS =32m.30s.
Helsinki eSKS =22m.55s., ePS =23m.15s., eSS =33m.12s.
Scoresby Sund i =13m.1s., SKS =23m.12s., iE =23m.47s., PS =24m.43s., eE =36m.13s.
Upsala iPSN =24m.53s., eSSN =29m.25s., eE =34m.52s., eN =36m.25s.
Tucson i =13m.10s., and 14m.36s., ePPP? =18m.44s., eSKS =23m.7s., ePS =23m.55s., ePPS =24m.55s., eSS =29m.19s., eSSS =33m.43s.
Denver SS =30m.26s.
Warsaw ePEN =13m.13s., eN =15m.18s., ePPPE =18m.56s., ePPPN =19m.2s., SKSEN =23m.40s,. SN =24m.6s., PSZ =25m.31s., PS?N =25m.47s., PPSZ =26m.3s., PPSE =26m.6s., ePPSN =26m.19s., eSSN =30m.22s., SSE =30m.26s., eSSSN =34m.2s., iN =34m.41s.
Copenhagen 17m.1s., 23m.48s., SS =30m.45s., SSS =34m.31s.
Potsdam ePPP?E =19m.52s., eSS?E =31m.13s.?
Budapest ePE =13m.38s.
Prague ePPS =26m.31s., eSS =31m.25s., eSSS =34m.55s., ePPP (Δ >180°) =38m.43s.
Aberdeen iEN =31m.5s.
Belgrade ePS? =26m.35s., eSS? =32m.37s.
Jena eN =13m.53s. and 31m.19s., eE =31m.25s., eN =31m.40s.
Cheb e =18m.43s., ePPP =19m.46s., ePPS =26m.42s., e =29m.43s., eSSS =35m.25s., e =39m.17s.
Helwan iZ =13m.49s., 14m.40s., and 17m.10s., PPZ =17m.49s., pSZ =25m.37s., PS?Z =26m.31s.
De Bilt eS =25m.23s.
Durham iN =24m.42s. and 32m.2s.
Stuttgart iPZ =13m.52s.a, ePP =17m.49s., ePPP =20m.3s., eS =25m.15s., ePS =26m.55s., eSS =32m.20s., eSSS =36m.11s.
Chicago iSKS =24m.13s.
Triest iSS =31m.56s.
Uccle ePPPN =20m.7s., ePSEN =26m.57s., eSSE =32m.22s.
St. Louis ipP?Z =13m.59s., iN =24m.44s., iPSN =27m.4s.
Strasbourg e =17m.8s., ePP =17m.40s., and 17m.52s., iPPP =20m.14s., eSKS =24m.25s., iS =25m.37s., ePS =26m.52s., iPS =27m.8s., ePPS =27m'40s., eSS =32m.10s., iSS =32m.26s. and 32m.32s., eSSS =36m.23s.
Zürich eS =25m.22s.
Kew iPPP?EZ =20m.23s., ePS?EZ =26m.59s.?, ePPS?E =28m.9s.?
Paris PPP =20m.18s., S =25m.48s., PS =27m.24s., SS =32m.49s.
Rome ePPE =17m.58s., eZ =18m.17s., eSKS? =24m.31s., ePS? =27m.0s., eSS? =33m.0s.
Ottawa SS =33m.19s., SSS =36m.55s., eE =42m.25s.?
Seven Falls PPP =20m.13s., SKKS =25m.49s., SS =33m.19s.
Clermont-Ferrand iS =26m.15s., iPS =27m.54s., iPPS =28m.27s.
Vermont eSS =33m.33s., eSSS =37m.44s.
Georgetown e =18m.42s., eS =28m.17s., SS =34m.18s.
Fordham i =18m.59s., iPPS? =29m.9s.
Philadelphia iPS =28m.19s., eSS =34m.0s., eSSS =38m.15s.
Halifax SS =34m.13s.
Columbia eSS =34m.5s.
Tortosa PPPN =21m.28s., SKSPN =22m.0s., SKSN =25m.0s., and 25m.39s., PPSN =29m.48s., SSN =34m.36s., SSPN =34m.45s.
Alicante PP =20m.30s., SS =33m.56s., Q =45m.54s.
Almeria PP =20m.55s., PPP =23m.22s., PPS =31m.42s., SS =36m.48s., SSS =41m.5s.
Granada PP =24m.5s., PPP =26m.10s., SKS =29m.38s., SKKS =30m.58s., PPS =34m.13s., SS =39m.42s., readings wrongly identified.
Malaga ePPZ =20m.50s., SKKSZ =27m.38s., PKKPZ =30m.42s., iSSZ =36m.14s., PKP,PKSZ =42m.10s.
Bermuda iPP =20m.23s.
Antarctica SKP =22m.41s., e =23m.51s., i =28m.32s., eS =29m.33s., e =30m.9s. and 33m.29s.
Huancayo eSS =40m.58s.
La Paz sPKPZ =21m.9s., PPN =23m.17s., SKPN =23m.25s., iSSN =42m.39s.
La Plata N =59m.43s., QN =71m.43s.
Long waves were also recorded at Tananarive, Besançon, Lisbon, and Pavia.

June 19d. 22h. 47m. 31s. Epicentre 5°·7N. 100°·2W.

$A = -\cdot1762$, $B = -\cdot9794$, $C = +\cdot0987$; $\delta = +1$; $H = +7$;
$D = -\cdot984$, $E = +\cdot177$; $G = -\cdot018$, $H = -\cdot098$, $K = -\cdot995$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Balboa Heights		20·7	79	e 4 45	+ 1	e 8 48	+17	—	—	—
Bogota	z.	26·0	90	i 5 39	+ 3	—	—	—	—	—
Tucson		28·2	341	e 5 55	− 1	e 10 49	+ 8	e 9 7	P_cP	e 12·1
Huancayo		30·4	125	i 6 16	0	—	—	—	—	e 11·5
La Jolla	z.	31·4	332	i 6 23	− 2	—	—	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Palomar		31·6	333	i 6 26k	0	—	—	—	—	—
Pasadena		32·8	333	i 6 36	− 1	—	—	i 9 19	PcP	e 15·5
Pierce Ferry		32·8	340	i 6 37	0	—	—	—	—	—
Mount Wilson	z.	32·9	333	i 6 37k	− 1	—	—	i 9 20	PcP	—
Boulder City		33·0	339	i 6 38	− 1	—	—	—	—	—
St. Louis		34·0	14	e 6 48	0	e 12 8	− 5	e 9 22	PcP	—
Haiwee		34·4	335	e 6 59	+ 8	—	—	—	—	—
Salt Lake City		36·4	346	e 7 9	+ 1	e 12 53	+ 3	e 8 36	PP	e 15·9
Chicago		37·7	14	e 7 21	+ 2	e 13 5	− 5	i 8 59	PP	e 16·3
La Paz		38·6	124	i 7 26k	0	i 13 29	+ 6	—	—	20·5
Shasta Dam		40·1	334	i 10 37	?	—	—	—	—	—
Philadelphia		40·9	30	e 7 49	+ 3	e 13 59	+ 1	e 9 19	PP	e 17·2
Fordham		42·2	30	e 9 41	PP	e 14 19	+ 2	—	—	—
Bermuda		42·4	47	—	—	e 14 29	+ 9	—	—	—
Weston		44·6	31	e 8 17	+ 1	i 14 57	+ 5	—	—	—
Ottawa		44·9	24	8 18	0	14 59	+ 3	18 11	SS	22·5
Seven Falls		48·4	27	8 43	− 3	15 49	+ 3	11 23	PPP	22·5
Scoresby Sund		80·7	19	12 17	+ 1	22 25	+ 1	27 47	SS	—
Malaga	z.	91·3	53	i 13 9a	0	e 24 17	+11	27 8	sS	44·4
Granada		91·8	53	i 12 38	−33	e 23 50	{− 5}	25 26	PS	43·4
De Bilt		94·9	36	—	—	e 25 59	PS	—	—	e 43·5
Strasbourg		97·5	39	e 17 38	PP	e 24 16	[+ 2]	e 26 48	PS	e 47·5
Copenhagen		97·8	32	26 37	PS	—	—	—	—	31·5
Stuttgart		98·3	39	e 17 44?	PP	e 24 23	[+ 4]	e 27 5	PPS	e 47·5
Rome		102·8	44	e 18 2	PP	e 27 10	PS	—	—	—
Istanbul		114·3	39	e 19 29	PP	—	—	—	—	e 61·5
Sverdlovsk		115·7	11	e 19 44	PP	—	—	—	—	—
Ksara		122·8	43	e 19 3	[+ 5]	e 29 5	?	—	—	—
Tashkent		132·2	10	e 19 16	[0]	i 22 55	PKS	—	—	—

Additional readings and note :—
Bogota iZ =5m.45s.
St. Louis epP?Z =7m.44s., iN =8m.16s., iSN =12m.21s., esS?N =14m.4s.
Seven Falls SS =18m.41s.
Malaga PPZ =17m.9s.
Granada PS =24m.23s.
Strasbourg ePS =26m.2s.
Long waves were also recorded at Honolulu, Butte, Berkeley, Alicante, Uccle, Paris, Clermont-Ferrand, and Kew.

