The International Seismological Summary.

1948 July, August, September.

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

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

The third quarter for 1948 contains 156 epicentres, 113 of which are repetitions from previously adopted epicentres.

Cases of deep focus are noted below :—

July	3d. 12h.	19·0S.	176·0W.	0·060
	12d. 2h.	17·2S.	174·4W.	0·020
	16d. 7h.	14·7N.	91·2W.	Suggested Deep.
	16d. 7h.	14·7N.	91·2W.	Suggested Deep.
	17d. 9h.	14·7N.	91·2W.	Suggested Deep.
	18d. 5h.	38·4N.	72·2E.	0·015
	19d. 5h.	36·9N.	70·8E.	0·030
	20d. 11h.	16·6S.	73·6W.	0·005
	24d. 14h.	17·0S.	177·0W.	0·050
	25d. 21h.	36·7N.	70·5E.	0·020
	30d. 2h.	40·9N.	142·7E.	0·005

Aug.	3d.	17h.	4·6S. 153·6E.	0·010
	4d.	18h.	Undetermined shock.	Suggested Deep.
	6d.	9h.	5·2N. 74·5W.	0·015
	11d.	10h.	17·7N. 95·2W.	0·005
	14d.	16h.	36·4N. 141·1E.	0·005
	16d.	10h.	24·5S. 65·6W.	0·020
	17d.	17h.	35·2N. 142·8E.	Suggested Deep.
	19d.	13h.	62·6N. 150·9W.	0·010
	20d.	22h.	31·0S. 178·5W.	0·040
	22d.	4h.	41·2N. 142·5E.	Suggested Deep.
	25d.	19h.	Undetermined shock.	Suggested Deep.
	26d.	20h.	27·0N. 139·5E.	0·080
	27d.	0h.	Undetermined shock.	Suggested Deep.
	27d.	16h.	28·0S. 66·0W.	0·025
	30d.	19h.	Undetermined shock.	Suggested Deep.
Sept.	3d.	9h.	20·8S. 69·0W.	Suggested Deep.
	5d.	10h.	29·6N. 139·8E.	0·050
	6d.	8h.	22·5S. 70·5W.	Suggested Deep.
	6d.	16h.	14·4N. 93·7W.	0·005
	7d.	8h.	36·3N. 71·0E.	0·025
	11d.	8h.	37·2N. 23·2E.	Suggested Deep.
	12d.	6h.	Undetermined shock.	Suggested Deep.
	22d.	7h.	24·5S. 65·6W.	0·020
	23d.	0h.	40·9N. 142·7E.	0·005
	26d.	0h.	8·5S. 158·5E.	0·005
	27d.	21h.	6·0S. 110·0E.	0·100
	28d.	21h.	22·3N. 94·1E.	0·005

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

KEW OBSERVATORY,
Richmond,
SURREY.

July, 1956.

1948 JULY, AUGUST, SEPTEMBER.

July 1d. 1h. Undetermined shock.

Fresno ePZ =50m.50s., iZ =53m.9s.
Mineral iPZ =52m.45s.
Tinemaha iPZ =53m.15s.a, epPZ =54m.58s.
Haiwee iPZ =53m.19s.
La Jolla iPZ =53m.21s.
Pasadena iPZ =53m.27s.a, epPZ =55m.10s.
Mount Wilson iPZ =53m.28s.a, epPZ =55m.11s.
Riverside iPZ =53m.29s.a, epPZ =55m.11s.
Boulder City iP =53m.31s.
Pierce Ferry iP =53m.33s.
Palomar iPZ =53m.36s.a, epPZ =55m.24s.
Tucson iP =54m.2s.a, epP =55m.48s., e =56m.18s.
Ottawa eZ =54m.30s.
Stuttgart eZ =54m.36s.
Paris i =54m.44s.

July 1d. 12h. Undetermined shock, S.W. Pacific.

Apia ePEN =48m.22s., SEN =49m.25s.
Brisbane iPN =52m.45s., iN =53m.8s. and 53m.26s.
Pasadena iPZ =58m.18s., iZ =58m.44s., eZ =59m.17s.
Mount Wilson iPZ =58m.19s., iZ =58m.46s.
Riverside iPZ =58m.20s., eZ =59m.16s.
Palomar iPZ =58m.20s., iZ =58m.47s., eZ =59m.18s.
Tinemaha ePZ =58m.28s., eZ =59m.27s.
Pierce Ferry iP =58m.40s., epP? =59m.39s.
Tucson iP =58m.42s., i =59m.9s. and 59m.41s.
Fresno ePZ =59m.18s.
Stuttgart eZ =66m.13s. and 66m.18s.
Paris iPKP =66m.18s.
Strasbourg ePKP =66m.19s.

July 1d. Readings also at 1h. (near Tacubaya), 4h. (near Obi-garm, Stalinabad, and Murgab), 9h. and 10h. (Tacubaya), 14h. (Paris and Tamanrasset), 15h. (Warsaw), 17h. (near Obi-garm, Andijan, Murgab, Stalinabad, Tashkent, and Samarkand), 21h. (Obi-garm, Samarkand, Andijan, Tashkent, Frunse, near Stalinabad, and Murgab), 22h. (near Ottawa), 23h. (Mineral).

July 2d. 2h. Undetermined shock.

Vladivostok eP =31m.35s.
Andijan eP =34m.57s.?
Stalinabad iP =35m.19s., iS =44m.28s.
Samarkand eP =35m.40s.
Sverdlovsk P =35m.44s., S =45m.27s.
Shasta Dam eP =36m.30s.
Fresno ePZ =36m.45s.
Hungry Horse eP =36m.51s.
Tinemaha ePZ =36m.53s., iZ =37m.7s.
Santa Barbara ePZ =36m.56s.
Mount Wilson iPZ =36m.57s., eZ =37m.9s.
Pasadena iPZ =36m.58s., iZ =37m.10s., eZ =37m.27s.
Palomar ePZ =37m.0s.
Boulder City eP? =37m.5s.
Moscow eP =37m.6s., eSKS =47m.27s.
Pierce Ferry eP? =37m.8s.
Tucson eP =37m.29s., e =41m.19s.
Ksara e =41m.47s. and 52m.41s.
Tashkent eS =44m.19s., S_cS =45m.7s.
Baku eS =47m.7s.
Long waves were also recorded at Wellington and at other European stations.

July 2d. 15h. 4m. 58s. Epicentre 27°·0N. 143°·0E. (as on 1939, July 13d.).

A = −·7125, B = +·5369, C = +·4516; δ = −14; h = +3;
D = +·602, E = +·799; G = −·361, H = +·272, K = −·892;

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Mizusawa	E.	12·2	353	e 5 22	S	(e 5 22)	+ 6	5 40	SSS	—
Vladivostok		18·5	334	e 4 11?	− 8	i 8 3?	SS	—	—	—
Tashkent		60·9	305	e 9 50?	−27	e 17 50?	−44	—	—	—
Sverdlovsk		63·7	324	i 10 30	− 6	19 5	− 5	—	—	—
Moscow		76·2	327	e 11 48	− 4	e 21 41	+ 5	—	—	—
Shasta Dam		76·2	52	i 11 52	0	—	—	i 11 58	P_cP	—
Hungry Horse		78·3	42	e 12 2	− 1	—	—	—	—	—
Santa Barbara	Z.	80·7	57	e 12 22	+ 6	—	—	—	—	—
Sotchi		80·7	314	e 12 13	− 3	—	—	—	—	—
Haiwee	Z.	81·3	54	e 12 26	+ 6	—	—	—	—	—
Pasadena	Z.	82·0	56	e 12 23	0	—	—	—	—	—
Riverside	Z.	82·7	56	e 12 27	0	—	—	—	—	—
Palomar	Z.	83·4	56	e 12 23	− 7	—	—	—	—	—
Boulder City		83·6	53	e 12 38	+ 7	—	—	—	—	—
Pierce Ferry		84·1	53	e 12 35	+ 1	—	—	i 12 40	P_cP	—
Ksara		88·2	307	e 12 51	− 3	—	—	—	—	—
Tucson		88·3	55	e 13 1	+ 6	—	—	e 13 36	?	—
Stuttgart	Z.	94·0	332	e 13 22?	+ 1	—	—	—	—	—
Strasbourg		94·8	333	e 13 22	− 3	e 27 8	?	—	—	e 51·0
Paris		96·7	335	e 17 24?	PP	—	—	—	—	e 59·0
La Paz		149·3	76	e 18 52	[−54]	—	—	—	—	—

Long waves were also recorded at other European stations.

July 2d. Readings also at 1h. (Fresno), 3h. (Mount Wilson, Pasadena, Palomar, Tinemaha, Tucson, Samarkand, near Obi-garm, Stalinabad, Andijan, and near Mineral), 5h. (Lick), 6h. (Istanbul, Rome, and near Mizusawa), 7h. (near Lick and Berkeley), 8h. (La Paz), 9h. (Sotchi), 10h. (Pierce Ferry, Tucson, Palomar, near Lick (2), and Berkeley), 11h. (near Alicante), 12h. (Pierce Ferry), 14h. (Alicante, Strasbourg, and near Stuttgart), 17h. (Istanbul), 18h. (near Lick (2)), 19h. (Ottawa and Wellington), 20h. (Christchurch, Strasbourg, Stuttgart, near Bologna, Salo, Florence, Padova, and Pavia), 21h. (Tacubaya and Hungry Horse), 23h. (Ottawa, Shasta Dam, and Hungry Horse).

July 3d. 4h. Undetermined shock.

Huancayo iP = 14m.59s., iS = 15m.30s., iL = 15m.41s.
La Paz iP = 15m.22s., S = 17m.36s., L = 18m.24s.
Bogota ePEZ = 17m.0s., iPPEZ = 17m.6s., iPPPEZ = 17m.13s., iSEZ = 19m.37s., iSSEZ = 19m.58s., iP_cPEZ = 20m.56s.
Ottawa eZ = 23m.3s. and 23m.42s.
Tucson iP = 23m.3s., i = 23m.39s., and 23m.49s.
Pierce Ferry iP = 23m.35s.
Palomar iPZ = 23m.36s., eZ = 24m.14s., iZ = 24m.27s.
Boulder City eP = 23m.40s.
Riverside iPZ = 23m.40s., eZ = 24m.17s.
Pasadena iPZ = 23m.46s., eZ = 24m.25s. and 24m.38s.
Mount Wilson iPZ = 23m.47s., iZ = 24m.22s.
Tinemaha iPZ = 23m.59s., iZ = 24m.38s.
Fresno ePZ = 24m.13s., eZ = 25m.30s.
Shasta Dam iP = 24m.27s.
Hungry Horse iP = 24m.33s.
Victoria eZ = 25m.2s.

July 3d. 12h. 50m. 18s. Epiccntre 19°·0S. 176°·0W. Depth of focus 0·060.
(as on 1947, July 13d.).

$A = -·9439$, $B = -·0660$, $C = -·3236$; $\delta = +2$; $h = +5$;
$D = -·070$, $E = +·998$; $G = +·323$, $H = +·023$, $K = -·946$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		6·6	39	i 1 29	−11	2 45	−14	—	—	—
Brisbane		29·6	247	i 5 24	− 7	i 9 47	− 9	e 7 2	PP	i 11·9
Riverview		32·7	236	i 5 51k	− 6	i 10 37	− 6	i 7 2	PP	—
Santa Barbara	z.	75·4	46	e 11 15	+14	—	—	—	—	—
Berkeley		75·8	41	i 11 4	+ 1	i 20 19	+ 9	i 20 49	PS	—
Lick	z.	75·9	41	e 11 4	0	—	—	—	—	—
La Jolla		76·2	48	i 11 6	0	—	—	i 12 31	pP	—
Pasadena		76·3	46	i 11 6a	0	i 20 20	+ 4	i 12 28	pP	—
Mount Wilson		76·4	46	i 11 6a	− 1	—	—	i 12 29	pP	—
Fresno		76·7	43	i 11 8k	0	i 20 32	+12	i 12 32	pP	—
Palomar		76·7	47	i 11 8a	0	i 20 30	+10	i 12 32	pP	—
Riverside		76·8	46	i 11 8a	− 1	—	—	e 12 29	pP	—
Shasta Dam		77·5	39	i 11 20	+ 7	i 20 42	+14	i 12 42	pP	—
Haiwee		77·6	44	i 11 14	+ 1	e 20 39	+10	—	—	—
Mineral	z.	77·7	40	e 11 14	0	—	—	—	—	—
Tinemaha		77·9	44	i 11 15a	0	—	—	e 12 39	pP	—
Vladivostok		78·2	323	i 11 8	− 8	e 20 28	− 8	i 13 11	sP	—
Boulder City		79·6	46	i 11 24	0	—	—	e 12 47	pP	—
Pierce Ferry		80·2	47	i 11 28	+ 1	—	—	i 12 51	pP	—
Tucson		80·5	51	i 11 30a	+ 1	e 21 12	+13	i 12 54	pP	—
Victoria	z.	81·9	32	e 11 37	+ 1	—	—	—	—	—
Tacubaya		84·4	68	e 11 53	+ 5	e 21 41	+ 3	e 13 24	pP	—
Butte	n.	86·4	38	—	—	e 22 3	+ 6	e 27 52	SS	—
Hungry Horse		86·8	36	i 11 59	− 1	e 21 52	[+ 7]	i 29 50	PKKP	—
La Paz	n.	100·8	112	e 14 2	+58	—	—	—	—	—
Tashkent		120·7	308	i 19 5	PP	e 24 22	[0]	e 20 40	PPP	—
Sverdlovsk		123·8	327	i 18 4	[− 6]	e 24 32	[0]	i 19 45	PP	—
Moscow		135·4	334	e 18 27	[− 5]	—	—	i 21 2	PP	—
Leninakan		139·7	312	e 21 45	PP	—	—	—	—	—
Warsaw		144·3	342	e 18 44k	[− 4]	e 25 21	[+ 6]	21 49	PP	e 69·7
Potsdam	z.	145·9	352	i 18 50k	[0]	—	—	—	—	—
Collmberg		147·0	351	e 18 53	[+ 1]	—	—	19 33	pPKP	—
De Bilt		147·0	359	i 18 52k	[0]	—	—	i 20 28	pPKP	—
Kew		147·4	6	e 18 53	[0]	—	—	e 19 8	PKP_2	—
Jena	n.	147·6	352	e 18 53	[0]	—	—	e 22 17	PP	—
Ksara		148·0	304	i 18 54	[0]	—	—	i 21 3	pPKP	—
Uccle	z.	148·3	2	18 56	[+ 2]	—	—	—	—	—
Istanbul		149·3	321	18 52	[− 4]	22 22	PP	(22 22)	PP	—
Stuttgart	z.	150·0	353	i 18 54k	[− 3]	—	—	e 20 57	pPKP	—
Paris		150·2	3	e 18 56	[− 1]	e 21 7	sPKP	e 20 32	pPKP	—
Strasbourg		150·3	356	e 18 56	[− 1]	—	—	—	—	—
Basle		151·4	355	e 18 57a	[− 2]	e 29 52	?	—	—	—
Zürich		151·5	355	i 18 52k	[− 7]	—	—	—	—	—
Triest		152·2	347	e 19 8	[+ 8]	—	—	e 23 20	?	—
Helwan		152·9	299	e 18 58	[− 3]	—	—	e 20 45	pPKP	—
Salo	z.	152·9	350	19 8a	[+ 7]	—	—	—	—	—
Clermont-Ferrand		153·3	2	i 19 1	[0]	47 42?	SSS	i 20 42	pPKP	—
Padova		153·7	348	e 19 19	[+17]	—	—	—	—	—
Bologna		153·9	349	e 19 2	[0]	e 26 5	[+38]	e 19 23	PKP_2	—
Rome	n.	156·1	345	e 19 31	[+26]	e 25 14	[−16]	—	—	—
Toledo	z.	158·1	17	i 19 10	[+ 2]	e 23 17	PP	—	—	—
Alicante		160·3	10	e 18 57	[−13]	—	—	—	—	—
Tamanrasset		176·0	340	i 19 19k	[− 2]	—	—	e 20 56	pPKP	—

Additional readings :—
Brisbane iE = 6m.32s., iN = 6m.35s.
Riverview isPE = 7m.20s., iNZ = 13m.25s., iS_eSN = 15m.40s.
Mount Wilson eZ = 13m.44s.
Fresno eN = 11m.12s., iZ = 12m.38s., eZ = 20m.31s.
Mineral ipPZ = 11m.16s., iZ = 11m.36s.

Continued on next page.

Tucson isP =13m.50s., ePP =14m.31s., ePKKP =30m.4s., ePKP,PKP =38m.15s.
Tacubaya ePN =11m.56s., eN =15m.53s., eSN =21m.55s.
Tashkent e =20m.1s., 27m.7s., and 28m.29s.
Sverdlovsk e =26m.8s. and 27m.19s.
Moscow i =21m.24s., e =21m.58s., 23m.5s., 23m.33s., and 24m.10s.
De Bilt eZ =21m.0s.
Jena eN =20m.10s.
Stuttgart iZ =19m.0s.k and 19m.5s.k, eZ =20m.29s.
Paris iPKP =19m.0s., i =19m.7s., ePP? =22m.27s., e =26m.42s.? and 33m.42s.?
Strasbourg i =19m.1s., e? =19m.6s.
Helwan i =19m.3s., e =22m.9s. and 24m.17s.
Clermont-Ferrand i =19m.8s. and 19m.20s., iPP =22m.58s.
Toledo iPP =19m.43s.
Alicante PP =19m.23s., PPP =19m.31s., eS =22m.57s., P_cP =23m.7s., SS =23m.47s., SSS =24m.5s., L =25m.15s., S_cS =30m.47s. ; readings wrongly identified.
Tamanrasset i =22m.28s., ePP =24m.47s.

July 3d. 15h. 45m. 43s. Epicentre 64°·0N. 20°·0W. (as on 1947, March 29d.)'

Felt over most of the S.W. of Iceland. Intensity V-VI near the epicentre.
Epicentre 64°N. 20°·5W.
Verdráttan 1948, Manadaryfirlit samid à vedurstofunni, juillet, p. 28.

A = +·4142, B = −·1508, C = +·8976 ; δ = −1 ; h = −10 ;
D = −·342, E = −·940 ; G = +·843, H = −·307, K = −·441.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Reykjavik	0·9	279	i 0 13k	− 7	i 0 22	−12	i 0 19	P	0·4
Scoresby Sund	6·5	354	1 45	+ 6	—	—	—	—	3·3
De Bilt	17·7	119	—	—	e 7 41	SS	—	—	e 8·3
Paris	19·5	130	i 4 30	− 1	e 8 15	+ 9	—	—	e 10·3
Potsdam	20·7	109	—	—	e 8 41	+10	—	—	e 10·3
Strasbourg	21·4	122	e 4 54	+ 3	e 8 59	+14	—	—	—
Collmberg	21·5	111	4 54	+ 2	—	—	—	—	—
Stuttgart	21·9	119	e 4 57	0	e 9 6	+12	—	—	e 11·3
Clermont-Ferrand	22·4	134	e 5 1	− 1	e 9 19	+15	—	—	12·3
Ottawa Z.	35·7	267	e 6 59	− 3	—	—	—	—	—
Istanbul	36·3	105	—	—	e 12 17	−31	—	—	—
Hungry Horse	49·6	300	i 8 54	− 1	—	—	—	—	—

Additional readings :—
Reykjavik iEN =16s.
Paris eS =8m.18s.
Potsdam eZ =8m.44s.
Long waves were also recorded at Ivigtut and other European stations.

July 3d. Readings also at 1h. (Fresno), 3h. (Lick, Hungry Horse, and near Victoria), 7h. (near San Juan and near Alicante), 8h. (near Irkutsk and near Mizusawa), 10h. (Hungry Horse, Pierce Ferry, Shasta Dam, Strasbourg, near Andijan, Murgab, and Stalinabad), 11h. (near Andijan), 12h. (near Alicante), 13h. (La Paz and near Andijan), 14h. (La Paz), 15h. (Alicante, Strasbourg, Tashkent, near Obi-garm (2)), Stalinabad (2), Murgab (2), and Andijan (2)), 16h. (near Tacubaya, Sverdlovsk, and near Andijan), 17h. (near Salo), 19h. (near Bogota), 20h. (Ottawa and Hungry Horse), 21h. (Ottawa, Christchurch, near Tuai, New Plymouth, and Wellington), 22h. (Shasta Dam).

July 4d. 23h. 24m. 19s. Epicentre 41°·8N. 48°·8E.

Suggested Epicentres : 41°·75N. 48°·75E. (Strasbourg).
41°·9N. 48°·8E. (U.S.S.R.).

A = +·4925, B = +·5626, C = +·6641 ; δ = +10 ; h = −2 ;
D = +·752, E = −·659 ; G = +·437, H = +·500, K = −·748.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Baku	1·6	148	i 0 27	− 3	—	—	—	—	—
Grozny	2·7	305	e 0 48	+ 3	1 31	S_g	—	—	—
Leninakan	3·9	257	e 1 6	+ 4	i 2 12	S_g	—	—	—
Piatigorsk	4·8	300	e 1 18	+ 3	e 2 18	+ 6	—	—	—
Sotchi	6·9	288	e 2 21?	P_g	—	—	—	—	—

Continued on next page.

		△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	Supp. m. s.		L. m.
Yalta		11·0	289	e 2 48	+ 6	e 4 50?	+ 3	—	—	—
Ksara		12·9	236	e 3 6	− 1	—	—	—	—	—
Samarkand		13·9	93	3 31	+10	—	—	—	—	—
Tashkent		15·3	85	e 3 36?	− 3	e 6 30?	0	—	—	—
Stalinabad		15·6	95	i 3 44	+ 1	i 6 34	− 3	—	—	—
Moscow		15·7	336	3 44	0	6 30	− 9	—	—	—
Obi-garm		16·3	94	e 3 47	− 5	—	—	—	—	—
Sverdlovsk		16·9	23	3 52	− 7	6 54	−13	—	—	—
Andijan		17·7	87	e 4 6	− 4	—	—	—	—	—
Frunse		19·1	79	e 4 24	− 3	—	—	—	—	—
Warsaw		21·5	309	e 5 15	PP	e 9 25	SS	e 13 27	Q	e 15·7
Triest		25·5	291	e 5 41	+ 9	e 12 24	L	e 8 1	?	(e 12·4)
Rome		26·9	283	—	—	e 11 28	SS	e 11 43	SSS	—
Stuttgart		28·5	298	e 5 52	− 7	—	—	—	—	e 18·7
Hungry Horse		89·0	349	i 12 54	− 4	—	—	—	—	—

Warsaw also gives eZ = 7m.27s., 9m.15s., and 10m.45s., eE = 11m.45s. and 12m.15s., eN = 12m.40s.
Long waves were also recorded at other European stations.

July 4d. Readings also at 3h. (Mount Wilson, Pasadena, Palomar, Tinemaha, Pierce Ferry, and Tucson), 4h. (near La Paz), 5h. (Ottawa and near Lick), 7h. (La Paz), 8h. and 9h. (near Mineral), 11h. (Stuttgart, Messina, and near Mineral), 12h. (Stuttgart, Messina (3), Istanbul, Huancayo, Ottawa, Palomar, Pasadena, Riverside, Hungry Horse, Pierce Ferry, Shasta Dam, Tucson, and Mineral), 13h. (Messina and near Tacubaya), 14h. (Hungry Horse, Fresno, and near Messina), 15h. (Palomar, Pasadena, Riverside, Tinemaha, Hungry Horse, Pierce Ferry, Tucson, and Berkeley), 16h. (Ottawa and near Tacubaya), 18h. (Istanbul, Ksara, Fresno, near Boulder City, and Pierce Ferry), 19h. (near Andijan), 23h. (Ksara, Copenhagen, Palomar, Mount Wilson, Pasadena, Riverside, Hungry Horse, Tucson, Lick, and Shasta Dam).

July 5d. 13h. 53m. 14s. Epicentre 29°·5N. 57°·5E. (as on 1946, Sept. 19d.).

A = +·4684, B = +·7353, C = +·4899 ; δ = +7 ; h = +2 ;
D = +·843, E = −·537 ; G = +·263, H = +·413, K = −·872.

		△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	Supp. m. s.		L. m.
Ashkabad		8·4	5	e 2 2	− 4	3 47	+ 4	—	—	—
Baku		12·5	332	e 3 8	+ 6	—	—	—	—	—
Samarkand		12·8	35	i 2 58	− 8	—	—	—	—	—
Stalinabad		13·0	43	i 3 8	− 1	—	—	—	—	—
Erevan		15·1	319	e 3 34	− 2	—	—	—	—	—
Tashkent		15·2	35	i 3 45	+ 7	e 6 39	+11	—	—	—
Leninakan		15·8	319	e 3 54?	+ 9	—	—	—	—	—
Andijan		16·5	43	e 3 47	− 7	—	—	—	—	—
Grozny		16·7	329	e 4 3	+ 6	—	—	—	—	—
Bombay		17·5	124	i 4 2	− 5	i 7 24	+ 3	—	—	9·2
Dehra Dun	N.	17·8	81	e 2 43?	?	e 6 58	−30	—	—	—
Ksara		19·0	289	i 4 26	0	i 8 14	SS	—	—	—
Sotchi		20·0	319	4 37	0	8 32	SS	—	—	—
Hyderabad	N.	22·6	117	4 59	− 4	9 11	+ 4	—	—	11·7
Helwan		22·8	277	5 7	+ 2	9 16	+ 5	5 32	PP	—
Theodosia		23·3	318	e 5 11	+ 1	—	—	—	—	—
Yalta		23·8	315	i 5 13	− 2	9 38	+10	—	—	—
Simferopol		24·0	316	5 18	+ 1	—	—	—	—	—
Istanbul		25·8	304	e 5 33	− 1	i 10 21	+19	—	—	—
Kodaikanal	E.	26·7	132	i 5 42	− 1	i 10 22	+ 5	11 42	SS	13·7
Sverdlovsk		27·4	4	i 5 47	− 2	i 10 26	− 2	—	—	—
Calcutta	E.	28·5	96	e 5 58	− 1	i 10 52	+ 6	i 6 55	PP	13·5
Bucharest		29·0	310	(e 5 47)	−17	(e 10 51)	− 3	—	—	(15·8)
Moscow		29·8	338	e 6 8	− 3	11 6	− 1	—	—	—
Colombo	E.	30·8	133	6 20	0	12 20	+57	—	—	18·1

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Belgrade		32·9	308	e 6 38	0	e 11 52	− 4	e 8 10	PP	21·8
Kalossa		34·4	311	e 6 56	+ 5	—	—	e 7 37	?	e 21·8
Taranto		34·5	299	6 52	0	13 2	+42	—	—	24·9
Budapest		34·6	312	6 58	+ 5	e 13 14	+52	8 18	PP	20·8
Warsaw		35·2	321	e 6 56a	− 2	13 30	+59	8 13	PP	e 17·8
Messina		35·7	295	e 7 3	+ 1	e 14 8	?	—	—	—
Raciborzu		36·0	317	e 7 10	+ 5	e 12 46?	+ 2	—	—	—
Helsinki		37·7	334	e 7 26	+ 7	—	—	—	—	e 15·8
Triest		37·7	308	i 7 15	− 4	i 13 0	−10	i 7 38	pP	—
Rome		38·2	303	e 7 20a	− 3	e 13 15	− 2	i 9 2	PP	e 19·3
Prague		38·3	315	e 7 29	+ 5	e 13 11	− 8	e 8 54	PP	e 15·8
Padova		38·9	306	e 7 24	− 5	e 13 44	+16	—	—	—
Collmberg		39·5	316	e 7 35	+ 1	—	—	i 8 44	PP	—
Cheb		39·6	314	e 7 34	− 1	e 13 33	− 5	e 8 58	PP	e 17·0
Potsdam		39·8	318	e 7 36	0	i 13 41	− 1	i 9 17	PP	e 18·8
Salo		40·0	307	e 7 40	+ 2	e 13 54	+10	—	—	—
Jena		40·3	314	e 7 40	0	e 13 46	− 3	e 9 31	PP	e 19·3
Upsala		40·5	331	e 7 46?	+ 4	13 50	− 2	9 20	PP	e 19·0
Pavia		40·9	307	e 7 54?	+ 8	—	—	—	—	—
Irkutsk		41·1	42	e 7 45	− 2	e 13 53	− 8	—	—	—
Copenhagen		41·2	323	e 7 48	0	13 58	− 4	9 27	PP	—
Stuttgart		41·3	312	e 7 48	− 1	14 5	+ 1	e 9 35	PP	e 23·3
Zürich		41·5	310	e 7 46	− 4	e 13 56	−11	—	—	—
Basle		42·2	310	e 7 58	+ 2	e 14 13	− 4	—	—	—
Strasbourg		42·2	311	e 7 53	− 3	e 14 17	0	e 9 29	PP	e 21·6
Neuchatel		42·6	309	e 7 56	− 3	—	—	—	—	—
De Bilt		44·4	316	e 8 15	+ 1	e 14 34	−15	e 10 2	PP	e 21·8
Uccle		44·7	314	e 8 21a	+ 5	e 14 55	+ 1	e 10 3	PP	e 20·8
Clermont-Ferrand		45·2	307	e 8 17	− 3	i 15 0	− 1	i 10 10	PP	22·8
Paris		45·7	311	e 8 24	0	i 15 15	+ 7	i 18 38	SS	e 23·8
Barcelona		45·9	301	—	—	e 15 5	− 6	18 46	SS	—
Tamanrasset		46·8	274	i 8 37a	+ 4	—	—	e 10 26	PP	—
Tortosa		47·2	300	i 8 38	+ 2	i 15 30	+ 1	10 31	PP	24·0
Kew		47·7	315	e 8 39	− 1	e 15 35	− 1	e 21 39	Q	e 24·8
Alicante		48·2	297	i 8 45	+ 1	15 47	+ 4	10 47	PP	24·1
Durham		48·8	318	—	—	i 16 0	+ 8	i 16 11	PS	i 19·9
Jersey		48·8	311	e 8 49	0	e 15 46	− 6	—	—	22·8
Tananarivo		49·1	193	—	—	e 16 0	+ 4	16 13	PS	25·3
Aberdeen		49·4	322	i 8 56	+ 3	i 15 56	− 4	i 19 33	SS	27·7
Edinburgh		49·8	320	—	—	e 15 47	−19	e 19 46	SS	—
Toledo		50·8	299	i 9 2	− 2	i 16 17	− 3	i 10 57	PP	—
Granada		50·9	296	i 9 6k	+ 1	i 16 8	−13	9 38	pP	28·9
Lisbon		54·9	299	9 34k	− 1	17 18	+ 2	9 47	pP	24·0
Scoresby Sund		59·0	337	10 8	+ 4	18 11	+ 1	13 26	PPP	26·0
Vladivostok		59·6	55	e 9 57	−11	e 18 4	−13	—	—	—
Ivigtut		71·7	330	—	—	e 20 52	+ 7	—	—	34·8
College		83·9	11	—	—	e 22 51	− 5	e 28 45	SS	e 34·3
Seven Falls	E.	90·6	327	—	—	(24 46?)	+46	—	—	24·8
Sitka		92·6	7	—	—	e 23 50	[+ 2]	e 24 28	S	e 38·8
Ottawa		94·2	329	13 22	0	24 4	[+ 7]	25 46	PS	50·8
Harvard		94·4	325	i 13 23	0	—	—	—	—	e 52·8
Fordham		96·8	325	e 13 38	+ 4	—	—	—	—	52·8
Bermuda		97·6	314	—	—	e 25 10	+10	e 26 6	PS	e 50·1
Cleveland		99·9	330	e 13 52	+ 4	e 24 29	[+ 2]	e 27 0	PS	—
Chicago		102·0	334	—	—	e 24 38	[+ 1]	e 26 10	S	e 44·4
Hungry Horse		102·1	354	e 13 57	− 1	—	—	—	—	—
Victoria		102·3	1	—	—	e 24 52	[+14]	e 41 46?	Q	52·8
St. Louis		105·8	334	—	—	i 25 36	−33	e 37 41	SSS	—
Lincoln	E.	106·0	340	e 21 48	?	e 30 58	?	—	—	e 49·0
San Juan		107·7	304	—	—	e 24 11	[−51]	—	—	e 46·2

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Salt Lake City		109·4	351	—	—	e 25 3	[− 7]	e 28 23	PS	e 50·4
Tinemaha	z.	113·6	356	e 19 32	PP	—	—	—	—	—
Fresno	z.	114·1	357	e 19 1	[+20]	e 29 34	PS	e 33 26	?	—
Pierce Ferry		114·2	352	e 19 48	PP	—	—	—	—	—
Mount Wilson	z.	116·5	355	e 19 43	PP	—	—	—	—	—
Pasadena		116·6	355	e 19 55	PP	—	—	e 22 23	PPP	e 46·7
Palomar	z.	117·3	353	e 19 49	PP	—	—	e 21 13	?	—
Tucson		117·6	348	e 18 53	[+ 5]	—	—	e 20 31	PP	e 48·2
La Paz		128·7	272	i 19 11	[+ 1]	—	—	22 5	?	56·8
Huancayo		133·0	281	e 19 22	[+ 4]	e 22 51	PKS	—	—	e 57·3

Additional readings :—
Helwan PPP = 5m.44s., SS = 9m.52s.
Calcutta iPPPE = 7m.9s., iSSSE = 12m.45s.
Bucharest readings have been increased by 3m.
Belgrade e = 15m.33s.
Budapest PPPN = 8m.57s., PSE = 13m.26s., eSSE = 15m.59s., eSSSE = 16m.55s., eN = 17m.46s.?
Warsaw PZ = 7m.0s., P_cPZ = 8m.41s., SZ = 13m.36s., P_cSE = 14m.7s., P_cSZ = 14m.19s., SSNZ = 14m.57s., eSSE = 15m.4s., eSSSZ = 15m.24s., eSSSN = 15m.27s., S_cSZ = 16m.53s., S_cSN = 17m.8s.
Triest iPP = 8m.28s., iPPP = 8m.54s., eSS = 15m.4s., eSSS = 15m.40s.
Rome iPPPZ = 9m.33s., eE = 13m.35s., iSSE = 16m.2s.
Prague e = 7m.55s., ePP = 8m.30s.
Padova e = 11m.29s., eE = 12m.29s.
Cheb e = 8m.46s. and 13m.40s.
Potsdam iPEZ = 7m.41s.a, ePSZ = 13m.47s., iSSN = 16m.36s., iSSSE = 17m.3s.
Jena eN = 16m.56s.
Upsala ePN = 7m.57s., PPE = 9m.17s., eSN = 13m.58s., iE = 14m.8s., SSN = 16m.32s., eE = 16m.46s.
Copenhagen 14m.21s., 16m.22s., and 17m.34s.
Stuttgart eZ = 8m.5s. and 12m.3s., eSS = 17m.3s., i = 17m.21s., eZ = 19m.11s.
Strasbourg eP = 7m.56s. and 7m.59s., e = 14m.4s., 14m.33s., and 17m.4s., eSS = 17m.18s., e = 17m.28s., i = 17m.34s.
De Bilt eSS = 17m.52s.
Uccle eZ = 9m.24s., ePPE = 10m.11s., eN = 11m.19s., ePSEN = 15m.4s., eSSEN = 17m.47s.
Clermont-Ferrand iP = 8m.24s., iPPP = 10m.55s., iP_cS = 13m.43s., iSS = 18m.23s., iSSS = 19m.39s.
Paris iP = 8m.28s., e = 15m.4s., 16m.7s., and 16m.16s.
Tamanrasset e = 8m.48s. and 10m.37s.
Tortosa P_cPN = 10m.11s., PSE = 15m.45s., SS?N = 21m.8s.
Kew iZ = 8m.44s., eEN = 20m.1s.
Alicante P_cP = 9m.55s., PPP = 11m.37s., P_cS = 13m.47s., iS = 15m.33s., PPS = 16m.3s., S_cS = 18m.11s., SS = 19m.11s., i = 19m.35s., SSS = 21m.3s.
Tananarive SSS = 21m.17s.
Aberdeen iE = 15m.30s.
Granada iPP = 11m.18s., PPP = 12m.23s., eP_cS = 14m.2s., PS = 16m.41s., sS = 17m.51s., iSS = 20m.29s., SSS = 22m.32s.
Toledo iP_cPE = 10m.3s., iPPPE = 11m.54s., iSS?E = 20m.23s.
Lisbon iPEZ = 9m.38s.a, Z = 10m.46s., PPZ = 11m.11s., SEN = 16m.53s., SS?E = 20m.22s. and 21m.9s., Z = 21m.28s., N = 23m.41s.
Scoresby Sund 23m.50s. and 24m.38s.
College e = 26m.13s.
Sitka ePPS? = 25m.36s., eSSS = 33m.22s.
Ottawa SS = 36m.46s.?
Bermuda ePPS? = 27m.38s., ePKKP = 30m.16s., e = 33m.50s.
Cleveland iPPZ = 17m.55s., eZ = 22m.5s., ePPSN = 27m.52s.
San Juan e = 31m.1s., eSSS = 39m.5s.
Salt Lake City eSS = 34m.11s.
Huancayo ePP = 22m.20s., e = 40m.8s. and 43m.0s., ePPS = 44m.14s., eSS = 49m.34s.
Long waves were also recorded at Butte and Ukiah.

July 5d. Readings also at 0h. (Paris and near Lick (3)), 1h. (Stuttgart, Strasbourg, Rome, Triest, Padova, near Bologna, Salo, and Pavia), 2h. (Apia and Shasta Dam), 3h. (Shasta Dam), 4h. (Shasta Dam and Hungry Horse), 5h. (Auckland, Christchurch, Wellington, Samarkand, Andijan, near Obi-garm, and Stalinabad), 6h. (Apia and near Tananarive), 9h. (Apia, near Berkeley, Branner, and Lick), 10h. (Branner, Lick, Fresno, near Mineral (5), Stuttgart, Strasbourg, near Zürich, and Basle), 11h. (Mineral), 12h. (near Andijan, Stalinabad, and near Zürich), 13h. (Ottawa and Zürich), 14h. (Stuttgart), 19h. (La Paz), 20h. (Rome), 23h. (Hungry Horse).

July 6d. Readings at 0h. (Rome, near Murgab, and Andijan), 1h. (near Andijan, and near Murgab), 2h. (Lick and near Mineral), 5h. (near Obi-garm, Stalinabad, Murgab, Samarkand, and near Belgrade), 6h. (near Apia), 7h. (Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Boulder City, Hungry Horse, Pierce Ferry, Tucson, near San Juan, Stuttgart (3), near Obi-garm, Stalinabad, Andijan (2), Murgab, and Samarkand; more than one shock), 11h. (Pasadena, Palomar, Tinemaha, Hungry Horse, Pierce Ferry, Tucson, Harvard, near San Juan, and Tacubaya), 13h. (Scoresby Sund, Theodosia, and near Tacubaya), 16h. (La Paz), 18h. (Ottawa, Hungry Horse, Shasta Dam, Stuttgart, near San Juan, near Basle, and Zürich), 19h. (Riverside, Tinemaha, Boulder City, Pierce Ferry, Shasta Dam, Tucson, Ottawa, La Paz, Bogota, Bermuda, and Stuttgart).

July 7d. 2h. 19m. 10s. Epicentre 33°·0N. 136°·5E.

Intensity V at Siomisaki and Kasiwara; IV at Hukui, Osaka, Sumoto, Gihu, Turuga, Koti, Hikone, and Tu; II-III at Kobe, Kyoto, Yonago, Iida, Wazima, Tottori, and Takayama. Epicentre as adopted. Macroseismic radius over 300kms. Shallow.

The Seismological Bulletin of the Central Meteorological Observatory, Japan, for the Year 1948, Tokyo, 1950, pp. 28-29, with macroseismic chart, p. 28.

$A = -·6096$, $B = +·5785$, $C = +·5421$; $\delta = +15$; $h = +1$;
$D = +·688$, $E = +·725$; $G = -·393$, $H = +·373$, $K = -·840$.

	△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	Supp. m. s.		L. m.
Siomisaki	0·8	297	0 14	P_g	0 22	S_g	—	—	—
Owase	1·1	347	0 17	− 5	0 27	−12	—	—	—
Kameyama	1·8	359	0 29a	− 3	0 59	+ 3	—	—	—
Osaka	1·8	334	0 29a	− 3	0 54	− 2	—	—	—
Sumoto	1·9	315	0 31a	− 3	1 0	+ 1	—	—	—
Kobe	2·0	327	0 33a	− 2	1 9	+ 7	—	—	—
Muroto	2·0	278	0 34a	− 1	1 11	+ 9	—	—	—
Kyoto	2·1	343	0 33	− 4	0 57	− 7	—	—	—
Nagoya	2·2	10	0 33	− 5	1 4	− 2	—	—	—
Hikone	2·3	355	0 38a	− 2	1 13	+ 4	—	—	—
Gihu	2·4	5	0 38a	− 3	1 11	− 1	—	—	—
Koti	2·5	284	1 10	+27	1 55	S_g	—	—	—
Shizuoka	2·5	38	0 45	+ 2	1 20	+ 6	—	—	—
Misima	2·9	43	0 44	− 4	1 47	S_g	—	—	—
Toyooka	2·9	331	0 44a	− 4	1 24	0	—	—	—
Osima	3·0	53	0 47	− 3	1 40	S_g	—	—	—
Simidu	3·0	267	0 47	− 3	1 37	S_g	—	—	—
Hunatu	3·1	36	0 50	− 1	2 2	S_g	—	—	—
Mera	3·4	54	1 44	+49	—	—	—	—	—
Yokohama	3·6	46	1 15	P_g	1 56	S_g	—	—	—
Hirosima	3·7	293	0 56	− 4	1 51	+ 6	—	—	—
Toyama	3·7	9	1 10a	P_g	1 36	− 9	—	—	—
Tokyo	3·8	44	1 15a	P_g	2 12	S_g	—	—	—
Kumagaya	3·9	36	1 1	− 1	1 49	− 1	—	—	—
Nagano	3·9	21	1 2	0	1 54	+ 4	—	—	—
Maebasi	4·0	31	1 4	0	2 20	S_g	—	—	—
Hamada	4·1	299	1 4	− 1	2 10	S*	—	—	—
Kakioka	4·4	42	1 13	+ 3	2 32	S_g	—	—	—
Miyazaki	4·4	257	1 1	− 9	2 31	S_g	—	—	—
Tukubasan	4·4	42	1 3	− 7	2 17	S*	—	—	—
Wazima	4·4	4	1 8	− 2	2 1	− 1	—	—	—
Utunomiya	4·5	37	1 6	− 5	—	—	—	—	—
Mito	4·6	43	1 20	+ 8	2 17	+10	—	—	—
Kumamoto	4·9	269	1 20	+ 3	2 37	S_g	—	—	—
Hukuoka	5·1	278	1 20k	0	2 46	S_g	—	—	—
Aikawa	5·2	15	1 57	P_g	—	—	—	—	—
Kagosima	5·2	256	1 39	P_g	2 41	S*	—	—	—
Unzendake	5·2	269	1 32	P*	2 59	S_g	—	—	—
Onahama	5·3	41	1 29	+ 7	—	—	—	—	—
Hukusima	5·7	33	1 33	+ 5	2 42	+ 7	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m.	s.	m.
Sendai		6·3	33	1 57	P*	—	—	—	—	—
Mizusawa	E.	7·1	30	1 49	+ 1	3 24	+14	—	—	—
Akita		7·3	22	1 19	−31	3 9	− 6	—	—	—
Morioka		7·6	28	2 10	P*	3 41	S*	—	—	—
Miyako		7·9	32	1 58	− 1	2 58	−32	—	—	—
Aomori		8·5	22	2 16	+ 9	5 11	?	—	—	—
Mori		9·7	18	2 19	− 3	5 6	S*	—	—	—
Sapporo		10·7	19	2 31	− 7	4 46	+ 7	—	—	—
Vladivostok		10·7	242	i 2 33	− 5	i 4 33	− 6	—	—	—
Nanking		15·0	269	e 3 35	0	e 6 34	+11	—	—	—
Guam		20·8	158	(i 4 42)	− 3	(i 8 41)	+ 8	—	—	—
Klyuchi		28·7	30	e 4 52	− 9	—	—	—	—	—
Irkutsk		30·2	319	6 9	− 5	e 11 7	− 6	—	—	—
Almata		47·1	301	8 34	− 1	e 15 29	+ 1	—	—	—
Frunse		48·8	300	e 8 48	− 1	e 15 53	+ 1	—	—	—
Dehra Dun	N.	49·3	283	(e 8 30)	−23	(e 15 59)	0	—	—	—
Murgab		50·2	295	8 58	− 2	16 10	− 1	—	—	—
Andijan		50·9	298	e 9 3	− 2	—	—	—	—	—
Tashkent		53·0	300	e 9 19	− 2	e 16 48	− 2	—	—	—
Stalinabad		54·1	297	i 9 28	− 1	i 17 3	− 2	—	—	—
College		54·6	31	e 9 33	+ 1	e 17 5	− 6	e 19 20	S_cS	e 22·2
Samarkand		55·1	298	9 40	+ 4	e 17 25	+ 7	—	—	—
Sverdlovsk		55·6	319	9 37	− 3	i 17 26	+ 1	—	—	—
Bombay		58·2	273	e 10 6	+ 8	e 18 0	+ 1	—	—	27·0
Honolulu		58·8	84	—	—	e 18 17	+10	e 21 3	?	e 24·5
Sitka		61·9	38	e 10 39	+15	i 18 45	− 2	e 22 55	SS	e 25·6
Ashkabad		62·1	299	e 10 24	− 1	—	—	—	—	—
Baku		67·2	304	e 10 59	+ 1	—	—	—	—	—
Apia	E.	67·8	124	—	—	e 25 32	SS	—	—	—
Riverview		67·9	167	—	—	e 20 8	+ 7	e 20 11	S	—
Moscow		68·1	323	i 11 0	− 4	19 55	− 8	—	—	—
Grozny		68·7	308	e 11 4	− 3	20 8	− 2	—	—	—
Piatigorsk		70·2	310	—	—	21 24	+56	—	—	—
Victoria		72·1	44	i 11 35	+ 7	—	—	e 19 58	?	28·8
Sotchi		72·5	311	e 11 28	− 2	—	—	—	—	—
Theodosia		74·5	314	e 11 38	− 4	—	—	—	—	—
Upsala		74·7	333	11 42a	− 1	21 14	− 5	14 20	PP	e 32·8
Grand Coulee		75·0	42	e 11 58	P_cP	—	—	—	—	—
Simferopol		75·3	315	e 11 49	+ 2	—	—	—	—	—
Yalta		75·5	313	i 11 45	− 3	21 22	− 6	—	—	—
Scoresby Sund		75·7	353	11 47	− 2	21 28	− 2	14 44	PP	—
Ukiah		77·1	52	—	—	e 23 6	PPS	—	—	e 34·4
Hungry Horse		77·5	40	e 11 58	− 1	—	—	—	—	—
Warsaw		78·2	326	11 59a	− 4	e 21 54	− 3	e 14 48	PP	e 39·8
Berkeley		78·4	53	e 12 4	0	i 22 1	+ 1	i 27 4	SS	e 32·8
Santa Clara		78·8	53	e 12 15	+ 9	e 22 4	0	—	—	e 34·1
Saskatoon		78·9	34	—	—	e 21 20	−45	—	—	32·8
Lick	Z.	79·1	53	e 12 9	+ 1	—	—	e 12 16	P_cP	—
Copenhagen		79·6	332	i 12 9a	− 1	22 8	− 4	27 21	SS	41·8
Butte	N.	79·7	41	e 12 13	+ 2	e 22 14	+ 1	—	—	e 34·2
Ksara		80·1	304	e 12 13	0	e 22 16	− 2	—	—	—
Bucharest		80·3	317	e 12 16	+ 2	e 22 18	− 2	—	—	—
Istanbul		80·5	313	i 12 16	+ 1	e 22 23	+ 1	—	—	—
Fresno		80·6	52	e 12 16	0	e 22 14	− 9	i 15 29	PP	—
Bozeman		80·7	41	e 12 22	+ 6	e 22 24	0	—	—	e 38·4
Raciborzu		80·9	325	e 12 12	− 5	e 22 24	− 2	e 23 32	PPS	e 44·8
Tinemaha	Z.	81·5	51	e 12 21	0	—	—	i 12 37	P_cP	—
Potsdam		81·7	329	i 12 19a	− 3	e 22 39?	+ 5	i 12 22	P	e 39·8
Budapest	N.	82·2	322	12 23	− 1	22 41	+ 2	—	—	e 42·8
	E.	82·2	322	12 24	0	22 38	− 1	—	—	e 43·8
Collmberg		82·5	328	e 12 28	+ 2	e 22 44	+ 2	e 28 10	?	e 34·3
Prague		82·7	326	e 12 26	− 1	e 22 40	− 4	e 23 26	PS	e 40·8
Kalossa		82·9	322	e 12 39	+11	—	—	e 13 0	?	e 49·3
Belgrade		83·2	320	i 12 28	− 1	e 22 49	0	—	—	40·8
Mount Wilson	Z.	83·2	53	e 12 29	0	—	—	e 12 40	P_cP	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Pasadena		83·2	53	e 12 29	0	i 22 47	− 2	e 28 8	SS	e 34·3
Salt Lake City		83·3	45	e 12 32	+ 2	e 22 52	+ 2	—	—	e 35·8
Jena	N.	83·4	328	e 12 28	− 2	e 23 8	+17	—	—	—
Aberdeen		83·6	339	e 15 52	PP	—	—	—	—	e 34·2
Cheb		83·6	328	e 12 29	− 2	e 22 50?	− 3	—	—	e 39·3
Riverside	Z.	83·8	53	e 12 32	0	—	—	i 12 43	PcP	—
Boulder City		84·3	50	e 12 36	+ 1	—	—	e 15 55	PP	—
Palomar	Z.	84·5	53	e 12 39	+ 3	—	—	i 16 3	PP	—
Pierce Ferry		84·8	50	e 12 38	+ 1	—	—	e 39 5	P′P′	—
Edinburgh		85·0	338	—	—	e 22 53	[− 8]	—	—	—
De Bilt		85·2	333	i 12 38a	− 1	e 23 7	− 2	e 15 56	PP	e 41·8
Durham		85·4	337	e 12 41	+ 1	23 6	[+ 3]	16 9	PP	—
Helwan		85·5	303	i 12 40k	− 1	23 14	+ 2	16 2	PP	—
Rapid City	E.	86·0	39	e 12 56	PcP	e 23 16	− 1	e 28 59	SS	e 41·1
Stuttgart		86·0	328	e 12 42a	− 1	e 23 10	[+ 3]	e 16 0	PP	45·8
Ivigtut		86·1	3	—	—	23 13	[+ 5]	29 2	SS	38·8
Triest		86·1	324	e 12 51	+ 7	e 23 6	[− 2]	e 16 16	PP	—
Uccle		86·5	332	e 12 44a	− 2	e 23 15	[+ 4]	e 16 11	PP	—
Strasbourg		86·8	328	i 12 46	− 1	e 23 26	+ 1	e 16 15	PP	45·8
Chur		87·3	326	e 12 53	+ 3	e 23 26	− 3	—	—	e 48·4
Zürich		87·3	328	e 12 47a	− 3	e 23 31	+ 2	e 23 10	SKS	—
Basle		87·6	328	e 12 48	− 3	e 23 15	[− 3]	e 16 17	PP	—
Kew		87·7	335	e 12 49	− 3	e 23 17	[− 2]	e 23 49	S	43·8
Salo		87·7	325	e 12 47	− 5	e 23 30	− 3	—	—	—
Padova		87·9	324	12 43	−10	e 23 15	[− 5]	24 7	PS	—
Bologna		88·1	324	e 13 12	+18	e 23 39	+ 2	e 16 18	PP	—
Neuchatel		88·3	328	e 12 53	− 2	e 23 21	[− 1]	—	—	—
Paris		88·8	332	i 12 56	− 1	e 23 24	[− 1]	e 16 17	PP	e 48·8
Tucson		89·2	51	e 13 2	+ 3	e 23 35	[+ 7]	e 16 36	PP	e 36·1
Rome		89·4	322	e 12 58a	− 2	i 23 48	− 1	e 16 26	PP	i 36·8
Jersey		90·3	335	e 12 42	−22	e 23 50?	− 7	—	—	44·8
Clermont-Ferrand		91·0	329	i 13 6	− 1	i 24 3	0	i 23 37	SKS	44·8
Lincoln	E.	91·7	38	—	—	e 24 0	−10	e 36 52	Q	e 42·1
Barcelona		94·9	327	—	—	(e 30 52)	SSP	—	—	e 30·9
Chicago		95·1	32	—	—	e 24 38	− 1	e 31 10	SS	e 38·6
Tortosa		96·1	328	17 11	PP	—	—	26 27	PPS	51·8
St. Louis		96·5	35	e 13 34	+ 2	e 24 13	[+ 4]	e 17 39	PP	e 44·1
Seven Falls	E.	96·5	18	—	—	(24 50?)	− 1	—	—	24·8
Ottawa		96·7	22	13 46	+13	24 20	[+10]	26 20	PS	43·8
Cleveland		98·0	28	e 17 49	PP	e 25 9	+ 5	e 26 33	PS	46·7
Alicante		98·5	327	8 2	?	24 19	[− 1]	26 28	PS	e 52·4
Toledo		98·8	331	e 13 21	−22	—	—	—	—	59·9
Granada		100·9	329	18 2	PP	e 23 32	[−59]	i 32 4	SS	47·4
Fordham		101·4	23	e 18 15	PP	e 24 32	[− 2]	e 25 45	S	—
Philadelphia		101·7	24	e 22 8	PKS	e 23 58	[−37]	e 26 46	?	e 48·4
Lisbon		101·8	333	13 3	−53	26 50	PS	40 56	Q	44·6
Tamanrasset		107·4	313	e 18 46	PP	—	—	—	—	—
Bermuda		112·0	19	e 28 2	PS	e 35 10	SS	e 29 55	PPS	e 47·3
San Juan		124·5	26	e 21 10	PP	e 28 4	{+20}	e 31 10	PS	e 49·1
Bogota		132·7	43	e 22 38	SKP	e 29 39	{+63}	—	—	58·8
Huancayo		144·2	62	e 19 39	[+ 1]	e 41 50	SS	e 23 0	PP	e 61·2
La Paz		152·4	58	i 19 55	[+ 4]	30 36	{+ 5}	i 23 50	PP	73·8

Additional readings :—
Guam readings increased by 15 minutes.
Dehra Dun readings increased by 5 minutes.
College e = 18m.46s.
Sitka eS = 18m.41s., eScS = 20m.36s.
Upsala SN = 21m.6s., eN = 24m.10s.
Scoresby Sund 16m.30s., SS = 26m.10s., SSS = 29m.53s.
Berkeley iPZ = 12m.8s. and 12m.12s., eZ = 14m.11s. and 21m.22s.
Warsaw ePE = 12m.2s., ePPPN = 16m.54s., ePPPZ = 17m.1s., eSZ = 22m.5s., ePSEN = 22m.32s., ePSZ = 22m.36s., SSZ = 26m.45s., SSN = 26m.48s., SSE = 26m.52s., eN = 29m.29s., eE = 29m.33s., eSSSE = 30m.21s., iZ = 31m.3s., iE = 31m.12s.
Fresno iZ = 12m.25s., eN = 12m.31s., iZ = 12m.48s.
Raciborzu eEN = 16m.29s.

Continued on next page.

Tinemaha iZ = 12m.28s.
Potsdam iSN = 22m.31s.
Prague ePP = 15m.14s., ePPP = 19m.11s., eS? = 22m.56s., ePPS = 24m.2s., eSS = 28m.14s., eSSS = 32m.26s.
Belgrade e = 14m.51s. and 17m.3s.
Pasadena iZ = 12m.38s.
Boulder City ePKP,PKP = 39m.9s.
Palomar iZ = 12m.44s. and 12m.58s.
De Bilt ePS = 24m.2s., eSS = 28m.50s.?
Durham N = 13m.1s., E = 13m.8s. and 16m.31s., N = 23m.33s.
Helwan PPP = 17m.57s.
Rapid City eSSSE = 33m.1s.
Stuttgart ePPP = 17m.44s., eSS = 28m.50s., eSSS = 32m.44s., eSSS = 35m.2s.
Ivigtut e = 23m.26s., 24m.3s.
Triest iS = 23m.27s.
Uccle ePPP = 18m.5s., eSSEN = 28m.50s.?
Strasbourg iP = 13m.4s., ePPP = 18m.13s., eS = 23m.30s., iS = 23m.33s., eSS = 29m.7s., e = 29m.39s.
Zürich ePP = 16m.8s.
Bologna ePPP? = 18m.8s., ePS = 24m.8s., eZ = 27m.3s.
Paris iP = 13m.11s., i = 13m.31s., ePPP = 18m.23s., eS = 23m.53s., ePS = 24m.53s.
Tucson eS_cS = 23m.53s., ePPS = 25m.2s., ePKP,PKP = 38m.24s.
Rome iPZ = 13m.8s., eSKS = 23m.20s., iSSE = 29m.49s.
Clermont-Ferrand iPP = 16m.48s., iPS = 25m.18s., eSSS = 34m.3s.
St. Louis iSKKS = 24m.56s., iPS = 26m.20s., eSS = 30m.55s.
Ottawa PPP = 20m.20s., SS = 31m.32s., e = 38m.50s.?
Cleveland iZ = 17m.56s., eSKKSE = 24m.59s.
Alicante S? = 31m.50s., Q = 46m.58s., readings wrongly identified.
Granada PPS = 27m.53s., SSS = 36m.20s.
Bermuda eSSS? = 40m.6s.
San Juan e = 29m.56s., eSS? = 36m.0s., eSSS = 41m.46s.
Huancayo eSSS = 47m.10s.
La Paz PKSZ = 23m.23s., PPSZ = 37m.18s., SS?N = 43m.20s.
Long waves were also recorded at Wellington and Kodaikanal.

July 7d. 9h. 24m. 35s. Epicentre 37°·8N. 142°·6E. (as on 1948, May 28d.).

Intensity V at Senmaya (Iwate Pref.); IV at Matsushima, Toyama (Miyagi Pref.); II-III at Onahama, Morioka, Sendai, Hukushima.
Epicentre 37°·9N. 142°·4E. Macroscismic radius 200-300kms. Shallow.

The Seismological Bulletin of the Central Meteorological Observatory, Japan, for the Year 1948, Tokyo, 1950, p. 30, with macroseismic chart.

$A = -\cdot 6293$, $B = +\cdot 4811$, $C = +\cdot 6103$; $\delta = -6$; $h = -1$;
$D = +\cdot 607$, $E = +\cdot 794$; $G = -\cdot 485$, $H = +\cdot 371$, $K = -\cdot 792$.

		Δ	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Sendai		1·4	289	0 44	+17	1 1	+15
Onahama		1·6	237	0 29	− 1	1 5	+14
Hukusima		1·7	268	0 28k	− 3	0 46	− 8
Misusawa	N.	1·7	286	0 32	+ 1	0 51	− 3
Miyako		1·9	345	0 32	− 2	0 54	− 5
Mito		2·2	230	0 41	+ 3	1 0	− 6
Morioka		2·2	330	0 35	− 3	0 59	− 7
Utunomiya		2·5	240	0 41	− 2	1 11	− 3
Tukubasan		2·6	232	0 40	− 4	1 9	− 8
Akita		2·7	315	0 37	− 8	1 10	− 9
Hatinohe		2·8	343	0 46	− 1	1 18	− 4
Tokyo		3·1	227	0 57	+ 6	1 30	+ 1
Maebasi		3·2	244	0 52	0	1 31	− 1
Aomori		3·3	335	0 59	+ 6	1 33	− 2
Yokohama		3·4	223	0 57	+ 2	1 36	− 1
Mera		3·6	219	0 36	−22	1 14	−28
Nagano		3·7	254	1 31	+31	—	—
Hunatu		3·8	235	1 4	+ 3	2 0	S_g
Misima		3·9	230	1 3	+ 1	2 3	S_g
Shizuoka		4·4	232	1 11	+ 1	2 2	0

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	Δ	Az.	P.	O − C.	S.	O − C.
	°	°	m. s.	s.	m. s.	s.
Toyama	4·5	255	1 16	+ 5	1 43	−22
Wazima	4·5	264	1 20	+ 9	—	—
Mori	4·6	340	2 16	+64	3 3	+56
Omaesaki	4·8	229	2 8	S	(2 8)	− 4
Nagoya	5·2	242	1 3	−18	1 56	−26
Sapporo	5·3	349	1 32	+10	—	—
Hikone	5·7	246	2 28	+60	—	—
Kameyama	5·8	241	1 56	P_g	2 57	S•
Hungry Horse	70·6	44	e 12 16	+57	—	—

July 7d. Readings also at 2h. (Tacubaya, Oaxaca, Merida, and near Lick), 4h. (Ottawa and Istanbul), 5h. (near Bogota), 7h. (near Ottawa and Shawinigan Falls), 8h. (near Balboa Heights), 9h. (Mount Wilson, Pasadena, Palomar, Tinemaha, Boulder City, Pierce Ferry, Shasta Dam, and Tucson), 12h. (Bucharest), 14h. (Victoria, Istanbul, and near Barcelona), 15h. (Hungry Horse and near Lick), 17h. (near Mizusawa), 19h. (near Klyuchi), 20h. (near Mizusawa), 23h. (Mount Wilson, Palomar, Boulder City, Tucson, Merida, Oaxaca, and Tacubaya).

July 8d. 4h. 35m. 37s. Epicentre 38°·5N. 30°·2W.

A = +·6781, B = −·3947, C = +·6199; δ = −12; h = −1;
D = −·503, E = −·864; G = +·536, H = −·312, K = −·785.

		Δ	Az.	P.	O − C.	S.	O − C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Toledo	z.	20·3	78	i 4 43?	+ 3	—	—	—	—	—
Granada		21·0	85	i 4 53k	+ 6	i 8 54	+17	i 5 15	PP	i 11·3
Alicante		23·2	80	e 5 11	+ 2	8 58	−20	5 38	PP	11·3
Tortosa		23·7	75	e 5 24	+10	e 9 31	+ 4	5 56	PP	11·4
Paris		25·6	56	e 5 34	+ 2	—	—	—	—	e 13·4
De Bilt		28·0	49	—	—	e 12 23?	Q	—	—	—
Strasbourg		29·0	57	e 6 2	− 2	—	—	—	—	e 15·4
Stuttgart	z.	30·0	57	e 6 12	0	—	—	—	—	—
Scoresby Sund		32·4	4	7 53	PP	11 59	+11	—	—	14·4
Tamanrasset		34·2	107	i 6 53a	+ 4	—	—	—	—	—
Tucson		64·1	292	e 10 37	− 1	—	—	—	—	e 37·5
Pierce Ferry		64·4	297	e 11 10	+30	—	—	—	—	—
Boulder City		65·0	297	e 10 44	0	—	—	—	—	—
La Paz		65·2	221	i 10 47	+ 2	i 21 15	?	—	—	—
Huancayo		65·6	230	e 10 48	0	—	—	—	—	—
Tinemaha	z.	66·8	300	e 10 56	0	—	—	—	—	—
Fresno	z.	68·0	301	e 11 3	0	—	—	e 11 33	P_cP	—
Mount Wilson	z.	68·2	297	e 11 16	+12	—	—	—	—	—
Pasadena	z.	68·3	297	e 11 3	− 2	—	—	—	—	—

Additional readings :—
Granada SS = 9m.39s.
Alicante SS = 9m.39s.
Tortosa PPPEN = 6m.7s., iN = 6m.30s., SSSE = 10m.38s.
Strasbourg eP = 6m.10s.
Long waves were also recorded at Potsdam.

July 8d. 12h. 34m. 36s. Epicentre 71°·3N. 4°·2W. (as on 1941, Sept. 7d.).

A = +·3217, B = −·0236, C = +·9465; δ = −9; h = −12;
D = −·073, E = −·997; G = +·944, H = −·069, K = −·323.

		Δ	Az.	P.	O − C.	S.	O − C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Scoresby Sund		5·9	271	1 26a	− 5	2 26	−14	—	—	—
Reykjavik	N.	9·8	232	e 2 21	− 3	—	—	—	—	e 5·0
Aberdeen	N.	14·2	176	i 3 25	+ 1	e 4 59	−65	—	—	6·7
Upsala		14·5	131	i 3 18a	−10	6 22?	+11	e 6 50	SSS	e 7·4
Edinburgh		15·5	178	e 3 48	+ 6	6 46	+11	15 58	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.
Durham		16·6	175	i 2 57	−59	i 7 11	+11	—	—	—
Copenhagen		17·2	148	e 4 0	− 3	7 5	− 9	—	—	8·4
De Bilt		19·7	164	i 4 33a	− 1	e 8 11	+ 1	—	—	e 9·4
Ivigtut		19·9	263	i 4 35	− 1	i 8 22	+ 7	—	—	10·4
Kew		20·0	174	i 4 37	0	e 8 23	+ 6	—	—	9·4
Potsdam		20·5	150	i 4 41	− 1	i 8 34	+ 7	i 5 30	PPP	e 10·4
Uccle		21·0	167	4 44a	− 3	8 37	0	—	—	10·4
Collmberg		21·5	149	e 4 54	+ 2	e 9 2	+15	—	—	—
Jena		21·7	153	e 4 53	− 2	e 9 1	+10	—	—	e 11·8
Warsaw		22·2	136	i 4 58a	− 2	i 9 13	+13	5 31	PP	e 11·4
Cheb		22·6	151	e 5 4	+ 1	e 9 21?	+14	e 5 36	PP	e 11·4
Paris		22·8	170	i 5 5k	0	e 9 6	− 5	i 5 34	PP	e 11·4
Prague		23·0	147	e 5 6a	− 1	e 9 21	+ 7	—	—	e 11·4
Strasbourg		23·5	158	e 5 9	− 3	e 9 44	+21	e 10 45	SSS	14·6
Stuttgart		23·5	159	i 5 12a	0	i 9 28	+ 5	—	—	e 11·9
Raciborzu		23·6	142	e 5 14	+ 1	e 9 44	+19	e 5 36	PP	—
Moscow		23·6	109	i 5 11	− 2	i 9 25	0	—	—	—
Basle		24·5	162	e 5 23	+ 1	e 9 52	+12	—	—	—
Zürich		24·8	161	e 5 24	− 1	e 9 46	0	—	—	—
Neuchatel		25·0	162	e 5 24	− 3	—	—	—	—	—
Clermont-Ferrand		25·9	170	i 5 34	− 1	i 10 10	+ 6	i 6 13	PP	12·4
Budapest		26·3	143	5 50	+11	e 10 24?	+13	—	—	14·9
Salo		26·7	156	e 5 42	− 1	e 10 39	+22	—	—	—
Pavia		27·0	158	e 5 46	+ 1	—	—	—	—	—
Triest		27·2	154	e 6 5	+18	e 10 56	+31	i 6 53	PP	—
Bologna		27·9	155	e 6 13a	+19	e 10 44	+ 7	e 6 48	PP	—
Padova		28·0	154	e 6 2	+ 7	—	—	—	—	—
Belgrade		29·1	142	i 6 2	− 2	—	—	—	—	19·4
Sverdlovsk		30·0	86	6 11	− 1	11 3	− 7	—	—	—
Barcelona		30·1	170	e 6 30	+17	—	—	—	—	e 15·4
Tortosa		30·6	172	e 6 20	+ 2	e 11 21	+ 1	7 18	PP	e 14·4
Rome		30·6	154	e 6 16a	− 2	e 11 21	+ 1	i 7 2	PP	e 14·2
Bucharest	N.	30·7	133	e 5 42	−37	—	—	—	—	—
Toledo	Z.	31·5	180	i 6 25	− 1	e 11 46	+12	i 7 34	PP	15·9
Yalta		32·7	124	e 6 35	− 1	11 53	+ 1	—	—	—
Lisbon		32·8	186	6 38k	+ 1	6 43	sP	—	—	15·8
Alicante		33·1	175	6 31	− 9	12 0	+ 1	6 42	pP	e 16·7
Granada		34·2	180	i 7 12a	+23	i 12 20	+ 4	i 8 10	PP	i 17·7
Istanbul		34·6	133	e 6 51	− 2	12 22	0	—	—	—
Grozny		37·0	111	e 7 17	+ 4	—	—	—	—	—
Leninakan		38·8	115	e 7 54	+26	—	—	—	—	—
Ville Marie		41·5	276	e 8 51	+61	—	—	—	—	—
Temiskaming		41·9	275	e 8 56	+62	—	—	—	—	—
College		41·9	338	e 7 53	− 1	e 14 14	+ 1	e 9 29	PP	e 17·4
Ottawa		42·0	273	7 55	+ 1	14 18	+ 4	9 33	PP	20·4
Vermont		42·0	269	—	—	e 15 22	+68	—	—	e 18·5
Ksara		43·1	129	e 8 4	0	14 38?	+ 8	—	—	—
Fordham		45·4	266	e 8 21	− 1	e 15 7	+ 3	—	—	23·9
Saskatoon		45·4	302	8 24	+ 2	15 7	+ 3	18 24	SS	22·4
Ashkabad		45·8	101	e 8 34	+ 9	—	—	—	—	—
Helwan		45·8	136	i 8 26a	+ 1	15 12	+ 3	10 14	PP	—
Tashkent		46·2	90	e 8 17?	−11	e 15 14?	− 1	18 18?	SS	—
Frunse		46·5	83	e 8 34?	+ 3	—	—	—	—	—
Philadelphia		46·7	266	e 8 12?	−20	e 14 39?	−43	e 9 56?	PP	e 18·9
Sitka		46·9	325	e 9 52	PP	e 15 30	+ 5	—	—	e 22·8
Almata		46·9	80	e 8 46?	+12	—	—	—	—	—
Irkutsk		46·9	53	e 8 31?	− 3	e 15 23?	− 2	e 10 21?	PP	—
Samarkand		47·0	92	e 8 34	− 1	—	—	—	—	—
Cleveland		47·3	274	i 8 38a	+ 1	i 15 33	+ 2	i 8 57	pP	—
New Kensington	E.	47·6	272	—	—	e 15 40	+ 5	—	—	e 22·6

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Andijan		47·7	88	e 8 41	+ 1	—	—	—	—	—
Stalinabad		48·6	91	i 8 50	+ 3	i 15 50	+ 1	—	—	—
Tamanrasset		48·9	168	e 8 53a	+ 3	—	—	e 10 49	PP	—
Chicago		49·0	281	e 8 49	− 1	e 15 57	+ 2	e 10 53	PP	e 19·6
Murgab		50·4	86	9 4	+ 3	16 20	+ 6	—	—	—
Hungry Horse		50·8	305	e 9 0	− 4	—	—	—	—	—
Rapid City	E.	51·7	295	e 9 12	+ 1	e 16 39	+ 7	e 11 28	PP	e 25·2
Bozeman		52·4	302	e 9 11	− 5	e 16 44	+ 2	e 20 24	SS	e 28·3
Butte	N.	52·6	303	e 9 12	− 6	e 16 35	− 9	e 20 8	SS	—
St. Louis		52·7	282	e 9 21	+ 3	i 16 58	+12	e 20 27	SS	i 26·7
Victoria		53·0	314	9 28	+ 7	17 4	+14	—	—	25·4
Salt Lake City		57·2	300	e 9 51	0	e 17 43	− 3	e 19 31	SeS	e 26·6
Pierce Ferry		62·2	300	i 10 23	− 3	—	—	e 12 39	PP	—
Tinemaha	Z.	62·4	305	e 10 27	0	—	—	—	—	—
Boulder City		62·5	300	e 10 26	− 2	—	—	—	—	—
Berkeley		62·7	308	e 10 28	− 1	e 18 48	− 9	i 19 6	PS	e 33·6
Lick	Z.	63·0	308	e 10 30	− 1	—	—	e 12 53	PP	—
Fresno	Z.	63·1	305	i 10 32k	0	—	—	e 13 34	PP	—
Santa Clara		63·1	308	—	—	e 36 4	?	—	—	e 37·6
Haiwee	Z.	63·2	305	e 10 32	0	—	—	—	—	—
Tucson		64·9	297	i 10 41	− 2	e 19 36	+12	e 12 56	PP	e 30·3
Mount Wilson	Z.	65·0	304	e 10 42	− 2	—	—	—	—	—
Riverside	Z.	65·1	304	e 10 41	− 4	—	—	—	—	—
Pasadena		65·2	304	e 10 43	− 2	—	—	—	—	e 31·3
Palomar		65·6	303	e 10 47	− 1	—	—	—	—	—
La Jolla	Z.	66·1	302	e 10 52	+ 1	—	—	—	—	—
Tacubaya	N.	73·4	281	i 11 41a	+ 5	e 21 12	+ 7	—	—	—
Bogota		79·3	253	e 12 11	+ 2	e 22 13	+ 4	—	—	39·4
La Paz	Z.	97·5	239	e 14 15	+38	—	—	—	—	—

Additional readings :—
Reykjavik eN = 2m.32s. and 3m.44s.
Upsala SSS?E = 6m.56s.
Edinburgh e = 7m.56s.
Durham iN = 3m.5s., iE = 4m.40s., iN = 6m.29s.
Copenhagen 4m.3s.
Kew eZ = 8m.30s. and 8m.41s.
Potsdam iPNZ = 4m.44s.k, iSN = 8m.38s., iSS?Z = 8m.53s.
Uccle iN = 8m.50s.
Jena ePEN = 4m.56s.
Warsaw PN = 5m.1s., eZ = 9m.3s., eE = 9m.6s., iSZ = 9m.17s., SSZ = 10m.12s., eSSEN = 10m.15s.
Cheb ePPP = 5m.53s.
Paris i = 5m.13s., ePPP = 5m.45s. and 5m.49s., e = 5m.55s. and 7m.57s., eS = 9m.12s. and 9m.17s.
Strasbourg iP = 5m.12s., i = 9m.49s.
Stuttgart i = 5m.26s.
Raciborzu eEN = 8m.52s.
Clermont-Ferrand iPPP = 6m.33s.
Bologna ePPP?Z = 7m.3s.
Belgrade e = 8m.41s.
Tortosa SSE = 12m.57s., L?N = 13m.35s.
Toledo iPPPZ = 8m.4s., eP_cPZ = 8m.48s.
Alicante PP = 7m.51s., P_cS = 12m.44s., Q = 13m.52s.
Granada SS = 14m.25s.
College eP_cP = 9m.42s.
Ottawa SS = 17m.12s.
Philadelphia ePPP = 10m.36s.?, e = 15m.6s.?
Cleveland ePPN = 10m.31s., eN = 11m.26s., eSN = 15m.36s., esSN = 16m.0s., eSSE = 18m.43s., eE = 18m.59s.
Tamanrasset iP = 8m.56s.
Chicago eS = 15m.33s.
Pierce Ferry ePKP,PKP = 39m.50s.
Berkeley iPZ = 10m.39s., eZ = 15m.16s., eE = 20m.2s., eSSN = 22m.54s.
Fresno iZ = 10m.49s.
Tucson ePPP = 14m.40s., eSS = 23m.38s.
Palomar iZ = 11m.1s.
Tacubaya eN = 17m.32s. and 24m.0s.

July 8d. 13h. 49m. 35s. Epicentre 12°·4N. 144°·1E. (as on 1948, June 19d.).

A = −·7914, B = +·5729, C = +·2134; δ = +7; h = +6;
D = +·586, E = +·810; G = −·173, H = +·125, K = −·977.

		Δ	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Andijan		67·5	309	e 11 1	+ 1	—	—
Stalinabad		70·9	307	i 11 19	− 2	i 20 30	− 6
Sverdlovsk		76·1	326	11 52	+ 1	21 29	− 6
Victoria	z.	82·5	42	e 12 33	+ 7	—	—
Berkeley	z.	85·3	53	i 12 36	− 4	—	—
Grand Coulee		85·5	42	e 12 37	− 4	—	—
Lick	z.	85·9	53	e 12 40	− 3	—	—
Fresno	z.	87·5	53	e 12 47	− 4	—	—
Hungry Horse		88·6	40	i 12 53	− 3	—	—
Tinemaha	z.	88·6	52	i 12 53	− 3	—	—
Haiwee	z.	89·1	53	i 12 56	− 2	—	—
Pasadena	z.	89·4	55	i 12 56	− 4	—	—
Mount Wilson	z.	89·5	55	i 12 57	− 3	—	—
Riverside	z.	90·1	55	i 12 59	− 4	—	—
Palomar	z.	90·7	55	i 13 2	− 4	—	—
Boulder City		91·6	53	e 13 37	+27	—	—
Pierce Ferry		92·2	52	i 13 40	+27	—	—
Tucson		95·8	55	e 13 27	− 2	—	—

Additional readings :—
Tinemaha iZ = 13m.2s.
Haiwee iZ = 13m.11s.
Pasadena iZ = 13m.6s. and 13m.12s.
Mount Wilson eZ = 13m.5s.
Riverside iZ = 13m.16s.
Palomar eZ = 13m.8s. and 13m.17s.

July 8d. 17h. 7m. 41s. Epicentre 6°·1S. 150°·5E. (as on 1947, June 17d.).

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		21·4	174	i 4 54	+ 3	i 7 56	−49	i 5 43 PPP	i 9·0
Murgab		83·3	309	12 31	+ 1	22 47	− 3	—	—
Frunse		83·9	314	e 12 47?	+14	—	—	—	—
Andijan		85·0	312	e 12 37	− 1	i 23 10	+ 3	—	—
Stalinabad		87·3	309	i 12 50	0	i 23 33	+ 4	—	—
Tashkent		87·4	312	e 12 41?	− 9	—	—	—	—
Shasta Dam		91·7	49	e 13 57	+47	—	—	—	—
Pasadena	z.	94·5	56	i 13 22	− 1	—	—	—	—
Mount Wilson	z.	94·6	56	e 13 15	− 9	—	—	—	—
Tinemaha	z.	94·6	54	i 13 22	− 2	—	—	—	—
Sverdlovsk		95·0	326	—	—	24 26	−12	—	—
Riverside	z.	95·1	56	i 13 25	− 1	—	—	—	—
La Jolla	z.	95·2	57	e 13 25	− 2	—	—	—	—
Palomar	z.	95·5	57	i 13 26	− 2	—	—	—	—
Boulder City		97·3	54	e 13 35	− 1	—	—	—	—
Pierce Ferry		98·0	54	e 13 20	−19	—	—	—	—
Ottawa	z.	124·0	37	e 18 47	[−13]	—	—	—	—
Stuttgart	z.	126·4	329	e 19 4	[− 1]	—	—	—	—
Tamanrasset		142·4	300	i 19 32$_a$	[− 3]	—	—	e 23 7 PP	—

Additional readings :—
Brisbane iSSE = 8m.9s.
Shasta Dam i = 14m.1s.
Pasadena iZ = 13m.43s. and 14m.3s.
Mount Wilson i = 13m.22s. and 13m.45s.
Tinemaha eZ = 13m.3s.
Riverside eZ = 13m.5s., iZ = 13m.47s. and 14m.7s.
Palomar iZ = 13m.47s.
Pierce Ferry eP = 13m.35s.
Tamanrasset i = 19m.56s.
Long waves were also recorded at Alicante.

July 8d. Readings also at 0h. (Tinemaha, Victoria, near Apia, near Istanbul (2), and near Hungry Horse), 1h. (Berkeley, Granada, and Stuttgart), 2h. (Branner, San Francisco, near Berkeley, Lick, and Santa Clara), 3h. (Andijan, Frunse, Samarkand, near Murgab, Obi-garm, Stalinabad, San Francisco, near Berkeley (2), Lick, and near Tacubaya), 5h. (near Oaxaca and Tacubaya), 6h. (Hungry Horse), 7h. (near Istanbul), 9h. (Helwan, Ksara, Istanbul, Scoresby Sund, San Francisco, near Berkeley, and Lick), 11h. (Mount Wilson, Pasadena, Riverside, Tinemaha, Pierce Ferry, and Bombay), 12h. (Clermont-Ferraud, Paris, Stuttgart, Scoresby Sund, Pierce Ferry, Berkeley, and near Lick), 13h. (Bogota and La Paz), 14h. (near Stuttgart), 17h. (near Tacubaya), 20h. (Mineral), 21h. (Ottawa, Victoria, Riverside, Tucson, Boulder City, Pierce Ferry, Shasta Dam, Mineral (4), Hungry Horse, near Merida, Tacubaya, near Andijan, and Murgab), 22h. (Stuttgart, Victoria, Hungry Horse, and near Ottawa), 23h. (near Andijan).

July 9d. Readings at 1h. (Boulder City, Pierce Ferry (2), Tucson, Mount Wilson, Tinemaha, and Victoria (2)), 3h. (Tucson, Mount Wilson, Riverside, and Tacubaya), 4h. (Christchurch), 5h. (near Lick), 6h. (near Mineral), 7h. (Istanbul), 8h. (Istanbul, Ksara, and Ottawa), 9h. (near Mineral), 11h. (Merida, Tacubaya (2), Pierce Ferry, Tucson, Ottawa, and Victoria), 15h. (Victoria and Scoresby Sund), 16h. (Hungry Horse, Pierce Ferry, Shasta Dam, Tucson, Mount Wilson, Riverside, Palomar, and Tinemaha), 17h. (near Zürich), 18h. (Ottawa, near Berkeley, Lick, and Santa Clara), 19h. (Stuttgart, Zürich, Collmberg, and Jena (intensity III-IV to the N. of Wiener Neustadt, macroseismic area 9900 sq. km., epicentre 47°·8N., 16°·2E.), and near Andijan), 21h. (Boulder City, Hungry Horse, Pierce Ferry, Shasta Dam, Pasadena, Mount Wilson, Riverside, Palomar, and Tinemaha), 23h. (near Mizusawa and near Andijan).

July 10d. 13h. Undetermined shock. Malacca ?

Vladivostok iP = 48m.37s., eS = 54m.34s.
Murgab P = 50m.58s., S = 58m.58s.
Andijan eP = 51m.16s., eS = 59m.34s.
Frunse eP = 51m.20s.
Stalinabad iP = 51m.27s., iS = 59m.57s.
Tashkent eP = 51m.51s.
Sverdlovsk P = 52m.37s., S = 62m.6s.
Istanbul e = 58m.
Tinemaha eZ = 59m.21s. and 59m.37s.
Pasadena ePZ = 59m.38s.
Mount Wilson ePZ = 59m.39s.
Pierce Ferry eP = 59m.44s.
Tucson eP? = 59m.51s., e = 60m.49s.
Ottawa eZ = 60m.12s.
Long waves were recorded at Potsdam.

July 10d. Readings also at 0h. (La Paz, Bogota, Tacubaya, Mount Wilson, Palomar, Riverside, Tucson, Huancayo, Pierce Ferry, Boulder City, Salt Lake City, Hungry Horse, and Berkeley), 1h. (La Paz, Tucson, Palomar, Riverside, Tinemaha, Pierce Ferry, Shasta Dam, and Hungry Horse), 2h. (Hungry Horse), 4h. (Stalinabad, Triest, and Wellington), 5h. (Scoresby Sund and Shasta Dam), 6h. (Huancayo, Shasta Dam (2), and near Mineral), 7h. (Nanking, Shasta Dam, and near Mineral), 8h. (near Murgab), 10h. (near Apia), 11h. (near Ashkabad), 16h. (Ottawa), 18h. (near Lick), 19h. (near Alicante), 20h. (Ottawa, near Berkeley (2), Lick (2), Pierce Ferry, and near Shasta Dam), 21h. (Ottawa), 22h. (Istanbul), 23h. (near Berkeley and Lick),

July 11d. 12h. 4m. 12s. Epicentre 35°·5N, 139°·0E.

Intensity VI at Shiraito (Shizuoka pref.); V at Misima; IV at Tokyo and Osima; II-III at Titibu, Ito, Shizuoka, Tukubasan, Kakioka, Utunomiya, and Onahama.
Macroseismic radius 200-300km. Epicentre as adopted. Very shallow.

The Seismological Bulletin of the Central Meteorological Observatory, Japan, for the year 1948, Toyko, 1950, p. 31, with macroseismic chart.

$A = -\cdot 6158$, $B = +\cdot 5353$, $C = +\cdot 5781$; $\delta = -4$; $h = 0$;
$D = +\cdot 656$, $E = +\cdot 755$; $G = -\cdot 436$, $H = +\cdot 379$, $K = -\cdot 816$.

		△	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Hunatu		0·2	270	0 6a	P*	—	—
Misima		0·4	186	0 8a	P_g	0 14	S_g
Tokyo		0·6	73	0 14k	− 1	0 24	− 2
Kumagaya		0·7	26	0 21	+ 4	0 32	+ 4
Shizuoka		0·7	218	0 14	P_g	0 24	S_g
Osima		0·8	157	0 15	− 3	0 26	S_g
Maebasi		0·9	3	0 20	0	0 33	− 1
Mera		0·9	131	0 20	0	0 30	S_g
Omaesaki		1·1	215	0 22	0	0 36	− 3
Tukubasan		1·1	51	0 19	− 3	0 35	− 4
Kakioka		1·2	53	0 22	− 2	0 40	− 1
Nagano		1·3	331	0 25	0	0 42	− 2
Utunomiya		1·3	34	0 23	− 2	0 40	− 4
Mito		1·5	54	0 27	− 1	0 47	− 2
Nagoya		1·7	259	0 33	+ 2	0 53	− 1
Gihu		1·8	267	0 34	+ 2	0 58	+ 2
Onahama		2·1	47	1 0	+23	1 24	+20
Kameyama		2·2	253	0 36	− 2	1 11	+ 5
Hikone		2·3	264	0 41	+ 1	1 11	+ 2
Hukusima		2·5	28	0 42	− 1	1 13	− 1
Wazima		2·5	318	0 44	+ 1	—	—
Aikawa		2·6	346	0 48	P*	1 12	− 5
Owase		2·7	238	0 49	P*	1 28	S_g
Osaka		3·0	254	1 2	P_g	1 41	S_g
Sendai		3·1	28	0 49	− 2	1 28	− 1
Kobe		3·2	257	1 18	P_g	—	—
Toyooka		3·4	273	1 4	P_g	1 34?	− 3
Sumoto		3·6	252	1 8	P_g	1 55	S_g
Mizusawa	E.	4·0	24	1 4	0	1 50	− 2
Akita		4·3	11	2 7	+59	—	—
Hungry Horse		74·2	42	i 11 36	− 4	—	—

Mizusawa also gives ePN = 1m.12s., eSN = 1m.53s.

July 11d. Readings also at 0h. (near Irkutsk), 5h. (near Berkeley and Lick), 6h. (Boulder City, Hungry Horse, Pierce Ferry, Tucson, Palomar, and near Tacubaya), 7h. (Lick, and near Mizusawa), 9h. (near Leninakan), 12h. (Pierce Ferry), 15h. (Pierce Ferry and Tucson), 16h. (La Paz, Huancayo, Tucson, Warsaw, Triest, Istanbul, Potsdam, Copenhagen, Rome, De Bilt, Stuttgart, and Ksara), 17h. (Pierce Ferry), 18h. (La Paz, Huancayo, and Tamanrasset), 19h. (Pierce Ferry, Shasta Dam, Mineral, near Berkeley, Santa Clara, Fresno, Lick, Pasadena, Mount Wilson, Riverside, Haiwee, and Tinemaha), 20h. (Boulder City, Pierce Ferry, San Francisco, Branner, near Berkeley (2), and Lick), 21h. (Hungry Horse), 23h. (near Andijan).

July 12d. 2h. 42m. 43s. Epicentre 17°·28. 174°·4W. Depth of focus 0·020.

A = −·9513, B = −·0933, C = −·2939 ; δ = +5 ; h = +5 ;
D = −·098, E = +·995 ; G = +·292, H = +·029, K = −·956.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Apia		4·2	37	i 1 4 a	0	i 1 48	− 5	—	—
Auckland	N.	21·8	205	—	—	e 8 33	+ 7	—	—
Wellington		25·7	200	5 19	+ 2	9 36	+ 4	—	—
Pasadena	Z.	73·9	47	i 11 20	+ 1	—	—	i 12 8	pP
Mount Wilson	Z.	74·1	47	i 11 20	0	—	—	i 12 8	pP
Palomar		74·4	48	i 11 22k	0	—	—	i 12 9	pP
Riverside	Z.	74·4	47	i 11 22k	0	—	—	i 12 6	pP
Shasta Dam		75·1	39	i 11 26	0	—	—	—	—
Haiwee	Z.	75·2	45	i 11 28	+ 2	—	—	—	—
Tinemaha	Z.	75·6	44	i 11 29k	0	—	—	i 12 18	pP
Boulder City		77·2	47	i 11 39	+ 1	—	—	i 12 28	pP
Vladivostok		77·6	323	i 11 37	− 3	i 21 17	0	—	—
Pierce Ferry		77·9	47	e 11 43	+ 1	—	—	e 12 31	pP
Tucson		78·2	52	i 11 44	+ 1	—	—	i 12 32	pP
Hungry Horse		84·5	36	i 12 16	0	—	—	—	—
Kulyab		120·6	304	e 19 33	PP	—	—	—	—
Sverdlovsk		123·1	328	e 20 17	PP	26 59	SKKS	—	—
Collmberg		145·5	353	e 19 23	[+ 4]	—	—	—	—
Ksara		148·2	307	e 19 30	[+ 6]	—	—	e 20 41	PP
Paris		148·4	5	e 19 30	[+ 6]	—	—	e 20 22	pPKP
Stuttgart	Z.	148·4	355	e 19 28	[+ 4]	—	—	e 20 19	pPKP
Strasbourg		148·6	357	e 19 31	[+ 7]	—	—	e 20 22	pPKP
Istanbul		148·8	325	e 19 17?	[− 8]	—	—	e 18 17	?
Helwan		153·3	302	i 19 53	[+22]	—	—	i 23 29	PKS
Tamanrasset		174·4	—	e 20 39	pPKP	—	—	—	—

Additional readings :—
Tinemaha iZ = 12m.36s.
Tucson i = 11m.50s., e = 13m.32s.
Strasbourg e = 21m.8s.

July 12d. Readings also at 0h. (Hungry Horse, Ksara, Istanbul, Tamanrasset, Strasbourg, Stuttgart, Potsdam, Rome, near Taranto, and Triest), 3h. (near Hungry Horse), 5h. (Mount Wilson, Palomar, Tinemaha, Tucson, Pierce Ferry, and near Leninakan), 6h. (Shasta Dam), 7h. (Shasta Dam (2), near Mineral, near Pierce Ferry, near Andijan and Murgab), 10h. (Stuttgart), 13h. (near Alicante (2)), 16h. (Auckland), 17h. (Mizusawa, Vladivostok, Mount Wilson, Palomar, Riverside, Tinemaha, Tucson, Boulder City (2), Pierce Ferry (2), Shasta Dam, Hungry Horse (2), Salt Lake City, Butte, Ottawa, Merida, near Oaxaca (2), Puebla (2), and Tacubaya (2)), 18h. (Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Boulder City, Pierce Ferry, and Hungry Horse), 19h. (Butte, Grand Coulee, Hungry Horse, Pierce Ferry, and Ksara), 20h. (Hungry Horse, and near Tacubaya), 21h. (near Tacubaya), 23h. (Palomar, Tucson, Boulder City, Pierce Ferry, Hungry Horse, Ottawa, Bogota, San Juan, Merida, Oaxaca, Puebla, and Tacubaya (2)).

July 13d. Readings at 1h. (Apia), 4h. (near Andijan (2)), 9h. (near Tacubaya), 10h. (La Paz, Frunse, near Andijan, Kulyab, Murgab, and Stalinabad), 11h. (Lick, Shasta Dam, and near Mineral), 12h. (La Paz, Paris, and Istanbul), 14h. (near Mineral and near Shawinigan Falls), 15h. (La Paz, Vladivostok, Shasta Dam, and near Shawinigan Falls), 16h. (Stuttgart), 17h. (Hungry Horse), 18h. (Istanbul, Ksara, Strasbourg, Stuttgart, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Boulder City, Pierce Ferry, Shasta Dam, and Hungry Horse), 20h. (Istanbul, Ksara, Salt Lake City, Butte, Palomar, Riverside, Tucson, Boulder City, Pierce Ferry, Shasta Dam, Hungry Horse, near Oaxaca, Puebla, and Tacubaya), 22h. (Ashkabad, Istanbul, Ksara, and Christchurch).

July 14d. 10h. 48m. 22s. Epicentre 45°·8S. 167°·6E.

Intensity VI near the Epicentre.

R. C. Hayes.
Earthquakes in New Zealand during the year 1948. New Zealand Journal of Science and Technology Sect. B., Vol. 31, No. 1, July, 1949. Epicentre as adopted.

$A = -·6833$, $B = +·1502$, $C = -·7146$; $\delta = +11$; $h = -4$;
$D = +·215$, $E = +·977$; $G = +·698$, $H = -·153$, $K = -·700$.

		Δ	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Monowai	E.	0·0	—	−0 22?	?	−0 17?	?
Christchurch		4·2	60	1 3	— 4	1 52	− 5
Kaimata		4·3	42	e 1 10	+ 2	1 55	− 5
Wellington		6·9	52	e 1 43	− 2	2 47	−18
New Plymouth	E.	8·3	38	2 0	− 4	3 29	−11
Tuai	N.	9·9	49	2 33	+ 8	—	—
Stuttgart	Z.	165·1	289	e 20 52	PKP_2	—	—

Long waves were recorded at Arapuni and Auckland.

July 14d. 22h. 29m. 4s. Epicentre 3°·6S. 146°·0E. (as on 1948, March 9d.).

$A = -·8275$, $B = +·5581$, $C = -·0623$; $\delta = +11$; $h = +7$;
$D = +·559$, $E = +·829$; $G = +·052$, $H = -·035$, $K = -·998$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Guam		17·0	355	3 57	− 4	—	—	—	—	—
Brisbane		24·7	165	i 5 20	− 4	(i 9 42)	− 2	i 5 55	PP	i 11·3
Riverview		30·5	172	e 6 18	+ 1	e 11 16	− 2	i 7 24	PP	e 14·0
Kagosima		37·9	338	e 12 36	S	(e 12 36)	−37	—	—	—
Siomisaki		38·1	346	e 6 9	?	12 58	−18	e 8 29	PP	—
Omaesaki		38·7	351	e 7 32	+ 5	—	—	—	—	—
Shizuoka		39·0	352	7 40	+10	—	—	—	—	—
Sumoto		39·2	346	7 26	− 5	13 52	+20	—	—	—
Kameyama		39·3	349	e 7 30	− 2	—	—	—	—	—
Osaka		39·3	347	7 32	0	—	—	—	—	—
Yokohama		39·3	352	7 43	+11	—	—	—	—	—
Kobe		39·4	347	9 1	PP	—	—	—	—	—
Nagoya		39·5	349	7 31	− 3	—	—	—	—	—
Tokyo		39·5	352	7 44	+10	—	—	—	—	—
Gihu		39·7	349	6 31	−65	—	—	—	—	—
Hikone		39·7	348	7 40	+ 4	—	—	—	—	—
Hukuoka		39·8	340	8 49	+73	15 11	+88	17 56	SS	—
Maebasi		40·3	351	7 40	0	—	—	—	—	—
Perth		40·4	221	i 10 41	?	13 53	+ 3	16 50	SS	20·8
Hamada		40·5	342	7 43	+ 1	14 3	+11	—	—	—
Nagano		40·7	351	e 7 54	+10	—	—	—	—	—
Toyama		40·9	349	7 52	+ 6	—	—	—	—	—
Wazima		41·6	349	6 11?	?	—	—	—	—	—
Sendai		41·9	355	e 8 3	+ 9	—	—	(17 14)	SS	17·2
Auckland	N.	42·4	145	12 56	PcS	14 15	− 5	17 16	SS	17·8
Apia		42·9	106	e 8 38	+36	e 14 21	− 6	e 17 41	Q	e 18·1
Miyako		43·2	356	e 7 56?	− 8	—	—	—	—	—
Arapuni	E.	43·7	146	—	—	e 14 56	+17	17 56	SS	28·9
Tuai	N.	45·1	145	8 9	−11	—	—	(18 56?)	SS	18·9
Wellington	Z.	45·5	150	8 20	− 3	—	—	—	—	22·9
Sapporo		46·6	356	8 37	+ 5	—	—	—	—	—
Vladivostok		48·2	346	i 8 42	− 2	—	—	i 19 49	SS	—
Honolulu		60·3	63	e 10 24	+11	e 18 22	− 4	e 20 10	ScS	e 24·8
Calcutta	E.	62·0	298	e 11 15	+51	e 19 27	+39	i 22 11	SS	26·4
Irkutsk		65·9	333	e 10 49	− 1	i 19 57	+20	—	—	—
Colombo	E.	66·8	279	11 6	+10	20 6	+18	—	—	—
Kodaikanal	E.	69·6	283	i 11 40	+27	—	—	20 40	PS	—
Hyderabad	N.	69·8	290	—	—	20 35	PS	—	—	—
Bombay	E.	75·3	290	e 11 36	−11	21 27	+ 1	13 48	PP	33·4
Almata		77·4	316	e 11 56	− 2	—	—	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Frunse		79·0	315	e 12 19?	+12	—	—	—	—	—
Andijan		80·0	312	e 12 16	+ 3	—	—	—	—	—
Kulyab		81·4	309	e 12 20	0	i 22 52	+21	—	—	—
Obi-garm		81·6	310	e 13 3	+42	—	—	—	—	—
Stalinabad		82·3	310	e 12 21	− 4	i 22 50	+10	—	—	—
Tashkent		82·4	312	e 12 6?	−19	e 22 34?	− 7	e 15 45?	PP	—
College		83·3	23	e 12 50	+20	e 22 53	+ 3	e 23 47	PS	e 33·3
Sitka		87·0	32	e 13 0	+12	e 23 20	− 7	e 24 10	PS	e 35·6
Sverdlovsk		90·4	327	e 13 10?	+ 6	24 3	+ 5	23 30	SKS	—
Ukiah		92·9	51	—	—	e 25 15	PS	31 59	SSP	e 39·3
Victoria		93·0	42	i 14 27?	?	e 25 44?	PS	—	—	31·9
Shasta Dam		93·5	49	e 13 15	− 4	—	—	—	—	—
Berkeley		93·6	52	e 13 22	+ 3	e 24 19	− 7	i 25 36	PS	e 42·2
Santa Clara	E.	93·8	52	e 18 21	?	e 26 44	PPS	—	—	e 42·6
Grand Coulee		96·0	42	e 13 27	− 3	—	—	—	—	—
Tinemaha	Z.	96·7	53	e 14 33	+60	—	—	—	—	—
Pasadena		96·8	55	e 13 32	− 2	i 26 17	PS	i 18 0	PP	i 38·9
Mount Wilson	Z.	96·9	55	e 13 34	0	—	—	—	—	—
Riverside	Z.	97·5	56	e 13 35	− 2	—	—	e 17 24	PP	—
Palomar	Z.	97·9	56	e 13 40	+ 1	—	—	e 17 54	PP	—
Hungry Horse		99·3	41	e 13 46	+ 1	—	—	—	—	—
Grozny		99·9	313	e 18 27	PP	—	—	—	—	—
Pierce Ferry		100·2	54	e 13 48	− 1	—	—	—	—	—
Butte	N.	100·5	43	e 14 31	+40	e 25 34	+ 9	e 18 3	PP	e 42·1
Leninakan		101·5	310	e 17 58	PP	—	—	—	—	—
Logan		101·5	48	e 18 6	PP	e 25 54	+21	e 32 44	SS	e 42·0
Bozeman		101·6	43	e 14 8	+12	e 24 41	[+ 6]	e 18 8	PP	e 42·4
Tucson		103·0	57	e 18 5	[−14]	e 24 46	[+ 5]	e 18 40	PP	e 47·3
Moscow		103·3	326	e 18 29	[+ 9]	24 53	[+10]	e 20 51	PPP	—
Saskatoon		103·5	36	e 16 22	?	e 26 14	+24	e 19 16	PP	47·9
Sotchi		104·3	314	—	—	e 24 34	[−13]	—	—	—
Rapid City	E.	107·4	44	e 19 14	PP	e 26 10	−13	e 28 8	PS	e 45·4
Yalta		108·0	315	e 14 42?	P	—	—	—	—	—
Ksara		108·7	304	19 4	PP	28 36?	PS	—	—	—
Upsala		111·5	335	—	—	e 27 56	?	e 29 37	PPS	e 43·9
Istanbul		112·5	313	e 14 50	P	29 7	PS	—	—	—
Scoresby Sund		112·8	356	19 21	PP	26 42	{+17}	30 33	PS	—
Lincoln	E.	112·9	46	—	—	e 28 40	PS	e 35 12	SS	e 48·0
Helwan		113·1	301	19 46	PP	e 29 38	PS	e 35 40	SS	—
Bucharest		113·6	317	e 19 26	PP	e 29 20	PS	—	—	48·9
Warsaw		113·6	326	e 19 32	PP	e 26 44	{+14}	e 23 14	PPP	e 51·9
Tacubaya	N.	114·6	70	i 23 13	?	i 29 2	PS	—	—	—
Copenhagen		116·2	333	19 50	PP	30 17	PS	36 20	SSP	52·9
Budapest	E.	116·9	322	e 20 20	PP	e 30 42	PPS	—	—	e 59·9
Belgrade		117·2	319	e 34 28	?	e 35 29	SS	e 43 4	?	e 62·9
Potsdam		117·8	329	e 20 10	PP	i 26 29	{−30}	e 22 56?	PPP	e 52·9
St. Louis		118·2	47	e 20 14	PP	e 27 10	{+ 9}	e 30 2	PS	e 49·2
Prague		118·3	327	e 18 56	[+ 7]	e 25 56	[+12]	e 36 2	SS	e 48·4
Chicago		118·9	43	e 20 7	PP	e 29 57	PS	e 22 55	PPP	e 48·5
Aberdeen	N.	120·9	341	i 22 1	PKS	i 30 43	PS	e 36 18	SS	—
Triest		121·0	323	e 20 52	PP	i 30 4	PS	e 35 44	SS	—
Ivigtut		121·5	8	e 20 34	PP	30 44	PS	36 56	SS	54·9
De Bilt		121·7	333	e 20 36	PP	e 30 32	PS	e 37 26	SS	e 55·9
Stuttgart		121·9	328	e 18 59	[+ 3]	e 37 29	SS	e 20 36	PP	56·9
Cincinnati		122·2	45	e 20 41	PP	—	—	e 22 38	PKS	e 58·9
Edinburgh		122·3	340	—	—	e 31 56	PPS	—	—	—
Durham		122·6	338	e 22 14	PKS	e 37 46	SS	—	—	—
Strasbourg		122·7	328	e 19 45	[+47]	e 26 13	[+14]	e 20 44	PP	e 50·9
Uccle		123·0	333	20 49	PP	e 30 29	PS	e 22 33	PKS	e 57·9
Zürich		123·0	327	e 19 21	[+22]	e 30 8	PS	e 21 11	PP	—
Bologna		123·1	322	e 23 56	PPP	e 35 14	?	—	—	—
Cleveland		123·2	41	e 20 45	PP	e 31 48	PS	e 37 34	SS	58·1
Basle		123·5	327	e 20 55	PP	—	—	—	—	—
Rome		123·7	320	e 19 14	[+14]	e 30 6?	PS	e 22 5	SKP	e 57·3
Kew		124·6	335	e 20 51	PP	e 26 18	[+13]	e 28 8	SKKS	e 56·9

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m. s.			m.
Ottawa		124·7	34	e 19 0	[− 2]	e 29 26	?	e 21 4	PP		56·9
Paris		125·3	331	e 19 10	[+ 7]	e 27 46	{− 3}	e 21 1	PP		60·9
Seven Falls	E.	126·2	29	e 20 52	PP	e 27 12	{−43}	e 30 2	PS		55·9
Vermont		126·7	34	e 19 11	[+ 5]	e 32 3	PPS	e 22 49	PKS		e 57·2
Clermont-Ferrand		127·0	328	e 19 25	[+19]	e 38 56?	SS	e 23 33	PPP		53·9
Philadelphia		128·1	39	e 21 22	PP	e 37 58	SS	e 22 57	PKS		e 53·0
Fordham		128·4	37	e 19 35	[+26]	—	—	e 21 15	PP		61·5
Halifax		131·6	28	e 22 44	PKS	e 30 56	?	—	—		57·9
Tortosa		131·7	324	20 42	?	25 50	[−34]	27 15	SKKS		69·0
Alicante		133·9	323	19 2	[−17]	26 7	[−22]	21 13	PP		e 59·9
Toledo		134·9	326	e 19 36	[+15]	e 22 30	PKS	—	—		61·4
Huancayo		136·1	111	e 20 6	[+43]	e 29 8	{+10}	e 23 21	PKS		e 56·4
Granada		136·5	324	i 20 2k	[+38]	27 20	[+47]	i 22 41	PP		i 66·2
Tamanrasset		137·3	300	e 19 33	[+ 7]	—	—	e 22 12	PP		—
Lisbon		138·4	331	—	—	25 52	[−45]	27 32	?		57·5
Bermuda		139·4	41	23 26	PKS	e 27 24	[+46]	e 29 36	SKKS		e 56·3
Bogota		140·0	87	e 20 0	[+29]	e 29 23	{+ 2}	e 22 51	PP		64·9
La Paz		140·8	122	i 19 38	[+ 6]	e 26 53	[+13]	i 23 5	PKS		65·9
San Juan		145·3	62	e 19 52	[+12]	e 27 38	[+51]	e 30 4	SKKS		e 58·9
Fort de France		151·0	66	e 19 48	[− 1]	—	—	—	—		—

Additional readings :—
Brisbane iN =5m.37s., 6m.37s., and 9m.8s., iSE =9m.13s., iN =9m.21s., 9m.25s., and 9m.40s. ; true S is given as iSS.
Riverview iNZ =6m.35s., iSN =11m.22s., iSSN =13m.2s., iE =13m.12s.
Perth SSS =17m.56s.
Arapuni eE =20m.26s. and 27m.8s.
Honolulu eSS =23m.18s.
Bombay SSE =26m.33s., SSSE =30m.11s.
College e =27m.21s. and 28m.7s., eSSS =32m.8s.
Sverdlovsk eSS =30m.26s.
Ukiah e =28m.15s.
Shasta Dam iP =13m.19s.
Berkeley eZ =13m.45s., eE =14m.56s., ePPPZ =20m.19s., iPSEN =26m.16s., iN =28m.18s. and 29m.22s., eN =38m.2s.
Pasadena iPPSE =26m.56s., eN =30m.41s., eSSEN =31m.37s.
Butte eN =26m.10s. and 29m.9s.
Bozeman eSKKS? =25m.34s., ePS =27m.22s., eSS =32m.52s., eSSS? =36m.26s.
Tucson e =19m.20s., ePPP =20m.46s., ePS =27m.33s., eSS =33m.22s.
Rapid City eSSE =34m.16s., eSSSE =38m.3s.
Upsala iPPS?E =29m.49s., eSSN =34m.56s.?, eE =35m.56s.?, eSSS?E =38m.56s.?
Scoresby Sund 20m.19s., 21m.46s., 27m.17s., 28m.36s., 34m.10s., and 35m.15s.
Helwan PP? =20m.47s.
Warsaw eSKSN =26m.48s., iSKSZ =26m.51s., ePSE =30m.30s., ePPSE =31m.20s., eSSN =36m.40s., and several other e readings without phase.
Tacubaya iN =24m.12s., eN =32m.16s.
Potsdam eE =29m.5s., eZ =30m.56s.?, eN =31m.14s., iN =36m.41s., eN =37m.56s. and 49m.32s.
St. Louis e =29m.34s., i =36m.22s., iSS =36m.32s., eSSS =40m.48s.
Prague eSKS? =25m.13s., ePS? =27m.59s., e =31m.16s. and 32m.56s., eSSS =41m.8s.
Chicago eSS =36m.35s.
Triest ePSPS =36m.59s., eSSS =40m.43s.
Ivigtut SSS =40m.8s.
De Bilt e =50m.26s.
Stuttgart ePPP =23m.8s., ePKKP =28m.38s., e =50m.38s., eQ =53·9m.
Durham eE =22m.19s., eEN =22m.41s. and 33m.37s.
Strasbourg e =21m.5s., ePPP =23m.5s., e =24m.24s. and 28m.41s., ePS =30m.18s., e =33m.8s. and 33m.18s., eSS =37m.27s., ePKP,PKP =37m.50s., eSSS =41m.40s., e =42m.11s.
Uccle eSKKSN =30m.33s., eSKKS?N =37m.44s., eSSEN =41m.33s., eSSS? =50m.56s.?
Cleveland eZ =21m.7s., eE =37m.42s. and 39m.10s., eN =50m.38s.
Rome iE =25m.37s., eSE =28m.39s.
Kew eSKSE =31m.16s., eSSE =41m.20s., ePPPE(△ >180°) =43m.42s., eSSSE =45m.2s.
Paris e =19m.28s. and 19m.43s., ePPP =23m.56s., e =27m.23s., ePPS =32m.4s., eSSS =41m.56s., eQ =51·9m.
Vermont ePPS =33m.30s., eSS =39m.11s.
Clermont-Ferrand eSSS =42m.56s.?
Philadelphia ePPP? =24m.1s.
Tortosa SKP?E =21m.56s., PPPEN =23m.13s., PSN =30m.22s., PPSEN =31m.46s., SKKSN =35m.54s., SSPN =37m.35s., SSSEN =41m.45s.
Alicante PKS =22m.31s., PPP =23m.59s., SSP =30m.14s., PPS =32m.52s., SS =38m.35s., SSS =43m.41s.

Continued on next page.

Toledo e =22m.3s., ePP =23m.0s.
Huancayo e =28m.6s., ePPS =34m.34s., eSS =40m.28s., eSSS =45m.25s.
Granada pPP =23m.44s., PPP =25m.48s., pPPP =26m.24s., SKKS =29m.8s., iS = 30m.35s., PS =33m.50s., PPS =34m.22s., iSS =40m.53s., SSS =45m.56s.
Tamanrasset ePKP =19m.53s.
Lisbon PSE =31m.43s.
Bermuda ePPS =35m.16s., eSS =41m.1s., ePSPS =42m.26s.
Bogota iSKPE =23m.31s.
La Paz iZ =19m.57s., PKSN =23m.19s., iSKKSE =29m.39s., iSSE =41m.1s., SSPNZ = 42m.27s., SSSEN =46m.55s.
San Juan eSS =43m.5s., eSSS? =47m.41s.
Long waves were also recorded at Manzanillo, Harvard, Barcelona, and Cheb.

July 14d. Readings also at 0h. (Taranto), 2h. (Apia and Ksara), 5h. (near Ashkabad), 6h. (near Mineral), 8h. (Strasbourg, Stuttgart, and near Zürich), 9h. (near Mineral), 10h. (Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Boulder City, Pierce Ferry, and Hungry Horse), 11h. (Messina, Andijan, near Kulyab, Murgab, Stalinabad, near Lick, and near Mineral), 12h. (Christchurch, Palomar, Tucson, Pierce Ferry, Messina, and near Murgab), 14h. (near Lick), 15h. (Pierce Ferry), 17h. (Erevan, Leninakan, and near Grozny), 18h. (near Piatigorsk and near Andijan), 19h. (near Andijan), 20h. (Bozeman, Tucson, near Tacubaya (2), and near Triest), 21h. (Almata, Frunse, near Andijan, Kulyab, Stalinabad, Tashkent, Strasbourg, near Stuttgart, and Zürich), 23h. (Apia).

July 15d. 11h. 2m. 2s. Epicentre 10°·0N. 104°·0W.

A = −·2383, B = −·9557, C = +·1725; δ = −9; h = +7;
D = −·970, E = +·242; G = −·042, H = −·167, K = −·985.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Manzanillo	N.	9·0	358	e 2 19	+ 6	e 3 53	− 5	—	—	—
Tacubaya		10·5	26	i 2 35	0	i 4 29	− 6	i 4 12	?	5·3
Merida		17·6	50	i 4 13	+ 5	i 7 47	SS	e 10 11	Q	i 12·8
Tucson		23·0	345	e 5 7	0	e 9 24	+10	i 5 38	PP	e 10·2
La Jolla	Z.	25·8	334	e 5 33	− 1	—	—	—	—	—
Palomar		26·1	336	i 5 35a	− 2	i 10 25	+18	i 9 8	PcP	—
Riverside	Z.	26·9	334	e 5 42	− 3	—	—	i 9 7	PcP	—
Mount Wilson	Z.	27·3	334	i 5 48	0	—	—	i 5 53	P	—
Pasadena		27·3	334	i 5 47	− 1	i 10 31	+ 4	e 8 13	PP	e 12·4
Pierce Ferry		27·5	343	e 5 48	− 2	—	—	—	—	—
Boulder City		27·7	341	e 5 49	− 3	—	—	—	—	—
Haiwee	Z.	29·0	337	e 6 3	− 1	—	—	i 6 8	P	—
Tinemaha	Z.	29·9	337	e 6 10	− 2	—	—	i 6 16	P	—
Bogota	Z.	30·2	97	e 6 16	+ 2	e 12 0	+47	i 6 23	pP	—
Fresno	N.	30·2	335	e 6 13	− 1	—	—	—	—	—
St. Louis		31·1	20	i 6 21	− 1	i 11 19	− 9	i 6 42	pP	—
Lincoln	E.	31·4	10	e 6 35	+10	e 11 21	−11	e 9 20	PcP	e 12·9
Lick		31·5	333	e 6 25	− 1	e 11 13	−21	e 15 46	Q	e 16·6
Santa Clara		31·7	333	—	—	e 11 43	+ 6	—	—	e 15·4
Berkeley		32·3	333	i 6 33k	0	i 11 48	+ 2	i 13 38	SS	e 15·3
Logan		32·4	349	e 7 16	+42	e 11 48	0	e 7 53	PP	e 15·0
Ukiah		33·7	333	—	—	e 13 21	PcS	—	—	e 16·3
Cincinnati		33·9	28	i 6 48	+ 1	i 11 49	−22	i 7 46	PP	—
Mineral	Z.	34·0	336	e 6 46k	− 2	—	—	i 6 52	pP	—
Rapid City	E.	34·0	2	e 6 51	+ 3	e 12 18	+ 5	e 13 52	SS	e 14·5
Shasta Dam		34·6	335	e 6 50	− 3	—	—	—	—	—
Chicago		34·9	20	e 6 54	− 1	e 12 26	− 1	e 8 6	PP	e 14·5
Huancayo		35·9	126	e 7 9	+ 5	e 12 27	−15	e 8 38	PPP	e 15·9
Bozeman		36·1	352	e 7 7	+ 2	e 12 46	+ 1	—	—	e 15·5
Butte	N.	36·6	350	e 7 7	− 3	e 12 53	0	e 8 37	PP	e 15·7
Cleveland		37·1	28	e 7 10	− 4	i 13 1	0	i 7 19	pP	18·7
New Kensington	E.	37·3	31	e 7 7	− 9	e 13 16	+12	e 8 22	PP	—
San Juan		37·6	72	e 7 19	+ 1	e 13 8	0	—	—	e 15·4
Pennsylvania		38·4	32	i 7 25	0	i 13 23	+ 3	e 8 53	PP	—
Hungry Horse		39·1	350	e 7 30	− 1	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Philadelphia		39·3	36	e 7 34	+ 2	e 13 34	0	i 9 1	PP	e 21·7
Grand Coulee		39·9	344	e 7 38	+ 1	—	—	—	—	—
Fordham		40·6	36	e 7 45	+ 2	i 14 2	+ 8	i 9 22	PP	—
Victoria		41·7	341	9 7?	+75	15 29?	+79	18 58?	?	24·0
Fort de France		42·1	79	e 7 49	− 6	—	—	—	—	—
Saskatoon		42·1	357	7 56	+ 1	14 16	0	9 19	PP	20·0
Bermuda		42·5	52	e 7 58	− 1	e 14 14	− 8	e 9 39	PP	e 17·4
Ville Marie		42·6	24	e 7 59	0	—	—	—	—	24·2
Ottawa		42·8	29	8 1	0	14 32	+ 6	17 46	SS	21·0
Harvard		43·0	35	i 8 3	0	e 14 37	+ 8	i 9 50	pP	e 24·0
Vermont		43·4	32	e 8 13	+ 7	e 15 45	+70	—	—	e 21·5
La Paz		44·2	125	i 8 15	+ 3	i 14 47	+ 1	i 14 57	PS	22·7
Seven Falls	E.	46·5	31	8 35	+ 4	15 23	+ 4	10 25	PP	24·0
Honolulu		52·8	289	—	—	e 17 2	+15	—	—	e 22·4
Sitka		52·8	339	e 9 30	+11	e 16 54	+ 7	—	—	e 22·0
College		62·6	340	—	—	e 18 54	− 2	e 23 6	SS	e 26·3
Ivigtut		65·2	26	e 10 45	0	e 19 24	− 4	23 49	SS	33·0
Scoresby Sund		78·0	20	12 4	+ 2	21 56	+ 1	14 59	PP	37·0
Kew	E.	90·6	37	—	—	e 24 30	+30	e 30 14	SS	e 42·0
Toledo		91·2	49	e 16 23	PP	24 32	+27	—	—	45·8
Granada		92·2	51	16 7a	PP	i 24 16	+ 2	30 28	SS	37·9
Paris		93·2	39	e 13 17	0	e 23 57	[+ 6]	e 24 37	S	e 44·0
Uccle		93·6	36	e 20 9	?	e 23 57	[+ 4]	—	—	e 44·0
De Bilt		93·7	35	e 17 4	PP	e 23 58	[+ 4]	—	—	e 44·0
Alicante		94·3	49	13 19	− 4	e 24 33	+ 1	23 54	SKS	e 45·6
Tortosa	E.	94·3	47	17 21	PP	24 35	+ 3	24 5	SKS	e 44·0
Clermont-Ferrand		94·6	42	e 13 25	+ 1	e 24 9	[+10]	e 17 8	PP	44·0
Copenhagen		96·1	30	—	—	24 10	[+ 3]	26 14	PS	43·0
Strasbourg		96·5	38	e 17 32	PP	e 24 15	[+ 6]	e 26 14	PS	47·0
Stuttgart		97·3	37	e 13 35	− 1	e 24 19	[+ 6]	e 17 23	PP	49·0
Potsdam		98·0	33	e 17 37	PP	e 26 33	PS	e 26 4?	?	e 41·0
Triest		101·5	38	e 18 5	PP	e 24 42	[+ 8]	i 27 7	PS	—
Warsaw		102·2	30	e 18 12	PP	e 24 41	[+ 3]	e 27 17	PS	e 51·0
Rome		102·3	43	e 14 1	+ 2	24 44	[+ 6]	—	—	—
Tamanrasset		103·7	63	e 18 25	PP	—	—	—	—	—
Vladivostok		106·7	320	e 27 52	PS	—	—	—	—	—
Moscow		107·1	21	e 28 6	PS	—	—	—	—	—
Sverdlovsk		112·2	8	19 23	PP	25 28	[+ 7]	e 28 58	PS	—
Istanbul		113·3	36	i 19 29	PP	e 29 4?	PS	—	—	—
Yalta		113·9	31	e 29 15	PS	—	—	—	—	—
Ksara		122·1	39	e 19 46	[+49]	e 30 10	PS	—	—	—
Tashkent		128·6	6	e 20 52	PP	—	—	—	—	—

Additional readings :—
Tucson i = 5m.28s. and 6m.19s., e = 8m.49s.
Palomar iZ = 5m.40s. and 5m.54s., eZ = 7m.24s.
Riverside iZ = 5m.47s.
Pasadena iZ = 5m.52s., iEN = 6m.18s., $iP_cP?Z$ = 8m.56s., eQN = 11m.52s.
St. Louis iPP = 7m.19s., iSS = 13m.11s.
Berkeley eN = 8m.48s., eZ = 9m.52s., iZ = 10m.38s., eN = 11m.40s., iN = 12m.20s., iSSSZ = 13m.56s.
Rapid City eE = 8m.43s.
Huancayo i = 12m.58s.
Cleveland iPZ = 7m.13s., ePPEN = 8m.26s., ePPPEN = 8m.45s., eSEN = 13m.6s., esSE = 13m.12s.
San Juan iS = 13m.13s., e = 14m.28s.
Pennsylvania iZ = 8m.24s.
Philadelphia i = 14m.6s.
Saskatoon PPP = 10m.2s., SS = 16m.46s., SSS = 17m.37s.
Harvard esS = 18m.10s.
La Paz iP_cP = 9m.55s., iPPZ = 10m.13s., iPPSE = 15m.15s., SS = 18m.19s.
Seven Falls SS = 18m.58s.
Scoresby Sund 27m.2s.
Granada PPS = 25m.34s.
Paris ePP = 17m.21s., e = 31m.45s. and 32m.17s.
De Bilt ePS = 24m.38s., eSS = 30m.58s.
Alicante PP = 17m.9s., PPP = 19m.11s., PS = 25m.45s., PPS = 26m.19s., SS = 30m.45s., SSP = 31m.11s.

Continued on next page.

Clermont-Ferrand ePPP = 19m.17s., ePS = 25m.36s., eSS = 31m.9s.
Copenhagen SS = 31m.21s.
Strasbourg ePPP = 19m.26s., ePS = 26m.19s., eSS = 31m.34s.
Stuttgart ePS = 26m.23s., eSS = 31m.35s., eQ = 45m.58s.?
Triest eSS = 35m.31s.
Warsaw eN = 27m.22s., eZ = 27m.25s., eE = 32m.46s., eN = 32m.50s., eZ = 36m.37s.
Sverdlovsk eS = 27m.3s., eSS = 34m.58s.
Long waves were also recorded at Guadalajara, Upsala, and Apia.

July 15d. 19h. Undetermined shock. South Pacific.

Apia eS?N = 21m.18s.
Wellington P = 22m.27s., S = 25m.16s.
Tuai eN = 24m.25s., S?N = 24m.28s.
Lick ePZ = 30m.31s.
La Jolla iPZ = 30m.32s.
Pasadena iPZ = 30m.32s.a
Mount Wilson iPZ = 30m.33s.a
Palomar iP = 30m.35s.a
Riverside iPZ = 30m.35s.a
Shasta Dam eP = 30m.38s.
Haiwee ePZ = 30m.39s.
Mineral ePZ = 30m.39s.
Tinemaha iPZ = 30m.40s.a
Boulder City iP = 30m.48s.
Tucson iP = 30m.53s.a, i = 31m.11s.

July 15d. Readings also at 0h. (Upsala), 1h. (Mount Wilson, Palomar, Tinemaha, Riverside, Boulder City, Tucson, Belgrade, Warsaw, Istanbul, Paris, Strasbourg, Stuttgart, Potsdam, Rome, near Triest, Taranto, and near La Paz), 3h. (Murgab), 4h. (Stuttgart, near Berkeley, Branner, and Lick), 5h. (Hungry Horse and Lick), 6h. (La Paz, Bogota, Huancayo, Balboa Heights, Hungry Horse, Tucson, Boulder City, Pierce Ferry, Mount Wilson, Riverside, and Tinemaha), 7h. (Murgab, near Andijan, Kulyab, Frunse, Tashkent, and Almata), 9h. (Messina), 10h. (Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Boulder City, Pierce Ferry, Tucson, and near Messina (3)), 11h. (Mineral, Boulder City, Pierce Ferry, Tucson, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tacubaya, and Manzanillo), 14h. (Apia), 15h. (Rome and near Andijan), 17h. (Scoresby Sund), 19h. (near Murgab), 21h. (near Murgab and near Rome), 22h. (Belgrade and near Mineral), 23h. (Hungry Horse).

July 16d. 7h. 12m. 20s. Epicentre 14°·7N. 91°·2W.
(as on 1946, June 26d. and foreshock of 7h. 19m.).

Felt at Guatemala and San Salvador. U.S.C.G.S. suggest a depth of 100km.
Seismo. Notes. Bull. Seismo. Soc. Amer. Vol. 38, No. 4, Oct., 1948, pp. 294-295.

$A = -\cdot0203$, $B = -\cdot9674$, $C = +\cdot2522$; $\delta = -12$; $h = +6$;
$D = -1\cdot000$, $E = +\cdot021$; $G = -\cdot005$, $H = -\cdot252$, $K = -\cdot968$.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Oaxaca	5·8	294	i 1 25	− 4	i 2 34	− 4	—	—	—
Merida	6·4	13	e 1 43	+ 5	i 3 2	+ 9	—	—	—
Puebla	8·0	304	i 2 7	+ 7	e 3 29	− 4	—	—	—
Tacubaya	9·0	303	e 2 19	+ 6	i 4 9	+11	—	—	i 4·6
Balboa Heights	12·8	115	e 2 58	− 8	—	—	—	—	e 10·2
Manzanillo	13·3	291	e 3 7	− 6	i 6 9	SS	—	—	i 6·4
Austin	16·7	340	4 1	+ 4	—	—	4 15	pP	—
Bogota	19·7	120	i 4 31	− 3	i 8 14	+ 4	i 4 49	PP	—
St. Louis	23·9	2	i 5 18	+ 2	i 9 33	+ 3	i 5 33	pP	—
San Juan	24·3	78	e 5 42	+22	e 10 3	+26	i 5 55	pP	e 10·8
Tucson	25·0	318	i 5 28	+ 1	e 9 54	+ 5	i 5 48	pP	e 10·5
Cincinnati	25·1	13	e 5 32	+ 4	—	—	i 5 47	pP	—
Georgetown	27·1	26	i 6 5	pP	e 10 28	+ 4	—	—	—
Chicago	27·2	6	e 5 59	+12	e 10 23	− 2	e 11 39	SS	e 13·1
Cleveland	28·0	16	e 5 54	− 1	e 10 37	− 1	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Pennsylvania		28·5	22	i 6 16	+17	i 10 44	− 2	e 9 5	PcP	i 13·2
Philadelphia		28·8	28	e 6 1	− 1	e 10 51	0	i 6 19	pP	—
Pierce Ferry		29·5	321	i 6 10	+ 2	e 11 55	+53	i 6 24	pP	—
La Jolla	z.	29·8	313	e 6 11	0	—	—	i 6 26	pP	—
Palomar		29·8	314	i 6 10k	− 1	i 12 50	S_cP	i 6 26	pP	—
Bermuda		29·9	49	e 6 6	− 6	e 11 2	− 7	—	—	e 12·6
Boulder City		29·9	320	i 6 13	+ 1	—	—	i 6 28	pP	—
Fordham		30·1	27	e 6 14	+ 1	i 11 14	+ 2	i 12 58	SS	—
Riverside	z.	30·5	314	e 6 19	+ 2	e 12 51	S_cP	i 6 32	pP	—
Huancayo		30·9	149	e 6 18	− 2	e 11 20	− 4	—	—	e 12·9
Rapid City	E.	31·0	344	e 7 13	+52	—	—	—	—	—
Mount Wilson	z.	31·1	314	i 6 22k	0	e 12 52	S_cP	i 6 36	pP	—
Pasadena		31·1	314	e 6 21k	− 1	e 11 28	0	i 6 36	pP	e 12·0
Haiwee	z.	32·1	317	e 6 33	+ 2	—	—	i 6 47	pP	—
Logan		32·3	332	e 6 31	− 2	e 11 41	− 5	—	—	—
Santa Barbara	z.	32·4	313	e 6 33	− 1	—	—	—	—	—
Harvard		32·5	28	i 6 34	0	—	—	—	—	e 16·7
Tinemaha	z.	32·8	318	e 6 37	0	i 13 1	S_cP	i 6 52	pP	—
Ottawa		33·3	20	6 42	+ 1	12 2	0	7 58	PP	—
Vermont		33·4	24	e 8 2	PP	e 13 4	+61	—	—	e 15·0
Fresno	N.	33·6	317	i 6 54	+10	—	—	—	—	—
Ville Marie		34·0	14	e 6 50	+ 2	—	—	e 8 27	PPP	—
Lick	z.	35·2	316	e 6 58	0	—	—	—	—	—
Shawinigan Falls	N.	35·3	23	e 7 0	+ 1	—	—	—	—	—
Berkeley	z.	35·9	316	e 7 4	0	i 12 43	+ 1	i 8 32	PPP	e 20·9
Butte	N.	36·0	336	e 8 44	PPP	e 14 19	?	—	—	e 15·8
Seven Falls	E.	36·5	24	7 9	0	12 51	0	8 40	PPP	—
Mineral	z.	36·8	321	e 7 11	0	—	—	—	—	—
Ukiah		37·2	317	—	—	e 14 49	?	—	—	e 17·2
Shasta Dam		37·5	320	e 7 14	− 3	—	—	i 7 30	pP	—
Halifax		37·9	33	8 58	PP	e 13 16	+ 3	16 16	SSS	—
Hungry Horse		38·5	337	i 7 27	+ 1	i 13 21	− 1	i 9 35	PcP	—
La Paz		38·5	142	e 8 29	+63	i 14 12	+50	i 9 3	PP	20·2
Saskatoon		39·3	345	7 52	+20	13 57	+23	9 48	PPP	—
Grand Coulee		40·3	332	i 7 43	+ 3	—	—	—	—	—
Victoria		42·9	329	9 17?	+75	15 42?	+75	—	—	—
College		62·9	337	—	—	e 17 45	−75	—	—	e 26·2
Scoresby Sund		69·3	19	15 40	PPP	—	—	—	—	—
Aberdeen		77·3	34	e 13 10	?	e 21 38	−10	—	—	e 40·2
Alicante		81·6	53	12 27	+ 6	—	—	14 59	PP	—
Uccle		82·2	40	e 11 43	−41	—	—	—	—	e 42·7
De Bilt		82·4	38	e 12 30	+ 5	e 22 40	− 1	—	—	—
Strasbourg		84·9	41	e 12 35	− 3	—	—	e 16 18	PP	—
Copenhagen		85·5	33	—	—	23 9	[+ 5]	—	—	—
Stuttgart	z.	85·8	41	e 12 41	− 1	—	—	—	—	—
Upsala		86·1	29	—	—	e 23 2	[− 6]	—	—	e 39·7
Potsdam	z.	87·0	37	e 12 47	− 1	—	—	e 16 26	PP	—
Triest		89·7	43	—	—	e 23 45	− 7	e 30 34	SS	—
Warsaw	z.	91·5	34	e 16 48	PP	e 23 48	[+ 6]	—	—	—
Istanbul		101·8	41	e 18 42	PP	—	—	—	—	—
Bombay	E.	143·1	25	—	—	e 41 40?	SS	—	—	—

Additional readings :—
Oaxaca eN = 2m.12s., iE = 2m.27s.
Merida iE = 1m.47s., iN = 2m.51s.
Puebla iN = 2m.16s.
Tacubaya iN = 3m.46s., iSE = 4m.12s.
Austin 4m.33s.
Bogota iPPPEZ = 4m.54s.
St. Louis isS = 10m.2s.
San Juan esP = 6m.7s.
Tucson i = 5m.39s., isP = 6m.0s., iP_cP = 9m.1s.
Cincinnati isS = 10m.32s., iSS = 11m.13s.
Georgetown e = 6m.22s., and 10m.58s.
Chicago e = 10m.51s.
Cleveland iPZ = 5m.57s., ePN = 6m.10s.
Pierce Ferry isP = 6m.33s., iP_cP? = 9m.10s.

Continued on next page.

Palomar $ePcPZ$ =8m.44s., $ipPcPZ$ −8m.58s.
Boulder City $iPcP$ =9m.12s., $eScP$ =13m.1s.
Riverside $ePcPZ$ =9m.15s., eZ =9m.30s.
Mount Wilson $iPcPZ$ =9m.16s., $epPcPZ$ =9m.32s.
Pasadena $iPcPZ$ =9m.17s., $ipPcPZ$ =9m.31s., $eScPZ$ =12m.49s., $iScSEN$ =16m.52s.
Haiwee $ePcPZ$ =9m.21s.
Logan e =6m.41s.
Tinemaha $iPcPZ$ =9m.20s., $ipPcPZ$ =9m.36s.
Ottawa i =6m.58s.
Ville Marie e =7m.3s.
Lick eN =7m.11s.
Berkeley iZ =9m.46s., $iPcSN$ =13m.16s., eQEN =17m.58s.
Mineral iZ =7m.17s., 9m.32s., and 9m.49s.
Ukiah e =15m.37s.
Shasta Dam $ePcP$ =9m.32s.
La Paz iPPN =10m.26s., iSSN =17m.9s., $iScSE$ =19m.7s.
Alicante PPP =16m.35s.
Long waves were also recorded at Lincoln, Lisbon, Kodaikanal, and Wellington.

July 16d. 7h. 19m. 34s. Epicentre 14°·7N. 91°·2W. (as above at 7h. 12m.).

Felt at Guatemala and San Salvador. U.S.C.G.S. suggest a depth of 100km.
Seismo. Notes., Bull. Seismo. Soc. Amer., Vol. 38, No. 4, Oct., 1948, pp. 294-295.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Oaxaca	E.	5·8	294	i 1 24	− 5	i 2 34	− 4	—	—	—
Merida		6·4	13	i 1 41	+ 3	3 2	+ 9	—	—	—
Puebla	E.	8·0	304	i 1 58	− 2	i 3 30	− 3	—	—	—
Tacubaya		9·0	303	e 2 19	+ 6	i 4 1	+ 3	—	—	i 4·6
Manzanillo		13·3	291	i 3 12	− 1	e 5 39	− 3	i 6 15	SS	i 6·8
Austin		16·7	340	i 4 2	+ 5	i 7 2	− 1	—	—	—
Bogota		19·7	120	i 4 30	− 4	i 8 15	+ 5	i 4 49	PP	—
St. Louis		23·9	2	—	—	i 9 33	+ 3	i 10 54	SSS	—
San Juan		24·3	78	e 5 58	+38	e 9 26	−11	—	—	i 10·5
Tucson		25·0	318	e 5 23	− 4	i 10 52	+63	i 5 44	pP	—
Chicago		27·2	6	e 5 49	+ 2	i 11 1	+36	—	—	e 12·9
Cleveland		28·0	16	i 5 59	+ 4	i 10 38	0	—	—	—
Philadelphia		28·8	28	e 6 4	+ 2	i 10 56	+ 5	—	—	e 15·2
Fort de France		29·1	86	e 6 3	− 1	—	—	e 12 48	SS	—
Pierce Ferry		29·5	321	i 6 7	− 1	—	—	i 6 25	pP	—
La Jolla	Z.	29·8	313	e 6 8	− 3	i 12 55	PcS	i 6 29	pP	—
Palomar		29·8	314	i 6 8k	− 3	i 12 51	PcS	i 6 26	pP	—
Boulder City		29·9	320	i 6 10	− 2	—	—	i 6 25	pP	—
Riverside	Z.	30·5	314	e 6 16	− 1	i 12 54	PcS	i 9 14	PcP	—
Huancayo		30·9	149	i 6 16	− 4	e 11 19	− 5	—	—	e 13·4
Rapid City	E.	31·0	344	e 7 0	+39	e 11 20	− 6	—	—	e 12·7
Mount Wilson	Z.	31·1	314	e 6 21	− 1	—	—	e 12 57	PcS	—
Pasadena		31·1	314	i 6 19	− 3	e 11 25	− 3	i 6 34	pP	e 14·5
Haiwee	Z.	32·1	317	e 6 30	− 1	—	—	i 6 45	pP	—
Logan		32·3	332	i 6 28	− 5	e 11 20	−26	e 7 19	PP	e 14·2
Santa Barbara	Z.	32·4	313	e 6 35	+ 1	—	—	—	—	—
Harvard		32·5	28	i 6 35	+ 1	i 11 49	0	—	—	e 16·4
Tinemaha		32·8	318	i 6 36	− 1	i 13 0	PcS	i 6 53	pP	—
Ottawa		33·3	20	6 46	+ 5	12 2	0	16 14	Q	19·4
Fresno	N.	33·6	317	i 6 47	+ 3	—	—	—	—	—
Ville Marie		34·0	14	e 6 47	− 1	—	—	e 7 6	pP	20·1
Bozeman		35·1	337	e 6 58	+ 1	e 12 30	0	e 8 21	PP	e 17·9
Lick		35·2	316	e 6 56	− 2	e 12 32	+ 1	—	—	—
Shawinigan Falls	N.	35·3	23	7 0	+ 1	12 32	− 1	—	—	—
Santa Clara		35·4	317	i 7 3?	+ 3	i 12 37	+ 3	—	—	e 17·3
Branner	E.	35·6	316	e 7 2	+ 1	e 12 43	+ 5	—	—	—
Berkeley	Z.	35·9	316	i 7 5a	+ 1	i 13 13	+31	i 8 31	PP	—
Seven Falls	E.	36·5	24	7 9	0	12 52	+ 1	8 44	PPP	20·4
Mineral	Z.	36·8	321	e 7 9	− 2	—	—	—	—	—
Halifax		37·9	33	—	—	e 13 8	− 5	e 16 2	SS	19·4

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Hungry Horse		38·5	337	i 7 25	− 1	—	—	i 8 35	PP	—
La Paz		38·5	142	i 8 21	+55	i 14 7	+45	i 9 53	PP	20·7
Saskatoon		39·3	345	7 36	+ 4	13 34	0	9 19	PP	18·4
Grand Coulee		40·3	332	i 7 41	+ 1	—	—	—	—	—
Victoria		42·9	329	9 15?	+73	15 41?	+74	19 14?	SS	24·4
Sitka		54·1	333	e 9 28	− 1	e 17 2	− 3	e 11 54	PP	e 22·6
Ivigtut		55·7	24	e 9 52	+12	i 17 19	− 7	—	—	23·4
College		62·9	337	—	—	e 19 0	0	e 20 16	ScS	e 25·5
Scoresby Sund		69·3	19	11 11	0	20 14	− 3	15 32	PPP	—
Edinburgh		76·9	36	—	—	e 21 26	−17	—	—	—
Aberdeen		77·3	34	e 12 20	+22	i 21 36	−12	e 26 45	SS	—
Durham		77·9	37	e 12 17	+16	i 21 46	− 8	—	—	—
Toledo		78·6	52	e 12 1	− 4	i 21 53	− 9	i 12 4	PcP	37·6
Kew	E.	79·2	40	—	—	e 22 7	− 1	e 26 58	SS	e 30·4
Granada		79·4	54	i 12 25s	+16	i 22 9	− 1	12 49	PcP	i 37·7
Paris		81·5	42	e 12 16	− 5	e 22 22	−10	e 12 35	pP	e 38·4
Alicante		81·6	53	e 12 29	+ 8	i 22 29	− 4	15 19	PP	e 38·2
Tortosa	E.	81·8	50	12 27	+ 5	22 25	−10	15 50	PP	e 38·4
De Bilt		82·4	38	e 12 23	− 2	e 22 33	− 8	e 27 56	SS	—
Clermont-Ferrand		82·6	45	e 12 25	− 1	i 22 36	− 7	i 15 34	PP	38·9
Strasbourg		84·9	41	e 12 34	− 4	e 23 4	− 2	e 12 52	pP	—
Basle		85·1	42	e 12 36	− 3	—	—	—	—	—
Copenhagen		85·5	33	e 12 39	− 2	23 11	− 1	23 3	SKS	—
Stuttgart		85·8	41	e 12 39	− 3	e 23 1	[− 5]	e 23 48	PS	e 37·4
Upsala		86·1	29	—	—	e 23 20	+ 2	e 22 58	SKS	e 35·4
Potsdam		87·0	37	e 13 4	pP	i 23 20	[+ 6]	e 16 2	PP	e 35·4
Cheb		87·3	38	—	—	e 28 35	SS	—	—	—
Prague		88·6	37	e 20 42	?	e 23 26	[+ 2]	e 28 56	SS	e 36·4
Triest		89·7	43	e 13 28	+27	i 23 45	− 7	—	—	—
Rome		90·2	46	e 16 47	PP	e 23 22	[−12]	—	—	—
Tamanrasset		90·4	66	e 13 3	− 1	—	—	—	—	—
Warsaw		91·5	34	e 12 46	−24	e 23 28	[−14]	e 30 9	SS	e 42·4
Moscow		97·2	26	—	—	24 11	[− 2]	e 24 45	S	—
Istanbul		101·8	41	e 18 30	PP	—	—	—	—	—
Yalta		103·0	36	—	—	24 30	[−11]	—	—	—
Helwan		109·1	52	e 21 36	PPP	—	—	—	—	—
Ksara		110·2	45	e 19 31?	PP	29 7?	PS	—	—	—
Vladivostok		110·2	326	i 19 7	PP	i 28 44	PS	34 33	SS	—
Tashkent		121·4	17	e 18 23?	[−32]	e 25 7	[−48]	e 21 50	PPP	—
Andijan		122·8	14	e 18 58	[0]	—	—	—	—	—
Stalinabad		123·8	18	e 18 58	[− 2]	—	—	—	—	—

Additional readings :—
Oaxaca iSN = 2m.37s.
Tacubaya SE = 4m.9s., iSE = 4m.12s.
Manzanillo eSN = 5m.43s., iN = 6m.25s.
Bogota i = 4m.44s., iPPP = 4m.59s., iSS = 8m.56s.
St. Louis ipP = 8m.34s.
Tucson iP = 5m.28s., isP = 5m.56s., iPP = 6m.18s., iP$_c$P = 8m.50s., iS$_c$P = 12m.36s.
Cleveland iPZ = 6m.17s.
Pierce Ferry isP = 6m.44s., iPP = 7m.34s.
La Jolla iZ = 6m.13s., iP$_c$PZ = 9m.11s.
Palomar i = 6m.11s., iE = 10m.53s. and 12m.29s., eZ = 13m.25s., eN = 16m.20s., iEN = 16m.46s.
Boulder City isP = 6m.51s., eP$_c$P = 9m.5s.
Riverside iZ = 6m.19s.
Mount Wilson iZ = 6m.24s., esS$_c$PZ = 13m.30s.
Pasadena i = 6m.23s., iP$_c$PEZ = 9m.13s., ipP$_c$PZ = 9m.30s., iN = 11m.31s., iS$_c$PZ = 12m.55s., esS$_c$PZ = 13m.25s., iS$_c$SEN = 16m.51s.
Haiwee iP$_c$PZ = 9m.17s.
Tinemaha iP$_c$PZ = 9m.17s., iS$_c$SEZ = 16m.59s.
Lick iNZ = 6m.59s., eSE = 12m.36s., eZ = 13m.11s.
Berkeley iZ = 7m.20s. and 9m.30s.
Seven Falls iE = 13m.20s., SSE = 16m.20s.
Mineral iPZ = 7m.13s., iZ = 7m.16s.
La Paz iSSE = 17m.7s., iS$_c$SE = 18m.35s.
Saskatoon SSS = 16m.46s.
Sitka eS$_c$S = 19m.8s., eSS = 20m.46s.
Scoresby Sund 24m.46s., and 28m.9s.

Continued on next page.

Toledo i =12m.25s., Q =32m.59s.
Kew eE =23m.18s.
Granada iPP =15m.22s., PS =22m.55s., iSS =26m.46s., SSS =30m.28s.
Paris SS =28m.24s., e =34m.40s.
Alicante PPP =16m.57s., PS =23m.15s., PPS =23m.41s., SS =27m.33s., SSS =31m.3s., Q =33m.41s.
Tortosa PPPE =17m.35s., PS?E =23m.9s., PPSE =23m.47s., SSE =27m.39s., eQE = 33·4m.
Clermont-Ferrand iPS =23m.29s., eSS =27m.37s., eSSS =31m.40s., Q =34m.46s.
Strasbourg iP =12m.38s., e =12m.50s., ePP =16m.14s., e =26m.54s., eSS =28m.51s.
Copenhagen SS =28m.44s.
Potsdam iPPE =16m.8s., isSEN =23m.51s., eSPZ =24m.14s.
Prague eSSS? =33m.14s.
Warsaw eZ =13m.27s., eE =16m.16s., eZ =17m.8s., eE =17m.12s., eN =23m.24s. and 27m.48s., eE =27m.51s., eN =30m.4s.
Moscow PS =26m.18s.
Long waves were also recorded at Lincoln.

July 16d. Readings also at 2h. (Hungry Horse), 3h. (Hungry Horse, Tacubaya, Copenhagen, Potsdam, Almata, Andijan, Frunse, Kulyab, Stalinabad, and Tashkent), 4h. (La Jolla, Riverside, near Mount Wilson, Pasadena, Palomar, Tucson, Boulder City, Pierce Ferry, and near Mineral), 5h. (Andijan, near Tashkent, and near Tacubaya), 6h. (Mount Wilson, Pasadena, Palomar, Tinemaha, Tucson, and Pierce Ferry), 7h. (Boulder City, Pierce Ferry, and near Lick), 11h. (Haiwee, La Jolla, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Boulder City, Pierce Ferry, Shasta Dam, Mineral, Hungry Horse, Sitka, College, Ottawa, Erevan, near Grozny, and Leninakan), 12h. (Mount Wilson, Palomar, Riverside, Tinemaha, Tucson, Boulder City, Pierce Ferry, Shasta Dam, Hungry Horse, Mizusawa, Andijan, Frunse, Tashkent, near Kulyab, Murgab, Stalinabad, near Apia, and near Tacubaya), 13h. (Mount Wilson, Palomar, Tinemaha, Tucson, Pierce Ferry, Shasta Dam, Hungry Horse, Harvard, Merida, Tacubaya, and near Mizusawa), 17h. (Istanbul), 18h. (Apia and near Hungry Horse), 19h, (De Bilt, Strasbourg, Stuttgart, Paris, Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Boulder City, Pierce Ferry (2), Shasta Dam, Hungry Horse, and near Harvard), 20h. (near Mineral).

July 17d. 9h. 30m. 43s. Epicentre 14°·7N. 91·°2W. (as on 16d.).

J.S.A. suggest a depth of 70km.

$A = -\cdot0203$, $B = -\cdot9674$, $C = +\cdot2522$; $\delta = -12$; $h = +6$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Merida		6·4	13	1 37	− 1	2 56	+ 3	3 0	SS	—
Puebla		8·0	304	—	—	e 3 49	SS	—	—	e 4·3
Tacubaya	N.	9·0	303	2 18	+ 5	4 3	+ 5	—	—	—
Bogota		19·7	120	i 4 13	− 3	e 8 21	+11	e 16 4	ScS	—
St. Louis		23·9	2	i 5 18	+ 2	e 9 40	+10	i 5 33	pP	—
San Juan		24·3	78	e 5 37	PP	e 10 41	SSS	—	—	e 11·4
Tucson		25·0	318	i 5 29	+ 2	i 12 37	ScP	i 5 43	pP	e 13·3
Chicago		27·2	6	—	—	e 10 44	+19	—	—	e 11·9
Cleveland		28·0	16	e 5 53	− 2	e 10 36	− 2	—	—	—
Pierce Ferry		29·5	321	i 6 0	− 8	e 11 7	+ 5	i 6 23	pP	—
La Jolla	Z.	29·8	313	e 6 17	pP	—	—	—	—	—
Palomar		29·8	314	i 6 11k	0	—	—	i 6 25	pP	—
Boulder City		29·9	320	i 6 13	+ 1	—	—	i 6 29	pP	—
Fordham		30·1	27	e 6 50	PP	e 11 14	+ 2	—	—	—
Mount Wilson	Z.	31·1	314	e 6 23	+ 1	—	—	i 6 38	pP	—
Pasadena	Z.	31·1	314	i 6 23	+ 1	—	—	i 6 39	pP	—
Haiwee	Z.	32·1	317	i 6 47	pP	—	—	—	—	—
Harvard		32·5	28	i 6 34	0	—	—	i 6 51	pP	e 17·3
Tinemaha	Z.	32·8	318	e 6 39	+ 2	e 13 1	ScP	i 6 54	pP	—
Ottawa	Z.	33·3	20	e 6 41	0	—	—	—	—	—
Fresno	N.	33·6	317	i 7 0	pP	—	—	—	—	—
Lick	Z.	35·2	316	e 6 59	+ 1	—	—	i 7 14	pP	—
Mineral	Z.	36·8	321	e 7 13	+ 2	—	—	i 7 20	?	—
Hungry Horse		38·5	337	i 7 29	+ 3	—	—	i 9 37	PcP	—
Victoria	Z.	42·9	329	e 8 23	+21	—	—	—	—	—
Stuttgart	Z.	85·8	41	e 12 38	− 4	—	—	—	—	—

For Notes see next page.

NOTES TO JULY 17d. 9h. 30m. 43s.

Additional readings :—
Tucson iPP = 6m.9s., e = 7m.28s., 8m.29s., and 10m.53s.
Cleveland eZ = 6m.10s., eSN = 10m.13s.
Palomar eZ = 6m.38s.
Pasadena eZ = 8m.23s., and 9m.16s.
Tinemaha eP_cPZ = 9m.21s.
Long waves were recorded at Paris.

July 17d. 19h. 34m. 19s. Epicentre 45°·8N. 10°·3E.
(as on 1947, Dec. 25d., and foreshock of 19d.).

A = +·6883, B = +·1251, C = +·7146, δ = +6 ; h = −4 ;
D = +·179, E = −·984 ; G = +·703, H = +·128, K = −·700.

	△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.		Supp. m. s.
Salo	0·2	143	e 0 4	P_g	0 10	S*	—	—
Zürich	1·8	323	e 0 36	P_g	e 1 9	S_g	—	—
Triest	2·3	94	e 0 25	−15	e 0 52	−17	—	—
Basle	2·5	313	e 0 50	P_g	e 1 29	S_g	—	—
Stuttgart	3·1	346	e 0 47	− 4	e 1 41	S_g	e 0 55	P*
Strasbourg	3·3	330	e 0 55	+ 2	e 1 30	− 5	e 1 4	P_g

Strasbourg also gives eS_g = 1m.49s.

July 17d. Readings also at 3h. (Lick), 4h. (Bogota), 6h. (Victoria, Hungry Horse (2), and near Grand Coulee). 7h, (Strasbourg, near Mineral, and Shasta Dam), 8h. (near Mineral), 9h. (near Lick and Fresno), 10h. (near Rome), 11h. (near Tacubaya), 12h. (Tacubaya), 13h. (near Andijan, near Lick, and Branner), 14h. (Brisbane, Boulder City, Grand Coulee, Hungry Horse, Pierce Ferry, Tucson, Pasadena, Mount Wilson, Palomar, Haiwee, La Jolla, and Tinemaha), 15h. (near Mineral, San Francisco, Berkeley (2), Lick (2), Branner, Fresno, and Santa Clara), 19h. (Hungry Horse), 20h. (Tacubaya), 22h. (near Ashkabad, near Victoria, and near Grand Coulee).

July 18d. 3h. Undetermined Shock.
Tacubaya PEN = 15m.15s., SE = 16m.56s.
Merida iSE = 16m.27s.
Tucson iP = 18m.23s., ipP = 18m.38s., iP_cP = 20m.56s., i = 21m.9s.
Pierce Ferry iP? = 19m.3s., ipP? = 19m.19s.
Palomar iPZ = 19m.6s., iP_cPZ = 19m.21s., iZ = 21m.37s.
Boulder City iP = 19m.8s.
Riverside ePZ = 19m.12s., iP_cPZ = 19m.26s., iZ = 22m.8s.
Mount Wilson eZ = 19m.17s., iZ = 19m.32s., eZ = 21m.48s.
Tinemaha ePZ = 19m.33s., ipPZ = 19m.49s., iP_cPZ = 22m.16s., eZ = 22m.32s.
Ottawa eZ = 19m.37s.
Hungry Horse iP? = 20m.23s., i = 22m.32s.
Shasta Dam iP = 22m.27s.

July 18d. 5h. 22m. 18s. Epicentre 38°·4N. 72°·2E. Depth of focus 0·015.

A = +·2402, B = +·7481, C = +·6186 ; δ = +2 ; h = −1 ;
D = +·925, E = −·306 ; G = +·189, H = +·589, K = −·786.

	△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.		Supp. m. s.
Murgab	1·4	90	i 0 18?	−10	—	—	—	—
Kulyab	2·0	266	e 0 32	− 2	—	—	—	—
Andijan	2·3	3	e 0 38	0	1 10	+ 3	—	—
Stalinabad	2·7	273	e 0 40	− 4	—	—	—	—
Tashkent	3·6	324	e 0 55	− 1	e 1 40	+ 2	—	—
Samarkand	4·3	289	e 1 2	− 3	1 54	− 1	—	—
Frunse	4·8	21	e 1 10?	− 2	e 2 10	+ 3	—	—
Almata	6·0	35	e 1 28	0	e 2 37?	+ 1	—	—
Ashkabad	10·9	272	—	—	4 23	−10	—	—
Sverdlovsk	20·0	341	4 25	+ 1	e 8 4	+ 7	4 59	pP

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Grozny		20·6	293	4 33	+ 2	—	—	—	—
Erevan		21·5	284	4 53?	+13	—	—	—	—
Leninakan		21·9	286	e 4 48?	+ 4	—	—	—	—
Piatigorsk		22·6	295	—	—	e 8 58?	+14	—	—
Sotchi		25·0	293	e 5 18	+ 5	—	—	—	—
Moscow		28·8	319	e 5 49	+ 1	—	—	e 6 23	pP
Jena	N.	43·7	307	e 7 56	+ 2	—	—	—	—
Stuttgart	Z.	45·6	304	e 8 10k	+ 1	—	—	—	—
Strasbourg		46·6	305	i 8 18	+ 1	—	—	e 8 47	pP
Paris		49·9	306	i 8 43	+ 1	—	—	—	—
Hungry Horse		93·5	4	i 13 5	+ 3	—	—	—	—

Sverdlovsk gives also sS = 8m.54s.

July 18d. 6h. 43m. 23s. Epicentre 1°·2N. 121°·8E. (as on 1946, Jan. 7d.).

A = −·5268, B = +·8497, C = +·0208; $\delta = -6$; $h = +7$;
D = +·850, E = +·527; G = −·011, H = +·018, K = −·1000.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Hukuoka		33·2	14	6 46	+ 6	12 5	+ 5	7 56	PP	14·4
Hamada		34·9	15	e 7 6	+11	—	—	—	—	—
Sumoto		35·2	19	e 6 52	− 6	—	—	—	—	—
Osaka		35·6	19	6 58	− 3	—	—	—	—	—
Kameyama		36·2	22	e 6 43	−23	—	—	—	—	—
Hikone		36·5	20	e 7 12	+ 3	—	—	—	—	—
Nagoya		36·6	22	7 10	0	—	—	—	—	—
Omaesaki		36·6	24	e 7 26	+16	—	—	—	—	—
Gihu		36·8	22	7 12	+ 1	—	—	—	—	16·6
Shizuoka		37·0	24	7 14	+ 1	13 2	+ 3	—	—	15·7
Misima		37·3	24	e 7 19	+ 3	—	—	—	—	—
Yokohama		37·9	25	e 7 12	− 8	—	—	—	—	—
Toyama		38·1	20	7 14	− 8	—	—	—	—	—
Tokyo		38·2	24	e 7 32	+ 9	12 5	−72	—	—	14·5
Maebasi		38·5	23	7 27	+ 1	—	—	—	—	—
Calcutta	E.	38·8	306	e 7 43	+15	i 13 33	+ 7	i 15 41	SS	18·3
Kakioka		38·8	24	e 7 22	− 6	—	—	—	—	—
Sendai		40·8	24	7 47	+ 2	13 56	+ 1	—	—	19·6
Brisbane	N.	41·4	136	i 7 51	+ 1	i 14 10	+ 5	i 9 29	PP	i 18·3
Akita		41·8	22	7 47	− 6	—	—	—	—	—
Colombo	E.	42·2	279	8 3	+ 7	14 25	+ 8	—	—	23·3
Vladivostok		42·7	11	i 8 0	0	i 14 23	− 1	—	—	—
Aomori		43·0	21	e 8 22	+19	—	—	—	—	—
Riverview		44·5	145	i 8 22a	+ 7	i 14 53	+ 2	i 10 8	PP	e 22·2
Kodaikanal	E.	45·0	286	e 8 15	− 4	i 15 10	+12	18 15	SS	22·9
Hyderabad	N.	45·6	294	e 8 36	+12	15 5	− 1	18 39	SS	24·2
Dehra Dun	N.	50·6	311	—	—	e 17 22	+65	e 21 58?	SSS	—
Bombay		51·1	294	e 9 7	+ 1	e 16 22	− 2	i 11 9	PP	25·7
Irkutsk		53·0	347	9 21	0	16 53	+ 3	—	—	—
Murgab		57·3	317	9 52	0	17 54	+ 7	—	—	—
Almata		57·9	323	i 9 57	+ 1	—	—	—	—	—
Frunse		59·1	321	e 10 5	+ 1	e 18 15	+ 4	—	—	—
Andijan		59·5	318	e 10 7	0	—	—	—	—	—
Kulyab		60·0	314	e 10 10	− 1	18 25	+ 2	—	—	—
Stalinabad		61·0	315	i 10 17	− 1	i 18 35	0	—	—	—
Tashkent		61·8	318	e 10 23?	0	e 18 48?	+ 2	—	—	—
Samarkand		62·7	314	10 31	+ 2	e 18 59	+ 2	—	—	—
Ashkabad		68·5	311	i 11 8	+ 2	e 20 8	0	—	—	—
Sverdlovsk		73·6	330	i 11 36	− 1	i 21 6	− 1	—	—	—
Baku		75·5	312	e 11 48	0	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Erevan		79·5	310	e 12 20	+10	—	—	—	—	—
Leninkan		80·1	311	e 12 17	+ 4	—	—	—	—	—
Honolulu		80·6	69	—	—	e 22 25	+ 2	—	—	e 41·8
Piatigorsk		81·1	315	e 12 20	+ 2	e 22 32	+ 4	—	—	—
Sotchi		83·4	314	—	—	e 22 50	− 1	—	—	—
Moscow		85·7	326	i 12 41	− 1	i 23 12	− 2	—	—	—
Ksara		85·9	303	e 12 44	+ 1	e 23 14	− 2	—	—	—
Theodosia		86·6	315	e 12 44	− 2	—	—	—	—	—
Yalta		87·5	314	12 59	+ 8	—	—	—	—	—
College		89·1	26	—	—	e 23 29	[+ 2]	e 29 31	SS	e 37·4
Helwan		89·8	299	e 13 1	− 1	23 55	+ 2	16 40	PP	—
Istanbul		91·3	311	e 13 5	− 4	—	—	—	—	—
Warsaw		95·7	323	e 13 25	− 4	e 24 2	[− 3]	e 17 28	PP	e 49·6
Sitka		95·9	33	e 13 25	− 5	e 24 17	[+11]	e 26 21	PS	e 40·7
Upsala		96·1	331	e 17 9	PP	24 4	[− 3]	e 31 29	SS	e 41·6
Belgrade		97·2	315	—	—	e 24 11	[− 2]	—	—	—
Prague		100·2	322	e 12 55	−54	e 25 10	−12	—	—	e 46·6
Potsdam		100·4	324	e 13 49	− 1	e 24 31	[+ 2]	e 26 52	PS	e 49·6
Jena		101·7	322	e 13 55	− 1	—	—	e 17 53	PP	—
Triest		101·7	317	e 18 7	PP	i 24 26	[− 9]	e 27 5	PS	e 57·6
Rome		103·5	314	e 18 19	PP	e 24 41	[− 3]	e 27 19	PS	—
Bologna		103·6	316	e 18 10?	PP	—	—	e 18 50?	?	—
Stuttgart		103·8	321	e 14 4	− 1	e 24 40	[− 5]	e 18 25	PP	e 52·5
Scoresby Sund		104·6	349	18 49	PP	24 46	[− 3]	27 52	PS	—
Strasbourg		104·8	321	e 14 5	− 5	e 24 47	[− 3]	i 18 36	PP	e 48·6
De Bilt		105·1	326	e 18 4k	PP	e 25 5	[+14]	e 33 37?	SS	e 50·6
Uccle		106·0	325	e 18 41	PP	e 24 52	[− 3]	e 26 9	S	e 51·6
Aberdeen		106·6	332	e 18 46	PP	i 24 55	[− 3]	e 28 42	PPS	e 51·6
Durham		107·6	330	e 18 18	PP	e 25 10	[+ 8]	—	—	—
Edinburgh		107·8	331	—	—	e 24 37	[−26]	—	—	—
Paris		107·9	322	e 18 3	PKP	e 25 4	[+ 1]	i 18 54	PP	e 56·6
Shasta Dam		108·5	47	e 14 25	P	—	—	e 18 17	PKP	—
Clermont-Ferrand		108·7	320	e 18 9	[−21]	i 28 21	PS	i 19 1	PP	44·6
Mineral	z.	109·2	47	e 18 30	[− 1]	—	—	—	—	—
Hungry Horse		111·0	36	e 14 39	P	—	—	—	—	—
Tortosa		112·4	315	19 19	PP	25 21	[− 1]	28 41	PS	e 55·6
Tinemaha	z.	112·7	49	e 18 40	[+ 2]	—	—	i 19 41	PP	—
Butte	N.	113·0	37	e 20 10	PP	e 26 40	{+14}	e 29 8	PS	e 53·7
Saskatoon		113·1	30	e 19 42	PP	e 29 8	PS	—	—	35·6
Haiwee	z.	113·3	49	e 18 43	[+ 3]	—	—	—	—	—
Pasadena	z.	113·8	52	i 18 41a	[0]	—	—	e 19 40	PP	—
Mount Wilson		113·9	52	i 18 41	[0]	—	—	e 29 33	PKKP	—
Alicante		114·0	314	19 39	PP	—	—	—	—	e 51·7
Riverside	z.	114·5	52	e 18 42	[0]	—	—	e 19 51	PP	—
La Jolla	z.	114·9	53	e 18 44	[+ 1]	—	—	i 18 56	PKP	—
Palomar	z.	115·1	52	e 18 43	[0]	—	—	i 19 46	PP	—
Boulder City		115·7	49	e 18 46	[+ 2]	—	—	—	—	—
Toledo		115·9	316	e 18 51	[+ 6]	i 25 44	[+ 9]	—	—	58·5
Pierce Ferry		116·3	48	e 18 48	[+ 2]	—	—	e 29 14	PKKP	—
Granada		116·7	314	19 49a	PP	35 50	SS	—	—	64·2
Ivigtut		117·3	355	i 20 11	PP	i 25 49	[+ 9]	30 1	PS	55·6
Rapid City	E.	119·7	35	—	—	e 30 11	PS	e 37 4	SS	e 51·8
Lisbon		120·0	317	20 35	PP	30 17	PS	41 19	SSS	—
Tucson		120·2	51	i 18 54	[+ 1]	e 30 5	PS	e 20 20	PP	e 63·1
Chicago		129·6	28	e 22 34	PKS	e 37 52	?	e 33 16	PPS	e 53·7
Seven Falls	E.	130·6	11	e 22 37	PKS	39 13	SSP	—	—	52·6
Ottawa		131·1	16	e 19 12	[− 2]	—	—	—	—	39·6
Cleveland		132·5	24	e 19 16	[+ 1]	e 31 56	PS	e 39 31	SS	—
Harvard		134·9	13	i 19 23	[+ 2]	—	—	e 21 55	PP	e 69·6
Tacubaya		134·9	61	i 17 46	?	—	—	e 19 31	PKP	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bermuda		146·0	10	e 20 22	[+41]	e 30 49	SKKKS	e 42 55	SSP	e 61·8
San Juan		159·0	21	e 20 41	[+41]	e 34 3	SKSP	e 24 55	PKS	—
Huancayo		159·9	123	e 20 11	[+10]	27 41	[+36]	e 24 29	PP	e 76·1
La Paz		161·9	148	i 20 8 a	[+ 5]	i 31 20	(− 3)	i 24 40	PP	79·0
Bogota	z.	163·1	70	i 20 4	[0]	—	—	1 20 56	PKP_2	—
Fort-de-France		163·8	11	e 20 4	[− 1]	—	—	—	—	—

Additional readings :—
Shizuoka ScS = 26m.37s.
Calcutta iPPPE = 9m.18s., iSSSE = 16m.7s.
Brisbane iPEN = 7m.54s., iN = 9m.57s., iSSN = 17m.7s.
Riverview iPcP?Z = 10m.2s., iN = 14m.56s., iPSE = 15m.3s., iN = 15m.17s., eSSE = 18m.2s., iS_cSN = 18m.17s., iSSSN = 18m.55s.
Bombay eSSN = 20m.7s., iSSE = 20m.19s.
Helwan ePPS = 25m.40s.
Warsaw ePPPE = 19m.5s., ePPPN = 19m.20s., PPPZ = 19m.35s., eN = 19m.59s., eE = 21m.13s., eN = 21m.26s., SKSE = 23m.53s.,? eSN = 24m.16s., eSE = 24m.23s., eN = 24m.58s., ePSE = 26m.12s., PSZ = 26m.17s., PPSEZ = 26m.54s., eZ = 29m.52s., eSSZ = 31m.2s., eSSE = 31m.11s., eSSSE = 34m.16s., eSSSN = 34m.22s., eSSSZ = 34m.27s.
Sitka ePP = 17m.13s., ePPS = 26m.57s., eSS = 31m.21s.
Upsala eN = 24m.37s.?, ePPSE = 26m.48s., eSSN = 31m.37s.?
Prague eSKS? = 21m.53s., eSS? = 31m.37s.
Potsdam iPPPEZ = 18m.4s., ePSE = 26m.56s.
Triest ePPS = 28m.15s., eSS = 32m.26s., eSSS = 37m.31s.
Stuttgart eZ = 17m.23s., ePS = 27m.27s., eSS = 33m.13s.
Scoresby Sund 24m.13s., 35m.55s., and 37m.47s.
Strasbourg e = 18m.10s. and 22m.51s,, eSKKS = 25m.31s., ePS = 27m.48s. and 27m.53s.
De Bilt eZ = 18m.34s., ePPS = 28m.37s.?, eSSS = 37m.37s.?
Uccle eE = 22m.43s. and 28m.40s.
Aberdeen eN = 19m.0s.
Paris ePP = 18m.44s., i = 19m.39s., iPPP = 20m.14s., iPS = 28m.8s., iPPS = 28m.58s., ePKKS = 33m.18s., SS = 34m.14s., eQ = 54m.37s.?
Shasta Dam iPKKP = 29m.53s.
Clermont-Ferrand iPPP = 21m.33s., i = 28m.36s., eSS = 33m.56s.
Tortosa PPP?E = 21m.21s., SKP?EN = 22m.41s., SKKSN = 26m.5s., SSE = 34m.35s., SSP?E = 34m.57s.
Tinemaha iZ = 18m.53s., ePKKPZ = 29m.37s.
Butte eSSN = 35m.18s.
Pasadena iZ = 18m.50s., ePKKPZ = 29m.32s.
Mount Wilson eZ = 18m.50s.
Riverside iZ = 18m.53s., ePKKPZ = 29m.27s.
Palomar eZ = 18m.54s., ePKKPZ = 29m.19s.
Granada SKS = 22m.56s., SSS = 39m.20s.
Lisbon Z = 20m.47s.
Tucson i = 19m.3s., ePKKP = 29m.0s., eSS? = 37m.51s.
Cleveland ePPEN = 22m.41s., iN = 22m.47s., eE = 22m.54s., eN = 33m.37s., 34m.58s., and 35m.29s.
Tacubaya eN = 18m.55s., iE = 20m.59s., eN = 22m.38s., eE = 22m.58s. and 29m.37s.
Bermuda ePP = 23m.57s., e = 34m.19s., ePPS = 35m.53s.
Huancayo e = 21m.30s., ePKS = 25m.15s., eSKKS? = 30m.37s., eSKSP = 34m.29s., ePPS = 37m.57s., eSS = 44m.9s., eSSS = 52m.7s.
La Paz iZ = 20m.59s., iPPSEN = 38m.14s., iSSEN = 45m.0s.
Bogota ePPZ = 24m.24s.
Long waves were also recorded at Kew, Halifax, Auckland, Christchurch, and Wellington.

July 18d. 16h. 13m. 7s. Epicentre 45°·8N. 10°·3E. (as on 17d.).

Foreshock of 19d. 18h.

A = +·6883, B = +·1251, C = +·7146 ; δ = +6 ; h = −4.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Salo	0·2	143	e 0 7	− 3	i 0 11	S*	—	—	—
Padova	1·7	140	e 0 35	+ 4	—	—	—	—	—
Zürich	1·8	323	—	—	e 0 54	S*	e 1 29	?	—
Triest	2·3	94	e 0 25	−15	e 1 13	+ 4	—	—	—
Stuttgart	3·1	346	e 0 51	0	e 1 29	0	e 1 2	P_g	—
Strasbourg	3·3	330	e 1 18	P_g	e 1 55	S_g	—	—	e 2·1

Stuttgart also gives eS_g = 1m.49s.

July 18d. 18h. 49m. 22s. Epicentre 45°·8N. 10°·3E. (as at 16h.).

Foreshock of 19d. 18h.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Salo		0·2	143	0 5a	P_g	i 0 9	S*	—	—	—
Pavia		1·0	232	i 0 22k	+ 1	i 0 44	?	i 0 25	P_g	—
Chur		1·2	333	e 0 23k	− 1	e 0 39	− 2	—	—	—
Bologna		1·5	151	e 0 29a	+ 1	i 0 47	− 2	—	—	—
Padova		1·7	140	e 0 18	−13	e 0 30	−24	—	—	—
Zürich		1·8	323	e 0 35	+ 3	e 1 5	S_g	e 0 39	P_g	—
Triest		2·3	94	e 0 39	− 1	e 1 5	− 4	i 0 42	P*	—
Basle		2·5	313	e 0 45	+ 2	e 1 26	S_g	e 0 52	P_g	—
Neuchatel		2·6	297	e 0 44	0	e 1 28	S_g	—	—	—
Stuttgart		3·1	346	e 0 48	− 3	e 1 26	− 3	e 0 58	P*	—
Strasbourg		3·3	330	e 0 52	− 1	e 1 35	0	e 1 4	P_g	i 1·9
Clermont-Ferrnad		5·0	272	e 1 31	P*	i 3 5	S_g	—	—	—
Jena	N.	5·2	8	e 1 32	P*	e 2 42	S*	—	—	—

Additional readings :—
Triest iS_g = 1m.12s.
Stuttgart iS_g = 1m.47s.
Strasbourg eS = 1m.45s.

July 18d. 20h. 6m. 30s. Epicentre 9°·7N. 125°·7E. (as on 1943, Dec. 13d.).

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

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Vladivostok		33·7	8	i 6 45	0	i 12 9	+ 1	—	—	—
Murgab		54·3	311	9 35	+ 5	—	—	—	—	—
Andijan		56·2	313	e 9 43	− 1	—	—	—	—	—
Stalinabad		58·3	310	i 10 1	+ 2	i 18 7	+ 6	—	—	—
Tashkent		58·6	313	e 10 3	+ 2	—	—	—	—	—
Ashkabad		66·3	307	e 10 51	− 1	—	—	—	—	—
Sverdlovsk		68·4	328	11 6	0	20 6	− 1	—	—	—
Grozny		76·1	313	e 11 52	+ 1	—	—	—	—	—
Moscow		81·0	325	12 17	− 1	e 22 19	− 8	—	—	—
Yalta		84·4	314	e 12 35	− 1	—	—	—	—	—
Ksara		84·5	303	e 12 36	0	e 23 24	+22	—	—	—
Istanbul		88·7	312	e 23 30	SKS	(e 23 30)	[+ 5]	—	—	—
Warsaw		91·2	324	(e 22 30)	?	—	—	—	—	e 22·5
Shasta Dam		99·8	46	e 13 44	− 3	—	—	—	—	—
Hungry Horse		101·9	36	e 13 55	− 2	—	—	—	—	—
Palomar	Z.	106·8	51	e 18 48	PP	—	—	i 19 1	PP	—
Tucson		111·8	50	e 18 57	PP	—	—	—	—	—

Long waves were also recorded at European stations.

July 18d. 22h. 29m. 43s. Epicentre 6°·5S. 155°·0E. (as on 1948, June 18d.).

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

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	N.	20·9	187	i 4 46	0	i 8 37	+ 2	i 5 6	PP	i 10·7
Riverview		27·4	188	—	—	i 10 27	− 1	11 41	SS	e 14·0
Auckland	N.	35·2	153	e 10 17	?	—	—	—	—	—
Wellington		38·9	157	16 17?	SSS	—	—	—	—	—
Christchurch		40·0	161	—	—	e 14 17?	+33	—	—	—
Vladivostok		53·7	339	e 9 22	− 4	—	—	i 17 24	PPS	—
Honolulu		53·9	57	e 17 23	PPS	—	—	—	—	e 24·1
Bombay	E.	84·7	290	e 18 19	?	e 18 53	?	—	—	—
Sitka		84·8	31	e 12 33	− 4	e 22 59	− 6	e 24 21	PPS	e 35·4
Murgab		87·0	309	12 49	+ 1	23 18	[+ 4]	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Shasta Dam		88·5	49	e 12 56	0	—	—	—	—	—
Andijan		88·6	311	e 12 51	− 5	23 41	− 1	—	—	—
Lick	z.	88·6	52	e 13 0	+ 4	—	—	—	—	—
Victoria		89·3	41	—	—	(24 17?)	PS	—	—	24·3
Santa Barbara	z.	89·8	56	e 13 4	+ 2	—	—	—	—	—
Tashkent		91·0	311	e 13 1	− 6	23 43	[+ 4]	e 25 22	PS	—
Pasadena		91·0	56	i 13 9a	+ 2	—	—	i 13 39	pP	—
Mount Wilson	z.	91·1	56	i 13 9a	+ 1	—	—	i 13 40	pP	—
Tinemaha	z.	91·2	53	i 13 10a	+ 2	—	—	—	—	—
Haiwee	z.	91·4	54	e 13 12	+ 3	—	—	—	—	—
La Jolla	z.	91·6	57	e 13 12	+ 2	—	—	—	—	—
Riverside	z.	91·6	56	i 13 12a	+ 2	—	—	—	—	—
Palomar	z.	92·0	57	i 13 14a	+ 2	—	—	—	—	—
Grand Coulee		92·1	42	e 13 12	0	—	—	—	—	—
Boulder City		93·9	54	i 13 23	+ 2	—	—	e 17 6	PP	—
Pierce Ferry		94·6	54	i 13 26	+ 2	—	—	—	—	—
Hungry Horse		95·5	42	e 13 26	− 2	—	—	—	—	—
Tucson		96·9	58	e 13 40	+ 6	—	—	—	—	e 44·9
Bozeman		97·4	45	—	—	e 24 29	[+15]	e 26 31	PS	e 45·8
Sverdlovsk		97·8	327	e 13 41?	+ 3	24 10	[− 6]	e 17 39	PP	—
Saskatoon		100·2	38	e 18 17	PP	e 27 20	PPS	—	—	45·3
Scoresby Sund		116·1	359	19 57	PP	29 32	PS	—	—	48·3
Yalta		116·3	317	e 19 52	PP	—	—	—	—	—
Ksara		117·7	304	e 19 15	[+27]	e 31 25	PPS	—	—	—
Istanbul		121·0	315	e 20 25	PP	e 30 14?	PS	—	—	—
Ottawa		121·5	39	e 18 55	[− 1]	(27 17)	[− 7]	—	—	27·3
Vermont		123·6	40	e 31 39	PPS	—	—	—	—	e 53·8
Potsdam		124·6	333	e 20 43	PP	—	—	e 57 17	Q	e 61·3
Collmberg	E.	125·4	332	e 21 17	PP	—	—	i 22 39	PKS	—
Harvard		125·5	41	i 19 3	[0]	—	—	e 20 52	PP	e 63·3
De Bilt		128·2	337	e 21 17	PP	—	—	—	—	e 55·3
Triest		128·6	326	e 22 33	PKS	e 33 49	PPS	e 36 37	?	—
Stuttgart		128·9	331	e 19 9	[− 1]	e 33 5	PPS	e 21 19	PP	e 67·3
Uccle		129·5	337	e 22 38	PKS	—	—	e 59 17?	Q	e 61·3
Strasbourg		129·7	332	e 19 10	[− 1]	e 33 17?	PPS	e 21 19	PP	e 60·3
Rome		131·6	323	e 21 29	PP	e 22 37	PKS	—	—	e 59·5
La Paz		131·6	119	22 52	PKS	—	—	—	—	63·3
Paris		131·8	336	e 19 14	[− 1]	e 32 17?	PS	e 21 36	PP	e 70·3
Clermont-Ferrand		133·9	333	e 19 31	[+12]	e 22 58	SKP	e 21 48	PP	63·3
Alicante		141·3	329	e 19 42	[+ 9]	—	—	—	—	e 66·5
Toledo		141·8	334	19 33	[− 1]	—	—	—	—	—
Granada		143·8	331	e 16 5	?	26 36	[− 9]	42 15	SSP	68·0
Tamanrasset		146·4	302	i 19 44k	[+ 2]	e 35 54	PPS	—	—	—

Additional readings :—
Brisbane i = 5m.52s., iSSN = 8m.55s.
Riverview iN = 10m.49s., iE = 10m.53s. and 12m.11s.
Sitka e = 28m.35s.
Pasadena iZ = 13m.23s.
Palomar iZ = 13m.34s. and 13m.45s.
La Jolla eZ = 13m.35s.
Riverside iZ = 13m.44s.
Sverdlovsk eS = 24m.55s., ePS = 26m.29s.
Stuttgart e = 22m.30s.
Strasbourg ePPP = 24m.17s.
Rome eN = 27m.5s.
Paris eSKP? = 22m.26s., ePPP = 24m.14s.
Granada ePP = 21m.0s., SKSP = 32m.3s., SSS = 50m.0s.
Tamanrasset i = 19m.58s.k, e = 39m.48s.
Long waves were also recorded at Seven Falls, College, Bermuda, Huancayo, Apia, and at other American and European stations.

July 18d. Readings also at 0h. (near Kulyab, Murgab, Andijan (2), and Stalinabad), 1h. (near Lick (2), Berkeley, Branner, and Fresno (2)), 3h. (Tacubaya), 6h. (Belgrade, near La Paz, and near Ashkabad), 7h. (Stuttgart), 8h. (near Messina), 9h. (Stuttgart), 10h. (Palomar, Riverside, Tinemaha, Boulder City, Pierce Ferry, Tucson, near Andijan, and near Messina (2)), 11h. (near Berkeley), 12h. (Pierce Ferry, and near Lick), 13h. (La Paz, Palomar, Tinemaha, Tucson, and near Mineral), 14h. (La Paz, near Erevan, and Leninakan), 16h. (Istanbul), 17h. (Strasbourg and near Lick), 18h. (near Salo), 19h. and 21h. (Tacubaya), 23h. (Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Boulder City, Pierce Ferry, San Juan, Stuttgart, Andijan, and Murgab).

July 19d. 5h. 8m. 16s. Epicentre 36°·9N. 70°·8E. Depth of focus 0·030.
(given by Russian Stations).

$A = +\cdot2636$, $B = +\cdot7570$, $C = +\cdot5978$; $\delta = -10$; $h = -1$;
$D = +\cdot944$, $E = -\cdot329$; $G = +\cdot197$, $H = +\cdot565$, $K = -\cdot802$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
	°	°	m. s.	s.	m. s.	s.	m. s.	
Kulyab	1·3	321	i 0 31	− 4	i 0 57	− 4	—	—
Stalinabad	2·3	316	i 0 42	− 2	i 1 16	− 1	—	—
Murgab	2·9	59	0 50	0	1 29	0	—	—
Andijan	4·0	17	e 1 4	+ 1	i 1 54	+ 2	—	—
Samarkand	4·1	314	i 1 3	− 1	i 1 53	− 1	—	—
Tashkent	4·6	346	1 11	0	e 2 6	+ 1	—	—
Frunse	6·6	25	e 1 36	0	2 54	+ 3	—	—
Almata	7·9	35	i 1 53	0	—	—	—	—
Ashkabad	9·9	280	e 2 16	− 2	e 4 0	− 7	—	—
Grozny	20·2	296	e 4 24	+ 5	—	—	—	—
Sverdlovsk	21·1	244	4 29	+ 1	8 19	+15	e 5 30	sP
Moscow	29·3	321	e 5 44	0	—	—	—	—

July 19d. 18h. 11m. 27s. (I) } Epicentre 45°·8N. 10°·3E.
18h. 26m. 42s. (II) } (as on 18d.).

Shock I intensity IV-V The Puschlav ; IV in the Engadine, and at Bergell ; III le Tessin and at Salo ; II at Pavia.
Shock II intensity V in The Puschlav ; IV-V in the Engadine and at Bergell ; IV at Oberhalbstein and le Tessin.

E. Wanner.
Jahresbericht des Erdbebendienstes der Schweiz im Jahre, 1948, Zürich, 1949, p. 3. Macroseismic charts figs. 2 and 3. Epicentre 45°48′N. 10°25′E.

$A = +\cdot6883$, $B = +\cdot1251$, $C = +\cdot7146$; $\delta = +6$; $h = -4$;

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
I Salo	0·2	143	i 0 5a	− 5	i 0 10	− 6	—	—	—
II	0·2	143	0 6a	− 4	i 0 11	− 5	—	—	—
I Pavia	1·0	232	i 0 25a	+ 4	i 0 41	+ 5	—	—	—
II	1·0	232	i 0 23a	+ 2	i 0 41	+ 5	—	—	—
I Chur	1·2	333	i 0 24	0	0 40	− 1	—	—	—
II	1·2	333	e 0 24	0	i 0 40	− 1	—	—	—
I Bologna	1·5	151	0 27	− 1	i 0 49	0	0 31	P_g	—
II	1·5	151	0 27k	− 1	i 0 57	S_g	e 0 30	P_g	—
I Padova	1·7	140	0 19a	?	0 32	P	—	—	—
II	1·7	140	0 21	?	0 33	P	—	—	—
I Zürich	1·8	323	e 0 37	+ 5	e 1 7	S_g	e 0 40	P_g	—
II	1·8	323	e 0 38k	+ 6	e 1 7	S_g	e 0 40	P_g	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
I	Florence	2·1	162	e 0 40a	+ 3	e 1 7	+ 3	i 1 12	S_g	—
I	Triest	2·3	94	i 0 35a	− 5	e 1 0	− 9	i 0 44	P_g	—
II		2·3	94	e 0 36a	− 4	i 1 1	− 8	i 0 40	P*	—
I	Basle	2·5	313	e 0 46	+ 3	e 1 30	S_g	e 0 52	P_g	—
II		2·5	313	e 0 46	+ 3	e 1 28	S_g	e 0 52	P_g	—
I	Neuchatel	2·6	297	e 0 46	+ 2	e 1 30	S_g	i 0 53	P_g	—
II		2·6	297	e 0 46	+ 2	e 1 31	S_g	e 0 56	P_g	—
I	Ebingen	2·6	339	e 0 43	− 1	e 1 13	− 4	e 1 25	S_g	—
II		2·6	339	e 0 50	P_g	e 1 22	S*	—	—	—
I	Stuttgart	3·1	346	e 0 49k	− 2	i 1 27	− 2	i 1 0	P_g	—
II		3·1	346	e 0 50k	− 1	i 1 28	− 1	i 1 0	P_g	—
I	Strasbourg	3·3	330	i 0 54k	+ 1	i 1 36	+ 1	i 1 5	P_g	i 2·1
II		3·3	330	i 0 55	+ 2	i 1 36	+ 1	i 1 5	P_g	i 2·1
I	Rome	4·2	158	1 13	P*	e 1 54	− 3	e 1 22	P_g	e 2·5
II		4·2	158	—	—	e 1 40	−17	—	—	2·5
I	Cheb	4·5	17	e 1 26	P_g	e 1 58	− 7	—	—	e 2·2
II		4·5	17	e 1 29	P_g	e 1 56	− 9	—	—	—
I	Clermont-Ferrand	5·0	272	i 1 21	+ 3	i 2 26	+ 8	i 1 45	P_g	—
II		5·0	272	i 1 20	+ 2	i 2 26	+ 8	i 1 45	P_g	—
I	Prague	5·1	31	e 2 3	?	e 2 21	+ 1	e 2 36	S*	—
II		5·1	31	e 1 51	P_g	e 2 30	+10	e 2 36	S*	e 2·9
I	Jena N.	5·2	8	e 1 22	+ 1	2 13	− 9	e 1 38	P*	—
II		5·2	8	e 1 25	+ 4	e 2 21	− 1	e 1 38	P*	—
I	Collmberg	5·8	18	e 1 29	0	i 3 0	S*	—	—	—
II		5·8	18	e 1 30	+ 1	i 3 6	S*	—	—	—
I	Paris	6·1	302	i 1 34	0	i 3 21	S_g	i 2 7	P_g	—
II		6·1	302	i 1 35	+ 1	i 3 25	S_g	i 2 4	P_g	—
I	Kalossa N.	6·1	80	—	—	e 3 13	S*	—	—	—
II	N.	6·1	80	—	—	e 3 13	S*	—	—	—
I	Budapest	6·3	71	2 0	P_g	3 27	S_g	—	—	4·0
II	E.	6·3	71	—	—	e 3 10	S*	—	—	—
I	Uccle	6·4	324	e 1 54	P*	e 3 4	+11	e 3 39	S_g	—
II		6·4	324	e 1 55	P*	e 3 35	S_g	—	—	—
I	Raciborzu	6·8	48	e 3 15	S	(e 3 15)	+12	e 3 47	S_g	—
II		6·8	48	—	—	e 3 19?	+16	e 4 1	S_g	—
I	Warsaw	9·5	44	—	—	e 4 49	S*	e 5 8	S_g	e 5·9
II	N.	9·5	44	—	—	e 5 2	S_g	—	—	e 6·0

Additional readings :—
Bologna I eZ = 42s., e = 47s., iS_gE = 57s., II iSZ = 49s.
Zürich I i = 1m.12s.
Florence I eE = 59s.
Triest I iP_g = 38s., iS_g = 1m.8s., II iS_g = 1m.9s.
Ebingen I e = 1m.21s., II e = 1m.6s.
Stuttgart I i = 56s.k and 1m.45s., iS_g = 1m.48s., II iS_g = 1m.48s.
Strasbourg I eS = 1m.47s., iS_g = 1m.55s., II iS_g = 1m.52s.
Cheb I e = 1m.46s. and 1m.52s.
Clermond-Ferrand I iS = 2m.43s., iS_g = 2m.58s., II iS = 2m.44s., iS_g = 2m.58s.
Prague I e = 2m.9s. and 2m.14s., II e = 1m.58s.
Jena I eP?E = 1m.25s., iS_gN = 2m.44s., II eN = 1m.28s.?, eSN = 2m.13s., eS_gEN = 2m.48s.
Paris I iP = 1m.43s., i = 2m.0s. and 2m.34s., iS_g = 3m.24s., e = 3m.43s., II iP = 1m.44s., i = 1m.59s. and 3m.43s.
Kalossa II eE = 3m.16s.
Budapest I ePN = 2m.6s., II eN = 3m.13s.
Uccle I eE = 3m.26s., eEN = 3m.44s., eN = 3m.50s., eEZ = 4m.10s., II e = 3m.51s., eE = 4m.11s.
Raciborzu I eEN = 3m.34s.? and 4m.1s., eS?EN = 4m.27s.
Warsaw I eEN = 4m.52s., eE = 5m.11s., II eZ = 5m.9s.
Long waves were also recorded at De Bilt, Kew, Potsdam, Copenhagen, Istanbul, Jersey, and Tamanrasset.

July 19d. 22h. 26m. 12s. Epicentre 14°·7N. 91°·2W. (as on 17d.).

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Oaxaca		5·8	294	—	—	i 2 54	+16	—	—	—
Merida		6·4	13	1 47	+ 9	i 3 5	+12	—	—	—
Tacubaya		9·0	303	2 22	+ 9	4 7	+ 9	—	—	—
Austin		16·7	340	4 2	+ 5	6 57	− 6	7 47	SS	—
St. Louis		23·9	2	i 5 18	+ 2	i 9 26	− 4	i 5 37	pP	e 12·1
Tucson		25·0	318	i 5 26	− 1	e 10 7	+18	i 9 0	PcP	e 13·3
Georgetown		27·1	26	e 5 50	+ 4	e 10 30	+ 6	e 11 30	SS	15·5
Chicago		27·2	6	—	—	e 10 20	− 5	—	—	i 11·0
Cleveland		28·0	16	e 5 56k	+ 1	e 10 38	0	—	—	14·6
Pierce Ferry		29·5	321	i 6 10	+ 2	—	—	—	—	—
La Jolla	Z.	29·8	313	e 6 11	0	—	—	—	—	—
Palomar		29·8	314	i 6 11a	0	—	—	i 9 12	PcP	—
Bermuda		29·9	49	—	—	e 11 38	+29	—	—	e 13·0
Boulder City		29·9	320	e 6 14	+ 2	—	—	i 9 40	PcP	—
Fordham		30·1	27	e 6 18	+ 5	e 11 14	+ 2	—	—	17·1
Riverside	Z.	30·5	314	e 6 15	− 2	—	—	i 9 14	PcP	—
Mount Wilson	Z.	31·1	314	e 6 22	0	—	—	i 9 17	PcP	—
Pasadena		31·1	314	i 6 22	0	—	—	i 9 14	PcP	e 17·3
Haiwee	Z.	32·1	317	i 6 34	+ 3	—	—	—	—	—
Logan		32·3	332	—	—	e 11 47	+ 1	—	—	e 13·0
Harvard		32·5	28	i 7 36	+62	—	—	—	—	e 17·8
Tinemaha	Z.	32·8	318	i 6 38	+ 1	—	—	i 9 20	PcP	—
Ottawa		33·3	20	6 42	+ 1	12 6	+ 4	14 40	SSS	17·8
Bozeman		35·1	337	e 10 8	?	e 12 32	+ 2	—	—	—
Lick		35·2	316	e 6 58	0	—	—	e 9 29	PcP	—
Butte	N.	36·0	336	—	—	e 13 13	+29	—	—	e 16·0
Seven Falls	E.	36·5	24	—	—	(12 48?)	− 3	—	—	12·8
Shasta Dam		37·5	320	i 7 16	− 1	—	—	e 9 32	PcP	—
Hungry Horse		38·5	337	e 7 22	− 4	—	—	e 9 42	PcP	—
La Paz	E.	38·5	142	e 7 23	− 3	—	—	—	—	—
Saskatoon		39·3	345	e 9 51	PcP	e 13 46	+12	—	—	18·8
Victoria		42·9	329	e 8 17	+15	—	—	—	—	16·8
Stuttgart	Z.	85·8	41	e 12 40	− 2	—	—	—	—	—

Additional readings :—
Tacubaya iPN = 2m.26s., iN = 3m.53s., iE = 3m.58s.
St. Louis i = 5m.32s., esS = 9m.57s., iSS = 10m.13s.
Tucson i = 5m.42s. and 6m.0s.
Cleveland eSE = 10m.41s., eE = 10m.54s.
La Jolla eZ = 6m.31s.
Palomar iZ = 6m.27s.
Riverside eZ = 6m.32s.
Mount Wilson eZ = 6m.37s.
Pasadena iZ = 6m.36s.
Long waves were also recorded at Puebla, San Juan, and other American and European stations.

July 19d. Readings also at 4h. (Riverview, Tamanrasset, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Boulder City, Pierce Ferry, and near Lick), 6h. (Alicante, Granada, Strasbourg, and Stuttgart), 7h. (Stuttgart, near Lick, and near Murgab), 9h. (Hungry Horse and near Mineral), 10h. (near Hungry Horse), 11h. (Tacubaya, Pierce Ferry, Shasta Dam, Hungry Horse, and near Mineral), 14h. (Klyuchi and Toledo), 15h. (Paris), 17h. (Lick, near Shasta Dam, and Mineral), 19h. (Paris and near Tacubaya), 20h. (Ottawa, Paris, near Andijan, Kulyab, and Stalinabad), 21h. (Rome, Shasta Dam, and near Mizusawa), 22h. (Bogota and Paris), 23h.(Hungry Horse).

July 20d. 0h. 41m. 30s. Epicentre 6°·5S. 155°·0E. (as on 18d.).

A = −·9006, B = +·4200, C = −·1125 ; δ = +14 ; h = +7 ;

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	N.	20·9	187	i 4 46	0	i 8 35	0	i 8 56	SS	i 10·7
Riverview		27·4	188	i 5 52a	+ 3	i 10 25	− 3	i 6 37	PP	e 14·3
Arapuni	E.	36·6	153	—	—	12 54	+ 1	—	—	19·5
Wellington		38·9	157	e 10 39	?	13 22	− 6	—	—	19·5
Christchurch		40·0	161	—	—	13 40	− 4	16 2	Q	18·8
Vladivostok		53·7	339	e 9 21	− 5	e 16 57	− 2	—	—	—
Honolulu		53·9	57	—	—	e 17 23	+21	—	—	e 24·1
Irkutsk		72·7	330	11 30	− 2	20 56	− 1	—	—	—
College		82·6	20	—	—	e 22 42	− 1	—	—	e 37·0
Bombay	E.	84·7	290	e 12 37	0	e 22 58	− 6	—	—	—
Sitka		84·8	31	e 13 40	+63	e 24 6	+61	e 17 28	PP	e 36·5
Murgab		87·0	309	12 47	− 1	23 26	− 1	—	—	—
Berkeley		88·2	52	i 12 56a	+ 2	e 23 30	− 8	i 24 58	PS	e 40·5
Shasta Dam		88·5	49	i 12 58	+ 2	—	—	—	—	—
Andijan		88·6	311	e 13 1	+ 5	e 23 41	− 1	—	—	—
Lick	Z.	88·6	52	e 12 59	+ 3	—	—	—	—	—
Victoria		89·3	41	(19 30?)	?	—	—	—	—	19·5
Kuiyab		90·2	308	e 13 14	+10	—	—	—	—	—
Tashkent		91·0	311	e 13 6	− 1	e 24 1	− 2	30 13	SS	—
Pasadena		91·0	56	e 13 8a	+ 1	e 24 5	+ 2	—	—	e 40·5
Mount Wilson	Z.	91·1	56	e 13 9a	+ 1	—	—	—	—	—
Stalinabad		91·1	309	e 13 8	0	i 24 14	+10	—	—	—
Tinemaha	Z.	91·2	53	e 13 0	− 8	—	—	—	—	—
Haiwee	Z.	91·4	54	i 13 6	− 3	—	—	—	—	—
Riverside	Z.	91·6	56	e 13 10a	0	—	—	—	—	—
Palomar		92·0	57	i 13 13	+ 1	—	—	—	—	—
Boulder City		93·9	54	e 13 21	0	—	—	—	—	—
Tucson		96·9	58	e 13 39	+ 5	e 26 34	PS	e 17 25	PP	e 40·2
Bozeman		97·4	45	—	—	e 24 0	[−14]	e 26 44	PS	e 43·8
Sverdlovsk		97·8	327	e 13 30	− 8	e 24 57	− 5	e 17 37	PP	—
Saskatoon		100·2	38	17 26	PP	24 6	[−22]	26 58	PS	46·5
Scoresby Sund		116·1	359	19 56	PP	26 57	{+ 9}	29 33	PS	—
Ksara		117·7	304	e 20 3	PP	e 32 23	?	—	—	—
Helwan		118·6	301	e 20 35	PP	—	—	—	—	—
Istanbul		121·0	315	20 26?	PP	30 8	PS	—	—	—
Ottawa		121·5	39	18 55	[− 1]	26 0	[+ 5]	20 30	PP	56·5
Seven Falls	E.	123·8	36	—	—	(25 30?)	[−32]	—	—	25·5
Potsdam		124·6	333	e 20 48	PP	—	—	—	—	e 60·5
Prague		125·5	330	—	—	e 26 30	[+23]	e 36 42	SS	e 63·5
De Bilt		128·2	337	e 21 12	PP	e 43 0	SSS	e 23 48	PPP	e 56·5
Triest		128·6	326	e 15 32	P	e 22 30	SKP	e 18 49	PKP	—
Stuttgart		128·9	331	e 19 11	[+ 1]	e 22 30	SKP	e 21 16	PP	e 67·5
Uccle		129·5	337	e 22 36	PKS	e 37 30?	SS	—	—	e 59·5
Strasbourg		129·7	332	e 19 12	[+ 1]	e 22 36	PKS	e 21 22	PP	e 60·5
Rome		131·6	323	e 21 40	PP	e 33 32	PPS	22 42	PKS	e 59·0
La Paz		131·6	119	14 29	P	i 22 45	PKS	—	—	69·5
Paris		131·8	336	e 19 19	[+ 4]	e 22 41	PKS	e 21 29	PP	e 65·5
Clermont-Ferrand		133·9	333	e 19 21	[+ 2]	e 22 57	PKS	e 21 50	PP	65·5
Bermuda		135·0	50	e 22 38	PP	e 22 58	PKS	e 31 52	PS	e 58·1
Tortosa		138·9	330	—	—	23 5	PKS	31 7	?	e 100·5
Alicante		141·3	329	e 21 42	PP	—	—	—	—	e 65·1
Granada		143·8	331	i 19 52a	[+15]	i 26 33	[−12]	23 0	PKS	79·3
Tamanrasset		146·4	302	e 19 42	[0]	—	—	—	—	—

Additional readings :
Brisbane iN = 5m.36s., and 5m.57s.
Riverview iZ = 6m.29s., iPPPZ = 6m.47s., iE = 10m.34s., isSN = 10m.42s., i = 10m.50s., iSSE = 11m.48s. and 12m.8s.
Wellington i = 13m.41s., e = 16m.31s.
Bombay eSN = 23m.1s.
Sitka eSKS = 23m.2s., eSS = 30m.14s., eSSS = 33m.38s.
Berkeley eSKSZ = 22m.37s., eSSN = 29m.26s.

Continued on next page.

Mount Wilson iZ = 13m.13s.
Riverside iZ = 13m.15s.
Palomar iNZ = 13m.16s., iZ = 13m.24s., iNZ = 14m.2..
Sverdlovsk ePS = 26m.29s.
Saskatoon SS = 32m.2s.
Ottawa PS = 30m.30s., SS = 37m.30s.?
Prague e = 41m.12s., 44m.0s., 50m.12s., and 58m.30s.
Triest ePP = 24m.8s. ,ePS = 31m.4s.
Strasbourg e = 22m.19s., eSKP = 22m.41s., e = 32m.6s., and 35m.0s., eSS = 38m.12s., e = 47m.48s.
Paris ePPP = 24m.13s.
Tortosa PP?E = 24m.40s., and 27m.3s., SKSP = 34m.47s., PPS? = 37m.43s.
Granada PKP_2 = 20m.45s., $pPKP_2$ = 21m.12s., iPP = 24m.12s., pPP = 24m.40s., iSKKS = 32m.0s., SKSP = 34m.9s., SS = 44m.21s., SSS = 45m.33s., Q = 67m.54s.
Long waves were also recorded at Auckland, Kodaikanal, Ivigtut, San Juan, Huancayo, Fort-de-France, and other American and European Stations.

July 20d. 8h. 11m. 38s. Epicentre 37°·3N. 121°·7W. (as on 1945, Nov. 8d.).

A = −·4190, B = −·6784, C = +·6034 ; δ = −12 ; h = −1 ;
D = −·851, E = +·525 ; G = −·317, H = −·513, K = −·797.

		△	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Lick		0·0	—	i 0 7	0	—	—	—	—
Santa Clara		0·2	284	e 0 7	− 3	i 0 10	− 6	—	—
Branner		0·4	287	(i 0 9)	− 4	(i 0 14)	− 7	—	—
Berkeley		0·7	321	i 0 14	− 3	i 0 22	− 6	—	—
San Francisco	E.	0·7	308	e 0 22?	+ 5	—	—	—	—
Fresno	N.	1·6	110	i 0 34	+ 4	i 0 57	+ 6	—	—
Tinemaha		2·7	94	i 0 51	P*	i 1 13	S_g	—	—
Mineral		3·1	2	e 0 51	0	i 1 25	− 4	i 1 0	P_g
Haiwee		3·2	111	e 0 59	P*	i 1 45	S_g	i 1 6	P_g
Santa Barbara	Z.	3·3	151	e 0 58	P*	—	—	—	—
Shasta Dam		3·4	351	i 0 56	+ 1	—	—	—	—
Mount Wilson	Z.	4·2	136	i 1 14	P*	—	—	—	—
Pasadena		4·2	137	i 1 12	P*	i 2 2	+ 5	—	—
Riverside	Z.	4·9	133	i 1 19	+ 2	—	—	—	—
Palomar	Z.	5·6	133	i 1 31	+ 4	—	—	—	—
Boulder City		5·7	102	e 0 55	−33	e 3 4	S_g	—	—
Pierce Ferry		6·3	99	e 0 11	?	—	—	i 1 56	P*
Tucson		10·3	117	e 2 40	+ 8	—	—	—	—
Tacubaya	N.	26·5	126	e 6 21	PP	—	—	—	—

Additional readings and note :—
Branner readings have been increased by 1m.
Berkeley iN = 17s., iE = 20s.
Tinemaha i = 1m.16s.
Mineral iZ = 56s., iE = 1m.29s.

July 20d. 11h. 2m. 21s. Epicentre 16·°6S. 73°·6W. Depth of focus 0.005.
(as on 1944, Aug .7d.).

Intensity V-VI and slight damage at Caraveli and Chuquibamba ; Intensity IV-V at Camana, III at Arequipa and Moquegua, II at Lima. Epicentre 16°·5S. 74°·0W. Depth 100km.

E. Silgodo.
Datos Sismologicos del Peru, 1948. Instituto Geologico del Peru, Bol 13, Lima, 1949, p.18. Map of epicentre p.8.

A = +·2707, B = −·9198, C = −·2839 ; δ = −9 ; h = +5 ;
D = −·952, E = −·282 ; G = −·080, H = +·272, K = −·959.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Huancayo		4·8	339	e 1 11	− 1	—	—	—	—	—
La Paz		5·2	90	i 1 25 a	+ 8	i 2 31	+14	—	—	—
Bogota		21·1	358	i 4 42	+ 1	i 8 41	+14	i 5 12	pP	—
La Plata	N.	23·0	147	i 5 5	+ 5	9 13	+11	5 35	PP	14·5
Balboa Heights		26·1	346	e 5 21	− 9	e 10 4	+10	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Fort de France		33·5	23	e 6 28	− 7	—	—	e 13 38	SS	—
San Juan		35·5	12	i 6 44	− 8	e 12 15	− 7	e 7 12	pP	e 14·7
Merida		40·5	337	i 7 41	+ 7	i 13 45	+ 7	e 16 58	SS	—
Tacubaya		43·7	324	8 1	+ 1	i 14 31	+ 6	10 3	pPP	e 22·0
Bermuda		49·4	10	i 8 44	− 1	e 15 54	+ 8	e 10 39	PP	—
Georgetown		55·3	357	i 9 29	0	i 17 11	+ 5	i 9 50	pP	—
Cincinnati		56·4	350	i 9 36	− 1	i 17 17	− 4	i 9 54	pP	27·6
New Kensington	E.	57·1	355	i 9 43	+ 1	i 17 33	+ 3	i 17 59	sS	—
St. Louis		57·1	344	i 9 39	− 3	i 17 26	− 4	i 10 2	pP	—
Fordham		57·2	0	i 9 41	− 2	i 17 31	− 1	i 10 3	pP	29·4
Pennsylvania	N.W.	57·2	356	i 9 44	+ 1	e 18 3	+31	e 11 51	PP	—
Cleveland		58·3	353	e 9 48	− 2	i 17 43	− 3	i 10 10	pP	—
Harvard		58·8	3	i 9 53	− 1	i 17 29	−24	i 12 3	PP	e 30·4
Chicago		59·5	348	i 9 51	− 8	i 17 51	−11	e 12 49	PP	e 24·9
Tucson		60·3	324	i 10 2	− 2	e 18 11	− 1	i 10 18	pP	e 24·7
Vermont		60·8	0	i 10 2	− 6	e 18 3	−15	i 10 28	pP	e 25·4
Halifax		61·6	9	10 14	+ 1	18 31	+ 3	12 31	PP	29·6
Ottawa		61·7	359	10 12	− 2	18 31	+ 1	19 15	PS	30·6
Shawinigan Falls	N.	62·9	2	10 20	− 2	—	—	—	—	—
Seven Falls	E.	63·5	3	10 26	0	18 55	+ 3	—	—	29·6
La Jolla		64·5	320	i 10 34a	+ 2	—	—	e 39 30	P′P′	—
Palomar	Z.	64·6	321	i 10 33a	0	e 19 39	PS	i 10 48	pP	—
Pierce Ferry		64·9	325	i 10 34	− 1	e 19 13	+ 3	i 10 49	pP	—
Boulder City		65·2	324	i 10 36	− 1	e 19 37	PS	e 13 1	PP	—
Riverside		65·3	321	i 10 37a	0	e 19 20	+ 6	i 10 55	pP	—
Mount Wilson		65·9	321	i 10 42a	+ 1	e 19 28	+ 6	i 10 58	pP	—
Pasadena		65·9	321	i 10 41a	0	i 19 23	+ 1	i 10 55	pP	e 27·3
Rapid City	E.	66·2	338	i 10 43	0	e 19 16	− 9	e 12 58	PP	e 27·1
Santa Barbara		67·1	319	e 10 49a	0	—	—	e 11 4	pP	—
Haiwee	Z.	67·2	322	i 10 50a	+ 1	—	—	i 11 7	pP	—
Tinemaha		68·0	322	i 10 54a	0	e 19 52	+ 5	i 11 10	pP	—
Logan		68·0	330	i 10 49	− 5	e 19 43	− 4	i 11 23	pP	e 27·6
Fresno	N.	68·6	322	i 10 58	0	—	—	—	—	—
Lick	Z.	70·2	321	e 11 8	0	—	—	e 39 12	P′P′	—
Santa Clara		70·4	321	e 11 10	+ 1	e 20 19	+ 4	—	—	e 34·8
Branner	Z.	70·5	321	i 11 10	0	—	—	—	—	—
Bozeman		70·7	333	i 11 10	− 1	e 20 20	+ 1	e 20 49	S_cS	e 27·9
Berkeley		70·9	321	i 11 12k	0	i 20 22	+ 1	i 11 28	pP	e 30·7
Butte	N.	71·6	333	i 11 15	− 1	e 20 32	+ 3	e 14 14	PP	e 30·2
Mineral	Z.	72·1	323	e 11 19	0	—	—	—	—	—
Ukiah		72·3	322	e 11 25	+ 5	e 20 47	+10	e 21 14	sS	e 34·6
Shasta Dam		72·8	323	e 11 21	− 2	—	—	—	—	—
Hungry Horse		74·0	334	i 11 26	− 4	—	—	—	—	—
Saskatoon		74·2	339	11 31	− 1	20 59	0	15 37	PPP	34·6
Grand Coulee		76·0	330	i 11 42	0	e 21 22	+ 3	i 12 12	pP	—
Victoria		78·5	329	12 21	+25	22 15	+30	15 16	PP	35·6
Ivigtut		80·2	12	i 12 5	0	i 22 5	+ 2	i 22 51	PS	39·6
Lisbon		81·6	46	12 15a	+ 3	22 28	+10	15 34	PP	33·6
Granada		84·8	50	i 12 31k	+ 2	i 22 56	+ 6	i 15 47	PP	i 41·8
Toledo		85·6	47	i 12 36	+ 3	i 23 1	+ 3	16 15	PP	40·1
Tamanrasset		86·7	66	i 12 42a	+ 4	e 23 14	+ 6	i 13 4k	pP	—
Alicante		87·5	49	12 45	+ 3	23 9	− 7	16 5	PP	e 39·6
Tortosa		89·2	47	i 12 53	+ 3	23 43	+11	16 25	PP	41·4
Sitka		89·7	332	i 12 51	− 1	e 23 38	+ 2	e 16 17	PP	e 37·0
Barcelona		90·5	46	e 12 58	+ 2	i 23 26	[+ 6]	—	—	e 41·9
Honolulu		90·7	292	—	—	e 23 33	[+12]	e 29 55	SS	—
Jersey		90·8	38	e 12 57	0	23 30	[+ 8]	e 16 37	PP	44·2
Clermont-Ferrand		92·8	43	i 13 9	+ 2	i 24 13	+ 9	i 16 50	PP	44·6
Kew		92·8	37	e 13 24	+17	e 23 58	− 6	e 26 5	PPS	e 44·6
Edinburgh		93·1	32	e 13 11	+ 3	24 10	+ 4	16 51	PP	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Durham		93·4	34	—	—	i 23 45	[+ 9]	—	—	—
Paris		93·5	40	i 13 10k	0	e 24 14	+ 4	i 13 46	pP	42·6
Apia	E.	93·7	255	—	—	e 24 25	+14	e 26 4	PS	e 43·6
Scoresby Sund		93·9	15	13 13a	+ 1	23 45	[+ 6]	16 21	PP	—
Aberdeen		94·1	31	i 13 12	0	i 23 47	[+ 7]	i 17 13	PP	44·0
Wellington		94·6	225	23 35	SKS	30 41	SS	25 39	PS	41·6
Christchurch		95·0	222	—	—	40 53	?	43 23	Q	—
Uccle		95·3	38	e 13 20a	+ 2	e 23 53	[+ 6]	e 17 9	PP	e 44·6
Arapuni	E.	95·4	228	—	—	e 24 3	[+16]	—	—	—
Neuchatel		95·7	43	e 13 21	+ 1	—	—	—	—	—
De Bilt		96·2	37	i 13 24a	+ 2	i 23 59	[+ 8]	i 13 38	pP	e 46·6
Basle		96·3	42	e 13 24a	+ 2	e 24 2	[+10]	e 17 16	PP	—
Pavia	Z.	96·6	45	i 13 36	+12	—	—	—	—	—
Strasbourg		96·7	41	i 13 26a	+ 2	i 24 1	[+ 7]	e 14 9	pP	45·6
Zürich		96·9	43	e 13 27a	+ 2	e 24 2	[+ 7]	e 17 19	PP	—
Stuttgart		97·7	42	i 13 30a	+ 1	e 23 53	[− 6]	i 13 46k	pP	e 46·6
Bologna		97·9	46	e 13 42	+12	e 24 13	[+13]	e 17 21	PP	—
Rome		98·0	49	i 13 33	+ 3	i 24 0	[− 1]	i 17 27	PP	e 47·6
Padova		98·3	46	13 35	+ 3	24 7	[+ 5]	17 27	PP	—
College		98·4	336	e 13 30	− 2	e 24 7	[+ 4]	e 17 35	PP	e 41·8
Jena	N.	99·7	41	e 13 41	+ 3	e 24 15	[+ 6]	e 13 58	pP	—
Triest		99·9	45	i 13 51?	+12	i 24 23?	[+13]	i 17 50?	PP	—
Cheb		100·0	40	e 13 39	0	e 24 23	[+12]	e 35 27	SSS	—
Collmberg		100·7	40	e 13 48	+ 6	—	—	—	—	—
Potsdam		101·0	38	i 13 44	0	i 24 26	[+10]	i 14 0	pP	e 45·6
Taranto		101·2	52	13 40	− 5	24 43	SKKS	17 53	PP	e 51·9
Prague		101·3	40	e 13 47	+ 2	e 24 26	[+ 9]	e 17 52	PP	e 47·6
Copenhagen		101·3	35	—	—	e 24 25	[+ 8]	25 26	S	33·6
Budapest		103·8	45	e 14 55	?	e 24 33	[+ 4]	e 18 24	PP	e 52·6
Belgrade		104·3	47	i 14 1	+ 3	e 24 41	[+10]	i 18 16	PP	57·6
Upsala	E.	104·8	31	e 17 20	PKP	e 24 14	[−19]	e 18 11	PP	e 42·6
Warsaw		105·7	39	14 7a	P	24 43	[+ 6]	18 21	PP	e 48·6
Bucharest		108·3	48	e 17 21	PKP	e 24 57	[+ 8]	e 28 19	PS	—
Helsinki		108·5	31	e 18 40	PP	e 24 46	[− 4]	e 28 13	PS	e 50·6
Istanbul		110·2	52	e 14 28	P	25 3	[+ 6]	—	—	—
Helwan		110·8	64	e 14 31	P	25 6	[+ 7]	18 59	PP	—
Yalta		114·1	48	e 18 35	[+ 3]	25 12	[0]	i 19 26	PP	—
Riverview		114·2	220	i 19 34	PP	i 25 24	[+11]	e 26 23	SKKS	e 52·4
Theodosia		114·9	47	e 19 21	PP	—	—	e 39 21	SSS	—
Ksara		115·1	61	e 13 38	P	28 8	PS	18 21	PKP	—
Moscow		115·5	36	e 14 50	P	i 25 20	[+ 2]	e 15 7	pP	—
Sotchi		118·1	49	e 19 48	PP	—	—	—	—	—
Sverdlovsk		127·2	29	e 15 47	P	26 2	[+ 6]	i 19 1	PKP	—
Ashkabad		132·9	53	e 19 13	[+ 5]	e 22 43	PKP	—	—	—
Tashkent		139·7	44	e 19 15	[− 6]	e 29 10	SKKS	e 22 52	PKS	—
Stalinabad		140·5	48	e 19 19	[− 3]	—	—	i 22 33	PKS	—
Kulyab		141·5	49	e 19 21	[− 3]	—	—	—	—	—
Andijan		142·0	44	e 19 31	[+ 6]	—	—	23 7	PKS	—
Frunse		142·3	40	e 19 26	[+ 1]	—	—	—	—	—
Almata		143·5	37	e 19 29	[+ 2]	—	—	—	—	—
Murgab		144·2	46	e 19 31	[+ 2]	—	—	—	—	—
Irkutsk		144·4	3	i 19 30	[+ 1]	e 29 36	SKKS	22 45	PP	—
Bombay		148·0	81	19 45	[+10]	—	—	—	—	—
Hyderabad	N.	153·3	84	—	—	43 3	SS	—	—	—
Calcutta	E.	162·0	67	20 8	[+15]	e 30 10	SKKS	24 32	PP	—

Additional readings :—
La Paz iP_g =1m.44s., iS_g =2m.54s.
Bogota isS =9m.23s., eP_cP?E =11m.6s., eS_cP?E =13m.21s.
La Plata PPP?N =6m.36s., N =7m.4s., P_cPN =8m.8s., SSN =9m.30s., Q?N =11m.6s.
San Juan ePP =8m.17s., esPP =8m.41s.
Merida eE =13m.33s., iSN =13m.50s.
Tacubaya iPN =8m.4s., iE =16m.5s., iN =16m.8s., eSSN =17m.58s., eQE =18m.3s.
Georgetown PP =11m.56s., e =19m.7s., eSS =21m.15s.
Cincinnati i =10m.15s. and 10m.32s., iPP =11m.43s., i =12m.52s., 13m.6s., and 20m.31s., 21m.47s., 23m.55s.

Continued on next page.

New Kensington iS_cSE =19m.21s.
St. Louis isS =18m.3s., iS_cS =19m.29s.
Pennsylvania iPPPNW =13m.15s., $iS_cP?NW$ =14m.9s.
Cleveland iPPN =12m.0s., ipPPN =12m.21s., eN =13m.29s., iN =13m.36s., iSE = 17m.57s., iSN =18m.1s., iE =18m.7s., isSN =18m.35s., iN =18m.59s., iE =19m.31s. and 19m.58s.
Chicago iS_cS =19m.39s., c =20m.7s., eSS =22m.3s., esSS =22m.47s.
Tucson i =10m.23s., 11m.5s., and 11m.33s., ePP =12m.38s., eSS =21m.58s., eSSS? = 23m.13s., ePKP,PKP =39m.23s., iPKP,PKP =39m.42s.
Vermont ePP =12m.20s., ePPP =14m.2s., isS =18m.47s., $iS_cS?$ =19m.48s., eSS = 22m.11s.
Halifax PPP =14m.3s., PS =19m.7s., SS =22m.33s., SSS =25m.3s.
Ottawa iE =20m.1s., SS =22m.45s., ePKP,PKP =39m.35s.
Palomar iZ =10m.42s. and 11m.22s., iPKP,PKPZ =39m.25s., iZ =39m.51s.
Pierce Ferry iP_cP =11m.4s., iPP? =12m.39s., ePKP,PKP =39m.9s.
Riverside iZ =11m.0s., iPKP,PKPZ =39m.22s., epPKP,PKPZ =39m.39s.
Boulder City ePKP,PKP =39m.24s.
Mount Wilson ePKP,PKPZ =39m.25s., epPKP,PKPZ =39m.45s.
Pasadena eEN =11m.8s., i =11m.26s., iN =12m.17s., iE =13m.6s. and 13m.59s., isS = 19m.53s., eSSN =23m.51s., iPKP,PKPZ =39m.24s., ipPKP,PKPZ =39m.46s.
Rapid City eS_cSE =20m.13s., eSSE =23m.26s.
Santa Barbara eZ =11m.18s., ePKP,PKPZ =39m.24s.
Haiwee ePKP,PKPZ =39m.20s.
Tinemaha iZ =11m.17s., ePKP,PKPZ =39m.14s.
Logan ePP =13m.16s., epPP =13m.42s., iS_cS =20m.41s., eSS =23m.55s., esSS =24m.57s.
Bozeman iPS =21m.7s.
Berkeley iZ =14m.10s., iN =14m.27s., iPSE =21m.6s., iE =25m.24s., eZ =28m.51s.
Butte eSSN =25m.3s.
Ukiah eSS =25m.20s., eSSS =28m.52s.
Saskatoon PS =22m.30s., SS =25m.42s., SSS =28m.42s.
Ivigtut 12m.21s., 22m.21s.
Lisbon Z =13m.12s., E =13m.35s. Z =15m.16s., $S_cSE?$ =22m.51s., $S_cS?EN$ =22m.54s., PSN =23m.31s.
Granada P_cP =12m.49s., PPP =17m.58s., iS =23m.25s., PS =24m.34s., SS =29m.11s., SSS =32m.10s.
Toledo eZ =27m.4s.
Tamanrasset ipP =13m.7s.k
Alicante P_cP =12m.49s., PPP =17m.52s., S_cS =23m.17s., PS =23m.57s., PPS =24m.19s., SS =29m.33s., SSS =31m.47s., Q =33m.15s.
Tortosa P_cPEN =12m.58s., PPN =16m.38s., PPPE =18m.34s., iSKSEN =23m.17s., PSEN =24m.51s., SSEN =29m.48s., SSSN =33m.41s., QN =36m.49s.
Sitka e =14m.45s., iSKS =23m.15s., ePS =24m.59s., eSS =29m.3s.
Clermont-Ferrand iPPP =18m.56s., iSKS =23m.41s., iSS =30m.48s.
Kew eE =28m.11s., eEN =33m.24s., eE =38m.11s.
Edinburgh eSKS =23m.36s., eSS =30m.36s.
Paris iPP =16m.49s. and 16m.54s., i =17m.10s., PPP =18m.50s., SKS =23m.40s., iPS =25m.34s., PPS =25m.54s., PKKP? =30m.34s., SS =30m.54s., SSS =34m.34s., PKP,PKP =38m.31s., Q =40·6m.
Scoresby Sund 20m.51s., 23m.9s., 24m.45s., 25m.32s., and 25m.52s.
Aberdeen iEN =26m.1s.
Wellington S =31m.0s., PS =31m.59s., SS =32m.35s., phases wrongly identified.
Uccle eSKSN =23m.57s., eSKKSN =24m.25s., eSKKSE =24m.29s., PSE =26m.5s., eSSEN =31m.39s., eSSSE =35m.39s., PKP,PKPN =37m.29s.
De Bilt iPP =17m.15s.a, ipPP =17m.36s.k, isSKS =24m.26s., ePS =26m.9s., eSSS = 35m.9s.
Basle eS =25m.6s.
Strasbourg i =13m.42s., esP =14m.46s., ePP =17m.12s. and 17m.20s., epPP =17m.49s., esPP =18m.18s., e =18m.51s., eSKS =23m.21s., eS? =24m.16s., esS? =25m.14s., e =29m.49s.
Zürich eS =24m.34s.
Stuttgart eZ =14m.48s., ePP =17m.27s., eSKKS =24m.36s., ePS =26m.19s., eSS = 31m.45s., e =33m.52s.
Bologna eE =25m.17s., eN =25m.39s., e =27m.4s.?
Rome SS =31m.51s.
Padova SKKS? =24m.42s., S? =25m.2s.
College ePS =26m.24s., eSS =31m.27s.
Jena eSKS?N =24m.19s.
Triest iSKKS? =25m.5s.?, ePPS =27m.26s.?
Cheb eN =27m.30s.
Potsdam iPPZ =17m.48s., ePPEN =17m.51s., ipPPZ =18m.4s., iSKKSN =24m.29s., iS?E =24m.52s., eZ =27m.9s., iE =27m.18s., iPPS?E =27m.48s., iZ =27m.55s.? and 28m.34s.?
Prague e =19m.59s., eSKKS =24m.54s., ePS =27m.3s., ePPS? =27m.33s., eSS = 31m.51s., eSSS =36m.15s.
Copenhagen 25m.52s.
Budapest eE =27m.29s.
Belgrade ePS =27m.20s.

Continued on next page.

Upsala eN −18m.58s., eSE =25m.2s., eN =26m.16s., PPSE =27m.26s., eN =28m.26s., eSSE =32m.9s., eN =37m.39s.?
Warsaw ePE =14m.10s., ePPN =18m.29s., eSKKSN =25m.14s., SKKSE =25m.23s., eSE =26m.1s., PPSE =27m.56s., PPSZ =28m.4s., eSSE =32m.56s., PKKSZ = 33m.44s., ePKKSN =34m.1s., PKKSE =34m.4s., with other readings without phase.
Helwan S =26m.45s.
Yalta PS =29m.11s.
Riverview iZ =19m.56s., iSKKKSEN =26m.29s., iPS =29m.12s., iPPSNZ = 30m.21s., eSSE =35m.18s., iSSE =35m.34s.
Moscow ePKP =18m.35s., iPP =19m.36s., SKKS =26m.34s.
Sverdlovsk ipPKP =19m.18s., iPP =20m.54s., ipPP =21m.14s., iSKKS =27m.55s., iPPS =32m.28s., SS =39m.21s., SSS =43m.21s.
Tashkent ePPP =25m.16s.
Irkutsk PKS =23m.15s., iSKSP =32m.57s., SS =41m.39s.?
Calcutta SKKSE =31m.50s.
Long waves were also recorded at Tananarive and Kodaikanal.

July 20d. Readings also at 0h. (Paris, Stuttgart, Huancayo, La Paz, Berkeley, Mount Wilson, Pasadena, Riverside, Tinemaha, Tucson, and near Mineral), 1h. (Granada, and near Mineral), 2h. (near Branner and near Messina), 4h. (La Paz, Huancayo, La Plata, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Boulder City, and Pierce Ferry), 5h. (Branner, near Lick and near Tacubaya), 6h. (near Alicante), 7h. (Apia), 8h. (near Branner (2) and Lick (2)), 9h. (Grand Coulee, Victoria, and near Alicante), 10h. (Helwan, Ksara, Yalta, Ashkabad, Andijan, Kulyab, Murgab, Stalinabad, and Tashkent), 12h. (Wellington), 14h. (Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Shasta Dam, and near Tacubaya (2)), 15h. (Riverview, La Paz, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Shasta Dam, Scoresby Sund, Strasbourg, and Stuttgart), 16h. (Riverview, Haiwee, La Jolla, Mount Wilson, Pasadena, Palomar, Riverside, Santa Barbara, Tinemaha, Pierce Ferry, Shasta Dam, and near Lick), 17h. (Wellington, Tacubaya, Mount Wilson (2), Pasadena (2), Palomar (2), Riverside (2), Tinemaha (2), Tucson, Ottawa, Pierce Ferry, Stuttgart, and Tamanrasset (2)), 18h. (Hungry Horse, near Branner and Lick), 19h. (Ottawa and near Branner), 20h. (Grand Coulee, Hungry Horse, and Victoria), 21h. (Stuttgart).

July 21d. 15h. 47m. 9s. Epicentre 23°·2S., 172°·7E. (as on 1947, Jan. 18d.).

A = −·9126, B = +·1169, C = −·3917 ; δ = −7 ; h = +4 ;
D = +·127, E = +·992 ; G = +·389, H = −·050, K = −·920.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Auckland	N.	13·7	173	4 22	+64	—	—	i 8 33	?	9·4
Tuai	N.	16·0	167	—	—	4 1	PP	—	—	—
Wellington		18·1	175	e 4 21	+ 7	8 5	SS	—	—	9·8
Brisbane	N.	18·3	252	i 4 18	+ 1	i 7 37	− 2	—	—	—
Riverview		21·7	235	i 4 51k	− 4	i 8 54	+ 3	i 5 26	PPP	e 10·8
Nanking		75·3	314	—	—	e 20 51	−35	—	—	—
Lick	Z.	86·2	46	e 12 45	+ 1	—	—	—	—	—
La Jolla	Z.	87·0	52	e 12 49	+ 1	—	—	—	—	—
Pasadena	Z.	87·0	51	i 12 48k	0	—	—	i 13 3	pP	—
Mount Wilson	Z.	87·1	51	i 12 49k	0	—	—	e 13 3	pP	—
Palomar	Z.	87·5	53	i 12 50	− 1	—	—	e 13 4	pP	—
Riverside	Z.	87·5	51	i 12 48k	− 3	—	—	e 13 8	pP	—
Shasta Dam		87·6	43	e 12 49	− 2	—	—	—	—	—
Mineral	Z.	87·9	44	e 12 51	− 2	—	—	—	—	—
Haiwee	Z.	88·1	49	e 12 54	0	—	—	—	—	—
Tinemaha	Z.	88·4	48	i 12 54k	− 1	—	—	—	—	—
Boulder City		90·2	50	i 12 34	−30	—	—	e 12 53	?	—
Pierce Ferry		90·9	51	i 11 36	−91	—	—	i 11 51	?	—
Tucson		91·5	55	i 13 9k	− 1	—	—	i 13 24	?	—
Calcutta	E.	93·8	292	e 16 17	PP	—	—	i 19 57	?	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ksara		140·9	296	—	—	28 51?	?	—	—	—
Istanbul		144·7	308	e 19 34	[− 5]	e 23 33	PKS	—	—	—
Helwan		144·9	288	i 19 34	[− 5]	i 29 57	{+ 8}	—	—	—
Potsdam		146·9	337	e 19 39	[− 3]	—	—	—	—	e 44·9
Stuttgart	z.	151·3	337	e 19 54	[+ 5]	e 23 33	PKS	—	—	—
Strasbourg		152·0	338	e 20 16	PKP_2	—	—	—	—	—
Tamanrasset		168·2	270	i 20 8k	[0]	—	—	e 25 2	PP	—

Additional readings :—
Wellington P? = −3m.5s., e = 1m.11s., S = 4m.35s., SS? = 5m.9s.
Riverview iZ = 4m.55s. and 5m.58s., iN = 7m.4s., iE = 7m.14s. and 9m.1s., iZ = 9m.9s., iN = 9m.12s.
Palomar eZ = 17m.0s.
Helwan i = 30m.21s.
Tamanrasset i = 20m.56s.k
Long waves were also recorded at Arapuni, Christchurch, San Juan, and Granada.

July 21d. Readings also at 0h. (Bermuda) 1h. (San Juan, Tucson, Alicante, Granada, Uccle, De Bilt, and Tamanrasset), 2h. (near Kulyab, Stalinabad, and Andijan), 3h. (Boulder City, Pierce Ferry, Tucson, Riverside, and Palomar), 4h. (near Huancayo), 7h. (near Andijan, Tashkent, Frunse, Murgab, Stalinabad, and Almata), 8h. (Boulder City, Hungry Horse, Pierce Ferry, Tucson, Mount Wilson, Riverside, Palomar, Tinemaha, near Tacubaya, and Puebla), 10h. (near Tacubaya), 11h. (Boulder City, Butte, Pierce Ferry, Rapid City, Tucson, Pasadena, Mount Wilson, Riverside, Palomar, Haiwee, La Jolla, Tinemaha, near Tacubaya (2), and Puebla (2); several shocks), 12h. (Saskatoon, Victoria, Boulder City, Pierce Ferry, Rapid City, Tucson (2), Riverside, Palomar (2), Tinemaha (2), near Tacubaya, and Puebla), 13h. (San Francisco and Tacubaya), 14h. (Scoresby Sund and near Reykjavik (2)), 15h. (near Kulyab, Stalinabad, Andijan, and Samarkand), 16h. (Rome), 18h. (Mineral and near Lick), 20h. (Stuttgart and Potsdam), 21h. (Pierce Ferry, Tucson, Mount Wilson, Palomar, Tinemaha, near Berkeley, Lick, and Branner), 22h. (near Berkeley and near Murgab), 23h. (Ottawa (2)).

July 22d. 6h. 46m. 55s. Epicentre 36°·9N. 22°·0E. (as on 1947, October 6d.).
A = +·7432, B = +·3003, C = +·5978; δ = −11; h = −1;
D = +·375, E = −·927; G = +·554, H = +·224, K = −·802.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Taranto		5·2	315	1 20	− 1	—	—	—	—	—
Messina		5·4	286	1 28k	+ 4	i 2 37	+ 9	—	—	—
Catania		5·6	279	1 33	+ 6	2 42	+ 9	—	—	—
Istanbul		6·9	50	1 22	−23	i 2 32	−33	—	—	—
Belgrade		8·0	353	e 1 57	− 3	e 3 31	− 2	e 2 31	P_g	—
Rome		8·9	306	e 2 30?	+18	—	—	—	—	e 5·1
Helwan		10·5	129	2 5	−30	3 44	−51	—	—	—
Triest		10·7	328	e 2 38	0	i 4 33	− 6	—	—	i 5·9
Bologna		11·1	316	e 2 44k	+ 1	e 4 48	− 1	—	—	—
Salo		12·3	319	e 3 1	+ 2	e 5 17	− 1	—	—	e 8·9
Pavia	z.	12·7	315	e 3 9	+ 4	—	—	—	—	—
Chur		13·6	321	e 3 15	− 2	e 5 34	−16	—	—	—
Zürich		14·4	321	e 3 23k	− 4	e 6 16	+ 7	—	—	—
Basle		15·1	319	e 3 33	− 3	e 6 35	+10	—	—	e 12·6
Stuttgart		15·1	326	e 3 31	− 5	e 6 14	−11	—	—	—
Strasbourg		15·6	323	i 3 41	− 3	e 6 27	−12	e 4 8	PPP	—
Clermont-Ferrand		16·7	308	i 3 56	− 1	—	—	—	—	—
Tortosa		17·2	290	4 4	+ 1	7 23	+ 9	i 4 13	PP	—
Ottawa	z.	69·6	312	e 11 1	−12	—	—	—	—	—
Hungry Horse		86·5	332	i 13 1	+15	—	—	—	—	—

Additional readings :—
Stuttgart iZ = 3m.36s.k and 3m.45s.
Strasbourg eSS = 6m.53s.
Clermont-Ferrand i = 4m.53s.
Tortosa PPPN = 4m.35s., SS?N = 7m.44s.

July 22d. 17h. 48m. 42s. Epicentre 7°·0N. 34°·6W. (as on 1945, June 1d.).

$A = +·8171$, $B = -·5636$, $C = +·1211$; $\delta = -4$; $h = +6$;
$D = -·568$, $E = -·823$; $G = +·100$, $H = -·057$, $K = -·993$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Granada		41·2	39	9 22	PP	i 14 7	+ 5	17 2	SS	21·6
Tamanrasset		41·6	65	e 7 47	− 4	—	—	e 9 29	PP	—
Alicante		43·9	44	e 9 57	PP	e 14 51	+ 9	—	—	e 22·4
Tortosa		46·0	39	—	—	18 58	SS	—	—	e 22·3
Jersey		50·2	28	e 8 58	− 2	—	—	—	—	—
Clermont-Ferrand		50·5	34	i 9 2	0	i 16 16	0	—	—	23·3
Seven Falls	E.	50·6	330	—	—	(15 18?)	−59	—	—	15·3
Paris		52·1	31	e 9 15	+ 1	e 16 33?	− 5	16 40	PS	e 24·3
Kew		52·6	27	—	—	(e 16 18?)	−26	—	—	e 16·3
Rome		54·2	44	e 12 38	PPP	e 17 1	− 5	—	—	e 25·5
Uccle		54·3	29	—	—	e 17 4	− 3	e 17 0	S	e 23·3
Strasbourg		54·7	33	e 9 29	− 4	e 17 8	− 5	e 21 0	SS	e 25·0
Stuttgart		55·6	35	e 9 43	+ 3	e 17 22	− 3	—	—	e 26·3
Aberdeen	E.	56·1	21	—	—	e 17 30	− 2	—	—	—
Scoresby Sund		63·9	4	—	—	19 12	0	—	—	26·3
Istanbul		65·7	49	e 18 18	?	—	—	—	—	e 33·3
Ksara		69·9	58	e 17 31	?	e 27 45	SSS	—	—	—
Tucson		74·7	302	e 11 41	− 2	—	—	—	—	—
Riverside	Z.	80·1	304	e 12 15	+ 2	—	—	—	—	—
Mount Wilson	Z.	80·7	303	e 12 19	+ 3	—	—	—	—	—
Pasadena	Z.	80·8	304	e 12 23	+ 6	—	—	—	—	—

Additional readings :—
Alicante e = 12m.51s.
Strasbourg ePPP = 12m.38s.
Long waves were also recorded at Bermuda, Ivigtut, and at other European stations.

July 22d. 20h. 5m. 18s. (I) } Epicentre 50°·3N. 130°·7W.
20h. 52m. 32s. (II) } (as on 1944, August 13d.).

$A = -·4182$, $B = -·4862$, $C = +·7672$; $\delta = -12$; $h = -6$;
$D = -·758$, $E = +·652$; $G = -·500$, $H = -·582$, $K = -·641$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
I	Victoria	5·1	108	1 37?	P_g	2 28?	+ 8	2 47?	S_g	3·2?
II		5·1	108	1 39?	P_g	2 34?	+14	2 46?	S_g	—
I	Sitka	7·8	341	e 1 58	0	e 3 18	−10	—	—	e 3·9
II		7·8	341	—	—	e 3 38	+10	—	—	i 4·3
I	Grand Coulee	8·1	103	e 1 59	− 3	—	—	—	—	—
II		8·1	103	i 2 2	0	—	—	—	—	—
I	Arcata	10·5	151	e 2 36	+ 1	—	—	e 8 36	PcP	e 6·1
I	Ferndale	10·7	153	—	—	e 4 44	+ 5	—	—	—
I	Hungry Horse	11·1	94	i 3 10	PPP	—	—	—	—	—
II		11·1	94	i 3 6	PP	—	—	i 3 11	PPP	—
I	Shasta Dam	11·3	146	e 2 43	− 3	—	—	—	—	—
II		11·3	146	e 2 46	0	—	—	—	—	—
I	Mineral	11·9	144	e 2 53k	− 1	e 4 58	−11	i 3 5	PP	e 7·0
II	Z.	11·9	144	e 2 54	0	—	—	i 3 5	PP	e 6·8
I	Ukiah	12·4	152	e 4 1	+60	—	—	—	—	e 6·4
I	Butte	N. 12·9	103	e 3 1	− 6	—	—	—	—	e 6·2
I	Berkeley	13·8	151	i 3 19k	0	i 5 56	+ 2	i 6 19	SS	i 7·8
II		13·8	151	e 3 15	− 4	e 5 53	− 1	i 6 24	SS	—
I	Bozeman	14·0	102	e 3 13	− 9	e 6 24	SS	—	—	e 6·9
I	Santa Clara	14·4	151	e 3 35	+ 8	e 6 13	+ 4	—	—	e 7·5
II		14·4	151	e 3 56	PPP	e 6 14	+ 5	—	—	e 7·9
I	Lick	Z. 14·5	150	e 3 8	−20	—	—	—	—	—
II		Z. 14·5	150	i 3 27	− 1	—	—	—	—	—
I	Saskatoon	15·2	74	3 38	0	6 39	+11	4 3	PPP	7·7
II		15·2	74	4 15	PPP	7 39	+71	8 24	Q	9·5
I	Logan	15·6	116	e 3 41	− 2	e 6 32	− 5	—	—	e 7·7
II		15·6	116	e 3 42	− 1	e 6 33	− 4	—	—	e 8·0
I	Fresno	N. 15·7	146	i 3 45	+ 1	—	—	—	—	—

Continued on next page.

			△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
			°	°	m. s.	s.	m. s.	s.	m. s.		m.
I	Tinemaha	Z.	16·0	141	e 3 49	+ 1	—	—	i 3 54	PP	—
II		Z.	16·0	141	e 3 50	+ 2	—	—	—	—	—
I	College		17·2	335	e 4 16	+13	e 7 47	SSS	—	—	e 8·9
I	Santa Barbara	Z.	17·8	147	e 4 14	+ 3	—	—	—	—	—
II		Z.	17·8	147	i 4 2	− 9	—	—	—	—	—
I	Boulder City		18·4	134	e 2 51	?	—	—	—	—	—
II			18·4	134	e 4 21	+ 3	—	—	e 4 43	PPP	—
I	Mount Wilson	Z.	18·6	145	e 4 22	+ 1	—	—	—	—	—
II		Z.	18·6	145	e 4 24	+ 3	—	—	—	—	—
I	Pasadena		18·6	145	e 4 21	0	—	—	—	—	i 7·7
II			18·6	145	e 4 20	− 1	—	—	—	—	i 7·7
I	Pierce Ferry		18·6	132	e 2 46	?	—	—	—	—	—
II			18·6	132	e 4 22	+ 1	—	—	—	—	—
I	Riverside	Z.	19·0	145	e 4 26	0	—	—	—	—	—
II		Z.	19·0	145	e 4 27	+ 1	—	—	—	—	—
I	Rapid City	E.	19·6	98	e 4 32	0	e 8 16	+ 8	—	—	e 10·4
II		E.	19·6	98	e 4 33	+ 1	e 8 10	+ 2	—	—	e 10·4
II	Palomar	Z.	19·8	143	i 4 36	+ 1	—	—	—	—	—
I	La Jolla	Z.	20·1	145	e 4 38	0	—	—	—	—	—
I	Tucson		23·3	132	i 5 11	+ 1	e 9 24	+ 4	i 5 47	PP	e 11·2
II			23·3	132	i 5 14	+ 4	e 9 26	+ 6	—	—	e 9·8
I	Chicago		30·7	89	—	—	e 11 26	+ 5	—	—	e 15·4
II			30·7	89	—	—	e 11 56	+35	—	—	e 15·8
I	St. Louis		30·8	96	i 6 20	0	i 11 22	− 1	—	—	e 14·7
II			30·8	96	i 6 22	+ 2	e 11 28	+ 5	—	—	e 15·3
I	Cleveland		34·8	85	e 6 56	+ 2	e 12 25	0	e 12 28	S	e 18·0
II			34·8	85	e 6 47	− 7	—	—	—	—	e 18·1
I	Ottawa		36·5	75	7 12	+ 3	12 56	+ 5	—	—	18·7
II			36·5	75	e 7 14	+ 5	—	—	—	—	18·5
I	Vermont		38·5	75	—	—	e 14 24	+62	—	—	e 20·7
I	Seven Falls	E.	38·7	70	—	—	13 27	+ 2	—	—	19·7
I	Georgetown		39·0	84	e 7 35	+ 5	e 13 35	+ 6	e 9 0	PP	19·6
I	Halifax		44·3	70	—	—	—	—	e 21 48	Q	22·7
I	Ivigtut		44·6	43	—	—	18 12	SS	—	—	22·7
I	Scoresby Sund		49·2	25	—	—	16 10	+12	19 49	SS	22·7
II			49·2	25	—	—	16 12	+14	19 34	SS	23·5
I	Bermuda		51·0	83	—	—	e 16 20	− 2	e 19 57	SS	e 25·8
I	Uccle		72·3	28	—	—	e 21 5	+13	e 32 42	Q	e 34·7
I	Sverdlovsk		72·8	353	11 44	+12	21 6	+ 8	—	—	—
I	Strasbourg		75·2	27	e 11 56	+10	e 21 42	+17	—	—	e 37·7
II			75·2	27	e 11 58	+12	e 21 46	+21	—	—	e 36·5
I	Stuttgart		75·5	26	e 12 0?	+12	e 21 45	+17	—	—	e 38·7
I	Alicante		81·5	37	12 16	− 5	e 22 10	−22	—	—	e 35·6
I	Rome		82·7	27	—	—	e 23 0	+16	—	—	e 39·4
I	Istanbul		87·3	15	e 20 42?	?	e 23 42?	+13	—	—	—
I	Tamanrasset		97·6	40	e 13 37?	− 1	—	—	—	—	—

Additional readings and notes :—
Victoria I P = 1m.48s.? and 1m.56s.?, S = 2m.36s.?, II P = 1m.44s.?, S = 2m.54s.?
Mineral I iPZ = 2m.56s., II iPZ = 2m.57s.
Berkeley I iZ = 3m.22s., iE = 6m.0s., II iN = 3m.23s.
The readings for the first shock for Boulder City and Pierce Ferry were given at 19h.
Georgetown I eSS = 15m.56s.
Long waves were also recorded at Honolulu and at other American, Canadian, and European stations.

July 22d. Readings also at 4h. (Samarkand, near Kulyab, Stalinabad, and near Messina), 5h. (Ottawa and Messina), 6h. (Alicante), 10h. (near Klyuchi), 11h. (Istanbul), 12h. (Mount Wilson, Pasadena, Riverside, and near Tucson), 13h. (Istanbul, Scoresby Sund, and near Lick), 14h. (near Tacubaya, near Lick, and near Mineral), 15h. (Tacubaya (2), Tucson, Riverside, Tinemaha, and near Alicante), 16h. (Tacubaya, Hungry Horse, Tucson, Tinemaha, near Andijan, Murgab, Kulyab, Stalinabad, and Tashkent), 17h. (Pierce Ferry, Tucson, Tinemaha, and near Tacubaya), 19h. (near Mineral (2)), 20h. (Apia), 21h. (near Lick), 22h. (Tacubaya and near Ottawa), 23h. (Istanbul, near Mineral, and near Ottawa).

July 23d. 12h. 21m. 10s. Epicentre 3°·6S. 146°·0E. (as on 14d.).