June 19d. Continuation of list of aftershocks from Central Asian epicentres.

Almata 22h.7m.48s.

Andijan 14h.40m.44s., 17h.48m.24s., 22h.5m.46s.

Frunse 17h,49m.51s., 22h.7m.11s.

Obi-garm 17h.48m.34s., 22h.6m.4s.

Stalinabad 17h.48m.39s., 22h.6m.14s.

Tashkent 17h.47m.53s., 22h.6m.16s.

Tchimkent 17h.47m.58s.

June 19d. Readings also at 1h. (Stuttgart), 4h. (La Paz), 6h. (Mount Wilson, Pasadena, Palomar, Shasta Dam, Haiwee, Tinemaha, Boulder City, Pierce Ferry, Tucson, Warsaw, Apia, and Riverview), 7h. (Berkeley), 8h. (Shasta Dam (2)), 10h. (College, Boulder City, Pierce Ferry, Tucson, Palomar, St. Louis, Helwan, Zagreb, Stuttgart, Zürich, and Triest), 11h. (Boulder City, Pierce Ferry (2), Tucson (2), Palomar (2), Mount Wilson, Pasadena, Haiwee (2), Tinemaha, Warsaw, Apia, Wellington, and Auckland), 12h. (Weston and Istanbul), 15h. (Shasta Dam, Pierce Ferry-Tucson, Palomar, Mount Wilson, Pasadena, Haiwee, Tinemaha, and Riverside), 18h. (Shasta Dam), 19h. (Triest and near Branner), 20h. (Shasta Dam, Palomar, Mount Wilson, Riverside, and near Branner).

June 20d. 13h. 34m. 20s. Epicentre 28°·7N. 43°·6W.

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

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bermuda		18·5	287	i 4 22	+ 3	e 7 51	+ 7	—	—	e 8·7
Weston		26·2	309	e 5 38	0	—	—	—	—	e 15·2
Fordham		27·5	305	e 5 51	+ 1	e 10 37	+ 7	—	—	—
Seven Falls		28·1	319	e 5 38	−17	(11 40?)	SS	—	—	11·7
Philadelphia		28·3	302	e 5 56	− 1	e 10 47	+ 4	e 6 49	PP	e 11·6
Ottawa		30·3	313	6 16	+ 1	11 20	+ 5	7 4	PP	14·7
Malaga	z.	33·8	65	i 6 43k	− 3	i 12 8	− 2	i 7 52	PP	15·3
Toledo	z.	34·3	60	i 6 48	− 2	12 23	+ 6	7 44	PP	—
Granada		34·4	64	i 6 52	+ 1	i 12 30	+11	8 27	PPP	i 14·8
Almeria		35·3	65	i 6 57	− 2	i 12 29	− 4	8 31	PPP	17·9
Alicante		36·9	63	e 7 16	+ 4	15 26	SS	7 28	pP	—
Tortosa		37·8	59	7 22	+ 2	13 14	+ 3	8 36	PP	e 15·7
Chicago		37·8	303	e 7 22	+ 2	e 13 14	+ 3	—	—	e 16·5
Kew		39·4	42	e 7 35?	+ 2	e 13 31	− 4	e 9 15?	PP	e 19·2
St. Louis		39·7	298	e 7 33	− 3	e 13 44	+ 4	e 9 6	PP	e 17·0
Paris		40·4	46	7 40	− 1	e 13 49	− 1	—	—	e 19·7
Uccle		42·0	43	e 9 36	PP	e 14 15	+ 1	—	—	e 17·7
De Bilt		42·9	42	e 8 0	− 2	e 14 28	+ 1	—	—	—
Scoresby Sund		43·6	11	8 7	− 1	14 42	+ 4	—	—	—
Strasbourg		43·8	48	e 8 8	− 1	—	—	—	—	—
Pavia	z.	44·5	53	e 7 40?	−35	—	—	—	—	—
Stuttgart		44·8	48	e 8 14	− 3	e 14 50	− 5	e 9 57	PP	e 21·7
Rome		46·9	57	e 8 32	− 2	e 15 24	− 1	—	—	—
Cheb		47·0	46	—	—	e 15 40?	+14	e 21 40?	Q	e 24·7
Triest		47·7	52	e 8 37?	− 3	e 15 37?	+ 1	—	—	—
Copenhagen		47·8	39	e 8 40	− 1	e 15 40	+ 2	—	—	23·7
Huancayo		50·8	222	i 9 4	0	—	—	—	—	—
La Paz		50·8	211	i 9 4k	0	16 30	+10	—	—	27·7
Warsaw		52·5	45	e 9 15	− 2	e 16 44	+ 1	e 16 50	PS	e 27·7
Salt Lake City		56·1	302	—	—	e 17 23	− 9	(e 23 18)	SSS	e 23·3
Tucson		57·2	292	e 9 50	− 1	e 17 50	+ 4	—	—	e 26·8
Pierce Ferry		58·7	297	i 10 1	− 1	—	—	—	—	—
Istanbul		59·3	56	e 10 8	+ 2	—	—	—	—	e 31·7
Boulder City		59·4	297	i 9 52	−14	—	—	—	—	—
Palomar		61·8	295	i 10 21k	− 2	—	—	—	—	—
Tinemaha	z.	61·8	299	i 10 23	0	—	—	—	—	—
Riverside	z.	62·0	296	i 10 23	− 1	—	—	—	—	—
La Jolla	z.	62·2	294	i 10 23	− 3	—	—	—	—	—
Mount Wilson	z.	62·5	296	i 10 27	− 1	—	—	—	—	—
Pasadena	z.	62·6	296	i 10 26	− 2	—	—	—	—	e 29·7
Shasta Dam		63·9	304	e 10 34	− 3	—	—	—	—	—
Helwan	z.	64·2	68	10 38	− 1	—	—	i 14 30	PPP	—
Ksara		66·5	63	e 10 52	− 2	e 19 50	+ 6	—	—	—
Santa Lucia	E.	66·9	205	—	—	22 51	?	—	—	—
Sverdlovsk		73·7	33	11 35	− 3	e 21 9	+ 1	—	—	—
Tashkent		86·7	44	e 12 45	− 2	—	—	—	—	—

Additional readings :—
Ottawa SSN = 12m.40s.
Malaga iP_cPZ = 9m.24s., iS_cP = 12m.40s., iSSZ = 16m.36s.
Almeria P_cP = 9m.37s., P_cS = 13m.17s., SS = 14m.37s., S_cS = 17m.19s.
Alicante PP = 8m.23s., PPP = 9m.10s., P_cP = 9m.50s., e = 18m.12s.
Tortosa PPPN = 8m.57s.
Chicago e = 8m.6s.
Stuttgart eSS = 18m.18s.
Warsaw eZ = 14m.14s., e = 15m.51s.
Boulder City e = 10m.5s.
Santa Lucia E = 23m.2s.
Long waves were also recorded at Berkeley and Bozeman.

June 20d. 17h. 4m. 57s. Epicentre 28°·7N. 43°·6W. (as at 13h.).

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bermuda		18·5	287	e 4 25	+ 6	e 7 51	+ 7	—	—	—
Seven Falls		28·1	319	e 5 54	− 1	(11 3?)	L	—	—	11·0
Malaga	z.	33·8	65	i 6 45k	− 1	i 12 13	+ 3	7 47	PP	15·6
Toledo	z.	34·3	60	i 6 49	− 1	—	—	—	—	—
Granada		34·4	64	—	—	(11 57?)	−22	—	—	12·0
Kew		39·4	42	—	—	(e 14 3?)	+28	—	—	e 14·0
St. Louis		39·7	298	e 7 37	+ 1	e 13 46	+ 6	—	—	—
Stuttgart		44·8	48	e 8 15?	− 2	—	—	e 9 58	PP	e 22·1
Rome		46·9	57	e 9 5	+31	e 15 23	− 2	—	—	—
Tucson		57·2	292	e 9 51	0	—	—	—	—	—
Palomar		61·8	295	i 10 21	− 2	—	—	—	—	—
Tinemaha	z.	61·8	299	e 10 24	+ 1	—	—	—	—	—
Riverside	z.	62·0	296	e 10 24	0	—	—	—	—	—
Mount Wilson	z.	62·5	296	i 10 29	+ 1	—	—	—	—	—
Shasta Dam		63·9	304	e 10 35	− 2	—	—	—	—	—

Additional readings :—
Malaga P_cPZ =9m.11s., S_cPZ =12m.45s., S_cSZ =16m.35s.
Long waves also recorded at Philadelphia.