$A = -\cdot8275$, $B = +\cdot5581$, $C = -\cdot0623$; $\delta = +11$; $h = +7$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	N.	24·7	165	i 5 18	− 6	i 9 31	−13	i 10 19	SS	i 12·1
Riverview		30·5	172	—	—	e 10 59	−19	i 12 44	SS	e 13·6
Kagosima		37·9	338	7 21	+ 1	—	—	—	—	—
Koti		38·8	343	7 35	+ 7	13 52	+26	—	—	16·6
Shizuoka		39·0	352	7 16	−14	13 35	+ 6	—	—	17·2
Misima		39·1	351	7 37	+ 6	—	—	—	—	—
Sumoto		39·2	346	e 6 26	?	—	—	—	—	—
Kameyama		39·3	349	7 39	+ 7	—	—	—	—	—
Osaka		39·3	347	e 8 34	+62	14 43	+69	—	—	21·0
Yokohama		39·3	352	8 2	+30	14 31	+57	—	—	18·2
Hunatu		39·5	352	e 6 38	−56	—	—	—	—	—
Nagoya		39·5	349	7 52	+18	—	—	—	—	—
Gihu		39·7	349	7 34	− 2	—	—	—	—	—
Maebasi		40·3	351	7 49	+ 9	—	—	—	—	—
Perth		40·4	221	i 12 45	?	13 50	0	—	—	—
Sendai		41·9	355	7 54	0	—	—	—	—	17·4
Auckland	N.	42·4	145	—	—	14 18	− 2	17 32	SS	18·8
Akita		43·4	354	8 48	+42	—	—	—	—	—
Arapuni	E.	43·7	146	—	—	e 18 2	ScS	—	—	—
Wellington		45·5	150	8 22	− 1	14 53	−12	17 20	SS	20·8
Christchurch		46·3	153	—	—	15 6	−10	17 54	SS	22·0
Vladivostok		48·2	346	e 8 45	+ 1	i 15 49	+ 6	—	—	—
Honolulu		60·3	63	e 12 11	PP	e 18 34	+ 8	e 21 41	SS	e 25·6
Calcutta	E.	62·0	298	e 10 34	+10	i 18 57	+ 9	i 23 8	SS	29·7
Irkutsk		65·9	333	e 10 52	+ 2	19 42	+ 5	—	—	—
Colombo	E.	66·8	279	20 20	PPS	—	—	—	—	—
Kodaikanal		69·6	283	—	—	i 20 27	+ 6	—	—	35·4
Bombay	E.	75·3	290	e 11 26	−21	e 21 0	−26	—	—	—
Almata		77·4	316	e 12 4	+ 6	e 21 58	+ 9	—	—	—
Murgab		78·3	310	12 4	+ 1	22 2	+ 3	—	—	—
Frunse		79·0	315	e 12 7	0	—	—	—	—	—
Andijan		80·0	312	e 12 13	0	22 20	+ 3	—	—	—
Kulyab		81·4	309	e 12 21	+ 1	22 35	+ 4	—	—	—
Stalinabad		82·3	310	i 12 24	− 1	22 43	+ 3	23 39	PS	—
Tashkent		82·4	312	i 12 26?	+ 1	e 22 36?	− 5	—	—	—
College		83·3	23	—	—	e 22 52	+ 2	e 27 54	SS	e 35·4
Sitka		87·0	32	e 12 52	+ 4	e 23 14	[0]	e 28 52	SS	e 35·8
Sverdlovsk		90·4	327	13 10	+ 6	24 2	+ 4	—	—	—
Ukiah		92·9	51	—	—	e 26 6	PPS	e 32 0	?	e 42·4
Victoria	Z.	93·0	42	e 13 39?	+22	—	—	—	—	—
Shasta Dam		93·5	49	e 13 17	− 2	—	—	—	—	—
Berkeley		93·6	52	e 13 24	+ 5	e 23 54	[+ 1]	e 18 43	PPP	e 42·2
Santa Clara		93·8	52	—	—	e 23 57	[+ 3]	—	—	—
Lick	Z.	94·0	52	e 13 20	− 1	—	—	e 16 44	PP	—
Tinemaha	Z.	96·7	53	e 13 33	0	—	—	—	—	—
Pasadena		96·8	55	e 13 32	− 2	—	—	e 31 26	SS	e 39·7
Mount Wilson	Z.	96·9	55	e 13 34	0	—	—	—	—	—
Riverside	Z.	97·5	56	e 13 36	− 1	—	—	—	—	—
Palomar	Z.	97·9	56	e 13 39	0	—	—	—	—	—
Hungry Horse		99·3	41	i 14 4	+19	—	—	—	—	—
Grozny		99·9	313	e 18 30	PP	—	—	—	—	—
Pierce Ferry		100·2	54	e 12 43	−66	—	—	—	—	—
Butte	N.	100·5	43	e 18 33	PP	e 24 28	[− 1]	—	—	e 42·1
Bozeman		101·6	43	e 14 6	+10	e 24 34	[− 1]	—	—	e 47·2
Tucson		103·0	57	e 16 53	?	e 24 41	[0]	i 18 13	PKP	e 43·2
Rapid City	E.	107·4	44	e 18 28	[+ 1]	e 27 20	?	e 28 15	PS	e 52·1
Yalta		108·0	315	e 18 55	PP	26 5	−23	—	—	—
Ksara		108·7	304	e 19 3	PP	—	—	22 45	PKS	—
Upsala		111·5	335	e 23 50?	?	e 34 11	SS	e 38 29	SSS	e 51·8
Istanbul		112·5	313	e 19 34?	PP	28 51	PS	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Scoresby Sund		112·8	356	19 26	PP	—	—	35 8	SS	—
Lincoln	E.	112·9	46	—	—	e 27 2	?	e 37 30	SS	e 48·3
Helwan		113·1	301	e 19 8	[+29]	e 29 14	PS	e 35 38	SS	—
Warsaw		113·6	326	e 19 2	[+22]	e 26 5	{−25}	22 8	PPP	e 55·8
Copenhagen		116·2	333	20 8	PP	29 20	PS	—	—	55·8
Prague		118·3	327	e 31 26	PPS	e 35 14	SS	e 40 20	SSS	e 50·8
Aberdeen		120·9	341	e 29 50?	PS	e 48 30	?	—	—	e 60·8
Triest		121·0	323	e 18 27	[−28]	e 37 11	SS	e 20 26	PP	—
De Bilt		121·7	333	e 20 44	PP	—	—	—	—	e 56·8
Stuttgart		121·9	328	e 19 0	[+ 4]	e 28 58	?	e 20 34	PP	60·8
Strasbourg		122·7	328	e 19 3	[+ 5]	e 22 11	PKS	e 20 39	PP	56·3
Uccle		123·0	333	—	—	e 29 50?	PS	e 41 50?	SSS	e 58·8
Bologna		123·1	322	e 21 27	PP	—	—	—	—	—
Rome		123·7	320	e 20 39	PP	—	—	—	—	e 56·0
Ottawa	Z.	124·7	34	e 19 5	[+ 3]	(29 50?)	?	—	—	29·8
Paris		125·3	331	e 19 5?	[+ 2]	—	—	e 20 41	PP	e 61·8
Seven Falls	E.	126·2	29	—	—	(24 50?)	?	—	—	24·8
Vermont		126·7	34	e 21 30	PP	e 30 58	PS	e 40 35	SSP	e 57·2
Clermont-Ferrand		127·0	328	e 19 9	[+ 3]	—	—	e 21 9	PP	62·3
Tortosa		131·7	324	e 22 17	PP	26 34	[+10]	22 44	PKS	e 64·8
Alicante		133·9	323	e 19 1	[−18]	41 7	SS	22 19	PKS	e 57·9
Toledo	Z.	134·9	326	19 56	[+35]	26 52	[+21]	22 58	PKS	68·2
Huancayo		136·1	111	e 19 14	[− 9]	e 27 4	[+31]	e 22 52	PKS	e 63·7
Granada		136·5	324	20 6a	[+42]	29 5	{+ 5}	22 41	PKS	60·4
Tamanrasset		137·3	300	e 19 27	[+ 1]	—	—	e 22 11	PP	—
Bermuda		139·4	41	e 23 8	PKS	e 29 51	{+34}	e 41 12	SS	e 62·9
Bogota	E.	140·0	87	e 20 32	[+61]	e 29 50	{+29}	e 23 13	PKS	66·8

Additional readings :—
Brisbane iN =5m.43s., 6m.44s., 7m.2s., and 9m.41s.
Riverview iN =11m.44s.
Wellington S_eS? =18m.24s., e =19m.29s.
Christchurch QEN =18m.40s.
College e =23m.21s.
Sitka e =24m.16s., eSSS =33m.52s.
Berkeley eN =20m.39s., ePSE =25m.30s., iN =26m.33s., eSSSE =30m.59s.
Butte eN =29m.11s.
Tucson ePP =18m.58s., eS =26m.16s., ePS =28m.30s., eSS =32m.40s.
Rapid City ePPSE =30m.34s., eSSE =34m.16s.
Upsala eSSE =34m.14s., eE =41m.50s.?.
Lincoln eS?E =28m.4s.
Helwan e =21m.53s., and 30m.32s.
Warsaw eSKSE =26m.12s., ePPSN =31m.38s., ePPSEZ =31m.44s., eSSZ =36m.1s., eSSE =36m.8s., ePKP,PKPZ =37m.59s., eSSSZ =41m.2s., eSSSE =41m.7s.
Triest eSSS =40m.52s.
Stuttgart ePPP =23m.55s., ePS =31m.20s., eSS =37m.20s., eSSS =41m.32s., eQ = 54·8m.
Strasbourg ePPP =23m.0s., ePS =30m.14s., eSS =36m.50s., eSSS =41m.50s. and 42m.15s.
Uccle eN =50m.50s.?, eE =51m.50s.?.
Rome eN =20m.59s.
Tortosa PPPEN =24m.5s., iEN =25m.6s., SKKS?N =28m.12s., PS?N =31m.23s., PPS?N =32m.53s., SSSEN =43m.31s.,
Alicante PPP =23m.23s., PS =30m.9s., PPS =31m.30s.
Huancayo ePKS =23m.32s., eSKSP =31m.43s., eSS =40m.37s., eSSS =45m.22s.
Granada S =30m.27s., PS =31m.42s., PPS =34m.25s., iSS =39m.17s., SSS =44m.53s.
Bermuda eSKSP =32m.38s.
Bogota eSKPE =23m.49s.
Long waves were also recorded at Apia, Hyderabad, Chicago, Potsdam, and Lisbon.

July 23d. 20h. 46m. 23s. Epicentre 14°·0S. 14°·0W. (as on 1939, Aug. 30d.).

$A = +·9419$, $B = -·2348$, $C = -·2404$; $\delta = +10$; $h = +·6$;
$D = -·242$, $E = -·970$; $G = -·233$, $H = +·058$, $K = -·971$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tamanrasset		41·3	28	e 7 48	− 1	—	—	e 9 26	PP	—
Granada		51·8	10	i 9 10a	− 2	i 16 1	−32	9 34	pP	—
Tortosa		56·2	14	9 59	+15	17 18	−15	12 53	PPP	31·9
Huancayo		59·6	294	e 10 9	+ 1	—	—	—	—	—
Rome		60·7	23	e 10 17	+ 2	e 18 39	+ 7	—	—	—
Clermont-Ferrand		61·5	14	e 10 17	− 4	—	—	—	—	—
Helwan		61·7	44	10 28	+ 6	—	—	e 11 58	PP	—
Paris		64·2	12	e 10 39	0	e 18 37?	−39	e 12 40	PP	e 32·6
Basle		64·2	18	e 10 39	0	—	—	—	—	—
Zürich		64·3	17	e 10 37	− 2	—	—	—	—	—
Triest		64·4	21	e 10 43	+ 3	e 19 21	+ 3	e 11 5	pP	—
Strasbourg		65·2	15	i 10 47	+ 2	e 19 18	−10	i 11 4	pP	—
Stuttgart		65·8	16	e 10 49	0	e 19 41	+ 6	—	—	—
Ksara		67·2	44	e 10 59?	+ 1	—	—	e 15 19	PPP	—
Istanbul		67·7	34	e 10 59	− 2	—	—	—	—	—
Jena		68·4	18	e 11 7	+ 1	—	—	—	—	—
Raciborzu		69·8	22	e 11 22	+ 8	—	—	—	—	—
Warsaw		72·6	22	e 11 31	0	e 21 4	+ 8	—	—	—
Yalta		72·8	34	e 11 30	− 2	—	—	—	—	—
Sotchi		75·4	37	e 11 32	−15	e 23 40	?	—	—	—
Grozny		78·9	40	e 11 13?	−54	—	—	—	—	—
Ottawa	z.	81·2	321	e 12 18	− 1	—	—	—	—	—
Moscow		81·8	27	12 22	0	e 22 37	+ 2	—	—	—
Scoresby Sund		84·5	357	12 43	+ 7	—	—	—	—	—
Sverdlovsk		93·4	32	e 13 21	+ 3	—	—	e 17 7	PP	—

Additional readings :—
Granada $P_cP = 10m.16s.$, PP = 11m.19s.
Tortosa PS?N = 17m.40s., SSE = 21m.11s.
Clermont-Ferrand eP = 10m.23s., e = 11m.26s.
Long waves were also recorded at Prague, Bermuda, and Seven Falls.

July 23d. 20h. 58m. 22s. Epicentre 14°·0S. 14°·0W. (as at 20h.46m.),

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tamanrasset	41·3	28	i 7 50k	+ 1	—	—	i 9 28	PP	—
Granada	51·8	10	i 9 12k	0	i 16 39	+ 6	9 30	pP	25·6
Alicante	53·6	13	i 9 19	− 6	i 14 38	?	—	—	e 22·0
Toledo	54·4	9	i 9 30	− 1	16 47	−22	11 19	PP	—
Tortosa	56·2	14	9 43	− 1	17 25	− 8	10 42	P_cP	e 26·6
Huancayo	59·6	294	e 10 7	− 1	e 17 57	−20	e 13 31	PPP	e 21·3
Rome	60·7	23	10 15	0	18 36	+ 4	12 33	PP	e 29·4
Clermont-Ferrand	61·5	14	i 10 21	0	e 18 44	+ 2	e 22 44	SS	28·6
Helwan	61·7	44	i 10 25k	+ 3	e 19 0	+16	—	—	—
Pavia	62·5	19	e 10 28?	0	—	—	—	—	—
Bologna	62·6	20	e 10 44	+16	—	—	e 13 5	PP	—
Paris	64·2	12	i 10 37	− 2	e 19 17	+ 1	e 13 11	PP	e 31·6
Basle	64·2	18	e 10 38	− 1	—	—	—	—	—
Zürich	64·3	17	e 10 37	− 2	—	—	—	—	—
Triest	64·4	21	i 10 40	0	i 19 23	+ 5	i 11 3	pP	—
Strasbourg	65·2	15	i 10 44	− 1	e 18 48	−40	e 12 56	PP	e 31·6
Stuttgart	65·8	16	e 10 47	− 2	e 19 38	+ 3	e 15 6	PPP	e 23·6
Kew	66·3	9	e 11 38?	+46	e 19 42	0	—	—	e 23·6
Uccle	66·5	12	—	—	e 19 38?	− 6	—	—	e 24·6
Ksara	67·2	44	i 11 4a	+ 6	20 22	+30	—	—	—
Istanbul	67·7	34	e 10 58	− 3	e 19 38?	−20	—	—	—
De Bilt	67·9	12	i 11 3a	+ 1	e 20 6	+ 5	e 13 44	PP	e 31·6
Jena	68·4	18	e 11 5	− 1	—	—	—	—	—
Raciborzu	69·8	22	e 11 23	+ 9	—	—	—	—	—
Warsaw	72·6	22	11 33a	+ 2	e 21 1	+ 5	11 51	P_cP	e 32·6

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Copenhagen		72·9	15	e 11 38	+ 5	21 0	+ 1	—	—	—
Ottawa		81·2	321	e 12 18	− 1	e 22 38	+ 9	—	—	37·6
Moscow		81·8	27	e 12 22	0	e 22 40	+ 5	e 12 43	pP	—
Scoresby Sund		84·5	357	12 38	+ 2	—	—	—	—	—

Additional readings :—
Tamanrasset ePPP = 9m.56s.
Granada P_cP = 10m.24s., iPP = 10m.47s., pPP = 11m.42s., PPP = 12m.39s., P_cS = 14m.4s., PS = 17m.27s., iSS = 20m.51s.
Tortosa PPE = 11m.40s., PPEN = 12m.46s., SN = 17m.4s., SS?EN = 21m.36s.
Huancayo e = 13m.0s.
Clermont-Ferrand eSSS = 25m.22s.
Helwan e = 19m.8s.
Bologna e = 11m.8s.
Paris i = 10m.58s.
Triest iPP = 13m.1s., iPPP = 14m.11s., eSS = 23m.46s.
Strasbourg i = 11m.3s.
Stuttgart e = 10m.54s. and 11m.5s.
De Bilt eSS = 24m.20s.
Warsaw ePN = 11m.36s., eZ = 12m.51s., ePPZ = 14m.17s., eSE = 21m.4s., ePPSEN = 21m.50s., PPSZ = 21m.53s., eE = 25m.7s., eSSE = 25m.59s., eSSZ = 26m.24s., eSSSN = 29m.3s.
Moscow PP = 15m.44s., pPP = 16m.5s., esS = 22m.17s.

July 23d. Readings also at 1h. (near Lick and near Tacubaya), 3h., 4h., and 7h. (near Mineral), 9h. (near Christchurch, New Plymouth, Wellington, Kaimata, and Monowai), 16h. (near Mineral (2)), 17h. (Ottawa, Stuttgart, and near Zürich), 18h. (near Ottawa (2)), 19h. (near Tananarive), 20h. (Tamanrasset, Ksara, Istanbul, Granada, Rome, Stuttgart, Clermont-Ferrand, Paris, Uccle, De Bilt, Kew, Bermuda, Bombay, Huancayo, and near Hungry Horse, (3)) 22h. (Pasadena, Palomar, Riverside, Lick, and Hungry Horse), 23h. (Ottawa, Pierce Ferry, Hungry Horse, and Sitka).

July 24d. 6h. 3m. 5s. Epicentre 34°·4N. 24°·5E. (as on 1943, June 27d.).
Suggested epicentres :—
35°·2N. 24°·4E. (J.S.A.) with deep focus.
35°·1N. 24°·3E. (Triest).
34°·5N. 24°·4E. (Strasbourg).
34°·5N. 24°·5E. (U.S.S.R.).

A = +·7524, B = +·3429, C = +·5624 ; δ = −2 ; h = 0 ;
D = +·415, E = −·910 ; G = +·512, H = +·233, K = −·827.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Helwan		7·4	126	i 1 51a	− 1	3 15	− 3	4 1	S_g	—
Istanbul		7·6	27	i 1 55	0	i 3 31	+ 8	—	—	—
Messina		8·2	300	i 2 0k	− 3	i 3 26	−12	—	—	—
Catania		8·3	295	2 3	− 1	3 13	−27	—	—	—
Taranto		8·4	319	i 2 4	− 2	3 31	−12	2 46	PP	3·8
Ksara		9·5	90	i 2 19k	− 1	3 54?	−16	—	—	—
Bucharest	N.	10·1	7	e 2 28	0	—	—	—	—	—
Belgrade		10·8	345	i 2 33	− 6	i 4 38	− 4	—	—	—
Campulung		10·9	2	e 2 42	+ 2	e 5 0	+16	—	—	—
Rome		12·1	312	i 2 53k	− 4	i 4 31	?	—	—	5·8
Yalta		12·5	34	i 3 0	− 2	e 5 37	+14	—	—	—
Kalossa		12·8	343	3 21	+15	—	—	—	—	7·4
Simferopol		12·9	32	i 3 6	− 1	—	—	—	—	—
Theodosia		13·5	35	e 3 14	− 1	—	—	—	—	—
Budapest	N.	13·7	344	e 4 6	+48	i 6 5	+13	—	—	7·4
Florence		13·9	316	e 3 18	− 3	e 5 16	?	—	—	e 6·8
Triest		13·9	327	i 3 17k	− 4	i 5 43	−14	—	—	i 7·6
Bologna		14·3	319	e 3 26k	0	i 6 13	+ 7	i 3 46	PP	i 8·8
Sotchi		15·0	48	e 3 32	− 3	—	—	—	—	—
Pavia	Z.	15·9	317	i 3 47k	0	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Raciborzu		16·3	345	e 3 50	− 2	e 6 35	−18	e 4 18	PP	e 7·8
Leninakan		16·6	62	e 4 0	+ 4	—	—	e 4 14	PP	—
Chur		16·8	322	e 3 58k	0	e 7 10	+ 5	—	—	—
Erevan		16·9	64	e 4 3	+ 4	—	—	e 4 35	PPP	—
Piatigorsk		17·2	50	e 4 3	0	7 15	+ 1	—	—	—
Prague		17·3	338	4 2k	− 2	e 7 8	− 8	—	—	—
Zürich		17·7	322	e 4 9k	− 1	e 7 20	− 6	—	—	e 10·2
Cheb		18·0	334	e 4 13	0	e 7 30	− 2	e 4 29	PP	e 8·6
Ebingen		18·0	328	i 4 13k	0	e 7 33	+ 1	e 7 52	SS	—
Warsaw		18·0	353	e 4 11	− 2	i 7 27	− 5	4 27	PP	e 7·9
Basle		18·3	322	e 4 17	0	e 7 40	+ 1	—	—	e 16·9
Neuchatel		18·3	321	e 4 15	− 2	e 7 35	− 4	—	—	—
Stuttgart		18·3	327	i 4 17k	0	i 7 35	− 4	i 4 30a	PP	e 9·9
Grozny		18·7	56	i 4 21	− 1	—	—	i 4 27	PP	—
Collmberg		18·8	336	i 4 24	+ 1	i 7 53	+ 3	—	—	i 11·8
Strasbourg		18·9	325	i 4 24k	0	i 7 53	0	—	—	—
Barcelona		19·0	299	i 4 23	− 3	i 7 49	− 6	8 33	SS	e 9·0
Jena		19·0	336	i 4 24	− 2	i 7 55	0	—	—	e 8·9
Clermont-Ferrand		19·8	312	i 4 35	0	i 8 13	0	—	—	11·1
Potsdam	N.	19·8	339	i 4 33	− 2	i 8 6	− 7	i 4 42	pP	—
Tortosa		20·0	295	i 4 38	+ 1	i 8 14	− 3	5 1	PP	11·7
Tamanrasset		20·2	239	i 4 41a	+ 2	e 8 31	+10	—	—	—
Alicante		20·5	289	i 4 43	+ 1	i 8 28	+ 1	5 4	PP	—
Baku		21·0	66	i 4 49	+ 2	—	—	—	—	—
Paris		21·8	318	i 4 54a	− 2	i 8 50?	− 2	i 5 20	PP	i 11·8
Uccle		22·0	324	i 4 59k	+ 1	i 8 53	− 3	e 6 8	PPP	e 11·4
De Bilt		22·5	329	i 5 3k	+ 1	i 9 5	0	—	—	e 10·9
Copenhagen		22·9	343	i 5 5a	− 1	i 9 9	− 4	—	—	—
Granada		22·9	285	i 5 7a	+ 1	i 9 19	+ 6	5 16	pP	—
Moscow		23·1	18	5 7	− 1	9 11	− 5	—	—	—
Toledo	Z.	23·4	292	i 5 14	+ 3	i 9 28	+ 7	i 5 50	PP	—
Jersey		24·6	316	i 5 37	+14	i 10 1	+19	—	—	13·9
Kew		24·7	322	i 5 25	+ 1	i 9 38	− 6	i 5 54	PP	e 15·9
Helsinki		25·8	0	i 5 32a	− 2	i 9 51	−11	i 5 52	PP	e 12·9
Upsala		25·9	352	i 5 34a	− 1	i 9 54	−10	i 6 12	PP	e 11·9
Durham		27·3	326	i 5 48	0	i 10 20	− 7	i 10 37	sS	i 15·0
Lisbon		27·3	289	5 45	− 3	10 10	−17	6 28	PP	11·2
Ashkabad		27·5	72	5 51	+ 1	—	—	—	—	—
Aberdeen		29·0	330	i 6 5	+ 1	i 10 47	− 7	i 11 58	SS	14·2
Sverdlovsk		33·2	36	i 6 39	− 1	i 11 51	− 9	—	—	—
Samarkand		34·1	68	i 6 50	+ 2	12 10	− 4	—	—	—
Stalinabad		35·6	69	i 7 2	+ 1	i 12 29	− 9	—	—	—
Tashkent		35·7	65	i 7 3	+ 1	—	—	—	—	—
Andijan		38·1	66	i 7 22	0	13 11	− 5	—	—	—
Frunse		39·5	62	i 7 35	+ 1	e 13 23	−14	—	—	—
Reykjavik		40·9	331	e 7 51	+ 5	12 58	−60	e 9 12	PP	e 20·2
Almata		41·2	61	i 7 49	+ 1	14 4	+ 2	—	—	—
Scoresby Sund		43·9	339	i 8 11a	+ 1	i 14 38	− 4	10 15	PP	—
Dehra Dun	E.	45·0	79	e 11 35?	?	e 14 49	− 9	—	—	—
Bombay	E.	45·4	97	e 8 30	+ 8	i 15 3	− 1	10 21	PP	26·5
Ivigtut		52·3	324	i 9 15	0	i 16 37	− 3	—	—	22·9
Kodaikanal	E.	53·9	102	i 9 42	+15	i 16 55	− 7	e 20 42	SS	25·8
Calcutta	N.	56·5	83	9 9	−37	—	—	11 21	PP	25·3
Tananarive		57·4	154	11 53	PP	e 18 14	+25	19 41	S_cS	—
Colombo	E.	57·7	105	e 10 55?	+60	e 17 55?	+ 2	—	—	34·9
Irkutsk		57·8	46	i 9 53	− 2	17 48	− 6	—	—	—
Johannesburg		60·3	176	10 19	+ 6	18 49	+23	12 55	PP	31·7
Halifax		65·6	309	10 51	+ 3	19 29	− 4	13 17	PP	32·9
Seven Falls	E.	69·0	313	11 9	0	20 9	− 5	21 8	PPS	30·9
Shawinigan Falls	N.	70·4	313	11 19	+ 1	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Harvard		71·7	309	i 11 27	+ 1	e 20 43	− 2	—	—	e 40·9
Vermont		71·7	312	e 11 27	+ 1	i 20 41	− 4	e 25 5	SS	e 28·8
Bermuda		72·0	297	e 11 23	− 5	i 20 45	− 4	e 25 23	SS	e 31·0
Ottawa		72·8	314	11 33	+ 1	20 57	− 1	14 16	PP	33·9
Ville Marie		73·9	316	i 11 40	+ 1	—	—	—	—	—
Fordham		74·0	308	i 11 42	+ 3	i 21 11	0	i 12 1	pP	34·7
Philadelphia		75·3	308	e 11 54	+ 7	i 21 30	+ 4	—	—	e 35·2
Pennsylvania	N.W.	76·6	311	i 11 55	+ 1	i 21 37	− 3	i 14 47	PP	—
Georgetown		77·2	308	i 12 1	+ 4	i 21 45	− 2	i 12 15	pP	e 34·2
Fort de France		78·3	279	e 12 2	− 1	e 21 56	− 3	—	—	—
Vladivostok		78·3	46	i 12 3	0	i 21 50	− 9	—	—	—
Cleveland		78·5	313	e 12 5	+ 1	i 21 56	− 5	e 12 19	pP	36·6
San Juan		80·3	286	e 12 13	− 1	e 22 13	− 7	e 28 34	SS	—
College		80·9	357	e 12 18	+ 1	e 22 21	− 5	i 22 46	S_eS	e 33·2
Cincinnati		81·7	312	(i 12 23)	+ 1	(e 22 31)	− 3	—	—	—
Chicago		81·9	316	e 12 21	− 2	i 22 27	− 9	e 15 27	PP	e 35·0
Hukuoka		83·1	54	e 12 29	0	22 42	− 6	—	—	—
Hamada		83·4	52	e 12 37	+ 7	22 37	−14	—	—	—
Kumamoto		83·7	54	12 28	− 4	—	—	—	—	—
Sapporo		83·7	41	12 33	+ 1	—	—	—	—	—
Saskatoon		83·8	332	12 31	− 1	22 47	− 8	17 39	PPP	39·9
Kagosima		84·4	56	12 36	0	22 51	−10	—	—	—
Aomori		84·9	43	12 40	+ 2	—	—	—	—	—
Akita		85·3	44	12 40	0	23 1	[− 2]	—	—	—
St. Louis		85·5	315	i 12 42	+ 1	i 23 0	[− 4]	i 13 2	pP	e 41·0
Toyama		85·5	48	12 43	+ 2	22 34	−38	—	—	—
Sumoto		85·6	51	12 43	+ 2	23 4	[− 1]	—	—	—
Hikone		85·8	50	e 12 41	− 1	—	—	—	—	—
Osaka		85·8	51	12 46	+ 4	23 3	[− 3]	13 28	pP	—
Gihu		86·1	49	12 45	+ 1	—	—	—	—	—
Kameyama		86·2	49	12 46	+ 2	—	—	—	—	—
Mizusawa	N.	86·3	44	e 12 46	+ 1	e 23 3	[− 6]	—	—	—
Miyako		86·4	43	12 42?	− 3	23 3?	[− 7]	—	—	—
Nagoya		86·4	49	12 14	−31	23 6	[− 4]	—	—	—
Sendai		86·7	45	e 12 46	− 1	23 0	[−12]	—	—	—
Sitka		86·8	349	i 12 51	+ 4	i 23 15	[+ 2]	i 23 51	S_eS	e 36·0
Maebasi		86·9	47	12 49	+ 1	23 12	[− 1]	—	—	—
Hunatu		87·3	48	12 34	−16	—	—	—	—	—
Shizuoka		87·4	49	12 52	+ 2	23 12	[− 5]	—	—	—
Kakioka		87·6	47	e 12 55	+ 4	—	—	—	—	—
Lincoln	E.	87·6	319	e 12 53	+ 2	i 23 26	− 6	e 16 15	PP	e 41·0
Misima		87·6	48	e 13 5	+14	—	—	—	—	—
Tokyo		87·7	47	e 11 59	−53	(e 22 51)	?	—	—	e 22·8
Rapid City	E.	88·5	325	e 13 0	+ 4	e 23 18	[− 6]	e 16 37	PP	e 36·3
Hungry Horse		89·7	334	e 13 1	0	i 23 54	+ 2	—	—	—
Bozeman		90·7	330	e 13 8	+ 2	e 23 27	[−10]	e 17 11	PP	e 40·2
Butte	N.	91·1	332	e 13 7	− 1	e 23 35	[− 4]	e 16 48	PP	e 37·0
Grand Coulee		91·7	337	i 13 11	+ 1	e 23 40	[− 3]	—	—	—
Victoria		93·1	339	13 16	− 1	23 54	[+ 3]	24 50	PS	42·9
Logan		94·3	329	e 13 20	− 3	e 23 47	[−10]	i 24 15	S	e 38·9
Bogota		94·5	279	i 13 19	− 4	e 24 7	[+ 9]	e 15 39	PP	36·9
Mineral	Z.	99·3	334	e 13 47	+ 2	—	—	i 17 36	PP	—
Shasta Dam		99·3	335	e 13 45	0	—	—	—	—	—
Arcata	Z.	99·7	336	e 17 51	PP	—	—	—	—	—
Pierce Ferry		99·9	327	i 13 49	+ 1	e 30 18	PKKP	e 17 49	PP	—
Boulder City		100·4	328	i 13 51	+ 1	e 30 7	PKKP	e 17 54	PP	—
Tinemaha	Z.	100·9	330	i 13 54	+ 2	e 26 55	PS	i 18 53	PP	—
Ukiah		101·0	335	e 19 40	PPP	e 25 21	− 8	26 29	PS	e 44·6
Tucson		101·5	323	i 13 56	+ 1	e 24 28	[− 6]	e 17 59	PP	e 41·8
Berkeley		101·7	333	e 13 58	+ 2	i 24 33	[− 2]	e 18 11	PP	e 47·1

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.	101·8	331	e 13 59	+ 3	e 24 33	[− 3]	e 18 11	PKP		—
Lick	Z.	102·0	333	e 13 58	+ 1	e 27 7	PS	—	—		—
Santa Clara		102·1	333	e 18 27	PP	e 24 37	[0]	e 32 23	SS		—
Riverside	Z.	103·1	328	e 14 2	0	e 27 23	PS	e 29 58	PKKP		—
Mount Wilson	Z.	103·2	328	e 14 3	0	e 27 23	PS	e 30 0	PKKP		—
Pasadena		103·4	328	e 14 3	− 1	i 24 41	[− 2]	i 18 22	PP	e 40·9	
Palomar	Z.	103·5	327	i 14 5	+ 1	i 27 23	PS	—	—		—
Tacubaya		104·3	306	e 20 40	PPP	e 25 2	{−23}	e 32 59	SS		—
Huancayo		104·8	265	e 18 32	PP	e 24 47	[− 3]	e 21 7	PPP	e 42·6	
Honolulu		124·6	3	20 45	PP	e 26 21	[+16]	e 31 8	PS	e 62·6	
Riverview		136·3	106	i 22 26k	PP	e 40 24	SS	i 23 14	PKS	e 67·3	

Additional readings and notes :—
Catania P*? = 2m.9s., S* = 3m.29s.
Bucharest iN = 2m.42s. and 3m.54s.
Belgrade i = 3m.4s., e = 4m.8s., iS = 6m.23s.
Campulung iN = 3m.14s., 4m.14s., and 4m.45s.
Rome iE = 3m.37s.?
Kalossa iE = 4m.30s., iEN = 5m.12s., iN = 6m.12s., iEN = 6m.36s.
Budapest iN = 5m.3s., 5m.16s., and 6m.25s.
Bologna iZ = 3m.50s., iSN = 6m.19s., iZ = 6m.41s.
Pavia e = 4m.44s.
Raciborzu e = 4m.48s., eP_cP?EN = 9m.43s.
Leninakan ePPP = 4m.24s.
Chur iS = 7m.14s.
Prague iZ = 4m.5s., eN = 4m.55s.
Cheb e = 4m.32s. and 6m.4s., i = 6m.44s., eSS = 7m.52s., e = 8m.3s.
Ebingen e = 5m.20s.
Warsaw PPN = 4m.31s., iSZ = 7m.30s., iSSZ = 7m.48s., iSSE = 7m.52s.
Stuttgart i = 4m.38s. and 4m.51s., iSS? = 7m.57s.
Grozny iP_cP = 5m.57s.
Potsdam iPPN = 4m.57s., iN = 7m.23s.
Tortosa iEN = 4m.52s., PPPEN = 5m.12s., SSN = 8m.49s., SSSE = 9m.15s.
Alicante PPP = 5m.13s.
Paris i = 6m.6s., iSS = 9m.15s., Q = 10m.50s.?
Uccle eE = 7m.9s., 7m.46s., and 8m.59s., iE = 9m.3s.
Granada iPP = 5m.38s., pPP = 5m.51s., PPP = 6m.10s., sS = 9m.47s.
Toledo iPPP = 6m.2s., iP_cP = 8m.42s., eSS = 10m.49s., eSSS = 11m.1s., iP_cS = 11m.30s., S_cS? = 16m.19s.
Kew iZ = 7m.54s., iEZ = 9m.53s., iE = 11m.29s., eEZ = 13m.4s., eQ = 13·9m.
Upsala iP_cPN = 9m.27s.
Durham iN = 10m.54s., iE = 11m.3s., iP_cSEN = 12m.48s.
Lisbon iPEN = 5m.49s., N = 8m.57s., iSEN = 10m.23s.
Aberdeen iEN = 8m.49s.
Reykjavik eN = 10m.17s., eSS?N = 16m.31s., eN = 17m.10s.
Scoresby Sund 8m.23s., 8m.31s., 14m.59s., 17m.2s., and 18m.1s.
Bombay iPN = 8m.33s., PPN = 10m.26s., SSE = 18m.18s., SSN = 18m.32s.
Ivigtut i = 9m.27s., eS = 16m.32s.
Calcutta eN = 16m.17s., SSN = 16m.40s.
Tananarive e = 16m.55s.
Johannesburg E = 31m.1s.
Halifax SS = 24m.7s.
Seven Falls SSE = 24m.1s.
Bermuda eS = 20m.33s., iS_cS = 21m.36s.
Ottawa PPP = 15m.53s., SS = 25m.55s., SSS = 28m.55s.
Ville Marie i = 11m.52s. and 12m.1s.
Philadelphia i = 12m.6s. and 21m.51s.
Pennsylvania ePPPNW = 16m.29s.
Georgetown ePP = 15m.1s., e = 22m.4s., eSS = 26m.39s.
Cleveland iSN = 21m.59s., iE = 22m.21s., isSE = 22m.29s., iE = 22m.34s.
San Juan e = 12m.29s.
College ePPS = 23m.14s., e = 24m.18s., eSS = 27m.18s.
Cincinnati readings have been reduced by 13m.
Chicago ePPS = 23m.59s., e = 29m.7s.
Saskatoon PS = 23m.43s., SS = 28m.31s., SSS = 31m.54s.
St. Louis i = 12m.56s. and 13m.15s., iPP = 16m.15s., isS = 23m.32s., iSS = 29m.20s., iSSS = 32m.28s.
Osaka PP = 15m.55s., PPP = 17m.39s., sS = 23m.29s.
Mizusawa SE = 23m.6s.
Sitka i = 25m.11s.
Lincoln eSKSE = 23m.9s., iS_cSE = 23m.50s., eSSSE = 32m.30s.
Rapid City ePPPE = 18m.37s., iPSE = 24m.38s., eSSE = 29m.26s., eSSSE = 32m.56s.
Bozeman e = 14m.23s., iS = 23m.55s.
Butte iS_cSN = 24m.25s., ePPSN = 25m.29s., eSSSN = 34m.14s.
Logan e = 29m.29s.

Continued on next page.

Bogota epPEZ =14m.56s., ePPSE =25m.54s.
Mineral iZ =14m.3s. and 15m.21s.
Arcata eN =17m.55s.
Pierce Ferry i =14m.4s.
Tinemaha iZ =14m.12s., eZ =30m.9s., iPKKPZ =30m.3s.
Ukiah eSS? =33m.26s.
Tucson i =14m.17s., ePKP =17m.30s., iPP =18m.3s., ePS =26m.25s., i =27m.27s., iPKKP =30m.27s., eSS =32m.36s., ePKP,PKP =38m.41s.
Berkeley eZ =14m.10s., iZ =18m.29s. and 24m.55s., iPPSZ =28m.29s., iE =32m.35s.
Fresno ePPN =18m.22s., eSKKSN =24m.52s.
Lick eZ =16m.43s.
Pasadena eZ =17m.32s., iZ =18m.34s., eEN =25m.3s., iPS =27m.22s., iZ =27m.47s., ePKKPZ =29m.58s., iSSE =32m.55s.
Palomar iZ =14m.20s., eZ =15m.54s., iZ =17m.15s., iNZ =17m.39s., eNZ =17m.49s., eN =24m.13s., eZ =30m.20s.
Tacubaya iE =20m.50s., eN =23m.55s., epSN =26m.11s., epSE =26m.15s., iN = 29m.0s. and 31m.45s.
Huancayo i =25m.17s., eSKKS =25m.31s., iS =26m.1s., ePS =28m.8s., ePPS =29m.1s., eSS =33m.13s.
Honolulu eSS =37m.35s.
Riverview iZ =22m.38s., ePPPZ =24m.4s., ePPPE =24m.14s., iZ =25m.53s., ePPSE = 34m.13s., ePPPSEZ =35m.19s., eSSSN =45m.12s., eE =46m.28s., eQN =60m.37s.
Long waves were also recorded at Auckland, Christchurch, and Wellington.

July 24d. 14h. 22m. 56s. Epicentre 17°·0S. 177°·0W. Depth of focus 0·050.
(as on 1942, Nov. 2d.).

A = −·9556, B = −·0501, C = −·2906 ; δ = +13 ; h = +5 ;
D = −·052, E = +·999 : G = +·290, H = +·015, K = −·957.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		6·0	60	i 1 33a	+ 2	2 46	+ 3	—	—	—
Tuai	N.	22·3	192	4 47	+17	e 8 33	+25	—	—	—
Wellington		25·2	195	e 5 12	+15	e 8 4?	−51	—	—	—
Christchurch		27·9	196	—	—	7 44	?	8 47	?	10·8
Brisbane	N.	29·6	244	i 5 39	+ 3	—	—	i 7 20	PP	—
Riverview		33·1	233	—	—	i 11 9	+10	—	—	i 14·1
Honolulu		42·5	27	—	—	e 13 14	− 5	—	—	e 17·5
Branner	z.	74·7	42	i 11 1	− 3	i 11 8	?	—	—	—
Santa Barbara	z.	74·7	46	i 11 2k	− 2	—	—	—	—	—
Berkeley		75·0	42	i 11 1	− 4	e 20 3	−10	i 11 10	pP	—
Lick	z.	75·0	42	i 11 2	− 3	—	—	—	—	—
Arcata	z.	75·6	39	i 11 5	− 4	—	—	—	—	—
La Jolla		75·6	49	i 11 6	− 3	—	—	e 12 31	pP	—
Pasadena		75·6	47	i 11 6k	− 3	i 20 15	− 4	e 12 31	pP	—
Mount Wilson		75·7	47	i 11 7k	− 2	—	—	e 12 31	pP	—
Palomar		76·1	48	i 11 10k	− 1	e 20 22	− 3	i 12 34	pP	—
Riverside		76·1	48	i 11 9k	− 2	—	—	e 12 31	pP	—
Shasta Dam		76·5	39	i 11 9	− 5	—	—	—	—	—
Haiwee	z.	76·8	45	i 11 14k	− 1	—	—	e 12 40	pP	—
Mineral	z.	76·8	40	i 11 10	− 5	—	—	—	—	—
Tinemaha		77·1	44	i 11 15k	− 2	—	—	e 12 42	pP	—
Boulder City		78·9	47	i 11 25	− 1	—	—	—	—	—
Pierce Ferry		79·6	47	i 11 28	− 2	—	—	e 12 25	pP	—
Tucson		80·0	51	i 11 32k	0	—	—	e 12 56	pP	—
Victoria	z.	80·8	33	e 12 18	?	—	—	—	—	—
Grand Coulee		82·8	35	i 11 40	− 7	—	—	—	—	—
Tacubaya	N.	84·6	68	i 12 1	+ 5	—	—	—	—	—
Hungry Horse		85·8	36	i 12 27	+25	—	—	—	—	—
Rapid City	E.	90·5	44	—	—	e 22 46	0	—	—	—
Copenhagen		140·7	353	18 49	[+ 1]	—	—	—	—	—
Istanbul		147·2	322	i 18 57	[− 2]	i 20 29	?	—	—	—
Stuttgart	z.	147·9	353	e 19 0	[− 1]	—	—	e 20 31	pPKP	—
Paris		148·3	2	i 19 2	[+ 1]	—	—	i 20 42	pPKP	—
Strasbourg		148·3	354	19 1	[0]	—	—	e 20 31	pPKP	—
Basle		149·3	355	e 19 2	[− 1]	—	—	e 20 36	pPKP	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Zürich		149·4	354	e 18 44	[−19]	—	—	— —	—
Triest		150·1	346	e 19 9	[+ 5]	—	—	e 20 42 pPKP	—
Helwan		151·1	302	19 4	[− 1]	—	—	i 20 38 pPKP	—
Clermont-Ferrand		151·3	0	i 19 6	[0]	—	—	i 20 34 pPKP	—
Pavia		151·4	350	e 19 11	[+ 5]	—	—	— —	—
Rome		153·9	344	e 19 8	[− 1]	—	—	e 20 37 pPKP	—
Toledo	z.	156·4	14	i 19 14	[+ 2]	—	—	— —	—
Alicante		158·5	7	e 20 24	pPKP	—	—	— —	—
Granada		159·1	15	i 19 53a	[+37]	—	—	— —	55·1
Tamanrasset		173·8	338	i 19 30k	[+ 3]	—	—	i 21 5 pPKP	—

Additional readings and note :—
Tuai iN = 6m.31s. and 8m.46s.
Berkeley eE = 22m.38s.
Pasadena eZ = 14m.7s.
Riverside iZ = 11m.21s.
Haiwee iZ = 11m.26s.
Mineral iZ = 11m.15s.
Tacubaya iE = 12m.4s.
Paris esPKP = 21m.4s.?
Strasbourg i = 19m.23s., esPKP = 21m.4s.
Helwan e = 32m.28s., 37m.34s., and 44m.6s.
Clermont-Ferrand iPKP = 19m.11s.
Rome eZ = 19m.26s.
Tamanrasset epPP = 26m.38s.
Long waves were also recorded at Auckland.

July 24d. Readings also at 0h. (Istanbul, Ksara, Tamanrasset, near Lick and Mineral), 1h. (near Mineral (2)), 2h. (Huancayo, La Plata, Mount Wilson, Palomar, Riverside, Tinemaha, Tucson, Pierce Ferry, and near Apia), 4h. (Istanbul, Rome, Strasbourg, Stuttgart, Ottawa, Huancayo, and near Tacubaya), 5h. (Istanbul), 6h. (Mineral, near Irkutsk and near Tacubaya), 7h. (near Mineral), 8h. (Stuttgart), 9h. (Granada, and Istanbul), 11h. (near Harvard), 13h. (Sverdlovsk, Mount Wilson (2), Pasadena, Palomar, Riverside (2), Tinemaha (2), Tucson (2), Boulder City, Pierce Ferry (2), Sitka, Hungry Horse, Arcata, near Berkeley, Lick, and near Mineral (2), several shocks), 15h. (Istanbul, Ksara, Strasbourg, Stuttgart, Toledo, Tamanrasset, Bombay, Kodaikanal, and near Mineral), 16h. (Clermont-Ferrand, Paris, Uccle, Alicante, Granada, Tortosa, Huancayo, and near Ottawa), 17h. (near Branner), 18h. and 19h. (Ottawa), 20h. (near Lick), 21h. (Clermont-Ferrand, Paris, Strasbourg, Stuttgart, Tamanrasset, near Mineral and near Tacubaya), 22h. (Ottawa and Rome).

July 25d. 0h. Region of Samoa.

Apia eP = 11m.0s., iS = 11m.31s.
Lick ePZ = 21m.49s.
Pasadena ePZ = 21m.50s.
Mount Wilson ePZ = 21m.52s.
Palomar ePZ = 21m.52s.
Riverside ePZ = 21m.52s.
Berkeley ePZ = 21m.58s., eE = 31m.12s., eLEN = 40·5m.
Tinemaha ePZ = 22m.1s.
Pierce Ferry eP = 22m.3s.
Boulder City eP? = 22m.11s.
Tucson eP = 22m.15s.
Victoria eZ = 23m.7s.
Hungry Horse eP? = 23m.12s.
Honolulu e = 27m.32s., eL = 30m.30s.
Istanbul e = 28m.
Paris ePKP = 30m.6s.? and 30m.15s., i = 30m.43s., ePP = 33m.55s., eL = 92m.
Stuttgart eZ = 30m.10s.? and 30m.35s.
Warsaw ePKPZ = 30m.10s., PP?Z = 33m.9s., eLZ = 98m.
Strasbourg ePKP = 30m.13s., e = 30m.34s.
Clermont-Ferrand ePKP = 30m.16s., L = 97m.
Ksara e = 31m.16s. and 44m.16s.
Rome eN = 74m.51s.
Long waves were also recorded at Auckland, Christchurch, Wellington, Seven Falls, and Kew.

July 25d. 5h. 25m. 7s. Epicentre 6°·2S. 105°·7E. (as on 1948, March 24d.).

A = −·2690, B = +·9571, C = −·1073; δ = −9; h = +7;
D = +·963, E = +·271; G = +·029, H = −·103, K = −·994.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Andijan		55·9	329	e 9 39	− 3	e 17 26	− 3	—	—
Frunse		56·4	332	e 9 43	− 2	—	—	—	—
Sverdlovsk		73·0	336	i 11 34	+ 1	e 20 57	− 3	—	—
Moscow		83·0	328	e 12 32	+ 4	e 22 48	+ 1	—	—
Victoria	z.	120·9	36	e 20 6	PP	—	—	—	—
Shasta Dam		125·1	44	e 19 27	[+24]	—	—	—	—
Mineral	z.	125·8	43	i 19 29	[+25]	—	—	—	—
Hungry Horse		126·2	32	e 19 57	[+52]	—	—	—	—
Tinemaha	z.	129·5	46	i 16 47	P	e 22 58	PKS	i 19 40	PKP
Santa Barbara	z.	129·6	49	e 19 40	[+29]	—	—	—	—
Haiwee	z.	130·3	46	e 19 40	[+27]	—	—	—	—
Mount Wilson	z.	130·9	49	e 17 31	?	e 23 6	PKS	e 19 41	PKP
Pasadena	z.	130·9	49	i 19 40	[+26]	i 23 3	PKS	—	—
Riverside	z.	131·5	49	i 17 35	?	—	—	e 19 40	PKP
Tucson		137·2	47	i 16 47	P	i 23 21	PKS	e 19 43	PKP
Ottawa	z.	140·9	2	e 22 41	PP	—	—	—	—

Additional readings :—
Tinemaha eZ = 18m.1s., 19m.56s., and 23m.23s.
Pasadena iZ = 20m.19s. and 23m.28s.
Tucson e = 23m.49s.

July 25d. 21h. 47m. 43s. Epicentre 36°·7N. 70°·5E. Depth of focus 0·020.
(as on 1947, Dec. 7d.).

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 39	− 1	i 1 11	+ 1	—	—
Samarkand	4·1	319	i 0 57	− 6	i 1 47	− 4	—	—
Andijan	4·3	20	e 1 2	− 3	i 1 57	+ 2	—	—
Tashkent	4·7	349	i 1 8?	− 2	e 2 2?	− 3	—	—
Frunse	6·9	26	e 1 37	− 3	e 2 54	− 3	—	—
Almata	8·2	35	e 2 5	+ 8	—	—	—	—
Baku	16·5	289	e 3 49	+ 6	e 7 23	+42	—	—
Grozny	20·0	297	i 4 25	+ 3	8 5	+12	—	—
Sverdlovsk	21·2	345	4 33	− 1	8 22	+ 7	5 1	pP
Moscow	29·2	322	e 5 48	− 1	e 10 43?	+15	e 6 18	pP
Copenhagen	43·0	316	7 45	0	—	—	—	—

July 25d. Readings also at 2h. (Apia), 3h. (Pierce Ferry, Copenhagen, Rome, and Istanbul), 4h. (Stuttgart, Boulder City, Pierce Ferry, Pasadena, Riverside, and near Mineral (2)), 7h. (Ottawa and Warsaw), 9h. (Tacubaya), 12h. (near Mineral (2)), 14h. (near Mineral and near Tacubaya), 15h. (near Mineral and near Lick), 16h. (Rome and near Mineral), 17h. (Alicante, Toledo, Clermont-Ferrand, Strasbourg, and Stuttgart), 23h. (Stuttgart).

July 26d. 3h. 33m. 35s. Epicentre 7°·5N. 77°·4W.

A = +·2163, B = −·9677, C = +·1297; δ = +5; h = +7;
D = −·976, E = −·218; G = +·028, H = −·127, K = −·992.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Balboa Heights		2·6	304	i 0 32	−12	i 1 10	− 7	—	—	—
Bogota	z.	4·4	131	i 1 10	0	i 2 8	+ 6	i 1 39	P_g	—
San Juan		15·4	44	e 3 43	+ 3	e 6 38	+ 6	e 3 55	PP	e 7·1
Merida	N.	17·8	320	i 4 44	PPP	—	—	—	—	—
Huancayo		19·5	174	i 4 34	+ 3	e 8 13	+ 7	—	—	e 10·1

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tacubaya	E.	24·2	302	e 5 11	− 8	—	—	e 5 50	PP	—
St. Louis		33·1	341	i 6 35	− 5	e 11 51	− 8	—	—	—
Harvard		35·2	8	i 6 58	0	—	—	i 7 8	P	—
Ottawa		37·8	3	i 7 18	− 2	—	—	i 9 31	?	20·4
Tucson		39·6	314	i 7 35a	0	—	—	e 9 5	PP	—
Boulder City		44·3	316	i 8 15	+ 2	—	—	—	—	—
Palomar	Z.	44·6	312	i 8 17a	+ 1	—	—	e 9 57	PP	—
Riverside	Z.	45·3	312	i 8 21a	0	—	—	e 9 59	PP	—
Mount Wilson	Z.	45·9	312	e 8 27	+ 1	—	—	—	—	—
Pasadena	Z.	46·0	312	i 8 26a	− 1	—	—	—	—	—
Tinemaha	Z.	47·3	315	i 8 38	− 1	—	—	—	—	—
Hungry Horse		51·1	330	i 9 5	− 1	—	—	—	—	—
Mineral	Z.	51·2	317	i 9 5	− 2	—	—	i 9 17	pP	—
Shasta Dam		51·9	317	i 9 8	− 4	—	—	—	—	—
Victoria		56·3	325	e 10 32	+47	—	—	—	—	—
Tamanrasset		80·6	68	i 12 14a	− 2	—	—	i 12 24a	P_cP	—
Strasbourg		81·2	42	i 12 17a	− 2	—	—	e 12 34	P_cP	—
Stuttgart	Z.	82·2	42	e 12 22	− 2	—	—	—	—	—

Additional readings :—
Bogota iS_gZ = 2m.44s.
Tucson i = 7m.45s., eP_cP = 9m.29s.
Palomar iZ = 8m.29s., 8m.38s., 8m.51s., 10m.7s., and 10m.17s.
Riverside iZ = 8m.34s.
Mount Wilson eZ = 8m.39s. and 8m.52s.
Pasadena eZ = 8m.38s., iZ = 8m.49s.
Tinemaha eZ = 9m.12s.
Long waves were also recorded at Uccle.

July 26d. 11h. 26m. 24s. Epicentre 35°·5N. 27°·2E. (as on 1948, March 29d.).

A = +·7258, B = +·3730, C = +·5781 ; δ = +11 ; h = 0 ;
D = +·457, E = −·889 ; G = +·514, H = +·264, K = −·816.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Istanbul		5·8	14	1 49	P_g	2 36	− 2	—	—	—
Helwan		6·6	147	i 1 43a	+ 2	e 2 53	− 5	—	—	e 5·0
Ksara		7·4	101	e 1 44?	− 8	e 3 12	− 6	—	—	—
Yalta		10·4	28	2 32	− 2	e 4 26	− 6	—	—	—
Belgrade		10·6	333	e 2 43	+ 7	—	—	—	—	i 6·7
Rome	N.	13·1	304	e 4 43	?	e 5 54	+16	—	—	—
Leninakan		14·1	63	e 3 23	0	—	—	—	—	—
Triest		14·4	319	i 3 43	+16	e 5 58	−11	—	—	e 7·4
Bologna		15·1	311	e 3 45	+ 9	—	—	e 3 57	PP	—
Warsaw		17·3	348	e 4 7	+ 3	e 7 21	+ 5	e 7 42	SS	e 9·6
Zürich		18·3	317	e 4 16k	− 1	e 7 36?	− 3	—	—	—
Stuttgart		18·7	322	e 4 22	0	e 8 12	SS	—	—	e 10·6
Basle		18·9	317	e 4 21	− 3	—	—	e 6 14	?	—
Jena	N.	19·1	330	e 4 21	− 6	—	—	e 4 28	P	—
Strasbourg		19·4	320	i 4 31a	+ 1	e 8 43	SSS	i 4 39	PP	e 10·6
Clermont-Ferrand		20·9	307	e 4 46	0	—	—	—	—	—
Moscow		21·5	16	e 4 50	− 2	e 8 41	− 6	—	—	—
Paris		22·5	314	e 5 2	0	e 9 30	SS	—	—	e 13·6
Copenhagen		22·6	338	5 2	− 1	—	—	—	—	14·6
Tamanrasset		22·7	242	i 5 10a	+ 6	—	—	i 5 25a	PP	—
Ashkabad		25·0	75	e 5 29	+ 2	e 9 52	+ 3	—	—	—
Sverdlovsk		31·0	36	—	—	e 11 14	−12	—	—	—
Tashkent		33·2	67	e 6 31?	− 9	—	—	—	—	—
Andijan		35·6	68	e 7 2	+ 1	—	—	—	—	—

Additional readings :—
Warsaw eSSN = 7m.46s.
Tamanrasset iPPP = 6m.40s. a.
Long waves were also recorded at De Bilt.

July 26d. 12h. 54m. 52s. Epicentre 16°·6S. 73°·6W. (as on 20d.).

$A = +·2707$, $B = -·9198$, $C = -·2839$; $\delta = -9$; $h = +5$;

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Huancayo		4·8	339	i 1 13	− 2	(i 2 8)	− 4	i 1 43	P_g	i 2·1
Bogota	z.	21·1	358	i 4 58	+10	—	—	—	—	—
Harvard		58·8	3	i 10 4	+ 2	—	—	—	—	—
Tucson		60·3	324	e 10 10	− 3	—	—	—	—	—
Ottawa		61·7	359	10 23	+ 1	18 40	− 4	—	—	—
Palomar	z.	64·6	321	e 10 44	+ 3	—	—	e 11 17	P_cP	—
Boulder City		65·2	324	e 10 46	+ 1	—	—	—	—	—
Riverside	z.	65·3	321	e 10 46	0	—	—	i 10 55	P	—
Mount Wilson	z.	65·9	321	e 10 49	− 1	—	—	i 11 0	P	—
Pasadena	z.	65·9	321	i 10 50	0	—	—	e 11 16	P_cP	—
Tinemaha	z.	68·0	322	i 11 4	+ 1	—	—	i 11 13	P_cP	—
Shasta Dam		72·8	323	e 11 30	− 2	—	—	—	—	—
Hungry Horse		74·0	334	i 11 39	0	—	—	—	—	—
Victoria	z.	78·5	329	e 12 55	+51	—	—	—	—	—
Granada		84·8	50	—	—	(31 38)	SSS	—	—	31·6
Toledo	z.	85·6	47	i 12 53	+12	—	—	—	—	—
Tamanrasset		86·7	66	i 13 1	+14	—	—	—	—	—
Stuttgart	z.	97·7	42	e 13 46	+ 8	—	—	—	—	—
Rome	E.	98·0	49	e 27 28	PS	—	—	—	—	—

Additional readings :—
Palomar iZ = 10m.51s. and 10m.54s.
Pasadena eZ = 10m.57s., iZ = 11m.1s.
Tinemaha iZ = 11m.10s.
Long waves were also recorded at other European stations.

July 26d. 17h. Undetermined shock.

Tucson iP = 33m.27s., i = 34m.39s., eS? = 36m.20s., eL = 37m.3s.
Palomar ePZ = 33m.59s., eZ = 34m.36s.
La Jolla eZ = 34m.8s. and 34m.19s.
Riverside iPZ = 34m.15s., iZ = 34m.26s. and 34m.32s.
Pasadena ePZ = 34m.19s., iZ = 34m.30s. and 34m.35s., eLNZ = 39m.
Mount Wilson iPZ = 34m.20s., iZ = 34m.31s.
Boulder City eP = 34m.24s., ipP = 34m.36s.
Pierce Ferry iP = 34m.26s.
Haiwee ePZ = 34m.37s., eZ = 34m.49s.
Tinemaha ePZ = 34m.52s., iZ = 34m.57s. and 35m.5s.
Lick ePZ = 35m.7s.
Mineral ePZ = 35m.31s.
Hungry Horse iP? = 36m.3s.
Tacubaya eN = 36m.7s.
Salt Lake City e = 39m.20s., eL = 41m.42s.
Santa Clara eSE = 39m.28s., eLE = 42m.26s.
Chicago e = 42m.38s., eL = 45m.44s.
Long waves were also recorded at other American stations.

July 26d. 17h. 49m. 59s. Epicentre 35°·7N. 118°·0W. (as on 1947, February 6d.).

$A = -·3821$, $B = -·7187$, $C = +·5810$; $\delta = +9$; $h = 0$;
$D = -·883$, $E = +·469$; $G = -·273$, $H = -·513$, $K = -·814$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Haiwee		0·4	4	i 0 13k	0	i 0 21	0	—	—	—
Tinemaha		1·4	352	i 0 28k	+ 1	i 0 48	+ 2	—	—	—
Mount Wilson		1·5	182	i 0 27k	− 1	i 0 45	− 4	—	—	—
Pasadena		1·6	185	i 0 28k	− 2	i 0 47	− 4	—	—	—
Fresno	N.	1·8	306	i 0 31	− 1	i 0 52	− 4	—	—	—
Riverside		1·8	163	i 0 32k	0	i 0 55	− 1	—	—	—
Santa Barbara		1·9	228	i 0 32	− 2	i 0 55	− 4	—	—	—
Palomar		2·5	158	i 0 43a	0	i 1 21	+ 7	—	—	—
Boulder City		2·6	84	i 0 46	+ 2	i 1 28	S_g	i 0 53	P_g	i 2·3
La Jolla		2·9	168	i 0 54	+ 6	i 1 31	+ 7	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Pierce Ferry		3·3	83	i 0 59	+ 6	i 1 51	S_g	i 1 9	P_g	—
Lick		3·4	300	i 0 53	− 2	i 1 43	+ 6	i 1 49	S_g	—
Santa Clara		3·6	298	—	—	e 2 1	S_g	—	—	—
Branner	z.	3·8	298	i 0 58	− 3	—	—	—	—	—
Mineral		5·4	330	i 1 27	+ 3	e 2 46	S*	i 2 51	S_g	—
Shasta Dam		6·1	326	i 1 34	0	—	—	—	—	—
Tucson		6·9	118	i 1 44	− 1	i 3 32	S*	—	—	i 3·8
Arcata		7·0	319	—	—	e 3 11	+ 3	e 3 44	S_g	—

Additional readings :—
Pierce Ferry i = 1m.26s.
Mineral iZ = 1m.38s.
The reading for Shasta Dam is reduced by 5 minutes.

July 26d. 19h. Undetermined shock. Strasbourg suggests 18°·0S. 170°·0E.

Brisbane iPN = 4m.30s., iPPN = 4m.42s., iN = 6m.54s., iSN = 8m.6s. and 8m.10s.
Riverview iP?Z = 5m.46s.k, eS?N = 9m.56s.
Shasta Dam iP = 12m.43s.
Lick iPZ = 12m.43s.
Mineral ePZ = 12m.46s.
Pasadena iPZ = 12m.52s., iZ = 13m.9s. and 13m.21s., eLEZ = 40m.0s.
Mount Wilson iPZ = 12m.53s.a, iZ = 13m.10s. and 13m.22s.
Palomar iP = 12m.54s a, iZ = 13m.9s. and 13m.12s.
Hungry Horse iP = 12m.54s., e = 13m.20s.
Riverside iPZ = 12m.55s.a, iZ = 13m.13s. and 13m.21s.
Tinemaha iPZ = 12m.56s., iZ = 13m.14s.
Boulder City iP = 13m.8s., ipP? = 13m.24s., i = 13m.37s.
Pierce Ferry iP = 13m.14s., ipP = 13m.30s.
Tucson eP = 13m.19s., e = 13m.36s., eL = 44m.40s.
Grand Coulee eP? = 13m.33s.
Victoria eZ = 13m.42s.
Ottawa iZ = 18m.52s.
Istanbul e = 20m.0s.?
Tamanrasset ePKP = 20m.3s.
Stuttgart eZ = 23m.19s.
Long waves were also recorded at Christchurch, La Plata, Fort de France, Seven Falls, and at other American and European stations.

July 26d. Readings also at 0h. (Mineral), 1h. (near Mineral and near Grozny), 2h. (Ottawa, near Lick, and Branner), 3h. (near Lick, Branner, and Santa Clara), 4h. (Tinemaha and Tucson), 6h. (Mount Wilson, Pasadena, Palomar, Tinemaha, Riverside, Ottawa (2), San Juan, Huancayo, Bogota, and near Balboa Heights), 11h. (Istanbul, Ksara, and near Hungry Horse), 12h. (near Stuttgart), 14h. (Alicante and near Mineral), 15h. (Alicante and near Mineral), 16h. (near Mineral), 17h. (Lick and near Piatigorsk), 19h. (Istanbul, and San Francisco), 20h. (De Bilt, Bogota, and near Huancayo), 21h. (Istanbul and Clermont-Ferrand), 23h. (near Mineral).

July 27d. 5h. 41m. 30s. Epicentre 44°·5N. 91°·5E.

$A = -·0187$, $B = +·7154$, $C = +·6985$; $\delta = +5$; $h = -3$;
$D = +1·000$, $E = +·026$; $G = -·018$, $H = +·698$, $K = -·716$.

	Δ	Az.	P.	O−C.	S.	O−C.	L.
	°	°	m. s.	s.	m. s.	s.	m.
Almata	10·6	269	e 2 31	− 5	—	—	—
Frunse	12·3	269	e 3 1	+ 2	—	—	—
Andijan	14·6	262	3 28	− 2	—	—	—
Tashkent	16·6	267	e 4 4	+ 8	e 7 4	+ 4	—
Obi-garm	17·3	258	e 3 2?	?	—	—	—
Stalinabad	18·0	260	i 4 12	− 1	e 7 31	− 1	—
Samarkand	18·8	265	4 30	+ 7	—	—	—
Sverdlovsk	22·9	314	5 2	− 4	e 9 4	− 9	—
Ashkabad	25·6	268	e 5 36	+ 4	—	—	—
Grozny	32·7	285	e 6 42	+ 6	—	—	—
Moscow	35·4	309	e 6 58	− 2	—	—	—
Stuttgart	54·0	306	e 9 28?	0	—	—	e 28·6
Paris	57·8	310	e 9 56	+ 1	—	—	e 30·5
Hungry Horse	84·9	18	i 12 32	− 6	—	—	—
Shasta Dam	89·9	26	i 12 57	− 5	—	—	—

Long waves were also recorded at several other European stations.

July 27d. Readings also at 1h. (Victoria), 3h. (Shasta Dam), 8h. (San Juan), 10h. (Almata, Samarkand, near Andijan, Frunse, Obi-garm, Stalinabad, and Tashkent), 12h. (near Pierce Ferry, Tucson, Pasadena, Riverside, La Jolla, Palomar, and near Tacubaya), 16h. (Rome), 17h. (Sverdlovsk, Mizusawa, Pasadena, Palomar, Riverside, Tucson, Pierce Ferry, Tinemaha, Grand Coulee, near Hungry Horse, and near Shasta Dam, deep focus), 18h. (Rome, Harvard, Ottawa (2), Seven Falls, Butte, Grand Coulee, and Hungry Horse (2)), 21h. (Shasta Dam (2)), 23h. (Shasta Dam and near Branner).

July 28d. 8h. Turkestan. U.S.S.R. gives 41°57′N. 75°00′E.

Frunse iP = 1m.25s., iS = 1m.47s., iS_g = 1m.55s.
Almata P = 1m.37s., S_g = 2m.10s.
Andijan eP = 1m.39s., iS_g = 2m.16s.
Tashkent eP = 2m.6s., eS_g = 3m.31s.
Stalinabad iP = 2m.24s., iS_g = 4m.4s.
Samarkand P = 2m.40s.
Sverdlovsk iP = 5m.9s.
Grozny eP = 5m.54s.
Irkutsk eP = 6m.8s., eS = 10m.7s.?
Leninakan P = 6m.29s.
Moscow eP = 6m.52s.

July 28d. 8h. Northern Alaska.

College iP = 16m.53s., iS? = 17m.3s., iL = 17m.15s.
Saskatoon P = 21m.18s., S = 26m.28s., SS = 28m.10s., L = 30·2m.
Victoria iPZ = 21m.30s., S = 27m.41s., eN = 27m.55s., L = 28·8m.
Grand Coulee eP = 21m.46s., eL = 28m.41s.
Hungry Horse iP = 22m.2s., iL = 29m.33s.
Shasta Dam iP = 22m.36s.
Mineral ePZ = 22m.41s.
Lick ePZ = 23m.7s.
Tinemaha iPZ = 23m.19s.
Haiwee ePZ = 23m.27s.
Vladivostok eP = 23m.36s.
Pierce Ferry eP = 23m.38s.
Mount Wilson iPZ = 23m.41s.
Pasadena iPZ = 23m.41s., eLE = 34·5m.
Riverside iPZ = 23m.44s.
Palomar iPZ = 23m.50s.
La Jolla ePZ = 23m.54s.
Tucson iP = 24m.16s., i = 24m.26s. and 25m.19s., eL = 37m.53s.
Chicago eP = 24m.28s., e = 29m.40s., eL = 38m.16s.
Boulder City eP = 24m.39s.
Ottawa P = 24m.42s., PP = 26m.24s., L = 36·2m.
Shawinigan Falls eN = 24m.46s., LN = 39·1m.
Seven Falls eE = 24m.49s., LE = 38·9m.
Cleveland iZ = 24m.51s., eEN = 25m.52s., iEN = 39m.48s.
Vermont e = 26m.28s. and 27m.32s., eL = 41m.6s.
Sverdlovsk P = 26m.31s., eS = 34m.47s.
Philadelphia e = 27m.1s. and 31m.18s., eL = 41m.14s.
New Kensington eE = 27m.17s., eLE = 40m.19s.
Harvard e = 30m.12s., iL? = 41m.6s.
Long waves were also recorded at other North American stations and at Ksara, Rome, Warsaw, and Istanbul.

July 28d. 8h. 18m. 31s. Epicentre 35°·5N. 26°·5E. (as on 1946, April 12d.).

$A = +·7303$, $B = +·3641$, $C = +·5781$; $\delta = +11$; $h = 0$;
$D = +·446$, $E = -·895$; $G = +·517$, $H = +·258$, $K = -·816$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Istanbul		5·9	19	e 2 18?	P_g	i 3 13	S_g	— —	—
Helwan		6·9	143	2 47	+62	—	—	e 3 2 P*	—
Ksara		7·9	99	e 1 56	− 3	—	—	e 5 54 ?	—
Warsaw		17·2	349	(e 4 4)	+ 1	(e 7 12)	− 2	(e 4 34) PPP	(e 7·5)
Stuttgart	z.	18·4	323	e 4 22	+ 4	—	—	— —	—
Strasbourg		19·0	320	e 4 25	− 1	—	—	— —	—
Paris		22·1	315	e 4 57?	− 2	—	—	e 5 17 PP	—
Tamanrasset		22·2	240	e 5 0	0	—	—	— —	—
Copenhagen		22·4	339	(5 29?)	PP	—	—	— —	5·5

Warsaw gives also eN = (4m.9s.), eE = (6m.39s.), readings increased by 4 minutes.
Long waves were also recorded at Triest, Uccle, and De Bilt.

July 28d. 14h. 21m. 52s. (I). | Epicentre 7°·5N. 81°·5W.
15h. 5m. 45s. (II). | (as on 1941, March 10d.).

Damage in Coiba Is., epicentre 8°N. 81°W. (Bulletin of the S.S.A., Vol. 38, No. 4, Oct., 1948, p. 296).

A = +·1466, B = −·9807, C = +·1297 ; δ = +9 ; h = +7 ;
D = −·989, E = −·148 ; G = +·019, H = −·128, K = −·992.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
I	Bogota	7·9	111	e 2 5	+ 6	i 3 39	+ 9	i 4 49	S_g	—
II		7·9	111	i 1 5	−54	e 2 32	−58	e 3 17	S_g	—
I	Merida	15·5	331	e 4 16	PPP	—	—	—	—	—
II		15·5	331	e 4 11	PPP	—	—	e 4 27	?	—
I	San Juan	18·4	53	e 4 16	− 2	e 7 52	+11	—	—	e 9·0
II		18·4	53	e 4 19	+ 1	e 7 47	+ 6	e 4 59	PPP	e 9·2
I	Huancayo	20·4	163	e 4 42	+ 1	e 8 43	SS	i 5 32	?	e 9·8
II		20·4	163	e 4 44	+ 3	e 8 38	SS	e 6 1	?	e 9·6
I	Tacubaya E.	20·8	307	i 4 48	+ 3	e 9 6	SSS	—	—	—
II	E.	20·8	307	i 4 48	+ 3	—	—	—	—	—
I	Fort de France	21·2	70	e 4 50	+ 1	e 8 58	+17	—	—	—
II		21·2	70	e 4 40	− 9	e 8 50	+ 9	—	—	—
I	La Paz	27·3	151	5 48	0	—	—	e 5 16	?	16·1
II		27·3	151	i 5 54	+ 6	i 10 37	+10	6 55	PPP	14·8
I	Bermuda	29·1	31	—	—	e 10 58	+ 2	—	—	e 13·3
I	St. Louis	32·0	347	i 6 17	−13	e 11 35	− 7	—	—	—
II		32·0	347	i 6 17	−13	i 11 31	−11	—	—	—
II	Philadelphia	32·8	11	—	—	e 11 57	+ 3	—	—	e 14·5
I	Cleveland	33·8	0	e 6 45k	− 1	e 12 9	− 1	—	—	e 16·4
I	Fordham	33·9	12	e 6 47	0	e 12 17	+ 6	—	—	—
II		33·9	12	e 8 15	PPP	e 12 18	+ 7	—	—	—
I	Tucson	36·7	316	i 7 10k	0	e 13 4	+10	e 8 22	PP	e 17·5
II		36·7	316	e 7 10	0	e 13 30	+36	e 7 55	?	e 17·5
I	Ottawa	38·1	8	7 21	− 1	13 20	+ 4	8 52	PP	18·1
II		38·1	8	7 19	− 3	13 15	− 1	8 45	PP	18·3
I	Seven Falls E.	40·5	11	—	—	e 13 50	− 2	—	—	16·1
II	E.	40·5	11	—	—	e 13 51	− 1	—	—	16·3
I	Pierce Ferry	41·1	319	e 7 48	+ 1	—	—	—	—	—
II		41·1	319	e 7 45	− 2	—	—	—	—	—
I	Boulder City	41·6	319	e 8 51	+60	—	—	—	—	—
II	La Jolla z.	41·6	313	e 7 51	0	—	—	—	—	—
I	Palomar	41·6	314	i 7 52k	+ 1	—	—	—	—	—
II		41·6	314	i 7 48	− 3	—	—	—	—	—
I	Riverside z.	42·3	314	i 7 57k	0	—	—	e 8 5	?	—
II	z.	42·3	314	e 7 53	− 4	—	—	—	—	—
II	Salt Lake City	42·7	326	e 13 27	?	e 14 31	+ 7	—	—	e 17·5
I	Mount Wilson z.	42·9	314	i 8 1k	− 1	—	—	e 8 12	?	—
II	z.	42·9	314	i 8 1	− 1	—	—	—	—	—
II	Pasadena	42·9	314	i 8 3k	+ 1	i 13 36	−51	i 8 14	?	e 23·1
II		42·9	314	i 8 2	0	i 14 32	+ 5	—	—	e 19·3
I	Haiwee z.	43·8	317	e 8 9	0	—	—	—	—	—
II	z.	43·8	317	e 8 8	− 1	—	—	—	—	—
I	Santa Barbara z.	44·2	313	e 8 13	+ 1	—	—	—	—	—
II	z.	44·2	313	e 8 12	0	—	—	—	—	—
I	Tinemaha z.	44·5	317	i 8 15k	0	—	—	—	—	—
II	z.	44·5	317	e 8 13	− 2	—	—	—	—	—
I	Lick z.	47·0	316	e 8 34	− 1	—	—	—	—	—
II	z.	47·0	316	e 8 31	− 4	—	—	—	—	—
I	Hungry Horse	49·1	333	i 8 49	− 2	—	—	—	—	—
II		49·1	333	i 9 48	+57	—	—	—	—	—
I	Toledo z.	75·6	52	i 11 46	− 2	—	—	—	—	—
I	Granada	75·9	54	i 11 53k	+ 3	i 21 38	+ 6	—	—	—
II		75·9	54	i 11 56s	+ 6	21 36	+ 4	i 14 12	PP	28·5
I	Alicante	78·3	53	e 11 26	−37	23 28	PPS	—	—	e 30·9
I	Clermont-Ferrand	80·9	47	i 12 18	+ 1	—	—	—	—	—
II		80·9	47	e 12 17	0	e 22 32	+ 6	e 27 44	SS	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.
I	Strasbourg	83·9	42	e 12 34	+ 1	e 23 2	+ 6	—	—	—
I	Tamanrasset	84·4	68	e 12 42	+ 6	—	—	i 8 48 a	?	—
II		84·4	68	i 12 36 a	0	—	—	—	—	—
I	Stuttgart	84·9	42	e 12 38	0	e 23 11	+ 5	e 40 8?	Q	e 43·1
II		84·9	42	e 12 37	− 1	e 23 27	S_cS	—	—	e 39·3
I	Copenhagen	86·1	34	—	—	23 26	+ 8	—	—	—
II		86·1	34	—	—	23 20	+ 2	—	—	—
I	Rome	88·0	48	e 12 53	0	23 43	+ 7	23 10	SKS	—
II		88·0	48	e 13 10	+17	e 23 42	+ 6	—	—	—
I	Triest	88·4	44	e 12 56	+ 1	e 23 28	[+ 5]	e 16 28	PP	—
II		88·4	44	—	—	e 23 27	[+ 4]	e 23 59	S	—

Additional readings :—
Ottawa II SS =15m.33s., SSS =15m.57s.
Palomar I iZ =7m.56s. and 8m.2s.
Tinemaha I iZ =8m.22s. and 8m.26s.
Granada II SS =25m.32s.
Tamanrasset I i =12m.56s.k, e =13m.13s.
Triest ePPP =18m.21s.
Long waves to II were recorded at Christchurch and to both shocks at other North American and European stations.

July 28d. 16h. Bavarian Alps.

Triest eP_g =39m.16s., iS_g =39m.26s.
Stuttgart eP?Z =40m.5s.?, eZ =40m.18s., eP_g? =40m.24s., e =41m.0s. and 41m.30s.
Zürich eP =40m.7s., eS? =41m.4s., eS_g =41m.20s.
Prague e =40m.15s. and 40m.39s., eS_g? =41m.0s.?
Bologna eZ =40m.28s., e =40m.44s.
Strasbourg eP_g =40m.31s., eS =40m.40s., e =41m.30s., 42m.21s., and 42m.30s.
Basle e =40m.48s. and 41m.58s.
Rome e =41m.19s.
Jena eN =41m.38s. and 41m.47s.
Potsdam e =42m.12s.

July 28d. Readings also at 0h. (Grand Coulee (2)), 1h. (near Victoria, near Mineral, Lick, Fresno, and Branner), 2h. (near Victoria), 3h. (Rome), 5h. (Tananarive, and near Lick), 6h. (near Lick), 8h. (Pasadena, Mount Wilson, Riverside, Palomar, Haiwee, Tinemaha, Butte, Grand Coulee, Hungry Horse, Rapid City, Salt Lake City, Sitka, Tucson, and near College), 10h. (Victoria (2), Palomar (2), Tinemaha, Hungry Horse, Pierce Ferry, Shasta Dam, and Tucson (2)), 19h. (near Ottawa), 21h. (Tacubaya and Merida), 22h. (near Mineral).

July 29d. 0h. 33m. 6s. Epicentre 45°·2N. 150°·4E.

A = −·6147, B = +·3492, C = +·7072 ; δ = −7 ; h = −4 ;
D = +·494, E = +·870 ; G = −·615, H = +·349, K = −·707.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Nemuro		4·0	244	1 1	− 3	—	—	—	—	—
Sapporo		6·9	255	1 48	+ 3	—	—	—	—	—
Mori		7·8	250	1 59	+ 1	—	—	—	—	—
Hatinohe		8·0	238	e 2 0	0	—	—	—	—	—
Miyako		8·4	231	e 2 10?	+ 4	—	—	—	—	—
Morioka		8·8	235	e 3 26	?	—	—	—	—	—
Mizusawa	E.	9·2	232	2 16	0	3 47	−16	—	—	—
Akita		9·4	238	2 19	+ 1	—	—	—	—	—
Sendai		9·9	229	4 41	S	(4 41)	+21	—	—	—
Hukusima		10·5	228	e 2 33	− 2	—	—	—	—	—
Onahama		11·0	224	e 3 28	+46	—	—	—	—	—
Mito		11·6	224	3 9	+19	—	—	—	—	—
Kakioka		11·9	224	2 51	− 3	—	—	—	—	—
Tukubasan		11·9	225	5 44	SSS	—	—	—	—	—
Kumagaya		12·3	227	2 58	− 1	—	—	—	—	—
Maebasi		12·3	228	e 3 5	+ 6	—	—	—	—	—
Tokyo		12·5	224	2 12	−50	—	—	—	—	—
Nagano		12·6	231	3 1	− 2	—	—	—	—	—
Wazima		12·8	237	e 3 4	− 2	—	—	—	—	—
Hunatu		13·1	226	3 24	+14	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Vladivostok		13·5	268	e 3 15	0	e 5 38	− 9	—	—	—
Shizuoka		13·7	226	5 44	S	(5 44)	− 8	—	—	—
Omaesaki		14·1	226	6 10	SS	—	—	—	—	—
Gihu		14·3	231	3 25	− 1	—	—	—	—	—
Nagoya		14·3	230	3 33	+ 7	—	—	—	—	—
Osaka		15·5	230	e 3 5	−37	—	—	—	—	—
Hukuoka		19·3	239	4 37	+ 8	8 17	+15	—	—	10·7
Irkutsk		30·8	301	—	—	e 12 0	+37	—	—	—
College		38·5	38	e 11 17	?	—	—	—	—	e 17·3
Almata		50·9	296	e 9 5	0	—	—	—	—	—
Frunse		52·6	297	e 9 19	+ 1	—	—	—	—	—
Sverdlovsk		53·7	317	9 24	− 2	e 17 3	+ 4	—	—	—
Andijan		55·2	295	9 36	− 1	—	—	—	—	—
Tashkent		56·8	297	e 9 46	− 2	e 17 37	− 4	—	—	—
Stalinabad		58·7	295	i 9 58	− 4	i 18 6	0	—	—	—
Samarkand		59·2	297	10 2	− 3	—	—	—	—	—
Shasta Dam		60·9	60	i 10 12	− 5	—	—	i 12 44	PP	—
Hungry Horse		61·2	49	e 10 17	− 2	—	—	i 12 34	PP	—
Mineral	Z.	61·6	60	e 10 20	− 2	—	—	e 14 21	PPP	—
Scoresby Sund		64·5	358	10 41	0	19 34	+15	—	—	—
Tinemaha	Z.	65·7	62	e 10 47	− 1	—	—	e 13 17	PP	—
Haiwee	Z.	66·5	62	e 10 55	+ 1	—	—	e 11 4	pP	—
Pasadena	Z.	67·6	64	i 11 1	0	—	—	i 11 12	pP	—
Mount Wilson	Z.	67·7	64	e 10 59	− 2	—	—	i 11 14	pP	—
Bombay	E.	68·2	275	e 6 18	?	—	—	—	—	—
Riverside	Z.	68·2	64	i 11 4	0	—	—	e 11 16	pP	—
Upsala		68·4	337	—	—	e 28 17	SSS	—	—	e 38·9
Boulder City		68·5	60	e 11 3	− 3	—	—	i 11 18	P	—
Pierce Ferry		68·9	59	i 11 8	− 1	—	—	i 13 38	PP	—
Palomar	Z.	69·0	63	e 11 9	0	—	—	i 11 19	pP	—
Leninakan		72·1	310	e 11 42	+14	—	—	—	—	—
Erevan		72·2	309	11 30	+ 1	—	—	—	—	—
Copenhagen		73·4	337	11 35	− 1	—	—	i 11 38	P	38·9
Tucson		73·5	61	e 11 34k	− 2	—	—	i 14 4	PP	e 43·4
Warsaw		73·6	331	e 11 34	− 3	—	—	—	—	e 40·9
Yalta		74·3	318	14 41	PP	—	—	—	—	—
Collmberg		77·1	334	e 11 57	0	—	—	—	—	—
Prague		77·7	333	e 11 54	− 6	—	—	—	—	—
De Bilt		78·6	339	e 12 9	+ 4	e 22 18	+16	—	—	e 41·9
Istanbul		79·3	319	i 12 13	+ 4	—	—	—	—	—
Uccle		80·0	340	e 12 13	0	e 31 54?	SSS	—	—	e 43·9
St. Louis		80·3	44	i 12 12	− 2	—	—	i 12 25	pP	—
Kew		80·4	342	—	—	e 21 54	−27	—	—	—
Stuttgart		80·5	335	e 12 14	− 1	e 22 30	+ 8	—	—	e 44·9
Ottawa		81·0	31	e 12 16	− 2	—	—	—	—	41·9
Strasbourg		81·0	336	e 12 18	0	—	—	i 12 32	PcP	e 43·9
Ksara		81·5	310	e 12 14	− 7	—	—	—	—	—
Triest		81·8	331	e 12 21	− 1	e 22 33	− 2	e 23 26	PS	—
Zürich		81·9	335	e 12 22k	− 1	—	—	—	—	—
Basle		82·0	336	e 12 24	+ 1	—	—	—	—	—
Cleveland		82·0	37	i 12 22a	− 1	e 22 34	− 3	—	—	—
Paris		82·3	339	i 12 25	0	—	—	i 14 40	?	e 47·9
Clermont-Ferrand		84·9	338	i 12 41	+ 3	e 23 8	+ 2	—	—	—
Harvard		85·0	30	i 12 38	0	—	—	—	—	—
Rome		85·5	330	e 12 42	+ 1	23 17	+ 5	29 39	SSP	e 43·6
Helwan		87·0	310	e 12 51	+ 3	e 23 30	+ 3	e 27 12	?	—
Granada		94·7	340	26 13	PPS	—	—	—	—	—

Additional readings and notes :—
Many readings for this shock and the following one at 0h.36m.52s. were confused by European and Japanese stations.
Mineral eZ = 10m.33s.
Tinemaha iZ = 11m.2s.
Haiwee eZ = 13m.20s.
Mount Wilson eZ = 13m.27s.
Riverside eZ = 13m.23s.

Continued on next page.

Boulder City i =14m.33s.
Pierce Ferry i =11m.20s.
Tucson i =11m.48s.
Collmberg eEZ =12m.14s.
Uccle eN =21m.54s.?
Strasbourg eP =12m.21s., e =13m.2s. and 14m.59s., eSSS? =32m.30s., e =34m.18s.
Cleveland iPZ =12m.25s., iZ =12m.35s. and 12m.38s.
Long waves were also recorded at Wellington, Christchurch, Honolulu, and at other American and European stations.

July 29d. 0h. 36m. 52s. Epicentre 45°·2N. 150°·4E. (as at 0h. 33m.).

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Mori		7·8	250	2 42	P_g	—	—	—	—	—
Hatinohe		8·0	238	2 2	+ 2	—	—	—	—	—
Mizusawa	E.	9·2	232	2 23	+ 7	3 48	−15	—	—	—
Hukusima		10·5	228	—	—	4 21	−14	—	—	—
Maebasi		12·3	228	—	—	5 7	−11	—	—	—
Tokyo		12·5	224	4 10	?	—	—	—	—	e 6·9
Hunatu		13·1	226	—	—	5 28	−10	—	—	—
Osaka		15·5	230	4 43	+61	6 19	−16	—	—	—
Shasta Dam		60·9	60	i 10 8	− 9	—	—	—	—	—
Hungry Horse		61·2	49	i 10 20	+ 1	—	—	—	—	—
Scoresby Sund		64·5	358	10 41	0	—	—	—	—	—
Tinemaha	z.	65·7	62	i 10 49	+ 1	—	—	i 11 6	PcP	—
Haiwee	z.	66·5	62	i 10 54	0	—	—	i 11 6	PcP	—
Pasadena	z.	67·6	64	i 11 1	0	—	—	i 11 13	PcP	—
Mount Wilson	z.	67·7	64	i 11 1	0	—	—	i 11 14	PcP	—
Riverside	z.	68·2	64	i 11 4	0	—	—	i 11 17	PcP	—
Boulder City		68·5	60	i 11 5	− 1	—	—	i 11 27	PcP	—
Pierce Ferry		68·9	59	i 11 9	0	—	—	i 11 22	PcP	—
Palomar		69·0	63	e 11 2	− 7	—	—	i 11 21	PcP	—
Copenhagen		73·4	337	11 37	+ 1	—	—	i 11 44	PcP	—
Tucson		73·5	61	i 11 36	0	—	—	i 11 49	PcP	—
Warsaw	z.	73·6	331	e 11 33	− 4	—	—	—	—	e 38·1
Collmberg		77·1	334	e 11 54	− 3	—	—	e 12 13	PcP	—
Prague		77·7	333	e 11 59	− 1	—	—	—	—	e 39·1
De Bilt		78·6	339	e 12 8	+ 3	e 22 14	+12	—	—	—
Istanbul		79·3	319	i 12 9	0	—	—	—	—	—
Uccle	z.	80·0	340	e 12 15	+ 2	—	—	—	—	—
St. Louis		80·3	44	i 12 14	0	—	—	i 12 27	PeP	—
Stuttgart	z.	80·5	335	e 12 17	+ 2	—	—	—	—	—
Ottawa	z.	81·0	31	i 12 18	0	—	—	—	—	—
Strasbourg		81·0	336	i 12 20	+ 2	—	—	—	—	—
Ksara		81·5	310	12 12	− 9	—	—	—	—	—
Triest		81·8	331	e 12 34	+12	—	—	—	—	—
Zürich		81·9	335	e 12 28	+ 5	—	—	—	—	—
Basle		82·0	336	e 12 25	+ 2	—	—	—	—	—
Cleveland	z.	82·0	37	i 12 25	+ 2	—	—	i 12 37	PeP	—
Paris		82·3	339	i 12 25	0	—	—	—	—	e 52·1
Clermont-Ferrand		84·9	338	i 12 41	+ 3	—	—	—	—	e 43·1
Harvard		85·0	30	i 12 40	+ 2	—	—	—	—	—
Rome		85·5	330	e 12 41	0	e 23 13	+ 1	—	—	—
Helwan		87·0	310	i 12 50	+ 2	—	—	—	—	—
Granada		94·7	340	—	—	i 26 8	PPS	—	—	57·4

July 29d. 8h. Undetermined shock.
Campulung ePEN =57m.14s., eSEN =57m.32s., iEN =57m.35s.
Bucharest iPE =57m.16s., iSEN =57m.36s.
Belgrade eP? =58m.3s., i =58m.29s., iS? =59m.9s.
Yalta P =58m.4s., S =59m.3s.
Simferopol eP =58m.5s., eS =59m.4s.
Theodosia eP =58m.16s.
Warsaw eZ =58m.32s. and 59m.41s., eE =59m.47s., eN =59m.54s., eL =60m.29s.
Moscow eP =59m.34s., eS =61m.38s.
Copenhagen P =59m.47s.
Jena eN =59m.58s.

July 29d. 18h. 57m. 58s. (I) } Epicentre 7°·5N. 81°·5W.
19h. 58m. 2s. (II) }
20h. 49m. 53s. (III) } (as on 28d.).

A = +·1466, B = −·9807, C = +·1297; δ = +9; h = +7.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
I	San Juan	18·4	53	e 4 20	+ 2	—	—	—	—	e 7·0
I	Huancayo	20·4	163	e 4 45	+ 4	e 8 46	SS	—	—	e 10·4
II		20·4	163	e 4 44	+ 3	—	—	—	—	—
III		20·4	163	e 4 46	+ 5	—	—	—	—	e 9·4
I	Tucson	36·7	316	e 7 10	0	—	—	—	—	e 20·6
II		36·7	316	e 7 10	0	—	—	—	—	—
III		36·7	316	e 7 9	− 1	—	—	—	—	—
I	Ottawa	38·1	8	7 20	− 2	13 8	− 8	16 2	SS	19·0
II	z.	38·1	8	i 7 22	0	—	—	—	—	—
III	z.	38·1	8	i 7 21	− 1	—	—	—	—	—
I	Seven Falls E.	40·5	11	—	—	(13 2?)	−50	—	—	13·0
I	Pierce Ferry	41·1	319	e 7 47	0	—	—	—	—	—
II		41·1	319	e 7 45	− 2	—	—	—	—	—
I	Boulder City	41·6	319	e 9 24	PP	—	—	—	—	—
I	Palomar z.	41·6	314	e 7 51	0	—	—	—	—	—
II	z.	41·6	314	e 7 51	0	—	—	—	—	—
III	z.	41·6	314	e 7 51	0	—	—	—	—	—
I	Riverside z.	42·3	314	e 7 56	− 1	—	—	—	—	—
II	z.	42·3	314	e 7 54	− 3	—	—	—	—	—
III	z.	42·3	314	e 7 55	− 2	—	—	—	—	—
I	Tinemaha z.	44·5	317	e 8 17	+ 2	—	—	—	—	—
II	z.	44·5	317	e 8 20	+ 5	—	—	—	—	—
III	z.	44·5	317	e 8 15	0	—	—	—	—	—
I	Hungry Horse	49·1	333	e 8 49	− 2	—	—	—	—	—

Long waves to the first shock were also recorded at Bermuda and Philadelphia.

July 29d. Readings also at 1h. (Triest and near Mineral), 2h. (near Mineral), 6h. (Uccle, De Bilt, Alicante, Clermont-Ferrand, and Tucson), 7h. (Frunse, Almata, Tashkent, near Stalinabad, Andijan, and Samarkand), 9h. (Shasta Dam), 12h. (near Bogota), 13h. (Shasta Dam), 15h. (near Apia), 17h. (Copenhagen, Jena, Stuttgart, Mount Wilson, Palomar, Riverside, Tinemaha, Tucson, Pierce Ferry, near Lick and Berkeley), 19h. (San Francisco, Rome, and Bologna), 20h. (Shasta Dam, Ottawa, San Francisco, near Berkeley, and Lick), 21h. (Hungry Horse), 23h. (Pierce Ferry and Hungry Horse).

July 30d. 2h. 44m. 18s. Epicentre 40°·9N. 142°·7E. Depth of focus 0·005.
(as on 1945, February 26d.).

Intensity IV at Aomori and Hatinohe; II-III at Urakawa, Miyako, and Morioka. Epicentre 41°·0N. 142°·9E. Depth 50km. Macroseismic radius 200-300km.

Seismo. Bull. Cent. Met. Obs., Japan, for 1948, Tokyo, 1950, p.32, with macroseismic chart.

A = −·6030, B = +·4594, C = +·6522; δ = +2; h = −2;
D = +·606, E = +·795; G = −·519, H = +·395, K = −·758.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Hatinohe	0·9	247	0 14	− 4	0 28	− 3	—	—	—
Miyako	1·4	203	0 22	− 2	0 40	− 3	—	—	—
Aomori	1·5	267	0 23k	− 3	0 42	− 3	—	—	—
Morioka	1·7	224	0 28k	0	0 55	+ 5	—	—	—
Mori	2·0	307	0 26k	− 6	0 49	− 8	—	—	—
Mizusawa	2·1	214	0 34	0	1 1	+ 2	—	—	—
Sapporo	2·4	235	0 32	− 6	0 55	−12	—	—	—
Sendai	3·0	208	0 48	+ 1	1 4	−18	—	—	—
Hukusima	3·6	209	0 56	+ 1	1 49	+12	—	—	—
Mito	4·8	202	1 10	− 2	2 8	+ 1	—	—	—
Kakioka	5·1	204	1 14	− 2	2 14	0	—	—	—
Tukubasan	5·1	204	1 15	− 1	—	—	—	—	—
Maebasi	5·3	214	1 24	+ 5	2 33	+14	—	—	—
Kumagaya	5·4	210	1 27	+ 7	2 33	+11	—	—	—
Tokyo	5·7	205	1 25	+ 1	2 44	+15	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Wazima		5·7	234	1 27	+ 3	2 35	+ 6	—	—	—
Hunatu		6·2	211	1 40	+ 9	2 58	+17	—	—	—
Mera		6·4	202	2 3	+29	3 4	+18	—	—	—
Misima		6·5	208	1 48	+13	3 8	+19	—	—	—
Osima		6·6	204	1 48	+11	2 54	+ 3	—	—	—
Shizuoka		6·8	211	1 52	+13	—	—	—	—	—
Nagoya		7·2	220	1 51	+ 6	—	—	—	—	—
Hikone		7·6	225	1 46	− 4	—	—	—	—	—
Kameyama		7·8	221	2 13	+20	—	—	—	—	—
Toyooka		8·2	232	1 28	?	—	—	—	—	—
Vladivostok		8·3	289	i 1 55	− 5	e 3 32	− 1	—	—	—
Osaka		8·4	224	2 16	+14	3 45	+ 9	—	—	—
Sverdlovsk		53·0	317	9 7	− 5	—	—	—	—	—
Victoria	z.	63·1	48	i 10 22	− 1	—	—	—	—	—
Shasta Dam		68·0	55	i 10 42	−12	—	—	i 11 6	pP	—
Tinemaha	z.	72·8	56	i 11 38	+15	—	—	—	—	—
Haiwee	z.	73·5	56	e 11 42	+14	—	—	—	—	—
Mount Wilson	z.	74·7	58	e 11 48	+14	—	—	—	—	—
Copenhagen		74·9	334	11 32	− 4	—	—	—	—	—
Riverside	z.	75·3	58	i 11 50	+12	—	—	—	—	—
Boulder City		75·6	55	e 12 52	+72	—	—	—	—	—
Palomar	z.	76·0	58	i 12 1	+19	—	—	—	—	—
Tucson		80·5	56	e 12 7	0	—	—	—	—	—
Stuttgart	z.	81·7	331	e 12 10	− 3	—	—	—	—	—
Strasbourg		82·4	332	e 12 14	− 2	—	—	—	—	—

July 30d. 3h. 30m. 7s. Epicentre 31°·0N. 49°·0E.

A = +·5634, B = +·6481, C = +·5125 ; δ = +11 ; h = +2 ;
D = +·755, E = −·656 ; G = +·336, H = +·387, K = −·859.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Baku		9·4	4	e 2 18	0	—	—	—	—	—
Erevan		9·8	340	e 2 45?	+21	e 4 41	+24	—	—	—
Ashkabad		10·0	48	e 2 33	+ 6	—	—	—	—	—
Leninakan		10·6	338	e 3 7?	+31	—	—	—	—	—
Ksara		11·4	288	e 2 53	+ 6	6 25	L	—	—	(6·4)
Piatigorsk		13·8	342	e 3 18	− 1	—	—	—	—	—
Sotchi		14·5	332	3 29	+ 1	—	—	—	—	—
Helwan		15·3	270	3 41	+ 2	6 38	+ 8	3 53	PP	—
Samarkand		17·0	55	e 3 56	− 5	—	—	—	—	—
Theodosia		17·6	326	4 7	− 1	e 7 25	+ 2	—	—	—
Yalta		17·8	323	e 3 16	−55	6 32	−56	—	—	—
Stalinabad		17·9	59	i 4 7	− 5	i 7 37	+ 7	—	—	—
Istanbul		19·0	307	4 23	− 3	7 54	− 1	—	—	—
Bucharest	E.	22·4	314	e 5 2	0	e 9 18	+14	—	—	—
Frunse		23·5	53	e 5 12	0	—	—	—	—	—
Bombay		24·7	114	i 5 28	+ 4	e 9 51	+ 7	11 18	SS	13·2
Almata		25·3	53	i 5 32	+ 2	—	—	—	—	—
Moscow		26·0	346	i 5 34	− 2	10 4	− 2	—	—	—
Belgrade		26·3	310	e 5 42	+ 3	e 10 29	+18	—	—	—
Sverdlovsk		27·1	15	i 5 43	− 3	10 18	− 6	—	—	—
Budapest	E.	27·9	315	5 57	+ 3	e 12 5	SS	—	—	e 19·9
Warsaw		29·5	325	—	—	11 2	0	e 12 21	SS	e 15·4
	Z.	29·5	325	6 7a	− 1	e 10 59	− 3	e 12 26	SS	—
Triest		31·0	309	e 6 19	− 2	e 11 25	− 1	—	—	—
Rome		31·1	302	e 6 21	− 1	11 27	− 1	7 6	PP	14·0
Prague		32·0	317	e 9 41	PcP	—	—	—	—	e 14·9
Bologna		32·4	305	e 6 5	−29	e 11 37	−11	—	—	—
Collmberg		33·4	317	e 6 37	− 5	—	—	—	—	—
Kodaikanal	E.	33·5	121	—	—	e 12 37	+32	—	—	—
Pavia		34·0	307	e 6 37?	−11	—	—	—	—	—

Continued on next page.

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Jena		34·1	316	e 6 45	− 3	—	—	—	—	e 17·0
Stuttgart		34·8	313	e 6 54	0	e 12 20	− 5	e 15 5	SSS	e 19·4
Zürich		34·9	310	e 6 53a	− 2	e 12 23	− 4	—	—	—
Basle		35·6	310	e 7 0a	− 1	e 12 36	− 2	—	—	—
Copenhagen		35·6	326	e 7 0	− 1	12 31	− 7	—	—	14·9
Strasbourg		35·7	312	e 7 0	− 2	e 12 35	− 4	e 8 17	PP	—
Upsala		35·7	333	—	—	e 12 27	−12	e 14 53?	SS	e 15·9
Calcutta	E.	36·0	94	—	—	e 12 45	+ 1	—	—	—
De Bilt		38·2	317	—	—	e 13 18	+ 1	—	—	e 19·9
Clermont-Ferrand		38·3	306	e 7 24	0	e 13 18	− 1	e 8 56	PP	19·4
Uccle		38·4	315	e 7 26	+ 1	e 13 19	− 1	e 8 55	PP	e 20·9
Tamanrasset		39·4	269	e 7 36	+ 3	—	—	i 9 1k	PP	—
Tortosa		40·0	298	7 39	+ 1	i 13 43	− 1	9 13	PP	e 18·9
Alicante		40·9	295	i 7 53?	+ 7	13 58	0	17 45	SSS	20·2
Kew		41·4	315	e 7 50	0	e 17 14	SS	e 17 57	SSS	e 22·9
Durham		42·8	319	i 14 26	S	(i 14 26)	0	i 18 8	SSS	—
Granada		43·5	293	i 8 10	+ 3	i 14 30	− 6	8 25	PP	22·5
Toledo		43·6	297	i 8 9	+ 1	i 14 37	− 1	—	—	—
Aberdeen		43·7	323	i 14 34	S	(i 14 34)	− 5	i 18 53	SSS	e 22·1
Irkutsk		45·2	45	8 20	0	e 15 0	− 1	—	—	—
Scoresby Sund		54·8	337	9 35	+ 1	17 15	+ 1	—	—	—
Vladivostok		64·7	54	e 10 37	− 5	19 18	− 4	—	—	—
Ottawa		88·9	325	i 12 56	− 2	e 23 23	[− 3]	—	—	35·9

Additional readings :—
Belgrade e =8m.55s.
Warsaw eZ =8m.26s., iN =11m.24s., iZ =11m.33s., eE =11m.36s., eSSSN =12m.57s., eSSSEZ =13m.1s.
Jena eE =6m.48s.
Stuttgart eZ =7m.17s.
Strasbourg eS =12m.29s., eSS =14m.41s.
Upsala eSN =12m.32s.
Calcutta iE =17m.5s., iSE =17m.25s., iSSE =18m.37s.
Clermont-Ferrand eSS =16m.8s.
Uccle eSE =13m.23s., eSSE =15m.40s., eSSN =15m.43s., eSSSN =16m.2s.
Tamanrasset iP =7m.40s.a, ePPP =9m.25s.
Tortosa PPN =9m.38s., P_cSN =13m.34s., SS?E =16m.35s., SSSE =17m.19s., S_cSN =17m.44s.
Kew eN =20m.28s.
Durham eEN =17m.42s.
Granada iPP =10m.9s., PPP =11m.21s., S_cS =17m.58s., SS =18m.55s.
Long waves were also recorded at Potsdam and Huancayo.

July 30d. Readings also at 0h. (Auckland, Arapuni, Christchurch, Wellington, Brisbane, Riverview, Palomar, Riverside, Tinemaha, and Tucson), 1h. (Collmberg, Jena, Strasbourg, and Stuttgart), 2h. (Hungry Horse and near Tacubaya), 4h. (Istanbul, Budapest, Warsaw, Triest, Prague, Rome, Bologna, Jena, Strasbourg, Stuttgart, Zürich, Kalossa, Bucharest, near Belgrade, Victoria, and near Mineral (2)), 5h. (Istanbul, near Grozny, and near Mineral (2)), 6h. (Helwan, Ksara, Stalinabad, and Granada), 7h. (Istanbul and Ksara), 12h. (near Honolulu (2)), 13h. (near Ottawa), 15h. (Helwan, Istanbul, Ksara, Stalinabad, and Tashkent, Philadelphia, Seven Falls, Ottawa, Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Pierce Ferry, Lick, Hungry Horse, Fort de France, Huancayo, and near Merida), 17h. (Reykjavik), 19h. (Tucson and near Ashkabad), 20h. (Boulder City, near Tucson, and near Ottawa), 21h. (Hungry Horse, Shasta Dam, Nanking, and Strasbourg), 22h. (Ottawa, Copenhagen, De Bilt, Uccle, Paris, Alicante, and Granada), 23h. (near Apia).

July 31d. 19h. 4m. 14s. Epicentre 7°·5N. 81°·5W. (as on 29d.).
A = +·1466, B = −·9807, C = +·1297 ; δ = +9 ; h = +7 ;

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bogota	Z.	7·9	111	i 2 4	+ 5	i 3 26	− 4	—	—	e 6·4
Merida		15·5	331	e 3 41	− 1	e 6 50	SS	e 4 32	?	—
San Juan		18·4	53	e 4 23	+ 5	e 7 54	+13	e 6 14	?	e 9·7
Huancayo		20·4	163	e 4 42	+ 1	—	—	e 5 6	PP	e 8·6
Tacubaya	N.	20·8	307	e 4 44	− 1	e 8 41	+ 8	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Fort de France		21·2	70	e 4 52	+ 3	e 8 52	+11	—	—	—
La Paz		27·3	151	e 5 41	− 7	10 21	− 6	i 6 33	PP	14·8
Bermuda		29·1	31	—	—	e 11 4	+ 8	—	—	—
St. Louis		32·0	347	e 6 26	− 4	i 11 43	+ 1	e 11 38	S	—
Philadelphia		32·8	11	e 7 34	+57	e 12 0	+ 6	—	—	e 14·6
New Kensington	E.	33·0	3	—	—	e 12 0	+ 3	—	—	e 14·2
Cleveland		33·8	0	i 6 48	+ 2	i 12 14	+ 4	i 7 54	PP	—
Fordham		33·9	12	e 6 47	0	i 12 19	+ 8	—	—	18·3
Chicago		34·7	352	—	—	e 12 17	− 7	—	—	e 15·9
Tucson		36·7	316	e 7 10	0	e 13 0	+ 6	e 8 25	PP	e 17·1
Vermont		37·5	11	e 6 56	−21	e 14 12	+65	e 9 54	PcP	e 18·0
Ottawa		38·1	8	7 22	0	13 16	0	8 54	PP	18·3
Seven Falls	E.	40·5	11	—	—	e 13 58	+ 6	—	—	16·8
Pierce Ferry		41·1	319	i 7 44	− 3	—	—	—	—	—
Rapid City	E.	41·1	337	e 7 49	+ 2	e 14 6	+ 5	—	—	e 17·4
Boulder City		41·6	319	e 7 51	0	—	—	—	—	—
La Jolla	Z.	41·6	313	i 7 51	0	—	—	—	—	—
Palomar		41·6	314	i 7 51	0	—	—	i 7 54	P	—
Riverside	Z.	42·3	314	i 7 57	0	—	—	—	—	—
Salt Lake City		42·7	326	e 7 57	− 3	e 14 29	+ 5	—	—	e 17·6
Mount Wilson	Z.	42·9	314	i 8 2	0	—	—	—	—	—
Pasadena		42·9	314	i 8 2	0	e 14 30	+ 3	—	—	e 19·8
Tinemaha	Z.	44·5	317	i 8 15	0	—	—	—	—	—
Fresno	N.	45·4	316	e 8 22	0	—	—	—	—	—
Butte	N.	46·8	332	e 10 25	PP	e 18 28	SS	—	—	e 19·4
Lick	Z.	47·0	316	e 8 33	− 2	—	—	—	—	—
Berkeley		47·7	316	i 8 40a	0	i 15 44	+ 8	—	—	—
Mineral	Z.	48·4	319	e 8 45	− 1	—	—	—	—	—
Hungry Horse		49·1	333	i 8 48	− 3	—	—	—	—	—
Shasta Dam		49·1	320	e 8 48	− 3	—	—	—	—	—
Victoria		54·0	327	e 10 3?	+35	—	—	—	—	17·8
Scoresby Sund		73·1	18	—	—	21 2	+ 1	—	—	31·8
Toledo	Z.	75·6	52	i 11 51	+ 3	—	—	—	—	—
Granada		75·9	54	12 25a	+35	21 40	+ 8	12 39	pP	29·3
Alicante		78·3	53	e 12 23	+20	—	—	—	—	e 27·3
Tortosa		79·1	50	e 21 12	?	22 14	+ 7	22 58	PS	e 43·8
Paris		80·5	42	—	—	e 21 55	−27	e 23 1	PS	e 36·8
Clermont-Ferrand		80·9	47	e 12 19	+ 2	—	—	e 12 33	?	—
Uccle		81·6	40	—	—	e 22 35	+ 2	—	—	e 35·8
De Bilt		82·1	39	—	—	e 22 46	+ 8	—	—	e 38·8
Strasbourg		83·9	42	e 12 36	+ 3	e 23 2	+ 6	e 28 46	SS	e 38·8
Tamanrasset		84·4	68	e 12 37	+ 1	—	—	—	—	—
Stuttgart		84·9	42	e 12 40	+ 2	e 23 10	+ 4	e 23 50	PS	43·8
Copenhagen		86·1	34	—	—	23 23	+ 5	—	—	38·8
Rome		88·0	49	—	—	e 23 43	+ 7	—	—	—
Triest		88·4	44	—	—	e 23 25	[+ 2]	e 23 56	S	—

Additional readings :—
Tacubaya ePE =4m.47s., eE =8m.51s.
La Paz iN =5m.55s., iEN =10m.46s., iSS =11m.46s., iSSS =12m.5s.
Cleveland eE =12m.41s.
Ottawa SS =16m.4s.
Berkeley iZ =18m.4s., iN =18m.42s.
Granada iPP =14m.34s.
Tortosa PPSE =23m.18s., SS?E =27m.10s.
Tamanrasset iP =12m.40s., i =12m.50s.
Stuttgart eQ =39m.46s.
Long waves were also recorded at La Plata, Sitka, and Ksara.

July 31d. Readings also at 0h. (Palomar, Riverside, Tinemaha, Hungry Horse, Shasta Dam (2), Tucson, Butte, Philadelphia, Seven Falls, Ottawa, Sitka, Stuttgart, near Ashkabad, and near Mizusawa ; more than one shock), 2h. (near Rome), 5h. (Wellington, Arapuni, and Christchurch), 6h. (Mount Wilson, Palomar, Riverside, Tinemaha, Boulder City, Hungry Horse, Pierce Ferry, Shasta Dam, and Tucson), 12h. (near Lick), 14h. (Ottawa), 16h. (La Paz, Hungry Horse, Tucson, Palomar, Tinemaha, and near Huancayo), 17h. (Ottawa, Hungry Horse, Pierce Ferry, Tacubaya, Merida, Ksara, near Andijan, and Stalinabad), 19h. (Almata, Tashkent, Samarkand, near Andijan, and Stalinabad), 20h. (2), and 21h. (near Mineral), 22h. (Samarkand, Tashkent, near Stalinabad, and Andijan).

August 1d. 18h. Undetermined shock.

Manzanillo eN =30m.16s., eE =31m.0s., eN =32m.0s., eE =32m.40s., eN =33m.0s., eE =34m.42s.
Tucson eP =31m.42s., eL =38m.26s.
Tacubaya eEN =32m.0s., eE =32m.6s. and 32m.10s., eN =32m.14s., eE =34m.54s.
Palomar ePZ =32m.11s.
Pierce Ferry eP? =32m.15s.?
Riverside ePZ =32m.18s.
Mount Wilson ePZ =32m.20s.
Pasadena ePZ =32m.24s., eLN =39m.
Tinemaha iPZ =32m.45s.
Shasta Dam iP =33m.20s.
Hungry Horse iP? =34m.3s.
Ottawa PZ =34m.28s., S =41m.6s., L =53m.
Saskatoon eNW =34m.53s. and 47m.7s., e =48m.6s., L =52.7m.
Long waves were also recorded at Kew.

August 1d. Readings also at 0h. (Balboa Heights, Palomar, Tinemaha, Hungry Horse, Pierce Ferry, Tucson, and Ottawa), 2h. (near Tacubaya), 3h. (Huancayo, La Paz, Balboa Heights, Tacubaya, Mount Wilson, Pasadena, Riverside, Tinemaha, Tucson, Pierce Ferry, Shasta Dam, Hungry Horse, and Reykjavik), 4h. (Granada and Hungry Horse), 5h. (Balboa Heights), 6h. (Frunse, near Stalinabad, Samarkand, Tashkent, Andijan, and Tchimkent), 7h. (near Andijan), 10h. (near Rome), 11h. (near Lick), 14h. (De Bilt), 16h. (Victoria), 17h. (near Mineral), 18h. (Paris, Strasbourg, Stuttgart, Jena, Basle, Zürich, Raciborzu, Uccle, and Ottawa), 20h. (Manzanillo and near Andijan), 21h. (Shasta Dam, Mineral, near Berkeley, Branner, Lick, and Fresno), 22h. (Tacubaya and near Andijan), 23h. (Manzanillo).

August 2d. Readings at 0h. (near Zürich), 1h. (Hungry Horse (2)), 2h. (Hungry Horse and near Zürich), 4h. (Balboa Heights and near Alicante), 5h. (Zürich and Balboa Heights), 7h. (Istanbul), 8h. (Pierce Ferry, Shasta Dam, Tucson, Hungry Horse, and near Apia), 9h. (Bogota and near Mineral), 10h. (near Victoria, near Lick, and near Balboa Heights), 12h. (Apia and Alicante), 14h. (near Rome, Triest, and near Andijan), 16h. (near Zürich), 17h. (Balboa Heights, near Branner, and near Zurich), 18h. (Istanbul, near Triest, Rome, Messina, and near Zürich), 19h. (Istanbul), 20h. (near Zürich), 21h. (Shasta Dam, Samarkand, near Murgab, Stalinabad, Andijan, and near Obi-garm), 22h. (Victoria, near Shasta Dam, and near Zürich), 23h. (Istanbul, La Paz, and near Zürich).

August 3d. 9h. 30m. 32s. Epicentre 12°·5N. 86°·8W. (as on 1946, Aug. 16d.).

$A = +\cdot0545$, $B = -\cdot9751$, $C = +\cdot2151$; $\delta = +6$; $h = +6$;
$D = -\cdot998$, $E = -\cdot056$; $G = +\cdot011$, $H = -\cdot215$, $K = -\cdot977$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tacubaya		13·7	301	e 3 26	+ 8	—	—	—	—	—
San Juan		20·8	70	e 4 52	+ 7	e 8 57	SS	—	—	e 9·7
St. Louis		26·2	354	i 5 39	+ 1	e 10 45	+36	—	—	—
Huancayo		26·9	154	e 5 38	− 7	e 10 7	−13	e 6 37	PP	e 12·8
Tucson		29·5	314	e 6 8	0	—	—	i 9 8	P_cP	e 14·7
Harvard		32·7	21	e 6 48	+12	—	—	—	—	e 19·5
Pierce Ferry		33·9	319	i 5 40?	−67	—	—	—	—	—
Ottawa		34·1	13	e 6 48	0	—	—	—	—	16·5
La Paz		34·2	145	(e 6 56)	+ 7	—	—	—	—	(17·0)
Boulder City		34·4	318	e 6 22	−29	—	—	—	—	—
La Jolla	z.	34·4	312	e 6 53	+ 2	—	—	—	—	—
Palomar		34·4	312	i 6 52	+ 1	—	—	i 9 23	P_cP	—
Riverside	z.	35·1	313	i 6 57	0	—	—	i 9 23	P_cP	—
Mount Wilson	z.	35·7	313	i 7 2	0	—	—	e 9 25	P_cP	—
Pasadena		35·7	313	i 7 2	0	—	—	e 9 24	P_cP	e 19·5
Tinemaha	z.	37·3	317	e 7 16	0	—	—	i 9 30	P_cP	—
Mineral	z.	41·3	319	e 7 49	0	—	—	—	—	—
Hungry Horse		42·3	334	i 7 56	− 1	—	—	i 9 46	P_cP	—
Victoria		47·0	327	e 9 14	+39	—	—	—	—	33·5

Additional reading and note :—
Tucson i =6m.22s. and 6m.34s.
La Paz readings reduced by 3 minutes.
Long waves were also recorded at Bermuda, Philadelphia, and at other European stations.

Aug. 3d. 17h. 11m. 13s. Epicentre 4°·6S. 153°·6E. Depth of focus 0·010.
(as on 1944, Oct. 5d.).

$A = -·8928$, $B = +·4432$, $C = -·0796$; $\delta = -15$; $h = +7$;
$D = +·445$, $E = +·896$; $G = +·071$, $H = -·035$, $K = -·997$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	N.	22·8	182	i 4 54	− 1	e 9 4	+11	i 5 32	PP	—
Riverview		29·2	185	i 5 55a	0	e 10 43	+ 5	i 6 19	pP	e 14·2
Auckland	N.	37·5	152	—	—	12 47	0	13 26	sS	—
Arapuni	E.	39·0	152	—	—	13 47?	sS	—	—	—
Tuai	N.	40·2	151	—	—	14 6	sS	—	—	—
Wellington		41·2	156	8 12	+36	14 15	sS	e 9 53	PPP	—
Christchurch		42·3	159	8 7	+21	14 30	sS	9 51	PP	20·5
Vladivostok		51·4	340	e 9 4	+ 7	e 16 18	+10	—	—	—
Irkutsk		70·3	330	e 13 47	PP	—	—	—	—	—
Murgab		84·8	309	e 12 26	+ 1	e 22 44	+ 1	—	—	—
Frunse		85·1	313	12 28	+ 2	—	—	—	—	—
Andijan		86·4	311	e 12 31	− 2	e 23 0	+ 1	e 13 11	pP	—
Shasta Dam		88·4	49	e 12 42	0	—	—	i 13 11	pP	—
Tashkent		88·7	311	e 12 38	− 6	e 23 14	− 6	—	—	—
Stalinabad		88·8	309	i 12 43	− 1	23 22	+ 1	e 13 23	pP	—
Pasadena	z.	91·1	56	e 12 55	0	—	—	e 13 23	pP	—
Mount Wilson	z.	91·2	56	e 12 56	+ 1	—	—	e 13 24	pP	—
Tinemaha	z.	91·3	53	e 12 56	0	—	—	i 13 23	pP	—
Riverside	z.	91·7	56	e 13 21	pP	—	—	—	—	—
Palomar	z.	92·1	56	i 13 28	pP	—	—	—	—	—
Boulder City		93·9	54	e 13 28?	pP	—	—	—	—	—
Pierce Ferry		94·6	54	e 13 7	− 4	—	—	i 13 35	pP	—
Hungry Horse		95·0	42	i 13 12	− 1	—	—	—	—	—
Sverdlovsk		95·4	326	e 13 12	− 3	e 23 41	[+ 1]	e 24 15	S	—
Tucson		97·1	58	e 13 51	pP	—	—	—	—	—
Scoresby Sund		114·1	358	29 5	PS	—	—	—	—	54·8
Ksara		115·5	305	e 19 43	PP	—	—	e 31 32	?	—
Istanbul		118·6	314	e 17 47?	[−50]	e 29 47?	PS	—	—	—
Ottawa	z.	121·0	38	e 19 16	[+35]	—	—	—	—	—
Triest		126·2	326	e 21 10	PP	e 27 20	SKKS	e 22 46	SPK	—
Stuttgart		126·6	331	e 18 41	[−11]	—	—	e 20 49	PP	e 63·8
Strasbourg		127·4	332	e 21 5	PP	—	—	—	—	—
Rome		129·2	322	e 21 14	PP	e 29 8	?	—	—	e 58·1
Paris		129·5	335	e 21 31?	PP	—	—	—	—	e 63·8
Clermont-Ferrand		131·6	332	e 19 5	[+ 4]	i 23 8	SKP	—	—	62·8
Tortosa	N.	136·6	329	22 26	PKS	25 2	?	—	—	—
Alicante		138·9	329	23 31	PKS	27 27	SKKS	—	—	e 64·8
Tamanrasset		144·2	302	e 19 23	[− 2]	—	—	—	—	—

Additional readings :—
Brisbane iN = 5m.39s., iSSN = 9m.33s.
Riverview iZ = 6m.37s., isSN = 11m.17s., iN = 11m.37s. and 11m.58s.
Auckland eN = 16m.31s., readings wrongly identified.
Wellington iZ = 8m.51s., e = 16m.57s.
Christchurch P_cSNZ = 13m.47s., QN = 17m.1s., SSZ = 17m.27s.
Stalinabad esS = 24m.29s.
Mount Wilson eZ = 13m.18s.
Sverdlovsk ePS = 25m.41s.
Stuttgart eZ = 19m.19s., e = 32m.47s.
Long waves were also recorded at Philadelphia.

Aug. 3d. Readings also at 2h. (near Stalinabad), 4h. (Ksara), 6h. (Istanbul), 7h. (near Zürich), 9h. (near Mineral and near Stalinabad), 10h. (Bologna, near Rome, and near Shasta Dam), 11h. (Triest, Haiwee, La Jolla, Palomar, Mount Wilson, Pasadena, Riverside, Tinemaha, Boulder City, Pierce Ferry, Hungry Horse (2), Shasta Dam, Tucson, Mineral, and near Victoria (2)), 13h. (Samarkand, near Stalinabad (2), Obi-garm, and near Tacubaya), 14h. (near Grozny and Piatigorsk), 15h. (Balboa Heights, near Mineral, and near Zürich), 16h. (Shasta Dam, San Francisco, near Fresno, Lick, Santa Clara, Branner, Berkeley, Mineral, near Stuttgart, Basle, and Zürich (2)), 18h. (La Paz and near Ottawa), 22h. (Ottawa and near Andijan), 23h. (Rome and Triest).

Aug. 4d. 18h. Apparently near Mariana Islands, but readings inconsistent.
U.S.S.R. gives 22°·5N. 139°·0E. Depth 85km.

Hunatu P =5m.54s., S =9m.6s.
Misima P =6m.7s., S =8m.53s.
Shizuoka P =6m.9s.
Kameyama P =6m.14s.
Nagoya P =6m.14s.
Maebasi P =6m.18s., S =9m.18s.
Toyama P =6m.36s., S =9m.35s.
Vladivostok iP =7m.30s., iS =11m.26s.
Tokyo S =8m.50s.
Sumoto S =9m.5s.
Gihu S =9m.19s.
Stalinabad iP =12m.39s., epP =13m.0s., iS =20m.52s.
Sverdlovsk P =12m.58s., iS =21m.27s.
Shasta Dam iP =13m.43s.
Lick ePZ =13m.51s.
Hungry Horse eP =14m.0s.
Santa Barbara iPZ =14m.4s.
Tinemaha iPZ =14m.5s.k
Haiwee iPZ =14m.7s.k
Pasadena iPZ =14m.10s.k
Mount Wilson iPZ =14m.11s.
Riverside iPZ =14m.12s.k
Pierce Ferry iP =14m.13s.?
Palomar iPZ =14m.15s.k
La Jolla iPZ =14m.17s.
Boulder City iP =14m.20s.?
Tashkent iS =20m.44s.?

Aug. 4d. 23h. 16m. 11s. Epicentre 9°·0N. 130°·5E. (as given by the U.S.S.R.).

A = −·6416, B = +·7512, C = +·1554; δ = +10; h = +7;
D = +·760, E = +·650; G = −·101, H = +·118, K = −·988.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Mizusawa		31·5	15	5 20	−66	5 57	PP	5 23	P	—
Vladivostok		34·0	1	e 6 50	+ 2	—	—	—	—	—
Calcutta	E.	42·6	293	e 9 49	P_cP	e 13 39	−44	—	—	—
Bombay		56·6	287	—	—	e 17 4	−34	—	—	—
Murgab		58·4	310	9 57	− 3	17 51	−11	—	—	—
Frunse		59·2	315	e 10 7	+ 2	—	—	—	—	—
Andijan		60·2	312	e 10 11	− 1	e 18 19	− 6	—	—	—
Stalinabad		62·4	309	i 10 25	− 2	i 18 44	− 9	—	—	—
Tashkent		62·6	312	i 10 28	0	e 18 49	− 7	—	—	—
Samarkand		64·0	309	e 10 34	− 4	—	—	—	—	—
Sverdlovsk		71·5	327	i 11 31	+ 7	i 20 43	0	e 21 31	PPS	—
Grozny		80·1	313	e 12 15	+ 2	22 15	− 3	—	—	—
Leninakan		81·7	310	e 12 7?	−15	—	—	—	—	—
Piatigorsk		82·0	314	e 12 23	0	—	—	—	—	—
Moscow		84·2	326	12 41	+ 7	e 23 0	+ 1	—	—	—
Yalta		88·3	315	e 12 52	− 3	23 18	[− 4]	—	—	—
Ksara		88·9	304	i 12 56a	− 2	e 23 43	− 1	—	—	—
Helwan		93·4	301	i 13 16k	− 2	23 46	[− 6]	e 24 13	S	—
Warsaw		94·6	325	e 13 26	+ 2	e 24 5	[+ 6]	—	—	e 53·8
Copenhagen		97·8	330	—	—	24 22	[+ 6]	—	—	49·8
Scoresby Sund		98·5	352	—	—	25 3	− 5	—	—	53·8
Triest		102·1	320	e 18 9	PP	i 24 36	[− 1]	e 25 48	S	e 49·8
Stuttgart		102·9	325	e 14 6	+ 5	e 24 42	[+ 1]	e 28 25	PPS	e 49·8
De Bilt		103·3	329	—	—	e 24 49	[+ 6]	—	—	e 57·8
Rome		104·1	317	e 18 20	PP	e 24 46	[0]	e 25 53	S	e 51·7
Paris		106·6	327	—	—	e 27 49?	PS	—	—	e 59·8
Clermont-Ferrand		108·0	325	—	—	e 25 37	{−14}	(29 49?)	PPS	29·8
Tucson		108·6	52	e 29 39	PPS	—	—	—	—	—
Granada		117·1	320	—	—	i 31 57	PPS	e 46 51	Q	57·7
Ottawa	Z.	120·9	21	e 19 11	[+16]	—	—	—	—	—

Additional readings :—
Stuttgart e =25m.7s., eSKKS =25m.49s.
Rome eE =25m.9s., eN =33m.14s.
Long waves were also recorded at Kew, Uccle, Strasbourg, Alicante, and La Plata.

August 4d. Readings also at 0h. (Ottawa, near Chur, and Zürich), 1h. (near Berkeley), 3h. Ksara, Istanbul, near Leninakan, Erevan, Grozny, Sotchi, and near Apia), 4h. (near Stalinabad), 5h. (Bogota, Hungry Horse, Shasta Dam, Tucson (2), Palomar (2), Tinemaha (2), and near Balboa Heights), 6h. (Tinemaha), 7h. (Mount Wilson, Riverside, Palomar, Hungry Horse, Pierce Ferry, Tucson, Mineral, near Shasta Dam, near Berkeley, Branner, Lick, Fresno, and near Zürich (2)), 8h. (near Zürich, near Andijan, Tchimkent, Frunse, Stalinabad, and Samarkand), 9h. (Hungry Horse, Pierce Ferry, Tucson, Mount Wilson, Riverside, Palomar, Tinemaha, and near Tacubaya), 10h. (Tacubaya, Pierce Ferry, Shasta Dam, Tucson (3), Riverside, Palomar, Tinemaha, Mineral, near Berkeley, Branner, Lick, near Fresno, near Apia, near Basle, Zürich, and Stuttgart), 11h. (near Andijan), 14h. (near Ottawa and Calcutta), 15h. (near Leninakan and near Zürich), 17h. (Ottawa (2), near Mineral, and near Zürich), 21h. (Ottawa (2)), 23h. (near Zürich).

August 5d. 22h. 35m. 14s. Epicentre 31°·0N. 49°·0E. (as on July 30d.).

$A = +\cdot5634$, $B = +\cdot6481$, $C = +\cdot5125$; $\delta = +11$; $h = +2$;
$D = +\cdot755$, $E = -\cdot656$; $G = +\cdot336$, $H = +\cdot387$, $K = -\cdot859$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ksara		11·4	288	e 3 41	+54	—	—	—	—	e 6·5
Grozny		12·5	249	e 3 29?	+27	—	—	—	—	—
Helwan		15·3	270	e 3 43	+ 4	8 23	Q	—	—	9·7
Yalta		17·8	323	e 4 10	− 1	i 7 39	+11	—	—	—
Stalinabad		17·9	59	e 4 12	0	e 7 30	0	—	—	—
Istanbul		19·0	307	4 25	− 1	8 1	+ 6	—	—	—
Tashkent		19·3	53	e 4 27	− 2	e 8 0	− 2	—	—	—
Andijan		21·2	57	e 4 47	− 2	—	—	—	—	—
Murgab		21·7	64	4 58?	+ 3	—	—	—	—	—
Frunse		23·5	53	5 19	+ 7	—	—	—	—	—
Moscow		26·0	346	e 5 35	− 1	e 10 12	+ 6	—	—	—
Sverdlovsk		27·1	15	e 5 46	0	—	—	—	—	—
Warsaw		29·5	325	—	—	e 11 46?	+44	e 16 46	Q	e 19·8
Rome	N.	31·1	302	—	—	e 11 37	+ 9	e 13 42	SS	—
Clermont-Ferrand		38·3	306	—	—	e 13 34	+15	—	—	e 21·8

Long waves were also recorded at other European stations.

August 5d. Readings also at 1h. (near Stalinabad, Andijan, and Samarkand), 2h. (Istanbul and near Zürich), 3h. (Rome, Triest, Stuttgart, Warsaw, and Ksara), 8h. (Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Boulder City, Hungry Horse, Pierce Ferry, Tucson, near Tacubaya, and near Alicante), 9h. (San Juan), 10h. (near Victoria), 11h. (near Zürich (2)), 12h. (near Andijan, Frunse, Stalinabad, and near Victoria), 15h. (near Victoria), 16h. (Ottawa), 17h. (Uccle), 20h. (Belgrade, and near Branner), 22h. (near Murgab, Stalinabad (2), Obi-garm, and Andijan), 23h. (Hungry Horse).

August 6d. 3h. 29m. 13s. Epicentre 29°·0N. 143°·0E. (as on 1945, January 25d.).

$A = -\cdot6996$, $B = +\cdot5272$, $C = +\cdot4823$; $\delta = -1$; $h = +2$;
$D = +\cdot602$, $E = +\cdot799$; $G = -\cdot385$, $H = +\cdot290$, $K = -\cdot876$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Vladivostok		16·7	330	i 4 6	+ 9	e 7 23	SS	—	—	—
Stalinabad		60·9	301	e 10 13	− 4	e 18 39	+ 5	—	—	—
Samarkand		62·0	302	e 10 26	+ 2	—	—	—	—	—
Sverdlovsk		63·2	323	10 26	− 6	18 55	− 8	—	—	—
Moscow		74·5	326	e 11 43	+ 1	e 21 20	+ 3	—	—	—
Shasta Dam		74·9	52	i 11 44	0	—	—	—	—	—
Hungry Horse		76·8	42	i 11 57	+ 2	—	—	—	—	—
Tinemaha	z.	79·4	54	e 12 9	0	—	—	—	—	—
Mount Wilson	z.	81·0	57	e 12 20	+ 2	—	—	—	—	—
Pierce Ferry		82·9	53	e 12 17?	−11	—	—	—	—	—
Boulder City		83·4	54	e 12 26?	− 4	—	—	—	—	—
Tucson		87·2	55	e 12 50	+ 1	—	—	—	—	—
Istanbul		87·3	316	e 12 47?	− 3	e 21 47?	?	—	—	—
Rome		96·0	325	e 18 42	?	e 23 35	[−32]	—	—	e 40·8

August 6d. 3h.

Felt in South Australia in the district of Wimmera. Slight damage at Adelaide. Epicentre 36°·5S. 136°·0E.

Monthly Seismological Bulletin of Brisbane.

Riverview iPZ = 32m.15s.a, iPPNZ = 32m.24s., iE = 32m.28s., iSN = 34m.29s., iZ = 34m.33s., iSSN = 34m.42s., iSSZ = 34m.45s., iSSSN = 34m.55s., iSSSE = 34m.58s.
Brisbane iPN = 33m.34s., iSN = 36m.25s., iLN = 37m.32s.
Pierce Ferry iPKP = 48m.46s.?
Palomar iPKP$_2$Z = 48m.50s.
Mount Wilson iPKP$_2$Z = 48m.50s.
Pasadena iPKP$_2$Z = 48m.50s.
Riverside iPKP$_2$Z = 48m.50s.
Tinemaha iPKP$_2$Z = 48m.52s.
Tamanrasset ePKP = 48m.53s.
Tucson iPKP = 48m.58s., e = 49m.17s.
Hungry Horse iPP = 49m.4s.
De Bilt iPKP = 49m.27s., ePP = 52m.42s., eL = 78m.
Stuttgart ePZ = 49m.28s.?, eZ = 53m.12s., eL = 85m.
Paris ePKP = 49m.31s., i = 49m.44s., eL = 85m.
Strasbourg ePKP = 49m.32s.
Alicante e = 49m.37s. and 50m.32s., eL = 75m.
Clermont-Ferrand ePKP = 49m.43s., eL = 90m.
Ottawa eZ = 49m.44s., iZ = 49m.56s.
Warsaw e = 52m., eLN = 83m.
Ksara e = 54m.5s., e = 64m.45s.
Long waves were also recorded at Uccle, Istanbul, Wellington, Christchurch, Arapuni, and Auckland.

Aug. 6d. 4h. 21m. 56s. Epicentre 37°·5N. 118°·5W. (as on 1947, January 11d.).

A = −·3795, B = −·6989, C = +·6062; δ = −4; h = −1;
D = −·879, E = +·477; G = −·289, H = −·533, K = −·795.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tinemaha		0·5	155	i 0 10k	P_g	i 0 17	S_g	—	—	—
Fresno	N.	1·3	233	i 0 23	− 2	i 0 36	− 8	—	—	—
Haiwee		1·4	163	i 0 27k	0	i 0 45	− 1	—	—	—
Lick		2·5	266	i 0 43	0	i 1 19	+ 5	—	—	—
Branner		2·9	268	i 0 48	0	—	—	i 0 56	P_g	—
Berkeley		3·0	277	i 0 50	0	i 1 29	+ 2	i 0 58	P_g	—
Boulder City		3·3	117	i 0 53	0	i 1 45	S*	i 1 1	P*	—
Mount Wilson		3·3	174	e 0 55	+ 2	e 1 44	S*	i 1 1	P*	—
Pasadena		3·4	175	e 0 54	− 1	i 1 44	S*	i 1 1	P*	—
Riverside		3·6	165	e 0 58	0	e 1 51	S*	i 1 8	P_g	—
Mineral		3·7	320	i 1 3	+ 3	i 1 58	S*	i 2 4	S_g	—
Pierce Ferry		3·9	110	i 0 51?	−11	i 1 53?	+ 3	i 0 59?	P	—
Palomar	Z.	4·4	162	e 1 8	− 2	—	—	i 1·19	P*	—
Shasta Dam		4·4	318	i 1 9	− 1	i 2 21	S_g	—	—	—
Tucson		8·2	128	e 2 27	P*	i 4 29	S_g	—	—	i 4·9

Additional readings :—
Berkeley iZ = 1m.16s.
Mineral iZ = 1m.11s.
Long waves were also recorded at Hungry Horse.

Aug. 6d. 9h. 56m. 14s. Epicentre 5°·2N. 74°·5W. Depth of Focus 0·015.

Felt in the departments of Tolima and Caldas. Epicentre near 5°·5N. 74°·5W.
Bull. Seism. Mensuel de Bogota.

A = +·2661, B = −·9597, C = +·0901; δ = −5; h = +7;
D = −·964, E = −·267; G = +·024, H = −·087, K = −·996.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bogota	0·7	146	i 0 2	−19	i 0 12	−24	—	—	0·7
Balboa Heights	6·3	307	i 0 13	?	i 0 49	?	—	—	—
Fort de France	16·2	55	e 3 33	− 8	—	—	—	—	—
Huancayo	17·2	182	e 3 47	− 7	e 6 46	−13	i 3 57	P	e 7·0
La Paz	22·5	162	4 57	+ 8	i 8 53	+10	9 58	SS	11·0

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
St. Louis		36·2	339	e 7 1	+ 9	e 12 31	+ 9	—	—	—
Ottawa	z.	40·0	359	e 7 23	− 1	—	—	—	—	—
Tucson		43·3	313	e 7 50k	− 1	—	—	i 7 58	?	—
Pierce Ferry		47·5	316	i 8 13?	−11	—	—	i 8 20?	P	—
Boulder City		48·0	315	e 7 57	−31	—	—	i 8 19	P	—
Palomar	z.	48·3	312	i 8 30	0	—	—	—	—	—
La Jolla	z.	48·4	310	i 8 37	+ 6	—	—	—	—	—
Riverside	z.	49·0	312	e 8 35	− 1	—	—	—	—	—
Mount Wilson	z.	49·6	312	e 8 39	− 1	—	—	—	—	—
Pasadena		49·6	312	e 8 40	0	—	—	i 8 47	?	—
								i 8 47	?	—
Haiwee	z.	50·4	314	i 8 52	+ 6	—	—	—	—	—
Santa Barbara	z.	50·9	311	e 8 56	+ 6	—	—	—	—	—
Tinemaha	z.	51·0	314	i 8 58	+ 7	—	—	—	—	—
Lick		53·5	313	e 9 9	0	i 9 16	?	—	—	—
Branner	z.	54·0	313	e 9 19	+ 6	—	—	—	—	—
Hungry Horse		54·6	329	i 9 15	− 2	—	—	i 9 22	?	—
Mineral	z.	54·8	317	e 9 23	+ 4	—	—	—	—	—
Shasta Dam		55·5	317	i 9 22	− 2	—	—	i 9 27	?	—
Grand Coulee		57·0	326	i 9 25	− 9	—	—	—	—	—
Victoria		59·8	324	e 8 52	−62	—	—	—	—	—
Paris		77·5	42	e 11 43	0	—	—	i 11 54	?	—
Clermont-Ferrand		77·6	45	e 11 54	+11	—	—	—	—	—
Tamanrasset		78·8	68	—	—	i 22 16	SP	—	—	—
Strasbourg		81·0	42	e 12 0	− 2	—	—	—	—	—
Stuttgart	z.	82·0	42	e 12 6?	− 1	—	—	—	—	—

Additional readings :—
La Paz iN = 5m.3s. and 9m.7s.
Palomar i = 8m.37s., iZ = 8m.51s.
Riverside iZ = 8m.42s., eZ = 9m.2s.
The readings for Lick were given as for a local shock.

Aug. 6d. Readings also at 0h. (Hungry Horse, Pierce Ferry, Tucson, Palomar, Riverside, and Tinemaha), 2h. (near Stuttgart, Ebingen, Zürich, Strasbourg, near Branner, and Lick), 6h. (Hungry Horse, Pierce Ferry, Shasta Dam, Tucson, Mount Wilson, Pasadena, Riverside, Tinemaha, and Apia), 7h. (Pierce Ferry, Tucson, Pasadena, Palomar, Riverside, Tinemaha, Ksara (2), Helwan (2), Apia, and near Mizusawa), 8h. (Mineral, Boulder City, Pierce Ferry, Shasta Dam, Tucson, Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, and Tinemaha), 9h. (Andijan, Tashkent, Stalinabad, Helwan, Ksara (2), Istanbul, and Stuttgart), 10h. (Tucson and near Bogota), 11h. (near Ottawa and near Zürich) 12h. (Andijan and near Murgab), 13h. (Stuttgart), 14h. (near Zürich), 15h. (Istanbul), 16h. (near Mineral), 17h. (near Arcata and Mineral), 18h. (near Mineral (2)), 19h. (near Basle, Chur, Neuchatel, Zürich, Strasbourg, Stuttgart, and Ebingen), 22h. (near Tacubaya), 23h. (Istanbul, Grand Coulee, and near Lick).

Aug. 7d. 14h. 40m. 9s. Epicentre 34°·8N. 141°·1E. (as on 1946, April 25d.).

$A = -\cdot6404$, $B = +\cdot5168$, $C = +\cdot5681$; $\delta = -7$; $h = 0$;
$D = +\cdot628$, $E = +\cdot778$; $G = -\cdot442$, $H = +\cdot357$, $K = -\cdot823$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Mizusawa	E.	4·3	1	−1 25	?	1 58	− 2	—	—	—
Vladivostok		11·0	322	i 2 44	+ 2	e 5 17	SSS	—	—	—
Nanking		18·8	269	e 4 31	+ 8	e 8 16	SS	—	—	—
Irkutsk		31·4	316	e 6 32	+ 7	—	—	—	—	—
College		51·1	32	e 9 9	+ 3	e 16 27	+ 3	e 18 23	S_cS	e 22·6
Frunse		51·2	301	—	—	e 16 29	+ 4	—	—	—
Andijan		53·4	299	—	—	17 16	P_cS	—	—	—
Honolulu		54·9	87	—	—	e 17 2	−14	—	—	e 23·1
Tashkent		55·4	300	e 9 27	−11	e 17 25	+ 3	—	—	—
Tchimkent		55·4	302	e 9 14	−24	—	—	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Obi-garm		56·0	298	i 9 55	+12	i 17 53	PPS	—	—	—
Stalinabad		56·7	298	i 9 40	− 8	i 17 49	+ 9	—	—	—
Sverdlovsk		56·7	320	e 9 43	− 5	i 17 43	+ 3	—	—	—
Samarkand		57·6	299	e 9 51	− 3	—	—	—	—	—
Hyderabad	N.	58·0	271	e 10 7	+10	—	—	—	—	—
Sitka		58·1	40	e 9 54	− 4	e 17 48	−10	e 12 5	PP	e 21·9
Bombay		61·9	275	e 10 34	+10	e 18 53	+ 6	—	—	—
Colombo	E.	62·5	260	i 13 13	PP	—	—	—	—	—
Kodaikanal	E.	62·6	265	e 10 34	+ 6	e 18 49	− 7	12 44	PP	29·7
Ashkabad		64·5	301	e 10 43	+ 2	—	—	—	—	—
Victoria		68·2	47	10 59	− 5	20 6	+ 2	28 51	Q	33·7
Moscow		68·9	325	11 6	− 3	20 14	+ 1	—	—	—
Riverview		68·9	172	e 11 8	− 1	i 20 11	− 2	i 20 44	PS	—
Baku		69·3	307	—	—	e 20 29	+12	—	—	—
Grozny		70·6	310	—	—	e 20 39	+ 6	—	—	—
Grand Coulee		71·0	45	e 11 20	− 2	—	—	—	—	—
Helsinki		71·9	333	e 11 36	+ 9	e 20 51	+ 3	e 21 55	PPS	e 32·9
Piatigorsk		71·9	312	e 11 39	+12	—	—	—	—	—
Ukiah		72·9	55	—	—	e 21 20	+21	—	—	e 31·4
Leninakan		73·1	309	e 11 31?	− 3	—	—	—	—	—
Hungry Horse		73·6	43	e 11 37	− 1	—	—	i 13 25	?	—
Berkeley		74·2	56	i 11 39	− 1	i 21 13	− 1	i 29 15	SSS	—
Sotchi		74·2	313	e 11 36?	− 4	—	—	—	—	—
Scoresby Sund		74·3	356	11 42	+ 1	21 13	− 2	26 9	SS	37·8
Santa Clara		74·7	56	—	—	e 21 18	− 1	—	—	e 31·2
Upsala		74·8	335	e 11 51	+ 7	21 20	0	e 21 44	PS	e 34·6
Lick	Z.	74·9	56	e 11 37	− 7	—	—	—	—	e 38·8
Saskatoon		75·2	37	11 50	+ 4	21 21	− 4	14 47	PP	36·7
Butte	N.	75·8	44	e 11 59	+ 9	e 21 31	0	e 22 21	S_cS	e 32·2
Yalta		77·0	316	e 11 53	− 3	—	—	—	—	—
Auckland	N.	77·9	154	e 15 27	PP	21 38	−16	—	—	39·8
Haiwee	Z.	78·0	55	e 11 53	− 9	—	—	—	—	—
Warsaw		78·8	328	12 15a	+ 9	e 22 10	+ 6	e 14 52	PP	e 41·8
Pasadena		79·0	56	i 11 58	− 9	e 21 51	−15	—	—	e 33·9
Mount Wilson	Z.	79·1	56	e 12 2	− 6	—	—	—	—	—
Salt Lake City		79·3	48	e 12 3	− 6	e 21 59	−10	—	—	e 33·0
Riverside	Z.	79·7	56	e 12 5	− 6	—	—	—	—	—
Copenhagen		79·8	334	e 12 19	+ 7	22 16	+ 2	—	—	—
Boulder City		80·2	53	e 12 7	− 7	—	—	i 12 32	P_cP	—
La Jolla	Z.	80·4	58	e 12 8	− 7	—	—	—	—	—
Palomar	Z.	80·4	56	i 12 7	− 8	—	—	—	—	—
Pierce Ferry		80·7	53	i 12 17?	+ 1	—	—	—	—	—
Bucharest		81·5	320	e 12 15	− 6	e 22 40	+ 8	e 23 4	PS	42·8
Raciborzu		81·6	328	e 12 26	+ 5	—	—	e 12 42	P_cP	e 46·8
Wellington		81·8	156	12 21	− 1	22 23	−12	i 12 34	P_cP	41·8
Istanbul		82·0	316	12 22	− 1	22 42?	+ 5	—	—	—
Potsdam		82·1	332	e 12 45?	P_cP	e 22 45	+ 7	—	—	e 43·8
Ksara		82·2	306	e 12 34	+10	23 4	+25	—	—	—
Collmberg		82·9	330	e 12 26	− 2	—	—	e 12 38	P_cP	—
Christchurch		83·1	158	e 15 49	PP	i 22 35	−13	—	—	e 36·4
Prague		83·2	330	e 12 31	+ 2	e 22 51	+ 2	e 16 6	PP	e 44·8
Aberdeen		83·3	342	i 12 46	+16	i 22 55	+ 5	—	—	46·6
Kalossa		83·7	325	e 13 7	+35	—	—	—	—	e 48·8
Jena	N.	83·8	331	e 12 35	+ 3	e 22 57	+ 2	e 12 43	P_cP	—
Ivigtut		84·0	6	e 12 39	+ 6	23 4	+ 7	23 16	S_cS	40·8
Cheb		84·1	331	e 18 9	PPP	—	—	—	—	e 45·8
Belgrade		84·2	323	e 12 33k	− 1	e 23 3	+ 4	e 13 3	PcP	e 49·1
Edinburgh		84·6	342	—	—	23 4	+ 1	23 58	PS	—
Tucson		85·1	54	e 12 31	− 8	e 22 57	[− 4]	e 16 11	PP	e 32·9
Durham		85·2	340	e 12 50	+11	23 11	+ 2	i 23 0	SKS	—
De Bilt		85·3	336	e 12 47	+ 7	e 23 8	− 2	e 32 21	SSS	e 45·8
Stuttgart		86·4	331	e 12 41	− 4	e 23 11	[+ 1]	e 16 19	PP	e 46·8
Uccle		86·6	336	e 12 56a	+10	e 23 27	+ 4	e 24 26	PS	e 46·8
Triest		86·9	327	e 12 54	+ 6	e 23 24	− 2	e 16 14	PP	—
Helwan		87·7	306	13 0	+ 8	23 57	+24	16 43	PP	—

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Kew	87·7	338	e 13 0	+ 8	e 23 20	[+ 1]	e 23 36	S	e 42·9
Zürich	87·8	331	e 12 51	− 1	e 23 30	− 4	e 16 54	PP	—
Basle	88·1	331	e 12 37	−17	e 24 19	PS	—	—	—
Salo	88·4	328	e 13 30	+35	e 23 39	− 1	—	—	—
Bologna	88·8	328	e 12 59	+ 2	e 23 43	− 1	—	—	—
Paris	89·0	335	13 3	+ 5	i 23 45?	0	i 16 41	PP	e 48·8
Rome	90·3	325	e 13 7	+ 3	e 23 55	− 2	e 17 0	PP	42·9
Clermont-Ferrand	91·3	332	e 13 18	+ 9	e 23 43	[+ 3]	e 16 51	PP	42·9
Chicago	91·7	35	e 16 57	PP	e 24 2	− 8	e 24 48	PS	e 45·9
St. Louis	92·8	39	e 13 16	0	e 23 49	[0]	e 26 7	PPS	—
Ottawa	93·5	25	13 12	− 7	24 19	− 6	16 58	PP	42·2
Cleveland	94·6	31	e 13 19	− 5	e 23 58	[− 1]	e 17 10	PP	—
Vermont	95·2	24	—	—	e 25 2	+22	—	—	e 53·1
Barcelona	95·3	330	—	—	e 25 30	+49	—	—	e 54·9
New Kensington E.	96·1	30	e 17 26	PP	e 24 19	[+12]	e 31 39	SS	—
Tortosa	96·5	331	18 13	?	24 56	+ 5	26 59	PPS	52·9
Fordham	98·1	25	e 13 59	+19	e 24 19	[+ 1]	e 18 50	PP	—
Philadelphia	98·4	27	e 18 0	PP	e 24 24	[+ 5]	—	—	—
Alicante	99·0	331	18 33	PP	24 53	{+ 6}	27 9	PS	e 48·3
Granada	101·2	332	e 13 51 a	− 3	i 25 42	+12	18 0	PP	e 47·0
Bermuda	108·9	23	e 20 43	?	e 28 31	PS	e 38 10	SSS	e 46·9
Tamanrasset	108·9	317	e 19 0	PP	—	—	—	—	—
Fort de France	126·4	27	e 20 56	PP	—	—	—	—	—
Huancayo	139·9	65	e 16 51	?	—	—	e 22 59	PP	e 53·9
La Paz	148·1	62	i 19 49	[+ 5]	i 29 59	{− 9}	i 23 22	PP	73·9

Additional readings :—
Sitka ePcP =11m.1s., ePPP? =13m.25s.
Kodaikanal PcPE =11m.27s., PSE =19m.1s., ScSE =20m.24s., SSE =22m.54s.
Riverview iZ =11m.22s. and 11m.45s., iPPSN =20m.54s., iScSN =21m.3s., iZ =22m.19s. iE =22m.26s. and 23m.46s., iSSE =24m.41s., eSSSE =27m.41s.
Helsinki eSS =24m.56s.
Berkeley eN =30m.39s.
Scoresby Sund 11m.49s. and 12m.43s.
Upsala eSSSN =30m.9s.
Saskatoon PPP =16m.29s., PS =22m.29s., SS =26m.36s.
Butte eN =23m.13s., eSSN =27m.1s.
Warsaw PN =12m.22s., eZ =13m.6s., 13m.56s., and 15m.55s., ePPPZ =16m.59s., eZ = 17m.57s., ePcSZ =19m.51s., eSN =22m.16s., ePSE =22m.41s., ePSN =22m.47s., ePPSE =23m.9s., ePPSZ =23m.20s., eSSE =27m.7s., eSSZ =27m.36s., eN = 29m.48s., eSSSN =30m.25s.
Salt Lake City e =13m.51s. and 24m.50s.
Wellington PP =15m.11s.?, PS =24m.0s., SS =26m.57s., SSS =33m.56s., Q? =36m.51s.
Christchurch iEN =26m.17s. and 29m.31s.
Prague ePPP? =17m.51s., eSKS =22m.45s., e =26m.27s., eSS =28m.15s., eSSS = 31m.51s.
Aberdeen eN =18m.29s., eE =19m.9s.
Kalossa eE =13m.15s. and 17m.2s.
Tucson eS? =22m.41s.?
Durham PcPN =13m.2s., ScSEN =23m.18s., EN =24m.2s. and 24m.12s., SSN = 28m.10s., SSSN =31m.39s.
Stuttgart e =12m.54s., ePS =25m.2s., e =27m.10s., eSSS =33m.51s.
Uccle ePPEN =17m.21s.
Triest iS =23m.42s., iPS =24m.37s., eSS =28m.48s., eSSS =32m.39s.
Kew eZ =17m.14s.
Salo eZ =14m.8s., ePP?Z =17m.2s.
Bologna eN =20m.17s., eSS?Z =32m.2s.?
Paris e =13m.59s., iPPP =18m.41s., e =24m.15s., ePS =24m.59s., SSS =33m.40s., e =36m.47s.
Rome eN =21m.7s., eSKS?N =22m.48s., eSSN =30m.28s.
Clermont-Ferrand iS =24m.11s., ePS =25m.21s., ePPS =25m.54s., eSS =30m.16s.
St. Louis iS =24m.24s.
Ottawa e =14m.21s., SS =30m.51s., SSS =35m.33s.
Cleveland ePPZ =17m.13s., eN =17m.48s., eSE =24m.41s.
New Kensington eSE =25m.17s.
Tortosa SKKSE =25m.18s., SE =25m.27s., ScS?E =25m.40s., SSE =31m.45s., SSSN = 35m.36s.
Alicante P =19m.29s., PPP =20m.33s., S =25m.41s., PPS =27m.53s., SS =32m.23s., SSS =35m.43s.
Granada SKS =24m.0s., PPS =27m.23s., iSS =32m.39s., SSS =37m.2s.
Bermuda e =33m.11s.
Huancayo ePKP? =20m.36s., e =42m.24s.
La Paz iNZ =20m.27s. and 33m.3s., SS =42m.22s.
Long waves were also recorded at Apia, Arapuni, Chur, and Toledo.

Aug. 7d. Readings also at 0h. (Hungry Horse, Mineral, near Berkeley, Lick (2), Branner, Fresno, and Santa Clara), 1h. (Hungry Horse, Collmberg, and near Victoria), 3h. (near Andijan, near Lick, and Branner), 5h. (near Mineral (2)), 6h. (Istanbul, Ksara, and near Mineral), 7h. (Kalossa), 10h. (Victoria, Pierce Ferry, Tucson, Palomar, and Tinemaha), 11h. (Ksara (2) and near Zürich), 14h. (Boulder City, Shasta Dam, Pierce Ferry, Tucson, Pasadena, Mount Wilson, Palomar, and Tinemaha), 16h. (Boulder City, Pierce Ferry, near Lick (2), and near Zürich), 17h. (near Mineral, near Bologna Ashkabad, near Kulyab, Stalinabad, Obi-garm, Andijan, Samarkand, Tashkent, Tchimkent, and Frunse), 18h. (Hungry Horse, Pierce Ferry, and Messina), 19h. (Rome), 20h. (near Ottawa), 22h. (Shasta Dam), 23h. (Christchurch and Wellington).

Aug. 8d. 16h. 13m. 16s. Epicentre 18°·7S. 168°·4E. (as on 1942, November 5d.).

A = −·9285, B = +·1906, C = −·3187 ; δ = +1 ; h = +5 ;
D = +·201, E = +·980 ; G = +·312, E = −·064, K = −·948.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Auckland	N.	18·9	165	4 35	+11	e 8 2	+ 9	—	—	11·0
Arapuni	E.	20·3	164	—	—	9 32	+69	—	—	—
Tuai	N.	21·4	163	4 55	+ 4	8 57	+12	—	—	—
Riverview		21·5	223	e 4 55	+ 3	i 8 57	+10	e 9 8	Q	e 10·6
Wellington		23·2	170	5 10	+ 1	9 22	+ 4	5 23	PP	12·7
Christchurch		25·0	173	e 5 14	−13	(9 53)	+ 4	(6 56)	PPP	12·8
Vladivostok		70·1	333	i 11 10	− 6	e 20 18	− 9	—	—	—
Lick	Z.	86·2	49	e 12 43	− 1	—	—	—	—	—
Shasta Dam		87·2	45	i 12 49	0	—	—	—	—	—
Pasadena	Z.	87·4	53	i 12 49	− 1	—	—	—	—	—
Mount Wilson	Z.	87·5	53	i 12 50	− 1	—	—	—	—	—
Mineral	Z.	87·6	46	e 12 50	− 1	—	—	—	—	—
Riverside	Z.	87·9	53	i 12 52	− 1	—	—	—	—	—
Palomar	Z.	88·0	55	i 12 52	− 1	—	—	i 12 58	PcP	—
Haiwee	Z.	88·3	51	e 12 54	− 1	—	—	—	—	—
Tinemaha	Z.	88·5	50	i 12 56	0	—	—	—	—	—
Victoria		90·2	38	e 12 51	−13	—	—	—	—	—
Pierce Ferry		91·3	52	i 12 32?	−37	—	—	—	—	—
Tucson		92·3	56	i 13 14	+ 1	—	—	—	—	—
La Paz	N.	114·3	119	e 18 24	[−18]	—	—	—	—	—
Ottawa		121·2	47	—	—	e 23 46	PPP	—	—	—
Ksara		135·2	300	e 18 29?	[−53]	—	—	22 10	PP	—
Stuttgart	Z.	145·6	336	e 19 40a	[0]	—	—	—	—	—
Triest		145·9	329	e 20 1	[+20]	—	—	—	—	—
Strasbourg		146·3	337	i 19 44	[+ 3]	—	—	—	—	—
Paris		147·9	344	i 19 48	[+ 4]	—	—	—	—	—
Rome	Z.	149·1	323	e 19 49	[+ 3]	—	—	—	—	—
Clermont-Ferrand		150·4	340	e 19 54	[+ 6]	—	—	—	—	—
Tamanrasset		163·5	287	e 20 5	[+ 1]	—	—	—	—	—

Additional readings and notes :—
Riverview eZ = 5m.6s.
Wellington i = 5m.49s., Q = 12m.8s.
Christchurch P?Z = 16h.14m.40s., PPP and S are given as S and Q respectively.
Stuttgart eZ = 19m.51s. and 20m.32s.
Triest e = 21m.10s.
Rome eZ = 20m.6s.
Long waves were also recorded at Copenhagen and Istanbul.

Aug. 8d. Readings also at 1h. (Kew and near Mineral), 4h. (near Bogota), 5h. (Ottawa), 6h. La Paz and Pierce Ferry), 7h. (Shasta Dam, Hungry Horse and near Mizusawa), 11h. (Hungry Horse, near Andijan, Kulyab, and Stalinabad), 12h. (Hungry Horse (2), Pierce Ferry, Ottawa, Andijan, near Murgab, and near Irkutsk), 17h. (Mineral, near Arcata, Ferndale, and near Ottawa), 18h. (Ottawa, Andijan, near Kulyab, and Stalinabad), 20h. (Warsaw, Rome, La Paz, and Hungry Horse), 21h. (near Mineral (2)), 22h. (Lick, and near Berkeley).

Aug. 9d. 12h. Possibly after-shock of 8d. 16h.

Brisbane iPN = 28m.15s., iN = 28m.57s.
Hungry Horse iP = 36m.32s., e = 40m.17s.
Lick iPZ = 36m.49s.
Santa Barbara ePZ = 36m.49s.
Pasadena iP = 36m.53s. a, iZ = 37m.7s., eZ = 37m.21s.
Mineral ePZ = 36m.54s.
Mount Wilson iP = 36m.54s. a, iZ = 37m.7s.
La Jolla iPZ = 36m.55s.
Riverside iPZ = 36m.56s. a, eZ = 37m.12s.
Palomar iP = 36m.57s., iZ = 37m.3s., eZ = 37m.14s.
Haiwee iPZ = 37m.0s. a, iZ = 37m.6s.
Tinemaha iPZ = 37m.0s. a, iZ = 37m.7s., eZ = 37m.18s.
Tucson iP = 37m.18s. a, i = 37m.34s., ePP = 38m.8s., e = 41m.6s.
Shasta Dam iP? = 37m.53s.
Ottawa e = 42m.57s.
Stuttgart ePZ = 43m.45s.
Chur e = 43m.51s. a.

Aug. 9d. Readings also at 0h. (near Lick), 2h. (Istanbul and near Tacubaya), 3h. (Jena, Kew, near Basle, Zürich, Strasbourg, and Stuttgart), 4h. (Tchimkent, near Andijan, Murgab, Samarkand, Stalinabad, and Tashkent), 5h. (near Kulyab and Stalinabad), 6h. (Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Shasta Dam, Mineral, Ksara, Samarkand, and near Andijan), 7h. (Santa Clara, Istanbul, and near Bucharest), 9h. (Stuttgart and Istanbul (2)), 11h. (near Arcata, Ferndale, and Mineral), 16h. (Istanbul), 17h. (Andijan, near Murgab, and Stalinabad), 18h. (Ksara), 19h. (Shasta Dam), 20h. (Frunse, Murgab, Tchimkent, near Andijan, Stalinabad, and Tashkent), 21h. (Samarkand, Tchimkent, near Andijan (2), Murgab (2), and Stalinabad), 22h. (Frunse (2), Samarkand, near Andijan (2), Murgab and Stalinabad).

Aug. 10d. 13h. 26m. 49s. Epicentre 36°·9N. 28°·8E. (as on 1943, Nov. 20d.).

$A = +\cdot7025$, $B = +\cdot3862$, $C = +\cdot5978$; $\delta = +2$; $h = -2$;
$D = +\cdot482$, $E = -\cdot876$; $G = +\cdot524$, $H = +\cdot288$, $K = -\cdot802$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Istanbul	4·2	2	e 0 57	−10	i 1 45	−12	—	—	—
Ksara	6·6	116	e 1 55	P*	e 3 49	S_g	—	—	—
Helwan	7·3	162	e 2 13	P*	i 3 47	S*	4 1	S_g	—
Bucharest	7·8	346	e 1 50	− 8	i 3 35	+ 7	i 3 57	S*	—
Yalta	8·6	26	e 2 1	− 8	—	—	—	—	—
Simferopol	9·0	25	e 2 6	− 7	—	—	—	—	—
Theodosia	9·5	29	e 2 16	− 4	—	—	—	—	—
Belgrade	10·1	324	e 3 7	PP	e 4 33	+ 8	e 4 52	SSS	i 5·3
Sotchi	10·7	48	e 2 36	− 2	—	—	—	—	—
Piatigorsk	13·0	52	e 3 11	+ 2	—	—	—	—	—
Rome	13·6	297	e 3 25	+ 8	e 6 13	SS	—	—	e 7·2
Triest	14·3	312	e 3 24?	− 2	e 6 1	− 5	—	—	i 7·6
Grozny	14·5	58	e 3 34	+ 6	—	—	—	—	—
Raciborzu	15·2	333	e 3 36	− 2	—	—	i 4 4?	PPP	e 8·4
Bologna	15·3	305	e 5 12	?	—	—	—	—	e 9·0
Warsaw	16·3	343	3 45 a	− 7	e 6 46	− 7	e 7 5	SS	e 9·2
Prague	16·7	326	e 3 53	− 4	e 6 47	−16	e 6 28?	?	e 7·7
Baku	16·8	71	e 4 10	+12	e 7 25	+20	—	—	—
Zürich	18·2	312	e 4 15 a	− 1	—	—	—	—	—
Stuttgart	18·6	316	e 4 19	− 2	e 7 43	− 3	—	—	e 9·8
Jena	18·7	325	e 4 19	− 3	e 7 47	− 1	e 7 50	S	—
Basle	18·9	312	e 4 23 k	− 1	—	—	e 9 51	Q	e 11·2
Potsdam	19·0	329	e 4 19	− 7	—	—	—	—	e 10·2
Strasbourg	19·3	315	i 4 29	0	i 8 5	+ 3	—	—	—
Clermont-Ferrand	21·2	302	e 4 51	+ 2	e 8 49	+ 8	—	—	12·2
Copenhagen	21·8	335	i 4 52	− 4	8 50	− 2	—	—	11·2
Uccle	22·3	316	e 5 0	− 1	e 9 1	− 1	—	—	e 11·7
De Bilt	22·5	321	e 5 4	+ 2	e 9 5	0	—	—	e 11·2
Paris	22·5	310	i 5 2	0	e 9 5	0	e 9 12	S	e 11·2
Alicante	23·2	283	5 36	PP	10 22	SSS	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Upsala		24·1	345	5 21k	+ 3	9 29	− 5	—	—	e 12·2
Tamanrasset		24·5	240	e 5 37	+15	—	—	—	—	—
Toledo	z.	25·8	287	e 5 40	+ 6	—	—	—	—	—
Sverdlovsk		29·1	36	6 2	− 2	e 10 51	− 5	—	—	—
Stalinabad		31·5	73	e 6 30	+ 4	—	—	—	—	—
Tashkent		31·5	68	e 6 29	+ 3	—	—	—	—	—
Andijan		33·9	70	6 51	+ 4	—	—	—	—	—
Scoresby Sund		42·8	337	8 2	+ 1	—	—	—	—	21·2
Vladivostok		74·1	47	e 11 41	+ 1	—	—	14 26	PP	—
Hungry Horse		88·9	336	e 11 58	−60	—	—	—	—	—

Additioual readings :—
Bucharest eS?EN =3m.10s., iS_sE =4m.0s.
Warsaw eSN =6m.39s., eSSSEN =7m.0s.
Alicante PP =6m..4s., PPP =6m.12s., P_cP =9m.2s., S =9m.34s., SSS =10m.34s., 11m.58s., P_cS =12m.54s., S_cS =16m.34s.
Vladivostok PPP =16m.15s.
Long waves were also recorded at Tortosa, Kalossa, and Edinburgh.

Aug. 10d. Readings also at 0h. (near Lick), 3h. (Rome), 5h. and 6h. (2) (near Mineral), 7h. (San Francisco, near Berkeley, Lick, Branner, Mineral (3), and near Stalinabad), 9h. (near Lick), 10h. (Rome), 11h. (Mount Wilson, Pasadena, Palomar, Riverside, and near Mineral), 13h. (near Stalinabad), 14h. (near Mineral (2), and near Lick), 15h. (Alicante), 17h. (near Istanbul and near Zürich), 18h. (Sotchi, Piatigorsk, Grozny, Yalta, Leninakan, Fresno, near Berkeley, and Lick (2)), 19h. (near Lick (2)), 20h. (Hungry Horse), 21h. (near Lick), 23h. (near Mineral (2)).

Aug. 11d. 10h. 36m. 18s. Epicentre 17°·7N. 95°·2W. Depth of focus 0·005.

Felt in Central and South-Eastern Mexico, particularly in the states of Oaxaca and Vera Cruz.

Bulletin Seismique mensuel de Tacubaya.

$A = -·0864$, $B = -·9493$, $C = +·3022$; $\delta = -4$; $h = +5$;
$D = -·996$, $E = +·091$; $G = -·027$, $H = -·301$, $K = -·953$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Oaxaca	z.	1·7	245	0 33	+ 5	—	—	—	—	0·7
Vera Cruz		1·7	329	0 49	+21	—	—	—	—	1·2
Puebla	E.	3·1	295	0 48	0	—	—	—	—	1·1
Tacubaya		4·2	295	1 3	0	1 31	−21	—	—	1·6
Merida		6·2	58	2 15	?	3 46	?	—	—	—
Guadalajara		8·2	292	2 1	+ 2	—	—	—	—	3·6
Manzanillo		8·8	280	2 5	− 2	—	—	—	—	3·7
Balboa Heights		17·5	116	e 3 56	− 5	—	—	—	—	—
Tucson		20·2	319	i 4 32k	0	i 8 8	− 2	i 5 15	PP	e 8·4
St. Louis		21·3	11	i 4 43	0	i 8 36	+ 5	—	—	—
Cincinnati		23·3	21	i 5 5	+ 2	i 9 24	+17	—	—	—
Bogota		24·4	119	i 5 18	+ 5	e 9 42	+16	e 5 27	PP	—
Pierce Ferry		24·8	322	i 5 7?	−10	i 9 27?	− 5	i 5 9?	pP	—
Chicago		24·9	12	i 5 18	0	i 9 35	+ 1	i 5 40	pP	e 11·9
La Jolla		24·9	312	i 5 18	0	—	—	—	—	—
Palomar		24·9	314	i 5 17k	− 1	—	—	i 5 52	pP	—
Boulder City		25·2	320	e 5 16	− 5	e 9 53	+14	i 5 38	pP	—
Riverside		25·6	314	i 5 24k	− 1	—	—	i 5 55	pP	—
Mount Wilson		26·2	314	i 5 30k	0	—	—	i 5 59	pP	—
Pasadena		26·3	314	i 5 30k	− 1	e 10 0	+ 3	i 6 1	pP	—
Cleveland		26·4	23	i 5 32a	0	i 9 57	− 2	i 6 11	pP	—
Georgetown		26·4	33	i 5 33	+ 1	e 9 59	0	i 6 4	PP	—
New Kensington	E.	26·4	27	e 5 30	− 2	i 9 57	− 2	i 6 1	pP	i 10·8
Rapid City	E.	27·1	347	e 6 47?	?	e 11 6?	?	e 7 22?	?	e 12·5
Salt Lake City		27·1	332	e 5 34	− 5	e 10 5	− 5	e 6 54	PP	i 11·3

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Haiwee		27·3	317	i 5 40k	− 1	—	—	i 6 16	pP	—
Santa Barbara		27·5	312	i 5 42	0	—	—	i 9 0	PcP	—
San Juan		27·6	83	e 5 44	+ 1	e 10 14	− 4	i 6 40	PP	i 10·9
Logan		27·9	333	e 6 42	PP	i 10 21	− 2	i 7 42	?	e 12·8
Tinemaha		28·0	318	e 5 47k	0	—	—	i 6 19	pP	—
Fresno	N.	28·8	316	i 5 54	0	i 10 38	0	—	—	e 15·6
Fordham		29·5	34	i 6 0	0	i 10 56	+ 7	i 6 48	PP	—
Lick		30·4	315	i 6 7	− 1	e 11 0	− 3	i 9 6	PP	e 15·6
Santa Clara		30·6	315	i 6 9	− 1	e 11 9	+ 3	—	—	e 16·4
Bozeman		30·9	338	e 6 12	− 1	e 11 7	− 4	—	—	e 14·3
Berkeley		31·1	315	e 6 13	− 1	e 11 16	+ 2	i 9 8	PcP	—
Bermuda		31·1	56	e 6 4	−10	e 10 50	−24	i 7 4	PP	e 12·5
Butte	N.	31·7	337	e 6 16	− 4	i 11 20	− 3	i 7 56	PP	e 12·9
Temiskaming		31·8	21	i 6 21	0	—	—	i 7 23	PP	—
Harvard		31·9	34	i 6 21	0	e 11 24	− 3	i 6 31	pP	—
Ottawa		32·0	26	6 23	+ 1	11 31	+ 3	7 13	PP	15·0
Mineral	Z.	32·1	321	e 6 21	− 2	—	—	—	—	e 16·8
Ville Marie		32·3	19	i 6 24	− 1	—	—	e 7 18	PP	—
Ukiah		32·4	317	e 6 33	+ 7	e 11 47	+13	—	—	e 16·1
Vermont		32·5	29	e 6 22	− 5	i 11 32	− 4	i 7 39	PP	e 12·7
Fort de France		32·8	90	e 6 29	0	e 11 45	+ 4	e 6 59	pP	—
Shasta Dam		32·8	321	e 6 26	− 3	—	—	—	—	—
Ferndale		33·8	319	e 6 44	+ 6	e 11 58	+ 2	—	—	—
Hungry Horse		34·2	338	e 6 41	0	—	—	—	—	—
Shawinigan Falls	N.	34·2	28	6 42	+ 1	12 5	+ 3	7 50	PP	15·8
Huancayo		35·5	144	i 6 55	+ 3	e 12 25	+ 3	—	—	e 15·2
Saskatoon		35·5	348	6 54	+ 2	12 20	− 2	7 35	PP	16·7
Seven Falls	E.	35·5	29	6 53	+ 1	12 23	+ 1	8 14	PP	14·7
Grand Coulee		35·9	333	i 6 58	+ 2	—	—	—	—	—
Halifax		37·7	38	7 14	+ 3	12 56	0	8 50	PPP	17·7
Victoria		38·4	329	7 9	− 8	12 58	− 9	7 53	PP	17·2
La Paz		43·2	140	i 7 58k	+ 2	i 14 13	− 5	i 9 43	PP	20·4
Sitka		49·4	332	i 8 45	0	i 15 48	+ 2	e 18 14	S_cS	e 22·0
Ivigtut		54·6	26	i 9 24	0	i 16 57	0	—	—	25·7
College		58·6	337	e 9 48	− 5	e 17 48	− 2	e 19 27	S_cS	e 25·4
Scoresby Sund		67·9	20	10 54	0	19 47	+ 1	11 30	pP	22·7
Lisbon		76·1	53	e 11 43a	+ 1	21 22	+ 2	14 12	PP	33·8
Edinburgh		76·6	35	—	—	21 22	− 3	—	—	—
Aberdeen	E.	77·0	34	i 11 49	+ 1	i 21 35	+ 6	—	—	30·2
Durham		77·8	36	i 11 54	+ 2	i 21 39	+ 1	i 22 37	PS	—
Jersey		78·8	41	e 12 9	+12	e 22 10	+21	—	—	e 37·7
Kew		79·3	39	i 12 2	+ 2	i 21 53	− 1	i 22 12	PS	e 34·7
Toledo	Z.	79·7	52	i 12 3	+ 1	e 22 8	+10	i 15 10	PP	—
Granada		80·8	54	i 11 42k	−26	i 21 42	−28	i 14 38	PP	32·2
Paris		81·8	41	i 12 15	+ 2	i 22 20	0	i 15 27	PP	e 37·7
De Bilt		82·4	38	i 12 17a	+ 1	e 22 28	+ 2	i 12 43a	pP	e 38·7
Uccle		82·4	39	e 12 18	+ 2	i 22 27	+ 1	e 12 53	pP	e 38·7
Alicante		82·8	52	i 12 21	+ 3	22 33	+ 3	15 33	PP	39·8
Tortosa		82·8	50	12 19	+ 1	e 22 28	− 2	i 12 28	PcP	39·3
Clermont-Ferrand		83·1	44	i 12 23	+ 3	i 22 40	+ 7	i 12 58	pP	38·7
Barcelona		83·8	48	e 13 0	+36	22 37	− 3	e 15 53	PP	e 35·6
Copenhagen		85·1	33	e 12 34	+ 4	22 58	+ 5	15 50	PP	31·7
Strasbourg		85·2	40	e 12 32	+ 1	i 22 59	+ 5	e 15 58	PP	39·7
Basle		85·4	41	e 12 34	+ 2	e 22 50	[+ 2]	e 15 56k	PP	—
Upsala		85·7	28	12 30k	− 3	e 22 44	[− 6]	e 12 56	pP	e 35·7
Stuttgart		86·0	40	e 12 36a	+ 1	e 22 54	[+ 2]	e 13 2	pP	40·7
Zürich		86·1	41	e 12 36a	+ 1	e 22 53	[+ 1]	e 12 52	pP	—
Jena		86·6	38	e 12 39	+ 2	e 23 12	+ 5	e 15 50	PP	—
Potsdam		86·8	36	e 13 16	+38	i 23 14	+ 5	—	—	e 36·7
Chur		86·9	42	e 12 41	+ 2	e 23 2	[+ 4]	e 16 5	PP	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Collmberg		87·2	37	e 12 47	+ 7	e 23 21	+ 8	e 16 16	PP	—
Pavia		87·3	43	e 13 42?	+61	—	—	—	—	—
Salo	z.	88·1	43	e 12 47	+ 2	—	—	e 16 16	PP	—
Prague		88·6	37	e 12 55	+ 8	e 23 24	− 2	e 13 18	pP	e 37·7
Helsinki		88·7	25	e 15 8	?	e 23 32	+ 5	e 16 6	PP	e 37·7
Bologna		89·0	44	e 13 1	+12	e 23 16	[+ 5]	e 13 25	pP	—
Florence		89·3	44	e 12 55?	+ 5	e 23 38	+ 5	e 16 29	PP	—
Triest		90·1	41	e 12 57	+ 3	i 23 43	+ 3	i 13 31	pP	—
Rome		90·3	45	e 13 1	+ 6	i 23 25	[+ 6]	16 37	PP	—
Raciborzu		90·7	36	e 13 7	+10	e 23 30	[+ 9]	e 15 31	PP	—
Warsaw		91·2	33	e 13 2a	+ 3	e 23 52	+ 2	e 16 38	PP	e 39·7
Tamanrasset		92·7	66	e 13 9	+ 3	—	—	i 13 36k	pP	—
Belgrade		94·7	40	e 13 18a	+ 3	i 23 44	[+ 1]	e 13 50	PcP	e 56·3
Moscow		96·7	25	e 13 27	+ 3	e 23 51?	[− 3]	e 17 23	PP	—
Bucharest		98·3	38	e 14 42?	?	e 24 0	[− 2]	—	—	42·7
Arapuni	E.	100·0	233	—	—	e 26 42?	PS	—	—	—
Wellington		101·5	230	—	—	23 42?	?	—	—	—
Istanbul		102·0	40	13 41	− 7	17 54	PP	—	—	—
Yalta		102·8	35	e 17 48	PP	i 24 23	[− 1]	—	—	—
Sverdlovsk		103·0	13	18 16	PP	i 25 21	− 9	i 27 11	PS	—
Theodosia		103·1	33	e 18 1	PP	e 24 25	[− 1]	—	—	—
Christchurch		103·5	228	18 8	PP	24 56	[+28]	27 10	PS	47·4
Vladivostok		105·6	326	e 14 22	P	—	—	i 18 34	PP	—
Sotchi		106·3	32	e 18 29	PP	e 24 43	[+ 3]	—	—	—
Irkutsk		108·3	348	—	—	25 42	SKKS	33 42	SS	—
Grozny		109·5	29	e 18 41	PP	28 17	PS	—	—	—
Helwan		110·1	48	e 18 31	[+ 7]	28 22	PS	18 57	PP	—
Leninakan		110·5	32	i 19 10	PP	—	—	—	—	—
Ksara		110·7	42	i 19 4	PP	28 31	PS	—	—	—
Erevan		111·3	32	e 19 10	PP	—	—	—	—	—
Baku		113·7	28	e 19 30	PP	e 28 44?	PS	—	—	—
Frunse		119·0	8	e 18 47	[+ 6]	—	—	—	—	—
Riverview		119·1	241	i 21 16	?	i 27 38	?	e 29 37	PS	55·1
Tashkent		119·5	13	e 18 45	[+ 3]	e 25 28	[− 4]	i 20 8	PP	—
Samarkand		120·6	17	19 7?	[+22]	—	—	—	—	—
Andijan		120·7	11	e 18 47	[+ 2]	e 29 39?	PS	i 20 8	PP	—
Obi-garm		122·1	13	18 21?	[−26]	e 29 42?	PS	22 0?	PKS	—
Stalinabad		122·1	14	i 18 49	[+ 2]	i 30 13	PS	—	—	—
Murgab		123·3	10	18 54	[+ 4]	30 16	PS	—	—	—
Calcutta	E.	139·9	354	e 23 29	?	e 26 48	[+25]	e 40 33	SS	—
Bombay	E.	141·8	19	e 21 19	PP	—	—	—	—	—
Kodaikanal	E.	151·3	15	—	—	e 36 24	PPS	—	—	—

Additional readings :—
St. Louis iE = 9m.1s.
Cincinnati i = 5m.13s., 9m.12s., and 9m.58s.
Bogota eS_cP = 10m.32s., eS_cS = 17m.42s.
Chicago i = 5m.27s., iP_cP = 7m.53s., i = 10m.13s.
Boulder City i = 7m.3s.
Riverside iP_cPZ = 8m.54s.
Mount Wilson iZ = 5m.36s. and 6m.57s., iP_cPZ = 8m.55s.
Pasadena iEZ = 5m.37s., ePP?Z = 5m.58s., isP?Z = 6m.25s., iP_cPZ = 8m.54s.
Cleveland iE = 11m.14s.
Georgetown i = 5m.42s., eSS = 10m.46s.
New Kensington iE = 6m.52s.
Salt Lake City e = 6m.43s.
Logan i = 6m.59s.
Tinemaha i = 5m.57s., iP_cPZ = 9m.2s.
Fordham i = 6m.10s.
Lick eSE = 11m.6s., eZ = 14m.54s.
Bozeman iS = 11m.13s.
Butte iN = 6m.57s.
Harvard ePP = 7m.19s., i = 8m.9s.
Ottawa PPP = 7m.32s., SS = 13m.16s., e = 13m.54s.
Mineral eE = 6m.34s.
Vermont i = 6m.34s.
Fort de France e = 12m.39s.
Ferndale eSN = 12m.12s.
Shawinigan Falls i = 6m.52s.

Continued on next page.

Saskatoon PPP =8m.9s., SS =14m.29s.
Halifax SS =15m.18s.
Victoria e =9m.42s.
La Paz iSSZ =16m.55s., iScSN =17m.47s.
Ivigtut i =9m.33s.
Lisbon NZ? =12m.10s., EZ? =12m.18s.a, E =21m.48s., NZ =32m.18s.
Durham iSKSEN =21m.53s., iPPSE =22m.48s.
Kew eSSE =27m.9s., eE =31m.37s.
Toledo iPPP =16m.59s.
Granada PcP =12m.2s., PS =22m.40s., SS =27m.14s.
Paris i =12m.39s., 12m.42s., 12m.50s., and 14m.17s., iSKS =22m.25s., e =22m.59s., iPS =23m.20s., e =24m.21s. and 25m.53s.
De Bilt eSS =27m.42s.
Uccle ePPE =15m.31s., iSN =22m.32s., ePSE =23m.21s., eE =26m.42s. and 29m.52s., eSSSEN =31m.42s.?, eN =35m.20s.
Alicante PPP =17m.29s., PS =23m.21s., PPS =23m.50s.
Tortosa PPEN =15m.24s., PPP =17m.22s., iScSEN =22m.38s., PSEN =23m.20s., PPSE =23m.39s., SSE =27m.56s., SSS?E =31m.44s.
Clermont-Ferrand iPP =15m.44s., ePPP =17m.38s., ePS =23m.57s., eSS =28m.42s.
Copenhagen 22m.45s., 23m.53s., SS =28m.18s.
Strasbourg iP =12m.35s., iSKS =22m.50s.
Upsala epPE =13m.0s., eN =13m.28s., PP =15m.51s., iE =23m.2s., eSS?E =27m.42s., eSSSE =32m.4s.
Stuttgart iP =12m.40s.a, e =13m.10s., ePPZ =15m.55s., e =23m.48s., ePPS =24m.54s., e =28m.6s., eSSS? =32m.42s., eQ =36·7m.
Zürich ePP =15m.53s.
Jena ePP?EZ =15m.58s., eSKS?E =22m.56s.
Potsdam eN =13m.19s. and 23m.18s.
Collmberg i =13m.23s., e =14m.29s.
Salo eZ =13m.20s.
Prague e =15m.7s., ePP =16m.54s., e =17m.7s., ePPP =18m.14s., eSKS =23m.7s., eSS =29m.0s.
Helsinki eSKS =23m.3s., eSKKS =23m.20s., ePS =24m.12s., ePPS =24m.51s., eSS =28m.46s., eSSS =31m.54s., eSSSS =34m.1s.
Bologna e =16m.58s.
Florence eSKSE =23m.16s.
Triest iPP =16m.27s., iPPP =18m.26s.
Rome iZ =13m.34s., iSKKSN =23m.57s., iSE =24m.19s., ePS?EN =25m.3s., eE =29m.4s.
Raciborzu eEN =13m.12s., eEN =17m.37s.?
Warsaw ePN =13m.10s., eE =13m.45s., eZ =13m.59s., ePPE =16m.44s., eZ =17m.21s., SKSEN =23m.23s., eSN =23m.58s., ePSEN =24m.59s., ePPSN =25m.31s., ePPSE =25m.36s., eSSN =30m.5s.
Tamanrasset iPP =16m.52s.a, ipPP =17m.19s.k.
Belgrade i =17m.3s.
Sverdlovsk PPS =28m.9s., SS =32m.54s.
Christchurch PPSEZ =28m.0s., SS =33m.2s., SSSEN =36m.30s., SSSS?E =40m.17s.
Helwan i =19m.13s., sPP? =19m.30s., i =19m.58s., PPP? =21m.22s.
Riverview ePPSE =30m.44s., eSSN =36m.13s., eSSPE =36m.23s., eQ =50m.24s.
Tashkent eSKKS =26m.46s., ePS =29m.58s., eSS =36m.12s.

Aug. 11d. Readings also at 2h. (Apia), 3h. (near Lick), 6h. (Tashkent, near Almata, Frunse, Murgab, Obi-garm, and Stalinabad), 8h. (near Zürich), 9h. (Istanbul), 11h. (Mount Wilson, Pasadena, Boulder City, Grand Coulee, and Shasta Dam), 12h. (Ferndale), 14h. and 15h. (Tucson), 16h. (Andijan and near Murgab), 18h. (Mount Wilson, Pasadena, Palomar, Tinemaha, Tucson, Boulder City, Pierce Ferry, Grand Coulee, Shasta Dam, and Hungry Horse), 19h. (Istanbul), 20h. (near Mineral (2)), 21h. (near Berkeley, Lick, Mineral, near Murgab, and near Obi-garm), 22h. (near Murgab and near Obi-garm (2)), 23h. (near Mineral (4)).

Aug. 12d. 22h. Undetermined shock. South Atlantic.

La Plata PN =31m.30s., PPN =31m.52s., PcPN =34m.0s., SN =36m.48s., QN =39m.14s. R?N =48m.42s.
La Paz iP =34m.13s., ipP =34m.17s., iPPZ =36m.12s., iSN =41m.49s., iSS? =44m.56s., LN =50m.48s.
Ford de France eP? =35m.3s.?, eS? =45m.3s.?
Huancayo eP =35m.7s., eS? =43m.20s., eSS =48m.31s., eL =50m.5s.
Riverview iPNZ =37m.27s.a, iPPZ =40m.53s., eSN =47m.51s., iScS?N =48m.11s., ePS?N =48m.56s., ePPSN =49m.13s., iSSN =53m.30s., iN =53m.47s. and 54m.9s.
Tamanrasset iP =37m.34s.k, i =37m.47s.k.
Granada eP =38m.58s.k, PP =42m.38s., iS =50m.26s., PPS =51m.55s., SS =56m.56s., SSS =63m.26s., iL =70m.24s.
Helwan eP =38m.44s., PP? =42m.57s.
Ksara eP =39m.7s., PP =43m.31s.
Aberdeen eN =42m.27s.

Continued on next page.

Rome ePP?Z =43m.15s., eN =50m.30s., eSKSE =52m.56s., eSSN =58m.36s., eE = 68m.53s., eL =72m.53s.
St. Louis ePKP =43m.22s., eSKKS? =50m.56s., ePS =53m.34s., ePPS =54m.53s.
Tucson iPKP =43m.30s., e =44m.37s., 53m.47s., and 57m.15s.
Palomar iPKP$_2$Z =43m.37s., eZ =44m.57s.
Riverside iPKP$_2$Z =43m.38s.
Mount Wilson iPKP$_2$Z =43m.39s.
Pasadena iPKP$_2$Z =43m.40s., iZ =43m.46s., eZ =44m.28s., ePPZ =45m.11s., eLEN = 61·8m.
Clermont-Ferrand ePP =43m.41s., ePS =53m.6s., L =77m.
Istanbul eP?Z =43m.42s., eS? =53m.20s.?
Tinemaha iPKP$_2$Z =43m.45s.
Lick ePZ =43m.48s.
Berkeley ePZ =43m.50s., eZ =45m.45s., eE =61m.58s., eLEN =94·4m.
Pierce Ferry iPKP =43m.50s.?
Shasta Dam ePKP =43m.51s.
Hungry Horse iPKP =43m.56s., i =52m.20s. and 56m.47s.
Scoresby Sund P =43m.58s., 46m.30s., 47m.25s., 54m.48s., and 64m.0s., L =84m.0s.
Cincinnati iPKP? =44m.0s., ePS =53m.29s., ePPS =54m.30s.
Grand Coulee iPKP =44m.0s.
Victoria e =44m.2s. and 47m.42s., L =76m.
Basle e =44m.4s. and 83m.0s.
Paris ePP =44m.4s., ePPP =46m.18s., ePS =53m.30s., eL =67m.59s.
Stuttgart ePP?Z =44m.8s., ePPP? =46m.48s., ePS? =53m.47s., ePKKP? =54m.16s., eSS? =60m., eL =82m.
Sitka ePKP? =44m.26s.
Copenhagen 45m.2s., 52m.4s., L =84m.
Bermuda e =48m.8s., eL =70m.18s.
Alicante E =50m.28s., eL =70m.28s.
Warsaw eE =51m.26s., eN =51m.49s., eEN =54m.46s., eLE =89m.
Tananarive e =52m.26s., 54m.12s., and 56m.2s.
Strasbourg ePS =53m.51s., eSSS =63m.0s., eL =72m.
Uccle eN =54m.0s. and 60m.0s., eLE =73m.
Kew eEN =60m.22s., eLE =76m.
Auckland eN =66m. and 73m.20s., LN =75m.
Wellington e =66m.
Long waves were also recorded at Arapuni, Tortosa, Edinburgh, Triest, and De Bilt.

Aug. 12d. 23h. 3m. 15s. Epicentre 40°·1N. 8°·6W.

Intensity V-VI at Condeix ; IV-V at Luso, Mealhada e Buçaco, Coimbra, etc.
Epicentre 40°4′N. 8°35′W. (Lisbon).

Observacoes macrosismicas, 1948, Anuario Sismologico de Portugal, No. 2, 1948, p. 2, with macroseismic chart p. 6.

$A = +·7584$, $B = -·1147$, $C = +·6416$; $\delta = -2$; $h = -2$;
$D = -·150$, $E = -·989$; $G = +·634$, $H = -·096$, $K = -·767$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Lisbon		1·4	197	0 28 a	+ 1	0 47	+ 1	0 31	P_g	—
Toledo	z.	3·5	92	i 0 53	− 4	i 1 49	S*	i 1 2	P*	—
Granada		4·9	125	i 1 55k	?	2 17	+ 2	2 41	S_g	—
Alicante		6·5	103	2 23	P_g	3 31	S_g	—	—	—
Tortosa		6·9	81	1 44	− 1	3 11	+ 6	—	—	4·5
Barcelona		8·3	77	4 19	S*	4 54	S_g	—	—	—

Additional readings and note :—
Lisbon Z =50s., E =56s., N =1m.4s.
Toledo iP =59s.
Granada P_g =2m.10s., P =2m.21s., PS =2m.34s., P_gS_g =2m.53s., iS_g =3m.13s. and 3m.22s.
Tortosa P_gS_gN =2m.56s., S_gE =3m.45s., S_gEN =3m.49s.
Alicante P =2m.33s., P_g =2m.51s., S =3m.50s., S_g =4m.7s.
Barcelona readings wrongly identified.

Aug. 12d. Readings also at 0h. (near Stalinabad and near Mineral), 3h. (near Balboa Heights), 4h. (Triest, Rome, Istanbul, Copenhagen, Warsaw, De Bilt, Stuttgart, Belgrade, and Tamanrasset), 6h. (Samarkand, Tashkent, Tchimkent, Ashkabad, Almata, near Stalinabad, Murgab, Andijan, and near Mineral), 7h. (near Lick), 8h. (near Samarkand, Stalinabad, Andijan, and near Zürich), 9h. (Samarkand and near Stalinabad), 10h. (near Zürich), 12h. (Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Boulder City, Pierce Ferry, Shasta Dam, and Tucson), 17h. (Ville Marie, Dack, Seven Falls, and near Ottawa (2)), 18h. (near Zürich), 20h. (near Mineral), 21h. (near Bogota and near Mineral), 22h. (Istanbul, La Paz, near Obi-garm, near Andijan, Frunse, and Almata).

Aug. 13d. 11h. 18m. 32s. Epicentre 15°·9N. 93°·0W. (as on 1945, January 12d.).

Felt at Tuxtla, Gutierrez, Chiapas (Mexico). Epicentre 16°51′N. 93°47′W. (Tacubaya).

Bulletin séismique mensuel de Tacubaya.

$A = -\cdot0504$, $B = -\cdot9609$, $C = +\cdot2722$; $\delta = -4$; $h = +6$;
$D = -\cdot999$, $E = +\cdot052$; $G = -\cdot014$, $H = -\cdot272$, $K = -\cdot962$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Oaxaca		3·8	287	1 17	P_g	—	—	—	—	1·9
Merida		6·0	32	1 54	P_g	3 2	S*	—	—	3·2
Tacubaya		6·9	302	1 54	+ 9	3 6	+ 1	—	—	3·3
Balboa Heights		14·8	116	i 4 50	+78	i 5 37	−41	—	—	—
Bogota		21·7	119	e 4 56	+ 1	e 9 16	SS	i 5 21	PP	—
St. Louis		22·8	5	i 5 4	− 1	i 9 16	+ 5	i 5 35	PP	—
Tucson		23·0	319	e 5 10	+ 3	e 9 31	+17	i 5 39	PP	e 12·6
Ciucinnati		24·3	17	e 5 19	− 1	e 10 28	SS	i 5 39	PP	—
San Juan		25·8	80	e 5 49	+15	e 8 52	−70	e 6 35	PPP	e 9·6
Pierce Ferry		27·5	323	e 5 30?	−20	—	—	—	—	—
La Jolla	z.	27·7	312	e 5 47	− 5	—	—	i 6 28	PP	—
Palomar		27·7	313	i 5 52	0	—	—	i 6 33	PP	—
Boulder City		27·9	322	i 5 54	0	—	—	i 6 14	?	—
Riverside	z.	28·4	314	e 6 0	+ 2	—	—	e 9 7	P_cP	—
Mount Wilson	z.	29·0	314	e 6 4	0	—	—	—	—	—
Pasadena	z.	29·0	314	i 6 5	+ 1	—	—	e 9 8	P_cP	—
Fordham		29·9	30	e 6 31	+19	e 11 3	− 6	—	—	—
Haiwee	z.	30·0	318	e 6 13	+ 1	—	—	e 6 44	?	—
Tinemaha	z.	30·8	318	i 6 21	+ 1	—	—	e 9 12	P_cP	—
Harvard		32·3	31	i 6 52	+19	—	—	i 7 2	pP	—
Huancayo		32·8	147	e 6 31	− 6	—	—	—	—	—
Ottawa		32·8	23	e 6 37	0	—	—	i 6 56	?	11·9
Lick	z.	33·1	317	e 6 41	+ 1	—	—	—	—	—
Mineral	z.	34·8	321	e 6 54	0	—	—	e 7 11	?	—
Shawinigan Falls	N.	34·9	25	e 7 15	+20	—	—	—	—	—
Shasta Dam		35·5	321	e 6 56	− 4	—	—	i 9 24	P_cP	—
Hungry Horse		36·7	337	i 6 40	−30	—	—	—	—	—
Grand Coulee		38·5	332	e 7 24	− 2	—	—	i 7 28	P	—
Victoria		40·9	330	e 7 41	− 5	—	—	—	—	—
Clermont-Ferrand		83·0	45	e 13 5	+37	—	—	—	—	—
Stuttgart	z.	86·0	40	e 13 13?	+30	—	—	—	—	—

Additional readings :—
Tacubaya SZ = 2m.56s.
Bogota iPPPEZ = 5m.37s., eS_cPE = 15m.4s.
St. Louis i = 5m.26s. and 10m.0s.
Tucson i = 5m.25s.
Palomar iZ = 6m.15s., iNZ = 6m.23s.
Riverside iZ = 6m.32s. and 9m.27s.
Mount Wilson eZ = 6m.26s., iZ = 6m.35s.
Pasadena eZ = 6m.26s., iZ = 6m.35s. and 7m.11s.
Tinemaha iZ = 6m.40s. and 6m.51s., eZ = 9m.39s.
Shasta Dam i = 6m.59s. and 9m.48s.

Aug. 13d. 12h. 34m. 33s. Epicentre 34°·8N. 137°·5E.

Intensity V at Maisaki, Fukuroi (Shizuoka Prefecture), Sakashita, Toyohashi (Aichi Prefecture); IV at Irako, Iida, and Nagoya; II-III at Shizuoka, Gihu, Kameyama, Hikone, Tsuruga, Osaka, and Tu.
Epicentre as adopted. Macroseismic radius 200-300km. Shallow.

The Seismological Bulletin of the Central Meteorological Observatory, Japan, for the year 1948, Tokyo, 1950, p. 33, with macroseismic chart.

$A = -\cdot 6067$, $B = +\cdot 5560$, $C = +\cdot 5681$; $\delta = -4$; $h = 0$;
$D = +\cdot 677$, $E = +\cdot 737$; $G = -\cdot 419$, $H = +\cdot 384$, $K = -\cdot 823$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Nagoya		0·6	314	0 12	− 3	0 21	− 5	—	—
Omaesaki		0·6	109	0 10a	− 5	0 21	− 5	—	—
Gihu		0·8	316	0 17	− 1	0 28	− 3	—	—
Kameyama		0·8	273	0 19	+ 1	—	—	—	—
Shizuoka		0·8	82	0 15a	− 3	0 26	− 5	—	—
Hikone		1·1	296	0 21a	− 1	0 38	− 1	—	—
Misima		1·2	89	0 20a	− 4	0 36	− 5	—	—
Hunatu		1·3	57	0 21	− 4	0 40	− 4	—	—
Owase		1·3	234	0 23	− 2	0 37	− 7	—	—
Kyoto		1·5	278	0 29	+ 1	0 47	− 2	—	—
Osaka		1·6	265	0 28	− 2	0 48	− 3	—	—
Osima		1·6	91	0 26	− 4	1 5	+14	—	—
Kobe		1·9	267	0 33	− 1	—	—	—	—
Mera		1·9	86	0 41	+ 7	1 6	+ 7	—	—
Nagano		1·9	18	0 34	0	0 58	− 1	—	—
Toyama		1·9	354	0 39	+ 5	1 5	+ 6	—	—
Yokohama		1·9	70	0 45	+11	1 3	+ 4	—	—
Kumagaya		2·0	49	0 35	0	0 59	− 3	—	—
Maebasi		2·0	40	0 36	+ 1	1 1	− 1	—	—
Siomisaki		2·0	226	0 39	+ 4	1 11	+ 9	—	—
Tokyo		2·0	64	0 38k	+ 3	0 52	−10	—	—
Sumoto		2·2	258	0 36	− 2	1 12	+ 6	—	—
Toyooka		2·3	289	0 19	−21	0 43	−26	—	—
Kakioka		2·6	57	0 44	0	—	—	—	—
Utunomiya		2·6	48	0 43	− 1	1 11	− 6	—	—
Wazima		2·6	351	0 49	+ 5	1 25	S_g	—	—
Mito		2·9	57	0 51	+ 3	1 33	S_g	—	—
Muroto		3·2	241	0 59	P*	1 44	S_g	—	—
Kôti		3·5	250	1 8	P_g	1 51	S*	—	—
Hirosima		4·2	265	1 16	P*	2 7	S*	—	—
Sendai		4·4	38	1 9	− 1	2 0	− 2	—	—
Hamada		4·5	373	1 27	P_g	2 10	+ 5	—	—
Mizusawa	E.	5·2	33	e 1 42	P_g	e 2 40	S*	—	—
Hukuoka		6·0	260	1 42	P*	2 57	S*	—	—
Shasta Dam		75·0	51	e 11 44	− 1	—	—	i 51 50	?
Hungry Horse		75·6	41	i 11 43	− 5	—	—	—	—

Aug. 13d. Readings also at 0h. (near Tacubaya), 1h. (Palomar, Riverside, Tinemaha, and Tucson), 4h. (Hungry Horse, near Mizusawa, and near Zürich), 6h. (near Andijan and near Lick (2), 7h. (near Mineral (5)), 8h. (Sverdlovsk, Andijan, Almata, Frunse, Stalinabad, Calcutta, Hungry Horse, and near Mineral (3)), 9h. (Stuttgart, Mount Wilson, Pasadena, Haiwee, Palomar, Riverside, Tinemaha, Boulder City, Grand Coulee, Hungry Horse (2), Pierce Ferry, Shasta Dam, Tucson, Mineral, Victoria, and near Bogota, 2 shocks), 10h. (near Tortosa (2)), 12h. (Calcutta and Bogota), 13h. (La Paz), 15h. (near Mineral), 16h. (near Obi-garm), 17h. (near Istanbul), 18h. (Stuttgart), 20h. (Hungry Horse and near Obi-garm), 21h. (near Obi-garm and near Mineral (2)), 22h. (Rome), 23h. (Auckland, near Samarkand (2), Tashkent, Frunse (2), Almata, Stalinabad (2), Murgab (2), Andijan (2), Tchimkent, and near Lick).

Aug. 14d. 10h. 43m. 6s. Epicentre 36°·1N. 136°·2E. (as on 1948, June 28d.).

Intensity V at Hukui; IV at Tsuruga and Maizuru; II-III at Kameyama, Osaka, and Wakayama. Macroseismic radius 200-300km. Epicentre 36°·1N. 136°·3E. Shallow.

Seismo. Bull. Cent. Met. Obs. Japan for 1948. Tokyo, 1950, p. 34, with macroseimic chart.

$A = -·5845$, $B = +·5606$, $C = +·5866$; $\delta = +1$; $h = 0$;
$D = +·692$, $E = +·722$; $G = -·423$, $H = +·406$, $K = -·810$.

	Δ	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Gihu	0·8	147	0 17	− 1	0 27	− 4
Hikone	0·8	177	0 20	+ 2	0 30	− 1
Nagoya	1·1	146	0 24	+ 2	0 39	0
Kyoto	1·2	199	0 22	− 2	0 42	+ 1
Toyooka	1·2	243	0 25	+ 1	0 43	+ 2
Kameyama	1·3	170	0 26	+ 1	0 44	0
Wazima	1·4	24	0 26	− 1	0 46	0
Osaka	1·5	201	0 33k	+ 5	0 53	+ 4
Kobe	1·6	210	0 35	+ 5	0 57	+ 6
Nagano	1·7	71	0 2	−29	0 41	−13
Owase	2·0	180	0 41	P_g	1 7	S_g
Sumoto	2·0	212	0 42	P_g	1 8	S_g
Shizuoka	2·1	122	0 39	P*	1 5	S*
Hunatu	2·2	106	0 35	− 3	1 10	+ 4
Omaesaki	2·2	132	0 9	?	0 28	?
Maebasi	2·3	83	0 44	+ 4	1 22	S_g
Kumagaya	2·6	89	0 51	P_g	1 16	− 1
Siomisaki	2·7	188	0 51	+ 6	1 28	S_g
Tokyo	2·9	98	0 58	P_g	1 33	S_g
Yokohama	2·9	103	1 1	P_g	1 21	− 3
Kakioka	3·2	88	1 1	P_g	—	—
Hirosima	3·5	242	1 34	S	1 51	S*
Mito	3·5	84	1 5	P*	—	—
Hamada	3·6	252	1 46	S	(1 46)	+ 4
Hukuoka	5·4	244	1 37	P*	—	—
Shasta Dam	75·0	50	i 11 29	−16	—	—
Hungry Horse	75·3	39	i 11 46	− 1	—	—
Mineral z.	75·7	50	e 11 47	− 2	—	—

Aug. 14d. 16h. 55m. 53s. Epicentre 36°·4N. 141°·1E. Depth of focus 0·005.
(as on 1947 May 3d.).

Intensity V at Mito, Kakioka, Onahama, and Yokohama; IV at Tukubasan, Shirakawa, Tokyo, Hukusima, Titibu, Sendai, and Hunatu; II-III at Karuizawa, Shizuoka, Morioka, and Miyako.
Seismo. Bull. Cent. Met. Obs., Japan, 1948, Tokyo, 1950, pp. 34, 35 with macroseismic chart. Epicentre 36°·4N. 141·2E. Depth 40km. Macroseismic radius >300km.

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

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Mito	0·5	268	0 10	− 3	0 18	− 5	—	—	—
Onahama	0·6	343	0 18k	+ 4	0 27	+ 2	—	—	—
Kakioka	0·8	257	0 13	− 4	0 24	− 5	—	—	—
Tukubasan	0·8	257	0 15k	− 2	—	—	—	—	—
Utunomiya	1·0	279	0 17k	− 2	0 30	− 3	—	—	—
Tokyo	1·3	237	0 21k	− 2	0 37	− 3	—	—	—
Hukusima	1·4	339	0 24k	0	0 42	− 1	—	—	—
Kumagaya	1·4	260	0 23k	− 1	0 40	− 3	—	—	—
Yokohama	1·5	231	0 22	− 4	0 41	− 4	—	—	—
Maebasi	1·6	270	0 27k	0	0 46	− 1	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Mera		1·8	215	0 27	− 3	0 53	+ 1	—	—	—
Sendai		1·9	355	0 29	− 2	0 52	− 2	—	—	—
Yamagata		2·0	342	0 33	+ 1	0 56	− 1	—	—	—
Hunatu		2·1	245	0 33	− 1	0 59	0	—	—	—
Osima		2·1	221	0 35	+ 1	1 1	+ 2	—	—	—
Misima		2·2	234	0 35	0	1 3	+ 1	—	—	—
Nagano		2·3	277	0 39	+ 2	1 16	+12	—	—	—
Shizuoka		2·6	237	0 42a	+ 1	1 15	+ 3	—	—	—
Aikawa		2·8	305	0 42	− 2	1 26	+ 9	—	—	—
Mizusawa	E.	2·9	0	0 44	− 1	1 13	− 6	—	—	—
Omaesaki		3·0	232	0 43	− 4	1 20	− 2	—	—	—
Toyama		3·2	275	0 51k	+ 2	1 48	+21	—	—	—
Miyako		3·3	12	0 48a	− 3	1 18	−11	—	—	—
Morioka		3·3	1	0 47	− 4	1 23	− 6	—	—	—
Akita		3·4	346	0 55	+ 3	1 39	+ 7	—	—	—
Nagoya		3·5	250	0 56	+ 2	1 43	+ 9	—	—	—
Wazima		3·5	289	0 52	− 2	1 45	+11	—	—	—
Gihu		3·7	256	0 58	+ 2	1 43	+ 4	—	—	—
Hatinohe		4·1	4	0 47	−15	1 39	−10	—	—	—
Hikone		4·1	255	1 5	+ 3	1 59	+10	—	—	—
Kameyama		4·1	249	1 3	+ 1	2 11	+22	—	—	—
Aomori		4·4	357	1 8	+ 2	2 7	+10	—	—	—
Kyoto		4·6	254	0 50	−19	1 25	?	—	—	—
Owase		4·6	242	1 13	+ 4	2 29	+27	—	—	—
Osaka		4·9	252	1 15	+ 2	2 33	+24	—	—	—
Kobe		5·1	252	1 20	+ 4	2 20	+ 6	—	—	—
Siomisaki		5·2	238	1 18	+ 1	2 39	+22	—	—	—
Toyooka		5·2	262	1 18	+ 1	2 22	+ 5	—	—	—
Sumoto		5·5	250	1 21	0	2 42	+18	—	—	—
Tottori		5·6	262	1 46	+23	3 1	+34	—	—	—
Mori		5·7	356	1 24	0	2 51	+22	—	—	—
Sapporo		6·7	1	1 41	+ 3	2 52	− 2	—	—	—
Hirosima		7·4	257	1 45	− 3	2 41	−30	—	—	—
Hamada		7·5	260	1 46	− 3	3 35	+21	—	—	—
Izuka		9·0	255	2 11	+ 1	—	—	—	—	—
Hukuoka		9·2	256	2 13	+ 1	4 26	+31	—	—	—
Kumamoto		9·3	250	2 15	+ 1	4 58	+60	—	—	—
Vladivostok		9·8	316	i 2 21	0	i 4 16	+ 6	—	—	—
Kagosima		10·0	244	2 28	+ 5	5 21	+66	—	—	—
Frunse		50·4	300	e 8 56	+ 3	—	—	—	—	—
Murgab		52·3	294	9 8	+ 1	16 33	+ 7	—	—	—
Andijan		52·7	298	9 11	+ 1	e 16 41	+10	—	—	—
Tashkent		54·7	299	i 9 24	− 1	e 16 56?	− 2	—	—	—
Obi-garm		55·3	297	(i 9 17?)	−12	(i 16 59?)	− 7	—	—	—
Sverdlovsk		55·5	319	9 31	0	17 7	− 2	—	—	—
Stalinabad		56·0	296	i 9 35	+ 1	i 17 23	+ 7	—	—	—
Victoria		67·0	46	e 10 49	+ 1	—	—	—	—	—
Moscow		67·6	323	10 50	− 2	e 19 37	− 5	—	—	—
Grozny		69·8	310	e 11 8	+ 3	—	—	—	—	—
Leninakan		72·1	308	e 11 13	− 6	—	—	—	—	—
Scoresby Sund		72·7	355	11 24	+ 1	20 48	+ 6	14 5	PP	34·1
Lick	z.	74·0	56	e 11 32	+ 2	—	—	e 11 43	pP	—
Yalta		75·9	316	e 11 40	− 1	—	—	—	—	—
Tinemaha	z.	76·4	54	e 11 46	+ 2	—	—	i 12 0	pP	—
Santa Barbara	z.	76·9	57	e 12 0	+13	—	—	—	—	—
Haiwee	z.	77·1	55	e 11 51	+ 3	—	—	e 12 3	pP	—
Pasadena		78·1	56	e 11 55	+ 1	—	—	e 12 7	pP	e 35·1
Mount Wilson	z.	78·2	56	e 11 56	+ 2	—	—	e 12 9	pP	—
Riverside	z.	78·8	56	e 11 58	+ 1	—	—	e 12 11	pP	—
Boulder City		79·3	53	i 12 31	+31	—	—	i 12 45	pP	—
La Jolla	z.	79·5	57	e 12 12	+11	—	—	—	—	—
Palomar	z.	79·5	56	i 12 3	+ 2	—	—	i 12 15	pP	—
Pierce Ferry		79·7	52	e 12 7?	+ 5	—	—	e 12 31?	pP	—
Istanbul		80·9	316	i 12 9	0	22 36?	+25	—	—	—
Ksara		81·3	306	i 12 11	0	22 40	+25	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Prague		81·9	329	—	—	e 21 41	−40	—	—	e 31·1
Jena	N.	82·4	330	e 12 18	+ 2	—	—	e 12 29	pP	—
Cheb		82·7	330	e 16 13	PP	e 22 58	PS	e 18 26	?	—
Belgrade		83·0	322	e 12 21	+ 1	e 23 2	PS	—	—	e 50·6
De Bilt		83·8	335	i 12 25	+ 1	e 24 21	PPS	—	—	e 42·1
Tucson		84·2	54	i 12 28	+ 2	—	—	i 12 40	pP	—
Stuttgart		85·0	330	e 12 31 a	+ 1	e 23 20	PS	e 12 43	pP	e 44·1
Strasbourg		85·8	331	e 12 37	+ 3	e 23 24	PS	—	—	38·6
Kew		86·2	338	—	—	(e 29 7?)	SS	—	—	e 29·1
Helwan		86·8	305	i 12 39 k	+ 1	e 23 35	PS	16 4	PP	—
Paris		87·5	334	e 12 44	+ 2	e 23 35?	PS	i 12 55	pP	e 44·1
Rome		89·0	323	—	—	e 23 41	PS	—	—	e 42·0
Alicante		97·6	330	e 12 25	−63	e 18 7	?	—	—	e 39·6
Toledo	Z.	97·6	334	e 13 42	+14	—	—	—	—	—
Tamanrasset		107·7	316	18 24	[+ 5]	—	—	—	—	—
La Paz		147·4	59	i 19 38	[+ 4]	—	—	—	—	—

Additional readings and Note :—
Mizusawa ePN =48s.
Obi-garm readings reduced by 6 minutes.
Scoresby Sund 21m.13s.
Pierce Ferry e =13m.35s.?.
Belgrade e =13m.12s.
Tucson i =13m.22s.
Long waves were also recorded at Bombay, Warsaw, Uccle, Clermont-Ferrand, and Granada.

Aug. 14d. 23h. New Zealand.

Tuai PN =40m.31s., SN =41m.17s.
Auckland eN =40m.38s., SN =41m.18s.
Arapuni eE =40m.54s., LE =42m.0s.
New Plymouth eE =41m.3s., SE =42m.0s.
Wellington i =41m.25s., S =42m.30s.
Christchurch e =42m.52s., S? =43m.13s.
Riverview iPZ =44m.43s.k.
Brisbane iPN =44m.53s., iN =45m.7s., and 45m.27s.
Pasadena ePZ =52m.22s.
Riverside ePZ =52m.26s.
Mount Wilson ePZ =52m.28s.
Palomar ePZ =52m.28s.
Tucson eP =52m.41s.
Ottawa e =58m.28s.
Istanbul e =59m., 63m., and 129m.
Ksara ePKP =59m.17s., PPS =76m.19s.
Belgrade eP? =59m.22s.a, e =59m.30s., i = 59m.59s. and 60m.11s.
Tamanrasset iPKP =59m.36s.a, ePP =64m.24s.
Stuttgart eZ =60m.24s.
Paris ePKP =60m.31s., eL =134m.
Long waves were also recorded at Rome and Uccle.

Aug. 14d. Readings also at 0h. (near Istanbul), 1h. (Almata, Andijan, Frunse, Stalinabad, Tashkent, Sverdlovsk, and Irkutsk,) 2h. (Copenhagen and De Bilt), 5h. (La Paz), 6h. (near Victoria), 7h. (Kaimata, Christchurch, near New Plymouth, Tuai, Wellington, Samarkand, near Andijan, and Obi-garm), 10h. (near Bogota), 11h. (Almata, near Andijan, and near Mineral), 12h. (Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Boulder City, Pierce Ferry, Shasta Dam, Hungry Horse, Mineral, and Victoria), 14h. (Basle, Zürich, Jena, Stuttgart, and Rome), 16h. (Hungry Horse), 17h. (Haiwee, Mount Wilson, Pasadena, Riverside, Tinemaha, Boulder City, Pierce Ferry, Hungry Horse, Mizusawa, and near Tortosa), 19h. (near Mineral), 20h. (Auckland, New Plymouth, Tuai, Wellington, Riverview, Palomar, Riverside, Tucson, Ottawa, and near Bogota), 21h. (near Mineral), 23h. (La Paz).,

Aug. 15d. 1h. New Zealand, probably repetition of shock at 23h, on 14d.

Tuai PN =15m.15s., SN =16m.0s.
Auckland PN =15m.21s.
New Plymouth eE =15m.47s., S?E =16m.42s.
Arapuni eE =16m.6s. and 16m.12s.
Wellington i =16m.16s., and 17m.15s.
Christchurch S =18m.18s.
Kaimata e =19m.18s.
Riverview iPZ =19m.26s.k.
Palomar ePZ =27m.12s.
Riverside ePZ =27m.12s.
Pasadena ePZ =27m.13s.
Mount Wilson ePZ =27m.14s.
Tucson eP? =27m.28s.
Ksara ePKP =33m.57s., PPS =51m.4s.
Tamanarasset iPKP =34m.15s.a, ePP =39m.3s.
Stuttgart eZ =35m.8s.
Paris ePKP =35m.15s., eL =108m.
Berkeley eN =38m.14s., 44m.18s., 52m.48s., and 54m.20s., eLN =61m.
Long waves were also recorded at Rome and Uccle.

Aug. 15d. 22h. Undetermined shock.

Brisbane iN =12m.48s., 13m.48s., 14m.9s., 15m.48s., 19m.13s., 19m.18s., 19m.45s., 19m.52s., 20m.6s., 20m.36s., 20m.54s., 21m.58s., 22m.14s., 23m.1s., 24m.16s., 24m.22s., and 25m.55s.
Vladivostok eP =14m.48s., iPS =21m.44s.
Frunse eP =17m.8s.
Andijan P =17m.10s., S =23m.10s.
Stalinabad iP =17m.18s., iS =26m.23s.
Tashkent iP =17m.23s., iS =26m.33s.
Tchimkent iP =17m.23s.
Samarkand P =17m.28s.
Sverdlovsk iP =18m.26s., iS =28m.29s.
Moscow eP =19m.19s., eSKS =29m.44s., eS =30m.20s.
Riverview iE =20m.43s., 23m.14s., and 23m.21s., iEZ =23m.52s., iN =24m.11s.
Tucson iP =24m.42s.
Ottawa e =25m.13s.
Huancayo eP =25m.45s., e =26m.33s.
Baku eS =28m.51s.
Long waves were recorded at La Plata.

Aug. 15d. Readings also at 3h. (Stuttgart), 4h. (Victoria (2) and Tamanrasset), 5h. (Boulder City, Pierce Ferry, Tucson, Pasadena, Mount Wilson, Riverside, Palomar, Haiwee, Tinemaha, and Victoria), 7h. (La Paz and Bogota), 9h. (Samarkand, Andijan, Tchimkent, and near Stalinabad), 11h. (Bogota and near Zürich), 13h. (Stuttgart), 14h. (Sotchi), 15h. (Stuttgart), 17h. (Stuttgart, Pierce Ferry, Shasta Dam, Tucson, Mount Wilson, Riverside, Tinemaha, Wellington, and near Ottawa), 18h. (Rome and Belgrade), 19h. (Tucson, Tinemaha, and near Apia), 20h. (near Obi-garm, Stalinabad, Tashkent, Andijan, and Tchimkent).

Aug. 16d. 3h. Undetermined shock ; near Samoa.

Apia iP =20m.46s.k, S. =21m.42s.
Hungry Horse eP =30m.30s.
La Jolla iPZ =30m.35s.
Pasadena iPZ =30m.37s.a,.
Mount Wilson iPZ =30m.38s.a, iZ =30m.44s.
Riverside iPZ =30m.39s.a,.
Palomar iPZ =30m.40s.a.
Shasta Dam iP =30m.41s.
Haiwee iPZ =30m.44s.
Tinemaha iPZ =30m.45s.a.
Boulder City eP? =30m.55s.?
Tucson iP =31m.2s.a, e =32m.23s.
Victoria e =31m.4s.
Pierce Ferry i =31m.36s.?.

Aug. 16d. 10h. 45m. 11s. Epicentre 24°·5S. 65°·6W. Depth of focus 0·020.

A = +·3763, B = −·8296, C = −·4124 ; δ = −9 ; h = +3 ;
D = −·911, E = −·413 ; G = −·170, H = +·376, K = −·911.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Montezuma		3·5	302	e 0 53	− 2	i 1 29	− 8	—	—	e 1·7
La Paz		8·3	343	i 1 58	0	i 3 25	− 6	—	—	—
La Plata	N.	12·3	149	3 9	pP	5 36	SS	—	—	6·4
Huancayo		15·5	322	e 3 31	0	e 4 54	?	—	—	e 6·2
Tucson		71·1	321	i 11 3	0	—	—	e 11 55	pP	—
Palomar	Z.	75·4	318	e 11 28	0	—	—	e 12 22	pP	—
Pierce Ferry		75·7	322	e 12 7?	pP	—	—	—	—	—
Boulder City		76·0	321	e 11 30	− 1	—	—	—	—	—
Mount Wilson	Z.	76·8	318	i 11 36	0	—	—	e 12 28	pP	—
Pasadena	Z.	76·8	318	e 11 36	0	—	—	e 12 31	pP	—
Haiwee	Z.	78·0	320	e 11 45	+ 3	—	—	—	—	—
Tinemaha	Z.	78·8	320	i 11 47	+ 1	—	—	e 12 45	pP	—
Shasta Dam		83·6	320	i 12 10	− 1	—	—	i 13 37	pP	—
Hungry Horse		84·5	330	i 11 17	−59	—	—	i 12 12	pP	—
Victoria		89·2	326	e 12 39	0	—	—	—	—	—

Additional readings :—
La Paz iSN = 2m.57s., iS* = 3m.13s.
Shansta Dam i = 12m.56s.
Hungry Horse i = 16m.32s.

Aug. 16d. Readings also at 0h. (Stalinabad), 1h. (Mount Wilson, Pasadena, Riverside, Tinemaha, Palomar, Shasta Dam, Tucson, and near Sotchi), 2h. (Rome), 3h. (Ksara), 4h. (near Mineral), 5h. (Mount Wilson, Pasadena, Riverside, Tinemaha, Palomar, Boulder City, Hungry Horse, Pierce Ferry, Shasta Dam, Tucson (2), Victoria, Ottawa, Mineral, and near College), 11h. (Mount Wilson, Palomar, Tinemaha, Tucson, Bogota, La Paz, and near Balboa Heights), 14h. (Mount Wilson, Pasadena, and Palomar), 19h. (near Ottawa), 20h. (near Auckland, New Plymouth, Tuai, Wellington, Christchurch, and Kaimata).

Aug. 17d. 5h. 3m. 15s. Epicentre 36°·0N. 93°·0E.

A = −·0424, B = +·8098, C = +·5852 ; δ = +3 ; h = 0 ;
D = +·999, E = +·052 ; G = −·031, H = +·584, K = −·811.

		△	Az.	P.	O−C.	S.	O−C.	L.
		°	°	m. s.	s.	m. s.	s.	m.
Almata		14·3	305	e 3 26	0	—	—	—
Frunse		15·8	302	e 3 51	+ 6	—	—	—
Andijan		16·8	293	e 4 1	+ 3	—	—	—
Irkutsk		18·1	23	e 4 14?	0	e 7 30	− 5	—
Obi-garm		18·7	287	i 5 24	+ 2	—	—	—
Tashkent		19·2	294	i 4 29	+ 1	e 8 0	+ 1	—
Stalinabad		19·4	287	i 4 30	0	—	—	—
Samarkand		20·8	289	4 45	0	—	—	—
Bomday	E.	24·6	233	e 9 22	S	(e 9 22)	−20	—
Vladivostok		30·6	325	e 6 11	− 7	—	—	—
Stuttgart		60·2	312	e 10 10	− 2	e 18 29	+ 4	e 32·8
Paris		64·3	313	i 10 38	− 1	—	—	e 34·8
Clermont-Ferrand		65·2	310	e 10 47	+2	—	—	—
Victoria		89·8	25	e 12 57	− 5	—	—	—
Hungry Horse		92·6	18	i 12 11	−64	—	—	—

Long waves were also recorded at Calcutta, Scoresby Sund, and other European stations.

Aug. 17d. 5h. Undetermined shock.

Victoria P =30m.33s., i =30m.36s., S =34m.59s., L =38·1m.
Shasta Dam iP =31m.34s.
Mineral ePZ =31m.37s., eZ =31m.41s.
Tinemaha ePZ =32m.16s., iZ =32m.40s.
Haiwee ePZ =32m.24s.
Boulder City eP? =32m.35s.
Mount Wilson iPZ =32m.36s., eZ =33m.0s.
Pasadena iPZ =32m.36s., eZ =33m.0s.
Pierce Ferry eP =32m.38s.
Riverside iPZ =32m.39s., iZ =33m.4s.
Palomar iPZ =32m.46s., eZ =33m.2s.
Tucson eP =33m.16s.
St. Louis iP =33m.52s., eS? =40m.30s., eSS? =44m.15s., eL =49·5m.
Ottawa e =34m.20s. and 34m.34s., L =50m.
Saskatoon eEN =36m.44s., L =41·5m.
Grand Coulee eS =39m.57s.
Butte eS?N =41m.29s., eN =43m.57s., eLN =45m.13s.
Granada i =44m.46s., L =63·0m.
Shawinigan Falls eN =49m.42s.
Seven Falls eE =50m.48s.
Alicante e =63m.56s.
Long waves were also recorded at Sitka, New Kensington, and Vermont.

Aug. 17d. 17h. 8m. 39s. Epicentre 35°·2N. 142°·8E.

Intensity II-III at Onahama. Epicentre as adopted. Depth of focus suggested 50km. Macroseismic radius 200-300km.

Seismo. Bull. Cent. Met. Obs., Japan, for 1948, Tokyo, 1950, pp. 36, 37, with macroseismic chart.

$A = -\cdot6523$, $B = +\cdot4951$, $C = +\cdot5739$; $\delta = -2$; $h = 0$;
$D = +\cdot605$, $E = +\cdot797$; $G = -\cdot457$, $H = +\cdot347$, $K = -\cdot819$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Mito		2·2	302	0 37	− 1	1 2	− 4	—	—
Onahama		2·3	318	0 44	+ 4	1 8	− 1	—	—
Kakioka		2·4	296	0 39	− 2	—	—	—	—
Tukubasan		2·4	295	0 43k	+ 2	1 9	− 3	—	—
Tokyo		2·5	281	0 37	− 6	1 5	− 9	—	—
Yokohama		2·6	275	0 38	− 6	1 1	−16	—	—
Utunomiya		2·7	300	0 45	0	—	—	—	—
Osima		2·9	261	0 42a	− 6	—	—	—	—
Kumagaya		3·0	289	0 45	− 5	—	—	—	—
Hukusima		3·2	324	0 55a	+ 3	1 31	− 1	—	—
Misima		3·2	268	0 45a	− 7	1 17	−15	—	—
Hunatu		3·3	275	0 40	−13	1 24	−11	—	—
Maebasi		3·3	292	0 51a	− 2	1 45	+10	—	—
Sendai		3·4	334	0 58	+ 3	1 30	− 7	—	—
Shizuoka		3·6	267	1 0	+ 2	1 33	− 9	—	—
Yamagata		3·6	328	1 2	+ 4	2 24	+42	—	—
Omaesaki		3·8	262	0 46	−15	1 29	−18	—	—
Nagano		4·0	293	1 4	0	2 19	S_E	—	—
Mizusawa	E.	4·1	342	1 15	+10	1 59	+ 4	—	—
Miyako		4·5	352	1 27	+16	2 9	+ 4	—	—
Aikawa		4·6	309	1 11	− 1	—	—	—	—
Morioka		4·7	344	1 16	+ 2	2 13	+ 3	—	—
Nagoya		4·8	271	1 15	0	2 27	S*	—	—
Toyama		4·8	290	1 19	+ 4	2 27	S*	—	—
Gihu		4·9	274	1 12	− 5	2 12	− 3	—	—
Akita		5·0	335	1 21	+ 3	2 12	− 6	—	—
Kameyama		5·2	268	1 13	− 8	—	—	—	—
Wazima		5·2	296	1 19	− 2	—	—	—	—
Hikone		5·4	273	1 19	− 5	2 19	− 9	—	—
Owase		5·6	260	1 17	−10	2 12	−21	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Aomori		5·8	345	1 39	+10	—	—	—	—	—
Osaka		6·0	267	1 31	− 1	2 46	+ 3	—	—	—
Siomisaki		6·1	255	1 6	−28	2 25	−20	—	—	—
Kobe		6·3	268	1 37	+ 1	2 47	− 3	—	—	—
Sumoto		6·6	265	1 19	−22	2 51	− 7	—	—	—
Mori		7·1	346	2 12	P*	4 10	S_g	—	—	—
Muroto		7·4	257	1 43	− 9	3 17	− 1	—	—	—
Sapporo		7·9	352	2 19	P*	—	—	—	—	—
Hirosima		8·6	267	2 1	− 8	3 14	−34	—	—	—
Hamada		8·8	271	2 6	− 5	4 58	S_g	—	—	—
Kumamoto		10·3	260	2 25	− 7	—	—	—	—	—
Hukuoka		10·4	265	2 26	− 8	4 25	− 7	—	—	—
Kagosima		10·9	254	2 33	− 7	4 29	−15	—	—	—
Vladivostok		11·6	316	i 2 48	− 2	—	—	—	—	—
Calcutta	E.	48·8	271	e 7 47	−62	e 16 5	+13	—	—	—
Frunse		52·2	300	e 9 15	0	e 16 37	− 2	—	—	—
Murgab		54·1	296	e 9 27?	− 2	e 17 5?	0	—	—	—
Andijan		54·4	298	e 9 31	0	—	—	—	—	—
Tashkent		56·5	300	i 9 44	− 2	e 17 29	− 8	—	—	—
Sverdlovsk		57·3	321	i 9 52	0	17 46	− 1	—	—	—
Stalinabad		57·8	298	i 9 54	− 1	i 17 52?	− 2	—	—	—
Bombay	E.	63·2	275	e 10 34	+ 2	—	—	—	—	—
Victoria		66·9	46	e 11 4	+ 8	—	—	—	—	26·4
Riverview		69·1	173	—	—	e 20 22	+ 7	—	—	—
Moscow		69·4	325	e 11 12	0	20 17	− 1	—	—	—
Baku		70·2	306	i 11 22?	+ 5	e 20 32?	+ 4	—	—	—
Shasta Dam		71·3	53	i 12 32	+69	—	—	—	—	—
Hungry Horse		72·4	43	i 12 8	+38	—	—	—	—	—
Berkeley		72·8	56	e 11 45	+13	—	—	—	—	e 31·2
Leninakan		74·0	309	e 11 32	− 7	—	—	—	—	—
Scoresby Sund		74·0	355	12 12	+33	21 21	+10	—	—	—
Upsala		75·1	335	—	—	e 31 21?	?	—	—	e 39·4
Tinemaha	Z.	75·9	55	e 11 51	+ 1	—	—	—	—	—
Pasadena	Z.	77·6	57	e 12 5	+ 5	—	—	—	—	—
Mount Wilson	Z.	77·7	57	e 11 58	− 2	—	—	—	—	—
Yalta		77·7	310	e 12 1	+ 1	—	—	—	—	—
Riverside	Z.	78·3	57	e 12 10	+ 7	—	—	—	—	—
Boulder City		78·9	54	e 12 16	+ 9	—	—	—	—	—
Palomar	Z.	79·0	57	e 12 18	+11	—	—	—	—	—
Pierce Ferry		79·3	53	i 12 19	+10	—	—	—	—	—
Copenhagen		80·1	334	e 12 50	+37	22 21	+ 3	—	—	42·4
Istanbul		82·7	316	e 12 28	+ 1	—	—	i 15 25	PP	—
Ksara		83·1	307	e 12 34	+ 5	e 23 47	PS	—	—	—
Prague		83·6	330	e 15 54	PP	e 22 59	+ 6	e 24 3	PPS	e 37·4
Tucson		83·7	55	e 12 41	+ 9	e 23 9	+15	—	—	e 41·4
Cheb		84·4	331	e 22 48	SKS	i 23 6	+ 5	i 28 30	SS	e 43·4
Durham	E.	85·3	340	—	—	i 23 15	+ 5	—	—	—
De Bilt		85·5	335	e 12 45	+ 4	e 23 13	+ 1	e 16 1	PP	e 44·4
Stuttgart		86·8	332	e 12 50	+ 3	e 23 15	[+ 2]	e 16 13	PP	e 46·4
Uccle		86·9	336	—	—	e 23 17	[+ 4]	—	—	e 44·4
Triest		87·3	327	—	—	e 23 23	[+ 7]	e 23 53	S	—
Strasbourg		87·5	332	—	—	e 24 23	PS	—	—	e 44·8
Kew		87·8	338	—	—	e 33 21?	SSS	—	—	e 46·3
Zürich		88·1	331	—	—	e 22 46	?	—	—	—
Basle		88·4	332	—	—	e 25 23	PPS	—	—	e 50·4
Helwan		88·6	306	12 58	+ 2	—	—	16 29	PP	—
Paris		89·2	335	e 13 3	+ 4	e 23 50	+ 3	e 16 35	PP	e 48·4
Jersey		90·3	339	—	—	e 23 21?	[−14]	—	—	—
Rome		90·8	325	e 16 22	PP	e 23 38	[0]	—	—	—
Clermont-Ferrand		91·6	333	e 13 30	+20	e 24 15	+ 6	e 16 57	PP	45·4
St. Louis		91·7	39	e 13 10	0	e 24 16	+ 6	—	—	—
La Paz		146·7	64	i 19 53 a	[+11]	—	—	—	—	—

For Notes see next page.

NOTES TO AUGUST 17d. 17h. 8m. 39s.

Additional readings :—
Tinemaha eZ = 12m.16s.
Pasadena eZ = 12m.12s. and 12m.37s.
Mount Wilson eZ = 12m.8s.
Palomar eZ = 12m.43s.
Prague eSS? = 28m.9s., eSSS? = 32m.15s.
Tucson e = 12m.55s.
Cheb e = 26m.36s., i = 41m.30s.
De Bilt ePS = 24m.15s.
Stuttgart eZ = 13m.4s., ePPP = 18m.23s., e = 24m.21s.
Strasbourg e = 31m.36s. and 37m.4s.
Paris eSKS = 23m.26s., ePS = 24m.58s.
Clermont-Ferrand eSKS = 23m.51s., ePS = 25m.15s., eSS = 30m.30s.
Long waves were also recorded at other European stations.

Aug. 17d. 19h. 1m. 52s. Epicentre 35°·8N. 142°·0E. (as on 1946, December 29d.).

Not an after-shock to the earthquake of 17h.

$A = -\cdot6406$, $B = +\cdot5005$, $C = +\cdot5823$; $\delta = -6$; $h = 0$;
$D = +\cdot616$, $E = +\cdot788$; $G = -\cdot459$, $H = +\cdot358$, $K = -\cdot813$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Mizusawa	E.	3·4	348	1 8	P_g	1 53	S_g	—	—	—
Vladivostok		10·7	316	i 2 40	+ 2	—	—	—	—	—
Almata		49·6	301	e 8 55	0	—	—	—	—	—
Frunse		51·4	300	e 9 9	0	—	—	—	—	—
Andijan		53·6	298	9 24	− 1	e 17 2	+ 4	—	—	—
Tashkent		55·6	299	e 9 37	− 3	e 17 26	+ 1	—	—	—
Sverdlovsk		56·4	320	i 9 43	− 2	17 37	+ 1	—	—	—
Stalinabad		56·9	298	i 9 49	0	—	—	—	—	—
Victoria		66·9	46	(e 10 58)	+ 2	—	—	—	—	—
Moscow		68·5	324	e 11 4	− 2	20 8	0	—	—	—
Shasta Dam		71·5	53	e 12 30	+ 6	—	—	—	—	—
Hungry Horse		72·4	43	i 12 1	+31	—	—	—	—	—
Leninakan		73·1	309	e 11 41	+ 7	—	—	—	—	—
Tinemaha	z.	76·1	55	e 12 2	+11	—	—	—	—	—
Mount Wilson	z.	77·9	58	e 12 1	0	—	—	—	—	—
Pasadena	z.	77·9	58	e 12 1	0	—	—	—	—	—
Riverside	z.	78·5	58	e 12 4	0	—	—	—	—	—
Boulder City		79·0	54	e 12 8	+ 1	—	—	—	—	—
Palomar	z.	79·2	57	e 12 8	0	—	—	—	—	—
Pierce Ferry		79·5	53	e 12 12	+ 2	—	—	—	—	—
Ksara		82·3	305	—	—	e 29 22	?	—	—	e 36·9
Prague		82·8	330	—	—	e 34 44	Q	—	—	—
Tucson		83·9	54	i 12 35	+ 2	—	—	—	—	—
De Bilt		84·7	335	e 13 8?	+31	—	—	—	—	e 45·1
Stuttgart		85·9	331	e 12 43	0	—	—	—	—	e 46·1
Triest		86·4	327	—	—	e 22 48	[−22]	—	—	—

Additional readings and note :—
Victoria reading increased by 2m.
Tucson e = 12m.55s.
Long waves were also recorded at Scoresby Sund and other European stations.

Aug. 17d. Readings also at 2h. (near Mineral), 7h. (Ksara, near Chur, and Zürich), 8h. (Istanbul), 10h. (Clermont-Ferrand, Basle, and Zürich), 14h. (near Lick), 16h. (Alicante), 17h. (Berkeley), 18h. (Paris and near Zürich (2)), 19h. (near Mineral), 20h. (Stuttgart), 22h. (Scoresby Sund).

Aug. 18d. 19h. 6m. 9s. Epicentre 38°·9N. 39°·4E. (as on 1942, February 7d.).

$A = +\cdot6030$, $B = +\cdot4953$, $C = +\cdot6254$; $\delta = +6$; $h = -1$;
$D = +\cdot635$, $E = -\cdot773$; $G = +\cdot483$, $H = +\cdot397$, $K = -\cdot780$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Leninakan		3·9	60	e 1 7	+ 5	e 2 20	S_g	—	—	—
Erevan		4·1	70	e 1 11	P*	2 31	S_g	e 1 43	?	—
Sotchi		4·7	3	e 1 16?	+ 2	e 2 25?	S*	—	—	—
Ksara		5·8	210	i 1 23k	− 6	i 2 54	S*	—	—	—
Piatigorsk		5·8	27	e 1 38	+ 9	—	—	—	—	—
Grozny		6·5	45	e 1 51	P*	3 34	S_g	—	—	—
Yalta		6·8	326	e 1 47?	+ 3	—	—	—	—	—
Simferopol		7·2	329	e 2 18?	P_g	e 3 26	+13	—	—	—
Baku		8·2	77	e 2 11	+ 8	—	—	—	—	—
Istanbul		8·2	289	2 2	− 1	4 36	S_g	—	—	—
Helwan		11·2	218	i 2 36a	− 8	e 4 37	−15	2 47	PP	—
Belgrade		15·3	299	e 3 41	+ 2	e 6 46	+16	—	—	—
Moscow		16·9	356	4 3	+ 4	7 16	+ 9	—	—	—
Warsaw		18·4	324	e 4 19	+ 1	e 7 52	+11	—	—	e 11·8
Raciborzu		18·7	314	e 4 21	− 1	e 8 42	SSS	e 4 52?	PPP	—
Triest		20·1	299	e 4 36	− 2	i 8 27	+ 8	i 4 47	PP	—
Rome		20·7	287	e 4 38	− 6	e 8 39	+ 8	—	—	—
Prague		20·9	312	e 4 46	0	e 8 21	−14	—	—	e 10·8
Samarkand		21·3	79	4 51	+ 1	—	—	—	—	—
Bologna		21·6	294	e 5 4	+10	—	—	e 5 17	PP	—
Florence		21·6	293	e 4 52	− 2	e 9 19	SS	—	—	—
Cheb		22·2	311	e 5 0	0	e 9 2	+ 2	e 7 4	?	—
Collmberg		22·2	313	e 4 2	−58	e 8 12	−48	e 4 34	PPP	—
Salo		22·3	296	e 5 0	− 1	—	—	—	—	—
Sverdlovsk		22·7	32	i 5 8	+ 4	i 9 21	+12	—	—	—
Jena	E.	22·9	311	e 5 9	+ 3	—	—	—	—	—
Stalinabad		22·9	80	i 5 8	+ 2	i 9 23	+10	—	—	—
Tashkent		22·9	74	i 5 8	+ 2	i 9 21	+ 8	—	—	—
Obi-garm		23·6	80	i 5 21?	+ 8	e 9 41?	+16	—	—	—
Stuttgart		23·8	305	e 5 15k	0	e 9 35	+ 7	e 10 54	SSS	e 13·3
Zürich		23·9	302	e 5 12	− 4	e 9 21	− 9	—	—	—
Basle		24·6	303	e 5 23	0	e 10 0	+18	—	—	—
Copenhagen		24·6	323	e 5 26	+ 3	9 52	+10	—	—	18·8
Strasbourg		24·7	305	e 5 27	+ 3	e 9 59	+15	—	—	—
Andijan		25·3	76	5 32	+ 2	—	—	—	—	—
Frunse		26·8	70	e 5 47	+ 3	—	—	—	—	—
De Bilt		27·1	311	e 5 50	+ 4	e 10 35	+11	—	—	e 13·8
Uccle		27·3	308	—	—	e 10 51?	+24	—	—	e 16·8
Clermont-Ferrand		27·5	296	—	—	e 10 54	+24	—	—	—
Alicante		31·0	282	e 8 54	?	e 13 54	SSS	—	—	16·8
Tamanrasset		33·1	250	i 6 35k	− 5	—	—	i 7 11k	?	—
Scoresby Sund		44·4	335	—	—	15 3	+14	18 23	SSS	25·8

Additional readings :—
Belgrade e = 8m.49s., 10m.5s., and 15m.45s.
Warsaw ePE = 4m.22s., eSZ = 7m.55s., eSSSN = 8m.30s., eSSSEZ = 8m.40s.
Triest esS? = 8m.38s.
Prague e = 4m.53s. and 5m.31s.
Collmberg i = 4m.7s., ePPP = 5m.17s.
Stuttgart e = 5m.19s.a, eZ = 5m.26s.
Long waves were also recorded at Paris, Kew, Upsala, and Tortosa.

Aug. 18d. 19h. 11m. 57s. Epicentre 40°·6N. 124°·6W. (as on 1947, May 27d.).

A = −·4324, B = −·6268, C = +·6482; δ = +1; h = −2;
D = −·823, E = +·568; G = −·368, H = −·534, K = −·762.

		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 11	+ 1	i 0 17	+ 1	—	—	—
Shasta Dam		1·7	87	i 1 32	+61	i 1 39	+45	—	—	—
Mineral	N.	2·3	96	e 0 38	− 2	i 1 7	− 2	i 0 44	P_g	—
Berkeley		3·3	145	i 0 50	− 3	i 1 25	−10	i 0 56	P*	—
San Francisco		3·3	147	e 0 3?	−50	—	—	—	—	—
Branner	E.	3·7	148	i 2 3?	+63	—	—	—	—	—
Santa Clara		3·8	147	i 1 5	+ 4	i 1 48	+ 1	—	—	—
Lick		4·0	143	i 1 0	− 4	e 1 44	− 8	—	—	—
Fresno	N.	5·4	134	i 1 23	− 1	i 2 23	− 5	—	—	—
Tinemaha		6·0	125	i 1 38	+ 6	i 2 51	+ 8	—	—	—
Haiwee		6·9	128	i 1 48	+ 3	—	—	—	—	—
Santa Barbara		7·2	146	e 1 53	+ 4	e 3 5	− 8	—	—	—
Mount Wilson	Z.	8·2	138	e 2 0	− 3	—	—	—	—	—
Pasadena		8·2	138	e 1 59	− 4	i 3 31	− 7	—	—	e 3·9
Grand Coulee		8·4	27	i 2 9	+ 3	—	—	—	—	—
Riverside		8·7	136	e 2 7	− 3	—	—	—	—	—
Boulder City		9·0	118	e 2 17	+ 4	—	—	—	—	e 7·3
Pierce Ferry		9·4	115	e 1 57	−21	—	—	i 2 22	P	—
Palomar		9·5	137	e 2 19	− 1	—	—	—	—	—
Salt Lake City		9·7	85	e 2 18	− 4	e 4 41	S*	—	—	e 5·3
Butte	N.	10·3	54	—	—	e 4 46	SS	—	—	e 5·5
Hungry Horse		10·8	41	i 2 42	+ 3	—	—	—	—	—
Tucson		13·9	123	e 3 21	0	e 7 25	?	e 4 29	?	e 8·4
St. Louis		26·5	83	i 5 41	0	e 10 20	+ 6	—	—	—
Ottawa		35·6	65	e 7 3	+ 2	—	—	—	—	16·1

Additional readings :—
Mineral iN = 1m.3s.
Berkeley iZ = 1m.17s.
Long waves were also recorded at Vermont.

Aug. 18d. 21h. 12m. 25s. Epicentre 41°·5N. 16°·1E.

Felt widely in Southern Italy with damage in the regions of Foggia and Gargano, in particular at S. Giovanni-Rotondo, Monte S. Angelo, and S. Marco in Lanis. 2205 houses damaged.
Quarterly seismic Bulletin of Triest.

Suggested epicentres : 41°·5N. 16°·2E. (Triest), 41°·5N. 16°·0E. (Rome and Strasbourg).

A = +·7217, B = +·2083, C = +·6601; δ = −3; h = −2;
D = +·277, E = −·961; G = +·634, H = +·183, K = −·751.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Rome		2·7	279	e 0 44	− 1	e 1 16	− 3	—	—	1·5
Messina		3·3	187	0 53	0	1 34	− 1	—	—	—
Catania		4·1	191	e 1 3	− 2	e 1 53	− 2	e 1 10	P*	—
Florence		4·2	304	e 1 16	P*	i 2 13	S_g	e 1 25	P_g	—
Triest		4·5	339	e 1 9	− 2	e 2 1	− 4	i 1 32	P_g	i 2·6
Belgrade		4·6	42	e 1 13a	+ 1	i 2 9	+ 2	i 1 20	P*	—
Bologna		4·6	312	e 1 9	− 3	e 2 6	− 1	i 1 40	P_g	i 3·4
Kalossa	N.	5·4	21	1 46	P_g	i 2 30	+ 2	2 55	S_g	3·1
Salo		5·8	317	e 1 21k	− 8	i 2 40	+ 2	e 1 33	P*	—
Pavia	Z.	6·2	309	e 1 35	0	—	—	e 2 6	P_g	—
Chur		7·1	321	e 1 42	− 6	—	—	—	—	—
Bucharest		7·9	65	e 2 9	+10	e 3 38	+ 8	—	—	4·6
Zürich		8·0	320	e 1 53	− 7	e 3 31	− 2	e 2 9	P*	—
Neuchatel		8·6	313	e 2 0	− 9	e 3 26	−22	i 2 12	P	—
Prague		8·6	353	e 1 53	−16	e 3 52	+ 4	e 2 5	P	e 4·9

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Raciborzu	8·7	9	e 1 54	−16	—	—	—	—	—
Stuttgart	8·8	329	e 2 4	− 7	e 3 59	+ 6	—	—	e 6·0
Cheb	9·0	344	e 2 21	+ 8	e 4 7	+ 9	e 4 31	S*	e 6·6
Strasbourg	9·2	323	e 2 16	0	e 4 5	+ 2	—	—	—
Istanbul	9·8	88	2 31	+ 7	4 21	+ 4	—	—	—
Jena	9·9	343	e 2 23	− 2	e 5 9	S*	e 5 23	S_g	—
Collmberg	10·1	349	e 2 35	+ 7	i 4 28	+ 3	i 4 38	SS	i 6·8
Clermont-Ferrand	10·3	299	e 2 39	+ 7	—	—	—	—	e 5·2
Potsdam	11·1	350	—	—	e 4 29?	−20	—	—	e 5·9
Warsaw	11·3	16	e 2 52	+ 6	e 5 18	SSS	e 2 56	PP	e 6·1
Tortosa	11·8	272	—	—	e 5 23	SS	—	—	6·8
Paris	12·1	312	e 2 51	− 6	i 5 7	− 7	i 3 0	PP	i 6·4
Uccle	12·3	323	e 3 14	+15	e 5 53	+35	—	—	e 7·9
De Bilt	13·0	329	i 3 10	+ 1	e 5 47	+12	—	—	e 6·6
Alicante	13·1	262	3 24	+14	6 10	+32	3 39	PPP	—
Yalta	13·6	71	e 3 21	+ 4	—	—	—	—	—
Copenhagen	14·4	352	e 3 36	+ 9	—	—	6 33	Q	8·1
Kew	15·0	317	e 3 42	+ 7	e 8 10	?	—	—	e 9·6
Toledo	15·4	271	i 3 39	− 1	e 6 53	+21	i 3 53	PP	9·0
Granada	15·8	261	i 3 53k	+ 8	i 7 13	SSS	4 4	pP	i 8·2
Helwan	16·9	128	4 9	+10	7 29	+22	—	—	—
Ksara	17·4	110	e 4 13	+ 7	—	—	—	—	e 9·0
Upsala	18·4	2	i 4 22k	+ 4	e 7 49	+ 8	—	—	e 9·9
Aberdeen	19·6	331	e 3 55	−37	i 8 11	+ 3	i 4 35	P	13·4
Moscow	20·1	37	e 4 32	− 6	e 8 19	0	—	—	—
Tamanrasset	20·7	210	e 4 40	− 4	—	—	i 5 2k	PP	—
Leninakan	20·9	82	e 4 55?	+ 9	—	—	—	—	—
Baku	25·5	80	e 5 46	+14	e 10 11	+14	—	—	—
Sverdlovsk	32·3	46	i 6 36	+ 3	e 11 55	+ 9	—	—	—
Tashkent	39·4	72	—	—	e 13 38	+ 3	—	—	—
Stalinabad	39·9	75	e 7 46	+ 9	—	—	—	—	—
Hungry Horse	80·3	329	i 12 10	− 4	—	—	i 17 23	PPP	—
Grand Coulee	82·5	332	e 12 37	P_cP	—	—	—	—	—
Tucson	91·8	317	i 13 9	− 2	—	—	—	—	—
Riverside	93·6	323	e 13 27	P_cP	—	—	—	—	—

Additional readings :—
Catania eS* = 1m.59s.
Belgrade i = 1m.54s., iS_g = 2m.33s.
Kalossa eE = 1m.50s., P*EN = 2m.7s., P_gN = 2m.15s., eE = 2m.51s.
Salo eZ = 1m.26s., eS = 2m.33s.
Pavia iZ = 1m.44s.
Prague e = 2m.54s., eS = 3m.42s., eS* = 4m.15s., eS_g = 4m.21s.
Raciborzu eZ = 2m.26s., e = 2m.36s.,? eEN = 3m.9s., iEN = 5m.22s., eEZ = 8m.4s.
Stuttgart e = 2m.12s., 2m.17s., and 2m.37s.,eP_g? = 2m.55s., e = 3m.32s., iS? = 3m.43s., iS_g? = 5m.6s. and 5m.23s.
Cheb eE = 3m.15s., e = 3m.28s., and 3m.45s., eS* = 4m.55s., e = 5m.6s. and 5m.31s.
Strasbourg e = 2m.29s., eS = 4m.8s.
Collmberg i = 2m.48s. and 3m.26s., iP_g? = 3m.35s., iS? = 4m.53s., i = 5m.51s., iS_g = 6m.12s., i = 6m.31s.
Tortosa eE = 6m.9s., eN = 6m.28s.
Paris i = 3m.16s., iSSS = 5m.31s., i = 5m.39s.
Uccle iEN = 7m.15s., eN = 7m.30s.
Alicante PPP = 3m.54s., PS = 6m.18s., PPS = 6m.42s., SS = 7m.9s., SSS = 8m.30s., P_cS = 12m.34s., S_cS = 16m.18s.
Kew eEZ = 8m.36s., eSS?EZ = 8m.49s.
Toledo eZ = 5m.34s.
Granada iPP = 4m.27s.
Aberdeen iE = 11m.15s., iN = 11m.40s.
Tamanrasset i = 4m.46s.k, iPP = 4m.54s.k..
Hungry Horse i = 12m.14s.
Long waves were also recorded at Jersey.

August 18d. Readings also at 0h. (Ksara), 2h. (near Lick and near Mineral), 3h. (Apia and near Piatigorsk), 3h. (Stuttgart), 4h. (De Bilt, Andijan, near Stalinabad, Murgab, and Samarkand), 5h. (Almata, near Stalinabad, Murgab, Samarkand, and Frunse), 6h. (Andijan, near Murgab, Almata, and Frunse), 9h. (Mineral), 10h. (Warsaw), 13h. (Stuttgart), 14h. (near Lick), 16h. (near Mineral), 17h. (near Mizusawa), 20h. (Hungry Horse, near Victoria, near Ottawa, and near Mizusawa), 22h. (Grand Coulee and near Obi-garm), 23h. (Tucson, Pasadena, Palomar, near Tacubaya, and Vera Cruz.)

Aug. 19d. 1h. 19m. 19s. Epicentre 1°·5N. 90°·3W. (as on 1940, Dec. 29d.).