June 20d. 18h. 54m. 59s. Epicentre 21°·6N. 145°·7E. (as on 19d.).

A = −·7688, B = +·5244, C = +·3660 ; δ =0 ; h = +4 ;
D = +·564, E = +·826 ; G = −·302, H = +·206, K = −·931.

		△	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Vladivostok		24·4	335	e 5 22	+ 1	e 9 40	+ 1
Andijan		63·8	306	e 10 31	− 5	—	—
Tashkent		66·1	307	e 10 51	0	—	—
Obi-garm		66·2	305	e 10 53	+ 1	e 19 37	− 3
Stalinabad		66·9	304	e 10 56	0	—	—
Sverdlovsk		69·5	325	i 11 10	− 2	e 20 16	− 4
Shasta Dam		77·6	51	e 11 59	− 1	—	—
Tinemaha	z.	81·9	54	i 12 27	+ 4	—	—
Moscow		82·0	327	e 12 22	− 1	—	—
Mount Wilson	z.	83·0	56	e 12 29	+ 1	—	—
Pasadena	z.	83·0	56	e 12 28	0	—	—
Riverside	z.	83·7	56	e 12 31	− 1	—	—
Palomar		84·3	56	e 12 35	0	—	—
Tucson		89·4	55	e 12 55	− 5	—	—
La Paz	z.	147·7	86	19 50	[+ 6]	—	—

Additional readings :—
Palomar eZ =12m.47s.
Tucson e =13m.6s.
Long waves were also recorded at some European stations.

June 20d. 22h. South Eastern Europe.

Bucharest ePEN =9m.2s., iPEN =9m.7s., iN =9m.11s., iSE =9m.37s., iS?N =9m.40s., iN =9m.44s., iE =9m.47s., iN =10m.2s.
Istanbul eP? =9m.15s., iS =10m.3s.
Belgrade iP =9m.26s., iP_g =9m.40s., iS_g =10m.40s., i =10m.52s.
Zagreb P =10m.28s.?, eNE =11m.31s.
Triest eP =10m.37s., eS =12m.15s.
Kalossa eN =11m.0s., eE =11m.9s., LE =11m.53s.
Stuttgart ePZ =11m.23s., eL? =15m.38s.
Rome e =11m.54s. and 14m.46s.
Warsaw eZ =12m.55s., eE =13m.2s., eN =13m.7s., eE =13m.57s., eNZ =14m.1s., eEN =14m.34s., eE =15m.10s., eZ =15m.40s., and 16m.0s., eN =16m.10s. and 16m.31s.
Pavia eZ =14m.
Florence iPN =14m.11s., iSN =14m.47s.
Ksara e =14m.42s.
Cheb e =15m.
Basle e =15m.44s.
Long waves were also recorded at Copenhagen, De Bilt, Strasbourg, and Kew.

June 20d. 23h. 9m. 25s. Epicentre 38°·0N. 29°·5W. (as on 10d. 19h.).

A = +·6876, B = −·3890, C = +·6131; δ = +1; h = −1;
D = −·492, E = −·870; G = +·534, H = −·302, K = −·790.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Lisbon		16·0	81	3 51	+ 3	6 46	0	—	—	7·6
Toledo	z.	19·9	76	4 48	+12	i 8 30	+15	—	—	—
Malaga	z.	20·0	85	i 4 38a	+ 1	i 8 32	+15	5 26	PP	—
Granada		20·5	85	i 4 44	+ 2	i 8 31	+ 4	4 54	pP	10·2
Almeria		21·5	86	i 4 55	+ 3	i 8 57	+10	5 26	PPP	13·2
Jersey		22·7	49	—	—	e 9 30	+21	—	—	e 12·6
Alicante		22·8	79	e 5 14	+ 9	e 9 18	+ 7	5 30	pP	12·2
Tortosa		23·3	73	5 16	+ 6	9 29	+ 9	5 59	PP	11·5
Barcelona		24·5	70	e 4 30	−52	e 9 11	−29	—	—	e 12·9
Kew		24·5	47	i 5 19	− 3	e 9 35	− 5	—	—	e 11·6
Durham	N.	25·3	39	—	—	e 9 53	− 1	—	—	—
Paris		25·5	54	e 5 29	− 3	e 10 2	+ 5	—	—	e 16·6
De Bilt		28·0	48	e 6 0	+ 5	e 10 39	+ 1	—	—	e 13·1
Strasbourg		28·9	55	e 6 3	0	e 10 44	− 9	—	—	e 12·1
Stuttgart		29·8	57	e 6 7	− 4	—	—	—	—	e 22·6
Florence		31·1	65	e 9 0	PcP	e 13 21	SS	—	—	—
Seven Falls		31·5	301	e 6 22	− 4	e 11 35	+ 1	—	—	16·6
Cheb		32·0	53	e 7 37	PP	e 11 43	+ 1	—	—	e 15·6
Rome		32·2	68	e 6 49	+17	e 11 50	+ 5	e 13 39	SS	—
Scoresby Sund		32·8	3	—	—	3 56	?	—	—	—
Triest		32·8	62	e 7 32?	PP	e 11 50	− 4	—	—	—
Copenhagen		33·1	43	—	—	e 11 56	− 3	—	—	15·6
Prague		33·3	53	e 5 47	−54	(e 12 35?)	+33	—	—	e 12·6
Ottawa		34·9	297	e 6 53	− 2	e 12 23	− 4	—	—	15·6
St. Louis		46·9	291	i 8 31	− 3	e 15 23	− 2	—	—	—
Moscow		47·2	45	e 8 36	0	—	—	—	—	—
Ksara		52·1	74	e 9 21	+ 7	e 17 5	+27	—	—	—
Sverdlovsk		59·5	40	e 10 4	− 3	e 18 16	0	—	—	—
Tucson		64·8	293	i 10 42	− 1	—	—	—	—	—
Riverside	z.	68·6	297	i 11 5	− 2	—	—	—	—	—
Tananarive	E.	91·7	113	11 49	?	—	—	—	—	—

Additional readings :—
Malaga iS_cPZ = 11m.40s., S_cSZ = 15m.42s.
Granada PP = 5m.6s., sS = 8m.51s.
Almeria PPP = 5m.35s., P_cP = 8m.51s., P_cS = 12m.23s.
Alicante PP = 5m.54s., P_cP = 8m.44s., SS = 10m.30s.
Tortosa PPPN = 6m.9s., P_cP?N = 9m.12s., SSEN = 10m.25s., SSSEN = 10m.48s.
Strasbourg eS? = 10m.39s.
Long waves were also recorded at Bermuda, Weston, Ivigtut, Uccle, Helsinki, Warsaw, and Istanbul.

June 20d. Readings also at 1h. and 2h. (Istanbul), 3h. (Rome), 6h. (Malaga), 7h. (Mount Wilson, Pasadena, Palomar, and Tinemaha), 8h. (Brisbane), 11h. (Malaga), 12h. (Alicante, Malaga, Kew, and Weston), 15h. (near Misuzawa), 18h. (Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, and Stuttgart), 20h. (near Obi-garm and Stalinabad), 22h. (Rome, Ottawa, Philadelphia, St. Louis, Salt Lake City, Boulder City, Tucson, Mount Wilson, Pasadena, Riverside, Tinemaha, and near Lick).

June 21d. 1h. North Atlantic.

Malaga iPZ = 2m.47s.a, PPZ = 3m.21s., iSZ = 6m.33s., P_cPZ = 6m.55s., LZ = 8m.41s., S_cPZ = 9m.53s., eS_cSZ = 13m.49s.
Granada eP = 2m.52s., S = 6m.52s., L = 9·3m.
Almeria P = 2m.54s., PP = 3m.28s., S = 7m.0s., L = 9m.56s., P_cS = 10m.28s., S_cS = 14m.8s.
Toledo iPZ = 2m.58s.
Alicante P = 3m.30s., pP = 3m.44s., eS = 7m.34s., SS = 8m.55s., eL = 10m.31s.
Tortosa P?E = 3m.42s., P_cP?E = 7m.30s., SEN = 7m.39s., eLN = 9m.
Paris e = 4m.0s., eS? = 8m.15s., eL = 10·5m.
Stuttgart e = 5m.0s.
Strasbourg e = 5m.2s. and 5m.18s., eL = 11m.0s.
Copenhagen eS = 10m.11s., L = 15m.
Long waves were also recorded at Bermuda and at other European stations.

June 21d. 8h. 9m. 41s. Epicentre 32°·7N. 115°·4W. (as on 1943, March 17d.).

Pasadena gives 32°·5N. 115°·5W.