A = −·0052, B = −·9997, C = +·0260; δ = +10; h = +7;
D = −1·000, E = +·005; G = ·000, H = −·062, K = −1·000.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bogota		17·3	78	e 4 4	0	e 7 29	+13	e 12 29	S_cP	9·5
Vera Cruz	N.	18·5	344	e 4 2	−17	e 8 2	SS	—	—	e 9·3
Tacubaya		19·8	336	e 4 38	+ 3	e 8 22	+ 9	—	—	—
Huancayo		20·1	134	e 3 8	?	e 8 39	S	e 4 43	P	e 10·0
La Paz		28·3	130	e 6 6	+ 9	i 11 3	+20	i 12 56	?	14·1
San Juan		29·0	53	e 8 46	?	—	—	—	—	e 10·8
Fort-de-France		31·6	65	—	—	e 11 41	+ 6	—	—	—
Tucson		36·2	330	e 7 7	+ 1	—	—	—	—	—
St. Louis		37·0	0	i 7 16	+ 3	e 12 59	0	—	—	—
Palomar	Z.	40·3	325	i 7 41	+ 1	—	—	i 7 54	?	—
Cleveland		40·6	10	—	—	e 13 50	− 4	e 13 54	S	—
Pierce Ferry		40·8	331	i 7 44	− 1	—	—	—	—	—
Riverside	Z.	41·1	325	e 7 46	− 1	—	—	—	—	—
Boulder City		41·2	330	e 8 15	+27	—	—	—	—	—
Mount Wilson	Z.	41·6	325	e 7 52	+ 1	—	—	—	—	—
Pasadena		41·6	325	e 7 51	0	—	—	—	—	e 15·7
Haiwee	Z.	42·9	327	e 8 3	+ 1	—	—	—	—	—
Tinemaha	Z.	43·8	327	e 8 9	0	—	—	e 9 54	PP	—
Ottawa		45·6	15	8 21	− 3	14 59	− 7	18 41	SSS	21·7
Lick	Z.	45·9	325	e 8 23	− 3	—	—	—	—	—
Hungry Horse		51·0	341	i 9 5	− 1	—	—	—	—	—
Kew		88·8	39	—	—	e 23 45	+ 1	—	—	e 40·7
Clermont-Ferrand		91·3	45	e 11 59	?	—	—	—	—	42·7
Tamanrasset		94·8	67	e 12 33	−52	—	—	—	—	—
Stuttgart		95·1	41	—	—	e 24 2	[0]	—	—	e 45·7
Triest		98·7	44	e 12 25	?	e 24 20	[− 1]	—	—	e 45·7

Additional readings :—
Vera Cruz eN =6m.20s. and 6m.44s.
Tacubaya iPEN =4m.41s., eSN =8m.25s.
Huancayo e =5m.42s.
Cleveland eE =16m.50s.
Tinemaha eZ =11m.15s.
Long waves were also recorded at Vermont and at other European stations.

Aug. 19d. 7h. Undetermined shock. Off the coast of Peru.

Bogota ePEZ =57m.40s., eS?EZ =61m.4s.
Tacubaya iPE =57m.44s., iPN =57m.48s., eN =61m.19s., eE =61m.24s., eN =62m.21s., eE =62m.24s.
Huancayo eP =57m.48s., eS =61m.50s., eL =63m.16s.
Vera Cruz eN =59m.34s., 64m.20s., and 68m.15s.
Tucson eP =60m.7s.
Mount Wilson eZ =60m.41s.
Riverside eZ =60m.47s.
Palomar iZ =60m.47s.
Boulder City eP =60m.48s.
Pierce Ferry eP =60m.49s.
Pasadena eZ =60m.49s.
Tinemaha ePZ =61m.10s.
Ottawa e =61m.24s.
Hungry Horse eP =62m.5s.
La Paz iPNZ =65m.36s., iN =68m.50s.

Aug. 19d. 10h. 49m. 5s. Epicentre 64°·0S. 30°·0W.

Very approximate determination.

$A = +·3817$, $B = -·2204$, $C = -·8976$; $\delta = -4$; $h = -10$;
$D = -·500$, $E = -·866$; $G = -·777$, $H = +·449$, $K = -·441$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
La Plata	N.	33·8	316	6 43	− 3	12 3	− 7	8 9	PP	—
La Paz		54·1	313	i 9 30k	+ 1	i 16 55	−10	i 9 52	pP	26·9
Huancayo		60·7	307	i 10 24	+ 9	i 18 55	+23	e 14 18	PPP	e 24·5
Bogota	E.	75·9	314	i 11 55	+ 5	e 21 47	+15	e 15 7	PP	56·9
Fort de France		82·1	330	e 12 19	− 5	—	—	—	—	—
Tamanrasset		90·8	32	i 13 2k	− 4	—	—	i 13 27k	?	—
Alicante		104·7	23	—	—	e 24 15	[−34]	—	—	53·9
Helwan		105·1	52	e 14 13	+ 2	i 25 55	− 8	e 18 13	PKP	—
Ksara		110·3	54	e 19 23	PP	e 27 27	?	—	—	—
Tucson		114·7	293	e 19 8	?	—	—	e 29 58	PKKP	—
Ottawa		114·8	326	18 59	[+16]	25 25	[− 6]	29 13	PS	—
Strasbourg		116·1	27	—	—	e 29 15	PS	e 38 55?	?	53·9
Stuttgart		116·6	28	—	—	e 29 35	PS	e 38 25	?	e 56·9
Uccle	E.	117·6	23	—	—	e 27 17	{+19}	—	—	e 45·9
Palomar	Z.	118·1	289	i 19 14	[+25]	—	—	e 20 24	PP	—
Riverside	Z.	118·9	288	i 19 15	[+24]	—	—	e 20 40	PP	—
De Bilt		119·0	23	e 19 43	PP	e 29 25	PS	e 35 43	?	e 50·9
Pierce Ferry		119·3	292	e 19 16	[+25]	—	—	e 20 26	PP	—
Pasadena	Z.	119·3	288	i 19 17	[+26]	—	—	e 20 43	PP	—
Mount Wilson	Z.	119·4	288	e 19 17	[+25]	—	—	e 38 34	P′P′	—
Boulder City		119·5	292	i 19 17	[+25]	—	—	—	—	—
Haiwee	Z.	121·0	289	e 19 21	[+26]	—	—	—	—	—
Tinemaha	Z.	121·8	289	i 19 22	[+26]	—	—	e 29 30	PKKP	—
Lick	Z.	123·5	287	i 19 16	[+16]	—	—	—	—	—
Berkeley	Z.	124·2	287	i 19 27	[+26]	—	—	i 19 56	?	—
Shasta Dam		126·7	288	e 20 26	PP	—	—	i 20 29	PP	—
Ferndale		127·3	287	i 19 24	[+17]	—	—	i 19 29	PKP$_3$	—
Hungry Horse		129·6	301	i 19 33	[+22]	—	—	i 40 25	P′P′	—
Victoria		133·5	294	e 20 58	?	—	—	—	—	—

Additional readings :—
La Plata $P_cPN = 7m.0s.$, $N = 7m.25s.$, $PPN = 9m.49s.$, $SKSN = 17m.4s.$, $SKKSN = 17m.47s.$, $SSN = 21m.37s.$, $SSSN = 24m.47s.$, $QN = 33m.45s.$, $RN = 42m.55s.$?
La Paz $iPP = 11m.45s.$, $iEZ = 17m.13s.$
Huancayo $e = 10m.45s.$
Helwan $e = 19m.31s.$
Tucson $ePKP,PKP = 38m.22s.$
Uccle $eE = 27m.58s.$ and $34m.55s.$?
Palomar $iZ = 20m.36s.$, $ePKP,PKPZ = 38m.36s.$
Riverside $iZ = 19m.38s.$, $ePKP,PKPZ = 38m.31s.$
Pierce Ferry $ePKP,PKP = 38m.21s.$
Pasadena $eZ = 19m.46s.$, $ePKP,PKPZ = 38m.31s.$
Tinemaha $eZ = 20m.56s.$
Ferndale readings given as for local shock.
Hungry Horse $i = 19m.41s.$ and $20m.18s.$
Long waves were also recorded at Paris and Istanbul.

Aug. 19d. 13h. 50m. 48s. Epicentre 62°·6N. 150°·9W. Depth of Focus 0·010.

Felt at Anchorage and Cordova. Epicentre 62°N. 151°W. (U.S.C.G.S.). Depth 100km.

L. M. Murphy, F. P. Ulrich.
United States Earthquakes, 1948, serial No. 746, Washington, 1951, p. 26.

$A = -\cdot4042$, $B = -\cdot2250$, $C = +\cdot8865$; $\delta = -12$; $h = -10$;
$D = -\cdot486$, $E = +\cdot874$; $G = -\cdot775$, $H = -\cdot431$, $K = -\cdot463$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
College		2·7	30	i 0 43	0	i 1 9	− 5	—	—	i 1·3
Sitka		9·3	116	i 2 12	− 1	i 3 52	− 4	—	—	e 4·5
Victoria		20·7	119	(4 44)	+10	(8 36)	+21	(5 5)	pP	—
Grand Coulee		23·0	114	e 4 58	+ 1	—	—	—	—	—
Hungry Horse		24·9	107	e 5 14	− 1	i 11 36	?	—	—	i 12·3
Saskatoon		25·5	94	5 32	+11	9 50	+11	5 55	pP	11·8
Butte	N.	27·3	108	e 5 56	pP	e 10 36	sS	—	—	e 11·5
Shasta Dam		27·8	128	e 6 41	PP	—	—	—	—	—
Bozeman		28·2	108	e 6 6	pP	e 11 56	SS	—	—	i 15·3
Berkeley		30·3	130	i 6 4	0	e 13 25	SSS	i 6 23	pP	—
Santa Clara		30·9	130	e 6 21	+11	e 11 28	sS	—	—	e 14·1
Lick	Z.	31·0	130	e 6 10	0	e 12 38	S_cP	i 7 22	PP	—
Salt Lake City		31·8	114	e 6 33	pP	e 11 47	sS	e 7 34	PP	e 13·7
Fresno	N.	32·2	128	e 7 23	+62	—	—	—	—	—
Tinemaha		32·5	126	i 6 24	+ 1	i 12 43	S_cP	i 6 46	pP	—
Haiwee		33·4	126	i 6 33	+ 2	—	—	i 6 54	pP	—
Santa Barbara	Z.	34·3	129	i 6 41	+ 2	—	—	—	—	—
Boulder City		34·7	122	i 6 44	+ 2	i 12 51	S_cP	i 6 58	pP	—
Pierce Ferry		34·9	121	e 6 43	− 1	—	—	i 8 57	PPP	—
Mount Wilson	Z.	35·1	127	i 6 47	+ 1	i 12 52	S_cP	i 7 14	pP	—
Pasadena		35·1	127	i 6 46a	0	i 12 15	+ 5	i 7 7	pP	—
Riverside	Z.	35·5	127	i 6 49	0	i 12 52	S_cP	i 7 10	pP	—
Palomar		36·3	126	i 6 56	0	i 12 54	S_cP	i 7 18	pP	—
Tucson		39·6	120	e 7 23	0	e 13 30	+11	e 7 45	pP	e 16·8
Ville Marie		41·4	77	e 7 38	0	e 13 47	+ 1	e 8 21	pP	—
Honolulu		41·6	189	e 7 33	− 7	i 13 47	− 1	e 14 1	?	e 17·0
Chicago		41·8	89	e 9 4	PP	e 14 56	+64	e 15 31	?	e 20·8
Scoresby Sund		42·5	24	7 48	+ 1	14 3	+ 1	8 20	pP	—
St. Louis		43·2	94	i 7 53	0	—	—	—	—	—
Ivigtut		43·4	44	e 7 51	− 3	14 15	0	17 35	SS	22·2
Ottawa		44·6	76	i 8 3	− 1	14 34	+ 2	9 38	PP	20·6
Cleveland		45·0	84	e 8 6	− 1	e 14 37	− 1	e 8 27	pP	—
Shawinigan Falls	N.	45·0	72	8 5	− 2	14 48	+10	—	—	18·2
Seven Falls	E.	45·4	70	8 10	0	14 46	+ 4	9 57	PP	18·2
Vermont		46·4	75	e 10 27	PP	e 15 57	+59	—	—	e 19·3
New Kensington	E.	46·6	83	e 8 37	+17	e 14 58	− 3	e 15 42	?	e 18·5
Vladivostok		47·3	284	i 8 22	− 4	e 14 57	−14	—	—	—
Harvard		48·7	75	i 8 36	0	e 19 12?	SS	e 10 30	PP	e 23·2
Fordham		49·0	78	i 8 38	− 1	e 15 34	0	—	—	—
Georgetown		49·1	82	e 8 40	+ 1	i 15 40	+ 4	i 9 2	pP	—
Philadelphia		49·1	80	e 8 47	+ 8	e 15 45	+ 9	e 16 21	?	e 19·0
Halifax		50·5	67	—	—	e 16 12	+17	e 20 24	?	24·2
Irkutsk		51·2	311	i 8 56	0	16 8	+ 3	—	—	—
Tacubaya		55·7	116	i 10 2	pP	—	—	—	—	—
Sverdlovsk		58·4	340	i 9 48	0	i 17 41	0	—	—	—
Bermuda		60·1	77	—	—	e 17 58	− 5	e 22 33	SS	e 23·7
Copenhagen		61·3	11	e 10 8	0	i 18 19	+ 1	18 50	PS	—
Moscow		61·8	354	10 10	− 1	18 26	+ 1	19 4	sS	—
De Bilt		64·1	16	e 10 27	+ 1	e 18 56	+ 3	e 10 48	pP	e 30·2
Potsdam	E.	64·7	12	—	—	e 19 3	+ 2	—	—	—
Uccle		65·3	18	—	—	e 19 8	0	—	—	e 31·2
Warsaw		65·3	6	e 10 33a	− 1	19 10	+ 2	e 19 26	PS	e 27·2
Collmberg	E.	65·7	12	e 10 38	+ 2	e 19 16	+ 3	e 20 21	S_cS	—
Jena	E.	66·0	13	e 10 35	− 3	e 19 16	− 1	—	—	—
Cheb		66·9	13	—	—	e 19 19	− 9	e 19 26	S	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Paris		66·9	19	i 10 44	0	e 19 28	0	i 11 10	pP	—
Prague		67·1	10	e 10 29	−16	e 19 31	+ 1	e 21 55	?	e 25·7
Raciborzu		67·3	8	e 10 44	− 2	i 19 31	− 1	e 11 5	pP	—
Stuttgart		67·8	15	e 10 50 a	0	e 19 42	+ 4	e 11 16	pP	—
Strasbourg		67·9	16	e 10 50	0	i 19 42	+ 2	e 11 15	pP	37·2
Frunse		68·7	326	i 10 56	+ 1	—	—	—	—	—
Basle		68·9	16	e 11 56	+60	—	—	e 16 32	?	—
Zürich		69·2	15	e 10 57	− 1	e 20 16	+21	e 11 21	pP	—
Clermont-Ferrand		70·0	19	i 11 4	+ 1	i 20 9	+ 5	i 20 46	PS	33·2
Tchimkent		70·5	329	i 11 5	− 1	i 20 10	0	—	—	—
Salo		71·1	14	e 11 15	+ 5	e 19 18	−59	—	—	—
Andijan		71·3	327	11 11	0	20 21	+ 2	—	—	—
Triest		71·4	12	—	—	e 20 19	− 1	i 21 1	PPS	—
Tashkent		71·5	329	i 11 11	− 1	i 20 22	0	—	—	—
Bologna		72·3	14	e 11 30	+13	i 20 38	+ 7	—	—	—
Theodosia		72·6	356	e 11 18	− 1	e 20 36	+ 2	—	—	—
Belgrade		72·7	6	—	—	e 20 37	+ 2	—	—	—
Simferopol		72·7	357	e 11 23?	+ 4	e 20 40?	+ 5	—	—	—
Florence	E.	73·0	14	—	—	e 20 43	+ 4	—	—	—
Yalta		73·2	357	e 11 20	− 2	i 20 41	0	—	—	—
Grozny		73·6	348	i 11 28	+ 4	i 20 51	+ 6	—	—	—
Sotchi		73·8	352	i 11 6?	−20	—	—	—	—	—
Obi-garm		73·9	328	11 36?	+10	e 20 59?	+10	—	—	—
Stalinabad		74·3	329	i 11 29	+ 1	i 20 52	− 1	—	—	—
Toledo	Z.	74·4	27	i 11 31	+ 2	e 25 2	SS	—	—	—
Rome		75·0	13	e 11 32	0	e 20 59	− 2	—	—	e 30·2
Baku		76·0	344	e 11 42	+ 4	e 21 20	+ 8	—	—	—
Leninakan		76·3	349	e 11 49	+ 9	—	—	—	—	—
Alicante		76·6	25	e 11 32	−10	i 21 22	+ 4	11 42	pP	e 35·5
Istanbul		76·7	0	i 11 42	0	i 21 23	+ 3	—	—	—
Granada		77·1	27	i 11 46 a	+ 2	i 21 34	+10	12 9	pP	—
Ksara		83·8	355	e 12 20	0	e 22 36	+ 3	—	—	—
Helwan		87·8	358	i 12 40 k	+ 1	i 23 12	0	e 13 6	pP	—
Tamanrasset		92·9	23	i 13 4 k	+ 1	—	—	e 16 14	PP	—
La Paz		101·2	103	e 13 44	+ 3	i 24 12	[+ 2]	i 24 48	SKKS	—

Additional readings and note :—
Victoria PP =(5m.26s.), sS =(8m.50s.), SS =(9m.12s.). Readings increased by 2m.
Saskatoon SS =10m.28s., i =11m.12s.
Salt Lake City e =6m.47s.
Tinemaha iZ =6m.58s.
Boulder City iP_cP? =7m.40s.
Pierce Ferry i =13m.25s.
Pasadena iP_cPZ =8m.28s., iZ =11m.12s., eEN =12m.37s., iS_cPZ =12m.52s.
Palomar iP_cPZ =8m.31s., eZ =12m.9s. and 15m.8s.
Tucson i =7m.42s., iPP =8m.26s., i =13m.9s., eS =13m.52s.
Ville Marie e =9m.13s. and 13m.16s.
Scoresby Sund 9m.32s., SS =17m.30s.
Ottawa iZ =9m.11s. and 9m.26s., PPP =10m.11s., SS =15m.12s., SSS =17m.57s.
Cleveland iPZ =8m.14s., iZ =8m.30s., esPN =8m.38s., esSE =15m.14s., esSN =15m.17s., iSSN =17m.50s., eE =17m.58s.
Harvard i =8m.58s. and 9m.59s., eS? =13m.44s.
Fordham i =8m.46s. and 16m.15s.
Georgetown e =13m.49s. and 16m.16s.
Bermuda e =18m.40s.
Copenhagen 14m.16s. and 19m.47s.
De Bilt esS =19m.36s., eSS =23m.12s.
Warsaw ePN =10m.37s., eZ =11m.4s., eSZ =19m.1s., eN =19m.50s., eS_cSN =20m.17s., eS_cSZ =20m.20s., eSSE =23m.13s., eSSN =23m.20s.
Collmberg eE =11m.49s.
Cheb e =20m.26s.
Raciborzu ePS?NZ =19m.36s., eEN =21m.5s.
Stuttgart epPP? =13m.47s., eZ =15m.53s., esS =20m.36s., eSS? =24m.12s.
Strasbourg e =12m.9s., ePP =13m.32s., esS =20m.32s., e =20m.59s.
Zürich ePP =13m.42s.
Belgrade e =22m.6s. and 22m.17s.
Toledo ePPZ =13m.31s., eS?Z =19m.1s.
Alicante PP =14m.32s., PPP =16m.22s., S_cS =21m.32s., PS =22m.4s., SS =26m.10s., Q =31m.26s.
Granada SS =26m.12s.
Helwan iPP? =16m.8s.

Aug. 19d. 19h. 58m. 58s. Epicentre 5°·0N. 82°·5W. (as on 1945, June 26d.).

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

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Balboa Heights		4·9	35	i 1 11	− 6	i 2 0	−15	—	—	i 3·7
Bogota		8·4	92	i 2 9	+ 3	e 3 47	+ 4	—	—	—
Port au Prince		16·8	37	i 4 3	+ 5	—	—	i 4 17	PP	—
Merida	N.	17·3	338	e 3 52	−12	—	—	—	—	e 8·8
Huancayo		18·7	157	e 4 23	+ 1	e 7 48	0	—	—	e 9·2
Vera Cruz	Z.	19·4	319	e 5 46	?	—	—	—	—	e 13·1
San Juan		20·8	48	i 4 42	− 3	i 8 35	+ 2	i 5 36	PPP	i 9·8
Tacubaya		21·7	314	e 4 54	− 1	e 9 6	+15	e 5 6	PP	i 10·9
Fort de France		23·1	65	i 5 11	+ 3	i 9 24	+ 8	5 49	PP	—
La Paz		25·7	146	i 5 37a	+ 4	i 10 12	+11	i 5 44	pP	13·5
Bermuda		31·8	31	e 6 30	+ 2	e 11 34	− 4	e 10 9	?	e 13·1
Georgetown		34·1	8	e 6 47	− 1	e 12 15	+ 1	14 9	SS	—
St. Louis		34·2	350	i 6 46	− 3	i 12 12	− 4	i 7 52	PP	—
Philadelphia		35·4	9	e 7 8	+ 8	i 12 41	+ 7	i 8 21	PP	e 16·6
Cleveland		36·3	2	i 7 2k	− 5	i 12 41	− 7	e 8 30	PP	—
Fordham		36·5	13	e 7 8	− 1	i 12 52	+ 1	i 15 36	SSS	—
Tucson		37·9	319	i 7 20a	0	e 13 15	+ 2	e 8 50	PP	e 19·0
Harvard		38·6	14	i 7 25	− 1	e 16 2	SS	i 8 58	PP	e 20·2
Vermont		40·2	11	e 8 40	+60	e 14 47	+59	e 10 16	PcP	e 17·4
Ottawa		40·7	7	7 42	− 2	13 50	− 5	9 19	PP	19·3
Shawinigan Falls	N.	42·2	11	e 7 53	− 3	—	—	—	—	—
Villa Marie		42·2	4	e 7 52	− 4	—	—	e 9 32	PP	—
Pierce Ferry		42·4	322	i 7 59	+ 1	—	—	—	—	—
Palomar		42·6	316	i 8 0a	+ 1	—	—	i 9 35	PP	—
Boulder City		42·8	321	e 8 0	− 1	—	—	e 9 35	PP	—
Seven Falls	E.	43·2	13	8 0	− 4	14 29	− 3	—	—	17·6
Riverside	Z.	43·3	316	i 8 5a	0	—	—	—	—	—
Mount Wilson	Z.	43·9	316	i 8 9a	− 1	—	—	—	—	—
Pasadena		44·0	316	i 8 11a	0	i 14 46	+ 3	i 9 51	PP	e 22·0
Salt Lake City		44·3	328	e 8 11	− 2	e 13 49	−59	—	—	e 16·9
Haiwee	Z.	45·0	319	i 8 18	− 1	—	—	—	—	—
Logan		45·0	330	e 8 11	− 8	e 14 45	−13	e 9 56	PP	e 18·5
Santa Barbara	Z.	45·2	315	i 8 20	0	—	—	—	—	—
Tinemaha		45·7	319	i 8 24a	0	—	—	—	—	—
Fresno	N.	46·5	318	e 8 28	− 3	—	—	—	—	—
Lick		48·1	318	i 8 42	− 1	—	—	—	—	—
Santa Clara		48·3	318	e 8 47	+ 2	e 15 48	+ 3	—	—	e 24·6
Butte	N.	48·5	333	e 8 47	+ 1	e 15 51	+ 3	e 10 43	PP	e 19·7
Berkeley		48·8	318	e 8 47k	− 2	i 15 56	+ 4	i 19 32	SS	e 24·0
Shasta Dam		50·4	322	i 8 57	− 4	—	—	—	—	—
Hungry Horse		50·9	334	i 9 3	− 2	—	—	—	—	—
Grand Coulee		52·9	330	i 9 18	− 2	—	—	—	—	—
Victoria		55·6	328	(i 9 47)	+ 7	(i 17 38)	+13	—	—	(23·0)
Scoresby Sund		75·8	17	11 50	0	21 28	− 3	21 52	PS	—
Toledo	Z.	78·0	51	i 12 2	0	e 21 57	+ 2	e 14 45	PP	—
Granada		78·2	54	i 12 8a	+ 5	i 22 6	+ 9	15 3	PP	36·8
Alicante		80·7	52	12 26	PcP	22 34	+10	12 36	pP	e 38·3
Kew		81·2	39	e 12 20	+ 1	e 22 29	0	e 23 23	PS	e 36·0
Tortosa		81·5	50	15 32	PP	22 33	+ 1	23 24	PS	e 38·0
Paris		83·0	42	12 28	0	e 22 49	+ 2	e 23 38	PS	e 38·0
Clermont-Ferrand		83·4	46	i 12 33	+ 3	e 22 55	+ 4	e 15 21	PP	40·5
Uccle		84·2	40	—	—	e 22 58	− 1	e 23 57	PS	e 35·0
De Bilt		84·7	39	i 12 40k	+ 3	e 23 2	− 2	e 23 56	PS	e 40·0
Tamanrasset		86·3	68	e 12 48	+ 3	—	—	e 16 6	PP	—
Strasbourg		86·5	42	e 12 48	+ 2	e 23 25	+ 3	e 16 8	PP	40·0
Stuttgart		87·4	42	e 12 50	0	e 23 34	+ 4	e 24 29	PS	41·0
Copenhagen		88·7	34	e 13 0	+ 3	23 49	+ 6	23 31	SKS	39·0
Cheb		89·3	40	—	—	e 23 5	[−24]	i 23 41	S	—
Rome		90·4	48	e 13 4	0	e 23 38	[+ 3]	e 30 2	SS	—
Prague		90·6	40	—	—	e 26 50	?	e 30 20	SS	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Triest		90·8	44	—	—	e 23 44	[+ 6]	i 24 12	S	—
Upsala	N.	90·8	30	i 13 18	+12	—	—	—	—	—
Warsaw		94·3	37	—	—	e 24 1	[+ 4]	e 25 42	PS	e 44·0
Moscow		102·2	30	e 18 10	PP	e 27 12	PS	—	—	—
Istanbul		102·7	47	e 13 2	−58	26 19	PS	—	—	—
Yalta		105·0	41	e 18 31	PP	e 24 58	[+ 7]	—	—	—
Helwan		107·9	57	e 18 56	PP	e 26 38	S	—	—	—
Ksara		110·3	52	e 18 59	PP	e 28 42	PS	—	—	—
Sverdlovsk		111·5	21	—	—	25 21	[+ 3]	—	—	—
Leninakan		113·1	41	e 20 0	PP	—	—	—	—	—
Tashkent		127·2	27	e 30 57	PS	—	—	—	—	—
Andijan		129·0	24	19 12	[+ 2]	—	—	—	—	—
Stalinabad		129·1	28	e 19 19	[+ 9]	e 26 18	[0]	—	—	—
Murgab		131·7	24	19 20	[+ 5]	—	—	—	—	—

Additional readings and note :—
Port au Prince i =4m.20s.
Tacubaya eE =5m.3s., iSZ =9m.10s., iSN =9m.13s.
Fort de France SSS? =10m.31s.
La Paz iPPZ =6m.9s., PPP =6m.36s., iP$_c$P =8m.42s., isSN =10m.24s.
Cleveland ePPN =8m.11s., iE =14m.57s.
Tucson i =7m.30s., ePPP =9m.43s.
Ottawa SSS =17m.2s.
Palomar iZ =8m.8s.
Pasadena iZ =8m.29s., eSSEN =18m.8s.
Butte eN =16m.37s.
Berkeley eSN =15m.42s.
Victoria readings increased by 2 minutes.
Scoresby Sund 23m.43s.
Granada P$_c$P =12m.18s., PPS =23m.45s., iSS =27m.3s.
Alicante PP =15m.36s., PPP =17m.34s., S$_c$S =22m.42s., PS =23m.18s., PPS =23m.40s., SS =27m.58s., SSS =31m.18s., Q =33m.32s.
Kew eZ =12m.35s.
Tortosa PPPE =17m.36s., SKSE =22m.48s., S$_c$S?E =23m.6s., PPSEN =23m.43s., iE = 24m.37s.
Paris PPP =17m.45s., e =25m.2s.?, eSSS =31m.48s.
Clermont-Ferrand ePS =23m.54s., eSS =28m.29s., eSSS =31m.42s.
Uccle eSN =23m.3s., eSS =28m.2s.
De Bilt eSS =28m.38s.
Strasbourg eSS =29m.8s.
Stuttgart iPZ =12m.54s.k, ePPPZ =18m.38s., ePKKP =29m.26s., eQ =38m.2s.
Copenhagen 25m.2s.
Cheb e =25m.13s. and 26m.21s., eSS =28m.30s., e =29m.35s.
Warsaw eN =25m.47s., eE =25m.53s.
Long waves were also recorded at La Plata and Ivigtut.

Aug. 19d. Readings also at 1h. (near Lick (2)), 2h. (Huancayo and near La Paz), 5h. (Boulder City, Pierce Ferry, Tucson, Pasadena, Riverside, Tinemaha, Huancayo, and near La Paz), 6h. (Tucson), 7h. (Tacubaya (2), near Murgab, Stalinabad, Obigarm, Andijan, and Samarkand), 10h. (Tacubaya, Istanbul, Rome, Belgrade (2), Triest (2), Lick, near Mineral, Ferndale, and near Murgab), 11h. (Victoria, Bombay, Kodaikanal, Colombo, Hyderabad, near Alicante, and near Zürich), 13h. (Vera Cruz), 14h. (near Alicante), 16h. (Stuttgart), 19h. (Vera Cruz), 20h. (Helwan, Ksara, Stuttgart, and La Paz), 21h. (near Tacubaya and near Murgab), 22h. (Mount Wilson, Pasadena, Palomar, Tinemaha, Tucson, Ottawa, and Tacubaya).

Aug. 20d. 18h. 45m. 58s. Epicentre 3°·7N. 124°·9E.

$A = -·5710$, $B = +·8185$, $C = +·0641$; $\delta = +9$; $h = +7$;
$D = +·820$, $E = +·572$; $G = -·037$, $H = +·053$, $K = -·998$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Vladivostok		39·7	8	i 7 36	0	i 13 36	− 4	—	—	—
Brisbane	Z.	41·2	140	e 7 46	− 2	—	—	i 9 21	PP	—
Riverview		44·8	148	i 8 18	+ 1	i 14 58	+ 3	e 15 12	PS	e 22·6
Hyderabad	N.	47·5	290	e 8 40	+ 2	15 37	+ 3	—	—	—
Bombay	E.	53·0	291	e 9 26	+ 5	i 16 56	+ 6	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Almata		57·9	321	e 10 11?	+15	—	—	—	—	—
Andijan		59·8	316	e 10 10	+ 1	—	—	—	—	—
Stalinabad		61·6	313	i 10 22	0	—	—	—	—	—
Tashkent		62·2	316	e 10 25	− 1	e 18 46	− 5	—	—	—
Sverdlovsk		73·0	329	11 33	0	20 57	− 3	—	—	—
Baku		76·2	311	—	—	e 21 44	+ 8	—	—	—
Leninakan		80·9	311	e 12 51	+34	—	—	—	—	—
Moscow		85·4	326	e 12 39	− 1	e 23 4	[+ 1]	—	—	—
Ksara		87·1	304	e 12 51	+ 2	26 21	PPS	16 23	PP	—
Yalta		88·0	314	e 16 23	PP	—	—	—	—	—
Helwan		91·3	300	e 13 8	− 1	—	—	16 50	PP	—
Istanbul		92·0	311	13 12	0	—	—	16 58	PP	—
Warsaw		95·5	323	e 17 19	PP	e 23 53	[−11]	e 25 57	PS	e 50·1
Copenhagen		100·0	328	18 2	PP	24 23	[− 4]	26 41	PS	50·0
Triest		101·9	318	e 18 20	PP	e 28 1	PPS	—	—	—
Scoresby Sund		102·7	350	18 18	PP	25 38	− 5	—	—	51·0
Stuttgart		103·8	322	e 18 28a	PP	e 27 50	PS	e 20 32	PPP	e 55·0
Shasta Dam		104·6	46	i 19 26	PP	—	—	—	—	—
Strasbourg		104·7	323	e 18 38	PP	e 27 57	PS	e 20 49	PPP	—
De Bilt		104·8	326	e 18 32	PP	e 27 38	PS	e 20 38	PPP	e 52·0
Uccle		105·8	326	—	—	e 28 2?	PS	—	—	e 48·0
Paris		107·8	324	14 25	− 4	e 28 15	PS	e 18 57	PP	e 57·0
Clermont-Ferrand		108·8	321	e 19 5	PP	i 29 42	PPS	i 39 22	SSS	58·0
Tinemaha	z.	108·8	49	e 18 34	[+ 3]	—	—	—	—	—
Pasadena		109·8	52	e 18 39	[+ 6]	—	—	e 44 2?	Q	—
Mount Wilson	z.	109·9	52	e 18 35	[+ 2]	—	—	—	—	—
Jersey		110·2	327	—	—	27 27	PS	—	—	—
Riverside	z.	110·5	52	e 19 10	PP	—	—	—	—	—
Palomar	z.	111·1	53	e 19 10	PP	—	—	—	—	—
Boulder City		111·8	49	e 18 40	[+ 3]	—	—	—	—	—
Pierce Ferry		112·3	48	e 18 41	[+ 3]	—	—	—	—	—
Alicante		114·5	315	e 20 15	PP	e 29 27	PS	—	—	e 70·1
Tucson		116·2	51	e 18 47	[+ 2]	—	—	—	—	—
Granada		117·2	315	—	—	30 30	PPS	35 33	SS	64·0
Ottawa		127·8	18	e 19 8	[0]	—	—	—	—	—
La Paz		162·0	136	20 8	[+ 5]	—	—	i 24 22	PP	74·4

Additional readings :—
Brisbane iZ = 8m.12s.
Riverview ePPSEN = 15m.20s., iS$_e$SN? = 18m.15s., iN = 18m.36s.
Warsaw eZ = 21m.28s., eN = 30m.16s., eE = 32m.48s.
Stuttgart eS? = 28m.32s.
Strasbourg ePPS = 28m.41s.
Paris e = 23m.1s. and 24m.15s., ePPS = 29m.25s.
Clermont-Ferrand e = 23m.58s., i = 30m.47s.
Granada SS = 50m.18s. (?Q).
Long waves were also recorded at Upsala, Kew, and Tortosa.

Aug. 20d. 22h. 37m. 13s. Epicentre 31°·0S. 178°·5W. Depth of focus 0·040.
(as on 1944, July 10d.).

A = −·8584, B = −·0225, C = −·5125 ; δ = +1 ; h = +2 ;
D = −·026, E = +1·000 ; G = +·512, H = +·013, K = −·859.

		Δ	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Auckland	N.	8·1	222	2 2	+ 7	3 33	+ 7
Tuai	N.	8·6	203	2 4	+ 2	3 39	+ 2
New Plymouth	E.	10·1	215	2 25	+ 5	4 39	+28
Wellington		11·6	206	2 37	− 2	4 37	− 7
Kaimata		14·1	212	e 3 7	− 2	—	—
Christchurch		14·4	207	3 12	− 1	5 34	−12
Apia		18·2	23	(3 56)	+ 2	3 56	P
Pasadena	z.	86·2	46	i 12 10	0	—	—
Mount Wilson	z.	86·3	46	i 12 10	− 1	—	—
Riverside	z.	86·6	46	i 12 11	− 1	—	—
Tinemaha	z.	88·1	44	i 12 19	0	—	—
Tucson		89·9	50	i 12 27	− 1	—	—
La Paz	N.	98·2	114	e 12 53	−13	—	—

Aug. 20d. Readings also at 0h. (near Tacubaya (2)), 2h. (Fresno), 4h. (Leninakan (3)), 5h. (near Berkeley and Lick), 6h. (Leninakan, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Pierce Ferry, Hungry Horse, Bogota, Huancayo, and near Balbao Heights), 7h. (Huancayo, La Paz, Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Lick, Boulder City, Pierce Ferry, Shasta Dam, Hungry Horse (2), Grand Coulee, and Ksara), 8h. (Hungry Horse), 9h. (Tchimkent, near Andijan, Frunse, Obi-garm, Murgab, Samarkand, Stalinabad; Stuttgart, near Basle, and Zürich), 10h. (Tacubaya), 12h. (near Mizusawa), 13h. (near Mount Wilson, Pasadena, Palomar, Riverside, Tucson, Boulder City, and Pierce Ferry), 14h. (Stuttgart and Triest), 16h. (Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Shasta Dam, Boulder City, Pierce Ferry, and near Stalinabad), 18h. (Raciborzu, Warsaw, near Bucharest, and near Stalinabad), 21h. (Apia), 22h. (Ottawa).

Aug. 21d. 8h. 44m. 51s. Epicentre 41°·5N. 16°·1E. (as on 18d.).

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Rome		2·7	279	0 43	− 2	e 1 13	− 6	i 0 50	P*	e 1·4
Messina		3·3	187	0 53	0	1 35	0	—	—	—
Catania		4·1	191	e 1 7	+ 2	e 1 55	0	—	—	—
Florence		4·2	304	e 1 14	+ 7	e 1 57	0	e 2 11	S*	—
Triest		4·5	339	e 1 13	+ 2	e 1 59	− 6	i 1 31	P_g	i 2·6
Belgrade		4·6	42	e 1 13k	+ 1	i 2 23	S*	i 1 29	P_g	—
Bologna		4·6	312	1 12	0	2 3	− 4	e 2 9	S	—
Kalossa	E.	5·4	21	e 1 57	P_g	2 59	S_g	—	—	3·2
Salo		5·8	317	e 1 29	0	e 2 34	− 4	—	—	e 3·4
Pavia		6·2	309	e 1 28	− 7	e 2 39	− 9	e 1 55	P*	—
Chur		7·1	321	e 1 46	− 2	—	—	—	—	—
Bucharest		7·9	65	e 2 3	+ 4	—	—	—	—	4·2
Zürich		8·0	320	e 1 35	−25	e 3 17	−16	e 1 55	P	—
Basle		8·6	318	e 2 7	− 2	e 3 32	−16	—	—	—
Neuchatel		8·6	313	e 2 1	− 8	e 3 28	−20	—	—	—
Prague		8·6	353	e 2 17	+ 8	e 4 0	+12	—	—	—
Raciborzu		8·7	9	e 2 38	+28	i 4 29	+39	e 8 37	PcP	—
Stuttgart		8·8	329	e 2 4	− 7	e 3 53	0	e 2 50	P_g	e 5·8
Cheb		9·0	344	e 2 27	+14	i 4 21	+23	—	—	e 6·2
Strasbourg		9·2	323	e 2 16	0	e 3 53	−10	e 4 34	S*	e 5·6
Istanbul		9·8	88	e 2 33	+ 9	e 4 23	+ 6	—	—	—
Jena	N.	9·9	343	e 2 25	0	e 5 27	S_g	e 3 15	P_g	—
Collmberg		10·1	349	e 2 29	+ 1	i 4 16	− 9	i 3 49	P_g	i 7·5
Clermont-Ferrand		10·3	299	e 2 31	− 1	e 4 27	− 3	e 5 28	S_g	5·9
Potsdam		11·1	350	—	—	e 4 51	+ 2	e 5 55	Q	e 6·2
Warsaw		11·3	16	e 2 45	− 1	e 5 4	+10	e 5 30	Q	e 6·2
Paris		12·1	312	e 2 55	− 2	i 5 22	+ 8	—	—	e 7·2
Uccle		12·3	323	e 4 9	+70	e 6 57	L	—	—	e 7·6
Alicante		13·1	262	3 5	− 5	e 5 37	− 1	3 13	PP	e 6·4
Yalta		13·6	71	3 18	+ 1	5 59	+ 9	—	—	—
Kew		15·0	317	e 3 33	− 2	—	—	—	—	e 8·5
Toledo		15·4	271	e 3 39	− 1	e 7 10	+38	—	—	8·5
Granada		15·8	261	i 3 53k	+ 8	i 6 50	+ 8	4 2	pP	i 7·2
Helwan		16·9	128	e 6 26	?	e 7 7	0	—	—	—
Ksara		17·4	110	e 4 11	+ 5	e 8 18	+59	—	—	—
Upsala		18·4	2	e 4 26	+ 8	e 7 40	− 1	—	—	e 10·0
Moscow		20·1	37	e 4 34	− 4	e 8 30	+11	—	—	—
Tamanrasset		20·7	210	i 4 41k	− 3	—	—	—	—	—
Grozny		21·9	74	e 5 11	+14	—	—	—	—	—
Sverdlovsk		32·3	46	e 6 31	− 2	—	—	—	—	—
Stalinabad		39·9	75	e 7 38	+ 1	—	—	—	—	—
Andijan		41·7	71	e 7 54	+ 2	—	—	—	—	—
Hungry Horse		80·3	329	i 12 11	− 3	—	—	—	—	—
Victoria		83·5	334	(e 12 41)	+10	—	—	—	—	—
Pierce Ferry		90·3	321	e 13 3	− 1	—	—	—	—	—
Boulder City		90·8	322	e 13 6	0	—	—	—	—	—
Tinemaha	Z.	91·3	325	e 13 8	− 1	—	—	—	—	—
Tucson		91·8	317	i 13 10	− 1	—	—	—	—	—
Mount Wilson	Z.	93·7	323	e 13 17	− 3	—	—	—	—	—

For Notes see next page.

NOTES TO AUGUST 21d. 8h. 44m. 51s.

Additional readings and note :—
Rome eS* =1m.21s.
Belgrade iP* =1m.19s., iS_g =2m.34s.
Bologna e =3m.19s.
Kalossa eE =2m.14s., eN =2m.51s., SN =3m.4s., eE =3m.7s.
Pavia iEN =2m.22s.
Prague e =3m.28s., 3m.33s., 4m.18s., and 4m.52s.
Raciborzu eEN =6m.55s.
Stuttgart eZ =2m.21s., e =3m.25s., eS? =3m.38s. and 3m.44s., e =4m.10s. and 4m.22s., eS_g? =4m.59s.
Cheb e =4m.49s. and 4m.54s.
Strasbourg e =2m.33s., eP =2m.44s., i =4m.23s.
Jena eP_g?E =3m.26s., eEN =4m.4s., eE =4m.42s.
Collmberg i =2m.52s. and 4m.30s., iS =4m.49s., i =5m.32s., 5m.46s., and 5m.49s., iS_g = 5m.59s.
Clermont-Ferrand eS =4m.54s.
Warsaw eS?N =5m.36s., eS?E =5m.42s.
Paris i =3m.8s., e =4m.50s.
Uccle eN =7m.17s.
Alicante PPP =3m.21s., eS =5m.15s., SS =5m.24s., P_cS =12m.15s., S_cS =15m.53s.
Granada PP =4m.17s., SS =7m.3s.
Helwan e =7m.33s.
Tamanrasset iP =4m.47s.k.
Hungry Horse i =12m.17s.
Victoria reading increased by 2 minutes.
Long waves were also recorded at Copenhagen, De Bilt, Jersey, Aberdeen, Barcelona, and Tortosa.

Aug. 21d. Readings also at 0h. (Almata, near Andijan, Frunse, Obi-garm, and Murgab), 1h. (Almata, Andijan, Frunse, and near Murgab), 3h. (Copenhagen, Paris, Strasbourg, Stuttgart, Helwan, Ksara, Istanbul, Tamanrasset, and Ottawa), 5h. (Ottawa), 8h. (Sverdlovsk, Moscow, Sotchi, Leninakan, Warsaw, Theodosia, Tashkent, near Yalta, Rome, Triest, Ksara, Istanbul (2), Stuttgart, Victoria, and Hungry Horse), 9h. (near Pasadena, Mount Wilson, Riverside, Boulder City, Pierce Ferry, Tucson, and near Apia), 14h. (Stalinabad, Sverdlovsk, Tashkent, and Vladivostok), 15h. (Helwan, Ksara, Istanbul, Warsaw, Rome, Triest, Strasbourg, Stuttgart, De Bilt, Alicante, near Granada, and near Obi-garm), 17h. (Scoresby Sund), 18h. (near Mineral), 21h. (Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Boulder City, Pierce Ferry, Shasta Dam, and Hungry Horse), 23h. (Clermont-Ferrand, Paris, Strasbourg, Stuttgart, near Triest, and Tamanrasset).

Aug. 22d. 4h. 9m. 16s. Epicentre 41°·2N. 142°·5E. (as on 1945, June 19d.).

Intensity IV at Hatinohe ; II-III at Urakawa and Miyako; suggested epicentre 41°·4N. 142°·6E. Depth of focus 60km.

Seismo. Bull. Cent. Met. Obs., Japan, 1948, Tokyo, 1950, p. 37 with macroseismic chart.

$A = -\cdot5987$, $B = +\cdot4594$, $C = +\cdot6561$; $\delta = -4$; $h = -2$;
$D = +\cdot609$, $E = +\cdot793$; $G = -\cdot521$, $H = +\cdot399$, $K = -\cdot755$.

	△	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Hatinohe	1·0	228	0 16	− 5	0 30	− 6
Aomori	1·4	254	0 17	−10	0 35	−11
Miyako	1·6	194	0 26a	− 4	0 47	− 4
Mori	1·7	302	0 18	−13	0 36	−18
Morioka	1·8	214	0 31	− 1	0 51	− 5
Sapporo	2·1	335	0 18	−19	1 1	− 3
Mizusawa	2·3	207	0 40	0	1 14	+ 5
Akita	2·4	231	0 34	− 7	1 5	− 7
Nemuro	3·1	47	0 42	− 9	1 15	−14
Sendai	3·2	203	0 41	−11	1 34	+ 5
Aikawa	4·6	228	1 57	+45	—	—
Mito	5·1	199	1 23	+ 3	2 22	+ 2
Utunomiya	5·1	205	1 24	+ 4	2 18	− 2
Kakioka	5·3	201	1 25	+ 3	—	—
Maebasi	5·5	210	1 35	+10	2 31	+ 1

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Kumagaya		5·6	207	1 35	+ 8	2 37	+ 4
Tokyo		5·9	202	1 43	+12	2 45	+ 5
Yokohama		6·2	202	2 44	S	(2 44)	− 4
Hunatu		6·4	208	1 44	+ 6	3 6	+13
Mera		6·6	199	0 58	?	—	—
Misima		6·7	206	2 13	P_g	—	—
Shizuoka		7·0	209	2 24	P_g	—	—
Gihu		7·4	220	1 54	+ 2	—	—
Nagoya		7·4	218	2 2	+10	—	—
Kameyama		7·9	219	1 59	0	—	—
Hukuoka		12·3	235	0 58	?	1 56	?
Shasta Dam		68·0	55	e 10 50	−13	—	—
Tinemaha		72·7	55	e 11 34	+ 2	—	—
Haiwee	z.	73·5	56	e 11 41	+ 5	—	—
Mount Wilson	z.	74·6	58	e 11 44	+ 1	—	—
Pasadena	z.	74·6	58	i 11 48	+ 5	—	—
Riverside	z.	75·2	58	e 11 44	− 2	—	—
Boulder City		75·6	55	e 11 39	− 9	—	—
Palomar	z.	76·0	57	i 11 55	+ 4	—	—
Pierce Ferry		76·0	54	i 11 53	+ 2	—	—
Tucson		80·5	55	i 12 21	+ 6	—	—

Additional readings :—
Shasta Dam i = 11m.7s.
Tinemaha eZ = 11m.38s. and 11m.58s.
Mount Wilson eZ = 11m.49s.
Riverside eZ = 11m.52s.
Tucson i = 12m.30s.

Aug. 22d. 23h. 16m. 25s. Epicentre 41°·5N. 16°·1E. (as on 21d.).

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Rome		2·7	279	e 0 43	− 2	e 1 15	− 4	e 0 47	P*	e 1·4
Messina		3·3	187	0 49	− 4	1 29	− 6	—	—	—
Catania		4·1	191	e 1 7	+ 2	e 1 55	0	e 2 5	S*	—
Florence		4·2	304	e 1 19	P*	e 1 57	0	e 1 26	P_g	e 2·4
Triest		4·5	339	e 1 11	0	i 1 58	− 7	i 1 32	P_g	i 2·6
Belgrade		4·6	42	e 1 15	+ 3	i 1 57	−10	i 1 21	P*	—
Bologna		4·6	312	e 1 12	0	e 2 9	+ 2	i 2 15	P*	i 3·1
Kalossa		5·4	21	e 1 50	P_g	2 54	S_g	—	—	3·1
Pavia		6·2	309	i 1 35a	0	2 40	− 8	—	—	—
Chur		7·1	321	e 1 55	+ 7	e 3 3	− 7	—	—	—
Bucharest	E.	7·9	65	e 2 5	+ 6	e 4 19	S_g	—	—	—
Zürich		8·0	320	e 1 56	− 4	e 3 28	− 5	—	—	—
Basle		8·6	318	e 2 4	− 5	e 3 32	−16	—	—	—
Neuchatel		8·6	313	e 2 2	− 7	e 3 31	−17	—	—	—
Prague		8·6	353	e 1 56?	−13	e 3 35?	−13	e 2 39	P*	—
Raciborzu		8·7	9	e 2 12	+ 2	e 4 38?	S_g	—	—	—
Stuttgart		8·8	329	e 2 5	− 6	e 3 55	+ 2	e 2 53	P_g	e 5·9
Cheb		9·0	344	e 2 9	− 4	e 4 2	+ 4	e 3 13	P_g	e 5·6
Istanbul		9·8	88	i 2 29	+ 5	—	—	2 37	PP	—
Jena	E.	9·9	343	e 2 29	+ 4	e 4 5	−15	i 5 32	S_g	—
Collmberg		10·1	349	e 2 28	0	i 4 55	S*	e 6 2	S_g	e 7·5
Potsdam	N.	11·1	350	—	—	e 4 59?	+10	—	—	e 6·1
Warsaw		11·3	16	e 2 48	+ 2	e 5 11	+17	—	—	e 5·6
Tortosa	E.	11·8	272	2 49	− 4	5 27	SS	2 57	PP	7·0
Uccle		12·3	323	e 3 21	PP	e 4 59	−19	—	—	e 7·8
Alicante		13·1	262	3 44	PPP	6 26	SSS	—	—	e 7·5
Kew		15·0	317	i 3 36	+ 1	i 6 15	− 8	e 6 45	SS	e 8·4
Toledo		15·4	271	i 3 42	+ 2	e 7 11	SSS	—	—	8·6
Granada		15·8	261	3 50	+ 5	6 52	+10	—	—	8·4
Helwan		16·9	128	i 4 3a	+ 4	7 23	+16	4 26	PP	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ksara		17·4	110	e 4 12	+ 6	e 8 49	L	—	—	(e 8·8)
Upsala	E.	18·4	2	—	—	e 7 43	+ 2	i 8 11	SS	e 10·2
Ottawa		63·1	308	e 10 28	− 4	—	—	—	—	—
Hungry Horse		80·3	329	i 12 14	0	—	—	—	—	—
Victoria		83·5	334	e 12 29	− 2	—	—	—	—	—
Shasta Dam		89·9	330	i 13 0	− 2	—	—	—	—	—
Tucson		91·8	317	i 13 10	− 1	—	—	—	—	—
Fresno	N.	92·3	326	i 10 36	?	—	—	—	—	—

Additional readings :—
Rome eS* = 1m.20s.
Florence iS_gE = 2m.14s.
Belgrade iS = 2m.12s.
Kalossa eE = 1m.54s., eN = 2m.40s., eE = 3m.2s.
Pavia eE = 2m.24s., e = 3m.3s.
Prague e = 3m.4s., eS* = 4m.6s., e = 4m.25s. and 4m.55s.
Raciborzu eN = 2m.19s., eEN = 3m.12s.
Stuttgart e = 2m.16s. and 2m.41s., eS? = 3m.35s., iS_g? = 3m.39s., eS_g? = 5m.2s.
Cheb eN = 2m.37s. and 2m.50s., e = 4m.23s., 5m.11s., and 5m.27s.
Collmberg iP? = 3m.15s., iP_g = 3m.40s., i = 3m.47s., 4m.8s., 4m.40s., 4m.47s., 5m.12s., 5m.37s., and 5m.54s.
Warsaw eZ = 4m.9s., eN = 4m.35s., eSN = 5m.14s.
Tortosa PPPE = 3m.3s.
Uccle eE = 7m.3s. and 7m.18s., eN = 7m.24s.
Alicante PP = 4m.0s., SS = 6m.40s., P_cS = 11m.42s., S_cS = 15m.48s.; record wrongly interpreted.
Hungry Horse i = 12m.18s.
Long waves were also recorded at Copenhagen and De Bilt.

Aug. 22d. Readings also at 0h. (Mineral, near Lick, and near Obi-garm), 6h. (Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Boulder City, Pierce Ferry, Huancayo, and near La Paz), 8h. (Andijan, Samarkand, Stalinabad, near Ashkabad, and near Apia), 10h. (near Pasadena, Palomar, Riverside, and Tucson), 11h. (near Leninakan), 13h. (near Obi-garm (2)), 15h. (Lick), 16h. (Palomar, Riverside, Tinemaha, and Tucson), 17h. (near Mineral), 18h. (Stalinabad, Andijan, Tashkent, and Sverdlovsk), 20h. (near Mizusawa), 22h. (near Stalinabad).

Aug. 23d. 3h. Azores.
Toledo iPZ = 7m.2s., eZ = 10m.16s. and 10m.46s.
Granada P = 7m.5s., S = 11m.7s., L = 12m.30s.
Alicante P? = 7m.22s., PP = 7m.38s., cS = 9m.51s., SS = 10m.6s., eL = 11m.0s.
Tortosa PE = 7m.31s., PPEN = 8m.9s., eE = 11m.35s., S?E = 11m.51s., SS?E = 12m.51s., eLE = 15m.4s.
Paris eP = 7m.42s.
Clermont-Ferrand eP = 7m.43s.
Stuttgart ePZ = 8m.17s.?
Hungry Horse iP = 12m.15s.
Tucson eP = 12m.59s.
Tinemaha ePZ = 13m.14s.
Pierce Ferry eP = 13m.15s.
Palomar iPZ = 13m.27s.
Long waves also recorded at De Bilt, Uccle, and Rome.

Aug. 23d. 11h. 50m. 39s. Epicentre 72°·7N. 3°·6E.

$A = +\cdot2986$, $B = +\cdot0188$, $C = +\cdot9542$; $\delta = +1$; $h = -12$;
$D = +\cdot063$, $E = -\cdot998$; $G = +\cdot952$, $H = +\cdot060$, $K = -\cdot299$.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Scoresby Sund	8·4	267	2 14	+ 8	—	—	—	—	3·4
Upsala	14·0	150	2 21	−61	—	—	—	—	e 6·4
Copenhagen	17·5	162	e 4 5	− 2	7 29	+ 8	—	—	9·3
De Bilt	20·7	177	—	—	e 8 21?	−10	—	—	—
Potsdam	20·8	164	e 4 49	+ 4	—	—	e 5 32	PPP	—
Warsaw	21·9	150	e 4 55	− 2	e 8 57	+ 3	e 9 37	SS	e 10·8
Moscow	22·0	122	4 52	− 6	8 53	− 3	—	—	—
Jena	22·1	165	e 4 58	− 1	—	—	—	—	—
Raciborzu	23·6	155	e 5 16	+ 3	—	—	—	—	—
Paris	24·0	182	i 5 19	+ 2	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Stuttgart		24·1	170	e 5 19	+ 1	e 9 45	+11	—	—	e 12·8
Strasbourg		24·3	172	e 5 22	+ 2	e 9 21	−16	—	—	—
Basle		25·3	173	e 5 31	+ 1	—	—	e 6 36	PPP	—
Zürich		25·5	172	e 5 26	− 6	—	—	—	—	—
Clermont-Ferrand		27·0	181	e 5 52	+ 7	—	—	—	—	—
Sverdlovsk		27·6	95	5 44	− 7	10 32	0	—	—	—
Yalta		31·7	135	e 6 23	− 4	e 11 34	− 3	—	—	—
Istanbul		34·0	144	e 6 21?	−27	—	—	—	—	e 19·4
Leninakan		37·4	126	e 7 36?	+20	—	—	—	—	—
Ksara		42·3	138	e 9 32	PP	e 15 52	?	—	—	—
Tashkent		43·9	98	e 9 41	PP	14 36	− 6	e 17 41	SS	—
Ottawa		44·3	277	e 8 14	+ 1	—	—	—	—	—
Andijan		45·3	96	e 8 25	+ 4	—	—	—	—	—
Stalinabad		46·3	100	e 8 27	− 2	—	—	—	—	—
Tamanrasset		49·9	178	8 59	+ 2	—	—	—	—	—
Hungry Horse		51·8	312	e 9 10	− 2	—	—	—	—	—
Shasta Dam		60·9	316	e 11 14	+57	—	—	—	—	—
Mineral	z.	61·1	315	e 10 16	− 2	—	—	—	—	—
Pierce Ferry		63·4	306	i 10 30	− 4	—	—	—	—	—
Tinemaha		63·5	311	e 10 34	0	—	—	—	—	—
Boulder City		63·7	307	e 10 37	+ 1	—	—	—	—	—
Haiwee		64·3	310	e 10 40	+ 1	—	—	—	—	—
Mount Wilson	z.	66·2	309	e 10 52	0	—	—	—	—	—
Pasadena	z.	66·3	309	e 10 52	0	—	—	—	—	—
Tucson		66·4	303	i 10 53	0	—	—	—	—	—
Palomar	z.	66·7	308	i 10 55	0	—	—	—	—	—

Additional readings :—
Warsaw ePE = 5m.6s., eSZ = 9m.0s., eSE = 9m.5s.
Jena eEN = 5m.12s.
Strasbourg e = 5m.33s.
Tinemaha iZ = 10m.41s.
Haiwee eZ = 10m.47s.
Pasadena eZ = 10m.57s.
Tucson i = 10m.57s.
Palomar iZ = 11m.1s.
Long waves were also recorded at Rome, Alicante, and Granada.

Aug. 23d. Readings also at 3h. (near Apia and near Berkeley), 6h. (near Tacubaya), 9h. (near Obi-garm), 10h. (near Andijan, Samarkand, Stalinabad, near Zürich, and near Laz Paz), 11h. (Basle and Zürich), 12h. (Palomar, Tinemaha, Tucson, Pierce Ferry, and near Apia), 13h. (near Ottawa), 15h. (near Ashkabad), 17h. (Hungry Horse and near Lick), 18h. (Palomar, Riverside, Tinemaha, and Tucson), 20h. (Tchimkent, near Andijan, Murgab, Obi-garm, and Stalinabad), 21h. (near Ottawa), 23h. (near Ashkabad).

Aug. 24d. 6h. Local European shock.

Istanbul iPNZ = 16m.9s., iS_gE = 17m.4s.
Yalta P = 16m.11s., iS_g = 16m.49s.
Theodosia eP = 16m.22s., iS_g = 17m.13s.
Sotchi eP = 16m.30s., iS_g = 17m.46s.
Ksara eP = 16m.59s., eS? = 18m.35s.
Triest iP = 19m.2s., eS = 22m.29s.
Helwan e = 19m.26s. and 22m.0s.
Stuttgart ePZ = 19m.35s., eL = 27·5m.
Strasbourg eP? = 19m.35s.?
Clermont-Ferrand eP = 20m.18s.
Sverdlovsk P = 20m.26s.
Warsaw ePN = 20m.57s., ePE = 21m.8s., eN = 21m.35s., eE = 21m.58s., eZ = 22m.30s., eN = 22m.36s., eZ = 22m.49s., eN = 23m.1s., eE = 23m.7s., eN = 23m.36s., eN = 24m.31s., eE = 25m.5s., eLEN = 27m.
Belgrade e = 21m.4s., 21m.29s., 21m.50s., 23m.8s., and 27m.54s.
Rome e = 22m.25s.
Long waves were also recorded at other European stations.

Aug. 24d. 8h. 3m. 45s. Epicentre 4°·5N. 98°·0E. (as on 1945, April 29d.).

A = −·1388, B = +·9873, C = +·0779; δ = +10; h = +7;
D = +·990, E = +·139; G = −·011, H = +·077, K = −·997.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Colombo	E.	18·2	278	4 14	− 2	7 41	+ 4	—	—	11·9
Calcutta	E.	20·2	333	e 4 38	− 1	i 8 22	+ 1	—	—	—
Kodaikanal	E.	21·1	288	i 4 49	+ 1	i 8 45	+ 6	5 11	PP	10·8
Hyderabad	N.	23·1	305	5 3	− 5	9 6	−10	—	—	—
Bombay		28·4	302	e 6 1	+ 3	e 10 26	−19	—	—	15·1
Murgab		40·2	330	7 42	+ 2	13 38	−10	—	—	—
Andijan		42·8	331	e 8 4	+ 3	e 14 28	+ 2	—	—	—
Stalinabad		43·1	326	e 8 2	− 2	i 14 20	−10	—	—	—
Frunse		43·5	335	e 8 21	+14	—	—	—	—	—
Tashkent		44·8	330	e 8 7?	−10	e 14 42?	−13	—	—	—
Tchimkent		45·3	330	—		e 14 52	−10	—	—	—
Vladivostok		48·8	33	i 8 50	+ 1	e 15 52	0	—	—	—
Baku		56·0	317	—	—	e 17 27	− 3	—	—	—
Sverdlovsk		60·0	338	10 12	+ 1	18 15	− 8	—	—	—
Grozny		60·1	318	e 10 53	PcP	—	—	—	—	—
Ksara		64·4	305	e 10 29	−11	e 20 29	?	—	—	—
Helwan		67·6	300	e 10 59	− 2	20 24	PS	13 32	PP	—
Theodosia		67·7	317	e 11 25	PcP	—	—	—	—	—
Moscow		69·9	328	e 11 32?	PcP	—	—	—	—	—
Triest		82·8	315	e 13 8	+41	—	—	—	—	—
Rome		83·7	311	e 12 25	− 7	e 22 43	−11	—	—	—
Bologna	z.	84·5	314	e 12 41	+ 5	—	—	e 16 26	?	—
Stuttgart		85·9	318	e 12 38	− 5	e 24 21	PS	—	—	e 54·2
Strasbourg		86·8	318	—	—	e 24 11	PS	e 24 31	PPS	—
De Bilt		88·2	322	—	—	e 23 33	− 5	—	—	e 39·3
Paris		90·3	319	e 13 8	+ 4	—	—	—	—	e 51·2
Tamanrasset		90·6	292	i 13 3k	− 2	—	—	i 13 11k	P	—
Hungry Horse		120·4	24	i 18 58	[+ 4]	—	—	—	—	—
Shasta Dam		121·8	35	e 20 3	[+67]	—	—	—	—	—
Tinemaha	z.	126·6	36	e 19 14	[+ 9]	—	—	—	—	—
Mount Wilson	z.	128·6	38	e 19 33	[+24]	—	—	—	—	—
Pasadena	z.	128·6	38	e 19 32	[+23]	—	—	—	—	—
Riverside	z.	129·2	38	e 19 23	[+13]	—	—	—	—	—
Boulder City		129·4	34	e 19 24	[+13]	—	—	—	—	—
Pierce Ferry		129·7	33	e 19 22	[+11]	—	—	—	—	—
Ottawa		130·0	354	e 19 55	[+43]	e 22 49	PKS	—	—	64·3
Tucson		134·3	33	e 19 21	[+ 1]	—	—	—	—	—
Fort de France		151·9	312	e 19 55	[+ 5]	—	—	—	—	—

Additional readings :—
Kodaikanal SSE = 9m.13s.
Tamanrasset i = 14m.14s.k.
Long waves were also recorded at Christchurch, Wellington, Arapuni, and at other European stations.

Aug. 24d. Readings also at 3h. (near Rome, Florence, Bologna, Triest, and near Mizusawa), 4h. (Istanbul, Ksara, near Yalta, and near Mineral), 5h. (Hungry Horse and near Istanbul), 6h. (Istanbul and near Alicante), 7h. (Zürich, Tacubaya, and Dehra Dun), 9h. (La Paz, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Boulder City, Pierce Ferry, and Tucson), 10h. (Apia), 11h. (Jena), 14h. (near Leninakan), 19h. (Ksara, Leninakan and near Erevan), 20h. (Ottawa and near Triest), 21h. (La Paz, Stuttgart, and near Ottawa), 22h. (Hungry Horse and Shasta Dam), 23h. (near Stalinabad).

Aug. 25d. 6h. 9m. 23s. Epicentre 24°·4S. 64°·6W.

Damage at Salta (Argentina). Epicentre 23°·5S. 65°W. (Gut.).

Boletin Sismologico, Observatorio Astronomico de la Universidad Nacional, La Plata, 1948.

$A = +·3910$, $B = -·8236$, $C = -·4108$; $\delta = -5$; $h = +4$;
$D = -·903$, $E = -·429$; $G = -·176$, $H = +·371$, $K = -·912$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Montezuma		4·3	293	e 1 11	+ 3	i 2 3	+ 3	i 1 18	P*	i 2·2
La Paz		8·6	336	i 2 12a	+ 3	i 3 55	+ 7	i 4 47	S_g	—
La Plata		12·0	153	i 2 29	−26	i 5 5	− 6	i 3 39	?	—
Huancayo		16·0	319	i 3 57	+ 9	e 7 7	SS	—	—	e 8·6
Bogota		30·3	341	i 6 14	− 1	e 11 37	+22	—	—	—
Balboa Heights		36·2	335	e 7 6	0	e 13 19	?	—	—	—
Fort de France		39·0	7	i 7 31	+ 1	e 16 26	SS	e 7 57	?	—
San Juan		42·6	358	i 7 47	−12	i 14 13	−10	i 10 13	PPP	e 16·5
Port au Prince		43·4	350	i 8 12	+ 6	—	—	i 9 15	?	—
Tacubaya		55·1	319	i 9 37	+ 1	e 17 17	− 1	e 9 57	pP	e 27·7
Bermuda		56·5	0	i 9 39	− 7	i 17 35	− 2	e 21 15	SS	e 24·3
Georgetown		64·0	349	e 10 37	− 1	e 19 23	+10	e 12 56	PP	—
Philadelphia		64·8	351	i 10 42	− 1	i 19 23	0	e 12 55	PP	e 27·2
Fordham		65·5	353	i 10 46	− 1	i 19 30	− 2	i 13 11	PP	—
New Kensington	E.	66·1	348	i 10 55	+ 4	i 19 55	+16	i 13 18	PP	e 37·6
Harvard		66·9	355	i 10 55	− 1	e 19 51	+ 2	—	—	e 35·6
St. Louis		67·2	338	e 10 55	− 3	i 19 38	−14	i 11 22	pP	—
Cleveland		67·4	346	e 10 47	−12	i 19 42	−13	e 13 19	PP	—
Halifax		68·7	1	11 8	+ 1	20 10	0	13 31	PP	33·5
Vermont		69·0	353	i 11 5	− 4	e 20 9	− 5	e 13 45	PP	e 29·5
Chicago		69·2	342	i 11 8	− 2	e 20 10	− 6	e 15 23	PPP	e 27·8
Ottawa		70·2	352	11 15	− 2	20 32	+ 4	13 49	PP	32·9
Shawinigan Falls	N.	71·0	354	11 21	− 1	20 37	0	—	—	37·6
Seven Falls	E.	71·4	356	11 25	+ 1	20 46	+ 4	21 17	PS	32·9
Tucson		71·6	320	i 11 24a	− 1	e 20 45	+ 1	—	—	e 29·1
Temiskaming		71·9	350	e 11 26	− 1	—	—	i 14 9	PP	—
Ville Marie		72·6	349	e 11 30	− 1	e 20 55	− 1	—	—	—
La Jolla		75·9	317	i 11 52	+ 2	e 21 36	+ 4	—	—	—
Palomar		76·0	317	i 11 50	− 1	e 21 32	− 2	e 39 4	P′P′	—
Pierce Ferry		76·2	321	i 11 51	− 1	e 21 42	+ 6	e 38 47	P′P′	—
Boulder City		76·5	320	i 11 55	+ 1	e 21 45	+ 6	e 14 5	PP	—
Riverside	Z.	76·7	317	i 11 54a	− 1	—	—	e 39 1	P′P′	—
Mount Wilson		77·3	317	i 11 58a	0	—	—	i 12 12	P_cP	—
Pasadena		77·3	317	i 11 58a	0	i 21 52	+ 4	i 39 9	P′P′	e 29·6
Salt Lake City		78·3	325	i 12 3	0	i 21 55	− 4	—	—	e 31·6
Haiwee		78·5	318	i 12 5	+ 1	e 22 6	+ 5	—	—	—
Santa Barbara	Z.	78·5	316	e 12 4	0	—	—	—	—	—
Logan		79·0	326	i 12 6	− 1	e 22 3	− 3	e 15 5	PP	e 35·2
Tinemaha		79·3	318	i 12 8a	− 1	e 22 13	+ 4	e 38 57	P′P′	—
Fresno	N.	80·0	318	i 12 13	0	e 22 15	− 2	—	—	—
Bozeman		81·5	329	e 12 21	0	i 22 35	+ 3	e 15 32	PP	e 43·3
Lisbon		81·5	41	12 20a	− 1	22 31	− 1	13 4	pP	40·4
Santa Clara		81·7	317	e 12 22	0	e 22 39	+ 5	—	—	—
Berkeley		82·2	317	i 12 24a	0	i 26 41	?	35 1	Q	e 42·0
Butte	N.	82·5	329	i 12 26	0	e 22 42	0	i 15 40	PP	e 32·7
Tamanrasset		82·7	61	i 12 27a	0	i 22 43	− 1	i 15 29a	PP	i 39·0
Mineral	Z.	83·4	320	e 12 27	− 3	e 23 13	+22	i 12 47	?	—
Ukiah		83·6	318	e 13 29	+58	e 22 50	− 3	e 15 43	PP	e 34·1
Granada		83·9	45	i 12 33a	0	i 22 54	− 2	23 53	PS	i 40·0
Shasta Dam		84·1	320	i 12 31	− 3	—	—	—	—	—
Saskatoon		84·6	335	12 37	+ 1	22 56	− 7	15 38	PP	41·8
Hungry Horse		84·9	330	i 12 37	− 1	—	—	—	—	—
Toledo		85·3	43	i 12 40	0	i 23 8	− 2	i 15 45	PP	35·2
Ivigtut		86·3	8	i 12 45	0	23 8	[− 1]	i 23 23	S	39·6
Alicante		86·6	45	12 46	0	23 25	+ 2	12 58	pP	e 41·2

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Grand Coulee		87·0	327	i 12 42	− 6	e 23 17	[+ 3]	—	—	—
Tortosa		88·6	44	i 12 57	+ 1	23 42	0	13 42	pP	38·4
Victoria		89·6	325	12 56	− 5	23 24	[− 6]	23 44	S	42·6
Barcelona		90·0	44	13 1	− 2	23 31	[− 2]	24 14	S	38·6
Clermont-Ferrand		92·9	41	i 13 17	+ 1	i 23 55	[+ 5]	i 24 27	S	43·6
Kew		94·2	35	i 13 21	− 1	e 23 57	[0]	i 13 33	pP	e 37·6
Paris		94·2	38	i 13 22	0	i 23 53	[− 4]	i 17 8	PP	45·6
Christchurch		94·4	218	13 22	− 1	23 52	[− 6]	17 7	PP	45·1
Wellington		94·6	221	13 24	0	24 33	− 2	17 11	PP	45·6
Edinburgh		95·4	31	e 19 48	PPP	e 24 22	−20	25 46	PS	—
Durham		95·5	32	e 17 21	PP	i 26 13	PS	i 26 26	PPS	—
Neuchatel		95·9	42	e 13 29	− 1	—	—	e 17 21	PP	—
Arapuni	E.	96·0	224	e 17 37?	PP	25 7	+20	31 37	SS	45·6
Pavia	Z.	96·3	43	e 13 34	+ 2	—	—	—	—	—
Uccle		96·3	36	e 13 31a	− 1	i 24 7	[− 1]	e 17 25	PP	e 42·6
Basle		96·5	41	e 13 33a	+ 1	e 25 11	+20	e 17 17	PP	—
Aberdeen		96·6	29	i 17 29	PP	i 26 23	PS	e 31 56	SS	47·0
Florence		97·0	45	e 13 35	0	e 24 59	+ 4	e 17 31	PP	—
Rome		97·0	48	i 13 36	+ 1	e 24 9	[− 3]	i 13 47	pP	—
Zürich		97·0	41	e 13 35a	0	e 25 5	+10	e 17 22	PP	—
Strasbourg		97·1	40	i 13 36	+ 1	i 24 17	[+ 5]	e 17 30	PP	39·6
Auckland	N.	97·3	225	—	—	25 22	?	—	—	45·6
Chur		97·3	42	e 13 37a	+ 1	e 24 58	0	e 17 31	PP	e 48·6
Bologna		97·4	44	e 13 39a	+ 2	e 23 53	[−21]	e 17 33	PP	—
De Bilt		97·4	36	i 13 37a	0	e 26 31	PS	i 17 30	PP	e 44·6
Stuttgart		98·0	40	i 13 39a	0	e 24 15	[− 2]	i 17 37	PP	46·6
Scoresby Sund		99·3	13	13 47	+ 2	24 13	[−11]	17 48	PP	—
Triest		99·4	44	i 13 46	0	i 24 20	[− 4]	i 17 46	PP	—
Jena	E.	100·4	39	e 13 45	− 5	—	—	e 17 49	PP	—
Cheb		100·5	39	e 13 55	+ 4	e 24 29	[0]	e 17 49	PP	e 46·6
Sitka		100·6	328	e 18 12	PP	e 25 15	−10	e 32 9	SS	e 38·2
Tananarive		101·1	117	e 13 57	+ 4	24 24	[− 8]	18 0	PP	50·9
Collmberg		101·4	39	e 13 57	+ 2	—	—	e 18 7	PP	—
Prague		101·7	40	e 13 57a	+ 1	e 24 35?	[0]	e 18 3	PP	e 41·6
Potsdam	N.	102·3	37	e 13 36	−23	—	—	—	—	e 45·6
Copenhagen		102·9	35	i 14 2k	+ 1	24 42	[+ 1]	18 15	PP	—
Belgrade		103·5	48	e 14 6a	+ 2	e 24 39	[− 5]	i 18 21	PP	e 53·5
Raciborzu		103·9	41	e 18 14	PP	—	—	e 19 2	?	—
Warsaw		106·3	40	e 14 18	P	e 24 58	[+ 2]	e 26 22	S	e 40·6
Helwan		106·6	295	e 14 16	P	24 57	[− 1]	26 19	S	—
Upsala		107·0	32	e 29 6	PPS	—	—	—	—	e 43·6
Istanbul		108·2	53	14 24	P	—	—	18 53	PP	—
College		109·0	334	e 18 54	PP	e 26 31	S	e 28 53	PS	e 41·7
Helsinki		110·6	32	e 18 40	[+ 6]	e 28 33	PS	—	—	e 49·6
Ksara		111·5	297	e 14 43	P	28 45	PS	19 18	PP	—
Yalta		112·7	50	e 19 26?	PP	—	—	—	—	—
Riverview		112·8	212	i 19 22a	PP	i 28 55	PS	e 35 15	SS	52·3
Theodosia		113·7	50	e 19 42	PP	e 29 16	PS	—	—	—
Sotchi		116·5	53	e 19 59	PP	—	—	—	—	—
Moscow		116·6	38	19 44	PP	e 25 38	[0]	29 38	PS	—
Brisbane	E.	116·9	218	—	—	i 29 41	PS	—	—	i 55·7
Leninakan		119·1	56	e 18 56	[+ 5]	—	—	—	—	—
Baku		123·6	57	e 20 50	PP	e 30 42?	PS	—	—	—
Sverdlovsk		129·2	35	e 16 1	P	28 15	{+ 1}	i 19 11	PKP	—
Ashkabad		130·1	60	e 21 28	PP	—	—	—	—	—
Samarkand		136·7	58	e 19 18	[− 6]	—	—	—	—	—
Stalinabad		138·2	58	e 19 4?	[−23]	—	—	—	—	—
Tashkent		138·3	55	e 19 15	[−12]	i 23 4	PKS	21 57	PP	—
Bombay		140·2	90	e 19 23	[− 8]	e 32 41	PS	e 22 29	PP	61·6
Andijan		140·7	56	e 19 25	[− 7]	i 23 12	PKS	e 22 33	PP	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Kodaikanal	E.	141·3	104	19 42	[+ 9]	23 15	PKS	33 16	PS	—
Colombo	E.	141·8	112	19 28	[− 6]	—	—	→	—	69·5
Frunse		141·8	51	e 19 31	[− 3]	—	—	e 22 42	PP	—
Almata		143·3	49	e 19 36	[0]	—	—	—	—	—
Hyderabad	N.	144·9	94	19 38	[− 1]	—	—	—	—	56·1
Dehra Dun	N.	146·4	72	i 15 43	?	e 20 37	?	→	—	—
Irkutsk		150·9	345	19 51	[+ 2]	33 39	SKSP	23 25	PP	—
Calcutta	E.	155·1	89	e 20 2	[+ 7]	e 26 52	[− 8]	i 44 37	SSP	—
Vladivostok		156·9	328	i 19 57	[0]	—	—	i 20 30	PKP_2	—

Additional readings :—
Montezuma i = 1m.49s.
La Paz i = 2m.32s., iN = 3m.4s.
San Juan i = 8m.27s., iS = 13m.39s., iS_cS = 17m.37s.
Tacubaya iP_cPZ = 10m.31s., iPPN = 11m.29s., ePPZ = 11m.39s., iN = 15m.32s. and 15m.56s., iSN = 17m.21s., iS_cSE = 19m.23s., eS_cSN = 19m.27s., iS_cSN = 19m.37s., eSSZ = 21m.21s., eSSSE = 23m.41s., eSSSN = 23m.52s., eSSSZ = 23m.55s.
Bermuda ePP = 13m.14s., iPP = 13m.21s., e = 18m.39s.
Philadelphia iP_cP = 11m.30s., iS_cS = 20m.28s.
New Kensington iE = 12m.4s. and 20m.23s.
St. Louis i = 12m.32s.
Cleveland iPZ = 10m.50s., eN = 19m.32s.
Halifax SS = 25m.1s., SSS = 27m.37s.?
Vermont ePPP = 15m.0s., eSS = 24m.35s.
Ottawa PPP = 15m.39s., iE = 20m.45s., eN = 24m.37s., SSS = 28m.41s.
Seven Falls iE = 20m.58s., eE = 22m.0s., SSE = 29m.19s.
Tucson ePP? = 14m.44s., ePPP = 16m.4s.
Temiskaming e = 13m.56s.
Ville Marie iZ = 11m.31s., e = 12m.27s. and 13m.4s.
Palomar iZ = 11m.54s. and 12m.7s., ePKP,PKP,PKPZ = 59m.1s.
Pierce Ferry ePPP = 15m.58s.
Boulder City i = 12m.6s. and 12m.55s., ePKP,PKP = 38m.59s.
Riverside iZ = 12m.8s., ePKP,PKP,PKPZ = 59m.5s.
Pasadena iZ = 12m.5s. and 12m.18s., ePKP,PKP,PKPZ = 58m.54s.
Salt Lake City ePPS = 23m.54s., e = 25m.2s.
Logan i = 12m.25s., iPP = 15m.14s., e = 16m.44s., eSS = 27m.20s., eSSS = 30m.39s.
Bozeman eSS = 28m.7s.
Lisbon iPZ = 12m.22s., iP_cPZ = 12m.33s., E = 12m.53s., SEN = 22m.34s., S_cS?N = 22m.54s., EN = 33m.25s.
Berkeley iZ = 12m.27s.
Butte iSN = 22m.46s., iS_cSN = 23m.1s., iPPSN = 23m.45s., iN = 24m.49s., eSSN = 28m.27s.
Tamanrasset iP_cP = 12m.44s.a, iPPP = 17m.32s.a
Ukiah eSS = 28m.45s.
Granada iPP = 14m.27s., PPS = 24m.15s., iSS = 28m.30s., SSS = 30m.41s.
Saskatoon PPP = 17m.52s., PS = 23m.53s., SS = 28m.41s., i = 30m.41s.
Toledo iP_cPE = 12m.48s., iPPPE = 17m.48s., iPSE = 24m.17s., iSSE = 28m.16s., iSSSE = 32m.15s.
Ivigtut 16m.5s., i = 24m.25s., SS = 28m.55s., 31m.1s.
Alicante PP = 16m.14s., PPP = 18m.5s., S = 23m.14s., PS = 24m.9s., PPS = 34m.38s., Q = 34m.42s.
Tortosa P_cPEN = 13m.2s., sPN = 14m.9s., PPEN = 16m.27s., PPPE = 18m.29s., SKSEN = 23m.29s., S_cSEN = 23m.59s., PSE = 24m.55s., PPSE = 25m.24s., SSE = 29m.41s., SSSE = 33m.19s.
Victoria iZ = 12m.59s., PS = 24m.58s.
Clermont-Ferrand iPP = 17m.0s., iPS = 25m.43s., iPPS = 26m.2s., iSS = 30m.58s., iSSS = 34m.25s.
Kew iZ = 14m.20s., iPP = 17m.8s., i = 17m.15s., esSEN = 24m.10s., eN = 24m.36s., eZ = 25m.25s., ePSEN = 25m.50s., ePPSEN = 26m.11s., eSS = 31m.14s., eSSSEN = 35m.10s.
Paris iS = 24m.15s., ePS = 25m.34s., ePPS = 25m.55s., iSS = 30m.50s., eSSS = 34m.35s., e = 35m.32s., i = 38m.50s. and 40m.20s., eQ = 41m.37s.?
Christchurch PPPE = 19m.5s., SKKSEN = 24m.48s., PSEN = 25m.49s., SSEN = 30m.51s., SSS?N = 34m.19s., QE = 38m.7s.
Wellington PPP?Z = 18m.5s., PS = 25m.39s., PPS = 26m.32s., e = 27m.54s., SS = 30m.37s., SSS = 33m.43s., e = 37m.49s., Q = 40m.37s.?
Edinburgh PPS = 26m.7s.
Uccle eEN = 22m.27s., eSKKSE = 24m.41s.?, ePSE = 26m.9s., eSSE = 31m.31s., eSSS = 36m.13s.
Aberdeen eEN = 41m.47s.
Florence ePSN = 26m.37s., eSSE = 32m.13s.
Rome iPP = 17m.27s., i = 18m.41s., eS = 25m.14s., ePS = 26m.25s., e = 27m.7s., eSS = 31m.37s.?, eSSS = 34m.37s.?
Zürich e = 26m.4s.

Continued on next page.

Strasbourg iPS =26m.21s., ePPS =27m.18s., iSS =31m.46s., eSSS =35m.34s.
Bologna e =20m.45s., eS? =25m.34s.
De Bilt iZ =13m.48s.
Stuttgart i =13m.51s.a, ePS =26m.31s., eSS =31m.55s., eSSS =35m.37s., eQ =41m.37s.?
Scoresby Sund 17m.7s., 23m.6s., and 24m.41s., iPS =26m.47s., SS =32m.7s. and 34m.1s.
Triest iPS =26m.52s.
Jena eZ =13m.49s., ePP?Z =17m.40s.
Cheb ePS =27m.3s., ePPS =27m.37s., eSS =32m.27s.
Sitka ePSPS =32m.47s.
Tananarive PPP =20m.2s., e =25m.42s., PS =26m.57s., SS =32m.30s., eQ =46m.57s.
Prague ePPP =20m.49s., eSKKS =25m.10s., e =25m.42s., ePPS =27m.17s., eSS = 32m.25s., eSSS =36m.37s.
Copenhagen 26m.1s., PS =27m.22s., SS =33m.1s.
Belgrade iPS =27m.37s.
Warsaw ePPN =18m.40s., ePPPZ =20m.53s., eSE =26m.25s., PSZ =28m.0s., ePSN = 28m.6s., eSSZ =33m.28s., eSSE =33m.45s., eSSSZ =37m.24s.
Helwan PP =18m.34s., PPP =20m.55s., PPS =28m.37s.
Upsala eN =29m.18s., eSS =32m.37s., eSSSE =36m.56s., eSSS?N =37m.15s., eE = 39m.12s.
College e =21m.9s., ePPS =29m.29s.
Helsinki eSKS =24m.37s., eSS =35m.40s.
Riverview iN =20m.8s., iZ =22m.27s., iPSZ =29m.5s., iN =29m.13s., eQN =46·4m.
Moscow ePPP =22m.13s., ePPS =30m.48s.
Sverdlovsk iPP =21m.26s., ePPP =24m.6s., ePPS =32m.58s., SS =38m.19s.?
Bombay eSSE =41m.11s., SSSE =46m.3s.
Kodaikanal PPE =22m.17s., SKKSE =28m.15s., PSE =31m.35s.
Dehra Dun eN =21m.32s., L =29m.55s.
Irkutsk SS =42m.27s., SSS =50m.7s.
Calcutta eSKPE =20m.27s., iSKSE =23m.57s., ePPSE =32m.47s., iSE =38m.44s.
Vladivostok iPPP =27m.42s.
Long waves were also recorded at Perth, Apia, Nanking, and Jersey.

Aug. 25d. 19h. Pasadena suggests Andes. Depth 150km.

La Paz iPZ =51m.0s.a, iP_g =51m.37s., iE =51m.53s., iS =52m.23s., iS_g =53m.5s.
Montezuma eP =51m.21s., iS =51m.43s., eL =51m.56s.
Huancayo eP =52m.42s., ePP =53m.12s., eS =54m.3s., eL =57m.51s.
St. Louis iP =60m.1s., i =60m.29s., ipP? =60m.40s., eS =68m.20s., e =69m.9s.
Ottawa e =60m.28s.
Tucson iP =60m.31s.k, ipP =61m.10s., e =89m.4s.
La Jolla ePZ =60m.59s., iZ =61m.19s.
Palomar iPNZ =60m.59s.k, iZ =61m.19s., ipPZ =61m.39s.
Pierce Ferry iP =61m.0s., ipP =61m.29s.
Boulder City iP =61m.2s., epP =61m.42s.
Riverside iPZ =61m.3s., iZ =61m.21s., ipPZ =61m.44s.
Pasadena iP =61m.6s.k, iZ =61m.23s. and 61m.35s., ipPZ =61m.48s.
Mount Wilson iPZ =61m.7s.k, iZ =61m.23s. and 61m.35s.
Haiwee ePZ =61m.14s., epPZ =61m.54s.
Tinemaha iPZ =61m.18s., iZ =61m.48s.
Lick ePZ =61m.30s.
Mineral ePZ =61m.38s.
Berkeley iPZ =61m.38s.a.
Shasta Dam iP =61m.43s.
Hungry Horse iP =61m.50s., i =62m.19s.
Grand Coulee eP =62m.0s., e =62m.23s.
Victoria e =62m.11s.

Aug. 25d. Readings also at 0h. (near Mineral), 2h. (Mount Wilson, Haiwee, Palomar, Riverside, Tinemaha, Boulder City, Hungry Horse, Pierce Ferry, Shasta Dam, and Mineral), 3h. (Boulder City, Pierce Ferry, Tucson, Riverside, Tinemaha, Huancayo, and La Paz), 10h. (Aberdeen), 13h. (Boulder City, Pierce Ferry, Tucson, Riverside, Tinemaha, and La Paz), 16h. (near Ottawa), 17h. (Hungry Horse), 18h. (Stuttgart), 19h. (near Balboa Heights), 22h. (La Paz), 23h. (near Murgab).

Aug. 26d. 14h. Tonga ?

Auckland eN = 19m.10s., LN = 21m.
Hungry Horse eP = 19m.27s.
Berkeley ePZ = 19m.56s., eSEN = 29m.58s.?, eLEN = 41·5m.
Palomar iPZ = 20m.0s., iZ = 20m.6s.
Riverside ePZ = 20m.2s.
Pasadena iPEZ = 20m.3s., eS?E = 30m.24s., eLNZ = 40·1m.
Mount Wilson iPZ = 20m.5s.
Haiwee iPZ = 20m.7s.
Tinemaha iPZ = 20m.8s.
Vladivostok eP = 20m.16s., iS = 30m.8s.
Boulder City eP = 20m.19s.
Pierce Ferry eP = 20m.22s.
Christchurch eE = 20m.46s., QEN = 21m.41s.
Istanbul e = 28m.
Stuttgart ePKP?Z = 28m.11s., ePKP$_2$?Z = 28m.41s., ePPP? = 36m.47s., eL = 92m.
Strasbourg ePKP = 28m.13s., i = 28m.42s., e = 29m.11s., eL = 85m.
Ksara e = 28m.18s.
Paris ePKP = 28m.26s., eL = 85m.
Rome e = 28m.53s.
Clermont-Ferrand e = 29m.3s., L = 85m.
Helwan e = 29m.42s. and 32m.33s.
La Paz iS?EN = 34m.0s., L = 57m.23s.
Long waves were also recorded at Apia, Arapuni, Wellington, De Bilt, Uccle, Kew, Alicante, and Granada.

Aug. 26d. 20h. 37m. 52s. Epicentre 27°·0N. 139°·5E. Depth of focus 0·080.
(as on 1940, March 9d.).

A = −·6784, B = +·5794, C = +·4516; δ = −13; h = +3;
D = +·649, E = +·760; G = −·343, H = +·293, K = −·892.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Mizusawa	N.	12·2	6	2 32	− 9	4 39	−11	—	—	—
Vladivostok		17·3	340	i 2 27	−65	i 4 27	?	—	—	—
Frunse		54·2	306	e 8 38	+ 1	—	—	—	—	—
Murgab		55·3	299	8 46	+ 2	15 52	+ 5	—	—	—
Andijan		56·1	302	8 52	+ 2	i 16 3	+ 5	—	—	—
Tashkent		58·4	304	i 9 5	− 1	i 16 28	+ 1	e 17 2?	sS	—
Stalinabad		59·3	301	i 9 13	+ 1	i 16 41	+ 3	—	—	—
Samarkand		60·4	302	9 8	−11	—	—	—	—	—
Sverdlovsk		61·8	323	i 9 26	− 2	e 21 2	SS	—	—	—
Baku		72·8	308	—	—	e 19 13	− 4	—	—	—
Moscow		74·4	325	e 10 42	− 2	19 32	− 3	20 3	sS	—
Grozny		74·5	312	e 10 45	+ 1	e 19 38	+ 2	—	—	—
Victoria		74·7	43	i 10 44	− 2	—	—	e 12 22	pP	—
Leninakan		76·9	310	11 1	+ 3	e 20 5	+ 3	—	—	—
Grand Coulee		77·6	43	i 11 0	− 2	e 20 25	+16	i 12 51	pP	—
Shasta Dam		78·6	50	i 11 6	− 1	—	—	i 12 52	pP	—
Mineral	z.	79·3	50	i 11 10	0	—	—	—	—	—
Hungry Horse		80·3	40	i 11 16	0	—	—	i 13 12	pP	—
Lick	z.	80·6	53	i 11 17	0	—	—	e 13 3	pP	—
Simferopol		81·4	317	—	—	e 20 49	+ 1	—	—	—
Yalta		81·6	316	11 21	− 1	—	—	—	—	—
Scoresby Sund		81·9	354	—	—	i 20 53	0	—	—	—
Fresno	N.	82·2	53	e 11 36	+11	(e 20 56)	0	—	—	—
Tinemaha		83·1	52	i 11 31a	+ 1	e 21 3	− 1	—	—	—
Santa Barbara	z.	83·3	55	i 11 32a	+ 1	—	—	i 13 15	pP	—
Haiwee		83·8	52	i 11 34a	+ 1	e 21 7	− 4	—	—	—
Mount Wilson		84·6	54	i 11 38a	+ 1	—	—	i 13 26	pP	—
Pasadena		84·6	54	i 11 37a	0	e 21 11	− 8	i 13 25k	pP	—
Riverside		85·2	54	i 11 39a	− 1	—	—	i 13 28	pP	—
Ksara		85·7	305	e 11 44	+ 1	e 21 41	+12	—	—	—
La Jolla		85·9	55	i 11 45	+ 1	—	—	e 13 32	pP	—
Palomar		85·9	54	i 11 44a	0	e 21 12	[− 4]	i 13 31k	pP	—
Boulder City		86·1	52	i 11 45	+ 1	—	—	e 13 34	pP	—
Pierce Ferry		86·6	51	i 11 48	+ 1	—	—	i 13 35	pP	—
Istanbul		86·6	315	11 57?	+10	(21 8?)	[−13]	—	—	21·1

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tucson		90·2	53	i 12 8a	+ 4	—	—	i 13 57	pP	—
Stuttgart	z.	92·5	329	e 12 14	0	—	—	e 14 10	pP	—
Rome		95·8	323	—	—	e 22 50	− 8	—	—	—
Huancayo		144·1	72	e 18 39	[+ 4]	—	—	e 24 32	PP	—
La Paz	N.	152·3	74	e 19 13	[+26]	—	—	—	—	—

Additional readings and note :—
Shasta Dam i = 14m.10s.
Mineral eN = 11m.44s.
Lick eZ = 13m.22s.
Fresno readings are given as separate P readings.
Tinemaha iZ = 11m.49s. and 14m.47s.
Pasadena isPZ = 14m.29s., ePKP,PKPZ = 40m.28s.
Riverside ePKP,PKPZ = 40m.16s.
Ksara e = 11m.12s.
Palomar iZ = 11m.52s. and 15m.10s., iSEN = 21m.21s.
Boulder City e = 15m.11s.
Pierce Ferry e = 15m.10s.
Tucson i = 12m.35s.

Aug. 26d. 20h. 54m. 59s. Epicentre 27°·0N. 139°·5E. Depth of focus 0·080. (as at 20h.37m. above).

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		
		°	°	m. s.	s.	m. s.	s.	m. s.		
Mizusawa		12·2	6	2 37	− 4	4 42	− 8	—		—
Vladivostok		17·3	340	i 2 28	−64	i 4 28	?	—		—
Frunse		54·2	306	e 8 40	+ 3	e 15 38	+ 5	—		—
Murgab		55·3	299	8 47	+ 3	15 53	+ 6	—		—
Andijan		56·1	302	e 8 53	+ 3	16 3	+ 5	—		—
Tashkent		58·4	304	i 9 5	− 1	i 16 30	+ 3	—		—
Stalinabad		59·3	301	i 9 13	+ 1	i 16 44	+ 6	—		—
Samarkand		60·4	302	9 21	+ 2	16 56	+ 4	—		—
Sverdlovsk		61·8	323	i 9 27	− 1	i 17 9?	0	—		—
Moscow		74·4	325	e 10 43	− 1	i 19 32	− 3	i 20 3		sS
Grozny		74·5	312	e 10 50	+ 6	—	—	—		—
Victoria		74·7	43	e 10 44	− 2	—	—	—		—
Grand Coulee		77·6	43	i 11 31	+29	—	—	—		—
Shasta Dam		78·6	50	i 11 6	− 1	—	—	—		—
Mineral	z.	79·3	50	i 11 9	− 1	—	—	—		—
Hungry Horse		80·3	40	i 11 16	0	—	—	i 13 38		pP
Yalta		81·6	316	e 11 23	+ 1	e 20 49	− 1	—		—
Scoresby Sund		81·9	354	—	—	20 54	+ 1	—		—
Tinemaha		83·1	52	i 11 31a	+ 1	—	—	i 13 19		pP
Santa Barbara	z.	83·3	55	e 11 31	0	—	—	—		—
Haiwee	z.	83·8	52	i 11 35a	+ 2	—	—	—		—
Mount Wilson	z.	84·6	54	i 11 38a	+ 1	—	—	e 13 27		pP
Pasadena		84·6	54	i 11 37a	0	e 21 13	− 6	i 13 26		pP
Riverside	z.	85·2	54	i 11 40a	0	—	—	e 13 36		pP
Palomar		85·9	54	i 11 41a	− 3	e 21 16	[0]	i 13 30		pP
Boulder City		86·1	52	i 11 46	+ 2	—	—	i 13 35		pP
Pierce Ferry		86·6	51	i 11 48	+ 1	—	—	e 13 35		pP
Tucson		90·2	53	i 12 8a	+ 4	—	—	e 13 58		pP
Stuttgart	z.	92·5	329	e 12 15	+ 1	—	—	—		—
Huancayo		144·1	72	e 18 41	[+ 6]	—	—	—		—

Additional readings :—
Shasta Dam i = 12m.52s. and 12m.59s.
Mineral iZ = 11m.41s.
Boulder City e = 13m.23s.

Aug. 26d. Readings also at 1h. (near Lick), 4h. (Ksara and near Granada), 5h. (Mount Wilson, Palomar, Tinemaha, Tucson, Pierce Ferry, near Andijan, Obi-garm, and Stalinabad), 7h. (near Andijan), 9h. (Mount Wilson (2), Pasadena, Palomar (2), Riverside (2), Tinemaha (2), Tucson, and Pierce Ferry), 10h. (Mount Wilson, Palomar, Riverside, Tucson, Pierce Ferry, and Paris), 11h. (La Jolla, Mount Wilson (3), Pasadena (3), Palomar (3), Riverside (2), Tinemaha (2), Tucson (3), Boulder City (3), Pierce Ferry (3), Shasta Dam (2), Hungry Horse, Ottawa, Bogota, and La Paz), 12h. (Apia and near Mineral), 13h. (Paris), 14h. (Istanbul and near Ottawa), 15h. (near Zürich), 16h. (La Paz), 17h. (La Paz and near Tacubaya), 18h. (La Paz), 21h. (near Ottawa).

Aug. 27d. 0h. Near Japan. U.S.S.R. suggest a depth of 70 km.

Vladivostok iP = 22m.27s., iS = 24m.27s.
Mizusawa PE = 22m.33s., eSN = 24m.38s.
Andijan eP = 28m.52s., eS = 36m.3s.
Stalinabad eP = 29m.12s.
Sverdlovsk P = 29m.27s., iS = 37m.9s.?
Shasta Dam iP = 31m.6s.
Hungry Horse iP = 31m.17s., i = 33m.0s., iS = 33m.7s.
Tinemaha iPZ = 31m.31s.
Pasadena iPZ = 31m.37s.
Mount Wilson iPZ = 31m.38s.a.
Riverside iPZ = 31m.40s.
Palomar iPZ = 31m.44s.
Pierce Ferry iP = 31m.48s., i = 33m.35s.
Tucson iP = 32m.9s.
Moscow esS = 39m.33s.

Aug. 27d. 10h. 44m. 6s. Epicentre 41°·7N. 19°·5E.

Intensity V at Danilovgrad ; IV at Crnojevica and Titograd ; III at Prizren.

B. J. Metovic.
Annuaire macroséismique pour l'année, 1948. Institut séismologique de Beograd. Nouvelle série No. 8, Belgrade, p. 61. Epicentre as adopted.

$A = +\cdot7059$, $B = +\cdot2500$, $C = +\cdot6627$; $\delta = -3$; $h = -2$;
$D = +\cdot334$, $E = -\cdot943$; $G = +\cdot625$, $H = +\cdot221$, $K = -\cdot749$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Belgrade		3·2	13	i 0 52k	0	i 1 30	− 2	i 1 3	P_g	—
Kalossa	N.	4·9	356	1 17	0	2 10	− 5	1 30	P_g	2·3
Rome		5·2	274	i 1 22	+ 1	i 1 52	P_g	i 1 33	P*	—
Catania		5·4	221	e 1 49	P_g	e 2 28	0	—	—	—
Bucharest	E.	5·6	59	e 1 29	+ 2	i 2 49	S*	e 1 59	P_g	—
Triest		5·7	315	i 1 27a	− 1	2 32	− 3	i 1 46	P*	i 3·2
Budapest		5·8	357	1 28	− 1	2 31	− 7	1 39	P*	3·2
Florence		6·4	292	e 1 38	0	e 2 38	−15	—	—	e 2·8
Bologna		6·6	298	e 1 41	0	i 2 58	0	e 2 21	P_g	—
Istanbul		7·2	92	1 47	− 2	i 3 40	S*	—	—	—
Salo		7·6	304	e 1 52a	− 3	i 3 16	− 7	—	—	—
Pavia		8·3	298	i 2 4a	0	e 3 36	− 4	e 2 21	P*	—
Raciborzu		8·4	354	e 2 16	+10	e 4 5	S*	—	—	—
Chur		8·8	309	e 2 10k	− 1	e 3 39	−14	—	—	—
Prague		9·1	339	i 2 14k	0	e 3 57	− 3	e 4 51	S_g	—
Zürich		9·6	310	e 2 20a	− 1	e 4 7	− 5	—	—	—
Cheb		9·7	332	e 2 29	+ 7	e 3 57	−18	e 4 35	S*	e 5·1
Stuttgart		10·1	318	e 2 26a	− 2	e 4 16	− 9	i 3 2	P_g	—
Basle		10·3	309	e 2 29	− 3	e 4 29	− 1	—	—	—
Neuchatel		10·4	305	e 2 31	− 3	e 4 23	− 9	—	—	—
Collmberg		10·6	337	i 2 37	+ 1	4 22	−15	3 54	?	—
Warsaw		10·6	5	e 2 38	+ 2	e 4 45	+ 8	—	—	e 5·9
Jena		10·7	332	e 2 35	− 3	e 4 51	+12	e 5 30	SS	—
Strasbourg		10·8	314	e 2 34	− 5	e 4 34	− 8	—	—	5·6
Yalta		11·1	71	i 2 47	+ 4	e 4 57	+ 8	—	—	—
Potsdam		11·6	340	e 2 54?	+ 4	e 4 54?	− 7	—	—	e 6·4
Theodosia		12·0	69	—	—	e 5 26	+15	—	—	—
Clermont-Ferrand		12·5	294	i 3 2	0	i 5 17	− 6	—	—	5·4
Paris		13·9	306	i 3 19	− 2	e 6 2	+ 5	—	—	e 7·4
Uccle		13·9	316	e 3 22	+ 1	e 6 19	+22	—	—	e 6·9
De Bilt		14·3	322	e 3 24	− 2	e 6 12	+ 6	—	—	e 6·9
Tortosa		14·2	273	3 31	+ 5	5 59	− 7	3 41	PP	9·0
Copenhagen		14·7	344	e 3 30k	− 1	6 16	0	—	—	6·9
Helwan		15·2	137	e 3 49	+11	6 48	+20	4 10	PPP	—
Ksara		15·2	116	e 3 28	−10	e 7 14	?	—	—	—
Alicante		15·7	264	i 3 45	+ 1	i 6 55	+16	3 54	pP	e 8·3
Kew		16·7	312	i 4 0	+ 3	e 7 15	+12	—	—	e 9·1
Jersey		16·9	304	e 3 59a	0	—	—	—	—	e 10·9
Toledo	Z.	17·9	271	i 4 15	+ 3	e 7 44	+14	—	—	—
Upsala		18·2	357	e 4 6	−10	e 7 30	− 7	e 4 27	PP	e 8·9

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Granada		18·4	263	i 4 22a	+ 4	i 7 57	+16	4 28	pP	i 9·4
Moscow		18·4	35	4 14	− 4	e 7 38	− 3	—	—	—
Helsinki		18·8	7	e 4 22	− 1	e 7 54	+ 4	—	—	e 10·4
Durham		19·1	320	i 4 28	+ 1	i 8 2	+ 5	—	—	—
Grozny		19·4	77	e 4 36	+ 6	e 8 18	+14	—	—	—
Edinburgh		20·5	321	—	—	e 8 24	− 3	—	—	—
Tamanrasset		22·2	216	i 5 4	+ 4	—	—	e 5 32	PP	—
Tashkent		36·9	73	—	—	e 12 48	−10	—	—	—
Stalinabad		37·4	77	e 7 19	+ 3	—	—	—	—	—
Andijan		39·2	73	e 7 36	+ 5	—	—	—	—	—
Frunse		40·2	69	e 7 44	+ 4	—	—	—	—	—
Hungry Horse		81·4	331	i 12 20	0	—	—	—	—	—
Victoria		84·4	336	e 12 33	− 3	—	—	—	—	—
Mineral	z.	91·0	331	e 13 6	− 1	—	—	—	—	—
Pierce Ferry		91·6	323	i 13 11	+ 1	—	—	—	—	—
Boulder City		92·1	324	e 13 14	+ 2	—	—	—	—	—
Tinemaha	z.	92·6	327	e 13 16	+ 1	—	—	—	—	—
Tucson		93·4	319	i 12 20a	−58	—	—	—	—	—
Riverside	z.	94·9	326	e 13 25	0	—	—	—	—	—
Mount Wilson	z.	95·0	326	e 13 26	0	—	—	—	—	—
Palomar	z.	95·2	324	i 13 28	+ 1	—	—	—	—	—

Additional readings :—
Belgrade iS_g =1m.44s.
Kalossa P*N =1m.24s., iN =1m.33s., eN =1m.49s., iN =1m.52s., iEN =2m.5s., iE = 2m.13s.
Bucharest eE =1m.35s., iE =2m.4s. and 3m.22s.
Budapest PPE =1m.48s., ePPN =1m.54s.?, iE =2m.8s., and 2m.20s., S_gEN =2m.57s.
Bologna iSE =2m.31s., iNZ =2m.53s., iZ =3m.53s.
Raciborzu eEN =2m.21s., 3m.7s., 4m.14s., and 4m.33s., e =6m.12s., eP_cP =8m.20s., eNZ =10m.23s.
Prague eS* =4m.4s.
Cheb eN =4m.53s.
Stuttgart e =2m.35s., i =2m.42s., e =3m.14s., 3m.39s., and 4m.42s., iS_g? =5m.22s. and 5m. 29s., i =5m.44s.
Basle i =2m.33s.
Collmberg S =5m.3s., 5m.56s., S_g =6m.20s.
Warsaw eE =3m.26s. and 4m.35s., SZ =4m.53s., eE =4m.58s., eN =5m.3s.
Jena eS_g?Z =5m.34s.
Strasbourg e =2m.54s., 3m.3s., 3m.34s., 4m.12s., and 4m.16s., eS? =4m.38s., i =5m.0s.
Potsdam e =6m.10s.
Clermont-Ferrand i =3m.16s. and 4m.11s.
Tortosa SSE =6m.22s.
Helwan SS =7m.8s.
Alicante PP =4m.5s., PPP =4m.13s., SS =7m.23s., P_cP =8m.15s., S_cS =11m.35s.
Kew iZ =5m.3s.
Toledo iZ =4m.33s., and 5m.10s., eZ =6m.0s., iE =13m.27s.
Upsala SSN =7m.54s.
Granada iPP =4m.55s., sS =8m.10s., SS =9m.0s.
Durham eE =4m.12s., iSEN =8m.6s.
Tamanrasset ePPP =5m.43s.

Aug. 27d. 11h. 24m. 19s. Epicentre 41°·7N. 19°·5E. (as at 10h.).

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Belgrade		3·2	13	e 0 52k	0	i 1 37	+ 5	i 0 56	P*	—
Kalossa		4·9	356	e 1 15	− 2	e 2 13	− 2	e 1 27	P*	e 2·7
Rome		5·2	274	i 1 23	+ 2	e 1 53	P_g	e 1 33	P*	—
Triest		5·7	315	e 1 29	+ 1	i 2 31	− 4	i 1 46	P*	i 3·2
Budapest	N.	5·8	357	e 1 41?	P*	—	—	—	—	e 3·0
Florence		6·4	292	e 1 40	+ 2	e 2 48	− 5	—	—	—
Bologna		6·6	298	e 2 1	P*	e 2 59	+ 1	e 3 14	S*	e 3·9
Istanbul		7·2	92	e 1 53	+ 4	—	—	—	—	e 4·7
Salo		7·6	304	e 1 56	+ 1	e 3 20	+ 7	—	—	e 4·1
Chur		8·8	309	e 2 11	0	—	—	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Prague		9·1	339	e 2 2	−12	e 4 0	0	—	—	—
Zürich		9·6	310	e 2 18	− 3	e 3 59	−13	—	—	—
Cheb		9·7	332	—	—	e 4 43	S*	—	—	—
Stuttgart	z.	10·1	318	e 2 27	− 1	—	—	—	—	—
Basle		10·3	309	e 2 36	+ 4	e 4 41	+11	—	—	—
Neuchatel		10·4	305	—	—	e 4 25	− 7	—	—	—
Warsaw		10·6	5	—	—	e 4 44	+ 7	—	—	e 5·7
Jena		10·7	332	e 2 41?	+ 3	e 4 6	−33	—	—	—
Strasbourg		10·8	314	—	—	e 4 14	−28	e 5 2	SSS	i 5·8
Clermont-Ferrand		12·5	294	e 3 34	+32	—	—	—	—	—
Paris		13·9	306	e 3 24	+ 3	e 5 46	−11	—	—	e 7·7
Hungry Horse		81·4	331	e 12 20	0	—	—	—	—	—

Additional readings :—
Belgrade iP = 1m.0s., iSS_g = 1m.45s.
Kalossa eN = 2m.5s., eEN = 2m.9s.
Rome iN = 3m.20s.
Triest iS_gS_g = 3m.5s.
Prague e = 4m.15s. and 5m.8s.
Warsaw eN = 4m.49s.
Jena eN = 2m.53s. and 4m.54s.
Long waves were also recorded at Copenhagen, Upsala, Potsdam, De Bilt, and Uccle.

Aug. 27d. 16h. 48m. 29s. Epicentre 28°·0S. 66°·0W. Depth of focus 0·025.
(as on 1940, May 1d.).

Felt in Chile 27°-28° S. lat. Suggested Epicentre 27°·6S. 66°·2W. Depth 200km.

Bolletin del Ano 1948, Instituto sismologico, Santiago, p. 34.

$A = +·3597$, $B = -·8078$, $C = -·4670$; $\delta = +1$; $h = +2$;
$D = -·914$, $E = -·407$; $G = -·190$, $K = +·427$, $K = -·884$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Montezuma		5·9	334	e 1 25	− 2	e 2 21	−13	—	—	e 2·9
La Plata		9·7	137	i 2 18	+ 2	i 4 24	+21	—	—	i 4·9
La Paz		11·6	350	i 2 37a	− 4	i 4 40	− 7	—	—	—
Bogota	z.	33·3	345	i 6 25	+ 4	e 11 55	+28	i 7 32	PP	—
Fort de France		42·7	8	e 7 40	0	e 13 45	− 3	—	—	—
San Juan		46·1	1	e 8 2	− 5	e 14 21	−16	e 9 50	PP	e 17·7
Fordham		68·9	354	i 10 46	0	i 19 37	+ 4	i 11 28	pP	—
St. Louis		70·1	340	i 10 51	− 2	i 19 36	−11	—	—	—
Harvard		70·3	357	i 10 55	+ 1	—	—	—	—	—
Cleveland		70·6	348	i 10 53k	− 3	i 19 50	− 3	i 11 33	pP	—
Tucson		73·5	322	i 11 13k	0	—	—	—	—	—
Ottawa		73·6	353	11 13	− 1	20 31	+ 4	28 31?	SSS	—
Shawinigan Falls	N.	74·5	356	e 11 20	+ 1	—	—	—	—	—
Seven Falls	E.	74·9	357	11 24	+ 3	20 46	+ 5	—	—	—
Temiskaming		75·3	351	i 11 23	− 1	—	—	—	—	—
Ville Marie		75·9	350	i 11 28	+ 1	e 20 55	+ 3	—	—	—
La Jolla	z.	77·7	318	i 11 37	0	—	—	—	—	—
Palomar		77·8	319	i 11 37k	− 1	e 21 17	+ 4	—	—	—
Pierce Ferry		78·2	322	i 11 40	0	—	—	—	—	—
Boulder City		78·5	321	i 11 42	+ 1	—	—	—	—	—
Riverside		78·5	318	i 11 41k	0	—	—	i 12 24	pP	—
Mount Wilson	z.	79·1	318	i 11 45k	0	—	—	—	—	—
Pasadena		79·1	318	i 11 44k	− 1	i 21 29	+ 3	e 12 25	pP	—
Santa Barbara	z.	80·2	318	e 11 51	+ 1	—	—	—	—	—
Haiwee		80·4	320	i 11 52k	+ 1	—	—	e 12 35	pP	—
Tinemaha		81·2	320	i 11 56k	0	e 21 51	+ 3	i 12 37	pP	—
Fresno	N.	81·9	319	i 11 59	0	i 12 47	pP	—	—	—
Lick	z.	83·4	318	i 12 7	0	—	—	—	—	—
Mineral	z.	85·4	321	e 12 15	− 2	—	—	e 15 35	PP	—
Tamanrasset		85·5	61	i 12 24a	+ 7	e 22 41	+10	i 13 13a	pP	—

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Shasta Dam	86·1	321	i 12 18	− 2	—	—	—	—	—
Hungry Horse	87·3	331	c 12 26	0	—	—	—	—	—
Granada	87·4	46	i 12 31k	+ 4	22 49	0	23 27	PS	38·9
Toledo	88·8	43	i 12 37	+ 4	i 22 55	− 7	i 13 20	pP	—
Grand Coulee	89·3	328	i 12 35	− 1	—	—	—	—	—
Alicante	90·0	46	12 32	− 7	i 22 58	[+ 9]	—	—	—
Victoria	91·8	326	e 12 43	− 4	—	—	—	—	—
Tortosa	92·1	44	13 7	+18	23 41	+10	14 9	pP	—
Clermont-Ferrand	96·5	41	i 13 13	+ 4	e 24 23	+14	i 17 9	PP	—
Paris	97·8	38	i 13 19	+ 5	i 24 32	+12	i 23 41	SKS	e 47·5
Kew	97·9	35	e 14 18	+63	e 24 26	+ 5	e 23 31	SKS	—
Uccle	99·9	37	e 23 53k	SKS	(e 23 53)	[+10]	e 26 25	PS	—
Basle	100·0	41	e 13 1	−24	e 23 53	[+10]	e 16 28	PP	—
Aberdeen	100·3	29	—	—	i 23 56	[+11]	e 27 42	PPS	—
Rome	100·3	48	i 17 37	PP	i 23 55	[+10]	e 26 29	PS	—
Florence	100·4	46	—	—	e 24 8	[+23]	e 24 49	S	—
Strasbourg	100·7	41	e 17 37	PP	e 23 51	[+ 4]	e 26 33	PS	—
De Bilt	101·0	36	—	—	e 23 58	[+10]	—	—	—
Stuttgart	101·6	41	e 13 35	+ 3	e 24 0	[+ 9]	e 17 44 a	PP	—
Triest	102·9	44	e 17 59	PP	i 24 5	[+ 8]	i 25 19	S	—
Copenhagen	106·6	36	—	—	24 23	[+ 9]	25 16	S	—
Helwan	109·2	66	—	—	e 24 37	[+12]	i 28 1	PS	—
Warsaw	109·9	41	e 18 47	PP	e 25 36	SKKS	28 2	PS	—
Istanbul	111·4	54	18 53	PP	e 25 44	SKKS	—	—	—
Ksara	114·2	64	e 19 19	PP	e 28 55	PS	—	—	—
Moscow	120·2	39	18 31	[+ 3]	i 25 19	[+13]	e 19 51	PP	—
Grozny	123·9	55	e 18 43?	[+ 8]	—	—	—	—	—
Sverdlovsk	132·9	37	i 18 56	[+ 3]	—	—	i 22 9	PKS	—
Samarkand	139·7	61	e 19 11	[+ 6]	—	—	—	—	—
Stalinabad	141·1	62	i 19 8	[0]	i 28 36	SKKS	—	—	—
Tashkent	141·3	57	i 19 9	[+ 1]	22 51	PKS	24 25	PPP	—
Andijan	143·7	58	19 15	[+ 3]	—	—	—	—	—
Frunse	145·0	54	i 19 21	[+ 7]	—	—	—	—	—
Almata	146·6	52	e 19 23	[+ 6]	—	—	—	—	—
Vladivostok	159·1	320	i 19 37	[+ 2]	—	—	i 23 57	PP	—

Additional readings :—
La Plata N = 3m.27s., Z = 3m.42s., N = 3m.57s., Z = 4m.35s. and 4m.53s.
La Paz iZ = 2m.50s. and 3m.31s., iN = 5m.26s., iS_g = 6m.0s.
Fordham e = 20m.29s.
Cleveland iZ = 11m.3s., iE = 20m.12s., eN = 20m.17s. and 20m.38s.
Seven Falls eE = 22m.49s. and 30m.19s.
Ville Marie e = 11m.40s.
Palomar iZ = 12m.2s., 12m.32s., and 14m.20s.
Riverside iZ = 11m.50s.
Pasadena iZ = 11m.59s.
Haiwee iZ = 12m.6s.
Tinemaha iZ = 12m.5s.
Tamanrasset iP_cP = 12m.32s. a.
Granada iS = 22m.58s., PPS = 24m.43s., iSS = 29m.10s., SSS = 32m.4s.
Toledo iSKSE = 23m.11s.
Tortosa SKSEN = 23m.11s., sSEN = 24m.33s., PSE = 25m.38s., SSE = 29m.33s.
Clermont-Ferrand iSKS = 23m.38s., iPS = 25m.42s., eSS = 30m.31s.
Paris ePS = 25m.54s.
Basle e = 25m.28s.
Rome eE = 23m.46s., iSN = 25m.1s., eSSS? = 27m.47s.
Strasbourg eS = 24m.0s., e = 26m.21s.
Stuttgart eS = 25m.6s., ePS = 26m.39s., ePPS = 27m.44s.
Copenhagen 27m.28s.
Helwan i = 25m.31s., e = 28m.55s.
Warsaw eSKKSN = 25m.45s., ePSEN = 28m.5s.
Sverdlovsk i = 19m.42s. and 28m.1s.

Aug. 27d. 20h. 59m.43s. Epicentre 39°·6N. 120°·8W.

A = −·3956, C = −·6636, C = +·6349 ; δ = −4 ; h = −2 ;
D = −·859, E = +·512 ; G = −·325, H = −·545, K = −·773.

		△	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Mineral		1·0	321	i 0 21	0	i 0 32	− 4
Shasta Dam		1·6	312	i 0 32	+ 2	i 0 59	+ 8
Berkeley		2·1	213	i 0 36	− 1	i 1 5	+ 1
San Francisco		2·2	215	e 0 48	+10	i 1 9	+ 3
Branner	E.	2·4	206	i 0 41	0	i 1 13	+ 1
Lick		2·4	196	i 0 39	− 2	i 1 10	− 2
Fresno	N.	3·0	164	i 0 48	− 2	i 1 24	− 3
Boulder City		5·9	125	e 1 47	P*	—	—
Pierce Ferry		6·4	121	i 1 0	?	i 3 9	S*
Grand Coulee		8·4	8	i 1 21	?	—	—
Hungry Horse		10·0	27	e 2 30	+ 3	i 4 39	+17

Additional readings :—
Mineral iN = 38s.
Berkeley iZ = 39s., iN = 52s.
Hungry Horse i = 2m.57s.

Aug. 27d. Readings also at 1h. (La Jolla, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Pierce Ferry, Tamanrasset, Andijan, Samarkand, Tashkent (2), near Kulyab, Murgab, and Stalinabad), 3h. (near La Paz), 4h. (Merida, Tacubaya, Mount Wilson, Palomar, Tinemaha, Tucson, Boulder City, and Pierce Ferry), 7h. (Strasbourg, Stuttgart, Zürich, and near Basle), 8h. (Tacubaya, Mount Wilson, Pasadena, Palomar, Tucson, Boulder City, and Pierce Ferry), 9h. (Fresno, Mineral, near Lick, and near Bogota), 11h. (Ksara), 12h. (Stuttgart, Triest, Jena, near Rome, and Bologna), 13h. (near Mineral), 14h. (Apia, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, and Tamanrasset), 16h. (Apia), 18h. (Balboa Heights and near Tacubaya (2)), 19h. (Andijan, near Obi-garm, and Stalinabad).

Aug. 28d. 2h. 27m. 58s. Epicentre 56°·5N. 163°·8E.

A = −·5325, B = +·1547, C = +·8322 ; δ = +5 ; h = −8 ;
D = +·279, E = +·960 ; G = −·799, H = +·232, K = −·555.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Klyuchi		1·7	264	0 7	−24	i 0 35	−19	—	—	—
Miyako		22·1	230	5 5?	+ 6	8 58	0	—	—	—
Mizusawa		22·9	231	e 5 9	+ 3	9 18	+ 5	9 22	S	—
Sendai		23·8	230	5 16	+ 1	9 29	+ 1	—	—	e 13·3
Vladivostok		24·3	250	e 5 14	− 6	i 9 31	− 6	—	—	—
College		24·5	50	e 5 20	− 2	e 9 39	− 1	—	—	e 11·9
Mito		25·5	229	e 5 42	+10	—	—	—	—	—
Utunomiya		25·6	230	e 5 20	−12	—	—	—	—	—
Kakioka		25·8	230	e 5 34	0	—	—	—	—	—
Maebasi		26·1	232	5 39	+ 2	—	—	—	—	—
Tokyo		26·4	229	5 40	0	—	—	—	—	—
Misima		27·2	229	e 5 50	+ 3	—	—	—	—	—
Gihu		27·9	233	6 0	+ 6	—	—	—	—	—
Nagoya		28·0	233	5 52	− 3	—	—	—	—	—
Osaka		29·1	235	e 6 32	+28	—	—	—	—	—
Sitka		32·2	62	e 6 24	− 8	i 11 56	+11	i 7 36	PP	e 13·6
Victoria		43·1	68	e 7 56	− 8	—	—	—	—	18·0
Grand Coulee		45·7	66	e 8 25	+ 1	—	—	—	—	—
Hungry Horse		47·9	62	e 8 42	0	—	—	—	—	—
Shasta Dam		48·8	76	e 8 47	− 2	—	—	i 8 50	pP	—
Saskatoon		48·9	55	e 9 14	+24	e 16 8	+15	—	—	21·3
Mineral	Z.	49·6	75	e 8 51	− 4	—	—	e 8 56	pP	—
Butte	N.	50·2	64	—	—	e 15 44	−27	—	—	e 20·7
Berkeley		50·9	78	e 9 8	+ 3	i 16 14	− 7	e 21 44	Q	e 26·3
Sverdlovsk		51·3	317	9 7	− 1	i 16 30	+ 4	—	—	—

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.	53·1	77	e 24 24	Q	—	—	—	—	—
Scoresby Sund		53·2	3	9 28	+ 6	16 58	+ 6	11 18	PP	26·0
Tinemaha	Z.	53·7	76	e 9 27	+ 1	—	—	i 9 33	pP	—
Almata		53·8	296	e 9 27	+ 1	—	—	—	—	—
Haiwee	Z.	54·5	76	e 9 33	+ 1	—	—	i 9 39	pP	—
Frunse		55·3	297	e 9 38	0	—	—	—	—	—
Mount Wilson	Z.	55·9	78	e 9 42	0	—	—	i 9 48	pP	—
Pasadena		55·9	78	e 9 42	0	e 17 20	− 9	—	—	—
Boulder City		56·3	74	e 9 47	+ 2	—	—	—	—	—
Riverside	Z.	56·5	78	e 9 46	0	—	—	i 9 52	pP	—
Pierce Ferry		56·7	73	e 9 45	− 3	—	—	i 9 48	pP	—
Palomar		57·2	78	e 9 50	− 1	—	—	i 9 53	pP	—
Andijan		58·0	297	e 9 57	0	e 18 0	+ 3	—	—	—
Murgab		59·0	293	10 5	+ 1	18 14	+ 4	—	—	—
Tashkent		59·0	299	i 10 5	+ 1	e 18 11	+ 1	—	—	—
Moscow		59·9	328	10 10	0	18 26	+ 5	—	—	—
Upsala		60·9	341	e 9 57	−20	e 18 34	0	e 10 16	pP	e 33·0
Tucson		61·3	74	e 10 20	0	e 18 43	+ 4	—	—	e 34·0
Stalinabad		61·4	298	i 10 20	0	i 18 44	+ 4	—	—	—
Calcutta	E.	63·5	272	—	—	e 23 19	SS	—	—	—
Copenhagen		65·8	343	e 10 51	+ 2	i 19 38	+ 3	23 56	SS	35·0
Aberdeen		66·1	353	—	—	i 19 47	+ 8	e 36 10	Q	e 39·5
St. Louis		66·5	55	e 10 50	− 4	e 19 43	− 1	i 13 20	PP	e 30·0
Ottawa		66·9	41	10 55	− 1	19 50	+ 1	27 2	SSS	32·0
Seven Falls	E.	67·1	37	—	—	e 19 46	− 5	—	—	27·0
Warsaw		67·4	336	10 59k	0	19 57	+ 2	20 18	PPS	e 35·0
Grozny		67·8	316	e 11 6	+ 4	—	—	—	—	—
Cleveland		68·0	48	i 10 59	− 4	e 19 57	− 5	e 27 30	SSS	—
Baku		68·6	312	—	—	e 20 16	+ 7	—	—	—
Vermont		68·6	40	—	—	e 21 10	+61	—	—	e 34·0
De Bilt		70·3	347	e 11 18	+ 1	i 20 35	+ 6	—	—	e 35·0
Jena		70·5	342	e 11 19	+ 1	—	—	e 11 26	pP	—
Prague		70·8	340	e 11 28	+ 8	e 20 36	+ 1	e 14 8	PP	e 32·0
Yalta		70·9	324	11 22	+ 1	e 20 47?	+11	—	—	—
Fordham		71·5	42	e 11 22	− 2	e 21 16	PS	—	—	39·5
Kew		71·6	350	e 11 33	+ 8	e 21 46	PPS	e 25 22	SS	e 35·0
Uccle		71·7	348	e 11 26	0	e 20 51	+ 6	e 28 56	SSS	e 40·0
Philadelphia		71·8	44	—	—	e 21 12	PS	e 22 9	?	e 29·0
Budapest	E.	72·3	336	e 11 45	+16	e 20 32	−20	—	—	e 40·5
Stuttgart		73·0	343	e 11 32	− 1	e 21 3	+ 3	e 14 16	PP	e 38·0
Strasbourg		73·4	344	e 11 37	+ 1	e 21 6	+ 1	e 14 15	PP	e 37·0
Paris		73·9	348	e 11 39	0	e 21 9	− 1	e 14 17	PP	e 37·0
Basle		74·4	344	e 11 32	−10	—	—	—	—	e 45·0
Zürich		74·4	344	e 11 39	− 3	e 21 20	+ 4	—	—	—
Belgrade		74·5	334	e 11 43	+ 1	e 21 24	+ 7	—	—	e 43·1
Chur		74·8	342	e 11 44	0	—	—	—	—	e 44·5
Bombay		75·0	282	—	—	e 21 23	0	—	—	—
Istanbul	Z.	75·6	327	11 46	− 2	21 2	−27	—	—	—
Clermont-Ferrand		76·8	346	e 11 57	+ 2	e 21 47	+ 5	e 26 47	SS	37·0
Rome		79·0	339	e 12 8	+ 1	e 22 11	+ 5	e 30 45	SSS	—
Ksara		79·8	318	e 12 16	+ 4	23 32	PPS	—	—	—
Tortosa		82·0	347	12 24	+ 1	22 35	− 2	23 18	PS	e 44·0
Toledo		83·4	351	e 12 41	+11	—	—	e 15 45	PP	39·2
Alicante		84·6	348	12 48	+12	23 10	+ 7	12 53	pP	e 40·4
Helwan		85·0	320	12 40	+ 2	23 8	+ 1	15 59	PP	—
Lisbon	Z.	85·0	355	12 42a	+ 4	—	—	12 48	PcP	—
Granada		86·1	351	i 12 45k	+ 1	i 23 11	[+ 3]	16 11	PP	i 41·0
Tamanrasset		98·9	340	e 17 56	PP	—	—	—	—	—
La Paz		124·3	66	e 18 11	[−50]	—	—	—	—	—

Additional readings :—
Sitka i = 10m.38s., eS = 11m.29s.
Mineral iZ = 8m.59s.
Berkeley eN = 12m.38s., iSE = 15m.38s.
Scoresby Sund 12m.47s., 19m.17s., and 20m.36s.

Continued on next page.

Pasadena iZ = 9m.48s. and 9m.55s.
Upsala ePcS? = 14m.19s., eN = 17m.20s., eSSSE = 25m.2s.?
St. Louis ePS? = 20m.50s., eSSS = 27m.7s.
Warsaw PcPZ = 11m.27s., eN = 12m.5s., ePPZ = 14m.9s., ePPPN = 15m.13s., eSN = 20m.0s., ePPSN = 20m.27s., ePPSZ = 20m.30s., ePPSE = 20m.33s., eZ = 22m.33s., eSSSNZ = 27m.30s., eSSSE = 27m.35s.
Cleveland iPZ = 11m.6s., eSE = 19m.54s., eN = 27m.38s.
Prague e = 15m.46s., eSS = 26m.38s., eSSS = 29m.32s.
Uccle e = 19m.2s.?, eN = 20m.57s.
Stuttgart iPcP? = 11m.43s.a, ePPP = 16m.7s., e = 17m.37s. and 25m.2s., eSSS = 29m.38s.
Strasbourg eS = 21m.11s., eSSS = 29m.32s. and 29m.52s.
Paris iPcP? = 11m.49s., ePPS = 21m.59s., eSS = 26m.2s.?
Belgrade e = 17m.35s. and 24m.7s.
Rome ePPP? = 16m.29s., eSS = 28m.20s.
Tortosa PcP? = 12m.34s., PPPE = 17m.22s., ScSE = 22m.44s.
Alicante PP = 16m.0s., PS = 23m.52s., PPP = 24m.8s., SS = 28m.32s., SSS = 31m.44s.
Granada PcP = 12m.56s., iS = 23m.24s., SS = 29m.23s.
Long waves were also recorded at Wellington, Christchurch, Arapuni, Halifax, Santa Clara, Ivigtut, and other European stations.

Aug. 28d. 5h. Undetermined shock. Strasbourg suggests a repetition of 27d. 10h.

Belgrade iP = 34m.25s.k, iPg = 34m.34s., iSg = 35m.1s. and 35m.16s.
Rome eP = 35m.17s., eS = 35m.56s.
Chur e = 35m.22s.
Zürich e = 35m.56s. and 39m.17s.
Basle e = 35m.57s.
Budapest ePN = 36m.5s., iE = 36m.53s., eN = 37m.10s., eE = 37m.27s.
Jena eE = 36m.20s.?, eN = 38m.24s. and 39m.32s.
Florence eN = 36m.20s. and 37m.34s.
Istanbul e = 37m.7s. and 37m.54s.
Warsaw eZ = 38m.1s. and 38m.27s., eN = 38m.35s., eE = 38m.57s., eLEZ = 39m.30s.
Prague eS? = 38m.18s.
Stuttgart e = 38m.20s.?, 39m.5s., and 40m.4s.
Strasbourg eS? = 38m.33s., e = 38m.40s. and 39m.25s.
Tamanrasset eP = 38m.43s.
Long waves were also recorded at Clermont-Ferrand and Potsdam.

Aug. 28d. 9h. 28m. 11s. Epicentre 16°·3S. 172°·8W. (as on 1943, September 11d.).

A = −·9528, B = −·1204, C = −·2789; δ = +11; h = +5;
D = −·125, E = +·992; G = +·277, H = +·035, K = −·960.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		2·7	21	i 0 31	−14	1 51	L	—	—	(1·8)
Auckland	N.	23·2	208	—	—	e 8 49?	−29	—	—	—
Christchurch		29·8	202	6 10	− 1	11 9	+ 2	12 41	Q	14·0
Pasadena	Z.	72·2	46	e 11 31	+ 2	—	—	—	—	—
Mount Wilson	Z.	72·4	46	e 11 29	− 1	—	—	—	—	—
Palomar	Z.	72·7	47	e 11 32	0	—	—	i 11 37	PcP	
Riverside	Z.	72·7	46	e 11 33	+ 1	—	—	—	—	—
Haiwee	Z.	73·5	44	e 11 43	+ 7	—	—	—	—	—
Shasta Dam		73·5	37	i 11 34	− 2	—	—	—	—	—
Mineral	Z.	73·7	38	e 11 36	− 2	—	—	e 11 46	PcP	—
Tinemaha	Z.	73·9	43	e 11 37	− 2	—	—	i 11 44	PcP	—
Boulder City		75·5	45	e 11 52	+ 4	—	—	—	—	—
Pierce Ferry		76·2	45	i 11 51	− 1	—	—	—	—	—
Tucson		76·4	50	e 11 55	+ 2	—	—	i 12 0	PcP	—
Vladivostok		77·9	322	e 12 1	0	e 21 52	− 2	—	—	—
Hungry Horse		82·9	35	e 12 33	+ 5	—	—	—	—	—
La Paz		98·9	110	e 12 26	?	24 36	[+14]	—	—	49·2
Paris		147·4	6	i 19 47	[+ 4]	—	—	—	—	e 80·8
Stuttgart		147·6	358	e 19 45a	[+ 2]	—	—	e 23 55	PP	—
Strasbourg		147·8	359	e 19 44	[0]	—	—	—	—	—
Istanbul		148·9	327	e 20 7	[+21]	—	—	—	—	—
Ksara		148·9	309	e 19 49	[+ 3]	—	—	23 19	PP	—
Clermont-Ferrand		150·4	5	i 19 54	[+ 6]	—	—	—	—	e 78·8
Helwan		154·1	305	e 20 3	[+10]	—	—	e 20 16	?	—

Stuttgart also gives eZ = 20m.9s.
Long waves were also recorded at Arapuni and Wellington.

Aug. 28d. 12h. 24m. 26s. Epicentre 20°·0S. 174°·0W. (as on 1942, February 13d.).

A = −·9352, B = −·0983, C = −·3400; δ = −14; h = +5;
D = −·105, E = +·995; G = +·338, H = +·036, K = −·940.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		6·5	19	e 1 39	0	e 2 42	−13	—	—	e 3·1
Auckland	N.	19·4	208	4 26	− 4	8 2	− 2	—	—	8·6
Tuai	N.	20·3	200	4 36	− 4	7 54	−29	—	—	—
Wellington		23·3	202	5 9	− 1	9 11	− 9	10 52	SS	12·4
Kaimata		25·6	206	5 30	− 2	9 55	− 4	—	—	—
Christchurch		26·0	202	5 33	− 3	10 1	− 5	10 52	Q	12·7
Brisbane		31·0	249	i 6 16	− 5	i 11 15	−11	i 7 6	PP	e 15·3
Riverview		33·8	238	i 8 3	PPP	e 11 51	−19	—	—	e 16·0
Santa Barbara	Z.	74·8	44	e 11 45a	+ 1	—	—	—	—	—
Berkeley		75·3	40	e 11 47	0	e 21 32	+ 6	e 16 42	PPP	e 38·3
La Jolla	Z.	75·5	46	e 11 49	+ 1	—	—	—	—	—
Pasadena	Z.	75·6	45	i 11 48a	0	—	—	i 11 57	PcP	—
Mount Wilson	Z.	75·8	45	i 11 50a	0	—	—	—	—	—
Palomar		76·0	48	i 11 52a	+ 1	—	—	—	—	—
Riverside	Z.	76·1	45	i 11 50a	− 1	—	—	—	—	—
Haiwee	Z.	77·0	43	i 11 57	+ 1	—	—	—	—	—
Shasta Dam		77·1	38	i 11 56	− 1	—	—	—	—	—
Mineral	Z.	77·3	39	e 11 57	− 1	—	—	e 12 6	PcP	—
Tinemaha	Z.	77·3	42	i 11 59a	+ 1	—	—	—	—	—
Boulder City		78·9	46	i 12 7	0	—	—	—	—	—
Pierce Ferry		79·6	46	i 12 10	0	—	—	—	—	—
Tucson		79·7	49	i 12 11a	0	e 22 19	+ 6	—	—	—
Vladivostok		80·1	323	e 12 26	+13	i 22 22	+ 4	—	—	—
Grand Coulee		83·6	34	i 12 31	0	—	—	—	—	—
Hungry Horse		86·5	36	i 12 45	− 1	—	—	—	—	—
St. Louis		97·6	52	e 13 35	− 3	e 25 6	+ 6	e 26 30	PS	e 47·6
La Paz		98·7	111	e 13 45	+ 3	i 25 22	+12	i 16 34	?	47·6
Tashkent		122·8	326	e 18 58	[0]	—	—	e 20 30	PP	—
Sverdlovsk		125·7	327	i 19 3	[− 1]	e 37 58	SS	i 20 54	PP	—
Copenhagen		144·0	353	i 19 36a	[− 1]	—	—	—	—	—
Warsaw		145·8	345	19 41a	[0]	—	—	e 23 10	PP	—
De Bilt		148·0	1	e 19 34	[−10]	—	—	—	—	e 75·6
Collmberg		148·3	352	i 19 51	[+ 6]	—	—	—	—	—
Raciborzu		148·5	345	e 19 49	[+ 4]	—	—	—	—	—
Jena	N.	148·8	352	e 19 48	[+ 3]	—	—	e 19 51	PKP_2	—
Uccle		149·2	2	e 19 51a	[+ 5]	—	—	—	—	e 79·6
Ksara		150·1	303	e 19 48	[0]	—	—	e 23 32	PP	—
Paris		151·1	4	e 19 49	[0]	e 26 34?	[−21]	e 23 34	PP	76·6
Stuttgart		151·2	356	e 19 49a	[0]	e 33 51	PS	e 20 4	PKP_2	e 81·6
Istanbul		151·3	322	19 47	[− 2]	—	—	e 23 32	PP	—
Strasbourg		151·4	356	e 19 49	[0]	—	—	e 23 40	PP	80·6
Basle		152·5	357	e 19 51	[0]	e 26 14	[−43]	e 23 47	PP	—
Zürich		152·6	357	e 19 58	[+ 7]	—	—	e 23 45	PP	—
Triest		153·6	343	e 20 9	[+16]	—	—	e 25 4	?	—
Clermont-Ferrand		154·2	356	e 19 55	[+ 2]	—	—	i 23 54	PP	79·6
Helwan		155·0	298	19 54	[0]	—	—	23 52	PP	—
Rome		157·5	347	e 19 58	[0]	—	—	e 20 30	PKP_2	—
Toledo	Z.	158·4	21	i 20 36	PKP_2	—	—	e 24 14	PP	—
Alicante		160·9	16	20 36	[+34]	—	—	e 21 32	?	—
Granada		160·9	23	i 20 49k	PKP_2	—	—	i 24 40	PP	—
Tamanrasset		177·3	—	i 20 14a	[+ 2]	—	—	e 25 48	PP	—

Additional readings :—
Tuai eN = 7m.59s.
Wellington i = 5m.3s.
Kaimata i = 6m.6s.
Brisbane iZ = 6m.54s., eE = 7m.45s., iSSN = 12m.33s.
St. Louis eSS = 31m.32s.
Warsaw eE = 19m.46s., PPZ = 23m.0s.
Raciborzu eEN = 20m.3s., eNZ = 20m.23s.?, eEN = 20m.54s., eEZ = 21m.1s.
Paris e = 21m.44s.
Stuttgart eZ = 19m.56s. a.

Continued on next page.

Strasbourg e = 19m.56s. and 33m.22s.
Clermont-Ferrand iPKP = 20m.17s.
Helwan PKP_2 = 20m.19s.
Toledo iZ = 20m.44s. and 20m.51s., eZ = 23m.10s.
Granada PKP_2 = 21m.5s.
Tamanrasset iPKP = 22m.0s.k, i = 22m.22s.k, ePPP = 28m.58s.
Long waves were also recorded at Kew.

Aug. 28d. Readings also at 0h. (Balboa Heights and near Bogota), 1h. (Stuttgart, near Belgrade, near Victoria, and near Ferndale), 3h. (near Auckland, Wellington, Tuai, and New Plymouth), 5h. (near Klyuchi, near Mineral, near Piatigorsk, and near Tacubaya), 6h. (Apia and Ksara), 8h. (near Mineral), 11h. (near Mineral), 12h. (Balboa Heights and Fresno), 13h. (Stuttgart, Mount Wilson, Pasadena, Palomar, Riverside, and Tinemaha), 14h. (near Zürich), 18h. (Stuttgart), 20h. (Scoresby Sund), 21h. (near Mineral), 22h. (near Andijan and Stalinabad).

Aug. 29d. 17h. 37m. 45s. Epicentre 15°·3S. 172°·5W. (as on 1948, June 29d.).

Intensity IV at Apia. Epicentre 15°·25S. 172°·4W.

Apia Seismic Bulletin 1948.

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

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		1·6	19	i 0 30k	0	e 0 52?	+ 1	—	—	—
Auckland	N.	24·3	206	5 20	0	9 46	+ 9	—	—	11·2
Arapuni	E.	25·0	203	—	—	10 15	+26	—	—	12·2
Tuai	N.	25·1	200	5 27	− 1	9 55	+ 4	—	—	—
New Plymouth	E.	26·5	203	5 44	+ 3	10 30	+16	—	—	12·2
Wellington		28·2	202	5 56	0	10 39	− 2	9 12	P_cP	12·8
Kaimata		30·5	204	6 25	+ 8	11 27	+ 9	—	—	—
Christchurch		30·9	202	6 27	+ 7	11 21	− 3	12 29	Q	14·7
Brisbane		34·2	244	i 6 43	− 6	i 12 19	+ 3	i 7 50	PP	i 16·8
Riverview		37·6	234	i 7 23k	+ 5	e 13 6	− 2	i 7 33	pP	e 18·0
Santa Barbara	Z.	70·4	45	e 11 18	0	—	—	—	—	—
Santa Clara		70·7	41	e 11 20	0	e 21 12	+38	e 29 43	Q	e 32·4
Berkeley		70·8	41	i 11 20k	0	i 20 46	+11	i 21 11	PS	e 32·2
Ferndale		71·3	37	—	—	—	—	e 29 15?	Q	e 31·2
La Jolla	Z.	71·3	47	e 11 22	− 1	—	—	—	—	—
Pasadena		71·3	46	i 11 22k	− 1	e 20 48	+ 7	—	—	e 29·2
Mount Wilson	Z.	71·4	46	i 11 22k	− 2	—	—	—	—	—
Arcata	Z.	71·7	38	e 11 25	− 1	—	—	—	—	—
Fresno	N.	71·7	42	i 11 36	+10	—	—	—	—	e 36·6
Palomar		71·8	47	i 11 25k	− 1	—	—	—	—	—
Riverside	Z.	71·8	46	i 11 25k	− 1	—	—	—	—	—
Shasta Dam		72·5	38	i 11 29	− 1	—	—	—	—	—
Haiwee	Z.	72·6	44	i 11 31	0	—	—	—	—	—
Mineral	Z.	72·8	39	e 11 30	− 2	—	—	—	—	—
Tinemaha		72·9	43	i 11 32k	− 1	—	—	—	—	—
Boulder City		74·6	46	e 11 44	+ 1	—	—	—	—	—
Pierce Ferry		75·3	46	i 11 45	− 2	—	—	—	—	—
Tucson		75·6	50	i 11 47k	− 1	(e 21 15)	−14	e 12 45	PP	e 21·2
Vladivostok		77·3	321	i 12 1	+ 3	i 22 0	+12	—	—	—
Grand Coulee		78·9	34	e 12 6	− 1	—	—	—	—	—
Salt Lake City		79·1	42	e 12 8	0	e 22 13	+ 6	e 26 28	SS	e 32·9
Tacubaya		79·9	67	i 12 9	− 3	—	—	—	—	i 41·2
Butte	N.	81·4	38	e 12 33	+13	e 22 33	+ 2	e 27 21	SS	e 35·0
Hungry Horse		81·9	36	e 12 20	− 3	—	—	—	—	—
St. Louis		93·5	51	i 13 17	− 2	i 24 35	+10	e 23 53	SKS	—
Huancayo		93·6	103	e 13 20	+ 1	e 33 52	SSS	—	—	e 38·4
Irkutsk		97·8	322	e 13 43	+ 5	e 24 32	{− 7}	e 18 3	PP	—
La Paz		99·0	110	i 13 46	+ 2	i 25 25	+13	i 17 50	PP	i 47·6
Cleveland		100·7	50	e 13 44	− 8	e 24 37	[+ 7]	e 25 23	S	e 46·0
Calcutta	E.	104·0	290	—	—	e 24 1	[−45]	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Philadelphia		105·2	52	—	—	e 26 1	− 3	e 32 25	SS	e 46·4
Ottawa		105·4	46	25 15?	?	e 27 39	PS	e 33 39	SS	40·2
Fordham		106·3	51	e 18 38	PP	e 27 59	PS	e 34 1	SS	—
Harvard		108·2	49	e 19 7	PP	—	—	e 34 11	SS	e 50·2
Seven Falls	E.	109·0	45	—	—	e 25 15	[+ 7]	e 34 39	SS	50·2
Bombay	E.	117·8	283	—	—	e 25 54	[+12]	—	—	—
Andijan		118·8	308	e 18 59	[+ 8]	—	—	—	—	—
Ivigtut		119·5	27	—	—	37 27	SS	—	—	64·2
Tashkent		121·1	309	e 18 57	[+ 2]	e 26 3	[+ 9]	e 20 30	PP	—
Stalinabad		121·8	307	i 18 59?	[+ 3]	—	—	—	—	—
Scoresby Sund		122·0	12	20 51	PP	26 9	[+12]	—	—	—
Sverdlovsk		122·5	329	e 18 59	[+ 1]	37 33	SS	e 20 35	PP	—
Moscow		133·5	337	19 19	[0]	28 38	{− 3}	21 47	PP	—
Upsala		134·9	353	i 22 1	PP	—	—	i 22 53	PKS	—
Grozny		137·1	319	i 19 32	[+ 7]	—	—	i 23 4	PKS	—
Copenhagen		139·5	356	e 19 34	[+ 4]	29 39	{+21}	22 30	PP	—
Sotchi		140·7	323	e 19 29	[− 3]	—	—	e 22 59	PKS	—
Warsaw		141·6	347	e 19 30a	[− 3]	e 26 39	[− 3]	e 21 46	PP	e 76·2
Simferopol		142·9	329	e 19 38	[+ 2]	—	—	—	—	—
Yalta		143·2	328	i 19 33	[− 3]	—	—	—	—	—
De Bilt		143·4	1	i 19 34	[− 2]	e 41 45	SS	e 22 51	PP	e 81·2
Kew		143·4	7	i 19 35	[− 1]	i 29 29	{−12}	e 22 57	PP	e 58·2
Collmberg		143·8	355	e 19 39	[+ 2]	—	—	e 22 55	PP	—
Raciborzu		144·2	348	e 19 40	[+ 2]	—	—	e 23 5?	PP	—
Jena	N.	144·3	354	e 19 38	[0]	—	—	e 22 33	PP	—
Uccle		144·5	4	e 19 39k	[+ 1]	e 4 28	SS	e 23 44	PKS	e 73·0
Prague		144·9	352	e 19 40	[+ 1]	—	—	e 32 15?	?	e 75·2
Paris		146·3	6	i 19 44	[+ 3]	e 34 5	PS	i 23 13	PKS	e 71·2
Budapest		146·5	346	19 48	[+ 6]	—	—	—	—	—
Stuttgart		146·6	357	e 19 43k	[+ 1]	e 26 45	[− 4]	e 20 29k	pPKP	79·2
Strasbourg		146·8	358	e 19 44	[+ 2]	e 25 56	PPP	—	—	81·2
Kalossa	N.	147·4	346	19 52	[+ 9]	—	—	—	—	—
Basle		147·8	0	e 19 49	[+ 5]	—	—	e 23 20	PP	—
Zürich		148·0	359	e 19 46	[+ 2]	—	—	—	—	—
Istanbul		148·2	328	e 19 46	[+ 1]	—	—	i 23 25	PP	—
Ksara		148·4	311	i 19 50	[+ 5]	—	—	23 25	PP	—
Neuchatel		148·4	1	e 19 47	[+ 2]	—	—	—	—	—
Chur		148·5	357	e 19 49	[+ 4]	—	—	—	—	—
Belgrade		148·6	341	e 19 46k	[+ 1]	e 29 9	{−62}	e 36 30	PPS	e 88·3
Triest		149·3	351	e 19 54	[+ 8]	—	—	e 42 16	SS	—
Clermont-Ferrand		149·4	6	e 19 48	[+ 2]	—	—	—	—	72·2
Salo	z.	149·7	355	e 19 51	[+ 4]	—	—	—	—	—
Pavia	z.	150·2	358	i 19 53	[+ 5]	—	—	—	—	—
Bologna	z.	150·7	355	e 19 53	[+ 5]	—	—	e 24 47	PP	—
Florence	z.	151·4	355	e 19 50	[0]	—	—	—	—	—
Lisbon		152·4	28	19 53k	[+ 2]	—	—	23 47	PP	73·6
Rome		153·1	351	e 19 52	[0]	e 34 13	PSKS	e 24 2	PP	—
Toledo	z.	153·5	20	e 19 55	[+ 2]	e 27 24	[+26]	e 23 48	PP	—
Helwan		153·7	308	19 54	[+ 1]	37 27	PPS	23 55	PP	—
Tortosa		153·8	11	19 40	[−13]	26 45	[−13]	23 33	PP	e 80·2
Alicante		156·0	15	20 1	[+ 5]	27 1	[0]	23 55	PP	e 72·4
Granada		156·1	22	i 20 0k	[+ 4]	i 26 19	[−42]	i 24 8	PP	79·6
Tamanrasset		172·3	14	i 20 11a	[0]	—	—	e 25 29	PP	—

Additional readings :—
Kaimata i = 7m.13s.
Brisbane iZ = 7m.33s., iE = 7m.57s., eSE = 12m.24s., iQE = 14m.38s.
Riverview iPEZ = 7m.26s., iPPZ = 8m.55s., iP_ePE = 9m.52s., iZ = 9m.58s., iN = 13m.21s., iE = 13m.25s., iN = 14m.8s., eQN = 16·2m.
Berkeley iE = 21m.17s., Q = 29m.21s.
Pasadena iZ = 11m.47s. and 12m.9s., iE = 21m.12s.
Palomar iZ = 11m.42s. and 12m.24s.
Tinemaha iZ = 11m.39s.
Tucson e = 15m.38s., eS? = 17m.39s.
Tacubaya iN = 12m.14s., eN = 12m.47s.
St. Louis iPS = 25m.40s., iSS = 30m.25s.

Continued on next page,

Huancayo e =14m.7s., ePP =20m.47s.
Irkutsk ePS =26m.37s.?
La Paz iPSN =27m.6s., iSSN =32m.6s., iN =41m.33s.
Ottawa eN =32m.45s.
Fordham e =19m.45s. and 25m.7s.
Tashkent PKS =22m.37s., eSKKS =27m.16s.
Sverdlovsk ePPP =23m.11s.
Moscow PKS =22m.48s.
Copenhagen 23m.15s.
Warsaw ePPE =21m.57s., ePPN =22m.9s., eSKPN =23m.17s., ePPPE =24m.55s., ePPPN =25m.13s., eSKSZ =26m.53s., eSKKSZ =29m.12s., ePKKSN =31m.46s., ePPSZ =34m.13s., and numerous other readings without phase.
Kew eZ =24m.45s., iN =27m.35s. and 39m.40s.
Collmberg eEZ =21m.50s.
Raciborzu eEN =21m.53s.
Uccle ePKP$_2$EN =19m.53s.
Paris iPKP$_2$ =20m.33s., i =25m.44s., ePPS? =37m.35s., eSS? =44m.15s.?, e =51m.15s.?
Budapest iN =20m.50s.
Stuttgart ePKP =19m.46s.k, eZ =20m.40s., e =21m.31s., eS? =32m.3s., ePSKS =33m.34s., eZ =35m.39s., eQ =77·2m.
Strasbourg iPKP =19m.47s.k, iPKP$_2$ =20m.6s., i =20m.42s.
Kalossa eE =19m.59s. and 20m.24s., eN =20m.43s., eE =21m.13s.
Belgrade i =19m.53s. and 21m.18s.
Triest iPKP$_2$ =20m.4s.
Clermont-Ferrand iPKP =19m.51s., iPKP$_2$ =20m.22s.
Salo eN =20m.38s.
Bologna e =21m.13s.
Lisbon PKP$_2$ =20m.13s.a, pPKP$_2$Z =20m.52s., E =22m.55s.
Toledo ePKP?Z =17m.7s.
Helwan PKP$_2$ =20m.19s.
Tortosa PKP$_2$N =19m.58s., sPKP?EN =20m.5s., SKKS?N =30m.45s.
Alicante PKP =20m.29s., SS =43m.5s., Q =59m.37s.
Granada pPKP =20m.26s., sPKP =20m.58s., PPP =27m.32s., SKKS =30m.53s., SKSP =34m.8s., SS =43m.9s.
Tamanrasset e =20m.22s., iPKP$_2$ =21m.39s.a, e =21m.50s., i =25m.37s.a, ePPP =29m.27s.
Long waves were also recorded at Aberdeen.

Aug. 29d. 18h. 36m. 25s. Epicentre 16°·5N. 106°·0W.

A = −·2644, B = −·9221, C = +·2823 ; δ = −13 ; h = +5 ;
D = −·961, E = +·276 ; G = −·078, H = −·271, K = −·959.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Manzanillo		3·0	32	e 0 47	− 3	e 1 15	−12	—	—	—
Guadalajara		4·9	31	1 7	−10	e 1 52	−23	—	—	—
Tacubaya		7·1	65	i 1 52	+ 4	i 3 19	+ 9	—	—	—
Vera Cruz		9·8	73	2 24	0	e 3 22	−55	—	—	—
Tucson		16·3	345	i 3 48	− 4	e 6 51	− 2	—	—	e 7·0
La Jolla	z.	19·2	331	i 4 27	− 1	—	—	—	—	—
Palomar		19·4	333	i 4 30k	0	—	—	—	—	—
Riverside	z.	20·2	332	i 4 40k	+ 1	—	—	—	—	—
Mount Wilson	z.	20·7	332	i 4 45k	+ 1	—	—	—	—	—
Pasadena		20·7	332	i 4 47k	+ 3	—	—	—	—	—
Pierce Ferry		20·8	342	i 4 45	0	—	—	—	—	—
Boulder City		20·9	340	e 4 45	− 1	—	—	—	—	—
Santa Barbara	z.	21·7	329	e 4 56	+ 1	—	—	—	—	—
Haiwee	z.	22·3	335	i 5 1	0	—	—	—	—	—
Tinemaha	z.	23·2	335	i 5 10k	+ 1	—	—	—	—	—
Fresno	N.	23·6	333	e 5 33	+20	—	—	—	—	—
Berkeley	z.	25·7	330	e 5 33	0	—	—	—	—	—
St. Louis		26·0	29	i 5 35	− 1	e 9 35	−31	—	—	—
Shasta Dam		28·0	334	i 5 54	− 1	—	—	—	—	—
Hungry Horse		32·4	351	i 6 34	0	—	—	—	—	—
Cleveland		32·6	35	e 6 33	− 2	e 13 27	SS	—	—	—
Fordham		36·8	43	e 7 13	+ 2	—	—	—	—	—
Ottawa		38·4	35	e 7 27	+ 2	—	—	e 8 47	PP	19·6

Additional readings :—
Tacubaya eN =1m.57s. and 2m.27s., eE =3m.12s.
Palomar iZ =4m.37s.

Aug. 29d. 23h. 29m. 31s. Epicentre 29°·0N. 131°·5E.

Intensity II-III at Naze and Kagosima. Macroseismic radius greater than 300km. Epicentre 30°·2N. 132°·2E. Very Shallow.

The Seismological Bulletin of the Central Meteorogical Observatory, Japan, for the year 1948, Tokyo, 1950, p. 38, with macroseismic chart.

$A = -\cdot5805$, $B = +\cdot6561$, $C = +\cdot4823$; $\delta = +6$; $h = +2$;
$D = +\cdot749$, $E = +\cdot663$; $G = -\cdot320$, $H = +\cdot361$, $K = -\cdot876$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Kagosima		2·7	343	0 38	− 7	1 9	−10	—	—	—
Miyazaki		2·9	359	0 51	+ 3	1 18	− 6	—	—	—
Kumamoto		3·9	350	1 3	+ 1	1 40	−10	—	—	—
Nagasaki		4·0	339	1 3	− 1	1 34	−18	—	—	—
Hukuoka		4·7	348	1 13	− 1	1 58	−12	—	—	—
Hirosima		5·4	8	1 16	− 8	2 11	−17	—	—	—
Hamada		5·9	4	1 29	− 2	2 59	S*	—	—	—
Sumoto		6·1	28	1 26a	− 8	—	—	—	—	—
Kobe		6·5	28	1 33a	− 6	—	—	—	—	—
Osaka		6·6	30	1 37	− 4	3 47	S_g	—	—	—
Kameyama		7·2	34	1 45	− 4	3 21	+ 8	—	—	—
Hikone		7·4	31	1 54	+ 2	—	—	—	—	—
Nagoya		7·7	36	1 53	− 3	—	—	—	—	—
Gihu		7·8	34	2 4	+ 6	—	—	—	—	—
Shizuoka		8·3	43	2 2	− 2	—	—	—	—	—
Misima		8·8	44	2 6	− 5	—	—	—	—	—
Osima		8·8	47	2 8	− 3	3 42	−11	—	—	—
Toyama		9·0	31	2 11	− 2	4 45	S_g	—	—	—
Mera		9·2	48	2 22	+ 6	—	—	—	—	—
Nagano		9·5	35	2 17	− 3	—	—	—	—	—
Wazima		9·5	27	2 17	− 3	—	—	—	—	—
Maebasi		9·7	39	2 23a	+ 1	5 6	S_g	—	—	—
Kakioka		10·3	43	2 29	− 3	—	—	—	—	—
Utunomiya		10·3	41	2 28	− 4	—	—	—	—	—
Hukusima		11·5	38	2 58	+10	—	—	—	—	—
Sendai		12·1	38	2 55	− 2	6 53	L	—	—	(6·9)
Akita		12·8	31	3 11	+ 5	—	—	—	—	—
Mizusawa	E.	12·9	36	3 8	+ 1	e 7 3	L	—	—	(e 7·0)
Miyako		13·8	37	2 29	+10	5 17	−37	—	—	—
Mori		15·0	27	3 36	+ 1	—	—	—	—	—
Irkutsk		30·8	327	e 6 19	− 1	e 11 16	− 7	—	—	—
Calcutta	E.	39·2	271	e 7 51	+20	e 16 25	SS	—	—	—
Almata		45·5	304	e 8 27	+ 4	—	—	—	—	—
Frunse		47·3	303	e 8 39	+ 2	—	—	—	—	—
Murgab		48·1	297	8 47	+ 4	15 49	+ 7	—	—	—
Andijan		49·1	300	8 54	+ 3	—	—	—	—	—
Hyderabad	N.	49·7	269	e 8 56	0	16 5	+ 1	—	—	—
Tashkent		51·3	302	e 9 8	0	e 16 27	+ 1	—	—	—
Stalinabad		52·1	299	i 9 15	+ 1	i 16 40	+ 2	—	—	—
Bombay	E.	54·1	273	e 9 38	+ 9	e 17 10	+ 5	—	—	—
Sverdlovsk		55·9	322	i 9 44	+ 2	i 17 25	− 4	—	—	—
Riverview	N.	65·2	162	—	—	e 19 42	+14	20 29	PPS	e 31·0
Grozny		67·8	308	e 11 16	+14	—	—	—	—	—
Moscow		68·6	323	11 7	0	20 3	− 6	—	—	—
Leninakan		70·1	306	e 11 46	P_cP	—	—	—	—	—
Sotchi		71·9	310	e 11 19	− 8	—	—	—	—	—
Yalta		75·1	313	11 46	0	e 21 18?	− 6	—	—	—
Upsala		76·3	332	—	—	e 21 29?	− 8	e 33 59	Q	e 38·5
Ksara		78·7	302	e 12 10	+ 4	e 22 48?	PS	—	—	—
Warsaw		78·9	324	12 10a	+ 3	e 22 7	+ 2	e 22 30	S_cS	e 41·5

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Scoresby Sund		79·0	352	12 8	+ 1	22 4	− 2	22 46	PS	—
Istanbul		80·0	311	e 12 13	0	e 22 15	− 2	—	—	—
Copenhagen		81·0	330	e 12 19	+ 1	22 23	− 4	27 35	SS	40·5
Shasta Dam		82·6	48	i 12 25	− 1	—	—	i 12 39	P_cP	—
Hungry Horse		83·3	37	i 12 29	− 1	—	—	i 12 41	P_cP	—
Mineral	z.	83·3	47	e 13 28	+58	—	—	e 12 41	?	—
Belgrade		83·4	318	—	—	e 22 57	+ 6	e 23 38	PS	e 46·1
Collmberg		83·5	326	e 12 34	+ 3	—	—	e 12 48	P_cP	—
Prague		83·6	324	e 12 40	P_cP	e 22 53	0	—	—	e 31·5
Helwan		84·0	300	12 35	+ 2	22 58	+ 1	23 56	PS	—
Berkeley	z.	84·2	50	i 12 24	−10	—	—	i 12 47	P_cP	—
Jena		84·4	326	e 12 36	0	e 22 58	− 3	—	—	—
Lick	z.	84·9	50	e 12 38	0	—	—	e 12 51	P_cP	—
De Bilt		86·6	330	i 12 48	+ 2	e 23 22	− 1	e 16 13	PP	e 41·5
Stuttgart		87·0	326	e 12 48	0	e 23 29	+ 2	e 29 14	SS	e 47·5
Tinemaha	z.	87·3	49	i 12 50k	0	—	—	i 13 3	PcP	—
Strasbourg		87·8	326	e 12 54	+ 2	e 23 33	− 1	e 16 23	PP	46·5
Uccle		87·9	330	—	—	e 23 35?	0	e 24 31	PS	e 42·5
Zürich		88·3	325	e 12 53a	− 2	e 23 33	− 6	—	—	—
Basle		88·7	325	e 12 57	0	e 25 36	PPS	—	—	—
Pasadena	z.	89·0	51	e 12 58	0	—	—	—	—	—
Mount Wilson	z.	89·1	51	e 12 58	0	—	—	—	—	—
Kew		89·4	332	—	—	e 23 41	− 8	e 24 47	PS	e 42·5
Riverside		89·7	51	e 13 0	− 1	—	—	—	—	—
Rome		89·8	319	e 13 5	+ 3	e 23 55	+ 2	e 16 29	PP	e 43·5
Paris		90·1	329	i 13 4	+ 1	e 24 39	PS	e 16 40	PP	e 49·5
Boulder City		90·2	48	e 13 10	+ 6	—	—	—	—	—
Palomar	z.	90·4	51	e 13 5	+ 1	—	—	—	—	—
Pierce Ferry		90·6	47	i 13 7	+ 2	—	—	—	—	—
Clermont-Ferrand		92·1	327	e 13 14	+ 2	e 24 15	+ 2	e 16 59	PP	46·5
Tamanrasset		106·8	308	18 31	PP	—	—	—	—	—
La Paz		158·1	59	i 20 4	[+ 5]	i 31 14	{+12}	i 24 20	PP	—

Additional readings :—
Mizusawa PN = 3m.13s., SN = 7m.15s.
Warsaw ePE = 12m.18s., ePS?Z = 22m.38s., ePS?N = 22m.43s., eSSN = 27m.14s., eSSSE = 30m.9s.
Scoresby Sund 27m.11s.
Copenhagen 22m.58s.
Collmberg eEZ = 13m.8s.
Prague ePP? = 16m.47s., ePPP?Z = 19m.1s.
Helwan i = 12m.56s.
De Bilt ePS = 24m.15s.
Strasbourg eS = 23m.36s., ePS = 24m.27s. and 24m.32s., eSS = 29m.29s.
Uccle e = 34m.5s.
Rome eSKS = 23m.29s., eSSS? = 34m.9s.
Clermont-Ferrand eSP = 25m.22s., eSS = 30m.35s.
Tamanrasset i = 18m.50s.a
Long waves were also recorded at other European stations.

Aug. 29d. Readings also at 0h. (Boulder City), 6h. (near Andijan, Murgab, Obi-garm, and Stalinabad), 10h. (Istanbul, Triest, Rome, Stuttgart, and Hungry Horse), 11h. (Mount Wilson, Pasadena, Palomar, Riverside, Tucson, Andijan, near Stalinabad, Murgab, and near Dack), 12h. (Palomar, Tinemaha, Tucson, Andijan, near Murgab, Obi-garm, and Stalinabad), 14h. (Mount Wilson, Pasadena, Riverside, Tinemaha, Tucson, and near Klyuchi), 15h. (Apia and Copenhagen), 16h. (Mount Wilson, Riverside, Bombay, Calcutta, Copenhagen, and near Tacubaya), 18h. (Boulder City, Pierce Ferry, Shasta Dam, and Hungry Horse), 21h. (La Paz and near Mizusawa), 22h. (Tacubaya), 23h. (near Branner and Lick).

Aug. 30d. 1h. 38m. 6s. Epicentre 67°·8N. 18°·5W.

A = +·3604, B = −·1206, C = +·9250 ; δ = +6 ; h = −11 ;
D = −·317, E = −·948 ; G = +·877, H = −·294, K = −·380.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Scoresby Sund		3·0	337	1 34	S*	2 39	?	—	—	—
Reykjavik		3·9	202	e 1 3	+ 1	i 1 40	−10	i 1 6	P*	1·9
Aberdeen	E.	13·0	137	—	—	i 5 25	−10	—	—	i 6·6
Durham		15·3	140	—	—	e 6 36	+ 6	—	—	—
Kew		18·6	143	—	—	e 7 31	−15	—	—	e 8·9
Copenhagen		18·7	117	e 4 23	+ 1	7 56	+ 8	—	—	8·9
Uccle		20·4	138	—	—	e 7 54?	−31	—	—	e 8·9
Paris		21·8	142	e 4 53	− 3	e 8 42	−10	—	—	e 11·4
Strasbourg		23·4	133	e 5 9	− 2	e 9 17	− 4	e 9 13	S	e 10·4
Stuttgart		23·6	131	e 5 14	+ 1	e 9 18	− 7	—	—	e 11·9
Prague		24·1	122	—	—	e 9 42	+ 8	—	—	—
Basle		24·3	135	e 5 24	+ 4	—	—	—	—	—
Warsaw		24·5	111	—	—	e 9 45	+ 5	—	—	e 13·9
Zürich		24·7	134	e 5 23	− 1	—	—	—	—	—
Clermont-Ferrand		24·8	143	e 5 23	− 2	e 9 41	− 5	—	—	11·4
Tamanrasset		47·4	149	e 8 37	− 1	—	—	—	—	—
Hungry Horse		48·3	297	i 9 12	+27	—	—	—	—	—

Warsaw gives also eN = 9m.52s.
Long waves were also recorded at Ivigtut, Alicante, Toledo, Tortosa, De Bilt, and Rome.

Aug. 30d. 19h. Western Pacific.

It is not possible to make a determination from these observations although the P readings are numerous from Japan, the U.S.S.R., and California.
The Japanese Central Meteorological Observatory Bulletin gives epicentre 24°N, 150°·E in Marianne Islands, and the Seismological Bulletin of U.S.S.R. gives 27°·0N. 143°·5E. with a depth of focus 100km.

Japanese readings :—

Osima P = 27m.38s., S = 30m.22s.
Misima P = 27m.45s., S = 30m.37s.
Tokyo P = 27m.46s., S = 30m.34s.
Yokohama P = 27m.47s., S = 30m.33s.
Nagoya P = 27m.48s.
Gihu P = 27m.52s.
Kakioka P = 27m.52s., S = 30m.43s.
Hikone P = 27m.53s.
Maebasi P = 27m.54s., S = 30m.52s.
Hukusima P = 28m.2s.
Toyama P = 28m.2s.
Kumagaya P = 29m.18s., S = 32m.8s.
Hunatu P = 29m.47s.
Kameyama P = 30m.40s.
Sendai P = 31m.35s.

Russian readings :—

Vladivostok iP = 29m.7s.
Frunse eP = 33m.49s., eS = 41m.34s.
Andijan eP = 33m.58s., S = 41m.56s.
Tashkent iP = 34m.11s., iS = 42m.22s., isS = 43m.7s.
Stalinabad iP = 34m.16s., eS = 42m.28s.
Sverdlovsk iP = 34m.36s., iS = 43m.4s.?
Moscow eP = 35m.41s., S = 45m.14s.
Grozny eP = 35m.43s.
Leninakan eP = 36m.3s.
Irkutsk eS = 37m.51s.

Californian readings :—

Graud Coulee iP = 35m.20s.
Shasta Dam iP = 35m.21s., i = 35m.29s. and 35m.35s.
Mineral iPZ = 35m.24s., eZ = 37m.39s.
Berkeley iPZ = 35m.26s.k
Lick iPZ = 35m.30s., eZ = 35m.42s.
Hungry Horse iP = 35m.39s.
Santa Barbara iPZ = 35m.42s.k
Tinemaha iPNZ = 35m.43s.k
Haiwee iPZ = 35m.46s.k
Mount Wilson iPZ = 35m.48s.k
Pasadena iP = 35m.48s.k
Riverside ePN = 35m.49s.
Palomar ePE = 35m.53s.
La Jolla iP = 35m.55s.k
Boulder City iP = 35m.58s.
Pierce Ferry iP = 36m.0s., e = 38m.9s.
Tucson iP = 36m.18s.k

European stations.

Strasbourg e = 35m.8s.
Stuttgart eZ = 37m.4s. and 41m.24s.

Aug. 30d. 21h. 41m. 54s. Epicentre 41°·5N. 47°·0E. (as on June 29d.).

Epicentre as given by Strasbourg; rough.

A = +·5123, B = +·5494, C = +·6601; δ = +2; h = −2;
D = +·731, E = −·682; G = +·450, H = +·483, K = −·751.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Grozny	2·0	333	i 0 43	P_g	1 2	0	i 1 11	S_g	—
Erevan	2·3	235	e 0 56?	+16	1 41	?	—	—	—
Leninakan	2·5	253	e 1 3?	+20	1 48	?	—	—	—
Piatigorsk	3·8	313	i 1 9	P*	i 1 54	S*	—	—	—
Sotchi	5·8	293	—	—	3 18	?	—	—	—
Yalta	9·9	292	e 2 32	+ 7	—	—	—	—	—
Ksara	11·7	232	3 17	PPP	e 6 56	?	—	—	—
Moscow	15·5	340	3 38	− 4	6 17	−18	—	—	—
Tashkent	16·7	83	e 3 50?	− 7	e 6 52?	−11	—	—	—
Tchimkent	16·8	80	e 3 52?	− 6	—	—	—	—	—
Stalinabad	16·9	93	e 3 35?	−24	—	—	—	—	—
Helwan	17·2	233	e 4 18	+15	e 7 27	+13	—	—	e 10·4
Sverdlovsk	17·7	26	i 4 0	−10	6 58	−28	—	—	—
Andijan	19·1	85	e 4 22	− 5	—	—	—	—	—
Frunse	20·5	78	i 4 39	− 3	—	—	—	—	—
Warsaw	20·6	311	e 4 46	+ 3	e 8 42	+13	—	—	e 10·5
Raciborzu	21·7	304	e 4 58?	+ 3	—	—	e 6 48	?	—
Triest	24·3	292	e 5 36	+16	e 10 36	SS	—	—	—
Rome	25·7	284	e 5 35	+ 2	e 10 26	+25	—	—	—
Jena	26·0	303	e 5 33	− 3	—	—	e 5 39	?	—
Copenhagen	26·6	315	5 47	+ 5	—	—	—	—	16·1
Stuttgart	27·4	299	e 5 52	+ 3	—	—	—	—	e 16·1
Tamanrasset	39·3	255	(i 7 40)	+ 8	—	—	—	—	—
Ottawa	79·5	323	e 12 11	+ 1	—	—	—	—	—
Hungry Horse	89·0	347	i 12 58	0	—	—	i 13 7	P_cP	—
Shasta Dam	97·6	352	i 13 37	− 1	—	—	—	—	—

Additional readings:—
Grozny i = 0m.46s. and 0m.53s.
Warsaw eE = 8m.4s., eZ = 8m.59s. and 9m.45s., eE = 10m.13s., eZ = 10m.21s.
Tamanrasset reading increased by 10m.
Long waves were also recorded at Strasbourg, Paris, and Uccle.

Aug. 30d. Readings also at 0h. (Apia), 1h. (Edinburgh, Paris, Basle, Zürich, Tacubaya, Boulder City, Grand Coulee, Hungry Horse, Pierce Ferry, Shasta Dam, Tucson, Pasadena, Mount Wilson, Riverside, Palomar, Tinemaha, near Mineral (2)), 6h. (Tacubaya), 7h. (Paris, Strasbourg, Clermont-Ferrand, Copenhagen, Uccle, Mizusawa, Mineral, Boulder City, Hungry Horse, Pierce Ferry, Shasta Dam, Tucson, Pasadena, Mount Wilson, Riverside, Palomar, La Jolla, Haiwee, and Tinemaha), 14h. (near La Paz), 16h. (Lick and near Balboa Heights), 17h. (Bogota, La Paz, and Pierce Ferry), 18h. (near Mineral), 19h. (near Fresno), 20h. (near Berkeley, Lick, and Branner), 21h. (near Ashkabad, near Mizusawa, near Berkeley, Lick, and Branner), 23h. (Pierce Ferry, Shasta Dam, near Lick, near Stalinabad, Andijan, and Obi-garm).

Aug. 31d. Readings at 0h. (near Klyuchi), 1h. (near La Paz), 3h. (Istanbul, Helwan, Ksara, Tamanrasset, near Andijan, Tchimkent, Tashkent, Frunse, Stalinabad, and Almata), 8h. (Pierce Ferry and near Mineral), 9h. (La Paz, Hungry Horse, Shasta Dam, Tamanrasset, Stuttgart, and Ksara), 10h. (Huancayo, Paris, Strasbourg, Clermont-Ferrand, Copenhagen, Uccle, De Bilt, and near Stalinabad), 15h. (near Lick), 16h. (near Ashkabad, near Santa Clara, Berkeley, Branner, and Lick (2)), 17h. (near Lick), 18h. (near Branner, Tashkent, Tchimkent, Andijan, Frunse, and near Stalinabad), 20h. (near Ottawa), 21h. (near Berkeley, Branner, Lick, and San Francisco), 22h. (near Berkeley and San Francisco), 23h. (Christchurch, Wellington, Tuai, Kaimata, and New Plymouth).

Sept. 1d. 19h.

Strasbourg suggests a foreshock of the shock at 19h. 53m. but the readings do not appear consistent with this.

Tucson e=18m.45s., i=19m.11s. and 19m.48s., eS?=20m.10s., iS=20m.15s., iL=20m.43s.
Palomar ePZ=18m.53s., eZ=19m.57s.
Pierce Ferry eP=19m.27s.,i=19m.47s. and 20m.15s., eL=23m.2s.
Manzanillo eE=19m.30s. and 22m.30s.
Boulder City eP?=19m.43s., e=20m.17s., eL=24m.14s.
Tacubaya eE=19m.53s.?, iE=20m.16s., eE=22m.32s., iE=23m.27s.
Riverside eZ=20m.12s.
Pasadena eZ=20m.16s., eLEN=22·5m.
Tinemaha ePZ=20m.24s.
Fresno ePN=20m.54s., iSN=21m.19s.
Mineral ePZ=21m.15s., eZ=21m.42s.
Berkeley iPZ=21m.26s., iZ=21m.59s., eN=24m.24s.
Hungry Horse eP=22m.11s., e=22m.37s.
St. Louis iP?=22m.20s., iS=26m.20s.
Victoria PZ=22m.30s., PP=23m.1s., S=27m.52s., L=31m.
Ottawa eZ=24m.12s., L=34m.
Santa Clara eSE=24m.42s., eLE=25m.26s.
Long waves were also recorded at College, Sitka, Ivigtut, Scoresby Sund, and at other North American and European stations.

Sept. 1d. 19h. 53m. 10s. Epicentre 24°·5N. 109°·0W. (as on 1946, Sept. 13d.).

A=−2966, B=−·8614, C=+·4124; δ=+6; h=+3;
D=−·946, E=+·326; G=−·133, H=−·390, K=−·911.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Guadalajara		6·4	124	—	—	e 3 10	S*	—	—	—
Manzanillo		6·9	140	e 1 33	−12	—	—	e 1 44	P	e 4·3
Tucson		7·8	350	i 1 55	− 3	i 3 21	− 7	i 2 33	P_g	i 3·9
Tacubaya		10·4	117	e 3 2	+28	—	—	—	—	e 5·5
Palomar	Z.	11·2	324	i 2 43 a	− 1	—	—	—	—	—
Riverside	Z.	11·9	325	e 2 53	− 1	—	—	—	—	—
Pierce Ferry		12·3	341	e 2 58	− 1	e 5 37	+19	—	—	e 6·1
Boulder City		12·5	338	e 3 4	+ 2	e 5 34	+11	—	—	e 6·2
Mount Wilson	Z.	12·5	324	i 2 59	− 3	—	—	—	—	—
Pasadena		12·5	324	e 3 1	− 1	—	—	—	—	i 5·3
Tinemaha	Z.	14·8	330	i 3 33	+ 1	—	—	—	—	—
Fresno	N.	15·3	325	i 3 39	0	—	—	—	—	e 9·6
Salt Lake City		16·4	353	e 3 55	+ 2	e 7 4	+ 8	—	—	e 8·0
Santa Clara	E.	16·9	322	e 4 14	+15	e 7 15	+ 8	—	—	e 8·1
Branner		17·1	322	i 4 9	+ 7	—	—	—	—	e 9·8
Berkeley		17·5	323	e 4 7	0	—	—	i 4 21	PP	e 8·5
Ukiah		18·9	325	e 5 27	+63	e 9 2	+69	—	—	e 10·0
Mineral		19·0	330	e 4 25	− 1	—	—	i 4 34	PP	e 11·1
Ferndale		20·5	326	e 8 33	S	(e 8 33)	+ 6	—	—	(e 12·0)
Arcata		20·6	327	e 4 50	+ 7	—	—	—	—	—
Bozeman		21·2	356	e 4 54	+ 5	i 8 56	+15	—	—	i 11·1
St. Louis		21·3	44	i 4 49	− 1	i 8 58	+15	i 5 28	PPP	—
Butte	N.	21·7	355	e 5 5	+10	e 8 55	+ 4	—	—	e 11·5
Hungry Horse		24·1	353	e 5 16	− 2	—	—	i 5 20	P	—
Grand Coulee		24·7	344	e 5 31	+ 7	—	—	—	—	—
Victoria		26·5	339	5 39	− 2	10 11	− 3	—	—	13·0
Cleveland	N.	28·4	47	—	—	e 11 17	+32	—	—	—
Philadelphia		32·3	54	—	—	e 13 32	SS	e 17 57	SeS	e 17·0
Ottawa		34·0	44	e 6 55	+ 7	12 28	+15	i 7 2	?	15·8
Seven Falls	E.	37·8	44	e 7 34	+14	—	—	—	—	19·8
Sitka		38·1	338	e 12 24	?	i 13 14	− 2	—	—	e 16·0
San Juan		40·2	90	e 12 5	?	e 26 2	L	—	—	(e 26·0)
Huancayo		49·0	134	—	—	e 16 34	+39	e 20 26	SSS	e 21·7
La Paz		57·0	131	i 10 9	+19	—	—	i 25 17	Q	31·2
De Bilt		84·6	35	—	—	e 23 20	+17	—	—	e 35·8

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Paris	84·9	39	e 12 54	+16	—	—	e 41 50?	Q	e 42·8
Uccle	84·9	37	—	—	e 23 14	+ 8	e 28 44	SS	e 40·8
Copenhagen	85·9	29	—	—	23 32	+16	—	—	42·8
Clermont-Ferrand	86·9	42	e 13 14	+26	e 23 44	+18	—	—	41·8
Strasbourg	87·9	37	e 12 56	+ 3	e 23 54	+19	e 13 11	?	e 41·8
Alicante	88·4	49	—	—	e 23 56	+16	—	—	e 36·6
Stuttgart	88·6	36	e 12 50?	− 6	—	—	—	—	e 45·8
Triest	93·0	37	e 18 27	?	—	—	—	—	—
Rome	94·6	40	e 22 6	?	—	—	—	—	e 44·0
Istanbul	104·0	32	e 22 50?	?	—	—	—	—	e 47·8
Ksara	113·1	32	e 32 51	?	e 43 11	?	—	—	—

Additional readings :—
Guadalajara eN = 4m.12s., eE = 6m.2s., iN = 7m.52s.
Manzanillo eZ = 2m.42s.
Tacubaya eN = 3m.9s.
Ferndale S and L given as P and S.
St. Louis i = 5m.3s.
Uccle eN = 34m.50s.?
Stuttgart e = 15m.50s.?, eZ = 42m.56s.
Rome e = 28m.34s.
Long waves were also recorded at College, Scoresby Sund, Ivigtut, Honolulu, Tamanrasset, and at other European and North American stations.

Sept. 1d. 20h. Undetermined Shock.

Brisbane iPZ = 21m.19s., ePE = 21m.23s., iPPN = 21m.39s., iZ = 22m.8s. and 22m.49s., iSN = 25m.19s., eSE = 25m.22s., iSSEN = 25m.47s., iLE = 29m.4s.
Vladivostok eP = 25m.59s., iS = 33m.2s.
Tinemaha iPZ = 29m.31s.
Pasadena iPZ = 29m.32s., ipPZ = 29m.57s.
Mount Wilson iPZ = 29m.33s., ipPZ = 29m.58s.
Riverside iPZ = 29m.35s., ipPZ = 30m.0s.
Palomar iPZ = 29m.37s., epPZ = 29m.59s.
Andijan eP = 29m.39s., eS = 39m.51s.
Stalinabad iP = 29m.47s., iS = 40m.11s.
Tashkent eP = 29m.48s.?, iS = 39m.59s.?
Victoria eZ = 41m.34s., L = 50·0m.
Long waves were also recorded at Ottawa, Seven Falls, and Santa Clara.

Sept. 1d. Readings also at 0h. (Mount Wilson, Pasadena, Palomar (2), Riverside, Tinemaha (2), Boulder City, Hungry Horse, Pierce Ferry (2), Tucson (2), Ottawa, Apia, and Kew), 3h. (Victoria), 5h. (Apia and near Mineral), 9h. (Apia), 14h. (near Ottawa), 15h. (Ashkabad (2), Samarkand, Frunse, near Stalinabad, Andijan, and Obi-garm), 18h. (Salt Lake City, Boulder City, Hungry Horse, Pierce Ferry (2), and Tucson (2)), 19h. (Apia, Tacubaya, Pierce Ferry, and Hungry Horse), 20h. (Tacubaya, Salt Lake City, Seattle, Branner, Lick, Butte, Pierce Ferry (2), Hungry Horse (2), and Tucson (2)), 21h. (Pierce Ferry, Ottawa, near Berkeley, Branner, and San Francisco), 22h. (Apia).

Sept. 2d. 22h. Undetermined Shock.

Ashkabad e = 45m.46s., eP = 48m.32s.
Ksara eP = 46m.57s., eS? = 49m.23s.
Stalinabad eP = 47m.17s., iS = 50m.41s.
Baku eS = 47m.18s.
Simferopol eP = 47m.24s.
Kulyab eP = 47m.25s.
Tashkent eP = 47m.34s., eS = 51m.10s.
Tchimkent eP = 47m.42s.
Andijan eP = 47m.56s.
Helwan eP? = 48m.13s., S = 51m.34s.
Frunse eP = 48m.27s.
Istanbul eP = 48m.30s., eS = 51m.0s.
Collmberg eEZ = 49m.52s.
Long waves were recorded at La Plata.

Sept. 2d. 23h. 34m. 48s. Epicentre 10°·3N. 126°·0E. (as on 1943, Aug. 20d.).

$A = -\cdot5784$, $B = +\cdot7962$, $C = +\cdot1776$; $\delta = +2$; $h = +6$;
$D = +\cdot809$, $E = +\cdot588$; $G = -\cdot104$, $H = +\cdot144$, $K = -\cdot984$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Subic Bay		7·2	309	e 2 15	P_g	—	—	—	—	—
Guam		18·6	79	i 4 15	− 6	e 7 56	+10	i 5 57	PPP	—
Kagosima		21·6	11	4 57	+ 3	9 14	SS	—	—	10·5
Nanking		22·6	344	e 5 3	0	e 9 13	+ 6	5 32	pP	—
Hukuoka		23·5	9	i 5 16	+ 4	9 46	+23	—	—	12·6
Koti		24·2	15	5 23	+ 4	10 33	SS	5 55	PP	11·5
Hirosima		24·7	14	5 24	0	—	—	—	—	e 12·4
Batavia		25·1	230	5 19	− 9	9 53	+ 2	—	—	—
Hamada		25·1	11	5 30	+ 2	—	—	—	—	—
Sumoto		25·3	18	i 5 32	+ 2	10 4	+10	i 6 11	pP	13·1
Kobe		25·7	17	e 5 28	− 5	—	—	—	—	—
Osaka		25·7	18	e 5 41	+ 8	10 0	− 1	i 6 24	PP	12·7
Kameyama		26·2	19	5 40	+ 2	—	—	i 6 26	PP	e 12·7
Owase		26·2	20	5 34	− 4	10 18	+ 9	6 10	pP	12·7
Toyooka		26·4	17	5 45	+ 5	10 17	+ 5	—	—	10·8
Hikone		26·5	18	e 5 44	+ 3	—	—	—	—	e 14·2
Nagoya		26·7	20	5 46	+ 3	10 24	+ 7	e 11 30	Q	15·1
Gihu		26·8	18	5 46	+ 2	—	—	—	—	13·2
Shizuoka		27·0	23	5 50	+ 5	10 30	+ 8	—	—	12·2
Osima		27·2	25	5 59	+12	—	—	—	—	—
Misima		27·4	24	e 5 55	+ 6	—	—	—	—	—
Hunatu		27·7	23	5 45	− 7	—	—	—	—	—
Yokohama		27·9	25	5 53	− 1	—	—	—	—	12·0
Toyama		28·1	19	5 55	0	—	—	—	—	11·3
Tokyo		28·2	23	e 5 18	−38	11 8	+27	—	—	—
Kumagaya		28·5	23	e 6 4	+ 5	—	—	—	—	—
Maebasi		28·6	22	5 59	− 1	—	—	—	—	—
Wazima		28·7	18	e 6 7	+ 6	10 51	+ 1	—	—	e 14·0
Kakioka		28·8	24	5 57	− 5	—	—	—	—	—
Mito		29·1	25	6 12	+ 8	—	—	—	—	12·8
Aikawa		29·7	19	e 6 21	+11	(12 38)	SS	—	—	12·6
Hukusima		30·3	24	e 6 22	+ 7	11 19	+ 4	i 7 24	PPP	14·2
Sendai		30·9	24	6 22	+ 2	11 51	+27	—	—	—
Mizusawa		31·7	23	6 38	+11	11 48	+11	11 52	S	—
Akita		31·9	22	6 33	+ 4	11 24	−16	—	—	e 14·5
Miyako		32·5	23	e 6 22	−12	11 59	+10	—	—	—
Aomori		33·1	21	e 6 48	+ 8	11 41	−18	—	—	16·6
Vladivostok		33·1	9	e 6 40	0	e 11 58	− 1	—	—	—
Mori		34·2	19	6 53	+ 4	—	—	—	—	—
Sapporo		35·3	19	7 7	+ 8	12 40	+ 7	—	—	17·7
Calcutta	E.	38·0	294	i 7 14 a	− 7	i 13 1	−13	i 8 54	PP	18·2
Perth		43·1	192	8 7	+ 3	14 20	−10	9 54	PP	—
Irkutsk		45·4	342	e 8 23	+ 1	15 10	+ 6	—	—	—
Colombo	E.	45·7	269	8 17	− 7	15 2	− 6	18 47	SS	27·8
Brisbane		45·8	145	e 8 23	− 2	i 15 7	− 2	i 10 9	PP	i 22·8
Hyderabad	N.	46·6	284	e 8 45	+13	15 11	−10	18 44	SS	21·5
Kodaikanal	E.	47·4	275	i 8 19	−19	15 12	PS	10 8	PP	23·3
Dehra Dun	N.	48·8	302	e 14 36	?	e 18 15	?	—	—	—
Riverview		50·0	152	i 9 0k	+ 2	e 16 8	− 1	i 10 54	PP	i 22·8
Bombay		52·0	285	e 9 7	− 6	i 16 29	− 7	i 11 14	PP	24·8
Almata		53·7	317	9 25	− 1	17 1	+ 2	—	—	—
Murgab		54·2	310	9 26	− 3	—	—	—	—	—
Frunse		55·1	316	e 9 34	− 2	e 17 19	+ 1	—	—	—
Andijan		56·0	312	e 9 40	− 3	e 17 31	+ 1	—	—	—
Kulyab		57·2	308	i 9 46	− 5	—	—	—	—	—
Stalinabad		58·1	309	i 9 54	− 4	i 17 52	− 6	—	—	—
Tashkent		58·4	313	i 9 56	− 4	e 17 55	− 7	—	—	—
Tchimkent		58·5	314	i 9 58	− 2	i 18 0	− 3	—	—	—
Samarkand		59·7	310	10 5	− 4	—	—	—	—	—
Auckland	N.	65·6	138	—	—	19 34	+ 1	23 32	SS	28·7

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ashkabad		66·1	307	10 50	− 1	e 19 39	0	—	—	—
Apia		66·2	111	—	—	e 19 48	+ 8	e 27 42	Q	e 32·2
Arapuni	E.	66·8	139	—	—	20 6	+18	—	—	32·2
Kaimata		67·0	145	11 9	+12	—	—	—	—	—
Tuai	N.	68·2	140	11 8	+ 4	—	—	—	—	—
Wellington		68·2	143	11 6	+ 2	20 2	− 2	11 28	pP	31·7
Christchurch		68·3	146	11 30	+25	20 0	− 6	24 2	SS	31·5
Baku		72·8	310	e 11 32	0	—	—	—	—	—
Honolulu		73·5	70	e 11 36	0	e 20 51	−15	e 25 58	SS	e 30·0
Grozny		75·9	312	i 11 50	0	e 21 31	− 1	e 12 20	P_cP	—
Erevan		77·0	309	e 11 58	+ 2	e 21 39	− 6	—	—	—
Leninakan		77·4	310	e 12 23?	+25	22 13?	+24	12 43?	PcP	—
College		79·1	26	e 12 15	+ 7	e 22 13	+ 6	e 27 28	SS	e 32·6
Sotchi		80·3	313	e 12 10	− 4	22 10	−10	—	—	—
Moscow		80·7	325	12 14	− 2	22 16	− 8	—	—	—
Tananarive		82·6	250	e 12 23	− 3	e 22 31	−12	23 18	PS	e 39·9
Theodosia		83·2	315	e 12 33?	+ 4	22 47?	− 2	—	—	—
Simferopol		84·1	315	12 36	+ 2	—	—	—	—	—
Yalta		84·2	314	e 12 28	− 6	22 49	−10	—	—	—
Ksara		84·4	303	e 12 35	− 1	e 23 3	+ 2	—	—	—
Sitka		86·0	32	e 13 28	+45	e 23 24	+ 7	e 16 36	PP	e 34·8
Helsinki		86·6	331	e 12 47	+ 1	e 23 16	[+ 5]	e 24 54	PPS	e 38·2
Istanbul	Z.	88·5	312	e 12 51	− 5	23 0	[−24]	—	—	—
Helwan		88·9	300	i 12 57k	− 1	23 48	+ 4	16 33	PP	—
Bucharest		89·8	316	e 13 1	− 1	e 23 49	− 4	e 23 13	?	36·2
Upsala		90·2	332	13 3k	− 1	23 51	− 5	e 16 6	PP	e 40·2
Warsaw		90·9	324	e 13 8a	+ 1	24 4	+ 1	23 40	SKS	e 38·2
Raciborzu		93·3	322	e 13 19	+ 1	e 23 40	[−12]	e 16 58	PP	—
Belgrade		93·6	317	e 13 19k	0	e 24 26	0	e 17 2	PP	e 49·8
Budapest	E.	93·7	319	13 18	− 2	e 24 7	[+13]	e 17 12?	PP	e 51·2
Kalossa	E.	94·0	319	e 13 24	+ 3	e 24 41	+11	—	—	—
Copenhagen		94·4	329	i 13 24a	+ 1	23 57	[− 1]	17 16	PP	45·2
Prague		95·6	323	e 13 29	+ 1	e 24 0	[− 4]	e 17 12	PP	e 41·2
Victoria		95·6	40	e 22 42	?	—	—	—	—	38·2
Collmberg		95·9	324	e 13 31	+ 1	e 24 11	[+ 5]	e 17 51	PP	—
Scoresby Sund		96·5	351	14 25	+53	25 0	+ 9	19 45	PPP	—
Cheb		96·8	324	e 12 59	−35	e 24 55	+ 1	e 35 36	SSS	e 50·2
Jena		96·9	324	e 13 36	+ 2	e 24 51	− 3	e 24 0	SKS	—
Taranto		97·3	313	17 51	PP	e 24 40	−18	—	—	47·7
Triest		97·7	320	e 13 44	+ 6	i 24 15	[0]	i 25 3	S	—
Stuttgart		99·2	323	e 13 42	− 3	e 24 55	(+ 7)	e 17 37	PP	51·2
Ukiah		99·2	48	e 13 38	− 7	e 25 38	+24	e 26 53	PS	e 41·5
Bologna	Z.	99·8	318	e 13 49	+ 2	e 25 26	+ 7	e 18 3	PP	—
Salo		99·8	319	e 13 48	+ 1	e 26 20	PS	—	—	—
Chur		99·9	321	e 13 48	0	e 24 22	[− 5]	e 17 38	PP	e 63·2
De Bilt		99·9	328	i 14 41	+53	e 24 19	[− 8]	e 18 42	PP	e 48·2
Florence		100·1	318	e 13 50	+ 1	e 25 7	−14	—	—	—
Rome		100·1	314	i 13 49a	0	e 25 11	−10	e 17 50	PP	e 46·4
Strasbourg		100·2	324	e 13 50	+ 1	e 24 25	[− 3]	e 18 25	PP	49·2
Zürich		100·2	323	e 13 40	− 9	—	—	e 17 55	PP	—
Berkeley		100·4	49	e 16 46	?	i 24 32	[+ 3]	i 36 37	SSS	e 45·5
Aberdeen		100·5	334	i 21 14	?	i 25 26	+ 1	—	—	45·8
Basle		100·8	323	e 13 52	0	e 25 26	− 1	e 26 12	?	—
Santa Clara	E.	100·8	49	—	—	e 24 38	[+ 7]	e 31 40	?	e 43·6
Uccle		101·0	327	e 13 57	+ 4	e 24 25	[− 7]	e 27 3	PS	e 48·2
Hungry Horse		101·3	36	e 13 57	+ 3	—	—	e 18 11	PP	—
Durham		101·7	332	i 19 6	?	i 25 31	− 4	—	—	—
Edinburgh		101·7	333	—	—	e 25 12	{+ 5}	—	—	—
Reykjavik	N.	101·9	347	—	—	e 25 13	{+ 5}	e 27 6	PS	e 52·2
Paris		103·0	326	e 14 0	− 2	e 24 44	[+ 3]	18 30	PP	e 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.
Kew	N.	103·1	329	—	—	e 24 33	[− 9]	e 25 31	S	e 43·4
Butte	N.	103·3	38	—	—	e 25 25	{+ 7}	—	—	e 42·5
Tinemaha	Z.	103·6	49	e 13 39	−25	—	—	e 17 41	?	—
Bozeman		104·4	38	—	—	e 24 40	[− 8]	e 25 40	S	e 44·2
Clermont-Ferrand		104·7	323	e 14 32	+23	i 25 36	{+ 8}	e 18 27	PP	50·2
Mount Wilson	Z.	104·9	50	e 14 33	+23	—	—	e 18 15	PP	—
Pasadena		104·9	50	e 17 31	?	i 24 57	[+ 7]	—	—	e 43·0
Riverside	Z.	105·5	50	e 18 36	PP	—	—	—	—	—
Palomar	Z.	106·2	51	i 18 53	PP	—	—	—	—	—
Salt Lake City		106·4	42	—	—	e 25 4	[+ 7]	e 37 30	SSS	e 44·3
Boulder City		106·9	48	e 14 25	P	—	—	e 18 43	PP	—
Pierce Ferry		107·1	47	e 14 27	P	e 17 46	?	e 19 31	?	—
Tortosa		108·5	320	18 59	PP	25 24	[+18]	33 35	SS	e 50·2
Ivigtut		108·6	357	19 0	PP	25 36	[+30]	28 18	PS	49·2
Alicante		110·5	318	19 15	PP	25 55	[+41]	29 49	PPS	55·7
Tucson		111·3	49	e 14 39	P	e 25 36	[+18]	e 19 17	PP	e 46·5
Toledo		111·9	321	e 19 21	PP	e 25 55	[+35]	48 42	Q	53·1
Tamanrasset		113·1	300	e 18 35	[− 4]	e 27 15	S	i 19 15a	PP	—
Granada		113·2	318	i 19 35k	PP	26 11	[+46]	i 30 11	PPS	i 56·0
Lincoln	E.	115·7	35	—	—	e 29 38	PS	e 30 48	PPS	e 46·9
Lisbon		115·8	322	19 51	PP	—	—	—	—	e 56·4
Chicago		119·6	29	—	—	e 30 35	PS	e 37 15	SS	e 49·5
St. Louis		120·7	33	e 18 54	[0]	e 25 47	[− 5]	i 20 25	PP	—
Ottawa		121·2	17	e 18 57	[+ 2]	e 30 24	PS	i 20 30	PP	55·2
Cleveland		122·6	24	e 20 41	PP	e 25 41	[−17]	e 23 36	PPP	—
Halifax		124·6	8	—	—	e 37 12?	SS	—	—	66·2
Harvard		125·0	15	i 19 2	[0]	e 33 9	PPS	e 20 47	PP	e 70·2
Fordham		125·9	17	e 20 59	PP	e 38 41	SSP	i 21 45	?	—
Philadelphia		126·3	20	e 21 28	PP	e 38 45	SSP	—	—	e 53·2
Bermuda		136·4	14	e 22 22	PP	e 45 27	SSS	i 24 0	PKS	e 55·2
San Juan		149·1	22	e 20 0	[+14]	e 27 17	[+25]	e 23 24	PP	e 60·6
Fort de France		154·1	16	e 19 57	[+ 4]	—	—	—	—	—
Huancayo		159·0	97	e 20 48	[+48]	e 44 24	SS	e 45 16	SSP	e 66·2
La Paz		165·0	116	i 20 13	[+ 7]	—	—	—	—	78·2

Additional readings :—
Nanking iP = 5m.10s., PP = 5m.57s., PPP = 6m.13s., eS = 9m.25s., iS = 9m.37s., sS = 10m.10s.
Koti S = 10m.3s.
Sumoto iPP = 8m.1s.
Kameyama Q = 11m.51s.
Calcutta iPPE = 8m.29s., iSSSE = 15m.56s.
Perth SSS = 17m.44s.
Brisbane iZ = 8m.51s., 10m.2s., 10m.20s., 11m.17s., 11m.44s., and 12m.35s., iSKSN = 18m.8s., iSSN = 18m.26s., iSSE = 18m.30s., iQE = 20m.10s.
Kodaikanal ScSE = 18m.0s., SSE = 18m.31s.
Dehra Dun eN = 23m.44s., iN = 32m.57s., eN = 36m.33s.
Riverview iNZ = 9m.27s. and 9m.53s., eSN = 16m.5s., iN = 19m.41s., iE = 19m.44s., iN = 20m.23s., iEZ = 20m.33s.
Bombay ePN = 9m.10s., iSE = 16m.25s., iSSE = 20m.30s.
Auckland S_cS?N = 21m.40s.
Wellington i = 12m.28s. and 12m.44s., PS = 20m.30s., i = 21m.43s., SS? = 23m.30s., i = 24m.32s., SSS = 26m.57s., SKKS = 37m.20s., PKP,PKP = 38m.31s., PKP,PKS = 42m.37s., SKKKS = 43m.21s.
Christchurch SN = 19m.34s., QE = 27m.22s.
Honolulu e = 15m.39s., i = 21m.28s., iS_eS = 22m.0s., eSSS = 28m.58s.
College iS_cS = 22m.49s., eSSS? = 30m.40s.
Tananarive SS = 27m.48s., SSS = 31m.10s.
Sitka iS = 23m.32s., iS_cS? = 24m.2s., eSS = 28m.54s., eSSS = 32m.32s.
Helsinki eS = 24m.2s., ePPS = 25m.22s., e = 27m.6s.
Helwan SKKS = 23m.36s., PS = 24m.55s., PPS = 25m.26s.
Upsala ePP?E = 17m.28s., ePP?N = 17m.31s., eSKSE = 23m.25s., eSN = 23m.44s., eN = 24m.22s., 26m.43s., 32m.12s.?, and 36m.21s., eE = 37m.12s.?
Warsaw eN = 13m.21s., ePPZ = 16m.48s., ePPPZ = 18m.39s., iE = 24m.26s., iN = 24m.34s., PSN = 24m.59s., PSZ = 25m.9s., iE = 25m.36s., PPSEZ = 26m.13s., eE = 26m.28s., SSE = 30m.9s., iN = 32m.0s. and 33m.5s., eSSSE = 33m.54s., eSSSN = 34m.15s.
Raciborzu e = 16m.35s., 18m.4s.?, 22m.26s. and 23m.4s.?, eEN = 27m.34s.
Copenhagen 18m.4s., S = 24m.46s., PS = 26m.5s., eE = 28m.36s., SS = 31m.18s.

Continued on next page.

Prague e =14m.19s., and 16m.24s., ePPP =19m.32s., e =21m.6s. and 21m.54s., eSKKS = 24m.12s., eS? =24m.36s., ePS =25m.36s., ePPS =26m.18s., eZ =27m.12s., e = 29m.54s., eSS =31m.12s., eSSS =35m.24s.
Collmberg eZ =13m.55s., 15m.47s., and 16m.43s.
Scoresby Sund 18m.3s., 18m.16s., 21m.54s., SKS =24m.37s. and 27m.0s.
Cheb eSKS? =24m.43s., e =27m.23s., 30m.43s., and 46m.10s.
Jena eSKS?N =24m.27s.
Triest ePPN =17m.45s., iPPPN =19m.50s., iPS =26m.27s., iPPS =27m.21s., eSS = 31m.40s.
Stuttgart eZ =14m.43s., e =18m.34s., ePPP? =19m.56s., e =21m.40s., eSKS =?23m.41s., eSSS? =36m.6s., eQ? =46m.12s.
Ukiah eSS =32m.29s., eSSS =36m.23s.
Bologna ePPS?Z =27m.24s.
De Bilt ePS =27m.30s.
Rome eZ =14m.36s., iPPPZ =19m.51s., eSKSE =24m.4s., eN =29m.20s., eSSE = 31m.47s., eSSSE =35m.55s.
Strasbourg ePKP? =17m.45s., ePP? =18m.40s., eSKP =21m.51s., e =22m.27s., ePS = 27m.27s., ePPS =28m.20s., eSS =33m.24s., eSSS? =36m.37s., e =39m.18s., iQ? = 42m.17s.
Zürich e =15m.21s.
Berkeley eN =17m.32s., iZ =18m.40s., iN =31m.29s.
Aberdeen iE =35m.37s., eN =41m.12s.
Uccle ePPE =18m.52s., eSKKSEN =25m.20s., ePSEN =28m.13s., ePPSE =30m.12s.?, eE =32m.58s., eSSE =35m.12s.?, eE =42m.6s.
Paris e =14m.52s., ePKP =18m.10s., i =19m.3s., and 23m.44s., iSKKS =25m.16s., ePS? =27m.13s., ePPS? =28m.12s., e =37m.33s.
Kew eN =25m.45s., iN =41m.1s.
Bozeman iPPS =28m.36s., eSS =32m.58s., eSSS =37m.16s.
Clermont-Ferrand iPP =19m.17s., iPPP =21m.33s., iPS =28m.27s., iPPS =29m.52s., Q =47m.12s.
Pasadena eN =29m.33s., iSSEN =31m.41s.
Salt Lake City ePS? =27m.10s., ePPS =28m.48s., eSS =33m.18s.
Boulder City e =17m.45s., ePKKP? =30m.22s.
Tortosa SSS?EN =37m.36s., QE =43m.40s.
Ivigtut 29m.11s., SS =34m.11s.
Alicante PP =20m.57s., PKS =22m.23s., PPP =23m.11s., SKKS =27m.11s., PPS = 31m.19s., SS =35m.58s., SSP? =36m.31s., SSS? =40m.55s., Q =47m.1s.
Tucson e =17m.57s. and 19m.59s., eS =27m.20s., ePS =28m.47s., ePPS =29m.52s., eSS =34m.24s., eSSS =39m.40s.
Toledo iZ =19m.35s., iPPE =20m.13s.
Tamanrasset ePPP =21m.52s., ePS =29m.15s.
Granada iPP =20m.27s.a, SKP =21m.47s.a, PPP =23m.20s.,k SKKS =29m.8s., i = 32m.59s., SS =35m.14s.
Lincoln eSSE =36m.6s., eSSSE =40m.16s.
Lisbon EZ =20m.33s., Z =20m.36s.
Chicago eSSS =41m.25s.
St. Louis iSKKS =28m.1s., iPS =30m.45s., i =40m.31s.
Ottawa e =26m.30s., 37m.40s., and 40m.36s.
Philadelphia e =21m.46s., ePS =31m.56s., e =34m.42s.
San Juan ePKS =24m.45s., eSKKS =30m.49s., ePPPS =36m.36s., eSS =43m.4s., eSSS =48m.29s.
Huancayo ePP? =23m.20s., eSKS? =28m.22s., e =31m.44s., eSSS =50m.22s.
La Paz iPPZ =24m.7s., iSKS =25m.35s., iSKKS =30m.22s., iN =35m.3s., iPPS = 37m.40s., iSSN =44m.12s., iSSS =50m.29s.
Long waves were also recorded at Potsdam and Barcelona.

Sept. 2d. Readings also at 0h. (Berkeley, Pierce Ferry, Triest, Stuttgart, and Collmberg), 1h. (Calcutta), 3h. (Pierce Ferry), 6h. (Upsala), 7h. (near Mineral), 8h. (Pierce Ferry (2), Hungry Horse, Salt Lake City, and Tacubaya), 9h. (near Mineral), 10h. (Tacubaya, Pierce Ferry, Istanbul, Ksara, near Erevan, and Leninakan), 17h. (near Pierce Ferry and near Apia), 18h. (Ottawa and Apia), 20h. (Brisbane, Frunse, Andijan, Tashkent, Stuttgart, Ottawa, Boulder City, Pierce Ferry (2), Salt Lake City, Pasadena, Mount Wilson, Riverside, Palomar, Tinemaha, near Berkeley, Lick, and Branner; several shocks), 21h. (La Paz and near Pierce Ferry), 22h. (near Lick and Branner).

Sept. 3d. 9h. 39m. 14s. Epicentre 20°·8S., 69°·0W. (as on 1945, May 1d.).

Suggested epicentres: 20°·7S., 68°·5W., depth 125km. (J.S.A.); 18°S., 72°W., depth 100km. (U.S.C.G.S.).

Felt in Chile, intensity IV between 23° and 24°S. (Santiago).

$A = +·3353$, $B = -·8735$, $C = -·3531$; $\delta = +11$; $h = +4$;
$D = -·934$, $E = -·358$; $G = -·127$, $H = +·330$, $K = -·936$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Montezuma		1·8	175	i 0 21	−11	i 0 34	−22	—	—	i 0·7
La Paz		4·4	11	i 1 41 a	P_g	i 2 11	+ 9	i 2 37	S_g	—
Huancayo		10·6	325	e 3 14	−22	e 5 45	+68	e 3 42	P	e 6·5
La Plata		17·1	147	3 9	−53	6 28	−44	3 27	PP	8·0
Bogota	z.	25·7	348	i 5 36	+ 3	e 10 55	SS	i 6 11	pP	—
Fort de France		36·1	14	e 6 55	−10	—	—	—	—	—
San Juan		39·0	5	e 9 19	PP	e 13 38	+ 9	—	—	e 17·2
St. Louis		62·4	341	i 10 27	0	e 18 57	+ 4	i 10 54	pP	—
Harvard		63·0	358	i 10 34	+ 3	—	—	—	—	—
Ottawa		66·2	354	i 10 53	+ 1	—	—	—	—	—
Tucson		66·2	322	i 10 52k	0	—	—	i 11 33	pP	—
Temiskaming		67·8	352	i 11 9	+ 7	—	—	—	—	—
Ville Marie		68·4	351	i 11 7	+ 1	—	—	—	—	—
Palomar		70·6	319	i 11 19k	0	—	—	i 11 46	pP	—
Pierce Ferry		70·8	323	i 11 21	+ 1	—	—	i 12 3	pP	—
Boulder City		71·2	322	e 11 22	− 1	—	—	i 12 3	pP	—
Riverside	z.	71·3	319	i 11 23k	0	—	—	i 11 51	pP	—
Mount Wilson	z.	71·9	319	i 11 26k	− 1	—	—	e 11 55	pP	—
Pasadena		71·9	319	i 11 27k	0	—	—	e 11 54	pP	—
Haiwee	z.	73·1	321	i 11 34	0	—	—	e 12 2	pP	—
Tinemaha		74·0	321	i 11 39k	0	—	—	i 12 7	pP	—
Lick	z.	76·2	319	i 11 50	− 2	—	—	—	—	—
Berkeley	z.	76·9	319	i 11 54k	− 2	—	—	—	—	—
Hungry Horse		79·7	331	e 12 10	− 1	—	—	i 12 50	pP	—
Grand Coulee		81·8	328	e 12 20	− 2	—	—	—	—	—
Granada		84·3	47	13 9k	+34	23 0	0	23 54	PS	—
Tamanrasset		84·6	63	i 12 29k	− 7	—	—	—	—	—
Toledo		85·5	44	i 12 38	− 3	—	—	—	—	—
Alicante		87·1	47	e 13 1	+12	e 23 5	[−10]	16 9	PP	e 40·4
Helwan		108·7	65	—	—	e 29 13	PPS	—	—	—
Istanbul		109·3	52	e 20 46	?	e 23 46?	?	—	—	—
Ksara		113·3	61	e 19 29	PP	e 29 6	PS	—	—	—

Additional readings :—
La Paz iN = 3m.1s., iS_g = 3m.25s.
La Plata P?Z = 3m.18s., E = 3m.30s., N = 3m.40s., E = 4m.4s. and 4m.36s., N = 5m.15s., E = 5m.35s., Z = 6m.46s.?, Z = 6m.53s.
St. Louis e = 20m.1s.
Tucson isP = 11m.52s., e = 12m.34s., ePP = 13m.57s., ePPP = 15m.54s.
Temiskaming i = 11m.37s.
Ville Marie i = 11m.34s.
Palomar iZ = 11m.35s., isPZ = 11m.58s., iZ = 12m.23s.
Pierce Ferry i = 11m.50s.
Boulder City i = 11m.51s.
Mount Wilson iZ = 12m.6s.
Pasadena iZ = 12m.8s.
Haiwee eZ = 12m.15s.
Tinemaha iZ = 12m.19s.
Lick iZ = 12m.32s.
Berkeley iZ = 12m.28s. and 12m.45s.
Hungry Horse i = 12m.39s., isP = 13m.15s.
Granada ePP = 16m.6s.a
Tamanrasset i = 12m.58s.k
Toledo i = 13m.6s.
Alicante PPP = 17m.53s., PS = 23m.57s., SS = 28m.29s., SSS = 32m.3s., Q = 36m.21s.

Sept. 3d. 21h. Undetermined shock.

Hungry Horse iP =30m.31s., iS =30m.55s.
Grand Coulee eP =30m.31s.
Mineral iPZ =31m.1s., iZ =31m.18s.
Boulder City eP =31m.58s., i =32m.17s.
Pierce Ferry iP =31m.58s., e =32m.15s.
Mount Wilson iPZ =32m.0s.k, ipPZ =32m.19s.
Pasadena iPZ =32m.1s., ipPZ =32m.18s.
Riverside iPZ =32m.4s.k, ipPZ =32m.21s.
Tinemaha iPZ =32m.40s.k, ipPZ =32m.57s.
Tucson eP =32m.40s.k, i =32m.49s. and 32m.59s.
Ottawa e =33m.23s.

Sept. 3d. Readings also at 2h. (Apia, Boulder City, Pierce Ferry, Tucson (2), and Bogota), 3h. (Granada), 5h. (near Stalinabad), 6h. (Stuttgart, La Paz, Huancayo, Pierce Ferry, Tucson, near Stalinabad, Kulyab, and Samarkand), 11h. (Lick), 12h. (Lick and near Tacubaya (3)), 15h. (Alicante), 16h. (near Obi-garm, Kulyab, Stalinabad, Samarkand, Murgab, Andijan, and Tchimkent), 18h. (near Pierce Ferry, near Arcata and Mineral), 20h. (near Andijan, Frunse, Murgab, Tchimkent, Tashkent, and Obi-garm), 22h. (Helwan and Ksara), 23h. (Ottawa, near Misusawa, Boulder City, Pierce Ferry, and near Fresno).

Sept. 4d. 15h. 8m. 54s. Epicentre 36°·8S. 51°·5E.

A = +·4997, B = +·6282, C = −·5964 ; δ = +3 ; h = 0 ;
D = +·783, E = −·623 ; G = −·371, H = −·467, K = −·803.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tananarive		18·2	347	i 4 15	− 1	7 45	+ 8	i 4 23	PP	i 8·1
Colombo		50·9	37	e 8 32	−33	e 16 22	+ 1	e 20 57	SSS	—
Kodaikanal	E.	52·8	33	e 13 35	?	e 16 40	− 7	—	—	18·2
Bombay		58·9	24	e 10 6	+ 3	e 18 8	0	—	—	—
Hyderabad	N.	59·6	30	e 10 8	0	18 10	− 7	—	—	—
Calcutta	E.	68·4	37	e 11 9	+ 3	e 20 9	+ 2	—	—	—
Helwan		69·0	341	11 8	− 1	20 21	+ 7	13 44	PP	—
Ksara		71·7	346	e 11 26	0	21 6	+21	—	—	—
Tamanrasset		73·4	316	e 11 38	+ 2	—	—	e 11 51	PcP	—
Ashkabad		74·6	6	11 45	+ 2	e 21 23	+ 5	—	—	—
Kulyab		76·2	15	11 50	− 2	21 34	− 2	—	—	—
Stalinabad		76·7	14	i 11 52	− 3	i 21 41	0	—	—	—
Baku		76·8	359	12 2?	+ 7	21 50?	+ 8	—	—	—
Erevan		76·9	354	12 26	PcP	—	—	—	—	—
Obi-garm		77·0	15	i 11 44?	−12	i 21 28?	−17	—	—	—
Riverview		77·4	122	e 11 57	− 1	i 21 52	+ 3	e 14 43	PP	35·8
Samarkand		77·4	12	e 11 58	0	—	—	—	—	—
Leninakan		77·5	354	e 12 1?	+ 2	—	—	e 12 21	PcP	—
Murgab		77·6	18	11 58?	− 2	—	—	—	—	—
Tashkent		79·4	14	i 12 8?	− 1	i 22 3?	− 7	—	—	—
Andijan		79·5	16	e 12 8	− 2	i 22 8	− 3	—	—	—
Grozny		79·9	356	e 12 12?	0	—	—	—	—	—
Istanbul		80·2	343	i 12 14	0	22 21	+ 2	—	—	—
Tchimkent		80·4	14	e 12 14	− 1	—	—	—	—	—
Sotchi		80·7	351	12 22	+ 6	—	—	—	—	—
Piatigorsk		80·8	354	12 16	− 1	—	—	—	—	—
Frunse		82·0	17	e 12 24	+ 1	—	—	—	—	—
Yalta		82·4	348	i 12 23	− 2	i 22 38	− 3	—	—	—
Brisbane	Z.	82·5	118	i 12 24	− 2	—	—	i 12 43	PcP	—
Theodosia		82·7	349	12 31	+ 4	—	—	—	—	—
Almata		83·0	19	e 12 30?	+ 2	—	—	—	—	—
Christchurch		83·8	141	—	—	23 0	+ 5	23 49	PS	39·0
Belgrade		86·0	338	e 12 43k	0	e 23 7	[0]	e 18 59	?	e 55·0
Rome		86·1	332	e 12 51	+ 7	e 22 41	[−27]	e 15 51	PP	e 36·7
Wellington		86·6	140	—	—	i 23 20	− 3	e 28 48	SS	41·2

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bologna	z.	88·7	333	e 13 18 a	+21	—	—	e 16 40	PP	—
Alicante		88·8	322	e 13 3	+ 6	23 40	− 4	16 36	PP	42·0
Budapest		88·8	339	12 56	− 1	e 24 6?	+22	—	—	—
Triest		88·8	335	e 13 6	+ 9	i 23 35	[+10]	i 23 58	S	—
Salo		90·0	332	e 12 57?	− 6	—	—	—	—	—
Tortosa	E.	90·3	324	13 17	+13	30 13	SSP	17 0	PP	e 43·1
Toledo	z.	91·8	321	i 13 15	+ 4	e 24 21	+10	i 16 54	PP	—
Prague		92·5	337	e 13 15	+ 1	e 23 36	[−11]	e 30 42	SSP	e 44·1
Warsaw		92·6	342	e 13 16	+ 1	e 23 49	[+ 1]	e 25 42	PS	e 45·1
Moscow		92·9	352	e 13 14	− 2	23 53	[+ 3]	16 58	PP	—
Clermont-Ferrand		93·0	328	e 13 21	+ 4	e 24 37	+16	e 31 0	SS	44·1
Stuttgart		93·1	333	e 13 17	0	e 24 0	{− 5}	e 30 54	SS	e 47·1
Strasbourg		93·5	333	e 13 19	0	e 24 8	{ 0}	e 17 15	PP	43·1
Sverdlovsk		93·5	5	13 17	− 2	24 26	ScS	25 43	PS	—
Lisbon		93·7	317	13 37 a	+17	25 54	PS	17 11	PP	46·1
Jena	N.	94·1	336	e 13 15	− 7	—	—	e 13 21	PcP	—
Paris		95·7	329	17 11	PP	e 26 31	PS	i 31 16	SS	e 45·1
Uccle		96·6	332	—	—	e 24 18	[+ 8]	e 26 23	PS	e 48·1
De Bilt		97·3	333	—	—	e 26 27	PS	e 31 54	SSP	e 48·1
Copenhagen		98·0	339	—	—	25 19	+15	—	—	—
Kew		98·9	330	—	—	e 24 11?	[−11]	e 26 47	PS	e 46·1
Irkutsk		99·9	30	e 18 6	PP	e 27 6	PS	e 36 6	SSS	—
Upsala		100·3	343	e 16 46	?	—	—	—	—	e 42·1
La Paz		102·3	239	e 13 7	−52	i 25 57	+17	i 18 10	PP	41·5
Vladivostok		107·9	50	18 14	PP	25 9	[+ 6]	e 21 38	PKS	—
Huancayo		110·3	237	—	—	e 27 16	S	e 28 55	PS	e 47·6
Fort de France		116·7	269	—	—	e 27 59	S	—	—	—
Scoresby Sund		119·0	338	—	—	30 18	PS	36 48	SSP	—
Harvard		136·5	297	e 22 16	PP	e 28 15	{−45}	—	—	e 64·1
Seven Falls	E.	136·8	303	(39 6?)	P′P′	—	—	—	—	39·1
Philadelphia		138·6	292	—	—	e 34 9	PPS	e 46 51	SSS	e 61·0
Ottawa		139·9	300	e 19 34	[+ 4]	(41 6)?	SS	e 22 31	PP	41·1
Temiskaming		142·4	301	e 19 36	[+ 1]	—	—	e 22 48	PP	—
Ville Marie		142·7	301	e 19 36	[+ 1]	—	—	e 22 42	PP	—
Tacubaya		149·0	245	18 36	[−70]	—	—	—	—	—
Sitka		158·7	11	—	—	i 44 34	SS	—	—	e 79·3
Hungry Horse		164·3	322	e 20 6	[+ 1]	—	—	i 21 1	PKP_2	—
Tucson		164·8	258	e 20 9	[+ 3]	e 46 34	SSP	e 24 59	PP	e 69·3
Grand Coulee		166·8	331	e 20 13	[+ 6]	—	—	e 21 7	PKP_2	—
Victoria		167·7	344	—	—	e 46 36	SSP	—	—	63·1
Pierce Ferry		168·3	271	e 20 10	[+ 2]	—	—	e 25 26	PP	—
Boulder City		168·9	270	e 20 15	[+ 6]	—	—	e 25 27	PP	—
Palomar	z.	169·9	254	e 20 16	[+ 7]	—	—	e 25 26	PP	—
Riverside	z.	170·5	255	e 20 13	[+ 3]	—	—	—	—	—
Mount Wilson	z.	171·1	256	e 20 11	[+ 1]	—	—	e 25 26	PP	—
Pasadena		171·2	256	e 20 11	[+ 1]	e 48 36	SSP	e 25 26	PP	e 73·2
Haiwee	z.	171·5	269	e 20 20	[+10]	—	—	—	—	—
Tinemaha	z.	171·8	275	e 20 19	[+ 9]	—	—	e 25 35	PP	—

Additional readings :—
Tananarive S = 7m.23s.
Kodaikanal SSE = 16m.48s., S_cSE = 17m.18s.
Tamanrasset ePP = 14m.18s., ePPP = 16m.11s.
Riverview iZ = 12m.24s., ePSZ = 22m.14s., iN = 22m.18s., ePPSZ = 22m.29s., eSSN = 26m.42s., eQN = 32m.24s.
Christchurch SS = 27m.56s., SSS = 31m.12s., QE = 33m.15s.
Wellington Q = 40m.6s.
Bologna e = 18m.52s.
Alicante PPP = 18m.48s., PS = 24m.44s., PPS = 25m.10s., SS = 29m.52s., SSS = 33m.28s., Q = 38m.10s.?
Toledo iPPPZ = 18m.54s.
Prague e = 15m.19s., eSKS = 22m.48s., ePS = 25m.0s., ePPS = 26m.17s.
Warsaw eZ = 16m.6s., eSE = 23m.52s., iN = 23m.56s., eE = 24m.28s., eN = 24m.32s., ePSE = 24m.50s.
Clermont-Ferrand iSS = 31m.6s.
Stuttgart e = 13m.32s., 16m.22s., and 24m.36s.

Continued on next page.

Strasbourg ePPP =19m.26s., eS =24m.35s., ePPS =26m.34s., eSS =30m.57s., 31m.1s., and 31m.6s.
Lisbon SSE =30m.59s.
Paris e =19m.42s.
Uccle eEN =25m.6s. and 31m.42s.
Kew eN =32m.13s.
La Paz iPSEN =27m.23s., PPS =28m.6s., iSSEN =33m.31s., SSS =37m.57s.
Vladivostok PS =27m.45s.
Huancayo ePPS =29m.54s., eSS =34m.58s., eSSS =39m.36s.
Philadelphia ePSPS =42m.19s.
Tucson i =20m.13s., eSKKS? =30m.12s., eSKSP =34m.19s., eSSS =52m.21s.
Riverside iZ =20m.26s.
Pasadena iZ =20m.26s. and 25m.57s., eSSSE =57m.12s.
Haiwee iZ =20m.27s.
Tinemaha iZ =20m.26s.
Long waves were also recorded at Arapuni, Auckland, Aberdeen, Barcelona, Granada, Butte, Chicago, and Salt Lake City.

Sept. 4d. Readings also at 0h. (near Berkeley), 5h. (Rome), 6h. (near Hungry Horse), 13h. (near Kulyab and Stalinabad), 14h. (Stuttgart), 15h. (Mineral), 16h. (near Florence and Bologna), 17h. (Tucson, Paris, Clermont-Ferrand, Copenhagen, Uccle, and De Bilt), 20h. and 21h. (near Mineral), 22h. (Alicante), 23h. (near Apia).

Sept. 5d. 10h. 0m. 14s. Epicentre 29°·6N. 139°·8E. Depth of focus 0·050.

Intensity II-III at Tokyo and Utunomiya.
Seismo. Bull. Cent. Met. Obs., Japan, for year 1948, Tokyo, 1950, p. 39, with macroseismic chart. Epicentre 29°·6N. 139°·8E. as adopted. Depth 300km.
Macroseismic radius > 300km.

$A = -\cdot6652$, $B = +\cdot5623$, $C = +\cdot4914$; $\delta = +15$; $h = +2$;
$D = +\cdot645$, $E = +\cdot764$; $G = -\cdot375$, $H = +\cdot317$, $K = -\cdot871$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
	°	°	m. s.	s.	m. s.	s.	m. s.	
Omaesaki	5·2	345	1 22	0	2 26	− 1	—	—
Osima	5·2	356	1 25	+ 3	2 26	− 1	—	—
Mera	5·3	0	1 33	+ 9	2 37	+ 8	—	—
Owase	5·4	326	1 28	+ 3	—	—	—	—
Shizuoka	5·5	348	1 26	0	2 33	0	—	—
Misima	5·6	352	1 27	0	2 34	− 1	—	—
Hunatu	5·9	352	1 31	+ 1	2 38	− 3	—	—
Kameyama	5·9	332	2 42	S	(2 42)	+ 1	—	—
Muroto	6·0	309	1 32	+ 1	2 40	− 3	—	—
Nagoya	6·0	337	1 34	+ 3	2 43	0	—	—
Tokyo	6·1	359	1 33	+ 1	2 40	− 5	—	—
Osaka	6·2	325	1 35k	+ 1	2 46	− 1	—	—
Sumoto	6·3	320	1 36k	+ 1	2 46	− 3	—	—
Hikone	6·4	333	1 39	+ 3	—	—	—	—
Kobe	6·4	324	1 41k	+ 5	2 56	+ 4	—	—
Kyoto	6·4	329	1 37	+ 1	2 43	− 9	—	—
Kumagaya	6·5	357	1 33	− 4	2 48	− 6	—	—
Kakioka	6·6	2	1 39	+ 1	2 56	0	—	—
Maebasi	6·8	355	1 41a	0	2 58	− 2	—	—
Mito	6·8	4	1 41	0	2 56	− 4	—	—
Utunomiya	6·9	0	1 39	− 3	2 54	− 8	—	—
Nagano	7·2	349	1 44	− 1	3 4	− 4	—	—
Toyooka	7·2	326	1 44	− 1	3 2	− 6	—	—
Matuyama	7·3	307	1 48	+ 1	3 9	− 1	—	—
Onahama	7·4	7	1 50k	+ 2	3 9	− 4	—	—
Toyama	7·4	343	1 51	+ 3	—	—	—	—
Miyazaki	7·6	290	1 53	+ 3	3 15	− 2	—	—
Hirosima	7·8	309	1 49	− 3	3 14	− 7	—	—
Hukusima	8·1	4	1 57	+ 1	3 24	− 4	—	—
Wazima	8·1	343	1 56	0	3 23	− 5	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Kagosima		8·2	286	2 0	+ 3	—	—	—	—
Aikawa		8·5	352	3 3	+62	—	—	—	—
Sendai		8·7	6	2 3	0	3 32	− 8	—	—
Hukuoka		8·9	299	2 5	− 1	3 40	− 5	—	—
Mizusawa		9·6	6	2 15	+ 1	4 0	0	—	—
Akita		10·1	1	2 18	− 2	4 8	− 3	—	—
Hatinohe		11·0	7	2 26	− 5	—	—	—	—
Aomori		11·2	4	2 20	−13	4 20	−14	—	—
Sapporo		13·5	5	2 58	− 2	—	—	—	—
Nemuro		14·5	17	3 1	−11	—	—	—	—
Vladivostok		14·9	337	e 3 10?	− 6	i 5 42	−11	—	—
Andijan		55·0	301	e 8 53	− 5	—	—	—	—
Tchimkent		56·7	304	e 9 4	− 6	—	—	—	—
Tashkent		57·2	303	i 9 4	− 9	—	—	—	—
Kulyab		57·6	298	9 11	− 5	—	—	—	—
Stalinabad		58·2	300	9 15	− 5	—	—	—	—
Samarkand		59·3	301	9 26	− 2	—	—	—	—
Sverdlovsk		60·0	322	—	—	i 17 2	−14	—	—
Moscow		72·5	325	10 46	− 5	19 32	−13	—	—
Victoria		72·6	44	e 11 44	+53	—	—	—	—
Grand Coulee		75·5	43	e 11 4	− 4	—	—	—	—
Mineral	z.	77·5	51	e 11 18	− 1	—	—	—	—
Hungry Horse		78·2	40	i 11 23	0	—	—	e 12 45	pP
Lick	z.	78·8	53	i 11 28	+ 2	—	—	—	—
Yalta		79·9	315	e 11 28	− 4	e 20 52	−13	—	—
Tinemaha		81·3	53	i 11 40 a	+ 1	—	—	i 13 20	pP
Haiwee	z.	82·0	53	i 11 44	+ 1	—	—	—	—
Mount Wilson	z.	82·9	55	i 11 48 a	+ 1	—	—	e 13 20	pP
Pasadena		82·9	55	i 11 48 a	+ 1	—	—	i 13 18	pP
Riverside	z.	83·5	55	i 11 50 a	0	—	—	—	—
Copenhagen		83·9	333	i 11 49	− 3	—	—	—	—
Palomar	z.	84·2	55	i 11 55 a	+ 1	—	—	e 13 26	pP
Boulder City		84·3	52	e 11 54	0	—	—	e 15 16	PP
Pierce Ferry		84·7	51	i 11 51	− 5	—	—	e 15 18	PP
Tucson		89·1	53	i 12 19 a	+ 2	—	—	e 15 56	PP
Stuttgart	z.	90·4	330	e 12 19	− 4	—	—	e 13 53	pP

Additional readings :—
Kameyama gives S as P and S =3m.53s.
Mizusawa SE =3m.55s.
Hungry Horse e =13m.49s.
Pasadena eZ =15m.6s.
Palomar eZ =15m.19s.

Sept. 5d. Readings also at 1h. (Andijan, near Kulyab, Obi-garm, and Stalinabad), 2h. (Mount Wilson, Pasadena, Riverside, Tinemaha, Tucson, and Pierce Ferry), 6h. (Mineral), 8h. (near Mizusawa), 9h. (near Mineral), 11h. (Frunse, Tashkent, Tchimkent, Samarkand, near Obi-garm, Andijan, Stalinabad, Kulyab, and Murgab), 12h. (Pierce Ferry and Tucson), 13h. (Istanbul and near Lick), 14h. (near Lick), 15h. (Pasadena, Palomar, Riverside, Tinemaha, Tucson, Boulder City, Pierce Ferry, and near Tacubaya), 16h. and 17h. (Tucson), 21h. (near Lick), 22h. (near Hungry Horse and near Zürich), 23h. (near Stalinabad).

Sept. 6d. 8h. 10m. 19s. Epicentre 22°·5S. 70°·5W. (as on 1943, July 18d.).

Intensity IV in south latitude 23°.
Boletín del año, 1948. Instituto sismológico, Santiago, p. 35.
Epicentre 23°·4S. 71°·3W. (J.S.A.).
24°·5S. 68°·5W. (Pasadena). Depth 100km. suggested.

$A = +\cdot3087$, $B = -\cdot8718$, $C = -\cdot3805$; $\delta = +11$; $h = +4$;
$D = -\cdot943$, $E = -\cdot334$; $G = -\cdot127$, $H = +\cdot359$, $K = -\cdot925$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Montezuma		1·5	94	i 0 29	+ 1	i 0 52	+ 3	—	—	i 1·0
La Paz		6·4	21	i 1 46a	+ 8	i 3 20	S*	i 2 28	P_g	—
Huancayo		11·4	335	e 2 59	+12	e 5 9	+13	—	—	e 5·5
La Plata	E.	16·5	141	4 4	+10	7 6	+ 8	4 43	PP	8·5
	N.	16·5	141	4 4	+10	7 3	+ 5	4 46	PP	8·4
	Z.	16·5	141	4 5	+11	—	—	7 47	SS	8·9
Bogota	Z.	27·2	353	i 5 52	+ 5	e 11 12	+47	i 6 25	pP	15·7
Fort de France		38·1	16	e 7 23	+ 1	i 12 43	−33	—	—	—
Roosevelt Roads		40·8	8	i 7 57	+12	—	—	—	—	—
San Juan		40·9	8	e 7 46	0	i 14 3	+ 5	e 8 19	PP	e 18·3
Tacubaya	N.	50·2	324	i 9 0	0	i 16 11	0	—	—	—
Bermuda		54·8	7	e 9 45	+11	e 17 22	+ 8	e 12 51	PPP	e 23·0
Philadelphia		62·3	357	e 11 28	+62	i 19 54	+62	e 13 44	PP	e 31·6
Fordham		63·1	358	i 10 30	− 2	i 19 4	+ 2	—	—	—
St. Louis		63·6	344	i 10 33	− 2	i 19 6	− 2	i 23 21	SS	—
Cleveland		64·5	351	e 10 37	− 4	i 19 16	− 3	e 10 52	pP	—
Harvard		64·7	0	i 10 41	− 1	—	—	—	—	e 36·7
Chicago		65·9	346	e 10 49	− 1	e 19 35	− 2	e 13 13	PP	e 29·6
Tucson		66·7	324	i 10 55a	0	e 19 54	+ 8	i 11 24	pP	e 27·8
Ottawa		67·7	357	11 1	0	20 1	+ 3	24 23	SS	32·7
Shawinigan Falls	N.	68·8	359	e 10 58	−10	—	—	—	—	—
Seven Falls	E.	69·3	0	—	—	(20 41?)	+24	—	—	20·7
Ville Marie		70·0	353	i 11 14	− 1	—	—	—	—	—
Palomar		71·0	321	i 11 21k	− 1	i 20 42	+ 5	i 11 52	pP	—
Pierce Ferry		71·3	324	i 11 22	− 1	—	—	—	—	—
Boulder City		71·7	323	e 11 26	0	—	—	—	—	—
Riverside	Z.	71·7	320	i 11 25a	− 1	—	—	i 11 49	pP	—
Mount Wilson	Z.	72·3	320	i 11 29k	0	—	—	i 12 1	pP	—
Pasadena		72·3	320	i 11 29a	0	i 20 52	0	i 12 0	pP	e 32·7
Haiwee	Z.	73·6	322	e 11 36a	− 1	—	—	e 12 6	pP	—
Salt Lake City		73·8	329	e 11 49	+11	i 21 11	+ 2	e 26 7	SS	e 30·9
Tinemaha		74·4	322	i 11 41a	− 1	e 21 20	+ 4	i 11 57	pP	—
Lick	Z.	76·5	320	e 11 55	+ 1	—	—	—	—	—
Bozeman		77·2	333	e 11 57	0	i 21 53	+ 6	e 27 13	SS	e 37·9
Berkeley		77·3	320	i 12 5	+ 7	i 21 52	+ 4	i 26 37	SS	e 40·5
Butte	N.	78·1	332	e 12 6	+ 4	i 21 58	+ 2	—	—	e 43·2
Mineral	Z.	78·5	323	e 12 3	− 1	—	—	—	—	—
Hungry Horse		80·6	333	i 12 9	− 7	—	—	i 12 26	pP	—
Grand Coulee		82·5	330	e 12 56	+30	—	—	—	—	—
Lisbon		83·7	44	i 12 33a	+ 1	22 56	+ 2	12 42k	P_cP	38·8
Victoria		85·0	328	12 35	− 3	23 5	− 2	—	—	—
Ivigtut		85·3	12	i 12 38	− 2	23 10	0	—	—	—
Tamanrasset		86·6	64	i 12 46a	0	—	—	i 13 20a	pP	—
Toledo		87·6	46	i 12 52	+ 1	i 23 33	+ 1	i 24 42	PS	44·6
Alicante		89·2	48	e 12 59	0	e 23 55	+ 8	16 47	PP	e 44·8
Tortosa	E.	91·1	47	17 11	PP	23 50	[+11]	24 18	S	e 56·7
Clermont-Ferrand		95·1	43	i 13 26	0	e 24 51	+12	i 17 16	PP	44·7
Kew	N.	95·8	37	—	—	—	—	e 19 47	PPP	e 41·7
Paris		96·1	40	i 17 22	PP	e 26 50	PPS	—	—	e 48·7
Uccle		98·1	38	e 16 41?	?	e 24 21	[+ 3]	e 25 11	S	e 44·7
Basle		98·7	43	e 12 39	−63	e 22 46	?	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Scoresby Sund		98·8	15	—	—	24 19	[− 2]	26 43	PS	—
De Bilt		99·1	37	e 17 41	PP	e 25 17	+ 4	e 26 48	PS	e 50·7
Strasbourg		99·2	41	e 13 45	0	e 24 31	[+ 8]	e 17 47	PP	44·7
Rome		99·7	49	i 13 48 a	+ 1	i 24 29	[+ 3]	i 17 50	PP	—
Stuttgart		100·1	42	e 13 48	− 1	e 24 29	[+ 2]	e 17 52	PP	e 54·7
Triest		101·9	46	e 18 3	PP	e 25 41	+ 5	e 24 37	SKS	—
Prague		103·8	41	e 14 5	0	e 26 11	+19	e 18 16	PP	—
Copenhagen		104·4	35	18 29	PP	24 49	[+ 1]	27 46	PS	49·7
Upsala		108·3	32	e 18 53	PP	e 21 51	PKS	e 28 19	PS	e 50·7
Helwan		110·7	65	e 19 8	PP	e 28 56	PS	e 29 54	PPS	—
Istanbul		111·4	53	14 36	P	26 11	{− 4}	—	—	—
Ksara		115·3	63	e 19 46	PP	e 29 39	PS	—	—	—
Yalta		115·7	50	e 19 44	PP	e 29 32	PS	—	—	—
Moscow		118·5	37	e 19 55	PP	e 29 47	PS	36 29	SS	—
Baku		127·1	55	e 21 19?	PP	—	—	—	—	—
Sverdlovsk		130·7	33	i 19 12	[− 1]	28 32	{+ 8}	i 21 37	PP	—
Ashkabad		133·4	58	e 22 51	PKS	—	—	—	—	—
Tashkent		141·7	51	i 19 29	[− 4]	e 23 13	PKS	e 22 39	PP	—
Stalinabad		141·8	55	i 19 28	[− 6]	e 23 16	PKS	e 22 37	PP	—
Andijan		143·9	52	19 37	[0]	—	—	23 18	PKS	—
Frunse		144·6	47	i 19 41	[+ 3]	—	—	—	—	—
Bombay		145·6	89	e 19 40	[0]	33 17	PSKS	—	—	—
Murgab		145·7	54	e 19 42	[+ 2]	—	—	e 22 41	PP	—
Almata		146·0	44	19 42	[+ 1]	—	—	—	—	—
Irkutsk		150·0	7	e 19 52	[+ 5]	e 33 36	PSKS	e 23 12	PP	—
Vladivostok		152·3	323	i 19 49	[− 2]	—	—	e 23 49	PP	—
Calcutta	E.	160·5	85	e 20 7	[+ 6]	e 31 57	{+42}	—	—	—

Additional readings :—
La Paz iS = 3m.50s., iS_g = 4m.13s.
La Plata N = 5m.39s., E = 5m.59s., Z = 8m.17s., E = 8m.33s.
Bogota eSS = 12m.17s., eS_cP = 13m.16s.
San Juan iP_cP = 9m.34s., ePPP? = 10m.9s., i = 14m.15s. and 15m.33s., iS_cS = 17m.9s.
Bermuda eS_cS = 19m.31s.
Philadelphia ePPP? = 15m.35s., iS_cS? = 21m.18s., e = 25m.59s.
St. Louis isS = 20m.26s., iSSS = 26m.11s.
Cleveland isSE = 19m.33s.
Chicago iS_cS = 20m.43s., eSS = 23m.45s.
Tucson isP = 11m.45s., i = 12m.19s., iPP = 13m.32s., ePPP? = 15m.2s., e = 22m.49s., eSS? = 25m.44s., ePKP,PKP = 39m.22s.
Riverside iZ = 11m.57s. and 12m.57s.
Bozeman e = 25m.9s.
Berkeley iZ = 21m.57s., iE = 22m.2s., eE = 26m.49s.
Lisbon pPZ = 13m.15s.k, PP = 15m.45s.a, S_cSEN = 23m.9s., PSEZ = 23m.56s.
Ivigtut eS = 23m.21s.
Tamanrasset e = 13m.49s.
Alicante PPP = 18m.55s., PS = 25m.3s., PPS = 25m.25s., Q = 37m.11s.
Tortosa SS?E = 30m.39s.
Clermont-Ferrand iSKS = 24m.8s., ePS = 26m.14s., eSS = 31m.31s., Q = 41m.41s.?
Uccle eE = 25m.19s., 26m.38s., and 32m.10s.
Strasbourg ePS = 26m.45s., eSS = 31m.41s.
Rome eS?N = 25m.31s., eE = 26m.45s. and 30m.28s., eSSS?EN = 35m.54s.?
Stuttgart ePS = 26m.57s.
Triest ePS = 26m.17s., eSS = 32m.51s.
Prague ePS = 27m.41s.?, eSS = 33m.23s.
Copenhagen 26m.2s.
Sverdlovsk iPKS = 22m.37s., PS = 31m.42s.
Tashkent ePPP = 26m.0s., SKSP = 29m.22s., eSKKS = 32m.48s.
Vladivostok $ePKP_3$ = 19m.56s.
Long waves were also recorded at Honolulu, Sitka, Aberdeen, Belgrade, Granada, Hyderabad, and Kodaikanal.

Sept. 6d. 8h. Tonga region, but no determination is made of the Epicentre.

Apia ePE =43m.20s., eSE? =44m.17s., eLN =44m.29s.
Auckland PN =46m.50s., PPN =47m.29s., SN =50m.49s., SSN =51m.51s., LN =52·3m.
Wellington PZ =47m.20s., PPZ =48m.22s., S =51m.40s., L =54m.
Kaimata P =47m.53s.
Brisbane iPZ =47m.57s., iZ =48m.11s., iPPZ =48m.41s., iE =48m.56s., iSEN =52m.53s., iN =53m.21s., iSSN =53m.53s., iEN =54m.56s.
Riverview ePEZ =48m.14s., iEZ =50m.4s., iN =53m.50s., 54m.3s., 56m.5s., and 56m.18s. eRN =56·7m.
Arapuni SE =52m.0s.
Christchurch SEN =52m.35s., SSZ =53m.24s., R =55m.22s.
Lick ePZ =53m.37s.
Mount Wilson ePZ =53m.39s.
Pasadena ePZ =53m.41s.
Riverside ePZ =53m.41s.
Palomar iPZ =53m.45s.
Haiwee ePZ =53m.47s.
Mineral ePZ =53m.47s.
Tinemaha iPZ =53m.50s.
Boulder City eP =53m.55s.
Pierce Ferry eP =53m.58s.
Tucson iP =54m.5s., i =54m.19s., e =55m.23s., ePP? =58m.19s.
Victoria e =54m.6s.
Grand Coulee eP =54m.23s.
Hungry Horse eP =54m.27s.
Uccle ePN =61m.30s.?, eL =109m.
Ksara e =61m.35s.
Paris PKP =61m.37s., eL =124m.
Stuttgart eZ =61m.37s. and 61m.45s.
Istanbul iP =61m.39s., e =65m.20s.
Strasbourg PKP =61m.40s., $iPKP_2$ =61m.47s., e =62m.13s., eL =105m.
Zürich ePKP =61m.42s.a, e =62m.28s. and 71m.44s.
Basle ePKP =61m.45s., e =64m.30s.
Clermont-Ferrand PKP =61m.45s., L =112m.
Helwan PKP =61m.48s., PKKP =62m.21s., i =63m.2s., 64m.47s., and 65m.2s., PKS = 65m.21s.
Rome ePZ =61m.58s., ePPZ =65m.33s., eZ =67m.51s.
Triest ePKP? =62m.2s., ePP =65m.45s.
College eS =64m.42s., eSS =70m.6s., eL =77m.12s.
Long waves were also recorded at Copenhagen, De Bilt, and Ivigtut.

Sept. 6d. 16h. 35m. 11s. Epicentre 14°·4N. 93°·7W. Depth of focus 0·005.
(as on 1947, May 2d.).

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

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Puebla		6·3	318	1 31	− 1	2 42	− 2	—	—	—
Tacubaya	E.	7·2	314	1 46	+ 1	3 8	+ 2	—	—	—
Merida	E.	7·5	30	1 22	−27	(2 37)	−37	—	—	2·6
Bogota	Z.	21·6	114	i 6 7	?	e 9 44	+68	—	—	—
Tucson		23·7	322	i 5 9k	+ 2	e 9 23	+ 9	i 5 33	pP	e 12·0
St. Louis		24·3	7	i 5 9	− 3	e 9 17	− 7	i 5 27	pP	e 11·9
San Juan		26·7	76	e 5 45	+10	e 10 53	+49	—	—	e 14·0
Roosevelt Roads		27·2	76	e 5 41	+ 1	—	—	—	—	—
Chicago		27·8	7	e 5 41	− 4	e 10 9	−13	—	—	e 11·5
Palomar		28·2	316	i 5 51k	+ 2	—	—	i 6 23	pP	—
Pierce Ferry		28·2	324	i 5 48	− 1	—	—	i 6 14	pP	—
Boulder City		28·6	323	i 5 54	+ 2	—	—	i 6 27	pP	—
Cleveland		29·0	19	i 5 54	− 2	e 11 1	+20	i 6 44	PP	—
Riverside	Z.	29·0	316	i 5 58	+ 2	—	—	i 6 31	pP	—
Mount Wilson	Z.	29·6	316	i 6 2k	+ 1	—	—	i 6 35	pP	—
Pasadena		29·6	316	i 6 3k	+ 2	—	—	i 6 34	pP	—
Philadelphia		30·2	29	e 7 43	PP	e 11 13	+13	—	—	e 13·5
Haiwee	Z.	30·7	319	i 6 12	+ 1	—	—	i 6 45	pP	—
Santa Barbara	Z.	30·8	314	e 6 14	+ 2	—	—	—	—	—
Tinemaha	Z.	31·5	320	i 6 19a	+ 1	—	—	i 9 14	P_cP	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Fordham		31·5	29	e 6 44	pP	—	—	—	—	—
Fort de France		31·5	85	e 6 17	− 1	—	—	—	—	—
Huancayo		32·0	144	e 6 38	+16	e 11 53	+25	—	—	e 14·8
Fresno	N.	32·2	319	e 6 26	+ 2	—	—	—	—	—
Lick	Z.	33·8	318	i 6 39	+ 1	—	—	—	—	—
Harvard		33·9	30	i 6 38	− 1	—	—	—	—	e 13·8
Ottawa		34·4	21	6 38	− 5	11 54	−11	7 35	PP	15·8
Butte	N.	35·3	339	e 6 23	−28	e 12 1	−18	—	—	e 16·4
Mineral	Z.	35·5	323	i 6 54k	+ 2	—	—	—	—	—
Shawinigan Falls	N.	36·5	25	e 7 1	0	—	—	—	—	—
Hungry Horse		37·8	339	i 7 11	− 1	—	—	i 7 25	pP	—
Grand Coulee		39·5	334	e 7 27	+ 1	—	—	e 7 42	pP	—
La Paz	Z.	39·8	138	i 8 3	pP	—	—	—	—	—
Victoria		41·8	331	7 45	0	13 56	− 1	—	—	22·8
Paris		83·3	42	e 12 52	pP	—	—	—	—	—
Basle		86·9	42	e 12 43	+ 4	20 53	?	—	—	—
Copenhagen		87·1	33	—	—	23 5	[+ 6]	—	—	42·8
Stuttgart	Z.	87·6	40	e 12 44	+ 2	—	—	e 13 20	pP	—
Jena		88·3	38	e 12 49	+ 3	—	—	e 13 23	pP	—
Triest		91·6	42	e 18 29	PPP	i 23 33	[+ 7]	—	—	—
Rome	Z.	92·1	46	e 17 12	PP	e 23 54	− 4	—	—	—
Tamanrasset		92·8	66	e 13 11	+ 4	—	—	i 13 48a	pP	—
Istanbul		103·6	41	—	—	e 27 49?	PS	—	—	53·8

Additional readings and note :—
Tucson isP = 5m.45s., i = 6m.7s., e = 8m.9s., i = 9m.36s., isS = 10m.9s., iS_cS? = 12m.34s.
St. Louis isP = 5m.35s., isS = 9m.48s.
Palomar iZ = 6m.12s. and 9m.30s.
Boulder City i = 6m.8s.
Cleveland iZ = 6m.17s., iN = 6m.27s. and 6m.38s., iPPZ = 6m.48s.
Riverside eZ = 6m.13s., iP_cPZ = 9m.8s., iZ = 9m.26s., eZ = 9m.42s.
Pasadena iZ = 6m.56s. and 7m.20s.
Ottawa PPP = 8m.1s., SS = 13m.55s.
Long waves were also recorded at Alicante, Clermont-Ferrand, De Bilt, Uccle, and Ivigtut.