$A = -·3620$, $B = -·7612$, $C = +·5382$; $\delta = +13$; $h = +1$;
$D = -·903$, $E = +·429$; $G = -·231$, $H = -·486$, $K = -·843$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Palomar	z.	1·3	298	i 0 26	+ 1	—	—	—	—	—
La Jolla		1·5	276	e 0 24	− 4	i 0 44	− 5	—	—	—
Riverside		2·1	308	i 0 39	+ 2	i 1 17	S_g	—	—	—
Mount Wilson		2·7	305	e 0 44	− 1	i 1 33	S_g	i 0 47	P*	—
Pasadena		2·7	302	i 0 44	− 1	i 1 27	S_g	—	—	—
Boulder City		3·3	8	i 1 1	P*	e 2 0	S_g	i 1 8	P_g	e 2·2
Pierce Ferry		3·6	19	i 1 5	P*	—	—	i 1 11	P_g	e 2·3
Tucson		3·9	96	i 0 54	− 8	—	—	i 1 9	P*	i 2·2
Fresno	N.	5·4	319	e 1 41	P_g	—	—	—	—	e 3·1
Rome		91·6	36	e 12 9	−61	—	—	—	—	—

Additional readings :—
Boulder City i = 1m.20s. and 2m.5s.
Pierce Ferry i = 1m.15s.
Tucson i = 1m.0s. and 1m.14s.

June 21d. Continuation of list of aftershocks from Central Asian epicentre.

Almata 23h. 21m.10s.

Andijan 4h. 53m. 12s., 21h. 47m.18s., 23h. 21m.12s.

Frunse 21h. 47m. 23s., 23h. 21m. 2s.

Obi-garm 4h. 51m. 49s., 21h. 47m. 40s., 23h. 19m. 56s.

Samarkand 23h. 20m.31s.

Stalinabad 4h. 52m. 4s., 21h. 47m.56s., 23h. 19m. 58s.

Tashkent 4h. 52m. 29s., 21h. 47m. 2s.?

Tchimkent 21h. 47m. 14s., 23h. 20m. 38s.

June 21d. Readings also at 0h. (Istanbul), 1h. (Rome and Malaga), 3h. (Shasta Dam, College, Tucson, Mount Wilson, and Palomar), 6h. (Malaga, Brisbane, and Riverview), 7h. (Arapuni, Wellington, and Weston), 12h. (Stuttgart), 16h. (Malaga), 17h. (Vladivostok, Pierce Ferry, Shasta Dam, and near Balboa Heights), 18h. (Pierce Ferry and Shasta Dam), 19h. (Vladivostok, Stuttgart, Strasbourg, Rome, Warsaw, and Malaga), 21h. (Malaga, Rome, and Weston), 22h. (Malaga (2) and Colombo).

June 22d. 18h. 1m. 19s. Epicentre 18°·6S. 175°·9E.

$A = -·9460$, $B = +·0678$, $C = -·3170$; $\delta = 0$; $h = +5$;
$D = +·072$, $E = +·997$; $G = +·316$, $H = -·023$, $K = -·948$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Auckland		18·2	182	5 18	+62	9 11	?	9 23	sS	—
Arapuni		19·4	180	—	—	8 41?	+37	—	—	—
New Plymouth		20·5	183	—	—	8 39	+12	11 19	P_cS	—
Wellington		22·6	183	5 3	0	9 14	+ 7	6 30	pP	—
Brisbane		22·8	243	i 5 2	− 3	e 9 13	+ 2	—	—	—
Riverview		26·8	230	e 5 47	+ 3	e 10 29	+10	i 10 45	sS	e 13·0
Berkeley	z.	80·8	45	i 18 25	?	—	—	—	—	—
Pasadena	z.	81·7	50	i 12 22	0	—	—	—	—	—
Mount Wilson	z.	81·9	50	i 12 22	− 1	—	—	—	—	—
Riverside	z.	82·2	50	i 12 23	− 1	—	—	—	—	—
Shasta Dam		82·2	42	e 12 24	0	—	—	—	—	—
Palomar		82·3	51	i 12 24	− 1	—	—	i 12 34	P_cP	—
Haiwee	z.	82·8	48	i 12 29	+ 2	—	—	—	—	—
Boulder City		85·0	49	i 12 39	+ 1	—	—	i 12 48	P_cP	—
Pierce Ferry		85·7	49	e 12 41	− 1	—	—	i 12 51	P_cP	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tucson		86·4	54	i 12 46	+ 1	—	—	—	—	—
Bombay	E.	107·8	284	—	—	e 27 41?	PS	—	—	—
La Paz	Z.	108·0	115	e 13 59	P	—	—	—	—	50·7
Copenhagen		140·9	346	e 19 34	[+ 2]	—	—	e 23 4	PP	67·7
Ksara		141·3	301	e 19 33	[0]	35 6	PPS	22 43	PP	—
Istanbul		143·9	316	e 19 27	[−10]	—	—	e 19 42	?	—
Jena	N.	145·4	342	e 19 42	[+ 2]	—	—	—	—	—
Helwan	Z.	145·9	297	e 19 41	[0]	—	—	e 20 5	?	—
Kew		147·1	356	i 19 45	[+ 2]	—	—	—	—	e 78·7
Uccle	N.	147·2	352	e 19 48	[+ 5]	—	—	—	—	—
Stuttgart		148·0	344	e 19 47?	[+ 3]	—	—	i 20 8	?	e 76·7
Strasbourg		148·6	345	e 19 47	[+ 2]	e 29 59	{−12}	e 24 1	PP	71·7
Paris		149·4	353	e 19 50	[+ 4]	—	—	—	—	—
Clermont-Ferrand		152·3	349	e 19 54	[+ 3]	—	—	e 24 56	?	73·7
Rome	Z.	152·8	334	e 19 45	[− 7]	—	—	—	—	—
Alicente		160·1	353	e 19 14	[−47]	—	—	—	—	e 73·8
Granada		161·5	0	i 19 28	[−34]	e 44 55	SS	19 54	pKPP	81·7
Almeria		161·8	356	e 19 59	[− 4]	—	—	—	—	81·7
Malaga	Z.	161·9	1	i 20 4k	[+ 1]	e 45 16	SS	i 24 50	PP	80·1

Additional readings :—
Auckland i = 5m.58s., pP? = 6m.37s., S_cP? = 11m.21s., P_cS = 12m.1s., i = 13m.30s. and 14m.19s., S_cS? = 15m.39s., sS_cS = 18m.8s.
Wellington iZ = 5m.41s., eZ = 6m.52s., iZ = 7m.11s., P_cPZ = 7m.50s., iZ = 9m.17s., P_cSZ = 11m.21s., S_cSZ = 14m.24s.
Riverview iZ = 6m.3s., ePPZ = 6m.39s., iN = 12m.0s.
Strasbourg iPKP = 19m.50s., $ePKP_2$ = 20m.41s., PPS = 37m.11s., e = 38m.59s.
Granada PP = 23m.59s., PPP = 28m.20s., SKSP = 35m.5s., ePPS = 39m.2s., SSS = 52m.29s.
Malaga $iPKP_2Z$ = 20m.54s., iPPSZ = 38m.25s.
Long waves were also recorded at Huancayo, Weston, and Warsaw.

June 22d. 23h. 29m. 31s. Epicentre 37°·0N. 121°·5W. (as on 1945, Jan. 7d.).

Intensity VI at Alma, Benecia, Felton, Gilroy, Morgan Hill, Mountain View, San Francisco, San Jose, etc. ; V at Alviso, Belmont, Boulder Creek, Fairfax, Mount Eden, San Anselmo, Santa Cruz, etc. Epicentre 37°00′N. 121°46′W.

L. M. Murphy.
United States Earthquakes, 1947, serial No. 730, Washington, 1950, pp. 21-23, map showing, epicentre p. 22.