Sept. 6d. Readings also at 0h. (Hungry Horse, Ottawa, near Christchurch, Wellington, Kaimata, Auckland, New Plymouth, Tuai, and near Obi-garm), 1h. (Klyuchi and Tucson), 3h. (Huancayo, Tacubaya, Tucson, near Lick, and near Nanking), 4h. (La Paz (2)), 5h. (Huancayo, La Paz, Tacubaya, Riverside, Tinemaha, Tucson, Boulder City, Pierce Ferry, and Hungry Horse), 6h. (Pasadena (2), Riverside, Tinemaha, Palomar, Tucson, Pierce Ferry, Honolulu, and near Apia), 10h. (Tucson, Andijan, Samarkand, near Murgab and Stalinabad), 11h. (Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson (2), Boulder City, Pierce Ferry, Hungry Horse, Mineral, Stuttgart, near Apia, and near Obi-garm), 12h. (Tchimkent, near Andijan, Murgab, Stalinabad, and near Zürich), 13h. (Huancayo, Tucson, Pierce Ferry, and near Andijan), 15h. (Mount Wilson, Palomar, Riverside, Tinemaha, Tucson, Boulder City, Pierce Ferry, near Pueblo, and Tacubaya), 18h. (Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Boulder City, Pierce Ferry, Hungry Horse, Lick, and Mineral), 19h. (Nanking, Hungry Horse, and near Lick), 20h. (Ksara and near Obi-garm), 21h. (Balboa Heights).

Sept. 7d. 4h. Near Samoa. May be repetition of shock at 17h. on Aug. 29d. Intensity II at Apia.
Apia iP = 32m.38s., S = 33m.12s.
Pasadena iPZ = 43m.14s.
Mount Wilson iPZ = 43m.15s.
Riverside iPZ = 43m.17s.
Haiwee ePZ = 43m.18s.
Palomar iPZ = 43m.18s.
Mineral iPZ = 43m.24s.
Boulder City eP = 43m.34s.
Pierce Ferry iP = 43m.35s.
Tucson iP = 43m.40s.a
Hungry Horse iP = 43m.41s.
Victoria e = 44m.44s.
Paris iPKP = 51m.27s.
Stuttgart eZ = 51m.27s.
Clermont-Ferrand iPKP = 51m.36s.
Manzanillo eE = 60m.54s., eN = 61m.5s., eE = 63m.5s., eN = 64m.12s.

Sept. 7d. 8h. 15m. 18s. Epicentre 36°·3N. 71°·0E. Depth of focus 0·025.
(as on 1948, June 27d.).

$A = +·2630$, $B = +·7638$, $C = +·5894$; $\delta = -5$; $h = 0$;
$D = +·946$, $E = -·326$; $G = +·192$, $H = +·557$, $K = -·808$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Kulyab		1·9	330	i 0 38	+ 1	—	—	—	—	—
Obi-garm		2·6	293	i 0 47?	+ 2	—	—	—	—	—
Stalinabad		2·9	322	i 0 48	− 1	i 1 22	− 4	—	—	—
Murgab		3·1	47	0 55	+ 4	—	—	—	—	—
Andijan		4·6	14	1 10?	0	i 2 1	− 3	—	—	—
Samarkand		4·6	319	i 1 11	+ 1	i 2 1	− 3	—	—	—
Tashkent		5·2	347	i 1 17	− 1	i 2 11	− 7	—	—	—
Tchimkent		6·1	351	i 1 28	− 1	i 2 30	− 9	—	—	—
Frunse		7·1	22	i 1 43	+ 1	i 2 58	− 4	—	—	—
Almata		8·3	32	1 59	+ 1	—	—	—	—	—
Dehra Dun	N.	8·4	133	e 7 18	?	—	—	—	—	—
Ashkabad		10·2	283	e 2 22	− 1	i 4 15	0	—	—	—
Semipalatinsk		15·6	22	e 3 31	0	i 6 24	+ 6	—	—	—
Baku		17·0	290	e 3 51	+ 3	—	—	—	—	—
Bombay		17·4	174	i 3 57	+ 5	i 7 8	+10	—	—	—
Hyderabad	N.	19·9	159	4 18	0	7 59	+12	i 5 19	PPP	—
Calcutta	N.	20·4	127	e 5 4	PPP	i 8 46	+50	—	—	—
Grozny		20·6	299	i 4 26	+ 1	—	—	—	—	—
Erevan		21·1	288	e 4 37	+ 7	—	—	—	—	—
Leninakan		21·6	292	e 4 38	+ 3	—	—	—	—	—
Sverdlovsk		21·7	345	i 4 37	+ 1	i 8 18	− 1	i 5 37	sP	—
Piatigorsk		22·6	300	i 4 46	+ 1	—	—	—	—	—
Sotchi		25·0	298	e 5 6	− 2	—	—	—	—	—
Kodaikanal	E.	26·6	166	e 6 32	+70	e 8 42	−59	e 10 46	sS	—
Theodosia		28·2	299	5 42	+ 5	—	—	—	—	—
Ksara		28·8	275	5 42	0	10 5	−11	6 25	pP	—
Yalta		29·0	297	5 45	+ 1	10 12	− 8	—	—	—
Moscow		29·8	321	5 51	0	i 10 32	0	e 6 31	pP	—
Colombo	E.	30·4	163	e 6 58	+62	e 12 32	?	—	—	—
Istanbul		32·8	292	i 6 15	− 2	e 11 19	0	—	—	—
Helwan		33·7	270	i 6 24a	− 1	11 32	− 1	i 7 8	pP	—
Bucharest		34·8	297	e 6 24	−10	e 15 30	?	—	—	—
Helsinki		37·7	325	e 6 58	− 1	e 12 33	− 1	e 13 46	sS	—
Warsaw		38·3	311	e 7 4a	+ 1	e 12 43	0	e 7 46	pP	—
Belgrade		38·8	298	e 7 8k	0	e 12 56	+ 5	e 7 50	pP	—
Budapest		39·6	303	7 16	+ 2	13 2	0	—	—	16·2
Kalossa		39·7	302	e 7 19	+ 4	e 12 53	−11	e 8 58	PP	—
Raciborzu		40·1	308	e 7 12	− 6	—	—	e 8 55	PP	—
Upsala		41·2	322	i 7 25a	− 2	i 13 26	0	i 8 10	pP	—
Prague		42·5	308	e 7 37	− 1	e 13 47	+ 2	e 8 22	pP	—
Collmberg		43·2	310	i 7 47	+ 3	—	—	i 8 39	pP	—
Potsdam		43·2	311	e 7 42	− 2	e 13 56	+ 1	e 17 18	SS	—
Triest		43·3	301	i 7 44	0	i 13 57	0	i 8 29	pP	—
Copenhagen		43·6	315	i 7 47a	0	i 14 1	0	i 8 30	pP	—
Jena	E.	44·2	308	e 7 53	+ 1	e 14 10	0	—	—	—
Rome		45·0	296	i 7 58a	0	i 14 22	+ 1	i 8 41	pP	—
Bologna		45·3	300	e 8 2	+ 2	—	—	e 8 45	pP	—
Salo		45·6	301	i 8 3	0	i 14 33	+ 3	i 8 47	pP	—
Stuttgart		46·0	306	i 8 6a	0	e 14 32	− 3	e 8 50k	pP	—
Chur		46·1	304	e 8 6	− 1	—	—	—	—	—
Vladivostok		46·4	62	i 8 9	0	—	—	—	—	—
Zürich		46·6	304	e 8 13	+ 3	—	—	e 11 7	PPP	—
Pavia	Z.	46·7	302	e 8 11	0	—	—	—	—	—
Basle		47·3	304	e 8 15a	− 1	—	—	e 8 58	pP	—
De Bilt		48·1	312	i 8 22a	0	i 15 8	+ 3	i 9 4	pP	e 24·7

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Uccle		48·8	310	e 8 27a	0	e 15 15	0	e 16 18	sS	—
Paris		50·4	307	i 8 38	− 2	i 15 39	+ 2	i 9 24	pP	e 30·7
Clermont-Ferrand		50·7	303	i 8 42	0	e 15 42?	+ 1	i 8 57	pP	19·7
Kew		51·6	312	i 8 48	− 1	i 15 52	− 1	i 9 31	pP	e 24·7
Tortosa		54·0	298	9 6	0	16 27	+ 1	10 17	pP	—
Alicante		55·5	296	e 9 11	− 6	e 17 21	+36	10 5	PcP	27·6
Scoresby Sund		57·2	337	—	—	17 17	+ 9	18 37	sS	—
Toledo	z.	57·5	298	i 9 31	0	—	—	i 10 16	pP	—
Tamanrasset		57·6	277	i 9 32a	0	e 17 18	+ 5	i 10 8a	pP	—
Granada		58·3	295	9 34k	− 3	14 15	PcS	9 55	pP	—
Ivigtut		71·0	334	—	—	i 19 59	+ 1	—	—	—
Sitka		84·4	13	—	—	e 23 20	+60	e 27 58	SS	e 36·1
Seven Falls	E.	90·2	335	—	—	(22 48)	[− 3]	—	—	22·8
Shawinigan Falls	N.	91·3	336	e 12 47	+ 2	—	—	—	—	—
Ville Marie		92·6	341	i 12 51	0	—	—	e 13 39	pP	—
Temiskaming		93·1	340	i 12 53	0	—	—	e 13 41	pP	—
Ottawa		93·3	336	i 12 55	+ 1	e 23 6	[− 2]	e 25 6	SP	38·7
Harvard		94·5	333	i 12 59	− 1	e 25 7	pS	—	—	—
Victoria		94·7	9	i 13 0	0	(23 12)	[− 4]	—	—	23·2
Hungry Horse		95·6	4	i 13 19	+14	—	—	—	—	—
Grand Coulee		95·7	8	e 13 6	+ 1	—	—	—	—	—
Philadelphia		98·0	334	—	—	e 24 34	+12	e 28 2	?	e 41·4
Chicago		99·8	345	—	—	e 23 42	[0]	e 26 6	SP	e 44·4
Mineral	z.	102·9	10	e 13 40	+ 3	—	—	i 17 39	PP	—
Tinemaha	z.	106·5	7	e 13 56	P	—	—	i 18 19	PP	—
Haiwee	z.	107·5	7	e 18 9	[+ 6]	—	—	e 18 32	PP	—
Pierce Ferry		107·8	4	e 13 59	P	—	—	e 18 12	PKP	—
Boulder City		107·9	5	e 17 6	?	—	—	e 18 14	PKP	—
Mount Wilson	z.	109·3	7	e 15 11	pP	—	—	e 18 8	PKP	—
Pasadena	z.	109·4	7	e 18 9	[+ 2]	—	—	i 18 39	PP	—
Riverside	z.	109·6	7	e 18 11	[+ 4]	—	—	—	—	—
Palomar	z.	110·5	6	i 18 26	PP	—	—	i 18 50	pPP	—
Tucson		111·8	1	e 14 20?	P	—	—	e 18 15	PKP	—
La Paz		138·8	288	e 19 13	[+10]	—	—	i 22 19	PP	—

Additional readings:—
Dehra Dun eN = 7m.57s., iN = 8m.48s., eN = 9m.0s.
Bombay ePE = 4m.0s., iN = 4m.45s.
Helwan PP = 7m.50s., PcP = 8m.52s.
Helsinki epP = 8m.1s., ePP = 8m.24s., e = 9m.4s., 9m.23s., and 14m.47s.
Warsaw eZ = 8m.8s., ePPPZ = 8m.37s., ePPPN = 8m.41s., ePcPNZ = 9m.32s., eSE = 12m.46s., eEZ = 13m.55s., eSSN = 15m.26s., eSSZ = 15m.29s., eSSSZ = 15m.48s., eSSSN = 15m.57s.
Belgrade e = 8m.35s. and 9m.52s.
Budapest iE = 8m.24s. and 10m.1s., eN = 10m.16s.
Kalossa eN = 8m.51s., eE = 10m.13s.
Raciborzu eNZ = 10m.5s., 11m.12s.? and 19m.12s.?
Upsala isPE = 8m.30s., iPPE = 9m.11s., iE = 9m.29s., iPPPE = 10m.4s., isPPN = 10m.20s., iN = 15m.54s. and 16m.16s., eE = 16m.22s., iN = 16m.32s., SSE = 16m.44s., eN = 17m.16s.
Prague ePPE = 9m.2s., ePPZ = 9m.36s., e = 10m.12s., eNZ = 10m.54s., eEN = 12m.18s., e = 15m.0s., eSS = 17m.12s., eEN = 19m.12s., eN = 19m.54s., and 21m.59s., eEN = 24m.12s., eN = 25m.48s., eEN = 27m.42s.
Collmberg iEZ = 9m.32s., iPPEZ = 9m.47s., iEZ = 10m.42s. and 11m.48s., esSSZ = 19m.28s.
Potsdam iPPPE = 10m.30s., ePPPN = 10m.33s.
Triest esP = 8m.45s., iPP = 9m.34s., iPPP = 10m.29s., isS = 15m.10s., eSS = 17m.20s.
Copenhagen 8m.51s., 9m.31s., 10m.24s., sS = 15m.14s., SS = 17m.10s. and 17m.34s.
Rome ePP = 10m.44s., e = 11m.24s. and 12m.42s., eSZ = 14m.28s., esSSE = 15m.39s., esSSZ = 15m.44s., eZ = 19m.7s.
Stuttgart e = 9m.10s., eZ = 10m.33s. and 13m.12s., e = 15m.56s., 18m.12s. and 19m.1s.
Basle e = 10m.10s.
De Bilt iZ = 9m.44s., epPP = 10m.56s., esS = 16m.35s., e = 18m.42s.
Uccle ePPP?E = 11m.6s., iS?N = 15m.18s., eSS?E = 18m.0s., eSSS? = 19m.6s.
Paris iPcP? = 8m.59s., isP? = 9m.43s., iPP? = 11m.18s., eS? = 17m.12s., e = 19m.42s.?
Clermont-Ferrand isP = 9m.46s., i = 16m.59s. and 17m.20s.
Kew iZ = 9m.52s., iEZ = 11m.47s., eN = 20m.4s. and 20m.24s.
Tortosa PcPN = 10m.4s., PPN = 11m.14s., sPcS?N = 15m.36s., ScSE = 18m.32s.
Alicante PP = 11m.19s., PPP = 12m.53s., PcS = 13m.57s., PPP = 18m.3s., ScS = 19m.21s., SS = 21m.23s., SSS = 23m.37s.

Continued on next page.

Toledo iZ = 9m.54s., ePPZ = 12m.9s.
Tamanrasset iP_cP = 10m.3s., esP = 10m.20s.
Granada P_cP = 10m.16s., pP_cP = 10m.36s., PPP = 13m.46s.
Ottawa e = 30m.18s.
Harvard e = 15m.42s., iPP = 16m.45s., epPP = 17m.33s.
Mineral iZ = 18m.41s.
Tinemaha eZ = 15m.39s. and 17m.17s.
Pierce Ferry $ePKP_2$? = 17m.10s.
Boulder City ePP = 18m.56s.
Mount Wilson iPPZ = 18m.38s., epPPZ = 19m.27s., ePKKPZ = 29m.17s.
Pasadena epPPZ = 19m.23s.
Palomar eZ = 19m.32s., iPKKPZ = 29m.14s.
Tucson iPP = 18m.49s., ipPP = 19m.50s., i = 20m.4s., iPKKP = 29m.7s., i = 29m.17s.

Sept. 7d. 15h. Undetermined shock.

Grozny eP = 28m.37s., eS = 32m.18s.
Erevan eP = 28m.45s.
Sotchi iP = 28m.49s.
Kulyab P = 31m.13s.
Stalinabad eP = 31m.20s.
Murgab P = 31m.36s.?
Samarkand eP = 31m.38s.
Andijan eP = 32m.0s.
Tashkent eP = 32m.19s.
Frunse eP = 32m.37s.
Hyderabad eN = 35m.58s.
Calcutta eE = 37m.26s., iE = 40m.8s.
Stuttgart eZ = 38m.3s.
Ksara P = 38m.8s.?, S = 42m.29s.?
Istanbul e = 43m.18s. and 50m.48s.
Kew e = 55m.

Sept. 7d. Readings also at 1h. (near Lick), 4h. (near Mineral), 5h. (Samarkand, Tchimkent, near Kulyab, Obi-garm, Murgab, and Stalinabad), 8h. (near Basle, Zürich, and Stuttgart), 10h. (Stuttgart, near Murgab, Andijan (2), Kulyab (2), Stalinabad (2), Tashkent, Almata, and Frunse), 11h. (near Lick), 14h. (near Stalinabad, Andijan, and Obi-garm), 16h. (Hungry Horse), 18h. (Apia), 19h. (near Hungry Horse), 21h. (Ottawa, Hungry Horse (2), Tucson (2), and near Irkutsk), 22h. (Ottawa, Hungry Horse, Pierce Ferry, Rome, De Bilt, Granada, Clermont-Ferrand, Tamanrasset, and Ivigtut), 23h. (Tashkent, Andijan, near Kulyab, Stalinabad, Obi-garm, and Samarkand).

Sept. 8d. 11h. 18m. 11s. Epicentre 33°·2N. 59°·0E. (as on 1948, March 14d.).

$A = +\cdot4319$, $B = +\cdot7187$, $C = +\cdot5450$; $\delta = +9$; $h = +1$;
$D = +\cdot857$, $E = -\cdot515$; $G = +\cdot281$, $H = +\cdot467$, $K = -\cdot838$.

	△	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Samarkand	9·1	43	e 2 15	+ 1	—	—
Stalinabad	9·6	53	e 2 21	0	—	—
Baku	10·2	317	e 3 10?	+39	—	—
Tashkent	11·5	42	e 2 48	0	e 4 47?	−12
Tchimkent	12·3	40	e 2 59?	0	—	—
Andijan	13·1	51	e 3 4	− 6	—	—
Frunse	15·6	47	e 3 41	− 2	e 6 21	−16
Almata	17·3	48	e 7 8	S	(e 7 8)	− 8
Ksara	19·3	276	e 4 43?	+14	e 8 33	+31
Sverdlovsk	23·7	2	e 5 16	+ 2	9 32	+ 5
Moscow	27·0	333	e 5 49	+ 4	—	—

Sept. 8d. 15h. 9m. 11s. Epicentre 21°·0S. 174°·0W. (as on 1948, Feb. 4d.).

Intensity VI Tonga ; IV at Apia and in the Isle of Niue. Tsunami at Pogo Pogo, in Samoa, and as far as Hawaii. This determination is not intended as approximate.

Seismological Bulletin of Apia, Samoa.

$A = -·9293$, $B = -·0977$, $C = -·3563$; $\delta = +9$; $h = +4$;
$D = -·105$, $E = +·995$; $G = +·354$, $H = +·037$, $K = -·934$.

		Δ	Az.	P.	O−C,	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		7·4	16	i 1 47	− 5	i 3 2?	−16	—	—	—
Auckland	N.	18·6	209	4 45	+24	8 9	+23	—	—	—
Arapuni	E.	19·2	205	4 37	+ 9	7 55	− 4	—	—	—
Tuai	N.	19·3	201	4 30	+ 1	i 7 54	− 8	—	—	—
New Plymouth	E.	20·7	206	4 49	+ 5	8 27	− 4	—	—	9·2
Wellington		22·3	204	4 56	− 5	8 52	−10	—	—	16·3
Kaimata		24·7	207	5 21	− 3	9 42	− 2	i 5 53	PP	11·3
Christchurch		25·1	203	5 26	− 2	9 48	− 3	—	—	—
Brisbane		30·7	251	i 6 13	− 6	e 11 8	−13	i 7 6	PP	i 14·5
Riverview		33·7	240	i 6 40a	− 5	i 11 57	−11	i 6 50	pP	e 14·4
Honolulu		44·9	22	e 8 20	+ 2	i 14 56	0	i 18 14	ScS	i 18·3
Guam		53·1	306	i 9 19	− 2	—	—	i 11 42	PP	—
Perth		62·8	244	10 39	+ 9	18 56	− 2	19 23	PS	26·0
Mera		70·8	322	11 26	+ 6	—	—	—	—	—
Yokohama		71·3	322	11 22	− 1	20 46	+ 5	—	—	31·7
Tokyo		71·4	322	i 11 26	+ 2	21 12	+30	—	—	—
Kakioka		71·5	323	11 24	0	20 40	− 3	—	—	—
Misima		71·5	321	11 24	0	20 46	+ 3	—	—	—
Omaesaki		71·5	321	e 11 21	− 3	—	—	—	—	—
Shizuoka		71·7	321	i 11 26	0	20 49	+ 4	—	—	28·1
Hunatu		71·8	322	11 25	− 1	20 45	− 1	—	—	—
Utunomiya		71·9	323	e 11 24	− 3	20 51	+ 3	—	—	—
Maebasi		72·3	322	11 28	− 1	20 57	+ 5	—	—	—
Siomisaki		72·3	318	11 28	− 1	20 57	+ 5	12 29	pP	22·8
Owase		72·4	319	11 25	− 5	20 59	+ 6	—	—	32·6
Sendai		72·6	325	11 30	− 1	21 16	+20	—	—	26·8
Mizusawa	E.	73·1	326	11 35	+ 1	21 5	+ 4	—	—	—
Hikone		73·2	320	11 48	+13	21 18	+16	—	—	—
Kobe		73·5	318	e 11 38	+ 2	21 5	− 1	—	—	—
Toyama		73·6	321	11 38	+ 1	21 9	+ 2	—	—	—
Toyooka		74·2	318	11 39	− 1	21 13	− 1	15 3	PP	31·4
Wazima		74·2	322	e 11 43	+ 3	21 15	+ 1	—	—	e 32·4
Aomori		74·5	327	e 11 41	− 1	—	—	—	—	34·7
Matuyama		74·5	316	e 11 40	− 2	21 19	+ 2	—	—	—
Kumamoto		75·2	314	11 47	+ 1	21 33	+ 8	—	—	34·5
Mori		75·5	328	11 49	+ 1	21 34	+ 6	—	—	35·0
Santa Barbara		75·5	44	i 11 48k	0	i 21 28	0	e 39 15	P′P′	—
Hamada		75·6	316	11 49	+ 1	21 32	+ 3	—	—	—
Sapporo		75·8	328	11 49	− 1	21 27	− 4	—	—	34·0
San Francisco		75·9	40	e 11 51	+ 1	e 21 33	+ 1	—	—	e 30·7
Santa Clara		76·0	40	e 11 52	+ 1	i 21 29	− 5	—	—	e 31·2
Berkeley		76·1	40	i 11 50	− 1	e 21 35	0	i 14 29	PP	e 32·1
Lick		76·1	40	i 11 51k	0	e 21 33	− 2	e 30 49?	PKKP	e 33·8
Pasadena		76·3	45	i 11 51k	− 1	i 21 36	− 1	i 31 26	PKKP	—
Ukiah		76·4	38	e 12 3	+10	i 21 45	+ 7	e 15 3	PP	e 31·5
Mount Wilson		76·5	45	i 11 52k	− 2	e 21 40	+ 1	i 31 36	PKKP	—
Palomar		76·7	46	i 11 54k	− 1	e 21 45	+ 4	i 31 7	PKKP	—
Ferndale	E.	76·7	37	i 12 17	+22	e 21 47	+ 6	e 22 18	PS	e 37·8
	N.	76·7	37	e 12 0	+ 5	e 21 38	− 3	e 22 36	PPS	e 37·8
Riverside		76·8	45	i 11 53k	− 2	i 21 41	− 1	e 39 11	P′P′	—
Fresno	N.	76·9	42	e 11 55	− 1	i 21 45	+ 2	—	—	e 33·9
Arcata	Z.	77·1	38	i 11 59	+ 2	e 22 2	+16	i 12 10	PcP	e 37·2
Haiwee		77·7	44	i 12 0k	0	i 21 48	− 4	e 39 7	P′P′	—
Tinemaha		78·1	43	i 12 2k	0	i 22 2	+ 6	e 39 14	P′P′	—
Mineral		78·1	38	i 12 0k	− 2	e 21 56	0	e 26 59	SS	e 34·8

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Manzanillo		79·0	64	e 11 1	−66	e 23 52	PPS	—	—	e 38·2
Boulder City		79·6	46	i 12 10	0	e 22 12	0	e 39 2	P′P′	—
Klyuchi		79·9	346	(e 12 19)	+ 7	(e 22 19)	+ 3	—	—	—
Pierce Ferry		80·3	46	i 12 10	− 4	i 22 19	− 1	e 38 59	P′P′	—
Tucson		80·3	50	e 12 14k	0	e 22 19	− 1	i 39 14	P′P′	—
Guadalajara	N.	80·5	63	—	—	e 23 25	+63	—	—	e 36·0
Vladivostok		80·9	323	i 12 17	0	i 22 25	− 1	i 12 23	PcP	—
Victoria		82·6	32	e 12 26	0	22 37	− 6	15 36	PP	38·1
Nanking		83·1	308	i 12 28	− 1	i 22 52	+ 4	i 12 39	PcP	35·9
Salt Lake City		84·3	43	e 12 35	0	i 22 59	− 1	e 16 14	PP	i 34·9
Grand Coulee		84·5	33	i 12 35	− 1	e 23 1	− 1	e 16 27	PP	—
Vera Cruz		86·0	68	(e 12 34)	− 9	(e 22 52)	[−15]	—	—	(e 39·8)
Hungry Horse		87·3	36	e 12 47	− 3	e 23 8	[− 8]	—	—	—
Bozeman		87·5	39	e 12 52	+ 1	i 23 16	[− 1]	i 16 12	PP	e 35·9
Merida		92·4	69	e 13 1	−13	e 23 29	[−18]	—	—	e 42·5
Saskatoon		93·4	35	13 22	+ 4	23 55	[+ 3]	17 13	PP	45·3
Huancayo		93·7	104	e 13 22	+ 2	e 23 57	[+ 3]	e 17 5	PP	e 38·2
Lincoln	E.	94·4	48	e 12 59?	−24	—	—	—	—	—
Montezuma		95·1	117	—	—	e 24 5	[+ 3]	e 25 36	PS	—
Balboa Heights		97·3	83	e 13 34	− 2	e 23 58	[−15]	—	—	—
La Plata	E.	97·7	133	13 49	+11	24 8	[− 7]	17 41	PP	45·0
	N.	97·7	133	13 37	− 1	24 21	[+ 6]	18 35	PP	45·6
St. Louis		98·2	52	i 13 39	− 1	i 24 45	{+ 4}	i 17 34	PP	—
La Paz		98·3	112	i 13 43	+ 2	i 24 25	[+ 6]	i 14 4a	pP	40·8
Bogota	Z.	100·9	89	e 14 13	+21	—	—	e 17 58	PP	—
Chicago		101·1	49	e 13 52	− 1	i 24 24	[− 8]	e 17 56	PP	e 42·6
Irkutsk		101·4	322	i 13 55	0	24 36	[+ 2]	e 17 45	PP	—
Calcutta	E.	104·5	289	14 11	+ 3	i 24 46	[− 2]	i 18 26	PP	50·4
Cleveland		105·4	51	e 14 15	+ 2	i 24 48	[− 4]	e 18 4	PKP	—
New Kensington	E.	106·5	52	e 14 34	+17	i 25 0	[+ 3]	e 18 0	PP	e 44·6
Colombo	E.	107·5	271	e 14 10	P	e 25 5	[+ 3]	28 22	PS	e 61·8
Pennsylvania	Z.	107·9	52	e 18 49	PP	i 28 21	PS	i 21 37	PPP	—
Georgetown		108·1	54	e 14 24	P	i 26 36	S	i 18 53	PP	—
Temiskaming		108·7	46	e 14 36	P	i 28 25	PS	e 18 0	PKP	50·8
Philadelphia		109·8	54	e 14 19	P	i 24 58	[−13]	e 18 21	PKP	e 44·5
Ottawa		110·4	48	14 38	P	24 59	[−15]	19 9	PP	50·8
Kodaikanal	E.	110·8	274	14 39	P	e 25 5	[−10]	19 16	PP	46·9
Fordham		110·9	53	e 14 37	P	i 27 1	?	i 19 13	PP	—
Hyderabad	N.	112·0	282	e 14 48	P	25 25	[+ 5]	19 17	PP	45·2
Shawinigan Falls	N.	112·6	47	e 15 26	?	e 28 58	PS	e 18 51	PKP	—
Harvard		112·9	51	e 15 0	P	e 27 14	S	e 18 37	PKP	e 52·8
Seven Falls	E.	113·9	47	14 56	P	25 37	[+ 9]	19 35	PP	53·3
Dehra Dun	N.	115·3	295	e 18 9	?	e 26 51	{+ 9}	i 22 47	PPP	i 64·8
Fort de France		116·2	84	e 18 52	[+ 7]	e 29 40	PS	e 19 50	PP	—
Bermuda		116·8	64	e 15 9	P	i 25 45	[+ 6]	i 19 59	PP	e 48·2
Bombay		117·6	281	e 20 3	PP	i 25 50	[+ 8]	i 29 48	PS	50·8
Almata		117·8	310	19 1	[+13]	—	—	—	—	—
Halifax		118·8	50	15 21	P	25 49	[+ 3]	20 11	PP	56·1
Andijan		121·1	306	e 18 55	[0]	26 0	[+ 6]	—	—	—
Tananarive		123·2	228	e 19 16	[+17]	25 57	[− 3]	20 37	PP	58·5
Tchimkent		123·2	308	i 19 7	[+ 8]	26 1	[+ 1]	—	—	—
Tashkent		123·4	307	i 18 58	[− 1]	i 26 9	[+ 8]	e 20 28	PP	—
Ivigtut		125·2	29	i 19 9	[+ 6]	30 49	PS	i 37 46	SS	51·8
Sverdlovsk		126·5	327	e 15 47	P	i 26 15	[+ 5]	i 19 5	PKP	—
Scoresby Sund		127·8	12	16 2	P	25 59	[−15]	19 8	PKP	—
Johannesburg		128·5	206	e 21 19	PP	e 28 19	{+ 9}	e 22 31	PKS	e 53·8
Ashkabad		132·0	303	e 19 11	[− 5]	i 22 46	PKS	i 21 41	PP	—
Reykjavik	N.	133·0	17	e 22 9	PP	e 28 19	{−19}	i 22 24	PKS	e 63·6
Baku		138·1	308	19 31?	[+ 4]	—	—	e 22 12?	PP	—
Moscow		138·1	334	e 16 45	P	29 8	{− 2}	e 19 16	PKP	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Helsinki		138·6	347	e 19 19	[− 9]	e 32 25	PS	e 22 19	PP	e 54·8
Upsala		140·3	353	19 20	[−11]	26 40	[0]	22 28	PP	e 55·8
Piatigorsk		141·7	317	19 37	[+ 4]	—	—	22 53	PP	—
Leninakan		142·4	311	e 19 38?	[+ 3]	—	—	—	—	—
Aberdeen		143·4	8	i 19 47	[+11]	i 26 40	[− 4]	i 23 20	PKS	71·6
Edinburgh		144·5	10	19 40	[+ 2]	26 46	[0]	41 34	SS	—
Copenhagen		145·0	355	i 19 39a	[0]	26 49	[+ 2]	22 51	PP	—
Durham		145·8	8	i 20 42	?	i 20 57	?	i 41 53	SS	—
Theodosia		146·0	323	19 43	[+ 2]	—	—	—	—	—
Simferopol		146·7	324	i 19 47	[+ 5]	e 30 5	{+ 5}	—	—	—
Warsaw		146·7	345	i 19 43	[+ 1]	29 43	{−17}	i 23 5	PP	e 58·8
Potsdam		148·2	353	e 19 48	[+ 3]	i 30 12	{+ 4}	i 19 59	PKP_2	e 59·8
De Bilt		149·0	2	i 19 47	[+ 1]	i 42 19	SS	i 26 57	PPP	e 78·8
Kew		149·2	8	i 19 48	[+ 2]	e 33 38	PSKS	i 20 23	PKP_2	e 68·8
Collmberg		149·3	352	e 19 49	[+ 3]	e 29 35	{−39}	i 20 27	PKP_2	e 62·8
Raciborzu		149·4	346	e 19 56	[+10]	e 30 40	{+25}	e 27 4	PPP	e 65·8
Jena		149·8	354	e 19 53	[+ 6]	e 31 3	{+46}	e 23 21	PP	e 61·3
Prague		150·2	351	e 19 50	[+ 2]	e 27 20	[+26]	e 22 58	PP	e 58·8
Uccle		150·3	4	i 19 50a	[+ 2]	e 26 37?	[−17]	e 23 6	PKS	—
Cheb		150·6	354	e 19 57	[+ 9]	e 33 50	SKSP	e 23 51	PKS	e 77·8
Ksara		150·7	302	i 19 50a	[+ 2]	—	—	e 35 12?	PS	—
Jersey		151·1	13	e 19 58a	[+ 9]	—	—	e 23 49	PP	—
Campulung		151·2	333	e 20 0	[+11]	—	—	—	—	43·8
Bucharest		151·3	331	e 20 1	[+12]	i 26 43	[−12]	i 23 55	PKS	43·8
Budapest	N.	151·5	343	19 58	[+ 8]	i 26 59	[+ 3]	e 33 52	PS	64·3
Istanbul		152·0	323	20 3	[+13]	—	—	23 33	PP	—
Stuttgart		152·2	356	i 19 51a	[0]	e 33 49	PSKS	e 23 39	PP	e 59·8
Kalossa		152·4	343	20 3	[+12]	—	—	—	—	e 67·3
Strasbourg		152·4	358	i 19 52	[+ 1]	i 26 52	[− 5]	i 23 50	PP	—
Paris		152·8	5	e 19 53	[+ 1]	i 42 13	SS	e 23 26	PKS	e 72·8
Belgrade		153·4	336	e 19 53k	[+ 1]	i 33 59	PS	i 23 54	PP	e 76·4
Basle		153·5	0	e 19 54a	[+ 1]	—	—	e 23 53	PP	—
Zürich		153·6	359	e 19 53a	[0]	e 43 14	SS	e 23 52	PP	—
Chur		154·1	356	e 19 54	[+ 1]	—	—	e 23 55	PP	—
Neuchatel		154·1	0	e 19 55	[+ 2]	e 30 50	{+ 9}	—	—	—
Triest		154·6	350	i 19 55a	[+ 1]	i 30 42	{− 2}	i 20 22	PKP_2	—
Clermont-Ferrand		155·2	6	i 19 57	[+ 2]	i 43 44	SS	i 20 17	PKP_2	—
Salo		155·2	354	19 55a	[0]	i 30 50	{+ 3}	i 20 23	PKP_2	e 64·8
Helwan		155·5	296	i 19 56a	[+ 1]	30 49	{ 0}	20 28	PKP_2	—
Pavia		155·8	356	e 20 15a	PKP_2	—	—	e 24 16	PP	e 65·9
Padova		156·1	352	19 49?	[− 7]	29 33?	{−79}	20 17?	PKP_2	—
Bologna		156·2	353	e 19 59a	[+ 3]	e 26 48	[−13]	i 20 34	PKP_2	e 72·6
Lisbon		158·0	34	i 20 1a	[+ 2]	27 19	[+16]	i 20 45k	PKP_2	76·8
Taranto		158·4	339	e 20 17	[+18]	—	—	—	—	e 69·4
Rome		158·5	349	i 19 59a	[0]	i 31 18	{+13}	e 24 25	PP	e 75·0
Toledo	Z.	159·3	23	i 20 2	[+ 2]	i 27 0	[− 4]	i 24 30	PP	73·8
Barcelona		159·4	10	e 20 8	[+ 8]	(e 49 21)	SSS	24 38	PP	e 49·4
Tortosa		159·7	13	i 20 5	[+ 5]	31 10	{ 0}	23 44	PKS	75·0
Messina		161·0	341	e 20 15	[+13]	—	—	—	—	—
Alicante		161·8	18	20 3	[0]	27 29	[+23]	20 43	PKP_2	e 74·9
Catania		161·8	338	e 20 4	[+ 1]	—	—	e 24 49	PP	—
Granada		161·8	27	i 20 15k	[+12]	i 26 51	[−15]	20 22	pPKP	i 76·2
Tamanrasset		178·2	—	i 20 15	[+ 3]	e 47 52	SS	i 25 59a	PP	—

Additional readings :—
Arapuni iE = 8m.43s.
Tuai SN = 7m.47s.
Kaimata i = 7m.56s.
Christchurch iEZ = 9m.56s.
Brisbane iPPZ = 7m.9s., iPP?E = 7m.16s., iSSE = 12m.26s.
Riverview iE = 7m.4s., iN = 7m.12s., iE = 7m.57s., iN = 8m.26s., iE = 8m.29s. and 8m.58s., iN = 9m.7s., iE = 9m.50s., iSE = 11m.54s., iN = 12m.36s., eQN = 13m.49s., eSSS?E = 14m.19s.
Guam iPPP = 12m.15s.

Continued on next page.

Siomisaki PcP =11m.51s., PP =13m.31s.
Mizusawa PN =11m.38s.
Toyooka L =24m.10s.
San Francisco iN =12m.7s., eSE =21m.38s.
Berkeley iEN =12m.11s. and 12m.31s., iN =14m.48s., iZ =14m.53s., eE =22m.20s., iE =25m.1s., eE =31m.13s.
Lick iN =11m.57s., eSZ =21m.38s.
Pasadena iZ =12m.2s., iN =23m.55s. and 25m.55s., Q =29m.54s., iPKP,PKP =39m.22s.
Ukiah i =13m.5s. and 21m.55s., iS_cS =22m.35s., i =24m.7s., iSS =27m.5s., eSSS =30m.31s.
Mount Wilson ePKP,PKP =39m.5s.
Palomar ePKP,PKP =39m.10s.
Ferndale eE =31m.4s., eN =33m.49s.?, eE =33m.53s.
Mineral eN =12m.3s., iN =12m.23s., eZ =21m.38s.
Manzanillo eN =11m.4s., eE =38m.4s.
Klyuchi readings have been increased by 6m.
Tucson iS =22m.23s., i =22m.29s.
Guadalajara eE =23m.29s.
Vladivostok iPP =15m.19s., S_cS =22m.32s., iPS =23m.6s.
Victoria i =12m.29s., iZ =13m.33s., e =22m.55s., PS =23m.27s., SS =27m.35s.
Nanking i =14m.3s., PS =23m.33s.
Salt Lake City i =13m.14s. and 14m.22s., iS_cS =23m.31s., iPS? =23m.54s., iPPS =24m.52s., iSS =28m.38s., iSSS =32m.14s.
Grand Coulee ePKKP =30m.48s., ePKP,PKP =38m.55s.
Vera Cruz eN =(12m.37s.), readings have been increased by 2m.
Bozeman iP =13m.5s., i =13m.32s., ePPP =18m.15s., iSS =28m.48s., eSSS =32m.40s.
Merida eN =23m.34s.
Saskatoon i =13m.55s. and 14m.16s., PPP =19m.28s., SKKS =24m.24s., S =24m.52s., PS =26m.9s., PPS =26m.52s., SS =30m.49s., SSS =34m.25s.
Huancayo eSS? =30m.53s.
La Plata N =17m.1s., PSEN =26m.41s., SSE =31m.25s., SSN =32m.9s., SSSE =40m.33s., SSSN =40m.44s., QN =42m.48s.
St. Louis i =14m.3s. and 18m.1s., iPS =26m.41s., iPPS =27m.2s., iSSS =36m.15s.
La Paz isPZ =14m.21s., iPPZ =17m.25s., ipPPZ =17m.40s., iS? =25m.11s., iN =25m.42s., iPPSN =27m.31s., iSSN =32m.6s., iSSSN =36m.2s.
Chicago e =17m.28s., ePPP =19m.56s., iS =25m.32s., ePS =26m.58s., eSS =32m.20s., eSSS? =37m.20s.
Calcutta iSKKSE =25m.39s., iSE =26m.14s., iPPSE =28m.39s., iSSE =33m.34s.
Cleveland ePEN =14m.18s., eN =17m.41s., iPKPE =18m.8s., iPPZ =18m.31s., iPPE =18m.34s., iPPPE =20m.48s., iSE =26m.13s., iPSE =27m.43s.
New Kensington iPSE =27m.56s., eSSE =33m.24s., eSSS?E =38m.37s.
Colombo eE =34m.35s., iE =44m.50s.
Pennsylvania iZ =19m.48s., iSSZ =34m.11s.
Georgetown iPKP =17m.55s., i =25m.9s., ePS =28m.14s., eSS =34m.19s.
Temiskaming i =28m.51s.
Philadelphia iPP =19m.9s., ePPP =20m.55s., iS =26m.45s., iPS =28m.27s., iSS =34m.13s., eSSS =37m.57s.
Ottawa i =20m.5s., S =26m.54s., PS =28m.39s., SS =34m.43s., SSS =38m.37s., e =45m.49s.?
Kodaikanal eE =18m.12s., PPSE =28m.27s., SSE =34m.2s.
Fordham i =15m.2s.
Hyderabad PSN =28m.51s., SSPN =34m.51s.
Shawinigan Falls eN =24m.52s., 27m.9s., and 33m.56s.
Harvard iPKP =19m.7s., ePS =28m.52s., ePPS =30m.1s., eSS =35m.1s., eQ =45·8m.
Seven Falls PPPE =21m.56s., SKKSE =26m.39s., SE =27m.29s., PSE =29m.13s., PPSE =30m.9s., SSE =35m.29s., SSSE =39m.49s.
Dehra Dun eN =45m.19s.
Bermuda e =15m.57s., i =27m.3s. and 27m.59s., iPS =29m.43s., iPPS =30m.57s., iSS =36m.5s., iPSPS? =36m.29s., iSSS =40m.35s., i =44m.5s.
Bombay ePSN =29m.51s., eSSN =36m.26s., iSSE =37m.2s., iSSSE =41m.49s.
Halifax i =21m.5s., SKP =21m.51s., PPP =22m.53s., SKKS =27m.9s., SE =28m.9s., PS =30m.3s., SS =36m.31s., SSS =40m.55s.
Tananarive PKKP =28m.45s., PS =30m.45s., SS =37m.27s., SSS =41m.36s., Q =51m.9s.
Tashkent SKKS =27m.28s., iSKSP =30m.0s.?
Ivigtut 20m.59s. and 23m.4s., i =29m.1s., 40m.43s.
Sverdlovsk PPP =23m.45s.
Scoresby Sund 21m.9s., 21m.34s., 22m.55s., 28m.31s., 28m.45s., 31m.25s., 32m.37s., 34m.37s., and 38m.10s.
Johannesburg eSSN =38m.43s.
Moscow PP =22m.6s., SKSP =32m.19s., PS =32m.40s., SS =40m.13s.
Helsinki e =19m.35s., 20m.1s., 22m.28s., 22m.44s., 23m.9s., 23m.23s., and 23m.37s., ePPP =25m.45s., ePcP,PKP =27m.48s., ePKKP =28m.40s., eSKSP =31m.54s., eS_cS,PKP =34m.54s., eSKKKS =37m.38s., e =39m.52s., eSS =40m.32s., e =45m.39s.
Upsala eE =20m.0s., iPKS =23m.8s., iPPPE =25m.24s., iPPPN =25m.36s., iSKKKS?N =29m.22s., iE =31m.42s., eN =31m.58s., iSKSP?E =32m.19s., eN =34m.10s. and 39m.48s.?, SSE =40m.48s.?, eSSSE =46m.1s.

Continued on next page.

Aberdeen iE =19m.1s., iPEN =20m.17s., iPPN =23m.54s., iPPPEN =27m.36s., iSKKSEN =31m.33s., iPSKSN =35m.20s., iPPSN =38m.30s., iSSE =44m.44s., iSSSN =50m.58s., and other unidentified phases.
Copenhagen 26m.14s., 26m.25s., 29m.49s., 30m.9s., 31m.31s., 33m.5s., 33m.57s., 35m.25s., and 41m.49s.
Edinburgh SSP =42m.16s.
Warsaw PPE =23m.9s., iPPN =23m.12s., ePPPE =26m.3s., iPPPN =26m.15s., iPPPZ =26m.20s., PKKPN =28m.30s., PKKPZ =28m.34s., SKKSE =29m.27s., PKKSN =30m.59s., iPSN =33m.18s., iPSE =33m.42s., PSZ =33m.47s., ePPSN = 35m.9s., PPSE =35m.30s., SSEZ =42m.1s., SSN =42m.6s., SSSZ =46m.50s., SSSE =47m.1s., eSSSN =47m.4s., and many other unidentified i readings.
Potsdam iE =21m.32s. and 22m.39s., eSKSP?N =33m.54s., ePPSN =36m.3s., eN = 38m.48s., eE =41m.49s.?, eSSSE =47m.49s.?
Kew iPP =23m.12s., eEN =33m.56s., eSSE =42m.26s., eSSPE =43m.50s., eSSSN = 45m.28s., eEN =48m.12s., eE =61m.28s.
Collmberg iEZ =19m.56s., 20m.8s., 20m.47s., 21m.6s., 21m.45s., and 22m.13s., eEZ = 22m.40s., ePPEZ =23m.34s., eE =41m.19s., eSSS =48m.20s.
Raciborzu eEN =19m.28s., ePKP$_2$? =21m.28s., eSKKS?EN =30m.45s., eSKKKS?EZ = 31m.11s.?, ePKKS?EZ =31m.28s., ePPP$_2$?($\triangle$ >180) =33m.59s., and many other readings without phase.
Jena eEN =23m.25s., eN =33m.41s., eE =34m.13s., 42m.31s., and 48m.21s.
Prague eN =19m.30s., iPKPN =19m.53s., ePPP =26m.1s., eSKKSZ =29m.55s., eSKSPN =33m.1s., ePPP ($\triangle$ >180°) =33m.37s., ePSN =34m.49s., ePPS?N = 36m.49s., eSS =42m.49s.?, eSSS =47m.25s., eSSSS =50m.49s., and many other readings without phase.
Uccle i =19m.54s.a, iPKP$_2$ =20m.1s., iPKSN =22m.49s., ePKSE =23m.13s., iPP = 23m.33s., ePPPE =26m.55s., eP$_c$P,PKP?N =27m.43s., eSKKSN =30m.25s.?, eSKSPN =33m.15s., eSKSP =33m.43s., ePPSE =35m.49s.?, iSSE =42m.37s., eSSSS?N =54m.13s., and many other unidentified readings.
Cheb eN =20m.29s., e =25m.17s., ePPPN =26m.51s., ePPPN ($\triangle$ >180°) =33m.44s., e =38m.37s., eN =39m.20s., eSSN =42m.43s., eSSSN =48m.34s.
Jersey e =22m.56s.
Bucharest ePE =20m.7s., iE =21m.0s. and 21m.45s., iN =22m.29s. and 25m.23s., iEN = 25m.59s., iE =27m.27s., iN =28m.50s., iE =30m.22s.
Budapest eN =27m.19s., 38m.2s., 39m.10s., and 59m.12s.
Stuttgart i =20m.9s.k, iPKP$_2$ =20m.15s.a, i =20m.22s.k, ePPP =26m.59s., ePPS = 36m.27s., eSS =42m.59s., eSSS =48m.39s., eSSSS? =51m.49s.
Kalossa eE =20m.10s., eN =20m.25s., eE =20m.51s., eN =20m.56s., eEN =21m.11s., eN =21m.57s., eE =26m.21s.
Strasbourg e =20m.1s., iPKP$_2$ =20m.17s., i =20m.59s., 21m.6s., and 22m.54s., iSKP = 23m.23s., i =24m.9s. and 25m.1s., iSKS =27m.3s., iPPP =27m.23s., iSKKS = 30m.38s., i =31m.52s. and 34m.1s., iPPS =37m.5s. and 37m.10s., i =38m.59s., iSS =42m.46s., 42m.55s., and 43m.1s., iSSS =49m.1s.
Paris iPKP$_2$ =19m.59s., iPP =23m.43s., eSS =42m.58s., eSSS =48m.26s., i =60m.46s. and 63m.58s.
Belgrade iSS =44m.50s.
Basle ePPP =27m.35s.
Zürich e =34m.46s.
Triest iSS =43m.13s.
Clermont-Ferrand iSSS =49m.36s., i =60m.31s.
Salo i =20m.33s.
Helwan PP =24m.3s., PSKS =34m.25s.
Bologna ePPZ =24m.10s., eSKKS =31m.8s.
Lisbon 20m.10s., EZ =20m.23s., N =22m.19s., PP =24m.28s.k, E =26m.28s., SKKS?EZ =30m.54s., EZ =32m.49s., E =33m.21s., SKKS$_2$?E =35m.13s., iSSEN =44m.14s., SSS =50m.8s., Z =54m.19s., E =57m.24s. and 59m.31s.
Taranto e =21m.13s.
Rome eN =22m.18s., ePPZ =25m.30s., eE =28m.17s., iPSKSN =34m.37s., eE = 43m.53s.?, eZ =45m.12s., eQN =65·0m.
Toledo i =28m.40s. and 32m.54s.
Tortosa PKP$_2$N =20m.46s., PPEN =24m.29s., SKSEN =27m.21s., PPPE =28m.18s., SKKSEN =34m.28s., SKSPN =34m.47s., PPSE =37m.31s., SSEN =44m.12s., SSPEN =45m.13s., SSSEN =50m.25s., SS?E =51m.3s., SSPE =53m.0s.
Alicante i =20m.15s., PKS =23m.28s., PP =24m.23s., PPP =28m.34s., SKKS = 31m.35s., SKKKS =32m.35s., SKSP =34m.49s., PPS =37m.43s., SS =44m.51s., SSP =45m.47s., SSS =50m.43s., Q =65m.59s.
Granada PKP$_2$ =21m.4s., pPKP$_2$ =21m.31s., sPKP$_2$ =21m.53s., SKP =24m.7s., iPP = 24m.37s., pPP =25m.25s., sSKS =27m.41s., PPP =28m.40s., iSKKS =30m.37s., sSKKS =32m.43s., SKSP =34m.43s., sSKSP =36m.13s., PPS =38m.49s., iSS = 44m.48s., SSS =50m.40s.
Tamanrasset ePKP$_2$ =22m.4s., e =29m.13s. and 37m.11s., ePPS =40m.12s.
Long waves were also recorded at Tacubaya.

Sept. 8d.

Numerous repetitions of the shock at 15h.9m.11s. occurred on this day. Owing to the disturbance caused by the large earthquake the records of these are not easy to interpret. Four of the principal after-shocks are given below, the remaining ones being referred to the final notes to the day.

Sept. 8d. 16h. 3m. 12s. (I)
16h. 12m. 24s. (II)
16h. 47m. 13s. (III)
19h. 59m. 40s. (IV)
} Epicentre 21°·0S. 174°·0W. (as at 15h.).

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
III Apia	Z.	7·4	16	i 1 47?	− 5	—	—	—	—	—
IV		7·4	16	e 1 51	− 1	e 3 9	− 9	—	—	—
I Arapuni	E.	19·2	205	—	—	8 36	+37	—	—	—
III	E.	19·2	205	(4 59)	+31	4 59	P	—	—	9·5
I Tuai	N.	19·3	201	—	—	e 8 9	+ 7	—	—	—
II	N.	19·3	201	—	—	e 7 53	− 9	—	—	—
III	N.	19·3	201	4 59	+30	8 19	+17	—	—	—
I Wellington		22·3	204	5 0	− 1	8 57	− 5	—	—	—
II		22·3	204	5 0	− 1	8 53	− 9	—	—	—
III		22·3	204	5 3	+ 2	9 1	− 1	—	—	—
IV		22·3	204	—	—	8 49	−13	—	—	12·3
I Kaimata		24·7	207	5 24	0	9 49	+ 5	—	—	—
II		24·7	207	5 28	+ 4	9 53	+ 9	—	—	—
III		24·7	207	5 32	+ 8	9 59	+15	—	—	—
IV		24·7	207	(5 28)	+ 4	5 28	P	—	—	—
I Christchurch		25·1	203	5 27	− 1	10 12	+21	—	—	—
II		25·1	203	5 57	+29	9 57	+ 6	—	—	—
III		25·1	203	6 55	?	10 18	+27	—	—	—
I Brisbane	Z.	30·7	251	i 6 9	−10	—	—	—	—	—
III	Z.	30·7	251	i 6 15	− 4	—	—	—	—	—
III Berkeley	Z.	76·1	40	i 11 50k	− 1	—	—	—	—	—
IV	Z.	76·1	40	i 10 53k	−58	—	—	—	—	—
II Lick	Z.	76·1	40	e 10 46	−65	—	—	—	—	—
I Pasadena		76·3	45	11 44	− 8	—	—	—	—	—
II		76·3	45	11 54	+ 2	—	—	—	—	—
III		76·3	45	11 50	− 2	—	—	—	—	—
IV		76·3	45	11 54k	+ 2	—	—	—	—	—
III Fresno	N.	76·9	42	e 11 56	0	—	—	—	—	—
IV	N.	76·9	42	e 11 59	+ 3	—	—	—	—	—
IV Tucson		80·3	50	i 12 16	+ 2	—	—	—	—	—
I Victoria		82·6	32	e 12 15	−11	—	—	—	—	—
II		82·6	32	e 12 24	− 2	—	—	—	—	—
III		82·6	32	e 12 26	0	—	—	—	—	—
IV		82·6	32	e 12 29	+ 3	—	—	—	—	—
IV Hungry Horse		87·3	36	e 12 50	0	—	—	—	—	—
I La Paz		98·3	112	13 42	+ 1	—	—	i 18 2	PP	—
II	Z.	98·3	112	i 13 45	+ 4	—	—	—	—	—
III		98·3	112	e 13 16	−25	—	—	i 18 22	PP	—
IV	Z.	98·3	112	e 13 43	+ 2	—	—	—	—	—
III Ottawa		110·4	48	e 19 3	PP	—	—	—	—	—
I Copenhagen		145·0	355	19 33	[− 6]	—	—	—	—	—
II		145·0	355	19 40	[+ 1]	—	—	—	—	—
III		145·0	355	19 39	[0]	—	—	—	—	—
IV		145·0	355	19 41	[+ 2]	—	—	—	—	—
III Potsdam	N.	148·2	353	e 19 47	[+ 2]	—	—	—	—	—
I Collmberg	Z.	149·3	352	e 19 46	[0]	—	—	—	—	—
II	Z.	149·3	352	e 19 55	[+ 9]	e 31 21	?	—	—	—
III	Z.	149·3	352	e 19 52	[+ 6]	e 36 45	PPS	—	—	—
IV	Z.	149·3	352	e 19 55	[+ 9]	—	—	—	—	—
I Raciborzu	N.	149·4	346	e 19 52	[+ 6]	—	—	—	—	—
III		149·4	346	e 19 50	[+ 4]	—	—	—	—	—
I Jena		149·8	354	e 19 42	[− 5]	—	—	—	—	—
II	N.	149·8	354	e 19 57	[+10]	—	—	—	—	—
III	N.	149·8	354	e 19 53	[+ 6]	—	—	—	—	—

Continued on next page.

			Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
			°	°	m. s.	s.	m. s.	s.	m. s.	s.	m.
I	Uccle		150·3	4	e 19 48	[0]	—	—	—	—	—
III			150·3	4	e 19 55	[+ 7]	—	—	—	—	—
I	Ksara		150·7	302	e 19 57?	[+ 9]	—	—	—	—	—
IV			150·7	302	e 19 53?	[+ 5]	e 25 25	?	—	—	—
I	Stuttgart	z.	152·2	356	e 19 44	[− 7]	—	—	—	—	—
II		z.	152·2	356	e 19 2	[−49]	—	—	—	—	—
III		z.	152·2	356	e 19 50	[− 1]	—	—	—	—	—
IV		z.	152·2	356	e 19 53	[+ 2]	—	—	—	—	—
I	Strasbourg		152·4	358	e 19 53	[+ 2]	—	—	—	—	—
II			152·4	358	e 19 56	[+ 5]	—	—	—	—	—
III			152·4	358	e 19 54	[+ 3]	—	—	—	—	—
I	Paris		152·8	5	e 19 46	[− 6]	—	—	—	—	—
II			152·8	5	e 19 59	[+ 7]	—	—	—	—	—
III			152·8	5	e 19 53	[+ 1]	—	—	—	—	—
IV			152·8	5	e 19 54	[+ 2]	—	—	—	—	—
III	Belgrade		153·4	336	e 20 1k	[+ 9]	—	—	e 25 36	?	—
IV	Basle		153·5	0	e 20 3	[+10]	—	—	—	—	—
IV	Zürich		153·6	359	e 19 20	[−33]	—	—	—	—	—
I	Clermont-Ferrand		155·2	6	e 19 51	[− 4]	—	—	—	—	—
II			155·2	6	e 20 10	[+15]	—	—	—	—	—
III			155·2	6	e 19 56	[+ 1]	—	—	—	—	—
IV			155·2	6	e 19 58	[+ 3]	—	—	—	—	—
I	Alicante		161·8	18	e 19 38	[−25]	—	—	—	—	—
IV			161·8	18	e 20 12	[+ 9]	—	—	—	—	—
III	Granada		161·8	27	20 41k	[+38]	23 53k	sSKP	20 52k	pPKP	—
IV			161·8	27	i 20 37a	[+34]	i 24 15	sSKP	—	—	—
I	Tamanrasset		178·2	—	i 20 7a	[− 5]	—	—	e 25 48	PP	—
III			178·2	—	e 20 13	[+ 1]	—	—	e 25 53	PP	—
IV			178·2	—	e 20 15	[+ 3]	—	—	e 25 59	PP	—

Additional readings :—
Tuai I S?N =8m.17s.
Wellington I i =9m.3s. and 9m.11s., II i =5m.7s., III i =5m.10s., IV e =8m.54s.
Kaimata IV P? =2m.23s.
Brisbane I iZ =6m.29s. and 7m.23s., III iZ =6m.36s. and 6m.47s.
Berkeley III iZ =11m.58s. and 12m.2s.
Lick II iS?Z =11m.52s.
Tucson IV i =12m.33s.
Hungry Horse IV i =13m.6s. and 13m.41s.
La Paz III iZ =14m.28s.
Potsdam III eE =20m.6s.
Collmberg I
Raciborzu I eEN =20m.42s., eZ =20m.46s., eN =21m.10s.?, eE =21m.16s., III e = 20m.8s.?, eNZ =20m.23s., eE =20m.26s., eNZ =20m.41s., e =21m.28s.
Jena I eEN =19m.57s.
Paris I i =19m.52s.
Belgrade III i =20m.17s. and 20m.41s.
Granada III PKP_2 =21m.23s.k, $pPKP_2$ =21m.46s.k, IV i =21m.14s.k.
Tamanrasset I $ePKP_2$ =21m.54s., e =28m.52s. and 35m.23s., III $ePKP_2$ =22m.0s., IV $ePKP_2$ =22m.4s.

Sept. 8d. Readings also at 2h. (Stuttgart), 4h. (Victoria, Fresno, Mineral, near Arcata, Berkeley, Lick, San Francisco, and Ferndale), 5h. (Port au Prince and San Juan), 6h. (Fresno, Mineral (2), Tucson, and Hungry Horse), 7h. (Mount Wilson, Tinemaha, Tucson, and Pierce Ferry (2)), 10h. (Zürich and near Granada), 12h. (near Pierce Ferry), 14h. (near Lick), 15h. (La Paz (2), Stuttgart, Granada, and near Zürich), 16h. (Copenhagen, Strasbourg, Stuttgart (2), Granada, La Paz, Victoria, Pasadena (2), and Berkeley), 17h. (Berkeley, Tucson (2), Pasadena (3), Victoria, Collmberg (4), and Stuttgart (3)), 18h. (Apia (2), Tacubaya, Pasadena (2), Hungry Horse, Tucson, La Paz, Tamanrasset, Paris, Stuttgart (2), and Collmberg (2)), 19h. (near Apia, Pasadena (3), Tucson (3), Hungry Horse (3), Collmberg (3), Copenhagen, Strasbourg, Jena, Paris (3), Stuttgart (2), and Tamanrasset (2)), 20h. (Hungry Horse, Pasadena, Tucson (2), Collmberg (2), and Stuttgart), 22h. (Pasadena, Tucson, and Hungry Horse), 23h. (Victoria (2), and near Lick).

Sept. 9d. 6h. 9m. 9s. I
12h. 24m. 20s. II
14h. 4m. 44s. III
Epicentre 21°·0S. 174°·0W. (as on 8d.).

Many other aftershocks of the earthquake at 8d. 15h. were recorded on this day, but these have been referred to the final notes because of insufficient data.

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

			△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
			°	°	m. s.	s.	m. s.	s.	m. s.		m.
I	Apia		7·4	16	e 1 54	+ 2	e 3 9	− 9	—	—	—
II			7·4	16	i 2 14	P*	e 3 30	+12	—	—	—
III			7·4	16	e 1 44	− 8	e 2 57	−21	—	—	—
III	Auckland	N.	18·6	209	4 16	− 5	7 11	−35	—	—	—
I	Arapuni	E.	19·2	205	—	—	8 9	+10	—	—	8·5
I	Tuai	N.	19·3	201	4 23	− 6	7 35	−27	e 4 30	P	—
II		N.	19·3	201	4 48	+19	8 15	+13	—	—	—
I	Wellington		22·3	204	—	—	9 2	0	—	—	—
II			22·3	204	5 16	PP	9 12	+10	—	—	11·3
III			22·3	204	5 8	+ 7	9 11	+ 9	—	—	11·3
I	Kaimata		24·7	207	5 19	− 5	9 51	+ 7	—	—	—
II			24·7	207	5 38?	+14	9 43	− 1	—	—	—
III			24·7	207	5 36	+12	—	—	—	—	—
I	Christchurch		25·1	203	5 25	− 3	9 39	−12	—	—	11·8
III			25·1	203	5 33	+ 5	9 47	− 4	—	—	12·9
I	Brisbane	N.	30·7	251	i 9 30	PcP	—	—	—	—	e 13·5
III			30·7	251	e 7 24	PP	—	—	—	—	e 15·8
I	Santa Clara		76·0	40	e 11 53	+ 2	e 29 11	SSS	—	—	—
I	Berkeley		76·1	40	i 11 51k	0	e 21 34	− 1	e 29 21	SSS	—
III			76·1	40	e 11 50	− 1	e 21 40	+ 5	e 22 34	PS	e 38·8
I	Lick	Z.	76·1	40	i 11 52a	+ 1	—	—	i 12 4	PcP	—
II		Z.	76·1	40	i 10 50k	−61	—	—	e 12 10	PcP	—
III			76·1	40	e 10 50	−61	—	—	—	—	—
I	Pasadena		76·3	45	11 53	+ 1	—	—	—	—	—
II			76·3	45	11 53	+ 1	—	—	—	—	—
III			76·3	45	11 50	− 2	—	—	—	—	—
I	Fresno	N.	76·9	42	e 11 59	+ 3	—	—	i 12 11	PcP	—
II		N.	76·9	42	e 11 57	+ 1	—	—	—	—	—
III		N.	76·9	42	e 12 3	+ 7	—	—	—	—	—
I	Mineral	Z.	78·1	38	e 12 22	PcP	—	—	—	—	—
II		Z.	78·1	38	i 11 59k	− 3	—	—	i 13 20	?	—
I	Tucson		80·3	50	e 12 14	0	e 22 24	+ 4	e 27 58	SS	e 35·5
II			80·3	50	i 12 17	+ 3	—	—	e 15 30	PP	—
III			80·3	50	e 12 12	− 2	—	—	i 12 21	PcP	—
I	Victoria		82·6	32	e 12 28	+ 2	—	—	—	—	—
II			82·6	32	e 12 19	− 7	—	—	—	—	—
III			82·6	32	e 12 23	− 3	—	—	—	—	40·3
II	Hungry Horse		87·3	36	i 13 5	PcP	—	—	e 15 54	PP	—
III			87·3	36	e 12 47	− 3	—	—	—	—	—
I	Huancayo		93·7	104	—	—	e 24 3	[+ 9]	e 25 55	PS	e 45·6
III			93·7	104	—	—	e 30 59	SS	e 25 44	PS	e 37·3
I	La Paz		98·3	112	13 0	−41	i 25 18	+12	i 18 2	PP	49·2
III			98·3	112	13 40	− 1	—	—	—	—	50·3
I	Bogota		100·9	89	—	—	e 24 25	[− 6]	e 29 40	?	—
I	Philadelphia		109·8	54	—	—	e 26 13	S	e 39 25	SSS	e 58·7
III	Seven Falls	E.	113·9	47	—	—	e 29 21	PS	—	—	57·3
I	Ashkabad		132·0	303	—	—	e 27 41	?	—	—	—
I	Copenhagen		145·0	355	19 39	[0]	—	—	—	—	—
I	De Bilt		149·0	2	e 19 51	[+ 5]	—	—	—	—	e 68·9
III			149·0	2	e 19 51	[+ 5]	—	—	—	—	e 83·3
I	Collmberg		149·3	352	e 19 53	[+ 7]	—	—	—	—	—
II			149·3	352	i 19 40	[− 6]	—	—	e 19 58	PKP_2	—
III		Z.	149·3	352	e 19 52	[+ 6]	—	—	—	—	—
I	Raciborzu		149·4	346	e 19 51	[+ 5]	—	—	e 15 21	P	—
I	Jena	N.	149·8	354	e 19 53	[+ 6]	—	—	—	—	—
III		N.	149·8	354	e 19 52	[+ 5]	—	—	—	—	—
I	Uccle		150·3	4	e 19 52	[+ 4]	—	—	—	—	e 82·8
I	Ksara		150·7	302	e 19 48	[0]	—	—	23 33?	PP	—
III			150·7	302	e 19 51?	[+ 3]	—	—	23 32	PP	—

Continued on next page.

			Δ	Az.	P.	O−C.	S.	O−C.	Supp.	L.
			°	°	m. s.	s.	m. s.	s.	m. s.	m.
I	Stuttgart		152·2	356	e 19 50	[− 1]	—	—	e 20 7 PKP$_2$	e 88·8
II		z.	152·2	356	e 19 46k	[− 5]	—	—	— —	—
III			152·2	356	e 19 50	[− 1]	—	—	— —	e 82·3
I	Strasbourg		152·4	358	e 19 51	[0]	—	—	i 20 10 PKP$_2$	—
III			152·4	358	e 19 42	[− 9]	—	—	— —	86·3
I	Paris		152·8	5	e 19 51	[0]	e 33 51?	PS	e 24 12 PP	e 85·8
II			152·8	5	i 19 46	[− 5]	—	—	— —	—
III			152·8	5	e 19 57	[+ 6]	e 23 16?	SKP	— —	e 79·3
I	Basle		153·5	0	e 19 52	[0]	—	—	— —	—
I	Zürich		153·6	359	e 20 11	PKP$_2$	—	—	— —	—
I	Clermont-Ferrand		155·2	6	e 19 56	[+ 1]	—	—	— —	87·8
II			155·2	6	i 19 53	[− 2]	—	—	i 20 6 PKP$_2$	—
I	Helwan		155·5	296	i 20 36	PKP$_2$	e 27 30	[+30]	— —	—
II	Toledo	z.	159·3	23	i 20 30	PKP$_2$	—	—	— —	—
II	Alicante		161·8	18	—	—	e 23 36	PKS	— —	—
II	Granada		161·8	27	i 20 39a	PKP$_2$	e 24 29	PP	— —	—
I	Tamanrasset		178·2	—	i 20 12a	[0]	—	—	e 21 57 PKP$_2$	—
II			178·2	—	i 21 45a	PKP$_2$	e 27 47	[+34]	e 25 25 PP	—
III			178·2	—	e 20 14	[+ 2]	—	—	e 22 3 PKP$_2$	—

Additional readings :—
Berkeley I iZ =11m.58s. and 12m.4s., eN =12m.35s., eSN =21m.46s., III iZ =11m.56s., eEN =31m.46s.
Lick I iZ =11m.58s.
Tucson I iP =12m.27s., e =13m.6s., ePP? =16m.29s., II e =13m.38s., III i =12m.33s.
Hungry Horse II e =17m.7s., III e =13m.33s.
La Paz I iSKS =23m.51s., PSE =27m.20s.
Raciborzu I eEN =20m.32s.
Stuttgart I eZ =20m.25s.
Strasbourg III e =28m.38s., 35m.21s., and 80m.16s.
Helwan I e =20m.54s.
Tamanrasset I ePP =25m.52s., e =29m.1s., III ePP =26m.2s., e =29m.8s.
Long waves to one or more of the above shocks were recorded at Honolulu, and at New Zealand, North America, and European stations, including some of those stations listed above.

Sept. 9d. Readings also at 0h. (Collmberg and Tucson), 1h. (Wellington, Christchurch, Auckland, Arapuni, Kaimata, and Tamanrasset), 2h. (Ksara, Hungry Horse, and Granada), 3h. (near Lick, Fresno, and Mineral), 4h. (Paris and Collmberg), 5h. (near Apia, Tuai, Kaimata, Pasadena, Tucson (2), Lick, Mineral, Victoria, Collmberg (2), and Stuttgart), 6h. (near Apia, Honolulu, Tacubaya, Lick, Mineral (2), Hungry Horse, Pasadena, Tucson (2), Victoria, Saskatoon, Seven Falls, Stuttgart, Collmberg, near Andijan and Murgab), 7h. (Hungry Horse, Pasadena (2), Tucson, Lick (2), Mineral (2), Victoria (2), Stuttgart (2), and Collmberg (2)), 8h. (Apia, Rome, and near La Paz), 11h. (Apia, Wellington, Auckland, and Mineral), 12h. (Tucson, Berkeley, Pasadena, Mineral, and Victoria), 13h. (Collmberg, Hungry Horse, and near Lick), 14h. (Apia, Hungry Horse, Pasadena, Tucson, and Collmberg), 16h. (Uccle, Boulder City, Pierce Ferry, Hungry Horse, Tucson, Victoria, near Ottawa, and near Tacubaya), 17h. (Apia, Boulder City, and Pierce Ferry (2)), 18h. (Boulder City, Hungry Horse (2), Pierce Ferry, Riverside, Palomar, Tinemaha, and Lick), 20h. (Ottawa), 21h. (Pierce Ferry and Reykjavik), 22h. (De Bilt, Paris, Clermont-Ferrand, Tamanrasset, and Reykjavik).

Sept. 10d. 12h. 2m. 45s. Epicentre 41°·8N. 71°·7E. (as on 1947, Dec. 20d.).

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

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Andijan	1·2	155	0 22	− 2	i 0 39	− 2	— —	—
Tchimkent	1·6	288	i 0 36	+ 6	i 1 0	+ 9	— —	—
Tashkent	1·9	255	i 0 38	+ 4	e 1 4	+ 5	— —	—
Frunse	2·4	63	i 0 36	− 5	i 1 4	− 8	— —	—
Obi-garm	3·5	207	i 0 58?	+ 1	i 1 40?	0	— —	—
Murgab	3·8	153	1 2	+ 1	1 48	+ 1	— —	—
Stalinabad	3·9	216	i 1 11	+ 9	—	—	— —	—
Almata	4·2	67	1 2	− 5	e 1 50	− 7	— —	—
Samarkand	4·2	241	i 1 9	+ 2	i 1 50	− 7	— —	—
Kulyab	4·2	202	i 1 11	+ 4	—	—	— —	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ashkabad		10·9	255	e 2 41	+ 1	e 4 48	+ 4	—	—	—
Baku		16·5	272	e 3 56	+ 2	—	—	—	—	—
Sverdlovsk		16·6	338	3 51	− 5	7 4	+ 4	—	—	—
Grozny		19·1	283	e 4 30?	+ 3	—	—	—	—	—
Piatigorsk		21·0	286	e 4 51?	+ 4	—	—	—	—	—
Bombay		22·8	177	e 5 6	+ 1	e 9 14	+ 3	—	—	11·6
Sotchi		23·5	285	e 5 17?	+ 5	—	—	—	—	—
Irkutsk		24·4	53	e 5 15	− 6	—	—	—	—	—
Hyderabad	N.	25·0	165	5 21	− 6	9 51	+ 2	—	—	13·1
Moscow		26·1	314	5 36	− 1	e 10 14	+ 7	—	—	—
Yalta		27·4	288	e 5 47	− 2	—	—	—	—	—
Ksara		29·2	266	e 6 7	+ 2	e 12 45	SS	—	—	—
Istanbul		31·7	284	—	—	e 12 15?	+38	—	—	—
Kodaikanal	E.	31·9	170	—	—	e 10 25	−75	—	—	—
Helwan		34·5	263	e 8 33	PPP	e 14 22	SS	—	—	e 18·4
Warsaw		35·4	304	e 7 0	0	e 12 35	+ 1	e 8 6	PP	e 17·2
Raciborzu		37·4	302	e 7 58	+42	e 16 14	SS	e 9 3	PP	e 17·8
Upsala	N.	37·4	318	—	—	e 14 29	?	e 15 34	SS	e 21·2
Prague		39·8	303	e 7 41	+ 5	e 13 44	+ 2	e 8 50	PP	e 19·2
Copenhagen		40·2	312	7 40	0	13 51	+ 3	—	—	—
Potsdam		40·2	306	—	—	e 17 3	SS	—	—	e 21·2
Triest		41·3	296	e 7 50	+ 1	e 14 13	+ 9	e 17 13	SS	—
Jena		41·4	303	e 7 49	− 1	—	—	e 18 28	SSS	—
Rome		43·3	292	8 5	0	14 39	+ 6	—	—	—
Stuttgart		43·4	301	e 8 6	0	e 14 45	+10	e 9 51	PP	e 23·2
Salo	Z.	43·5	297	e 8 5	− 2	—	—	—	—	—
Zürich		44·2	300	e 8 10	− 2	—	—	—	—	—
Strasbourg		44·4	302	e 8 15	+ 1	e 14 39	−10	e 9 56	PP	—
De Bilt		45·0	307	e 8 9	−10	e 14 57	− 1	e 10 3	PP	e 24·2
Uccle		45·9	306	—	—	e 18 15?	SS	e 20 15?	SSS	e 23·2
Paris		47·6	304	e 8 40	+ 1	(e 15 15?)	−20	e 10 31	PP	e 15·2
Clermont-Ferrand		48·3	299	e 8 45	0	e 15 48	+ 3	e 19 22	SS	25·2
Kew	N.	48·5	308	—	—	e 19 15?	SS	—	—	—
Alicante		53·8	292	e 7 50	?	e 14 39	?	—	—	e 21·2

Additional readings :—
Warsaw ePZ =7m.34s., eSE =12m.47s., iN =14m.25s., eZ =14m.32s., eSSZ =15m.5s., eSSE =15m.11s., eSSN =15m.14s.
Upsala eN =15m.1s. and 19m.33s., iE =19m.38s., eN =19m.57s.
Prague e =16m.35s., and 18m.15s.?
Stuttgart eSS =17m.55s.
Strasbourg eSS =18m.3s. and 18m.7s.
De Bilt eSS =18m.21s.
Long waves were also recorded at Aberdeen, Ivigtut, and Reykjavik.

Sept. 10d. 13h. 48m. 30s. Epicentre 43°·7N. 147°·6E. (as on 1948, May 28d.).

Intensity V at Kusiro and Nemuro; IV at Hatinohe; II-III at Mizusawa, Abashiri, Urakawa, Aomori, and Morioka.
Epicentre 42°·8N. 147°·5E. Shallow. Macroseismic radius >300km.

Seismo. Bull. Cent. Met. Obs., Japan, for 1948, Tokyo, 1950, pp. 40-41 with macroseismic chart.

$A = -·6124$, $B = +·3886$, $C = +·6884$; $\delta = -6$; $h = -3$;
$D = +·536$, $E = +·844$; $G = -·581$, $H = +·369$, $K = -·725$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Nemuro	1·4	256	0 29k	+ 2	0 47	+ 1	—	—	—
Sapporo	4·6	264	1 17a	+ 5	2 13	+ 6	—	—	—
Yuzno-Sakhlinsk	4·7	315	1 12?	− 2	—	—	—	—	—
Mori	5·4	253	1 6a	−18	2 8	−20	—	—	—
Hatinohe	5·6	236	1 26a	− 1	2 22	−11	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Aomori		5·8	242	1 33a	+ 4	2 39	+ 1	—	—	—
Miyako		5·8	228	1 26a	− 3	2 28	−10	—	—	—
Morioka		6·3	232	1 34	− 2	2 40	−10	—	—	—
Mizusawa	E.	6·7	229	1 41	− 1	2 52	− 8	—	—	—
Sendai		7·4	225	1 47a	− 5	3 9	− 9	—	—	—
Yamagata		7·7	228	1 54	− 2	3 17	− 8	—	—	—
Hukusima		8·0	225	2 1	+ 1	3 23	−10	—	—	—
Onahama		8·5	219	2 5a	− 2	3 34	−11	—	—	—
Aikawa		9·0	234	2 13	0	3 59	+ 1	—	—	—
Mito		9·1	219	2 14k	0	3 40	−20	—	—	—
Utunomiya		9·3	222	2 14	− 3	3 52	−13	—	—	—
Kakioka		9·4	220	2 14	− 4	3 54	−13	—	—	—
Tukubasan		9·4	220	2 14	− 4	3 53	−14	—	—	—
Kumagaya		9·8	223	2 23	− 1	4 7	−10	—	—	—
Maebasi		9·8	225	2 10	−14	3 36	−41	—	—	—
Nagano		10·0	229	2 34	+ 7	4 37	+15	—	—	—
Tokyo		10·0	220	2 27a	0	4 34	+12	—	—	—
Wazima		10·3	236	2 30	− 2	4 23	− 7	—	—	—
Yokohama		10·3	219	2 27	− 5	4 17	−13	—	—	—
Hunatu		10·6	223	2 36	0	4 27	−10	—	—	—
Mera		10·6	217	2 38	+ 2	—	—	—	—	—
Toyama		10·7	232	2 34a	− 4	4 40	+ 1	—	—	—
Misima		10·9	221	2 36	− 4	4 31	−13	—	—	—
Osima		11·0	218	2 38	− 4	4 35	−12	—	—	—
Shizuoka		11·3	222	2 44	− 2	4 42	−12	—	—	—
Vladivostok		11·4	272	i 2 49	+ 2	i 4 58	+ 2	—	—	—
Omaesaki		11·6	222	2 8	?	3 25	?	—	—	—
Gihu		11·8	229	2 49	− 4	5 12	+ 6	—	—	—
Nagoya		11·8	227	2 50	− 3	4 59	− 7	—	—	—
Hikone		12·1	230	3 0	+ 3	5 30	+16	—	—	—
Kameyama		12·4	228	2 57	− 4	5 47	+26	—	—	—
Toyooka		12·8	235	3 4	− 2	5 8	−22	—	—	—
Osaka		13·0	229	3 6	− 3	6 21	+46	—	—	—
Owase		13·1	226	3 6	− 4	5 56	+18	—	—	—
Kobe		13·2	231	3 14	+ 3	6 28	+48	—	—	—
Sumoto		13·6	231	3 19	+ 2	5 52	+ 2	—	—	—
Siomisaki		13·8	226	3 11	− 8	6 18	+24	—	—	—
Muroto		14·8	230	3 42	+10	6 36	+18	—	—	—
Hamada		14·9	239	3 33	− 1	6 36	+16	—	—	—
Hirosima		15·0	237	3 27	− 8	5 39	−44	—	—	—
Klyuchi		15·2	29	e 4 5	+27	e 7 9	+41	—	—	—
Simidu		15·8	231	3 44	− 1	6 58	+16	—	—	—
Hukuoka		16·8	239	3 58	0	7 15	+10	—	—	—
Kumamoto		17·1	236	4 4	+ 2	7 22	+10	—	—	—
Unzendake		17·5	236	3 35	−32	—	—	—	—	—
Kagosima		18·1	233	4 16	+ 2	7 31	− 4	—	—	—
Nanking		25·4	253	5 35	+ 4	10 2	+ 6	6 16	PP	11·5
Irkutsk		29·8	303	i 6 20	+ 9	—	—	—	—	—
Guam		30·2	185	e 6 13	− 1	e 11 3	−10	—	—	i 12·6
College		40·9	35	e 7 50	+ 4	i 13 58	0	e 9 37	PP	e 17·2
Sitka		48·3	45	i 8 48	+ 3	i 15 49	+ 4	i 10 56	PP	e 20·6
Honolulu		50·2	97	i 9 3	+ 3	i 16 14	+ 3	i 11 10	PP	e 21·4
Frunse		51·5	296	e 9 10	+ 1	e 16 25	− 4	—	—	—
Sverdlovsk		53·4	318	i 9 23	− 1	i 16 51	− 4	—	—	—
Andijan		54·0	295	9 29	+ 1	17 5	+ 2	—	—	—
Murgab		54·1	291	e 9 30?	+ 1	—	—	—	—	—
Tchimkent		55·0	297	9 36	+ 1	i 17 12	− 5	—	—	—
Dehra Dun	N.	55·6	282	9 25	−15	16 57	−28	—	—	24·1
Tashkent		55·7	297	i 9 43	+ 3	i 17 21	− 5	—	—	—
Obi-garm		56·8	294	i 9 38?	−10	—	—	—	—	—
Stalinabad		57·5	294	9 52	− 1	17 40	−10	—	—	—
Samarkand		58·1	296	i 9 56	− 2	i 17 50	− 8	—	—	—
Victoria		58·6	52	10 3	+ 2	18 9	+ 5	12 29	PP	28·3
Grand Coulee		61·3	50	i 10 11	− 9	e 18 37	− 2	—	—	—
Arcata	Z.	62·3	58	i 10 14	−12	e 18 43	− 9	i 10 28	pP	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ferndale		62·4	59	e 10 32	+ 5	e 19 0	+ 7	—	—	e 30·6
Hyderabad	N.	63·2	268	10 27	− 5	18 51	−12	12 35	PP	—
Hungry Horse		63·7	47	i 10 37	+ 1	—	—	—	—	—
Ukiah		63·8	60	e 11 2	+26	e 19 26	+15	i 20 50	S_cS	e 26·9
Mineral	Z.	64·1	58	i 10 40 a	+ 2	e 19 40	+26	—	—	—
Moscow		64·7	324	10 41	− 1	19 18	− 4	—	—	—
Ashkabad		65·1	299	e 10 42	− 3	—	—	—	—	—
Scoresby Sund		65·1	357	i 10 50	+ 5	19 35	+ 8	15 7	PPP	—
San Francisco		65·1	61	e 10 51	+ 6	e 19 30	+ 3	—	—	e 30·1
Saskatoon		65·1	41	10 50	+ 5	19 32	+ 5	13 12	PP	30·5
Berkeley		65·2	61	e 10 46	+ 1	i 19 20	− 8	—	—	e 33·2
Santa Clara		65·7	60	e 10 55	+ 7	e 19 38	+ 4	—	—	e 31·9
Lick		65·9	61	i 10 51 a	+ 1	e 19 41	+ 4	—	—	e 29·9
Butte	N.	66·0	47	e 10 54	+ 4	i 20 2	+24	—	—	e 28·6
Bombay		66·3	273	e 10 52	0	e 19 39	− 3	e 13 22	PP	32·5
Helsinki		66·4	333	e 10 51 a	− 2	e 19 32	−11	e 11 13	PcP	e 29·5
Bozeman		67·0	48	e 11 1	+ 4	i 19 49	− 1	e 11 33	PcP	e 27·2
Fresno	N.	67·5	61	e 11 3	+ 3	e 20 18	+22	i 13 42	PP	—
Apia		68·2	136	—	—	e 20 12	+ 8	—	—	e 30·5
Tinemaha		68·2	59	i 11 7 a	+ 3	e 20 2	− 2	i 11 22	pP	—
Baku		68·3	306	11 6	+ 1	20 8	+ 2	—	—	—
Kodaikanal	E.	68·7	263	i 11 6	− 1	i 20 19	+ 9	20 43	PS	33·7
Grozny		68·8	309	e 11 9	+ 1	e 20 9	− 2	—	—	—
Santa Barbara	Z.	68·9	62	e 11 9	0	—	—	—	—	—
Haiwee		69·0	59	i 11 12	+ 3	e 20 15	+ 1	i 11 39	pP	—
Upsala		69·0	335	11 8 k	− 1	i 20 7	− 7	e 15 40	PPP	e 32·5
Colombo	E.	69·2	260	e 10 21	−49	20 19	+ 3	—	—	42·5
Salt Lake City		69·7	53	e 11 18	+ 4	i 20 27	+ 5	e 13 40	PP	e 30·1
Piatigorsk		69·8	312	e 11 16	+ 2	e 20 20	− 3	—	—	—
Pasadena		70·1	61	i 11 18 a	+ 2	i 20 27	0	i 11 33	pP	e 28·9
Riverside		70·7	61	i 11 20 a	0	e 20 33	− 1	i 11 34	pP	—
Brisbane		71·0	174	i 11 23	+ 1	i 20 38	+ 1	i 20 59	PS	i 29·7
Boulder City		71·0	58	i 11 23	+ 1	e 20 41	+ 4	i 11 36	pP	—
Pierce Ferry		71·4	57	i 11 26	+ 2	e 20 46	+ 4	—	—	—
Palomar		71·4	62	i 11 26	+ 2	i 20 46	+ 4	i 11 43	pP	—
Erevan		71·5	308	e 11 29	+ 5	e 20 47	+ 4	—	—	—
Sotchi		71·9	314	e 11 30	+ 3	20 50	+ 2	—	—	—
Rapid City	E.	72·2	45	i 12 37	+68	e 21 46	+55	e 15 18	PP	e 30·2
Reykjavik	N.	72·2	356	e 11 26	− 3	e 20 48	− 3	e 21 14	PS	37·5
Theodosia		73·1	317	e 11 39	+ 5	e 21 3	+ 2	—	—	—
Simferopol		73·7	318	e 11 44?	+ 6	21 10?	+ 2	—	—	—
Warsaw		73·9	329	e 11 39 a	0	i 21 10	0	e 14 40	PP	e 32·5
Copenhagen		74·0	335	i 11 39	0	21 8	− 3	26 6	SS	—
Yalta		74·1	317	i 11 39	− 1	—	—	—	—	—
Ivigtut		74·7	8	i 11 43	0	i 21 16	− 3	22 14	PPS	32·5
Tucson		76·0	58	i 11 52 a	+ 1	e 21 37	+ 3	i 12 7	pP	e 31·2
Aberdeen	E.	76·3	343	i 11 58	+ 6	i 21 39	+ 2	i 21 55	S_cS	38·6
Potsdam		76·6	334	i 11 58	+ 4	i 21 39	− 1	i 21 57	S_cS	e 31·5
Raciborzu		76·7	329	e 11 54	− 1	e 21 45	+ 4	e 12 9	P_cP	—
Riverview		77·2	177	i 12 3	+ 6	i 21 49	+ 2	i 12 10	P_cP	37·0
Edinburgh		77·7	344	—	—	21 45	− 7	22 2	S_cS	—
Lincoln	E.	77·9	44	e 12 5	+ 4	e 21 51	− 3	e 15 10	PP	e 31·6
Bucharest		78·0	321	e 11 43	−19	e 21 33	−22	i 14 36	PP	40·5
Prague		78·1	332	i 12 1 a	− 1	21 51	− 5	18 6	PPP	e 35·5
Jena		78·2	332	e 12 3	0	e 21 54	− 3	—	—	e 37·0
Budapest		78·5	326	12 8	+ 4	22 4	+ 3	15 21	PP	41·5
Durham		78·5	342	i 12 5	+ 1	i 21 59	− 2	i 12 28	P_cP	—
Cheb		78·8	332	e 12 6?	0	e 22 4	0	e 22 39	PS	e 38·5
Istanbul		79·1	319	e 12 8	0	—	—	—	—	—
De Bilt		79·2	337	i 12 10	+ 2	e 22 6	− 2	e 27 18	SS	e 37·5

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Kalossa		79·3	327	12 14	+ 5	e 22 14	+ 5	—	—	e 43·5
Belgrade		80·1	324	e 12 13k	0	i 22 19	+ 1	i 26 4	SS	e 44·0
Ville Marie		80·3	32	i 12 14	0	—	—	—	—	—
Uccle		80·6	338	i 12 17a	+ 1	i 22 21	− 2	i 15 31	PP	e 35·5
Perth		80·7	206	i 12 28	+12	i 22 6	−18	—	—	—
Ksara		80·9	307	i 12 18	+ 1	22 30	+ 4	—	—	—
Stuttgart		80·9	333	i 12 18a	+ 1	e 22 26	0	e 15 30	PP	e 39·5
Temiskaming		81·0	31	i 12 17	− 1	—	—	—	—	—
Kew		81·2	340	i 12 19	0	i 22 29	0	i 12 31	pP	e 36·5
Chicago		81·4	39	e 12 21	+ 1	e 22 25	− 6	i 15 41	PP	e 32·8
Strasbourg		81·6	334	i 12 22a	+ 1	i 22 33	0	e 15 31	PP	e 37·5
Triest		82·1	330	e 12 27	+ 3	i 22 34	− 4	e 15 28	PP	e 38·8
Zürich		82·4	333	e 12 25a	0	e 22 36	− 5	e 15 22	PP	—
Basle		82·5	334	e 12 26a	0	e 22 40	− 2	e 15 11	PP	—
Chur		82·5	333	e 12 26	0	e 22 40	− 2	—	—	e 40·6
St. Louis		82·8	41	i 12 28	+ 1	i 22 44	− 1	15 53	PP	—
Paris		82·9	337	i 12 29k	+ 1	i 22 45	− 1	i 12 47?	pP	e 35·5
Salo		83·3	331	e 12 29	− 1	i 22 48	− 2	—	—	—
Ottawa		83·3	29	12 30	0	22 47	− 3	15 40	PP	38·5
Shawinigan Falls	N.	83·3	27	—	—	e 22 50	0	—	—	46·5
Seven Falls	E.	83·4	25	12 32	+ 2	22 48	− 3	15 36	PP	40·6
Jersey		83·8	342	e 12 36	+ 4	e 27 30	SS	—	—	38·5
Bologna		83·9	330	e 12 36a	+ 3	e 22 58	+ 2	e 26 45?	SS	e 44·6
Auckland	N.	83·9	158	12 9	−24	22 54	− 2	28 30	SS	40·5
Pavia		84·1	332	e 12 37k	+ 3	—	—	—	—	e 43·5
Cleveland		84·4	35	i 12 42	+ 6	i 22 57	− 4	i 28 38	SS	—
Taranto		85·0	324	12 39	+ 1	23 11	+ 4	—	—	—
Arapuni	E.	85·3	158	—	—	23 30	+20	29 0	SS	42·5
Clermont-Ferrand		85·3	336	i 12 42	+ 2	i 23 14	+ 4	i 16 21	PP	39·5
Rome		85·7	327	e 12 42a	0	i 23 7	[+ 2]	16 3	PP	e 41·9
New Kensington	E.	85·9	34	e 12 46	+ 3	i 23 7	[0]	e 15 56	PP	—
Helwan		86·4	309	i 12 45a	0	23 18	− 3	16 9	PP	—
Harvard		87·3	27	i 12 51	+ 1	e 23 15	[− 1]	i 24 25	PS	e 43·5
Halifax		87·8	22	12 54	+ 2	23 34	0	16 12	PP	40·7
Fordham		87·9	29	i 12 56	+ 3	i 23 21	[+ 1]	—	—	—
Wellington		88·1	160	12 54	0	23 45	+ 8	13 44	pP	42·0
Philadelphia		88·2	32	e 12 56	+ 2	i 23 25	[+ 3]	e 16 17	PP	e 36·9
Kaimata		88·5	163	13 8	+12	23 37	− 4	—	—	—
Christchurch		89·7	162	13 5	+ 4	23 26	[− 5]	16 28	PP	—
Barcelona		89·8	334	e 13 14	+12	i 23 54	+ 1	18 37	PPP	e 41·3
Tortosa		90·8	335	13 8	+ 2	23 57	− 5	13 21	P_cP	40·3
Tacubaya	N.	92·4	60	i 14 11	+57	—	—	—	—	e 52·4
Toledo		93·0	339	i 13 16	− 1	i 24 35	+14	e 17 20	PP	41·3
Alicante		93·4	335	13 25	+ 7	24 10	−14	13 33	pP	e 44·6
Lisbon		95·3	341	13 28	+ 1	24 21	−20	26 15	PS	49·5
Granada		95·4	338	i 13 31a	+ 3	i 24 52	+10	i 17 1a	PP	i 44·0
Bermuda		98·7	27	e 13 58	+16	i 25 22	+12	e 18 4	PP	e 41·8
Tamanrasset		105·2	324	e 14 14	+ 2	e 29 54	PKKP	e 17 33	PP	—
Tananarive		110·0	263	19 24	PP	25 21	[+ 9]	28 49	PS	e 56·0
San Juan		110·9	33	e 18 38	[+ 3]	e 25 38	[+22]	e 19 20	PP	e 45·6
Fort de France		116·2	31	e 19 21	[+36]	e 29 41	PS	e 19 53	PP	—
Bogota	Z.	119·0	49	—	—	e 24 51	[−55]	—	—	—
Huancayo		131·5	62	e 19 23	[+ 8]	e 28 26	{− 3}	e 22 31	PKS	e 54·4
La Paz		139·4	59	i 19 35k	[+ 6]	26 45	[+ 7]	i 19 48	pPKP	67·0

Additional readings :—
Nanking PPP? =6m.36s., iN =6m.56s., iE =7m.7s.
College iS_cS =17m.47s.
Sitka i =8m.58s., eS_cS? =18m.18s., i =18m.48s., eSS =19m.43s.
Honolulu i =9m.18s., e =12m.0s., i =16m.38s., iS_cS =18m.52s., eSS =19m.57s.
Victoria PPP =13m.59s., PSN =18m.42s., e =19m.9s. and 21m.23s., SSS =23m.54s.
Ferndale eN =10m.38s.
Hyderabad SSN =22m.41s.
Hungry Horse i =10m.51s. and 12m.18s.
Ukiah e =13m.39s., i =19m.56s., eSS =23m.52s.
Mineral iZ =10m.43s. and 10m.53s.

Continued on next page,

Scoresby Sund 19m.55s. and 21m.6s., SS =24m.12s.
Saskatoon i =11m.2s., PPP =14m.29s., PS =19m.52s., i =21m.2s., SS =23m.32s., SSS = 25m.52s.
Berkeley eZ =10m.49s., iPZ =10m.52s., iN =11m.0s. and 12m.13s., iE =19m.31s., iZ = 20m.15s., eN =30m.6s.
Lick eEN =10m.55s.
Butte eN =20m.42s.
Bombay SSE =23m.51s., SSN =23m.57s.
Helsinki e =10m.54s., ePPP =15m.5s., e =19m.54s., eS_cS =20m.58s., eSS =23m.51s., eSSS =27m.16s.
Bozeman i =20m.9s., eSS =24m.29s., iSS =24m.57s.
Tinemaha ePKP,PKPZ =39m.47s.
Kodaikanal SSE =24m.44s.
Santa Barbara iZ =11m.23s. and 11m.36s.
Haiwee iZ =11m.22s., iN =20m.37s.
Upsala PE =11m.12s., eE =12m.56s. and 13m.22s., eN =20m.23s., eE =20m.52s., S_cS = 21m.24s., eSSE =25m.6s., eSSSE =27m.48s., SSS?N =28m.13s.
Salt Lake City i =11m.28s., ePPP =15m.6s., i =20m.48s., iS_cS =21m.42s., eSS = 25m.20s., eSSS =28m.35s.
Pasadena iZ =11m.23s. and 11m.58s., iEN =20m.51s., iSSN =25m.14s., eSSE =25m.54s. iPKP,PKPZ =39m.19s.
Riverside iZ =12m.6s., eZ =14m.31s., ePKP,PKPZ =39m.17s.
Brisbane iZ =11m.37s. and 12m.53s., iSKSE =21m.19s., iSSE =24m.49s.
Palomar iZ =11m.31s., iSN =21m.10s., iN =21m.54s., iPKP,PKPZ =39m.16s.
Rapid City iE =12m.44s., 12m.52s., and 21m.53s., iS_cS?E =22m.14s., eSSE =26m.22s.
Reykjavik eN =11m.44s.
Warsaw PN =11m.42s., iZ =12m.29s., PSZ =21m.35s., PPSN =21m.47s., PPSE = 21m.53s., eSSE =26m.4s., eSSN =26m.15s., eSSSE =28m.52s., eSSSN =29m.24s., iE =30m.3s.
Copenhagen 17m.28s. and 22m.2s.
Ivigtut i =23m.14s.
Tucson i =12m.17s. and 12m.34s., ePP =15m.3s., ePPP =16m.53s., iS =21m.57s., iS_cS =22m.36s., i =24m.3s., eSS =27m.4s., eSSS? =30m.25s.
Aberdeen iE =22m.31s., iSSSE =30m.26s.
Potsdam iSKSE =22m.2s.
Raciborzu iEZ =12m.37s.?, eEN =15m.28s., ePPP?EN =17m.9s., ePS?EZ =22m.3s., ePPSEZ =22m.37s.?
Riverview iN =12m.7s., iE =13m.16s., iPPN =14m.56s., iPPZ =14m.59s., iZ = 21m.54s.,, iSKSE =22m.9s., iS_cSN =22m.12s., iE =22m.26s., iPSZ =22m.33s., iE =22m.44s., iPPSN =22m.53s., iSSN =26m.54s., eZ =27m.17s., eSSSN = 30m.11s., eQE =32m.30s.
Edinburgh S_cS =23m.11s., SS =26m.44s.
Lincoln iE =12m.16s. and 22m.12s., iS_cS?E =22m.26s., eSSE =27m.6s., eSSS?E = 31m.22s.
Prague iZ =12m.4s. and 12m.13s., ePS =22m.12s., ePPS? =22m.42s., eSS =26m.30s., eSSS =29m.48s.
Budapest ePPE =15m.44s., PPPN =17m.20s., PSEN =22m.30s., eSSSE =31m.30s.?
Durham iEN =22m.23s., PPSN =23m.8s., SSSN =30m.19s.
Cheb eSS =27m.18s., e =28m.51s., eSSS =30m.53s.
Kalossa ePE =12m.21s., eN =12m.45s., eE =13m.10s., eN =13m.27s., eE =13m.33s.
Uccle eE =12m.32s., eN =18m.54s., eE =19m.8s., eN =21m.22s., eEN =28m.36s.
Perth i =24m.22s.
Stuttgart ePPP =17m.24s., e =18m.48s., eSS =27m.48s.
Temiskaming i =12m.30s.
Kew iZ =12m.42s., ePPNZ =15m.36s., eN =18m.33s., iS_cSN =22m.44s., iPSNZ = 23m.3s., eSSN =27m.31s., iNZ =28m.48s.
Chicago iS =22m.39s., iS_cS =23m.9s., eSS =28m.1s., eSSS =31m.37s.
Strasbourg e =12m.36s., i =12m.40s., ePP =15m.37s., iS =22m.51s., i =23m.3s., e = 25m.45s., eSS =27m.26s.
Triest ePPP =17m.19s., iS =22m.49s., iPS =23m.19s.
St. Louis i =12m.42s. and 23m.5s.
Paris i =14m.9s., iPP =15m.38s., i =19m.44s., iSS =28m.20s., i =28m.30s., eSSS = 31m.30s.
Ottawa i =12m.45s., PPP =17m.30s., i =23m.6s., SS =28m.48s., SSS =31m.41s.
Seven Falls PPPE =17m.38s., PSE =23m.49s., SSE =29m.27s., SSSE =31m.51s.
Bologna eZ =23m.26s.
Auckland SN =23m.17s., SSSN =34m.42s.
Pavia e =13m.37s.
Cleveland iZ =12m.50s. and 12m.56s., iE =23m.23s., eSSN =28m.48s.
Arapuni eE =25m.18s., SSSE =35m.36s.
Clermont-Ferrand iS =23m.33s., iPS =24m.57s., iSS =29m.11s., iSSS =32m.47s.
Rome e =19m.12s., iE =23m.36s., eE =38m.52s.?
New Kensington eSSE =29m.24s.
Helwan SKS =23m.10s., PPS =24m.35s.
Halifax i =23m.56s., PS =24m.34s., SS =29m.0s., SSS =33m.0s.
Wellington iZ =16m.25s., 17m.40s., and 19m.26s., SKSZ =23m.14s., i =23m.31s., 24m.2s., and 24m.44s., SS =29m.15s.
Philadelphia i =13m.6s. and 13m.25s., iS_cS =23m.55s., iPS =24m.45s., eSS =29m.32s,

Continued on next page.

Christchurch eNZ = 22m.6s., SSEN = 28m.25s.
Barcelona PS = 25m.6s.
Tortosa PPN = 16m.34s., PPPN = 16m.38s., SKSN = 23m.39s., S_cSEN = 24m.6s., iEN = 24m.17s., PSN = 25m.8s., PPSN = 25m.30s., SSE = 29m.32s., SSS?E = 33m.16s.
Toledo iSKSE = 24m.6s., iE = 25m.52s., eSSSE = 34m.28s.
Alicante PP = 16m.58s., PPP = 19m.4s., SKS = 23m.52s., i = 24m.42s., PS = 25m.30s., PPS = 25m.56s., SS = 30m.48s,. SSS = 34m..38s., Q = 39m.6s.
Lisbon P?E = 13m.32s., E = 24m.58s., N = 28m.54s., E = 29m.7s. and 42m.30s.?
Granada PPP = 19m.4s. a, SKS = 24m.4s., PPS = 26m.5s., SS = 31m.28s., SSS = 35m.31s.
Bermuda e = 21m.22s., iSKS = 24m.32s., e = 24m.36s., iS = 25m.40s., iPS = 27m.8s., iPPS = 27m.57s., iSS = 32m.26s., iSSS = 36m.21s., iS_cSS_cS = 37m.54s.
Tananarive PPS = 29m.24s., SS = 34m.39s.
San Juan iPS = 28m.48s., iPPS = 30m.14s., iSS = 35m.0s., eSSS = 39m.16s.
Huancayo e = 31m.51s., eSS? = 39m.1s., eSSS = 44m.54s.
La Paz iPPZ = 22m.38s., ipPPZ = 23m.9s., isPPZ = 23m.25s., PPPEN = 25m.49s., SKKS = 29m.17s., SSEN = 41m.30s.

Sept. 10d. Readings also at 0h. (Reykjavik (2) and Paris), 1h. (Reykjavik, Clermont-Ferrand, Paris, Tamanrasset, Apia, Riverside, Tinemaha, Tucson, Pierce Ferry, Lick, Mineral, Hungry Horse, near Ottawa, and near San Francisco), 2h. (Reykjavik, Clermont-Ferrand, Paris, Tamanrasset, Kew, De Bilt, Huancayo, near La Paz, and near Bogota), 3h. (Alicante, Granada, Ksara, Tchimkent, near Andijan, Kulyab, Murgab, Obi-garm, Samarkand, Stalinabad, and Tashkent), 4h. (Tacubaya), 5h. (Reykjavik, Paris, Samarkand, near Andijan, Kulyab, Murgab, Obi-garm (2), and Stalinabad), 6h. (Pierce Ferry, Reykjavik, Seven Falls, Clermont-Ferrand, Paris, Stuttgart, and near Tortosa), 7h. (Reykjavik (2), De Bilt, Kew, Paris, Clermont-Ferrand, Tamanrasset (2), and near Tortosa), 9h. (Reykjavik), 10h. (Paris), 11h. (Reykjavik, Paris, and Ottawa), 12h. (Apia, Haiwee, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Boulder City, Lick, Mineral, Pierce Ferry, Hungry Horse, Saskatoon, Victoria, Paris, Stuttgart, and near Andijan), 13h. (Tamanrasset, Reykjavik, and Stuttgart), 14h. (Hungry Horse, Mineral (2), and near Mizusawa), 15h. (Reykjavik, Paris, Clermont-Ferrand, Stuttgart (2), Palomar, Pasadena, Riverside, Tinemaha, Tucson (2), Boulder City, Pierce Ferry, Lick, Mineral, and near Tacubaya), 16h. (Ville Marie, Andijan, Samarkand, near Kulyab, Murgab, Obi-garm, and Stalinabad), 17h. (Reykjavik, Ivigtut, Scoresby Sund, De Bilt, Clermont-Ferrand, Paris, Stuttgart (2), Tamanrasset, and near Mizusawa), 19h. (Rome), 20h. (Haiwee, Tinemaha, Tucson, Boulder City, Pierce Ferry, Hungry Horse, Samarkand, near Andijan, Tchimkent, and Tashkent), 21h. (Mizusawa, near Andijan, Frunse, Tashkent, and Tchimkent), 22h. (Stuttgart, La Paz, Bogota, and near Balboa Heights), 23h. (Auckland, Wellington, Apia, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Pierce Ferry, Berkeley, Lick, De Bilt, Paris, Stuttgart, and Ksara).

Sept. 11d. 8h. 52m. 32s. Epicentre 37°·2N. 23°·2E.

Felt at Athens, Taranto, in the province of Brindisi, and the Gulf of Corinth. Epicentre as adopted.
Monthly Seismic Bulletin of the Instituto Nazionale de Geofisica, Rome.

The U.S.S.R. and the J.S.A. suggest a depth of 100-110km.

$A = +\cdot7339$, $B = +\cdot3145$, $C = +\cdot6020$; $\delta = -8$; $h = -1$;
$D = +\cdot394$, $E = -\cdot919$; $G = +\cdot553$, $H = +\cdot237$, $K = -\cdot798$.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Taranto	5·7	307	1 30	+ 2	2 26	− 9	—	—	—
Istanbul	6·0	48	i 1 34	+ 2	i 2 46	+ 3	—	—	—
Messina	6·1	281	i 1 38	+ 4	i 2 43	− 2	—	—	—
Catania	6·5	275	e 1 41	+ 2	e 2 48	− 7	—	—	—
Bucharest	7·5	16	e 1 36	−17	i 3 19	− 1	i 3 41	S*	—
Belgrade	7·9	346	e 1 59k	0	i 3 33	+ 3	—	—	—
Rome	9·5	303	i 2 22k	+ 2	e 4 7	− 3	i 2 30	PP	—
Kalossa	9·8	343	2 34	+10	i 4 55	S*	e 2 39	PP	—
Helwan	10·0	135	i 2 28a	+ 1	4 13	− 9	4 52	S*	—
Budapest	10·7	345	e 2 38	0	e 4 42	+ 3	4 54	SS	e 6·0
Ksara	10·9	104	i 2 40	0	4 38	− 6	—	—	—
Triest	11·0	323	e 2 41	− 1	i 4 33	−14	i 3 42	?	i 5·8
Yalta	11·0	45	i 2 43	+ 1	i 4 43	− 4	—	—	—
Simferopol	11·3	43	2 51	+ 5	—	—	—	—	—
Bologna	11·6	313	e 2 50k	0	5 0	− 1	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Salo		12·7	315	i 3 5a	0	i 5 18	−10	i 3 11	PP	—
Pavia		13·2	311	i 3 15a	+ 4	e 5 28?	−12	—	—	—
Raciborzu		13·4	346	e 3 18	+ 4	e 5 59	+14	e 6 20	SSS	e 9·2
Chur		14·0	318	e 3 24	+ 2	e 5 51	− 8	—	—	—
Sotchi		14·1	58	i 3 25	+ 2	—	—	—	—	—
Prague		14·3	337	3 25?	− 1	e 6 1	− 5	e 6 44	SSS	e 7·2
Zürich		14·8	318	e 3 34a	+ 2	e 6 24	+ 6	i 4 10	PPP	—
Cheb		15·1	332	e 3 36	0	e 6 9	−16	—	—	e 7·0
Warsaw		15·1	355	e 3 38k	+ 2	6 24	− 1	e 3 53	PP	e 8·0
Stuttgart		15·4	323	e 3 40	0	i 6 32	0	i 4 18a	pP	e 9·0
Basle		15·5	317	e 3 42	0	e 6 38	+ 3	i 4 17	PPP	—
Neuchatel		15·5	314	e 3 43	+ 1	e 6 47	+12	—	—	—
Strasbourg		16·0	320	i 3 48	0	e 6 47	+ 1	i 4 22	sP	—
Jena	N.	16·1	332	e 3 51	+ 2	e 6 52	+ 3	i 4 24	PPP	—
Piatigorsk		16·6	59	i 4 27?	+31	—	—	—	—	—
Barcelona		16·8	291	e 3 59	+ 1	7 11	+ 6	—	—	e 10·2
Potsdam		16·8	338	e 4 1	+ 3	i 7 11	+ 6	—	—	—
Erevan		16·9	73	4 5	+ 6	—	—	—	—	—
Clermont-Ferrand		17·3	305	e 4 5	+ 1	i 7 33	SS	i 4 35	PPP	10·5
Tortosa		18·0	288	i 4 14	+ 1	i 7 33	+ 1	4 38	PPP	—
Grozny		18·2	64	4 22	PP	—	—	—	—	—
Alicante		18·7	281	4 24	+ 2	7 50	+ 2	4 33	pP	e 9·2
Paris		19·0	315	i 4 25a	− 1	i 7 49	− 6	4 40	PP	e 11·0
Uccle		19·1	321	e 4 27	0	e 7 53	− 4	i 4 57	PPP	e 10·5
De Bilt		19·6	326	e 4 30	− 2	e 8 4	− 4	e 5 2	pP	e 10·0
Copenhagen		19·9	342	e 4 34	− 2	8 7	− 8	i 5 3	PPP	—
Tamanrasset		20·9	232	i 4 50k	+ 4	—	—	i 5 11a	pP	—
Baku		21·0	73	4 39	− 8	—	—	—	—	—
Moscow		21·0	23	i 4 43	− 4	i 8 25	−12	5 6	pP	—
Granada		21·3	279	i 4 48k	− 2	i 8 41	− 2	5 8k	pP	i 10·6
Toledo	z.	21·4	285	i 4 52	+ 1	i 8 49	+ 4	i 5 15	PP	—
Jersey		21·9	312	e 4 54	− 3	i 8 47	− 7	e 5 28?	PPP	—
Kew		21·9	319	e 5 14	PP	e 8 51	− 3	e 5 27	PPP	e 11·5
Helsinki		23·0	2	e 5 2	− 5	e 9 2	−12	e 5 32	PP	—
Upsala		23·0	353	i 5 3a	− 4	i 9 8	− 6	5 27?	pP	—
Durham		24·4	324	e 5 20	− 1	i 9 35	− 4	e 5 46	PP	—
Lisbon		25·5	284	5 31k	− 1	9 58	+ 1	6 5a	PP	—
Aberdeen		26·1	329	i 6 14	PP	i 10 2	− 5	i 10 48	SS	—
Ashkabad		27·8	78	e 5 52	− 1	—	—	—	—	—
Sverdlovsk		31·6	40	i 7 24	PP	11 19	−16	—	—	—
Samarkand		34·1	72	6 40?	− 8	—	—	—	—	—
Tashkent		35·6	69	e 6 59	− 2	e 12 17	−21	e 7 24	pP	—
Stalinabad		35·7	73	i 7 0	− 2	—	—	—	—	—
Obi-garm		36·4	73	i 6 31?	−37	—	—	—	—	—
Andijan		38·0	70	7 20	− 1	—	—	—	—	—
Frunse		39·3	66	7 1?	−31	—	—	—	—	—
Scoresby Sund		40·9	339	8 16	+30	13 48	−10	9 58	PPP	—
Bombay		46·9	99	e 8 34	0	i 15 18	− 7	—	—	—
Ivigtut		49·4	323	i 9 25	+32	i 15 49	−11	19 40	SS	—
Hyderabad	N.	52·1	97	—	—	e 16 18	−20	—	—	—
Harvard		69·2	308	i 11 7	− 3	—	—	i 11 33	PcP	—
Ottawa		70·1	313	11 13	− 3	20 8	−19	20 56	PS	—
Ville Marie		71·2	316	i 11 20	− 3	—	—	—	—	—
Temiskaming		71·4	315	i 11 20	− 4	—	—	i 11 44	PcP	—
Vladivostok		77·1	45	e 11 51	− 6	e 22 27	PS	e 14 43	PP	—
Chicago		79·2	315	—	—	e 21 53	−15	e 22 35	SeS	e 34·6
St. Louis		82·8	314	i 12 23	− 4	i 22 33	−12	i 12 49	pP	—
Lincoln	E.	84·8	319	e 12 36	− 1	e 22 44	−21	e 23 26	SeS	e 33·6
Hungry Horse		86·7	333	e 12 40	− 7	—	—	—	—	—
Bozeman		87·8	330	—	—	e 23 24	−10	—	—	e 37·9

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Grand Coulee		88·8	336	e 12 54	− 3	—	—	—	—	—
Victoria		89·6	338	e 12 56	− 5	—	—	—	—	—
Mineral	z.	96·3	334	e 13 48 a	+16	—	—	e 17 14	PP	—
Pierce Ferry		97·0	326	e 13 32	− 3	—	—	e 13 58	?	—
Boulder City		97·4	327	e 13 35	− 2	—	—	—	—	—
Tinemaha	z.	98·0	330	e 13 38	− 1	—	—	e 14 6	?	—
Haiwee	z.	98·6	329	e 13 40	− 2	—	—	e 18 2	PP	—
Tucson		98·7	322	e 13 38	− 4	—	—	i 18 12	PP	—
Berkeley		98·8	333	e 18 11	PKP	e 31 50	SS	—	—	e 48·4
Riverside	z.	100·2	328	e 18 27	PP	—	—	—	—	—
Mount Wilson	z.	100·3	328	e 17 55	PP	—	—	i 18 30	PKP	—
Pasadena	z.	100·4	328	e 17 55	PP	—	—	e 18 30	PKP	—
Palomar	z.	100·5	327	i 18 30	PKP	—	—	—	—	—

Additional readings :—
Bucharest iP*EN = 1m.55s., iSEN = 2m.54s., iS*N = 3m.22s.
Belgrade i = 2m.50s.
Rome i = 2m.45s., iSE = 4m.1s., i = 4m.23s.
Kalossa iE = 4m.52s., eE = 5m.32s., eN = 5m.40s. and 6m.1s., iE = 6m.31s.
Helwan i = 2m.55s. and 4m.40s.
Budapest ePE = 2m.59s., iN = 3m.9s.
Bologna eP_g?Z = 4m.48s., eS = 4m.52s., e = 6m.43s.?
Salo iSE = 5m.12s.
Cheb e = 5m.18s. and 5m.41s.
Warsaw ePN = 3m.41s., ePE = 3m.45s., PPPZ = 4m.0s., ePPPN = 4m.7s., SE = 6m.21s., SSEN = 6m.31s., SSZ = 6m.35s., SSSN = 6m.41s., SSSE = 6m.48s., SSSZ = 6m.55s.
Stuttgart eS = 6m.18s.
Strasbourg e = 6m.28s.
Potsdam iPPEN = 4m.31s., iPPPN = 4m.44s.
Tortosa PPPE = 4m.48s., SSEN = 8m.9s.
Alicante PP = 4m.46s., PPP = 4m.56s., sS = 8m.16s., SS = 8m.22s., SSS = 8m.52s., P_cP = 8m.56s., P_cS = 12m.11s.
Paris isP? = 4m.53s., isS = 8m.41s.
Uccle iEN = 5m.17s., iE = 8m.6s.
De Bilt iZ = 8m.13s., isS = 8m.44s.
Tamanrasset esP = 5m.18s., ePP? = 6m.16s., ipPP? = 6m.31s.
Moscow iPP = 5m.12s., sS = 9m.0s.
Granada iPP = 5m.38s., pPP = 6m.8s., sS = 8m.53s., SS = 9m.44s.
Toledo isP?Z = 5m.26s., iPPZ = 5m.37s., iSSZ = 9m.20s.
Kew eZ = 6m.13s., e = 9m.13s., 9m.33s., and 9m.57s.
Helsinki e = 5m.27s., 5m.43s., 9m.43s., and 12m.36s.
Upsala iPPE = 5m.52s., iS = 9m.3s., isSE = 9m.44s., isS?N = 9m.50s., eN = 11m.47s.
Durham SSSEN = 10m.2s.
Lisbon Z = 5m.51s.k, SE = 9m.43s., N = 9m.46s., E = 9m.55s., EZ = 10m.3s., SSEZ = 10m.37s.
Scoresby Sund SS = 16m.58s.
Ottawa i = 11m.34s., SS = 24m.40s., SSS = 27m.34s.
Lincoln eE = 13m.4s.
Tucson i = 15m.11s.
Berkeley ePPPN = 24m.52s., eN = 47m.22s., readings wrongly identified.

Sept. 11d. Readings also at 0h. (La Paz, Ivigtut, Scoresby Sund, Uccle (2), Alicante, Granada, Kew, Strasbourg, Clermont-Ferrand, Rome, Tamanrasset, Stalinabad, Kulyab, near Andijan, Frunse, Tchimkent, and Tashkent, near Basle and Zürich), 1h. (Kew), 2h. (Scoresby Sund, Reykjavik, Paris, Strasbourg, Clermont-Ferrand, Uccle, De Bilt, Rome, and Tamanrasset), 3h. (near Lick), 5h. (Scoresby Sund, Reykjavik, Paris, Clermont-Ferrand, De Bilt, Rome, Stuttgart, and Tamanrasset), 6h. (near Huancayo and near Obi-garm), 7h. (near Andijan, Tchimkent, Obi-garm, Frunse, Tashkent, and Stalinabad), 8h. (near La Paz, near Obi-garm, Andijan, Tchimkent, Tashkent, and Stalinabad), 9h. (Reykjavik, Tchimkent, Stalinabad, near Branner and Lick), 12h. (near Obi-garm, near Lick, and Fresno), 13h. (Boulder City, Pierce Ferry, Tucson, Pasadena, Mount Wilson, Riverside, Palomar, Haiwee, Tinemaha, and Mineral), 16h. (Apia, Stuttgart, Boulder City, Pierce Ferry, Tucson, Mount Wilson, Palomar, Haiwee, Tinemaha, Lick, and Mineral), 17h. (Boulder City, Hungry Horse, Pierce Ferry, Tucson, and near Mizusawa), 18h. (Rome), 19h. (Paris), 20h. (Pierce Ferry, Lick (2), and Apia), 22h. (Mineral), 23h. (Christchurch, Boulder City, Hungry Horse, Grand Coulee, Pierce Ferry, Tucson, Pasadena, Mount Wilson, Palomar, Tinemaha, Lick, Branner, Mineral, Victoria, Stuttgart, near Obi-garm, Stalinabad, and Kulyab).

Sept. 12d. 3h. 19m. 44s. Epicentre 21°·0S. 174°·0W. (as on 9d.).

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		7·4	16	e 1 52	0	e 3 7	−11	—	—	—
Auckland	N.	18·6	209	4 18	− 3	7 54	+ 8	—	—	9·3
Tuai	N.	19·3	201	e 4 59	+30	7 47	−15	—	—	—
New Plymouth	E.	20·7	206	4 41	− 3	8 32	+ 1	—	—	—
Wellington		22·3	204	e 4 59	− 2	8 51	−11	e 6 11	PP	12·3
Kaimata		24·7	207	5 29	+ 5	9 47	+ 3	—	—	—
Brisbane		30·7	251	i 6 20	+ 1	i 11 20	− 1	i 7 23	PP	e 14·9
Riverview		33·7	240	e 7 56	PP	i 11 58	−10	e 14 19	SS	—
Santa Barbara	Z.	75·5	44	e 11 49	+ 1	—	—	—	—	—
Berkeley		76·1	40	i 11 52a	+ 1	e 21 38	+ 3	—	—	e 31·7
Lick	Z.	76·1	40	i 11 52a	+ 1	—	—	—	—	—
Pasadena		76·3	45	i 11 52	0	e 21 21	−16	—	—	e 30·3
Mount Wilson		76·5	45	i 11 53a	− 1	—	—	—	—	—
Palomar		76·7	46	i 11 55a	0	—	—	—	—	—
Riverside		76·8	45	i 11 57	+ 2	—	—	—	—	—
Fresno	N.	76·9	42	e 11 58	+ 2	—	—	—	—	—
Haiwee	Z.	77·7	44	i 12 0	0	—	—	—	—	—
Tinemaha		78·1	43	i 12 0a	− 2	e 22 6	+10	—	—	—
Mineral	Z.	78·1	38	e 12 2a	0	—	—	—	—	—
Boulder City		79·6	46	i 12 3	− 7	—	—	—	—	—
Pierce Ferry		80·3	46	i 12 15	+ 1	—	—	—	—	—
Tucson		80·3	50	i 12 15a	+ 1	—	—	—	—	—
Vladivostok		80·9	323	i 12 18	+ 1	i 22 31	+ 5	—	—	—
Victoria		82·6	32	e 12 26	0	—	—	—	—	—
Grand Coulee		84·5	33	e 12 36	0	—	—	—	—	—
Hungry Horse		87·3	36	i 12 50	0	—	—	—	—	—
Huancayo		93·7	104	—	—	e 23 57	[+ 3]	e 24 26	S	e 38·6
La Paz		98·3	112	e 13 25	−16	(24 18)	[− 1]	e 18 0	PP	24·3
Philadelphia		109·8	54	—	—	e 27 49	PS	—	—	e 35·7
Ottawa		110·4	48	—	—	e 28 40	PS	e 34 38	SS	45·3
Ashkabad		132·0	303	e 22 46	PKS	—	—	—	—	—
Copenhagen		145·0	355	i 19 39	[0]	—	—	—	—	70·3
Warsaw		146·7	345	19 48k	[+ 6]	—	—	e 23 3	PP	e 78·3
De Bilt		149·0	2	e 19 46	[0]	—	—	—	—	e 72·3
Kew		149·2	8	e 19 49	[+ 3]	—	—	—	—	e 75·3
Collmberg	Z.	149·3	352	e 19 51	[+ 5]	—	—	—	—	—
Jena		149·8	354	e 19 55	[+ 8]	—	—	—	—	—
Prague		150·2	351	e 19 44	[− 4]	e 36 16	PPS	e 23 40	PP	—
Uccle		150·3	4	e 19 56	[+ 8]	—	—	—	—	e 78·3
Ksara		150·7	302	e 19 54	[+ 6]	—	—	e 23 34	PP	—
Istanbul		152·0	323	e 19 47	[− 3]	—	—	e 23 37	PP	e 83·3
Stuttgart		152·2	356	e 19 52	[+ 1]	—	—	—	—	e 79·3
Strasbourg		152·4	358	e 19 59	[+ 8]	—	—	—	—	e 74·3
Paris		152·8	5	i 19 53	[+ 1]	—	—	e 23 41	PP	e 78·3
Triest		154·6	350	e 20 15	[+21]	—	—	—	—	—
Clermont-Ferrand		155·2	6	e 19 59	[+ 4]	—	—	—	—	79·3
Helwan		155·5	296	i 19 58	[+ 3]	e 23 2	PKS	e 23 45	PP	—
Rome		158·5	349	i 20 1k	[+ 2]	e 44 51	SS	e 24 46	PP	—
Tamanrasset		178·2	—	i 20 15a	[+ 3]	e 22 5	PKP_2	i 25 56	PP	—

Additional readings :—
Wellington e =8m.56s.
Brisbane iZ =6m.50s., and 7m.29s., iE =7m.50s.
Berkeley eSZ =21m.41s.
Lick iZ =12m.38s.
Pasadena iZ =12m.15s., iSE =21m.44s.
Palomar iZ =12m.6s. and 12m.16s.
Haiwee iZ =12m.20s.
Tinemaha eZ =12m.20s.
Mineral eN =12m.4s., iZ =12m.33s.
Tucson i =12m.40s., e =13m.43s.
Huancayo eSS =31m.5s., e =31m.13s.
Warsaw ePPZ =23m.10s., ePPE =23m.21s.
Kew iZ =19m.57s. and 20m.19s., eN =52m.16s.?
Prague eSS? =42m.16s.?