A = −·4183, B = −·6826, C = +·5992 ; δ = −4 ; h = −1 ;
D = −·853, E = +·522 ; G = −·313, H = −·511, K = −·801.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Lick		0·4	340	i 0 9	P_g	i 0 13	S_g	—	—	—
Santa Clara		0·5	314	i 0 12	− 2	—	—	—	—	—
Branner		0·7	307	i 1 29?	S	(i 1 29?)	+61	—	—	—
Berkeley		1·1	325	i 0 19	− 3	—	—	—	—	—
Fresno	N.	1·4	101	i 0 28	+ 1	i 0 48	+ 2	—	—	—
Ukiah		2·5	328	e 0 48	+ 5	e 1 5	− 9	—	—	i 1·6
Santa Barbara	Z.	2·9	151	e 0 47	− 1	—	—	—	—	—
Haiwee	Z.	3·0	107	e 0 51	+ 1	i 1 39	S_g	—	—	—
Mineral	E.	3·4	359	e 0 57	+ 2	—	—	—	—	—
Shasta Dam		3·8	349	e 0 58	− 3	e 1 48	+ 1	i 1 2	P*	—
Mount Wilson		3·9	134	i 1 2k	0	—	—	—	—	—
Pasadena		3·9	135	e 1 1k	− 1	i 1 52	+ 2	—	—	—
Ferndale		4·2	330	e 0 43	−24	e 2 8	S*	e 1 40	P_g	—
Riverside	Z.	4·5	130	i 1 10	− 1	—	—	—	—	—
Boulder City		5·5	99	i 1 26	+ 1	i 2 29	− 1	i 1 36	P*	e 2·6
Pierce Ferry		6·1	96	i 1 35	+ 1	i 2 32	−13	i 1 41	P*	—
Salt Lake City		8·4	60	—	—	e 2 48	P_g	—	—	e 4·5
Tucson		10·0	115	e 2 28	+ 1	—	—	i 2 34	PP	e 4·8
St. Louis		24·7	76	e 5 31	+ 7	e 10 3	+19	—	—	—
Ottawa		35·1	61	e 7 7	+10	—	—	—	—	18·5

Long waves were also recorded at Strasbourg, Cheb, Uccle, Granada, and at other American stations.

June 22d. Readings also at 0h. (Fresno, Tucson, Pierce Ferry, Boulder City, Shasta Dam, Palomar, and Mount Wilson), 1h. (St. Louis, Pasadena, Mount Wilson, Palomar, Tucson, Pierce Ferry, Shasta Dam, Boulder City, Malaga, Alicante, Paris, Strasbourg, Stuttgart, Ksara, and near Apia), 2h. (Malaga, Clermont-Ferrand, Kew, Weston, and Brisbane), 3h. (near Tortosa), 9h. (Bogota and near Obi-garm), 10h. (Tucson, Palomar, and Haiwee), 11h. (St. Louis, Salt Lake City, Boulder City, Pierce Ferry, Tucson, Mount Wilson, Pasadena, Palomar, and Riverside), 12h. (Bozeman, La Paz, and near Huancayo), 13h. (near Lick, Fresno, and Berkeley), 14h. (Shasta Dam and near Mizusawa), 16h. (near Grozny), 17h. (Strasbourg and near Harvard), 18h. (near Ferndale and Mineral), 19h. (Shasta Dam), 20h. (La Paz, Jena (2), Sotchi, Erivan, near Leninakan and Grozny), 22h. (Vladivostok), 23h. (Stuttgart, Basle, Boulder City, Pierce Ferry, Shasta Dam, Mineral, and near Ferndale).

June 23d. 11h. 50m. 44s. Epicentre 40°·0N. 54°·6E. (as on 1946, Nov. 4d.).

$A = +\cdot4450$, $B = +\cdot6262$, $C = +\cdot6402$; $\delta = +1$; $h = -2$;
$D = +\cdot815$, $E = -\cdot579$; $G = +\cdot371$, $H = +\cdot522$, $K = -\cdot768$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Baku		3·6	278	e 1 11	P_g	e 1 47?	S*	—	—	—
Ashkabad		3·6	124	0 48?	−10	1 36?	− 6	—	—	—
Stalinabad		11·1	93	i 3 0	+17	—	—	—	—	—
Tashkent		11·2	78	e 2 42	− 2	e 4 55	+ 3	—	—	—
Tchimkent		11·5	74	2 43	− 5	—	—	—	—	—
Obi-garm		11·8	92	e 2 46	− 7	i 4 59	− 7	—	—	—
Andijan		13·6	81	e 3 21	+ 4	—	—	—	—	—
Frunse		15·3	73	e 3 41	+ 2	—	—	—	—	—
Ksara		16·2	253	e 3 49	− 1	e 7 1	−10	—	—	—
Sverdlovsk		17·3	11	4 4	0	i 7 16	0	—	—	—
Moscow		19·3	330	4 29	0	8 1	− 1	—	—	—
Helwan	Z.	21·5	249	e 4 49	− 3	—	—	—	—	—
Warsaw	E.	26·0	308	—	—	e 10 5	− 1	e 10 58	SS	e 13·8
Stuttgart		33·2	301	e 6 39	− 1	—	—	—	—	e 21·3

Long waves were also recorded at Copenhagen.

June 23d. 21h. 33m. 26s. Epicentre 36°·8N. 69°·4E. Depth of focus 0·005.
(as on 1946, April 29d.).

Epicentre very close to that suggested by U.S.S.R. which gives depth 100k.

$A = +\cdot2824$, $B = +\cdot7513$, $C = +\cdot5964$; $\delta = -11$; $h = 0$;
$D = +\cdot936$, $E = -\cdot352$; $G = +\cdot210$, $H = +\cdot558$, $K = -\cdot803$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Stalinabad		1·8	344	i 0 31	+ 1	0 55	+ 3	—	—	—
Obi-garm		1·9	7	i 0 33	+ 2	—	—	—	—	—
Samarkand		3·5	327	i 1 1	+ 7	i 1 42	+ 8	—	—	—
Tashkent		4·5	359	e 1 7	0	—	—	—	—	—
Andijan		4·6	30	e 1 9	0	e 2 1	− 1	—	—	—
Frunse		7·3	32	e 1 45	− 1	e 4 1	+52	—	—	—
Almata		8·7	39	e 2 1	− 5	—	—	—	—	—
New Delhi	N.	10·5	139	e 2 19	−11	i 4 12	−15	i 2 37	P	—
Grozny		19·2	297	e 4 23	+ 2	—	—	—	—	—
Sverdlovsk		20·9	346	i 4 39	0	e 8 35	+12	—	—	—
Ksara		27·4	274	e 4 7	?	e 9 50	−38	—	—	—
Stuttgart		44·7	305	e 8 7	− 1	—	—	—	—	e 29·6

New Delhi gives also S_gN =5m.16s.
Long waves were also recorded at Warsaw, Istanbul, De Bilt, Rome, Kew, and Copenhagen.

June 23d. Continuation of list of shocks from Central Asia.

Almata 9h.57m.59s.

Andijan 9h.56m.22s.

Frunse 7h.4m.25s., 9h.57m.4s.

Obi-garm 0h.21m.4s., 9h.29m.21s., 9h.56m.51s., 19h.45m.56s.

Tashkent 9h.56m.24s.

June 23d. Readings also at 0h. (Sverdlovsk, Vladivostok, Boulder City, Pierce Ferry, Mineral, Branner (2), near Berkeley and Lick (2)), 3h. (Colombo, Branner, and near Lick), 4h. (Malaga), 5h. (Malaga, Mount Wilson, Riverside, and Tucson), 6h. (Colombo), 8h. (Stuttgart, Uccle, Kew, Tortosa, and Malaga), 9h. (Malaga and Rome), 10h. (Malaga), 13h. (near Grozny), 15h. (La Paz, La Plata, Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, and Tucson), 16h. (Stuttgart, Fresno, near Boulder City, and Pierce Ferry), 17h. (Stuttgart, Ksara, and Antarctica), 18h. (Mizusawa), 19h. (Clermont-Ferrand, Paris, Strasbourg, Stuttgart, Copenhagen, Istanbul, Kew, Alicante, Granada, Malaga, Tortosa, Almeria, Santa Lucia, and near Tananarive), 21h. (near Ottawa).

June 24d. Readings at 0h. (near Obi-garm), 1h. (Pierce Ferry), 2h. (Mount Wilson, Pasadena, Palomar, Tucson, Pierce Ferry (2), Shasta Dam (2), Vladivostok, and Sverdlovsk), 4h. (near Andijan), 6h. (Strasbourg), 10h. (near Mizusawa), 11h. (Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, Tucson, and Pierce Ferry), 15h. (near Obi-garm), 17h. and 18h. (Istanbul), 21h. (near Ottawa).

June 25d. 16h. Andes, rather deep, but no determination seems possible from the readings.

Montezuma eP =38m.17s., iS =38m.33s., eL =38m.47s.
La Paz PZ =39m.56s., iSE =41m.30s., LZ =42m.8s.
Huancayo eP =41m.3s., iS? =43m.45s.
La Plata SE =43m.54s., SN =44m.18s., LN =45m.0s.
St. Louis iPZ =48m.15s., ipPZ =48m.30s.
Tucson iP =48m.38s., ipP =48m.51s., i =48m.55s.
Palomar iPNZ =49m.3s., i =49m.17s., eZ =49m.24s.
Pierce Ferry iP =49m.5s., ipP =49m.20s., i =49m.27s.
Riverside iPZ =49m.8s., ipPZ =49m.23s., iZ =49m.30s.
Pasadena iPZ =49m.10s., ipPZ =49m.25s., iZ =49m.32s.
Mount Wilson iPZ =49m.11s., ipPZ =49m.25s., iZ =49m.32s.
Boulder City iP =49m.13s., i =49m.22s. and 49m.30s.
Haiwee ipPZ =49m.33s., iZ =49m.39s.
Shasta Dam eP =49m.47s., ipP =50m.2s.

June 25d. 22h. 50m. 4s. Epicentre 15°·5N. 91°·7W. (as on 1947, May 26d.).

A = −·0286, B = −·9637, C = +·2656 ; δ = +8 ; h = +6 ;
D = −1·000, E = +·030 ; G = −·008, H = −·265, K = −·964.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
St. Louis		23·1	3	e 5 6	− 2	e 9 14	− 2	i 10 16	SSS	e 16·0
Tucson		24·1	318	i 5 22	+ 4	—	—	—	—	e 15·6
Pierce Ferry		28·6	320	i 6 2	+ 2	—	—	—	—	—
Palomar		28·9	314	i 6 4a	+ 1	—	—	—	—	—
Boulder City		29·0	319	i 6 6	+ 2	—	—	—	—	—
Riverside	z.	29·6	314	i 6 10a	+ 1	—	—	—	—	—
Mount Wilson	z.	30·2	314	i 6 16	+ 2	—	—	—	—	—
Pasadena	z.	30·2	314	i 6 16	+ 2	—	—	—	—	e 21·3
Huancayo		31·8	148	—	—	—	—	(e 13 3)	SS	e 13·0
Tinemaha	z.	31·9	318	i 6 32	+ 3	—	—	—	—	—
Ottawa		32·7	21	e 6 25	−11	—	—	—	—	15·9
Shasta Dam		36·6	320	e 7 8	− 2	—	—	—	—	—

Tucson gives also i =5m.31s., e =6m.41s.
Long waves were also recorded at La Paz, Columbia, Bermuda, Philadelphia, Berkeley, Malaga, Kew, Stuttgart, Rome, and Uccle.

June 25d. Continuation of list of shocks from Central Asia.

Andijan 13h. 11m.5s., 15h. 14m. 53s., 20h. 45m. 51s., 20h. 51m. 46s., 21h. 58m. 10s.

Obi-garm 13h. 11m.49s., 20h. 44m. 50s.

Samarkand 13h. 11m. 52s., 20h. 45m. 10s.

Stalinabad 13h. 12m. 33s.?, 20h. 44m. 42s.

Tashkent 13h. 11m. 26s., 20h. 45m. 46s.

Tchimkent 13h. 11m. 24s.

June 25d. Readings also at 3h. (Palomar, Tucson, and Pierce Ferry), 10h. (Alicante), 12h. (near Pierce Ferry), 17h. (near Bogota), 18h. (Boulder City and Pierce Ferry), 19h. (near Harvard and near Mizusawa), 20h. (Boulder City, Pierce Ferry, and Fresno), 21h. (near Istanbul), 22h. (near Harvard).

June 26d. Readings at 1h. (Istanbul and Ksara), 2h. (Wellington), 6h. (Mount Wilson, Palomar, Riverside, Tinemaha, Tucson, Strasbourg, Stuttgart, and Port au Prince), 8h. (2) and 11h. (Strasbourg), 15h. and 16h. (Rome), 17h. (near Antarctica (2) and near Reykjavik), 18h. (Colombo, Vladivostok, Tashkent, Samarkand, Stalinabad, Sverdlovsk, Grozny, and Moscow), 19h. (Rome, De Bilt, Uccle, and Stuttgart), 20h. (La Paz, Branner, Tucson, and near Fort de France), 23h. (Bombay, Ksara, and near Antarctica).

June 27d. 15h. 8m. 16s. Epicentre 10°·0N. 47°·0E. Rough.

$A = +\cdot6718$, $B = +\cdot7204$, $C = +\cdot1725$; $\delta = +5$; $h = +7$;
$D = +\cdot731$, $E = -\cdot682$; $H = +\cdot118$, $H = +\cdot126$, $K = -\cdot985$.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Helwan	24·6	326	5 9	−14	e 9 34	− 8	e 6 23	PPP	—
Ksara	25·8	338	e 5 35	+ 1	e 10 6	+ 4	—	—	—
Baku	30·4	4	e 6 19	+ 3	—	—	—	—	—
Istanbul	34·8	336	(e 6 59)	+ 5	e 6 59	P	—	—	—
Tashkent	36·9	28	e 7 9	− 3	e 12 52	− 6	—	—	—
Rome	43·9	324	—	—	e 14 35	PS	e 17 55	SS	e 26·8
Moscow	46·2	353	e 8 28	0	—	—	—	—	—
Sverdlovsk	47·9	11	e 8 43	+ 1	15 33	− 6	—	—	—
Stuttgart	49·9	328	e 8 56	− 1	e 15 50	−17	—	—	e 26·7
Strasbourg	50·5	327	e 9 0	− 2	—	—	e 10 56	PP	—

Helwan gives also eZ = 7m.11s.
Long waves were also recorded at Copenhagen.

June 27d. Readings also at 0h. (Istanbul), 3h. (La Paz, near Fort de France, and near Lick), 5h. and 6h. (Ksara), 9h. (Istanbul), 11h. (Kew), 12h. (near Misusawa), 14h. (near Obi-garm), 18h. (Stuttgart), 22h. (Ksara and near Tortosa), 23h. (near La Paz).

June 28d. 1h. 47m. 25s. Epicentre 1°·5N. 126°·0E. (as on 1944, Sept. 11d.).

$A = -\cdot5876$, $B = +\cdot8088$, $C = +\cdot0260$; $\delta = +11$; $h = +7$;
$D = +\cdot809$, $E = +\cdot588$; $G = -\cdot015$, $H = +\cdot021$, $K = -1\cdot000$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	N.	38·8	140	i 7 19	− 9	e 13 0	−26	—	—	—
Vladivostok		41·8	7	i 7 52	− 1	i 14 10	− 1	—	—	—
Riverview		42·4	149	e 10 4	PPP	i 14 5	−15	e 17 16	SS	e 21·0
Irkutsk		53·7	344	9 26	0	e 16 58	− 1	—	—	—
Bombay		54·9	292	e 10 35	+60	—	—	—	—	—
Almata		60·2	321	e 10 16	+ 4	—	—	—	—	—
Andijan		62·1	316	e 10 29	+ 4	—	—	—	—	—
Obi-garm		63·2	313	e 10 35	+ 3	e 19 1	− 2	—	—	—
Tashkent		64·5	316	e 10 39	− 2	e 19 11	− 8	—	—	—
Sverdlovsk		75·5	330	i 11 46	− 2	i 21 20	− 8	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Baku		78·4	311	e 12 14	+10	e 22 3	+ 3	—	—	—
Grozny		81·9	313	e 12 23	0	e 22 34	− 2	—	—	—
Leninakan		83·1	311	e 12 32	+ 3	—	—	—	—	—
Moscow		87·9	326	12 50	− 3	23 30	− 5	—	—	—
Ksara		89·3	303	e 13 0	+ 1	23 56	+ 8	17 27	?	—
Helwan	z.	93·3	300	13 15	− 3	—	—	e 17 23	PP	—
Istanbul		94·3	311	i 13 23	0	e 21 18	?	—	—	—
Warsaw		98·0	322	e 13 40	+ 1	25 2	− 2	e 17 47	PP	53·6
Copenhagen		101·8	328	—	—	24 35	[− 1]	—	—	47·6
Prague		102·5	322	—	—	e 24 17	[−22]	—	—	—
Cheb		103·8	323	—	—	e 24 33	[−12]	e 27 29	PS	e 56·6
Scoresby Sund		105·1	349	—	—	e 24 51	[0]	—	—	54·6
Shasta Dam		105·2	47	e 18 28	PKP	—	—	—	—	—
Stuttgart		106·2	322	e 18 35	PP	e 26 9	− 3	e 24 49	SKS	e 53·6
Rome		106·3	315	e 18 43	PP	e 26 11	− 2	e 33 59	SS	—
Strasbourg		107·1	322	e 19 8	PP	e 26 23	+ 3	e 24 54	SKS	e 54·6
De Bilt		107·2	326	—	—	e 24 55	[− 5]	i 27 59	PS	e 55·6
Uccle		108·2	326	—	—	e 25 1	[− 4]	—	—	e 54·6
Paris		110·1	324	28 29	PS	—	—	—	—	e 61·6
Mount Wilson	z.	110·4	53	e 19 0	PP	—	—	—	—	—
Kew		110·5	327	(i 18 35a)	[+ 1]	(e 25 14)	[0]	(e 19 34)	PP	(e 50·6)
Riverside	z.	111·5	53	e 19 10	PP	—	—	—	—	—
Palomar	z.	111·6	53	e 19 15	PP	—	—	—	—	—
Tucson		116·7	52	e 18 45	[− 1]	—	—	—	—	—
Weston		133·6	17	e 22 49a	PKS	—	—	—	—	e 64·8
Philadelphia		134·4	21	e 21 50	PP	—	—	—	—	—
Bermuda		144·8	16	e 19 40	[+ 1]	—	—	—	—	—
Huancayo		156·4	117	e 20 0	[+ 4]	—	—	—	—	—
La Paz		159·6	138	e 19 59	[− 1]	—	—	—	—	—

Additional readings and note :—
Helwan eZ =13m.42s.
Warsaw ePP?E =18m.6s., SKSEN =24m.14s., PSZ =26m.16s., ePPSZ =27m.22s., eN =29m.40s., SSZ =31m.3s., eN =31m.34s.
Cheb e =32m.35s.
Rome eSKS =24m.51s., eSKKS? =25m.38s., e =37m.9s.
Strasbourg ePPP =21m,28s., e =23m.39s., ePS =27m.56s., eSS =33m.59s., eSSS = 37m.35s.
Kew readings reduced by 10 minutes.
La Paz iN =20m.35s.
Long waves were also recorded at Pasadena and Wairiri.

June 28d. 11h. 13m. 12s. Epicentre 48°·2N. 9°·0E. (as on April 14d.).

Intensity VI-VII in the region Hechingen-Balingen-Ebingen with slight damage; III-IV in the Canton of Schaffhausen. Macroseismic area app. 100,000 sq. km. Epicentre 48°15′N. 9°03′E. Focal depth 10km.

Dr. W. Hiller.
Die Erdbebentätigkeit in Südwestdeutschland im Jahre, 1947, Statistische Monatshefte Württemberg-Baden, Heft 6, June, 1949, 3 figures, including two macroseismic charts.

Dr. E. Wanner.
Jahresbericht des Erdbebendienstes der Schweiz im Jahre, 1947, Zürich, 1948, p. 2.

$A = +\cdot6609$, $B = +\cdot1046$, $C = +\cdot7432$; $\delta = +8$; $h = -5$;
$D = +\cdot156$, $E = -\cdot988$; $G = +\cdot734$, $H = +\cdot116$, $K = -\cdot670$.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ebingen	0·0	—	i 0 3a	P*	i 0 5	S*	—	—	—
Stuttgart	0·6	13	i 0 12a	P_g	i 0 18	S_g	i 0 17	P	—
Strasbourg	0·9	295	i 0 20k	0	i 0 32	S*	—	—	—
Zürich	0·9	198	i 0 20	0	i 0 33	− 1	—	—	—
Basle	1·2	235	e 0 23	− 1	e 0 42	+ 1	—	—	—
Chur	1·4	165	e 0 29	+ 2	i 0 50	+ 4	—	—	—
Neuchatel	1·8	229	e 0 32	0	e 1 7	S_g	i 0 38	P_g	—
Besançon	2·2	243	e 0 45	P_g	i 1 21	S_g	—	—	—
Cheb	2·9	50	i 0 57	P_g	i 1 23	− 1	i 1 33	S_g	—
Pavia	3·0	178	e 1 3	P_g	i 1 44	S_g	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Jena		3·2	32	e 0 53	+ 1	i 1 33	+ 1	i 0 59	P*	—
Prague		4·0	62	e 1 9	P*	e 2 9	S_g	1 16	P_g	—
Uccle	N.	4·0	311	e 1 4	0	e 1 54	+ 2	e 1 11	P*	—
Triest		4·1	128	e 1 27	P_g	e 2 2	S*	i 2 19	S_g	—
Paris		4·4	278	—	—	e 1 54	− 8	i 2 18	S*	—
De Bilt		4·6	330	—	—	e 2 18	S*	—	—	—
Clermont-Ferrand		4·7	236	i 1 32	P_g	i 2 40	S_g	—	—	—
Potsdam		4·9	33	—	—	e 2 6?	− 9	—	—	i 2·6
Zagreb		5·3	113	e 1 45	P_g	e 2 45	S*	—	—	—
Rome	Z.	6·8	157	—	—	e 3 38	S_g	—	—	—
Kew		6·9	303	—	—	e 3 39	S_g	—	—	e 4·0
Copenhagen		7·6	16	—	—	e 4 11	S_g	—	—	5·8
Warsaw		8·7	58	—	—	e 3 59	+ 9	—	—	—
Tortosa	N.	9·5	223	—	—	4 58	S*	5 20	S_g	—
Alicante		12·0	219	—	—	e 5 36	SSS	—	—	e 6·6
Almeria		14·1	221	—	—	e 5 36	−26	—	—	e 6·9

Additional readings :—
Cheb i = 1m.1s., iP? = 1m.6s., i = 1m.14s., and 1m.19s.
Jena iE = 1m.19s., iN = 1m.37s., iEN = 1m.40s.
Prague eS_g = 2m.18s.
Uccle eP_gN = 1m.18s., eN = 1m.33s., iSN = 2m.5s., eE = 2m.9s., iSEN = 2m.12s., iS_gN = 2m.19s., iN = 2m.47s. and 3m.15s.
Clermont-Ferrand iP = 1m.38s., iS = 2m.49s.
Tortosa S_gN = 5m.25s., iS_gEN = 5m.31s.

June 28d. Continuation of list of aftershocks from Central Asian epicentre.

Almata 17h. 53m.52s.?

Andijan 17h. 52m.58s.

Frunse 17h. 53m. 19s.

Obi-garm 17h. 53m.25s., 19h. 17m. 7s.

Samarkand 17h. 53m. 33s.

Stalinabad 17h. 53m. 27s.

Tashkent 17h. 52m. 46s.?

Tchimkent 17h. 52m. 34s.

June 28d. Readings also at 7h. (Santa Lucia), 8h. (Rome), 9h. (Rome and near Mizusawa), 10h. (Zagreb), 11h. (Potsdam, Calcutta, and Bombay), 13h. (Mount Wilson, Tinamaha, Riverside, Palomar (2), and Tucson (2)), 17h. (Stuttgart, Paris, Scoresby Sund, and Reykjavik (2)), 18h. (Stuttgart and near Malaga), 19h. (Uccle, De Bilt, Kew, Paris, Warsaw, Strasbourg, Stuttgart, Rome, Weston, Ivigtut, Scoresby Sund, and near Reykjavik), 21h. (Uccle), 22h. (De Bilt, Kew, Paris, Strasbourg, Stuttgart, Rome, Zagreb, Ksara, Weston, Scoresby Sund, Ivigtut, and near Reykjavik).

June 29d. Continuation of list of aftershocks from Central Asian epicentre.

Almata 8h. 14m. 46s.

Andijan 8h. 13m. 43s.

Frunse 8h. 14m. 11s.

Obi-garm 4h. 50m.40s., 8h. 14m. 19s.

Samarkand 4h. 50m. 39s., 8h. 14m. 39s.

Stalinabad 4h. 50m. 32s., 8h. 14m. 24s.

Tashkent 4h. 51m. 34s., 8h. 13m. 50s.

Tchimkent 8h. 13m. 54s., 18h. 13m. 54s.

June 29d. Readings also at 2h. (Antarctica), 3h. (Theodosia), 8h. (Tucson, Grand Coulee, and Weston), 10h. (Pasadena, Mount Wilson, Riverside, Palomar, Tinemaha, Tucson, and near Sitka), 12h. (Theodosia), 14h. (Brisbane and Riverview), 15h. (Stuttgart, Strasbourg, and Zagreb), 16h. (Zagreb (2) and Mineral), 19h. (Zagreb and near Mizusawa), 20h. (Rome), 23h. (Stuttgart).

June 30d. 3h. Undetermined shock. U.S.S.R. gives 36°N. 58°E.

Ashkabad P = 37m.20s., S_g = 37m.46s.
Samarkand eP = 38m.32s.
Obi-garm eP = 38m.55s.
Stalinabad eP = 39m.6s., eS = 40m.58s.
Tashkent eP = 39m.21s., eS = 41m.31s.
Andijan eP = 39m.41s.
Sverdlovsk eP = 41m.28s., eS = 45m.21s.

June 30d. 7h. 51m. 33s. Epicentre 1°·1N. 126°·4E. (as on 13d.).

$A = -\cdot5933$, $B = +\cdot8047$, $C = +\cdot0190$; $\delta = -9$; $h = +7$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane		38·3	140	i 7 18	− 6	e 13 6	−13	—	—	—
Riverview		41·8	148	e 7 45	− 8	e 14 3	− 8	e 17 8	SS	e 24·2
Vladivostok		42·1	6	i 7 53	− 2	i 14 12	− 4	—	—	—
Hyderabad	N.	49·8	292	—	—	e 15 58	− 8	—	—	e 22·6
Irkutsk		54·3	343	9 31	+ 1	17 2	− 5	—	—	—
Bombay	E.	55·4	292	e 13 20	PPP	—	—	—	—	—
Wairiri		60·2	144	8 45	?	18 7	−18	27 47	Q	32·6
Almata		60·8	321	e 10 16	0	—	—	—	—	—
Obi-garm		63·8	313	i 10 37	+ 1	—	—	—	—	—
Stalinabad		64·4	313	i 10 45	+ 5	—	—	—	—	—
Tashkent		65·1	315	i 10 43	− 2	e 19 22	− 5	—	—	—
Samarkand		66·1	313	e 11 10	+19	—	—	—	—	—
Sverdlovsk		76·0	329	e 11 48	− 3	i 21 22	−12	—	—	—
Baku		79·0	311	e 12 8	+ 1	e 22 7	+ 1	—	—	—
Leninakan		83·7	310	e 12 35	+ 3	—	—	—	—	—
College		87·2	25	—	—	e 23 10	[− 5]	—	—	—
Moscow		88·4	326	e 12 53	− 2	23 33	− 7	—	—	—
Ksara		89·8	303	e 13 5?	+ 3	e 24 1?	+ 8	—	—	—
Helwan		93·9	300	e 13 17	− 4	e 24 27	− 2	23 54	SKS	—
Istanbul		94·8	311	e 13 28	+ 3	e 24 4	[+ 4]	—	—	—
Warsaw		98·5	323	e 18 13	PKP	e 24 18	[− 2]	—	—	e 52·4
Copenhagen		102·4	328	—	—	24 34	[− 5]	—	—	49·5
Shasta Dam		105·2	47	e 18 33	PP	—	—	—	—	—
Scoresby Sund		105·6	350	18 45	PP	24 51	[− 2]	—	—	—
Stuttgart		106·7	322	e 18 55	PP	e 24 53	[− 5]	e 27 43	PS	e 58·4
Rome		106·9	315	e 18 42	PP	24 52	[− 7]	—	—	e 49·2
De Bilt		107·7	327	e 19 3	PP	—	—	—	—	e 55·4
Strasbourg		107·7	323	e 18 57?	PP	e 28 30	PS	—	—	e 66·4
Uccle		108·8	326	—	—	e 25 3	[− 4]	—	—	e 55·4
Tinemaha	z.	109·3	50	e 19 12	PP	—	—	—	—	—
Edinburgh		110·1	332	14 49	P	—	—	e 18 39	PKP	—
Pasadena	z.	110·2	53	e 19 33	PP	—	—	—	—	e 45·3
Mount Wilson	z.	110·3	53	e 18 32	[− 2]	—	—	i 19 7	PP	—
Paris		110·8	324	e 18 42	[+ 7]	e 26 17	{+ 6}	e 19 33	PP	e 53·5
Riverside	z.	110·9	53	e 19 14	PP	—	—	—	—	—
Kew		111·0	328	(e 19 27?)	PP	—	—	—	—	e 19·4
Palomar	z.	111·5	53	e 19 17	PP	—	—	e 19 43	?	—
Clermont-Ferrand		111·8	321	—	—	e 24 57	[−23]	e 28 7	PS	59·4
Boulder City		112·3	50	e 18 17	[−21]	—	—	e 18 42	?	—
Pierce Ferry		112·9	50	e 18 41	[+ 2]	—	—	—	—	—
Tucson		116·6	53	e 18 49	[+ 3]	—	—	e 19 55	PP	—
Weston		133·9	18	e 19 19	[0]	—	—	e 22 48	PKS	70·5
Bermuda		145·1	17	e 19 39	[0]	—	—	—	—	—
Huancayo		155·8	117	e 20 10	[+15]	—	—	—	—	e 76·6
La Paz		159·0	138	e 20 16	[+16]	—	—	—	—	78·5

For Notes see next page.

NOTES TO JUNE 30d. 7h. 51m. 33s.

Additional readings and note :—
Riverview eZ =9m.48s., iN =18m.1s.
Helwan iZ =13m.42s., eZ =17m.24s., eE =26m.3s.
Warsaw iE =21m.16s. and 21m.46s., eE =31m.2s.
Stuttgart e =28m.34s.
Edinburgh P given as SS, PKP given as SSS.
Paris ePPP =20m.56s., e =24m.3s., eSKS =24m.57s., ePS =28m.7s.
Long waves were also recorded at Arapuni, Wellington, Honolulu, and Cheb.

June 30d. 23h. 41m. 5s. Epicentre 18°·7S. 170°·3E.

$A = -\cdot 9343$, $B = +\cdot 1597$, $C = -\cdot 3187$; $\delta = -1$; $h = +5$;
$D = +\cdot 168$, $E = +\cdot 986$; $G = +\cdot 314$, $H = -\cdot 054$, $K = -\cdot 948$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.
		°	°	m. s.	s.	m. s.	s.	m. s.
Riverview		22·8	224	i 1 5 9k	+ 4	i 9 41	SS	— —
Wellington		22·8	171	5 6	+ 1	9 1	−10	12 55 P_cS
Vladivostok		70·9	331	i 11 14	− 7	—	—	— —
Antarctica		84·0	161	e 12 30	− 3	i 22 34	−23	e 13 32 pP
Berkeley	z.	84·7	47	i 12 37	0	—	—	— —
Lick		84·8	47	e 12 39	+ 2	—	—	— —
Santa Barbara	z.	84·9	51	i 12 39	+ 1	—	—	— —
Pasadena		85·9	52	i 12 42a	− 1	—	—	— —
La Jolla		86·1	53	i 12 45	+ 1	—	—	— —
Mount Wilson		86·1	52	i 12 44a	0	—	—	i 16 8 PP
Riverside		86·5	52	i 12 45a	− 1	—	—	— —
Palomar		86·6	53	i 12 46a	0	—	—	i 13 48 ?
Shasta Dam		86·8	44	i 13 2	P_cP	—	—	e 16 6 PP
Haiwee	z.	86·9	50	i 12 48a	0	—	—	— —
Tinemaha		87·1	49	i 12 50a	+ 1	—	—	— —
Boulder City		89·2	51	i 12 58	− 1	—	—	i 13 36 ?
Pierce Ferry		89·9	51	i 13 1	− 1	—	—	— —
Tucson		90·8	56	i 13 7	+ 1	—	—	i 16 46 PP
Sverdlovsk		116·2	325	e 19 42	PP	e 29 29	PS	— —
Ksara		136·7	300	e 22 1	PP	e 35 59	?	— —
Jena	N.	143·7	336	e 19 28	[− 9]	—	—	— —
Uccle		146·1	345	e 19 36a	[− 5]	—	—	— —
Stuttgart		146·3	338	i 19 37a	[− 4]	—	—	i 20 45 ?
Kew	z.	146·5	349	i 19 39	[− 3]	—	—	e 20 58 ?
Strasbourg		147·0	339	i 19 39a	[− 4]	—	—	e 20 58 ?
Zürich		147·7	337	e 19 41	[− 3]	—	—	— —
Chur		147·8	335	e 19 50	[+ 6]	—	—	— —
Basle		148·0	338	e 19 41a	[− 3]	—	—	— —
Rome	z.	150·1	327	e 19 39	[− 9]	—	—	— —

Additional readings :—
Riverview eE =9m.35s.
Wellington iZ =5m.15s., S_cS =16m.45s.
Antarctica iP =13m.22s.
Long waves were also recorded at Auckland and Pavia.

June 30d. Readings also at 4h. (St. Louis. The only station recording a big American earthquake*), 7h. (near Rome), 8h. (Nanking and Vladivostok), 9h. (Upsala, Strasbourg, Paris, Rome, Clermont-Ferrand, Cheb, Warsaw, Copenhagen, Stuttgart, Uccle, Tashkent, Sverdlovsk, Tucson, and Mineral), 13h. (near Reykjavik), 14h. (Strasbourg), 15h. (near Apia), 18h. (Ksara), 21h. (Stuttgart), 23h. (Rome, Paris, Strasbourg, Stuttgart, De Bilt, and Edinburgh).

* Ross R. Heinrich.
"The Mississippi valley earthquake of June 30, 1947." Bull. Seismo. Soc. Amer., vol. 40, No. 1, Jan., 1950, pp. 7-19, figs. pp. 12, 15, and 16.

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A digital hypocenter file of the ISS (Villaseñor and Engdahl, 2005) can be obtained from the USGS web site: http://earthquake.usgs.gov/scitech/iss/

Villaseñor, A., and E.R. Engdahl, *A digital hypocenter catalog for the International Seismological Summary,* Seism. Res. Lett., vol. 76, no. 5, pp. 554-559, 2005.

Villaseñor, A., E.A. Bergman, T.M. Boyd, E.R. Engdahl, D.W. Frazier, M.M. Harden, J.L. Orth, R.L. Parkes, and K.M. Shedlock*, Toward a comprehensive catalog of global historical seismicity,* Eos Trans. AGU, vol. 78, no. 50, pp. 581, 583, 588, 1997.