Continued on next page.

Stuttgart eZ =19m.59s. and 20m.8s.
Strasbourg ePKP$_2$ =20m.10s., e =22m.18s.
Helwan i =20m.35s.
Rome eZ =20m.21s., e =20m.40s., ePPS =34m.37s., eSS =40m.28s.?, e =52m.28s., true SS =is given as SSS.
Tamanrasset ePPP =29m.10s.
Long waves were also recorded at Arapuni, Bombay, and College.

Sept. 12d. 6h. Tonga region. Pasadena suggest depth 550km.

Apia ePEN =26m.20s., iSEN =27m.47s.
Brisbane iPZ =29m.36s.
Santa Barbara iPZ =35m.24s.k
Berkeley iPZ =35m.26s.k
Lick iPZ =35m.26s.a, iZ =35m.44s.
Pasadena iPZ =35m.28s., eZ =35m.51s.
Mount Wilson iPZ =35m.29s.k, eZ =35m.51s.
Palomar iP =35m.31s.k, iZ =35m.51s., epP?Z =37m.29s., eZ =38m.15s.
Riverside ePEN =35m.31s.
Fresno ePN =35m.31s.
Haiwee iPZ =35m.34s.
Mineral iPZ =35m.35s.
Tinemaha iP =35m.37s.k, eZ =35m.56s., iZ =36m.2s., epP?Z =37m.37s.
Boulder City iP =35m.46s.,
Pierce Ferry iP =35m.49s., e =37m.49s.
Tucson iP =35m.51s., i =36m.8s.
Victoria e =35m.55s.
Grand Coulee eP =36m.5s.
Hungry Horse iP =36m.19s.
Collmberg iEZ =39m.35s. and 43m.11s.
Stuttgart eZ =43m.10s. and 43m.16s.
Ksara e =43m.10s. and 45m.16s.
Strasbourg ePKP =43m.18s.
Paris iPKP =43m.18s.
Clermont-Ferrand ePKP =43m.25s.
Tamanrasset ePKP =43m.37s., e =45m.18s.

Sept. 12d. Readings also at 0h. (Clermont-Ferrand, Paris, and Rome), 1h. (near Pierce Ferry), 5h. (Alicante, near Rome, Samarkand, near Andijan, Kulyab, Obi-garm (2), and Stalinabad), 8h. (Palomar, Tinemaha, Tucson, Pierce Ferry, and near Lick), 9h. (Pierce Ferry), 10h. (Paris and Stuttgart), 11h. (near Lick), 13h. (Apia, Stuttgart, Ksara, Grozny, Sverdlovsk, Ashkabad, Samarkand, near Almata, Andijan, Frunse, Kulyab (2), Murgab, Obi-garm (2), Stalinabad (2), Tashkent, Tchimkent, near Ottawa and near Tacubaya), 14h. (Upsala, Copenhagen, Paris, Warsaw, De Bilt, Frunse, Kulyab, Stalinabad, Tashkent, near Andijan, Obi-garm, and Tchimkent), 15h. (near Mineral), 16h. (Brisbane), 17h. (Pierce Ferry, Sverdlovsk, and near Obi-garm), 18h. (Tinemaha, Tucson, Boulder City, Stuttgart, Triest, Taranto, and Istanbul), 19h. (Mount Wilson, Pasadena, Riverside, Tinemaha, Tucson, Boulder City (2), Pierce Ferry (2), Hungry Horse, Victoria, Stuttgart, and near Mizusawa), 20h. (Ashkabad), 21h. (Frunse, near Andijan, Obi-garm, and Tchimkent), 22h. (near Tacubaya), 23h. (Stuttgart and near Lick).

Sept. 13d. 21h. 7m. 41s. Epicentre 13°·8N. 93°·1W. (as on 1947, July 10d.).

A = −·0525, B = −·9701, C = +·2370; δ = +2; h = +6;
D = −·999, E = +·054; G = −·013, H = −·237, K = −·972.

	△	Az.	P.	O−C.	S.	O−C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Merida	7·8	25	e 2 16	P*	3 48	S*	— —	—
Tacubaya	8·1	315	2 20	P*	e 3 55	S*	— —	i 4·3
Manzanillo	12·0	297	e 3 11	+16	e 5 29	+18	— —	—
Bogota	20·9	114	i 4 58	+12	e 8 56	+21	— —	—
Tucson	24·5	322	i 5 23	+ 1	i 9 59	+19	i 6 26	PP e 11·1
St. Louis	24·9	5	e 5 25	− 1	e 9 47	0	— —	—
San Juan	26·3	76	e 5 35	− 4	e 9 58	−13	— —	e 11·8
Chicago	28·4	7	e 9 43	?	e 10 51	+ 6	— —	(e 14·1)
New Kensington E.	29·1	21	e 9 59	?	—	—	— —	e 13·0
Palomar Z.	29·1	316	i 6 4	0	—	—	— —	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Pierce Ferry		29·1	324	e 6 4	0	—	—	—	—	e 16·2
Cleveland	E.	29·4	18	—	—	e 12 5	SS	—	—	—
Boulder City		29·5	325	e 6 8	0	—	—	e 6 46	PP	e 17·4
Riverside	Z.	29·8	317	e 6 11	0	—	—	—	—	—
Mount Wilson	Z.	30·4	317	e 6 16	0	—	—	—	—	—
Pasadena		30·4	317	e 6 16	0	—	—	—	—	e 14·1
Philadelphia		30·4	28	e 7 55	PP	e 12 20	+64	—	—	e 13·6
Huancayo		31·1	144	e 8 15	PPP	e 13 43	SS	—	—	e 17·0
Rapid City	E.	31·4	346	—	—	e 12 32	+60	—	—	e 15·0
Salt Lake City		31·5	333	e 6 26	0	e 11 38	+ 4	—	—	e 13·9
Fordham		31·7	29	e 6 29	+ 2	e 11 39	+ 2	—	—	—
Fort de France		32·0	85	—	—	e 11 39	− 3	—	—	—
Tinemaha	Z.	32·3	320	i 6 34	+ 1	—	—	—	—	—
Lick	Z.	34·6	318	e 6 52	− 1	—	—	—	—	—
Santa Clara		34·8	318	—	—	e 12 37	+12	—	—	e 18·8
Ottawa		34·8	21	6 53	− 1	12 25	0	—	—	16·8
Bozeman		35·2	339	—	—	e 12 39	+ 8	—	—	e 17·4
Berkeley		35·3	318	e 7 3	+ 4	i 12 39	+ 6	—	—	e 17·4
Butte	N.	36·1	338	e 7 23	+18	i 12 32	−13	—	—	e 15·5
Mineral	Z.	36·4	322	e 6 59	− 9	—	—	—	—	e 21·1
Seven Falls	E.	38·1	24	e 8 52	PP	—	—	(15 49)	SS	15·8
Hungry Horse		38·6	338	i 7 25	− 1	—	—	—	—	—
La Paz		38·9	139	e 6 26	−63	i 13 43	+15	—	—	19·2
Victoria		42·7	331	e 8 11	+11	—	—	—	—	24·1
Paris		83·4	42	e 12 26?	− 4	e 22 59?	+ 8	—	—	e 42·3
De Bilt		84·2	38	—	—	e 23 7	+ 8	—	—	e 42·3
Clermont-Ferrand		84·5	44	—	—	e 23 9	+ 7	—	—	50·8
Strasbourg		86·8	40	e 12 50	+ 3	23 19	− 6	—	—	42·3
Copenhagen		87·3	33	—	—	23 28	− 1	—	—	46·3
Stuttgart		87·7	40	e 12 47	− 5	e 23 49	+16	—	—	e 49·3
Potsdam	Z.	88·8	36	e 13 3	+ 6	—	—	—	—	e 50·3
Cheb		89·2	38	—	—	e 23 33	[+ 5]	—	—	—
Triest		91·6	42	e 13 5	− 5	e 23 28	[−14]	e 24 13	S	—
Rome		92·1	46	—	—	e 23 55	{− 2}	e 26 36	PPS	e 46·9

Additional readings and note :—
Tacubaya iSE =3m.58s.
Tucson i =5m.36s. and 5m.39s.
St. Louis eZ =5m.40s., iSN =9m.54s., isS?N =10m.20s.
Chicago S is given as e and L as S.
Palomar iZ =6m.13s.
Cleveland eE =12m.53s. and 13m.34s.
Boulder City i =6m.17s.
Riverside eZ =6m.19s.
Mount Wilson eZ =6m.25s.
Tinemaha iZ =6m.42s.
Berkeley eE =7m.16s., iN =7m.47s.
Hungry Horse i =7m.37s. and 7m.43s.
Strasbourg eP =12m.54s.
Long waves were also recorded at Puebla, Ukiah, College, Alicante, and Uccle.

Sept. 13d. Readings also at 0h. (Ashkabad, Collmberg, Ksara, Yalta, near Erevan, Grozny, Leninakan, Piatigorsk, Sotchi, and near Tacubaya), 1h. (Andijan, Jena, Stuttgart, and Hungry Horse), 4h. (near Zürich), 6h. (Mineral and near Lick (2)), 7h. (Jena and near Stuttgart), 11h. (Hungry Horse and near Balboa Heights), 14h. (Apia, Arapuni, Auckland, Christchurch, Kaimata, Wellington, Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Boulder City, Pierce Ferry, Hungry Horse, Jena, Paris, Strasbourg, Stuttgart, Collmberg, Istanbul, and Ksara), 15h. (Alicante, Clermont-Ferrand, Philadelphia, Hungry Horse, and Lick), 16h. (Mount Wilson, Palomar, Tinemaha, Tucson, Pierce Ferry, and Mizusawa), 17h. (near Tacubaya), 18h. (Hungry Horse and Pierce Ferry), 21h. (Huancayo (2), Pierce Ferry, Samarkand, Tashkent, near Andijan, Kulyab, Murgab, Obi-garm, and Stalinabad), 22h. (Mount Wilson, Pasadena, Palomar, Riverside, Tucson, Boulder City, Pierce Ferry (2), gulf of California, also Rome and near Lick), 23h. (Victoria, Budapest, near Belgrade, near Andijan, Kulyab, Murgab, Obi-garm, Stalinabad, and Tchimkent).

Sept. 14d. 8h. 12m. 52s. Epicentre 21°·0S. 174°·0W. (as on Sept. 12d.).

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		7·4	16	i 1 45	− 7	e 2 53	−25	—	—	—
Auckland	N.	18·6	209	—	—	6 57	−49	—	—	8·6
Tuai	N.	19·3	201	4 45	+16	7 52	−10	—	—	—
New Plymouth	E.	20·7	206	5 18	+34	—	—	—	—	—
Wellington		22·3	204	5 9	+ 8	8 59	− 3	16 18	S_cS	—
Kaimata		24·7	207	5 33	+ 9	9 52	+ 8	—	—	—
Christchurch		25·1	203	5 52	+24	10 2	+11	11 3	Q	12·3
Brisbane		30·7	251	e 6 21	+ 2	i 11 14	− 7	i 7 23	PP	—
Riverview		33·7	240	6 39	− 6	e 12 3	− 5	i 8 13	PP	e 16·1
Santa Barbara	Z.	75·5	44	e 11 47	− 1	—	—	—	—	—
Branner	Z.	75·9	40	i 11 49a	− 1	—	—	—	—	—
Berkeley		76·1	40	e 11 50a	− 1	e 21 30	− 5	—	—	e 32·0
Lick	Z.	76·1	40	e 11 50a	− 1	—	—	—	—	—
Pasadena		76·3	45	i 11 51a	− 1	e 21 35	− 2	—	—	—
Mount Wilson	Z.	76·5	45	i 11 52a	− 2	—	—	—	—	—
Palomar		76·7	46	i 11 55a	0	—	—	—	—	—
Riverside	Z.	76·8	45	i 11 53a	− 2	—	—	—	—	—
Fresno	N.	76·9	42	i 11 57	+ 1	—	—	—	—	—
Haiwee		77·7	44	i 12 9a	+ 9	—	—	—	—	—
Tinemaha	Z.	78·1	43	i 12 1	− 1	—	—	—	—	—
Mineral	Z.	78·1	38	i 12 0a	− 2	—	—	—	—	—
Boulder City		79·6	46	e 12 10	0	—	—	—	—	—
Pierce Ferry		80·3	46	i 12 13	− 1	—	—	—	—	e 39·0
Tucson		80·3	50	i 12 14a	0	e 22 21	+ 1	e 15 15	PP	e 35·8
Vladivostok		80·9	323	i 12 17	0	i 22 28	+ 2	—	—	—
Victoria		82·6	32	e 12 27	+ 1	—	—	—	—	—
Grand Coulee		84·5	33	i 12 35	− 1	—	—	—	—	—
Huancayo		93·7	104	—	—	e 24 4	{− 5}	e 26 12	PPS	e 43·6
Sverdlovsk		126·5	327	18 56	[− 9]	—	—	—	—	—
Potsdam		148·2	353	i 19 47	[+ 2]	—	—	—	—	e 77·1
De Bilt		149·0	2	e 19 49	[+ 3]	—	—	—	—	e 71·1
Collmberg		149·3	352	e 3 50	?	—	—	—	—	—
Jena	E.	149·8	354	e 19 49	[+ 2]	—	—	—	—	—
Uccle		150·3	4	e 19 54	[+ 6]	—	—	—	—	e 77·1
Ksara		150·7	302	e 19 35	[−13]	—	—	36 17	PPS	—
Istanbul		152·0	323	e 19 44	[− 6]	—	—	—	—	—
Stuttgart		152·2	356	e 19 52a	[+ 1]	—	—	—	—	e 86·1
Paris		152·8	5	i 19 52	[0]	—	—	i 24 24	PP	e 79·1
Basle		153·5	0	e 19 47	[− 5]	e 27 13	[+15]	e 25 55	?	—
Zürich		153·6	359	e 19 53a	[0]	—	—	—	—	—
Clermont-Ferrand		155·2	6	e 19 57	[+ 2]	—	—	—	—	81·1
Helwan		155·5	296	i 19 54	[− 1]	—	—	—	—	—
Tamanrasset		178·2	—	e 20 12	[0]	—	—	i 25 51	PP	—

Additional readings :—
Brisbane iZ =6m.53s., iS?N =11m.20s.
Riverview eSSSN? =14m.20s.
Berkeley eSE =21m.37s.
Pasadena iZ =12m.6s.
Mount Wilson iZ =12m.8s.
Palomar iZ =12m.21s.
Riverside iZ =12m.10s.
Tinemaha iZ =12m.22s.
Mineral iZ =12m.22s.
Tucson i =12m.35s. and 12m.43s.
Huancayo eSS =31m.16s.
Jena eN =19m.53s.
Stuttgart eZ =19m.58s.a.
Paris i =19m.59s.
Helwan e =20m.13s.
Tamanrasset ePKP$_2$ =22m.0s., ePPP =29m.5s.
Long waves were also recorded at Arapuni and La Paz.

Sept. 14d. Readings also at 0h. (Hungry Horse and Pierce Ferry), 2h. (Frunse, near Andijan, Kulyab, Murgab (2), Samarkand, Stalinabad, Tashkent, and Tchimkent), 4h. (Mizusawa, Pierce Ferry, La Paz, and near Huancayo), 5h. (Pierce Ferry and near Obi-garm), 7h. (Pierce Ferry), 8h. (Tchimkent, near Andijan, Kulyab, Obi-garm (2), Stalinabad, and near Lick), 9h. (near Andijan, Kulyab, Obi-garm, and Stalinabad), 13h. (near Berkeley), 17h. (Mount Wilson, Pasadena, Palomar, Riverside, Pierce Ferry, and near La Paz), 18h. (Calcutta, near Andijan, Frunse, Tchimkent, and near Apia), 20h. (Auckland, Mount Wilson (2), Pasadena (2), Palomar (2), Riverside (2), Tinemaha (2), Tucson (2), Boulder City, Pierce Ferry, Berkeley, Lick, Hungry Horse, and Stuttgart), 21h. (Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson (2), Boulder City, Pierce Ferry (2), near Hungry Horse (2), Montezuma, and near La Paz), 22h. (San Francisco), 23h. (Tucson, Lick, San Francisco, near Berkeley, and Branner).

Sept. 15d. 3h. 52m. 26s. Epicentre 33°·4N. 84°·2E.

$A = +\cdot0845$, $B = +\cdot8323$, $C = +\cdot5479$; $\delta = +6$; $h = +1$;
$D = +\cdot995$, $E = -\cdot101$; $G = +\cdot056$, $H = +\cdot545$, $K = -\cdot837$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Murgab		9·7	304	2 22	0	i 4 14	− 1	—	—	—
Almata		11·4	332	e 2 46?	− 1	—	—	—	—	—
Calcutta	E.	11·4	160	—	—	e 4 37	−19	e 5 37	SSS	i 5·9
Andijan		11·9	311	e 3 1	+ 7	—	—	—	—	—
Frunse		12·1	324	e 3 4	+ 7	—	—	—	—	—
Kulyab		12·6	295	i 3 2	− 1	i 5 23	− 3	—	—	—
Obi-garm		12·9	298	i 2 56?	−11	i 5 13?	−20	—	—	—
Stalinabad		13·5	296	i 3 18	+ 3	i 5 48	+ 1	—	—	—
Tashkent		14·2	308	e 3 26	+ 2	e 6 1?	− 3	—	—	—
Tchimkent		14·5	312	e 3 35	+ 7	—	—	e 3 40?	P	—
Bombay		17·7	218	e 4 9	− 1	i 7 40	+14	—	—	8·8
Irkutsk		23·8	31	5 17	+ 2	9 43	+15	—	—	—
Kodaikanal	E.	23·9	197	e 9 15	PcP	e 11 15	?	—	—	12·2
Sverdlovsk		28·5	332	i 6 0	+ 1	10 53	+ 7	—	—	—
Grozny		31·5	300	e 6 18	− 8	—	—	—	—	—
Moscow		39·0	319	7 31	+ 1	13 34	+ 5	—	—	—
Ksara		39·9	284	e 7 43	+ 6	e 13 53	+10	—	—	—
Yalta		39·9	301	e 7 32	− 5	—	—	—	—	—
Istanbul		43·9	297	—	—	e 15 6	+24	e 17 49	SS	—
Helwan		44·8	280	e 8 20	+ 3	e 15 3	+ 8	e 19 19	SSS	—
Warsaw		48·4	313	—	—	e 19 42	SS	—	—	e 26·6
Potsdam		53·2	314	e 9 23	+ 1	—	—	—	—	e 28·6
Stuttgart		56·4	309	e 9 46	+ 1	—	—	—	—	e 31·6
Paris		60·4	311	i 10 16	+ 3	—	—	—	—	—
Tamanrasset		68·7	285	e 11 9	+ 2	—	—	e 13 37	PP	—
Hungry Horse		97·0	12	i 13 35	0	—	—	—	—	—
Huancayo		151·7	314	i 20 2	[+12]	—	—	—	—	—

Tamanrasset also gives e =12m.7s.
Long waves were also recorded at other European stations.

Sept. 15d. Readings also at 4h. (Hungry Horse, Pierce Ferry, Stalinabad, Obi-garm, and near Kulyab), 5h. (near Fresno), 6h. (Alicante, Granada, and Pierce Ferry), 9h. (Tucson and near Tacubaya), 13h. (La Paz), 14h. (Apia (2)), 15h. (near Tortosa), 16h. (Mount Wilson, Pasadena, Palomar, Riverside, Tucson, Boulder City, Pierce Ferry, near Obi-garm, and near Tortosa (3)), 17h. (near Branner and near Tortosa (2)), 18h. (near Branner (2)), 22h. (Istanbul, Rome, Taranto, near Branner, and near Lick), 23h. (Christchurch, near Kaimata, New Plymouth, Tuai, Wellington, and near Belgrade (2)).

Sept. 16d. 8h. 9m. 12s. Epicentre 30°·4N. 128°·0E.

Intensity II-III at Kagosima. Epicentre as adopted, shallow. Macroseismic radius 200-300km.

Seismo. Bull. Cent. Met. Obs., Japan, 1948. Tokyo, 1950, p. 41, with chart.

$A = -·5319$, $B = +·6808$, $C = +·5035$; $\delta = -8$; $h = +2$;
$D = +·788$, $E = +·616$; $G = -·310$, $H = +·397$, $K = -·864$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Nanking		8·1	284	e 1 56	− 6	e 3 48	+13	—	—	—
Vladivostok		13·1	13	e 3 5	− 5	e 5 25	−13	—	—	—
Irkutsk		27·9	327	e 6 4	+10	e 10 51	+14	—	—	—
Andijan		45·7	299	e 8 27?	+ 3	—	—	—	—	—
Tchimkent		47·7	301	e 8 42	+ 2	—	—	—	—	—
Obi-garm		48·0	296	e 8 7?	−36	—	—	—	—	—
Tashkent		48·0	300	e 8 45	+ 2	—	—	—	—	—
Stalinabad		48·8	296	e 8 51	+ 2	—	—	—	—	—
Sverdlovsk		52·9	320	9 18	− 2	—	—	—	—	—
Ksara		75·4	300	e 13 23	?	e 24 0	?	—	—	—
Warsaw	N.	76·0	322	e 12 27	+36	—	—	e 16 17	PPP	—
Victoria		78·9	39	e 12 5	− 2	—	—	—	—	—
Triest		83·7	319	—	—	e 27 41	SS	—	—	—
Hungry Horse		84·0	36	i 13 4	+31	—	—	i 16 2	PP	—
Stuttgart		84·1	324	e 12 35	+ 1	—	—	e 17 11	PPP	e 45·8
Mineral	z.	84·6	46	i 12 35a	− 1	—	—	—	—	—
Tinemaha	z.	88·6	47	e 12 56	0	—	—	—	—	—
Mount Wilson	z.	90·5	49	e 13 10	+ 5	—	—	—	—	—
Palomar	z.	91·8	49	e 13 10	− 1	—	—	—	—	—
Tucson		96·4	47	e 13 32	0	—	—	—	—	—

Additional readings :—
Warsaw eN = 13m.29s., 18m.55s., 19m.57s., and 23m.57s.
Tucson e = 14m.18s.
Long waves were also recorded at Bombay and other European stations.

Sept. 16d. Readings also at 1h. (Palomar and near Balboa Heights), 2h. (Mount Wilson, Palomar, Riverside, Tinemaha, Tucson, Mineral, Hungry Horse, Ottawa, Paris, and Stuttgart), 3h. (Granada and Rome), 4h. (Tacubaya, Palomar, Tucson, Hungry Horse and near Mineral (2)), 5h. (Tortosa and near Apia (2)), 6h. (Pasadena, Tinemaha, Tucson, and Hungry Horse), 9h. (near Zürich and near Tortosa), 10h. (Auckland, Christchurch, Kaimata, near New Plymouth, Tuai, and Wellington), 12h. (Strasbourg, Stuttgart, Sotchi, Palomar, Pasadena, Tinemaha, Tucson, and near Balboa Heights), 14h. (Ksara), 17h. (near Zürich), 20h. (Andijan and near Apia), 21h. (Pierce Ferry), 22h. (Tucson and near Mineral).

Sept. 17d. Readings at 1h. (Sotchi (3)), 4h. (La Paz, Huancayo, Pierce Ferry, Tucson, Pasadena, Mount Wilson, Riverside, Palomar, and Tinemaha), 8h. (Tananarive, and Hungry Horse), 9h. (La Paz, Huancayo, Boulder City, Hungry Horse, Pierce Ferry, Tucson, Pasadena, Mount Wilson, Riverside, Palomar, Tinemaha, and near Mineral), 10h. (Tortosa (2) and Strasbourg), 11h. (near Taranto and near Mineral), 12h. (Alicante, Warsaw, Bucharest, Triest, Belgrade, and near Istanbul), 13h. (near Basle, Zürich, and Stuttgart (47°27′N. 8°42′E., intensity IV-V), Tortosa, near Apia, near Leninakan (2), and Grozny), 14h. (near Tacubaya), 18h. (Apia and Tucson), 19h. (Pierce Ferry, Ottawa, and La Paz), 20h. (Apia), 21h. (Apia, Lick, and near Murgab), 22h. (Alicante), 23h. (near Berkeley and Lick).

Sept. 18d. 7h. South America.

Montezuma eS? =52m.40s., eL =53m.16s.
La Paz iPZ =53m.40s., iS =55m.51s., SS =56m.18s., L =56m.54s.
Huancayo eP =55m.0s., eS =58m.10s., e =58m.18s., eL =58m.32s.
La Plata S?N =57m.5s., SE =57m.11s., N =57m.36s., LN =57m.53s.
Tucson iP =62m.31s.k, i =62m.50s., 62m.55s., and 63m.23s., e =64m.47s.
Palomar iPZ =62m.56s.k, iZ =63m.11s. and 63m.25s.
Pierce Ferry iP =62m.58s.
Boulder City iP =63m.1s.
Riverside iPZ =63m.2s.k, iZ =63m.31s.
Mount Wilson iPZ =63m.5s.k, iZ =63m.33s. and 63m.54s.
Pasadena iP =63m.5s.k, eZ =63m.34s.
Santa Barbara ePZ =63m.11s.
Haiwee iPZ =63m.12s.k, eZ =63m.41s.
Tinemaha iP =63m.16s.k.
Lick iPZ =63m.28s., ipPZ =63m.31s.
Hungry Horse iP =63m.51s.
Victoria e =64m.10s.

Sept. 18d. 8h. 36m. 12s. Epicentre 9°·2N. 84°·2W. (as on 1944, Aug. 2d.).

A = +·0998, B = −·9822, C = +·1589; δ = −7; h = +7;
D = −·995, E = −·101; G = +·016, H = −·158, K = −·987.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Balboa Heights		4·6	93	i 1 9	− 3	e 2 7	0	—	—	—
Bogota	Z.	11·0	124	i 2 43	+ 1	e 4 46	− 1	—	—	e 5·8
Tacubaya	N.	17·7	307	e 4 9	− 1	e 8 6	SSS	e 4 20	PP	—
San Juan		19·8	60	e 4 34	− 1	i 8 20	+ 7	i 4 54	PP	e 9·6
Huancayo		22·9	158	e 5 5	− 1	e 9 16	+ 3	e 5 49	PP	e 10·1
Fort de France		23·2	75	e 5 12	+ 3	—	—	—	—	—
St. Louis		29·8	351	e 6 8	− 3	e 11 13	+ 6	e 7 10	PP	e 12·8
La Paz		30·1	148	6 30	+17	e 11 2	−10	7 6	PP	17·1
Philadelphia		31·7	13	(e 7 28)	PP	(e 11 48)	+11	—	—	(e 17·0)
Cleveland	E.	32·2	3	—	—	e 11 56	+11	e 13 56	SSS	—
Fordham		32·8	15	e 6 38	+ 1	e 12 2	+ 8	e 7 46	PP	—
Tucson		33·7	318	e 6 43a	− 2	e 12 11	+ 3	—	—	e 14·6
Ottawa		36·8	9	e 7 9	− 2	—	—	—	—	18·8
Pierce Ferry		38·1	319	e 7 21	− 1	—	—	—	—	—
Palomar		38·5	314	i 7 35a	+ 9	—	—	—	—	—
Boulder City		38·6	319	e 7 27	+ 1	—	—	—	—	—
Riverside	Z.	39·2	315	i 7 33	+ 2	—	—	i 7 58	?	—
Mount Wilson	Z.	39·8	315	e 7 37	+ 1	—	—	e 7 56	?	—
Pasadena		39·8	315	i 7 38	+ 2	—	—	e 7 56	?	—
Tinemaha	Z.	41·5	318	i 7 51	+ 1	—	—	i 8 8	?	—
Lick	Z.	43·9	317	i 8 11k	+ 1	—	—	—	—	—
Berkeley		44·6	317	e 8 16	0	e 15 2	+10	e 8 29	?	e 24·5
Mineral	Z.	45·4	319	e 8 21	− 1	—	—	—	—	—
Hungry Horse		46·4	334	i 8 30	0	—	—	—	—	—
Paris		81·0	43	e 12 15	− 3	—	—	—	—	—

Additional readings and note :—
San Juan i =4m.48s. and 8m.32s.
Huancayo i =9m.32s.
St. Louis eSS =12m.39s.
La Paz SS =13m.6s.
Philadelphia readings reduced by 1 minute.
Tucson i =7m.0s. and 7m.18s.
Long waves were also recorded at Bermuda, Chicago, Bozeman, Seven Falls, and Prague.

Sept. 18d. Readings also at 2h. (Hungry Horse, near Kulyab, Stalinabad, Murgab, Andijan, and Tchimkent), 3h. (Boulder City, Chicago, and Tucson), 4h. (near Kulyab), 6h. (near Theodosia, near Boulder City, and Pierce Ferry), 7h. (Hungry Horse, Pierce Ferry, and near Tortosa), 9h. (near Lick (2), 13h. (Ottawa and near Tacubaya), 15h. (near Johannesburg), 16h. (Boulder City, Pierce Ferry, Tucson (2), Pasadena, Mount Wilson, Palomar, Mineral, and near Fresno), 17h. (near Ottawa), 18h. (Mineral and near Fresno), 19h. (Bucharest, Belgrade, and Istanbul), 21h. (Boulder City, Tucson, Pasadena, Mount Wilson, Riverside, Palomar, Tinemaha, and Lick), 23h. (Mizusawa, near Kulyab, Stalinabad, and Obi-garm).

Sept. 19d. 1h. Undetermined shock.

La Paz PNZ=31m.0s., iN=31m.53s., iE=32m.26s., iS=32m.54s., SS=33m.10s., L=33m.42s.
Huancayo eP=32m.29s., e=35m.21s., eS=37m.40s., eL=38m.58s.
La Plata S?N=33m.0s., LN=33·9m.
Tucson iP=40m.4s., i=40m.24s., 40m.51s., and 46m.31s.
Temiskaming i=40m.14s.
Ville Marie i=40m.16s.
Pierce Ferry iP=40m.32s.
Boulder City iP=40m.35s.
Riverside iPZ=40m.36s., iZ=41m.23s.
Pasadena ePZ=40m.37s., iZ=40m.40s. and 41m.29s.
Mount Wilson iPZ=40m.38s., eZ=41m.32s.
Tinemaha iPZ=40m.50s., eZ=42m.0s.
Lick iPZ=41m.2s.k.
Victoria e=41m.41s.
Mineral iPZ=42m.11s.a.

Sept. 19d. 4h. 45m. 20s. Epicentre 21°·0S. 174°·0W. (as on 14d.).

A=−·9293, B=−·0977, C=−·3563; δ=+9; h=+4;

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		7·4	16	e 1 46	− 6	e 2 52	−26	—	—	e 3·4
Auckland	N.	18·6	209	—	—	8 14	SS	—	—	10·8
Wellington		22·3	204	—	—	9 16	+14	11 40?	Q	13·7
Christchurch	Z.	25·1	203	(4 58)	−30	4 58	P	—	—	12·7
Berkeley		76·1	40	i 11 48	− 3	—	—	e 32 34	Q	e 32·8
Lick	Z.	76·1	40	e 11 52	+ 1	—	—	—	—	—
Pasadena	Z.	76·3	45	e 11 55	+ 3	—	—	—	—	—
Mount Wilson	Z.	76·5	45	e 11 55	+ 1	—	—	—	—	—
Palomar		76·7	46	i 11 55	0	—	—	—	—	—
Riverside	Z.	76·8	45	e 11 54	− 1	—	—	—	—	—
Haiwee	Z.	77·7	44	e 12 1	+ 1	—	—	—	—	—
Mineral	Z.	78·1	38	e 12 3	+ 1	—	—	—	—	—
Tinemaha	Z.	78·1	43	e 12 3	+ 1	—	—	—	—	—
Boulder City		79·6	46	e 12 10	0	—	—	—	—	—
Pierce Ferry		80·3	46	e 12 4	−10	—	—	—	—	—
Tucson		80·3	50	e 12 14	0	—	—	—	—	e 38·4
Grand Coulee		84·5	33	e 12 38	+ 2	—	—	—	—	—
Hungry Horse		87·3	36	e 12 49	− 1	—	—	—	—	—
Potsdam	Z.	148·2	353	i 19 51k	[+ 6]	—	—	—	—	—
Ksara		150·7	302	19 54	[+ 6]	33 56	PSKS	—	—	—
Istanbul		152·0	323	e 19 54	[+ 4]	e 23 31	PKS	—	—	—
Stuttgart	Z.	152·2	356	e 19 55	[+ 4]	—	—	—	—	—
Paris		152·8	5	e 19 55	[+ 3]	—	—	—	—	—
Helwan		155·5	296	i 20 27	[+32]	e 20 58	?	—	—	—
Tamanrasset		178·2	—	e 20 19	[+ 7]	—	—	—	—	—

Additional readings :—
Christchurch PZ given at 4h.42m.8s.
Tucson i=13m.19s. and 13m.58s.
Long waves were also recorded at Arapuni, Uccle, Granada, Huancayo, and La Paz.

Sept. 19d. 6h. 14m. 4s. Epicentre 51°·6N. 177°·8W. (as on 1943, August 22d.).

A=−·6232, B=−·0239, C=+·7817; δ=0; h=−6;
D=−·038, E=+·999; G=−·781, H=−·030, K=−·624.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
College	20·4	38	e 4 39	− 2	e 8 27	+ 2	i 8 37	SS	i 8·9
Sitka	25·0	59	e 5 12	−15	i 10 41	SS	i 10 12	?	e 11·5
Honolulu	34·0	144	—	—	e 12 11	− 2	—	—	e 14·0
Victoria	34·4	73	6 51	0	12 20	+ 1	8 2	PP	16·8
Vladivostok	34·5	275	i 6 48	− 4	i 12 15	− 5	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Grand Coulee		37·3	71	e 7 17	+ 1	e 13 6	+ 2	—	—	—
Arcata	z.	37·9	83	e 7 23	+ 3	—	—	—	—	—
Ukiah		39·4	86	—	—	e 13 36	+ 1	—	—	e 17·1
Mineral	z.	39·7	84	i 7 38a	+ 2	—	—	i 7 46	?	—
Hungry Horse		40·0	68	i 7 41	+ 3	—	—	i 8 52	PP	—
Berkeley		40·8	87	i 7 46	+ 1	i 13 59	+ 3	e 17 38	SSS	—
Santa Clara		41·3	87	e 7 51	+ 2	e 14 9	+ 5	—	—	e 19·8
Lick	z.	41·5	87	e 7 52a	+ 2	—	—	i 7 58	pP	—
Butte	N.	42·0	70	e 7 59	+ 5	e 14 17	+ 3	e 13 49	?	e 17·7
Saskatoon		42·3	60	6 51	−66	14 14	− 5	—	—	16·1
Bozeman		43·1	70	e 8 12	+ 8	i 14 32	+ 2	—	—	e 18·1
Tinemaha	z.	43·8	85	i 8 12a	+ 3	—	—	—	—	—
Haiwee	z.	44·6	85	e 8 17	+ 1	—	—	—	—	—
Santa Barbara	z.	44·6	88	i 8 22	+ 6	—	—	—	—	—
Salt Lake City		45·5	77	e 8 27	+ 4	e 15 9	+ 4	i 18 18	SS	e 18·6
Mount Wilson	z.	45·7	88	e 8 26a	+ 2	—	—	—	—	—
Pasadena		45·7	88	e 8 25	+ 1	i 15 7	− 1	—	—	e 18·8
Irkutsk		45·8	303	8 22	− 3	18 8	SS	e 10 10	PP	—
Riverside	z.	46·3	88	e 8 31a	+ 2	—	—	—	—	—
Boulder City		46·6	84	i 8 33	+ 1	e 15 23	+ 2	i 10 5	PP	—
Pierce Ferry		47·0	83	i 8 36	+ 1	e 15 29	+ 3	i 10 12	PP	—
Palomar		47·1	88	i 8 37a	+ 2	i 15 30	+ 2	i 8 41	?	—
Rapid City	E.	48·6	67	(e 8 50)	+ 3	(e 15 50)	+ 1	(e 11 3)	PP	(e 21·1)
Tucson		51·5	84	i 9 10a	+ 1	e 16 36	+ 7	e 11 33	PP	e 21·7
Chicago		58·9	61	—	—	e 18 3	− 5	i 19 43	S_cS	e 28·2
Ville Marie		59·2	52	i 10 5	0	—	—	—	—	—
St. Louis		59·5	65	i 10 7	0	i 18 15	− 1	i 10 19	pP	—
Temiskaming		59·9	51	i 10 10	0	—	—	i 10 55	?	—
Sverdlovsk		61·7	328	i 10 19	− 3	i 18 41	− 3	—	—	—
Cleveland	z.	62·3	57	i 10 30	+ 4	—	—	—	—	—
Ottawa		62·4	51	e 10 25	− 2	—	—	—	—	29·9
Seven Falls		63·5	46	—	—	e 19 8	+ 1	—	—	29·9
Fordham		66·7	53	i 10 55	0	e 19 38	− 8	—	—	—
Philadelphia		66·7	54	—	—	e 20 41	PPS	i 21 50	?	e 32·0
Frunse		67·0	310	e 10 55	− 2	—	—	—	—	—
Moscow		69·1	340	11 8	− 2	e 20 5	−10	—	—	—
Andijan		69·6	310	e 11 11	− 2	—	—	—	—	—
Tchimkent		69·7	313	e 11 9	− 5	—	—	—	—	—
Murgab		70·0	308	11 18	+ 3	20 30	+ 4	—	—	—
Tashkent		70·7	313	i 11 17	− 3	e 20 27	− 7	—	—	—
Stalinabad		73·1	311	i 11 32	− 2	—	—	—	—	—
Potsdam		76·0	353	i 11 49a	− 2	—	—	i 14 39	PP	e 35·9
De Bilt		76·6	358	i 11 55	+ 1	e 21 25	−15	—	—	e 36·9
Kew		77·3	2	e 11 55	− 3	—	—	—	—	e 38·9
Bermuda		77·9	52	e 12 4	+ 3	e 22 4	+10	e 27 8	SS	e 32·5
Prague		78·2	352	e 12 1	− 2	e 22 8	+11	—	—	e 40·9
Baku		79·4	325	e 12 47?	+38	—	—	—	—	—
Stuttgart		79·8	355	e 12 10a	− 2	e 23 14	PPS	e 15 29	PP	e 40·9
Paris		80·0	0	i 12 12	− 1	—	—	—	—	e 46·9
Strasbourg		80·1	356	e 12 12a	− 1	e 22 16	− 2	e 27 26	SS	e 33·6
Yalta		80·4	337	12 12	− 3	—	—	—	—	—
Basle		81·1	357	e 12 17	− 1	e 21 56	−32	—	—	—
Leninakan		81·1	329	e 12 21	+ 3	—	—	—	—	—
Triest		82·6	352	e 15 49	PP	e 22 43	0	e 23 54	PPS	—
Belgrade		82·7	347	e 12 25a	− 2	—	—	—	—	e 51·8
Clermont-Ferrand		83·0	359	i 12 29	+ 1	e 22 59	+12	—	—	45·9
Bologna		84·0	353	e 12 34	+ 1	e 23 41	PS	—	—	—
Florence		84·7	353	e 12 36a	− 1	e 22 57?	− 7	—	—	—
Hyderabad	N.	84·8	291	e 12 27	−10	e 22 49	−16	—	—	—
Istanbul		84·8	340	i 12 36	− 1	22 57	− 8	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Rome		86·4	353	i 12 45a	0	e 23 22	+ 1	e 29 13	SS	—
Bombay	E.	86·8	296	e 12 46	− 1	e 23 4	[− 9]	—	—	—
San Juan		88·5	62	e 13 1	+ 5	e 23 20	[− 4]	i 23 48	S	e 36·2
Toledo	Z.	88·7	5	—	—	i 22 52	−51	—	—	—
Ksara		89·9	333	i 13 0	− 2	e 23 59	+ 5	—	—	—
Alicante		90·4	2	13 6	+ 2	23 32	[− 3]	16 34	PP	e 43·9
Granada		91·4	3	i 12 13a	−56	22 40	[−61]	—	—	40·5
Fort de France		94·2	60	e 12 43	−39	—	—	—	—	—
Helwan		94·9	335	13 22	− 3	23 56	[− 5]	17 16	PP	—

Additional readings :—
Victoria PPP = 8m.26s., SS = 13m.38s.
Hungry Horse i = 8m.29s.
Berkeley iZ = 7m.54s., eEN = 7m.57s.
Lick eE = 7m.55s.
Saskatoon PP = 7m.33s., PPP = 8m.3s., S = 12m.5s.
Salt Lake City i = 15m.26s.
Mount Wilson iZ = 8m.34s. and 8m.44s.
Boulder City i = 8m.54s., iP_cP? = 9m.52s.
Rapid City (eSSE = 20m.0s.) readings increased by 4m.
Tucson i = 9m.29s. and 9m.47s., iP_cP = 10m.18s., iPPP = 12m.32s.
St. Louis eP_cP = 11m.5s., eS_cS = 19m.51s.
Bermuda i = 22m.21s., eS_cS = 23m.16s.
Strasbourg ePP = 14m.38s., ePPP = 17m.31s., eS = 21m.42s.
Rome ePS = 24m.37s., eSSS? = 33m.10s.
Alicante PPP = 18m.36s., S? = 23m.48s., PS = 25m.28s., SS = 30m.24s., Q = 37m.52s.
Helwan SKKS = 24m.14s.
Long waves were also recorded at Halifax, Ivigtut, Wellington, Auckland, Arapuni, and at other European stations.

Sept. 19d. 20h. 16m. 12s. Epicentre 21°·0S. 174°·0W. (as at 4h.).

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m.	s.	m.
Apia		7·4	16	e 1 52	0	e 3 15	− 3	—	—	—
Berkeley		76·1	40	i 11 51a	0	—	—	—	—	e 51·1
Lick	Z.	76·1	40	i 11 52	+ 1	—	—	—	—	—
Pasadena	Z.	76·3	45	i 11 52	0	—	—	—	—	—
Mount Wilson	Z.	76·5	45	i 11 53	− 1	—	—	—	—	—
Palomar	Z.	76·7	46	i 11 55	0	—	—	—	—	—
Riverside	Z.	76·8	45	i 11 54	− 1	—	—	—	—	—
Haiwee	Z.	77·7	44	e 12 0	0	—	—	—	—	—
Mineral	Z.	78·1	38	i 12 2a	0	—	—	—	—	—
Tinemaha	Z.	78·1	43	i 12 2	0	—	—	—	—	—
Boulder City		79·6	46	e 12 10	0	—	—	—	—	—
Pierce Ferry		80·3	46	i 12 13	− 1	—	—	—	—	—
Tucson		80·3	50	i 12 13	− 1	—	—	i 12 34	P_cP	—
Stuttgart	Z.	152·2	356	e 19 55	[+ 4]	—	—	—	—	—
Strasbourg		152·4	358	e 19 55	[+ 4]	—	—	—	—	—
Paris		152·8	5	e 19 50	[− 2]	—	—	—	—	—

Sept. 19d. Readings also at 1h. (Hungry Horse), 3h. (near Mizusawa), 4h. (Cheb, near Andijan and Murgab), 5h. (near Tacubaya), 7h. (Theodosia), 8h. (Apia, Mount Wilson, Palomar, Tinemaha, Pierce Ferry, and Tucson (2)), 10h. (near Mineral), 11h. (Stuttgart), 12h. (Mount Wilson, Tucson, and Tinemaha), 13h. (Hungry Horse, Pierce Ferry, near Strasbourg, Basle, Ebingen, and Stuttgart), 15h. (near Obigarm), 16h. (near Ebingen, Stuttgart, and near Lick), 18h. (Victoria), 19h. (Hungry Horse and near Mineral), 21h. (Lick, Tinemaha, Tucson, and Pierce Ferry), 22h. (Pierce Ferry).

Sept. 20d. 17h. 59m. 52s. Epicentre 34°·9N. 27°·0E. (as on 1938, June 3d.).

$A = +·7324$, $B = +·3732$, $C = +·5696$; $\delta = +13$; $h = 0$;
$D = +·454$, $E = -·891$; $G = +·507$, $H = +·259$, $K = -·822$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Helwan		6·2	143	1 32	− 3	i 2 32	−16	—	—	—
Istanbul		6·3	14	1 43	+ 7	3 4	+14	—	—	—
Ksara		7·4	96	e 1 54	+ 2	e 3 29	+11	—	—	—
Taranto		9·5	309	—	—	e 3 51	−19	e 6 15	?	—
Bucharest		9·6	356	e 2 26	+ 5	e 4 0	−12	—	—	4·6
Yalta		11·0	28	2 47	+ 5	e 4 58	+11	—	—	—
Belgrade		11·1	336	e 3 56a	?	e 6 3	?	e 7 1	?	—
Rome		13·3	306	e 3 19	+ 6	e 5 34	− 8	e 6 40	Q	e 6·8
Budapest		13·9	337	e 3 31	PP	—	—	e 3 35	PPP	8·6
Triest		14·7	321	e 3 37	+ 6	e 6 31	+15	—	—	i 8·9
Erevan		14·9	64	e 3 55?	+21	—	—	—	—	—
Florence		15·1	311	e 3 55?	+19	e 6 30	+ 5	—	—	—
Bologna		15·4	313	e 3 43	+ 3	e 6 41	+ 9	e 10 13	?	—
Padova		15·6	317	e 3 35?	− 8	e 6 40?	+ 3	—	—	—
Raciborzu		16·5	340	e 4 8	PP	—	—	e 4 58	?	e 8·3
Salo		16·5	315	3 55a	+ 1	7 3	+ 5	—	—	—
Grozny		16·8	54	e 4 7	+ 9	—	—	—	—	—
Pavia	z.	17·0	312	e 4 1	0	—	—	—	—	—
Prague		17·7	332	e 4 7	− 3	e 7 19	− 7	e 7 50	SS	e 9·6
Chur		17·8	318	e 4 8	− 3	e 7 33	+ 5	—	—	—
Warsaw		17·8	347	e 4 15	+ 4	e 7 32	+ 4	e 4 34	PP	e 9·1
Cheb		18·5	329	e 4 21	+ 2	e 7 49	+ 5	e 8 16	SS	e 10·1
Zürich		18·6	318	e 4 17a	− 4	e 7 42	− 4	—	—	—
Baku		18·9	65	e 4 31?	+ 7	—	—	—	—	—
Stuttgart		19·1	323	e 4 24k	− 3	e 8 24	SS	e 4 47	PP	e 10·1
Basle		19·2	318	e 4 24	− 4	e 8 4	+ 5	—	—	—
Collmberg		19·3	332	e 4 30	+ 1	—	—	—	—	—
Neuchatel		19·3	317	e 4 24	− 5	e 7 59	− 3	—	—	—
Jena		19·5	330	e 4 28	− 3	e 8 22	SS	e 4 35	?	—
Strasbourg		19·7	321	e 4 31	− 3	e 8 21	+11	e 8 34	SS	10·1
Potsdam		20·1	335	e 4 38	0	e 8 31	+12	e 8 42	SS	e 9·1
Clermont-Ferrand		21·1	308	i 4 45	− 3	i 8 45	+ 6	—	—	11·1
Tortosa		21·7	293	i 4 52	− 3	e 8 18	−33	5 18	PP	—
Moscow		22·1	16	i 4 58	− 1	e 9 1	+ 3	—	—	—
Alicante		22·3	287	5 25	PP	9 1	− 1	5 35	pP	e 10·7
Tamanrasset		22·3	243	i 4 55	− 6	—	—	e 5 30	PP	—
Paris		22·8	315	i 5 3	− 2	e 9 8	− 3	—	—	e 12·1
Uccle		22·8	321	e 5 4	− 1	e 9 10	− 1	—	—	e 11·7
Granada		24·8	284	i 5 25k	0	—	—	i 6 4a	PP	—
Toledo		25·1	290	i 5 24	− 4	e 10 58	SS	i 5 53	PP	—
Ashkabad		25·3	73	i 5 29	− 1	—	—	—	—	—
Kew		25·7	318	i 5 31	− 2	—	—	i 5 52	PP	e 10·1
Upsala		25·7	348	e 12 36	PcS	—	—	—	—	e 15·1
Sverdlovsk		31·6	35	e 6 37	+11	e 11 47	+12	—	—	—
Tashkent		33·6	66	e 6 46	+ 2	e 12 10	+ 4	—	—	—
Tchimkent		33·9	63	e 6 48	+ 1	—	—	—	—	—
Andijan		36·0	66	e 7 7	+ 2	—	—	—	—	—
Almata		39·1	61	e 7 48	+17	—	—	—	—	—
Ottawa		73·9	314	e 11 36	− 3	—	—	—	—	—
Ville Marie		75·0	317	e 11 42	− 3	—	—	—	—	—
Hungry Horse		90·1	335	e 18 2	?	—	—	—	—	—

Additional readings :—
Bucharest eP?N = 2m.50s., eE = 2m.56s.
Prague e = 6m.34s., eZ = 7m.33s., e = 7m.39s.
Warsaw ePE = 4m.20s., eSZ = 7m.35s., eSN = 7m.38s., eSSE = 7m.53s., eSSN = 7m.58s.
Cheb eSS? = 8m.38s.
Stuttgart eZ = 4m.34s.
Tortosa PPN = 5m.6s., SSE = 8m.49s.
Alicante PP = 5m.45s., PPP? = 5m.54s., P_cP = 9m.22s., SS = 9m.36s., P_cS = 13m.26s., S_cS = 16m.36s.
Long waves were also recorded at De Bilt and Copenhagen.

Sept. 20d. Readings also at 0h. (Auckland, Apia, Boulder City, Pierce Ferry, Tucson, Riverside, Palomar, Tinemaha, Lick, Rome, and Triest), 2h. (Tortosa), 3h. (near Ashkabad), 4h. (near Mineral and near Lisbon), 5h. (near Andijan and near Lick), 8h. (near Lick), 9h. and 11h. (Hungry Horse), 12h. (Wellington, Christchurch, Auckland, Arapuni, and Huancayo), 13h. (Paris, Clermont-Ferrand, Strasbourg, De Bilt, Uccle, Stuttgart, Alicante, Rome, Ksara, and near Grozny), 14h. (near Grozny and near Tacubaya), 16h. (near Tacubaya), 17h. (near Zürich and near Mineral), 18h. (Klyuchi and near Apia), 19h. (near Obi-garm), 20h. (Clermont-Ferrand, Stuttgart, Basle, and Zürich), 21h. (Pierce Ferry and near Apia).

Sept. 21d. 14h. 47m. 10s. Epicentre 21°·0S. 174°·0W. (as on 19d.).

$A = -\cdot9293$, $B = -\cdot0977$, $C = -\cdot3563$; $\delta = +9$; $h = +4$;

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		7·4	16	e 1 48	− 4	i 3 5	−13	—	—	e 4·1
Auckland	N.	18·6	209	e 6 50?	?	—	—	—	—	8·8
Christchurch		25·1	203	—	—	9 54	+ 3	11 58	Q	13·9
Lick	Z.	76·1	40	i 11 52k	+ 1	—	—	—	—	—
Pasadena	Z.	76·3	45	e 11 53	+ 1	—	—	—	—	—
Mount Wilson	Z.	76·5	45	e 11 52	− 2	—	—	—	—	—
Palomar	Z.	76·7	46	e 11 55	0	—	—	i 12 0	P	—
Riverside	Z.	76·8	45	e 11 55	0	—	—	—	—	—
Tinemaha	Z.	78·1	43	i 12 7	+ 5	—	—	—	—	—
Boulder City		79·6	46	e 12 11	+ 1	—	—	—	—	—
Pierce Ferry		80·3	46	i 12 14	0	—	—	—	—	—
Tucson		80·3	50	i 12 15	+ 1	—	—	i 12 33	PcP	—
Hungry Horse		87·3	36	i 12 52	+ 2	—	—	—	—	—
Ksara		150·7	302	e 20 1	[+13]	43 11	SS	—	—	—
Istanbul		152·0	323	e 19 44	[− 6]	—	—	e 23 32	PP	—
Stuttgart		152·2	356	e 19 55	[+ 4]	e 33 50?	PS	—	—	—

Christchurch also gives iNZ = 10m.1s.
Long waves were also recorded at Huancayo, Arapuni, and Wellington.

Sept. 21d. 17h. 33m. 43s. Epicentre 6°·0N. 94°·5E. (as on 1937, August 4d.).

$A = -\cdot0780$, $B = +\cdot9915$, $C = +\cdot1038$; $\delta = -7$; $h = +7$;
$D = +\cdot997$, $E = +\cdot078$; $G = -\cdot008$, $H = +\cdot103$, $K = -\cdot995$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Kodaikanal	E.	17·4	288	i 4 6	0	e 7 29	+10	—	—	8·6
Calcutta	E.	17·5	341	e 4 22	PP	i 7 37	+16	i 7 53	SS	—
Hyderabad	N.	19·4	308	4 23	− 7	8 1	− 3	—	—	10·2
Bombay		24·7	304	e 5 27	+ 3	i 9 52	+ 8	e 9 56	S	11·5
Murgab		37·2	333	7 18	+ 3	—	—	—	—	—
Kulyab		38·9	328	i 7 31	+ 2	e 13 33	+ 5	—	—	—
Obi-garm		39·5	329	8 13?	+39	14 13?	+36	—	—	—
Andijan		39·9	334	e 7 40	+ 3	—	—	—	—	—
Stalinabad		39·9	328	e 7 35	− 2	i 13 41	− 2	—	—	—
Almata		40·2	341	e 7 45	+ 5	—	—	—	—	—
Frunse		40·7	338	e 7 47	+ 3	—	—	—	—	—
Samarkand		41·7	328	e 7 52	0	—	—	—	—	—
Tashkent		41·8	332	i 7 55	+ 2	i 14 10	− 1	—	—	—
Tchimkent		42·4	333	e 7 59	+ 1	e 14 19	− 1	—	—	—
Ashkabad		45·7	319	e 8 27	+ 3	e 15 12	+ 4	—	—	—
Irkutsk		46·8	8	8 59?	+26	—	—	—	—	—
Vladivostok		49·5	36	i 8 55	+ 1	i 16 5	+ 3	—	—	—
Baku		52·6	318	e 9 38?	+20	—	—	—	—	—
Grozny		56·7	320	e 9 42	− 6	e 17 42	+ 2	—	—	—
Sverdlovsk		57·3	340	i 9 51	− 1	i 17 49	+ 2	—	—	—
Piatigorsk		58·7	319	e 10 5	+ 3	—	—	—	—	—
Ksara		60·7	305	e 10 30	+15	e 18 38	+ 6	—	—	—
Sotchi		60·8	317	e 10 14	− 2	—	—	—	—	—
Helwan		63·8	301	i 10 32k	− 4	i 19 27	+16	—	—	—
Yalta		64·9	318	e 10 40	− 3	19 17	− 7	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Riverview		66·6	131	—	—	i 19 36	− 9	—	—	e 32·4
Moscow		66·9	330	10 54	− 2	19 42	− 7	—	—	—
Istanbul		67·6	312	i 10 57	− 4	20 12	+15	—	—	—
Bucharest		70·4	316	e 20 5	?	e 20 26	− 4	—	—	—
Warsaw		75·2	323	e 11 43	− 3	e 21 22	− 3	e 13 30	?	—
Raciborzu		76·6	321	e 12 6	+12	—	—	e 13 23?	?	—
Prague		79·1	321	e 12 3	− 5	e 21 57	−10	e 12 21	pP	e 26·8
Potsdam		80·0	323	e 12 27	+14	i 22 12	− 5	—	—	e 29·3
Rome		80·1	312	i 12 9	− 4	e 22 5	−13	e 15 36	PP	e 40·3
Copenhagen		80·6	327	12 16	0	22 21	− 2	23 24	PS	—
Padova		80·6	316	e 12 12?	− 4	—	—	—	—	—
Jena	E.	80·9	321	e 12 16	− 1	e 22 35	+ 9	—	—	—
Bologna		81·0	315	e 12 13	− 5	e 22 30	+ 3	e 12 33	pP	—
Florence	Z.	81·0	314	e 12 18	0	—	—	—	—	—
Salo		81·5	316	e 12 18	− 3	e 22 24	− 8	—	—	—
Chur		82·2	317	e 12 21k	− 3	e 22 23	−16	e 23 12	PS	—
Stuttgart		82·4	319	e 12 23	− 2	e 22 37	− 4	e 15 51	PP	—
Zürich		82·9	318	e 12 24a	− 4	e 22 39	− 7	—	—	—
Strasbourg		83·4	319	e 12 35	+ 5	e 22 45	− 6	e 15 45	PP	—
Basle		83·5	318	e 12 37	+ 6	e 22 50	− 2	e 15 36	PP	—
De Bilt		84·9	323	e 12 55	+17	e 23 3	− 3	—	—	—
Uccle	N.	85·5	321	e 13 4	+23	e 23 8	− 4	—	—	—
Clermont-Ferrand		86·7	316	e 12 45	− 2	i 23 24	0	i 13 4	pP	28·3
Tamanrasset		86·8	293	i 12 45k	− 2	—	—	i 13 5a	pP	—
Paris		86·9	319	i 12 45	− 3	e 23 17?	[+ 4]	i 13 0	pP	—
Tortosa		89·2	311	16 55	PP	23 40	− 7	i 23 20	SKS	32·3
Alicante		90·2	309	e 13 24	+20	—	—	—	—	—
Toledo		92·7	310	i 13 14	− 1	—	—	i 13 28	pP	—
Granada		92·8	308	i 13 42k	+26	i 24 17	− 2	17 2	PP	i 45·3
Scoresby Sund		92·9	344	—	—	23 46	[− 4]	24 26	S	—
Hungry Horse		120·4	21	i 18 51	[− 2]	—	—	i 16 46	—	—
Mineral	Z.	123·2	32	i 18 57	[− 2]	—	—	e 16 48	P	—
Berkeley	Z.	124·6	35	e 19 1	[− 1]	—	—	e 19 23	PKP2	—
Fresno	Z.	126·8	33	e 17 20	P	—	—	—	—	—
Tinemaha	Z.	127·4	32	i 19 7	[0]	—	—	i 22 22	?	—
Haiwee	Z.	128·2	32	e 19 9	[0]	—	—	i 19 31	PKP2	—
Mount Wilson	Z.	129·5	35	e 19 11	[0]	—	—	e 17 36	?	—
Pasadena		129·5	35	e 19 10	[− 1]	—	—	e 24 2	PPP	—
Boulder City		130·0	31	e 19 11	[− 1]	—	—	17 32	?	—
Riverside	Z.	130·1	35	i 19 11	[− 1]	—	—	i 17 41	?	—
Pierce Ferry		130·3	30	e 19 2	[−11]	—	—	e 17 35	?	—
Palomar	Z.	130·9	34	e 19 21	[+ 7]	—	—	e 17 31	?	—
Tucson		135·0	30	e 19 21	[0]	—	—	e 18 7	?	e 55·4
Fort de France		148·3	310	e 19 25	[−20]	—	—	—	—	—
La Paz		160·0	237	—	—	e 31 57	{+45}	—	—	79·8

Additional readings :—
Calcutta ePPE = 4m.32s., iScSE = 16m.22s.
Helwan i = 11m.40s., 13m.33s., and 15m.32s.
Bucharest eP?E = 20m.20s.
Prague e = 18m.56s., ePS = 22m.26s.
Potsdam iSKSEN = 22m.36s., eNZ = 24m.22s.
Rome iZ = 12m.27s., e = 13m.36s.
Copenhagen i = 12m.29s.
Jena ePN = 12m.19s., eE = 12m.34s., eN = 22m.40s.
Stuttgart e = 12m.40s., eZ = 19m.21s.
Zürich e = 13m.0s., eS = 22m.57s.
Tamanrasset e = 13m.0s., i = 13m.19s.k, ePP = 16m.22s.
Tortosa S?EN = 24m.8s., PS?E = 25m.35s.
Scoresby Sund 30m.48s.
Mineral iPPZ = 20m.45s.
Mount Wilson eZ = 22m.28s. and 22m.54s.
Pasadena eZ = 19m.28s., 22m.28s., and 22m.55s.
Boulder City i = 22m.31s. and 22m.58s.
Riverside iZ = 22m.30s.
Pierce Ferry i = 22m.32s. and 22m.58s.
Palomar iZ = 22m.32s. and 22m.59s.
Tucson i = 22m.47s. and 23m.8s., eSKS? = 34m.25s., eSKKS? = 35m.47s.
Long waves were also recorded at Huancayo.

Sept. 21d. 17h. 53m. 53s. Epicentre 36°·6N. 21°·5E. (as on 1947, June 1d.).

$A = +·7487$, $B = +·2949$, $C = +·5936$; $\delta = -12$; $h = 0$;
$D = +·367$, $E = -·930$; $G = +·552$, $H = +·218$, $K = -·805$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Messina		5·1	291	e 1 18	− 2	e 2 9	−11	—	—	—
Taranto		5·1	321	e 1 8	−12	e 2 10	−10	—	—	—
Istanbul		7·4	50	e 1 55	+ 3	i 3 43	S*	—	—	—
Belgrade		8·3	354	e 2 5k	+ 1	e 4 25	S_g	e 2 25	P*	—
Bucharest		8·6	22	—	—	e 3 34	−14	—	—	4·1
Kalossa		10·1	350	e 3 29	+61	i 5 3	SSS	—	—	e 6·5
Florence		10·6	316	e 2 19	−17	e 5 44	+67	—	—	—
Helwan		10·6	126	i 2 28k	− 8	i 4 49	+12	i 2 39a	P	—
Padova		10·8	320	e 2 44?	+ 5	—	—	—	—	—
Budapest		11·0	351	e 4 14	?	—	—	e 4 37	?	6·3
Bologna		11·1	319	e 2 44	+ 1	—	—	—	—	e 7·4
Salo		12·2	321	e 2 56	− 2	5 6	−10	—	—	—
Pavia		12·6	316	e 2 52?	−11	—	—	—	—	—
Chur		13·6	323	e 3 2	−15	—	—	—	—	—
Zürich		14·4	322	e 3 35	+ 8	e 6 15	+ 6	—	—	—
Basle		15·0	321	e 3 36	+ 1	—	—	—	—	e 9·4
Cheb		15·0	337	e 2 19	?	e 6 37	+14	—	—	e 7·1
Stuttgart		15·1	327	e 3 35	− 1	e 6 30	+ 5	e 7 22	Q	e 8·8
Sotchi		15·6	58	e 3 44	+ 1	—	—	—	—	—
Warsaw		15·6	359	e 3 43	0	e 6 44	+ 7	e 3 47	PP	e 8·1
Strasbourg		15·7	324	e 3 47	+ 3	e 6 53	+14	—	—	—
Jena	N.	16·0	337	e 3 49	+ 1	—	—	e 3 54	PP	—
Clermont-Ferrand		16·6	309	e 3 55	− 1	—	—	—	—	—
Alicante		17·5	285	3 44	−23	i 7 30	+ 9	3 54	pP	9·1
Piatigorsk		18·0	58	e 4 13	0	—	—	—	—	—
Paris		18·5	319	e 4 20	+ 1	i 7 50	+ 6	i 4 33	PP	e 10·1
Uccle		18·8	326	e 4 25	+ 2	e 7 58	+ 8	—	—	10·8
De Bilt		19·3	331	e 4 45	+16	e 8 13	+11	—	—	e 10·1
Tamanrasset		19·5	233	i 4 29	− 2	—	—	—	—	—
Grozny		19·7	62	e 4 34	0	e 8 13	+ 3	—	—	—
Copenhagen		20·1	347	e 4 37k	− 1	8 24	+ 5	—	—	10·1
Granada		20·1	281	i 4 36a	− 2	i 8 23	+ 4	9 18	SSS	i 12·1
Toledo		20·3	289	i 4 40	0	i 8 29	+ 6	i 5 4	PP	—
Kew		21·5	323	e 3 25?	?	e 8 51	+ 4	e 9 53	SSS	e 11·4
Moscow		22·1	25	4 56	− 3	8 59	+ 1	—	—	—
Upsala		23·4	356	i 5 17k	+ 6	9 23	+ 2	—	—	e 11·1
Durham	N.	24·1	328	i 3 21	?	i 9 46	+12	—	—	—
Aberdeen		25·9	332	i 2 32	?	—	—	i 3 34	?	—
Ashkabad		29·2	75	e 6 2	− 3	—	—	—	—	—
Sverdlovsk		33·0	39	6 35	− 4	—	—	—	—	—
Andijan		39·5	68	e 7 33	− 1	e 13 34	− 3	—	—	—
Frunse		40·7	64	e 7 42	− 2	e 13 55	0	—	—	—
Ottawa		69·5	313	11 10	− 2	—	—	—	—	—
Ville Marie		70·7	315	e 11 13	− 7	—	—	—	—	—
Hungry Horse		86·6	333	e 12 44	− 2	—	—	—	—	—

Additional readings :—
Belgrade e = 3m.15s.
Kalossa eE = 3m.48s. and 5m.30s.
Helwan S = 4m.17s.
Cheb ePP?E = 2m.35s., eE = 2m.52s.
Warsaw ePN = 4m.8s., eSNZ = 6m.30s.
Alicante PP = 4m.7s., PPP = 4m.22s., P_cP = 7m.43s., Q = 7m.55s.
Granada PP = 4m.56s.k
Toledo e = 16m.28s.

Sept. 21d. Readings also at 0h. (Pierce Ferry), 1h. (Tinemaha and Port au Prince), 4h. (near Kulyab, near Stalinabad, Obi-garm (2), Tashkent, Murgab, and Tchimkent), 5h. (near Samarkand (2), Ashkabad, Frunse, Andijan, Tashkent, Stalinabad, Tchimkent, Murgab, and near Mineral (2)), 6h. (near Lick and near Mineral (3)), 7h. (near Kulyab), 8h. (Ottawa, Boulder City, Pierce Ferry (2), Hungry Horse, Tucson, and Mineral), 9h. (near Apia), 10h. (near Ottawa), 13h. (near Apia), 15h. (Lick, Mineral, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Boulder City, Pierce Ferry, Tucson, and Stuttgart), 16h. (Boulder City and Mizusawa), 17h. (Mizusawa, Stuttgart, and near Zürich (2)), 18h. (Hungry Horse), 19h. (Granada, near Stalinabad, and Kulyab), 20h. (Tchimkent, near Samarkand and Obi-garm), 23h. (Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Pierce Ferry, Tucson, and near Apia).

Sept. 22d. 7h. 17m. 52s. Epicentre 24°·5S. 65°·6W. Depth of focus 0·020.
(as on 1948, Aug. 16d.).
Intensity IV between 27° and 28° S.Lat. Epicentre 24°S., 66·5°W. Depth of focus 220km.
Boletin del año, 1948, Instituto Sismologico, Santiago, pp. 37-38.

$A = +\cdot3763$, $B = -\cdot8296$, $C = -\cdot4124$; $\delta = -9$; $h = +3$;
$D = -\cdot911$, $E = -\cdot413$; $G = -\cdot170$, $H = +\cdot376$, $K = -\cdot911$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
La Paz		8·3	343	i 1 59a	+ 1	i 3 30	− 1	i 2 18	pP	—
La Plata	E.	12·3	149	2 7	−44	4 28	−37	—	—	5·3
	N.	12·3	149	2 7	−44	4 27	−38	—	—	i 5·4
	Z.	12·3	149	2 10	−41	4 36	−29	—	—	i 5·8
Huancayo		15·5	322	i 3 28	− 3	i 6 15	− 3	i 3 57	pP	i 6·9
Bogota	Z.	30·1	343	i 5 52	− 5	e 10 57	+15	i 6 6	pP	—
Fort de France		39·2	8	e 7 15	+ 1	e 13 1	− 1	—	—	—
San Juan		42·6	0	e 8 34	+52	e 13 42	−10	i 17 22	S_cP	e 18·2
Tacubaya	E.	54·5	321	i 9 24	+11	e 16 32	− 6	—	—	—
Bermuda		56·6	1	—	—	e 17 2	− 4	e 18 25	sS	e 24·5
Fordham		65·5	354	i 10 28	0	e 18 58	0	i 11 21	pP	—
St. Louis		66·9	340	i 10 35	− 2	e 19 3	−12	i 11 22	pP	—
Cleveland		67·3	348	i 10 38k	− 2	e 19 12	− 8	—	—	—
Ottawa		70·2	353	i 10 56	− 1	—	—	e 11 46	pP	—
Tucson		71·1	321	i 11 1k	− 2	e 19 58	− 6	i 11 44	pP	—
Temiskaming		71·9	351	i 11 7	0	—	—	e 11 56	pP	—
Ville Marie		72·6	350	e 11 11	− 1	—	—	—	—	—
Palomar		75·4	318	i 11 27k	− 1	—	—	i 12 18	pP	—
Pierce Ferry		75·7	322	i 11 32	+ 3	—	—	—	—	—
Boulder City		76·0	321	i 11 31	0	—	—	—	—	—
Riverside		76·2	318	i 11 31k	− 1	—	—	i 12 18	pP	—
Mount Wilson		76·8	318	i 11 34k	− 2	—	—	i 12 28	pP	—
Pasadena		76·8	318	i 11 35k	− 1	—	—	i 12 31	pP	—
Santa Barbara	Z.	77·9	317	i 11 40k	− 2	—	—	—	—	—
Haiwee		78·0	320	i 11 42k	0	—	—	—	—	—
Tinemaha		78·8	320	i 11 46k	0	—	—	i 12 14	pP	—
Lick	Z.	81·0	319	i 11 58k	0	—	—	i 12 49a	pP	—
Branner	Z.	81·4	319	i 11 59	− 1	—	—	—	—	—
Berkeley	Z.	81·7	319	i 12 2k	0	—	—	i 12 54	pP	—
Mineral	N.	82·9	321	e 12 6	− 2	—	—	—	—	—
Tamanrasset		83·5	62	i 12 21k	+10	—	—	i 13 11	pP	—
Hungry Horse		84·5	330	i 12 16	0	—	—	—	—	—
Granada		84·6	45	i 12 25a	+ 9	i 22 33	+ 5	16 22	?	—
Toledo		86·0	43	i 12 31	+ 8	i 22 41	− 1	i 12 51	pP	—
Grand Coulee		86·6	327	i 12 26	0	—	—	—	—	—
Alicante		87·3	46	—	—	i 23 4	+10	—	—	e 45·1
Victoria		89·2	326	e 12 39	0	—	—	—	—	—
Tortosa		89·3	44	13 35	pP	23 0	[+ 8]	16 12	PP	—
Clermont-Ferrand		93·7	41	e 13 57	+58	i 23 28	[+11]	i 24 9	S	39·1
Paris		94·9	38	i 13 10	+ 5	—	—	i 14 0	pP	e 53·1

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Basle		97·2	41	e 13 14	− 1	e 23 44	[+ 8]	e 24 32	S	—
Rome		97·7	48	—	—	i 24 40	+15	—	—	—
Strasbourg		97·8	40	e 13 50	pP	—	—	e 14 8	?	—
Stuttgart		98·7	40	e 13 28	+ 6	e 23 50	[+ 7]	e 24 46	S	—
Triest		100·1	44	(i 13 27)	− 2	(i 26 57)	PPS	(i 14 30)	pP	—
Jena	N.	101·0	39	e 13 29	− 4	—	—	e 14 4	pP	—
Helwan		107·5	65	e 18 38	PP	e 24 32	[+ 8]	i 19 24	pPP	—
Istanbul		109·0	53	—	—	e 33 8?	SS	e 34 8?	?	—
Sverdlovsk		129·8	35	18 56	[+ 6]	22 19	PKS	e 21 59	PP	—
Stalinabad		139·1	58	e 19 7	[− 1]	—	—	—	—	—
Tashkent		139·1	54	i 19 14	[+ 6]	i 22 55	PKS	i 20 11	pPKP	—
Tchimkent		139·1	52	e 19 25	[+17]	—	—	—	—	—
Andijan		141·5	55	e 19 14	[+ 2]	—	—	—	—	—
Frunse		142·6	51	e 19 29	[+15]	—	—	—	—	—
Vladivostok		156·5	326	i 19 39	[+ 3]	—	—	—	—	—

Additional readings and notes :—
La Paz iZ = 2m.48s., iS_eZ = 4m.18s.
La Plata Z = 2m.24s., N = 2m.44s., E = 3m.2s., N = 3m.26s. and 3m.44s., E = 3m.58s., N = 4m.8s., iE = 4m.32s., N = 4m.55s., Z = 5m.20s.
Huancayo i = 4m.14s. and 4m.40s.
Bogota ePPZ = 6m.49s., eP_cPZ = 8m.54s., eS_cSZ = 12m.9s.
San Juan i = 15m.11s.
Bermuda eSS? = 21m.2s.
St. Louis i = 10m.46s., iP_cP = 11m.4s., ipP_cP = 11m.47s., e = 19m.45s. and 20m.21s., esS = 20m.31s.
Tucson ipP? = 11m.12s., ePP = 13m.14s., iPPP? = 14m.48s., esS = 20m.26s., ePKKP = 29m.16s., ePKP,PKP = 39m.1s.
Mount Wilson iZ = 11m.45s.
Pasadena iZ = 11m.51s.
Tinemaha iZ = 11m.56s. and 12m.3s.
Toledo iZ = 13m.21s., iSKSE = 22m.53s.
Tortosa PPP?E = 18m.18s., SKKSEN = 23m.19s., PSEN = 24m.45s., SS?N = 29m.26s., SSS?N = 33m.13s.
Rome eE = 15m.35s., eZ = 18m.9s., iPSKSE = 23m.46s., ePPSE = 26m.7s., e = 59m.11s.?
Stuttgart eZ = 13m.48s., e = 13m.55s. and 14m.16s.
Triest ipS = (25m.57s.), readings increased by 2 minutes.
Jena eE = 13m.36s.
Helwan e = 25m.26s., 27m.14s., and 28m.47s.
Tashkent iPPP = 25m.17s.

Sept. 22d. 21h. Undetermined shock. Insufficient consistent data to determine an epicentre.
San Juan eP = 33m.20s., eS? = 36m.40s., eL = 37m.36s.
Fort de France eP = 34m.25s.
Bermuda eP = 34m.37s., eS = 38m.34s., eL = 39m.36s.
St. Louis iP = 34m.44s., i = 34m.53s. and 35m.7s., iS = 38m.48s., eL = 40m.44s.
Philadelphia eP? = 34m.48s., eS = 39m.3s., eL = 42m.15s.
Chicago eP = 35m.3s., eL = 42m.47s.
Fordham iP = 35m.3s., eS = 39m.21s.
Cleveland iPZ = 35m.11s. a.
Ottawa eZ = 35m.37s., L = 45m.
Temiskaming e = 35m.47s.
Ville Marie e = 35m.54s.
Tucson iP = 35m.59s. k, i = 36m.10s., ePP? = 37m.54s., eS = 41m.3s., eL = 43m.15s.
Pierce Ferry eP = 36m.33s.
Boulder City eP = 36m.38s., e = 40m.38s.
Palomar ePZ = 36m.42s.
Riverside ePZ = 36m.49s.
Pasadena ePZ = 36m.53s.
Mount Wilson ePZ = 36m.57s.
Tinemaha ePZ = 37m.2s.
La Paz iPZ = 37m.6s.
Columbia eS = 37m.9s., eL = 37m.42s.
Hungry Horse iP = 37m.24s.
Lick ePZ = 37m.25s., iZ = 37m.28s. k.
Mineral iPZ = 37m.32s. k.
Grand Coulee eP = 37m.47s.
Victoria e = 38m.10s.
Alicante iP? = 41m.4s., PP = 43m.30s., eS = 49m.20s., PS = 49m.32s., eL = 61·1m.
Granada iP = 41m.6s. k, S = 50m.21s., SS = 54m.46s., L = 61·3m.
Basle e = 41m.42s. and 46m.54s.
Stuttgart eZ = 41m.45s.
Rome eZ = 42m.3s., e = 42m.33s., 52m.22s., 57m.31s., and 70m.33s.
Tamanrasset eP = 42m.7s.
Long waves were also recorded at Uccle and Strasbourg.

Sept. 22d. Readings also at 0h. (Boulder City, Grand Coulee, Hungry Horse, Tucson, Pasadena, Mount Wilson, Palomar, Riverside, Santa Barbara, Haiwee, Tinemaha, Berkeley, Lick, Branner, and Fresno), 1h. (Boulder City), 2h. (Istanbul, Hungry Horse, Pierce Ferry, Tucson, Palomar, Riverside, Tinemaha, Lick, Fresno, Wellington, Auckland, and near Apia), 3h. (near Lick), 4h. (Uccle, Hungry Horse, Vladivostok, and near Mizusawa), 5h. (Boulder City, Grand Coulee, Hungry Horse, Pierce Ferry, Tucson, Pasadena, Mount Wilson, Riverside, Palomar, Tinemaha, Berkeley, Lick, Branner, Victoria, Ottawa, Paris, Stuttgart, Rome, and Uccle), 6h. (Istanbul, near Andijan, Tchimkent, Tashkent, and Obi-garm), 7h. (Apia, Istanbul, Stuttgart, Salo, Padova, Rome, and near Belgrade), 8h. (Istanbul and Ksara), 11h. and 13h. (near Lick), 17h. (Boulder City, Hungry Horse, Pierce Ferry, Tucson, Pasadena, Mount Wilson, Palomar, Tinemaha, and Stuttgart), 18h. (near Balboa Heights, near Kulyab, Stalinabad, and Obi-garm), 21h. (Lick), 23h. (Pierce Ferry, Apia, and near Kulyab).

Sept. 23d. 0h. 52m. 42s. Epicentre 40°·9N. 142°·7E. Depth of focus 0·005.
(as on 1948, July 30d.).

Intensity V at Okunakayama (Iwate Pref.); IV at Urakawa, Aomori, Hatinohe; II-III at Miyako, Hakodate, Mori.
Epicentre 40°·8N. 143°·7E. Depth 60kms. Macroseismic radius more than 300kms.

The Seismological Bulletin of the Central Meteorological Observatory, Japan, for the year, 1948, Tokyo, 1950, pp. 41-42, with macroseismic chart p. 41.

$A = -\cdot6030$, $B = +\cdot4594$, $C = +\cdot6522$; $\delta = +2$; $h = -2$;
$D = +\cdot606$, $E = +\cdot795$; $G = -\cdot519$, $H = +\cdot395$, $K = -\cdot758$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Hatinohe		0·9	247	0 18a	0	0 36	+ 5	—	—	—
Miyako		1·4	203	0 23a	− 1	0 42	− 1	—	—	—
Aomori		1·5	267	0 28a	+ 2	0 51	+ 6	—	—	—
Morioka		1·7	224	0 29a	+ 1	0 52	+ 2	—	—	—
Mori		2·0	307	0 31a	− 1	1 2	+ 5	—	—	—
Mizusawa	N.	2·1	214	0 35	+ 1	1 2	+ 3	—	—	—
Akita		2·3	239	1 8	S	(1 8)	+ 4	1 34	?	—
Nemuro		3·2	41	1 40	S	(1 40)	+13	—	—	—
Yamagata		3·2	214	0 49	0	1 32	+ 5	—	—	—
Onahama		4·2	200	1 9a	+ 6	2 10	+18	—	—	—
Mito		4·8	202	1 12	0	2 11	+ 4	—	—	—
Utunomiya		4·9	208	1 11	− 2	2 30	+21	—	—	—
Kakioka		5·1	204	1 14	− 2	2 13	− 1	—	—	—
Tukubasan		5·1	204	1 15	− 1	2 14	0	—	—	—
Maebasi		5·3	214	1 20	+ 1	2 18	− 1	—	—	—
Kumagaya		5·4	210	1 21	+ 1	2 41	+19	—	—	—
Nagano		5·5	221	1 27	+ 6	2 39	+15	—	—	—
Tokyo		5·7	205	1 25	+ 1	3 1	+32	—	—	—
Wazima		5·7	234	1 30	+ 6	2 48	+19	—	—	—
Yokohama		5·9	204	1 28	+ 1	2 55	+21	—	—	—
Yuzno-Sakhlinsk		6·0	0	1 21	− 7	2 24	−13	—	—	—
Hunatu		6·2	211	1 36	+ 5	2 54	+13	—	—	—
Mera		6·4	202	1 48	+14	3 14	+28	—	—	—
Misima		6·5	208	1 36	+ 1	3 4	+15	—	—	—
Osima		6·6	204	1 37	0	—	—	—	—	—
Gihu		7·2	222	1 28	−17	3 16	+10	—	—	—
Nagoya		7·2	220	1 49	+ 4	3 46	L	—	—	(3·8)
Omaesaki		7·2	211	1 53	+ 8	3 50	L	—	—	(3·8)
Hikone		7·6	225	1 18	−32	2 34	−42	—	—	—
Kameyama		7·8	221	2 0	+ 7	3 41	+20	—	—	—
Toyooka		8·2	232	2 2	+ 3	3 37	+ 6	—	—	—
Vladivostok		8·3	289	i 2 1?	+ 1	4 31?	—	—	—	(4·5)
Osaka		8·4	224	2 10	+ 8	4 28	—	—	—	(4·5)
Kobe		8·6	226	2 13	+ 9	—	—	—	—	—
Owase		8·6	219	2 17	+13	4 0	+19	—	—	—
Sumoto		9·0	226	2 8	− 2	4 11	+20	—	—	—
Hamada		10·3	238	2 35	+ 8	—	—	—	—	—
Kôti		10·3	228	2 25	− 2	—	—	—	—	—
Hukuoka		12·2	237	2 53	0	—	—	—	—	—
Miyazaki		12·7	229	2 59	− 1	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Kagosima		13·5	230	3 25	+15	—	—	—	—	—
Irkutsk		28·4	307	5 50	0	e 10 41?	+10	—	—	—
College		45·3	35	e 8 46	+33	i 14 46	− 2	—	—	e 18·4
Frunse		49·5	297	e 8 46	0	—	—	—	—	—
Andijan		51·8	294	e 9 3	0	16 37	+18	—	—	—
Murgab		51·8	291	9 4	+ 1	16 30	+11	—	—	—
Sverdlovsk		53·0	317	i 9 11	− 1	16 40	+ 4	—	—	—
Tchimkent		53·1	298	9 13	0	—	—	—	—	—
Tashkent		53·7	297	i 9 17	− 1	e 17 3	+18	—	—	—
Obi-garm		54·6	294	10 9?	+45	—	—	—	—	—
Kulyab		54·9	293	—	—	i 17 31	+30	—	—	—
Stalinabad		55·3	294	i 9 29	0	e 17 27	PS	—	—	—
Samarkand		56·0	295	e 9 38	+ 4	e 17 33	+17	—	—	—
Hyderabad	N.	59·4	267	—	—	e 17 59	− 1	—	—	30·5
Bombay		62·8	272	—	—	e 19 5	+21	—	—	—
Victoria		63·1	48	e 10 22	− 1	—	—	—	—	—
Moscow		64·8	323	10 32	− 2	19 9	+ 1	—	—	—
Grand Coulee		65·9	47	e 10 49	+ 8	—	—	—	—	—
Baku		66·9	305	e 10 50	+ 3	—	—	—	—	—
Grozny		67·7	309	e 10 52	− 1	19 50	+ 6	—	—	—
Hungry Horse		68·3	45	i 10 52	− 4	—	—	—	—	—
Scoresby Sund		68·4	355	—	—	19 55	+ 3	—	—	30·3
Mineral	Z.	68·7	55	i 10 58k	− 1	—	—	—	—	—
Berkeley	Z.	69·8	58	e 11 2	− 3	—	—	—	—	—
Upsala	E.	69·9	334	—	—	e 20 30	+20	—	—	e 35·3
Lick	Z.	70·5	58	i 11 10	0	—	—	—	—	—
Tinemaha	Z.	72·8	56	e 11 24	+ 1	—	—	—	—	—
Haiwee	Z.	73·6	56	e 11 38	+10	—	—	—	—	—
Yalta		73·6	315	e 11 26	− 2	—	—	—	—	—
Warsaw		74·4	328	e 11 32	− 1	e 21 3	+ 2	e 21 25	PS	e 37·3
Mount Wilson	Z.	74·7	58	e 11 35	+ 1	—	—	e 11 45	P_cP	—
Pasadena	Z.	74·7	58	e 11 35	+ 1	—	—	e 11 43	P_cP	—
Copenhagen		74·9	334	e 11 37	+ 1	21 12	+ 6	—	—	38·3
Riverside	Z.	75·3	58	e 11 37	− 1	—	—	—	—	—
Palomar	Z.	76·0	58	e 11 42	0	—	—	i 11 50	P_cP	—
Pierce Ferry		76·0	54	e 11 41	− 1	—	—	—	—	—
Potsdam		77·4	332	i 11 49a	− 1	i 21 38	+ 4	e 14 42	PP	e 42·3
Ivigtut		77·9	6	—	—	e 21 42	+ 3	—	—	40·3
Istanbul		78·6	315	e 11 55	− 1	22 6	+19	—	—	—
Prague		78·7	329	e 11 57	0	e 21 48	0	—	—	e 40·8
Jena		79·1	331	e 11 54	− 5	—	—	e 11 58	P	—
Cheb		79·5	331	e 11 58	− 3	e 22 1	+ 5	e 30 54	SSS	e 41·3
Belgrade		80·2	322	e 12 18k	+13	e 22 28	+25	e 27 21	SS	e 47·9
De Bilt		80·3	335	e 12 0	− 5	e 22 8	+ 4	—	—	e 39·3
Tucson		80·5	56	i 12 8	+ 1	—	—	—	—	—
Stuttgart		81·7	331	e 12 12a	− 1	e 22 23	+ 4	e 42 18?	Q	46·3
Uccle		81·7	335	e 12 14	+ 1	e 22 21	+ 2	e 27 54	SS	e 38·3
Strasbourg		82·4	332	e 12 16	0	e 22 26	0	e 15 30	PP	e 39·3
Kew		82·5	338	e 12 19	+ 2	e 22 32	+ 5	e 15 22	PP	e 40·3
Triest		82·5	327	e 12 15	− 2	e 22 30	+ 3	—	—	—
Zürich		83·1	331	e 12 19a	− 1	e 23 5	+32	—	—	—
Basle		83·4	331	e 12 21	− 1	e 22 38	+ 2	—	—	e 45·7
Ville Marie		84·5	28	e 12 24	− 3	—	—	—	—	—
Helwan		85·2	306	i 12 31a	0	22 52	− 2	15 48	PP	—
Temiskaming		85·2	28	e 12 28	− 3	—	—	—	—	—
Rome		86·1	325	e 12 34a	− 1	e 23 0	− 3	e 15 56	PP	—
Clermont-Ferrand		86·5	333	e 12 36	− 1	i 23 15	+ 9	i 16 0	PP	42·3
St. Louis		87·3	39	e 12 40	− 1	i 23 13	− 1	e 29 2	SS	e 34·3
Ottawa		87·5	27	e 12 39	− 3	—	—	—	—	46·3
Tortosa		91·7	332	e 13 8	+ 6	23 48	− 6	16 43	PP	e 49·3
Alicante		93·9	333	e 17 0	PP	e 24 34	+21	26 2	PS	e 45·8
Toledo		94·1	334	e 13 13	+ 1	—	—	e 17 1	PP	45·1
Granada		96·4	333	17 17a	PP	i 25 1	+27	34 32	?	i 47·7
Tamanrasset		105·2	320	e 18 25	PP	—	—	—	—	—
La Paz		144·0	56	i 19 41	[+13]	—	—	i 23 18	PP	70·3

For Notes see next page.

NOTES TO SEPTEMBER 23d. 0h. 52m. 42s.

Additional readings :—
Potsdam ePSN =22m.18s.
Jena eN =12m.14s.
Cheb e =25m.44s.
Belgrade e =14m.41s.
Tucson e =12m.14s., i =12m.24s.
Stuttgart eZ =12m.32s., eSSS =32m.30s.
Uccle eN =29m.13s. and 33m.18s.
Strasbourg eS =22m.30s., eSS =27m.36s., eSSS? =32m.36s.
Kew ePSN =23m.2s.
Triest i =12m.43s., iS =22m.46s.
Helwan i =23m.21s.
Rome eSKS? =21m.51s., eSSS? =32m.51s.
St. Louis eS =22m.52s.
Tortosa SE =24m.4s., S_cSEN =24m.15s., PPSE =25m.51s.
Alicante PPS =26m.42s., SS =31m.2s., SSS =34m.36s., Q =39m.50s.
Toledo iZ =13m.41s.
Long waves were also recorded at Bozeman, Huancayo, and at other European stations.

Sept. 23d. 12h. Undetermined Shock.

Brisbane iPE =36m.13s., iPPEN =36m.30s., iSN =39m.34s., eLE =41m.19s.
Riverview ePZ =36m.58s., epPNZ =37m.7s., iE =37m.15s., iPPZ =37m.28s., iSN = 40m.57s., iEN =41m.4s., iZ =41m.11s., iEZ =41m.21s., iE =41m.28s., eLZ =42·5m., iScSN =48m.19s.
Tuai S?N =36m.42s.
Auckland eN =39m.30s.
Mineral iPZ =44m.44s.a.
Berkeley iPZ =44m.57s.a.
Lick iPZ =44m.58s.a.
Palomar iPZ =45m.3s.k, iZ =45m.8s.
Mount Wilson ePZ =45m.3s.
Pasadena ePZ =45m.4s.
Riverside iPZ =45m.5s.k.
Tinemaha iPZ =45m.9s.
Boulder City eP =45m.17s.
Pierce Ferry eP =45m.21s.
Tucson eP =45m.25s.k.
Stuttgart eZ =51m.57s. and 52m.5s.
Long waves were also recorded at Wellington and Arapuni.

Sept. 23d. 15h. 11m. 8s. Epicentre 43°·7N. 147°·6E. (as on 10d.).

A = −·6124, B = +·3886, C = +·6884 ; δ = −6 ; h = −3.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Yuzno-Sakhlinsk		4·7	315	1 0?	−14	—	—	—	—	—
Mizusawa		6·7	229	1 38	− 4	2 46	−14	1 42	P	—
Vladivostok		11·4	272	i 2 48	+ 1	i 5 20?	SSS	—	—	—
Irkutsk		29·8	303	e 6 12	+ 1	e 11 22	+15	—	—	—
College		40·9	35	—	—	e 13 58	0	—	—	e 17·2
Almata		49·8	296	e 8 56	0	—	—	—	—	—
Frunse		51·5	296	e 9 11	+ 2	e 16 34	+ 5	—	—	—
Sverdlovsk		53·4	318	i 9 22	− 2	16 57	+ 2	—	—	—
Andijan		54·0	295	e 9 28?	0	e 17 12?	+ 9	—	—	—
Murgab		54·1	291	9 29?	0	17 17?	+12	—	—	—
Tchimkent		55·0	297	i 9 36	+ 1	i 17 18	+ 1	—	—	—
Tashkent		55·7	297	i 9 40	0	e 17 30	+ 4	—	—	—
Obi-garm		56·8	294	10 38?	+50	e 18 34?	+53	—	—	—
Stalinabad		57·5	294	i 9 53	0	i 17 52	+ 2	—	—	—
Samarkand		58·1	296	e 9 54	− 4	—	—	—	—	—
Hungry Horse		63·7	47	i 10 34	− 2	—	—	—	—	—
Mineral	z.	64·1	58	e 10 39	+ 1	—	—	—	—	—
Moscow		64·7	324	10 39	− 3	19 21	− 1	—	—	—
Ashkabad		65·1	299	e 10 40	− 5	—	—	—	—	—
Scoresby Sund		65·1	357	—	—	19 40	+13	—	—	31·9

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tinemaha	z.	68·2	59	e 11 15	+11	—	—	—	—	—
Grozny		68·8	309	11 2	− 6	—	—	—	—	—
Mount Wilson	z.	70·1	61	e 11 16	0	—	—	—	—	—
Pasadena	z.	70·1	61	e 11 12	− 4	—	—	—	—	—
Boulder City		71·0	58	e 11 19	− 3	—	—	—	—	—
Palomar	z.	71·4	62	e 11 20	− 4	—	—	—	—	—
Pierce Ferry		71·4	57	e 11 22	− 2	—	—	—	—	—
Sotchi		71·9	314	e 11 34	+ 7	—	—	—	—	—
Warsaw		73·9	329	e 11 38	− 1	e 21 4	− 6	e 21 21	PS	e 40·9
Copenhagen		74·0	335	11 50	+11	—	—	—	—	40·9
Yalta		74·1	317	e 11 40	0	e 21 14	+ 2	—	—	—
Tucson		76·0	58	e 11 49	− 2	—	—	—	—	—
Potsdam		76·6	334	e 11 53	− 1	e 21 43	+ 3	e 21 51	?	e 41·9
Prague		78·1	332	e 12 5	+ 3	e 21 58	+ 2	e 34 13	Q	e 41·9
Jena		78·2	332	e 12 3	0	—	—	e 13 5	?	—
Cheb		78·8	332	e 12 10	+ 4	e 22 28	PS	e 30 16	SSS	e 41·9
Istanbul		79·1	319	12 7	− 1	22 7	0	—	—	—
De Bilt		79·2	337	e 12 7	− 1	e 22 16	+ 8	—	—	e 42·9
Uccle		80·6	338	—	—	e 21 52?	−31	—	—	e 38·9
Stuttgart		80·9	333	e 12 18a	+ 1	e 22 31	+ 5	e 12 30	P_cP	e 42·9
Strasbourg		81·6	334	e 12 20	− 1	e 22 22	−11	e 27 22	SS	41·9
Zürich		82·4	333	e 12 22	− 3	—	—	—	—	—
Basle		82·5	334	e 12 26	0	—	—	e 14 27	?	—
Paris		82·9	337	i 12 28	0	e 22 52?	+ 6	—	—	e 45·9
Ottawa		83·3	29	e 12 37	+ 7	—	—	—	—	—
Clermont-Ferrand		85·3	336	i 12 42	+ 2	e 23 30	+20	43 52?	Q	48·9
Rome		85·7	327	e 12 40	− 2	e 23 28	+14	—	—	e 41·9
Helwan		86·4	309	i 12 46a	+ 1	23 24	+ 3	—	—	—
Granada		95·4	338	e 13 43k	+15	—	—	—	—	52·1

Additional readings :—
Prague eZ = 21m.4s. and 29m.55s.
Strasbourg eSSS = 31m.52s.
Basle e = 19m.30s.
Rome e = 23m.31s. and 26m.41s.
Helwan i = 12m.59s., e = 24m.18s.
Long waves were also recorded at other European stations.

Sept. 23d. Readings also at 0h. (Pierce Ferry, Auckland, Granada, Uccle, and Rome), 1h. (near Apia), 3h. (near Stalinabad, Andijan, and Obi-garm), 4h. (near Tacubaya), 5h. (near Obi-garm), 7h. (near Bogota), 8h. (Auckland, Apia, Theodosia, Lick, Palomar, Pasadena, Mount Wilson, Tinemaha, Riverside, Hungry Horse, Boulder City, Pierce Ferry, and Tucson), 9h. (near Tacubaya, Boulder City, Pierce Ferry, Tucson (3), Tchimkent, near Kulyab, Stalinabad, and Obi-garm), 12h. (Hungry Horse, and Riverview), 13h. (near Berkeley), 14h. (Bombay, Auckland, Christchurch, Wellington, Arapuni, near Lick (3), and Branner (3)), 15h. (Hungry Horse, Istanbul, and near Mineral), 17h. (Tucson and near Tacubaya), 18h. (near Lick), 20h. (Mizusawa, Istanbul, and near Leninakan), 21h. (Misuzawa, Paris, Stuttgart, Granada, and Hungry Horse), 22h. (Boulder City, Pierce Ferry, near Tucson, Palomar, Riverside, and Pasadena), 23h. (near Lick, Branner, and near Mineral).

Sept. 24d. 20h. 41m. 43s. Epicentre 4°·1S. 143°·8E. (as on 1943, Dec. 1d.).

$A = -·8049$, $B = +·5891$, $C = -·0710$; $\delta = -6$; $h = +7$;
$D = +·591$, $E = +·807$; $G = +·057$, $H = -·042$, $K = -·997$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	E.	24·9	161	e 5 33	+ 7	i 9 54	+ 7	i 10 25	SS	e 12·1
	N.	24·9	161	i 5 29	+ 3	e 9 59	+12	—	—	—
Riverview		30·4	169	i 6 24k	+ 8	i 11 24	+ 8	i 7 31	PP	e 14·4
Perth		38·2	220	i 7 42	+19	13 27	+10	15 39	SS	—
Arapuni	E.	44·6	144	—	—	e 14 23	−29	18 17?	Q	20·7
Wellington		46·3	147	e 8 17?	−12	e 15 17?	+ 1	18 17?	Q	21·3
Christchurch		46·8	151	—	—	18 45	SS	20 55	Q	23·2
Vladivostok		48·2	349	i 8 43	− 1	i 15 38	− 5	—	—	—
Calcutta	E.	60·3	299	e 10 11	− 2	i 18 29	+ 3	—	—	—
Colombo	E.	64·7	279	e 10 47	+ 5	19 27	+ 5	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Irkutsk		65·4	334	10 43	− 4	—	—	—	—	—
Kodaikanal	E.	67·6	283	—	—	e 20 12	+15	—	—	—
Hyderabad	N.	67·9	291	—	—	19 54	− 7	—	—	—
Bombay		73·4	291	e 11 41	+ 5	i 21 11	+ 6	—	—	—
Almata		76·2	317	e 11 50	− 2	—	—	—	—	—
Murgab		76·9	311	11 55	− 1	e 21 41?	− 2	14 58	PP	—
Frunse		77·8	315	e 12 2	+ 1	—	—	—	—	—
Andijan		78·8	313	—	—	e 22 7	+ 3	—	—	—
Kulyab		80·0	310	e 12 8	− 5	i 22 18	+ 1	—	—	—
Obi-garm		80·2	310	12 13	− 1	22 21	+ 2	—	—	—
Stalinabad		80·9	310	i 12 16	− 1	i 22 26	0	—	—	—
Tashkent		81·1	313	i 12 18	0	i 22 26	− 2	—	—	—
Tchimkent		81·1	314	i 12 18	0	i 22 29	+ 1	—	—	—
College		84·7	23	—	—	e 22 53	−11	—	—	e 34·9
Sitka		88·5	33	e 12 35	−21	i 23 34	− 7	e 28 50	SS	e 35·0
Ashkabad		88·9	308	e 13 2	+ 4	—	—	—	—	—
Sverdlovsk		89·7	327	12 58	− 3	i 23 45	− 7	e 16 35	PP	—
Victoria		94·9	41	—	—	e 23 59	[− 2]	—	—	43·3
Hungry Horse		101·1	41	e 14 32	+39	—	—	—	—	—
Moscow		102·5	326	e 14 4	+ 4	24 37	[− 2]	e 18 12	PP	—
Saskatoon		105·2	36	e 18 44	PP	—	—	—	—	49·4
Tucson		105·2	57	e 18 32	PP	—	—	—	—	e 47·4
Yalta		106·8	315	e 14 21	+ 3	e 24 53	[− 6]	e 18 49	PP	—
Upsala		111·0	333	—	—	e 28 33	PS	—	—	e 53·3
Istanbul		111·2	312	14 34	P	—	—	19 17	PP	—
Helwan		111·5	300	e 19 21	PP	e 29 20	PS	e 21 41	PPP	—
Warsaw		112·8	326	e 19 28	PP	e 25 16	[− 8]	e 26 31	SKKS	e 55·3
Scoresby Sund		113·1	355	—	—	26 47	{+20}	35 5	SS	47·3
Copenhagen		115·6	332	19 51	PP	29 23	PS	—	—	55·3
Belgrade		116·1	317	e 19 48	PP	—	—	—	—	e 69·4
Potsdam		117·1	328	i 20 2	PP	i 29 39	PS	—	—	e 56·3
Prague		117·5	325	—	—	e 25 35	[− 6]	e 36 17	SS	e 55·3
Jena	N.	118·6	327	e 20 1	PP	—	—	—	—	—
Cheb		118·7	326	e 20 14	PP	e 29 24	PS	e 31 42	PPS	e 58·3
Triest		120·1	321	e 20 21	PP	e 25 59	[+ 9]	e 30 9	PS	—
Stuttgart		121·1	326	e 18 54	[− 1]	25 29	[−25]	e 20 29a	PP	e 59·3
De Bilt		121·2	331	e 20 23	PP	e 30 21	PS	e 23 2	PPP	e 73·3
Padova	Z.	121·8	322	e 21 3?	PP	—	—	—	—	—
Strasbourg		122·0	327	e 20 33	PP	e 30 30	PS	e 37 21	SS	e 55·3
Salo		122·1	323	e 22 27?	PKS	—	—	—	—	—
Uccle		122·4	330	e 23 13a	PPP	e 30 21	PS	e 37 47	SS	e 55·3
Rome		122·6	318	e 20 41	PP	e 28 37	?	e 23 9	PPP	e 57·8
Kew		124·1	333	—	—	e 27 29	{−13}	—	—	e 60·3
Paris		124·6	329	e 18 59	[− 3]	e 30 46	PS	e 20 52	PP	e 59·3
Clermont-Ferrand		126·2	326	i 21 5	PP	e 33 29	PPS	—	—	60·3
Ottawa		126·3	33	e 19 3	[− 2]	—	—	—	—	57·3
Tortosa		130·8	322	21 31	PP	26 26	[+ 4]	22 39	PKS	e 66·3
Alicante		132·9	321	21 25	PP	38 53	SS	22 50	PKS	e 58·3
Toledo		134·0	324	e 19 22	[+ 2]	—	—	e 21 54	PP	64·3
Granada		135·5	321	19 20k	[− 2]	32 20	PS	21 51a	PP	65·9
Tamanrasset		135·6	299	e 19 26	[+ 4]	—	—	e 21 55	PP	—
Lisbon		137·7	327	19 30	[+ 4]	34 20	PPS	22 3	PP	—
La Paz		142·4	124	e 19 59	[+24]	—	—	—	—	—
San Juan		147·5	61	e 19 45	[+ 2]	—	—	e 24 47	?	e 46·7

Additional readings :—
Riverview iZ = 7m.51s., iNZ = 8m.2s., eN = 11m.53s., iN = 12m.12s., eQN = 13m.17s.
Sitka eS? = 23m.1s., iPPS = 24m.47s.
Sverdlovsk SKS = 23m.25s., eSSS = 36m.53s.
Helwan e = 20m.26s.
Warsaw PSE = 28m.58s., PSN = 29m.3s., ePPSE = 30m.36s., ePPSN = 30m.47s., eE = 31m.24s., eN = 31m.34s., eSSN = 35m.13s., eSSE = 35m.34s.
Prague ePS? = 28m.23s., eSS? = 34m.54s., eSSS? = 40m.23s., e = 43m.17s., 45m.5s., 47m.47s., 49m.47s., and 51m.53s.
Jena eE = 20m.7s.
Cheb e = 24m.51s., 32m.59s., 33m.58s., and 40m.36s.

Continued on next page.

Triest iPPS = 31m.17s., eSKP,PKP = 43m.38s.
Stuttgart ePS? = 30m.17s.
Strasbourg e = 21m.4s., 30m.11s., 31m.29s., and 31m.42s., ePKKS? = 32m.35s., eSSS = 41m.17s.
Uccle eZ = 24m.32s., eE = 41m.17s.?, and 50m.17s.?
Rome ePPPN = 23m.19s., ePSE = 30m.27s., eZ = 31m.53s., and 34m.19s.?, eSS?N = 37m.19s., eSSS?E = 41m.49s.
Paris ePPP = 23m.30s., ePPS? = 31m.44s., ePKKS? = 33m.4s., eSS = 37m.47s., eSSS = 42m.2s.
Tortosa PSN = 31m.48s., PPSN = 33m.32s.
Alicante PPS = 33m.36s., SSS = 42m.53s., Q = 50m.51s.
Granada PPP = 23m.14s.k, PPS = 34m.4s., SS = 42m.8s., SSS = 45m.44s.
Lisbon E? = 23m.9s., N? = 23m.16s., E? = 30m.39s.
Long waves were also recorded at Auckland, Salt Lake City, Chicago, and Aberdeen.

Sept. 24d. 23h. 27m. 59s. Epicentre 21·5N. 122°·0E.

$A = -\cdot4935$, $B = +\cdot7898$, $C = +\cdot3644$; $\delta = +11$; $h = +4$;
$D = +\cdot848$, $E = +\cdot530$; $G = -\cdot193$, $H = +\cdot309$, $K = -\cdot931$.

		△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	Supp. m. s.		L. m.
Nanking	N.	10·9	345	e 4 12	S	(e 4 12)	−32	—	—	(1 5·4)
Vladivostok		23·1	19	i 5 10	+ 2	i 9 25	+ 9	—	—	—
Mizusawa		24·0	39	5 16	− 1	9 38	+ 6	—	—	—
Calcutta	E.	31·2	279	e 8 0	PPP	i 12 25	+56	—	—	e 15·3
Irkutsk		33·6	340	6 43	− 1	—	—	—	—	—
Hyderabad	N.	41·2	272	e 10 26	PPP	—	—	—	—	22·9
Almata		43·2	312	e 8 11	+ 7	—	—	—	—	—
Murgab		44·4	304	8 14	0	—	—	—	—	—
Frunse		44·7	310	e 8 19	+ 3	—	—	—	—	—
Andijan		46·0	307	8 31	+ 4	e 15 14	+ 2	—	—	—
Bombay		46·1	276	e 8 30	+ 2	—	—	—	—	—
Kulyab		47·6	303	e 8 39	0	i 15 34	− 1	—	—	—
Obi-garm		47·7	304	8 40	0	15 36	0	—	—	—
Tchimkent		48·2	309	i 8 48	+ 4	i 15 48	+ 5	—	—	—
Tashkent		48·3	307	i 8 44	− 1	e 18 38	S_cS	e 10 38	PP	—
Stalinabad		48·4	304	i 8 45	− 1	i 15 45	− 1	—	—	—
Sverdlovsk		56·7	325	i 9 47	− 1	i 17 37	− 3	—	—	—
Ashkabad		56·9	302	e 9 46	− 3	—	—	—	—	—
Grozny		65·8	309	i 10 49	0	19 33	− 2	—	—	—
Leninakan		67·6	307	e 10 48?	−13	—	—	—	—	—
Moscow		69·4	324	11 11	− 1	20 12	− 6	—	—	—
Yalta		73·8	312	i 11 37	− 1	21 5	− 4	—	—	—
Istanbul		78·3	310	e 12 2	− 1	21 56	− 3	—	—	—
Warsaw		79·7	323	e 12 13	+ 2	22 12	− 1	e 31 40	SSS	e 42·0
Helwan		80·1	298	i 12 13k	0	22 21	+ 3	i 15 22	PP	i 40·5
Belgrade		82·9	315	e 12 30k	+ 2	e 25 21	?	—	—	e 45·9
Copenhagen		82·9	328	e 12 29	+ 1	22 55	+ 9	—	—	42·0
Potsdam		84·1	325	i 12 34s	0	i 22 55	− 3	—	—	e 42·0
Prague		84·4	323	e 12 37	+ 1	e 22 52	− 9	—	—	e 40·8
Scoresby Sund		84·8	349	12 40	+ 3	23 4	− 1	—	—	39·0
Cheb		85·6	323	e 22 4	?	e 23 26	+13	e 33 41	SSS	e 47·0
Jena	E.	85·6	223	e 12 43	+ 2	—	—	—	—	—
Triest		86·8	319	e 12 49	+ 2	i 23 20	− 5	e 16 9	PP	—
Stuttgart		88·0	323	e 12 52	− 1	e 23 34	− 2	e 16 31	PP	e 45·0
De Bilt		88·4	327	e 12 49	− 6	e 23 31	− 9	i 16 22	PP	e 47·0
Strasbourg		88·9	323	e 12 57	− 1	e 23 41	− 3	e 24 38	PS	e 44·0
Zürich		89·1	322	e 13 0	+ 2	—	—	—	—	—
Victoria		89·2	37	e 13 0	+ 1	—	—	—	—	e 41·3
Rome		89·4	315	e 13 0	0	e 23 36	[+ 7]	e 16 33	PP	—
Basle		89·6	322	e 12 54	− 7	e 26 1	?	—	—	e 50·0
Uccle		89·6	327	e 13 3?	+ 2	e 23 55	+ 4	e 36 1?	Q	e 43·0
Kew		91·6	328	e 17 41?	PP	24 29	+20	—	—	e 44·0
Paris		91·7	325	e 13 13?	+ 3	e 24 6?	− 4	e 16 48	PP	e 47·0
Grand Coulee		91·9	36	e 13 13	+ 2	—	—	—	—	—
Clermont-Ferrand		93·1	322	i 17 3	PP	—	—	—	—	50·0

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Hungry Horse		94·3	34	i 13 24	+ 1	—	—	—	—	—
Alicante		99·7	318	17 43	PP	24 29	[+ 3]	28 1	PS	e 53·0
Mount Wilson	z.	100·4	47	e 18 8	PP	—	—	—	—	—
Pasadena	z.	100·4	47	e 18 5	PP	—	—	—	—	—
Toledo		100·9	320	e 18 0	PP	—	—	e 20 12	PPP	52·8
Granada		102·3	318	17 42a	PKP	25 8	{− 3}	18 1	PP	54·0
Tamanrasset		104·1	302	e 18 8	PP	—	—	—	—	—
Tucson		106·5	46	e 18 43	PP	—	—	—	—	—

Additional readings :.—
Mizusawa PE =5m.21s.
Warsaw eE =19m.28s., 20m.20s., and 21m.41s., eS?E =22m.22s., eN =23m.4s., ePS?N = 23m.40s.
Potsdam ePE =12m.37s.
Jena eN =12m.47s.
Triest iPS =24m.25s., eSS =29m.1s.
Stuttgart ePS? =24m.31s.
Strasbourg eSS? =29m.37s.
Rome ePSN =24m.9s., eSSN =29m.50s.
Uccle ePN =13m.23s.?
Paris ePS =25m.51s.
Alicante PP =18m.28s.
Granada ePPP =21m.24s., PPS =28m.45s., SS =34m.10s.
Long waves were also recorded at Kodaikanal, Upsala, Aberdeen, Tortosa, Lisbon, College, and Ivigtut.

Sept. 24d. Readings also at 0h. (Mount Wilson, Pasadena, Palomar, Riverside, Tucson, Boulder City, and Pierce Ferry), 1h. (Victoria), 2h. (near Mizusawa (2)), 3h. (Helwan, Istanbul, Potsdam, Stuttgart, Paris, Tortosa, Alicante, Granada, Tamanrasset, Ottawa, Hungry Horse, Vladivostok, and near Mineral (2)), 4h. (Stuttgart, and near Tacubaya), 5h. (near Balboa Heights), 6h. (near Andijan), 8h. (Basle (2), Zürich (4), and near Stuttgart), 9h. (Stuttgart, Hungry Horse, Theodosia, Frunse, Samarkand, Yuzno-Sakhlinsk, near Andijan, Murgab, Obi-garm, Tashkent, Tchimkent, Stalinabad, and near Mizusawa), 10h. (near Stuttgart), 11h. (Tacubaya (3)), 13h. (near La Paz), 14h. (Boulder City, Pierce Ferry, and near Bogota), 15h. (Stalinabad, near Andijan, and Murgab), 16h. (Kew, Ottawa, Tucson, Hungry Horse, near Tacubaya, and near Mineral), 17h. (Bermuda), 18h. (Ottawa (3), Andijan, Kulyab, Tchimkent, near Obi-garm, Samarkand, Stalinabad, and near Mizusawa), 19h. (Istanbul (2) and Cheb), 20h. (near Stuttgart), 22h. (Grand Coulee, Hungry Horse, near Victoria, and near Berkeley), 23h. (Tucson and near Berkeley).

September 25d. 3h. 12m. 16s. Epicentre 10°·9N. 122°·1E. (as on 1948, Feb. 6d.).

$A = -\cdot5219$, $B = +\cdot8320$, $C = +\cdot1879$; $\delta = -9$; $h = +6$;
$D = +\cdot847$, $E = +\cdot531$; $G = -\cdot100$, $H = +\cdot159$, $K = -\cdot982$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Vladivostok		33·2	13	i 6 38	− 2	e 11 56	− 4	e 7 50	PP	—
Calcutta	E.	34·2	294	e 6 55	+ 6	—	—	—	—	—
Irkutsk		43·7	344	8 8	0	14 38	− 1	—	—	—
Bombay	E.	48·1	286	e 8 48	+ 5	i 16 21	+39	—	—	—
Kulyab		53·9	309	e 9 25	− 2	—	—	—	—	—
Obi-garm		54·1	310	e 9 30	+ 1	—	—	—	—	—
Stalinabad		54·8	310	i 9 34	0	e 17 18	+ 4	—	—	—
Tashkent		55·2	313	i 9 36	− 1	e 19 28	S_cS	—	—	—
Sverdlovsk		65·5	329	i 10 47	0	19 31	− 1	—	—	—
Moscow		78·0	325	e 12 1	− 1	—	—	—	—	—
Istanbul		85·2	310	e 12 39	0	—	—	e 15 46	PP	—
Helwan		85·3	299	12 41	+ 1	—	—	12 58	P_cP	—
Warsaw		88·2	323	—	—	e 23 16	[− 6]	—	—	e 52·7
Potsdam		92·8	325	e 13 16	0	—	—	—	—	e 50·7
Prague		92·8	322	—	—	e 32 3	?	—	—	e 53·7
Scoresby Sund		95·2	348	21 14	?	26 20	PS	—	—	47·7
Stuttgart		96·4	322	e 13 33	+ 1	—	—	—	—	e 52·7
Victoria		97·5	38	e 13 38	+ 1	—	—	—	—	—
Hungry Horse		103·0	35	e 14 1	− 1	—	—	—	—	—
Tucson		113·7	47	e 19 31	PP	—	—	—	—	—

Prague also gives e =40m.20s. and 42m.8s.
Long waves were also recorded at other European Stations.

September 25d. 7h. 37m. 26s. Epicentre 46°·3N. 15°·2E.

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

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Triest	1·2	237	e 0 22	− 2	i 0 35	− 6	—	—	—
Florence	3·8	229	—	—	e 1 51	+ 4	e 1 59	S*	e 2·1
Prague	3·8	353	e 0 55?	− 6	e 2 17	S_g	e 1 24	P_g	—
Chur	4·0	280	e 1 9k	+ 5	—	—	—	—	—
Pavia	4·4	257	e 1 9	− 1	—	—	—	—	—
Stuttgart	4·8	303	e 1 19?	+ 4	e 2 15	+ 3	e 1 28	P*	e 2·9
Jena	5·2	334	—	—	e 2 14	− 8	e 2 47	S_g	e 3·0
Basle	5·4	286	e 1 45	P_g	e 3 14	S_g	—	—	—
Strasbourg	5·5	297	e 1 55	P_g	e 2 59	S_g	—	—	e 3·4

Additional readings :—
Prague eS_g = 2m.21s.
Stuttgart eP_gZ = 1m.43s., eZ = 2m.23s., e = 2m.45s., eS_g = 2m.51s.
Jena eN = 2m.18s.
Long waves were also recorded at Warsaw and Potsdam.

September 25d. Readings also at 0h. (Granada, Paris, Tamanrasset, Nanking, and Hungry Horse), 1h. (Tucson), 2h. (Alicante), 3h. (near Bogota), 4h. (Istanbul), 5h. (Vladivostok, near Murgab (2), Kulyab (2), and Obi-garm (2)), 6h. (La Paz, College, Hungry Horse, Tucson, near Kulyab, Murgab, and Obi-garm), 7h. (Triest and near Murgab), 9h. (near La Paz, near Kulyab, Murgab, and Obi-garm), 10h. (Theodosia, near Mineral, near Zürich, and Basle), 11h. (near Bogota and near Mineral), 12h. (Rome), 13h. (near Mineral), 15h. (Tacubaya, Hungry Horse, Pierce Ferry, Tucson, and Tinemaha), 16h. (near Mineral), 18h. (near Kulyab, Murgab, Stalinabad, Andijan, Tchimkent, Samarkand, Obi-garm, and Frunse), 20h. (Piatigorsk, near Erevan, Grozny, and Leninakan).

Sept. 26d. 0h. 59m. 19s. Epicentre 8°·5S. 158°·5E. Depth of focus 0·005.

A = −·9204, B = +·3625, C = −·1468 ; δ = +9 ; h = +7 ;
D = +·367, E = +·930 ; G = +·137, H = −·054, K = −·989.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane		19·6	194	i 4 26	+ 1	i 8 9	+11	i 4 44	PP	i 10·1
Riverview		26·1	193	i 5 32a	+ 2	i 10 2	+ 8	i 6 6	pP	e 12·5
Apia		29·6	103	e 5 56	− 5	—	—	e 6 19	pP	—
Auckland	N.	31·9	154	—	—	10 41?	?	—	—	14·7
Arapuni	E.	33·3	154	—	—	—	—	e 14 41	Q	—
Tuai	N.	34·5	153	6 47	+ 3	12 54	+47	—	—	—
Kaimata		35·7	163	6 54	0	—	—	—	—	—
Wellington		35·7	158	6 50	− 4	13 0	+35	8 16	PP	15·5
Christchurch		37·0	162	7 5	0	15 34	SS	i 7 34	pP	—
Vladivostok		56·8	337	i 9 40	0	i 17 24	− 2	—	—	—
Irkutsk		76·1	329	11 42?	0	—	—	—	—	—
College		83·3	20	—	—	e 22 25	−10	—	—	e 34·6
Branner	Z.	86·7	52	i 12 37	− 1	—	—	—	—	—
Berkeley	Z.	86·8	52	i 12 36	− 2	—	—	i 13 5	pP	—
Santa Barbara	Z.	88·0	56	i 12 44	0	—	—	e 13 16	pP	—
Victoria		88·5	41	e 12 46	− 1	—	—	—	—	—
Pasadena		89·2	56	i 12 48a	− 2	i 23 28	− 4	i 13 22	pP	e 41·7
Mount Wilson		89·3	56	i 12 49a	− 1	—	—	i 13 22	pP	—
Tinemaha		89·7	53	i 12 49	− 3	—	—	i 13 25	pP	—
Haiwee	Z.	89·8	54	i 12 51	− 2	—	—	i 13 26	pP	—
Riverside		89·9	56	i 12 51a	− 2	—	—	i 13 25	pP	—
Palomar		90·2	57	e 12 54a	− 1	e 23 43	+ 2	i 13 28	pP	—
Murgab		91·0	308	12 58	0	—	—	i 13 31	pP	—
Frunse		91·2	313	e 13 3	+ 4	e 23 20	[− 4]	—	—	—
Grand Coulee		91·3	42	e 12 57	− 3	—	—	e 13 25	pP	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Boulder City		92·2	54	e 12 34	−30	—	—	i 13 2 pP	—
Andijan		92·6	311	e 13 7	+ 1	—	—	— —	—
Pierce Ferry		92·9	54	e 13 6	− 1	—	—	i 13 41 pP	—
Kulyab		94·2	308	e 13 15	+ 2	—	—	— —	—
Obi-garm		94·3	309	e 13 21?	+ 8	—	—	— —	—
Hungry Horse		94·6	42	i 13 15	0	—	—	— —	—
Tchimkent		94·8	312	13 17	+ 1	—	—	— —	—
Tucson		95·0	58	i 13 17	0	—	—	i 13 49 pP	—
Tashkent		95·0	311	i 13 14	− 3	i 23 38	[− 7]	i 13 48 pP	—
Stalinabad		95·0	309	i 13 17	0	—	—	— —	—
Samarkand		96·5	309	e 13 31	+ 8	—	—	— —	—
Sverdlovsk		101·4	327	e 13 58	+12	i 25 7	− 9	17 50 PP	—
Moscow		114·1	329	e 19 21	PP	e 26 4	SKKS	e 28 59 PS	—
Scoresby Sund		118·1	0	20 11	PP	25 26	[− 1]	29 31 PS	—
Warsaw	N.	124·3	331	—	—	e 25 39	[− 8]	e 28 40 SKKS	—
Istanbul		124·8	315	20 42	PP	e 31 7	PS	— —	—
Copenhagen		125·9	338	18 55	[0]	—	—	21 16 PP	60·7
Helwan		126·3	301	i 20 54	PP	—	—	i 21 25 pPP	—
La Paz	E.	127·6	118	18 57	[− 1]	—	—	— —	—
Potsdam		128·0	334	e 18 56	[− 3]	e 30 54?	PS	i 21 3 PP	e 57·7
Prague		128·9	331	e 21 17	PP	e 27 29	SKKS	e 22 11 PKS	e 54·7
Aberdeen	N.	129·2	347	i 21 28	PP	—	—	— —	—
Jena	E.	129·7	333	e 19 6	[+ 4]	—	—	e 21 9 PP	—
Durham	N.	131·2	345	i 22 29	PKS	—	—	— —	—
De Bilt		131·4	339	i 19 5	[0]	—	—	e 21 20 PP	e 60·7
Triest		132·2	327	i 22 31	PP	i 27 3	SKKS	i 23 3 pPP	—
Stuttgart		132·3	333	e 19 0	[− 7]	e 31 23	PS	e 19 40 pPKP	—
Uccle		132·7	339	e 22 3	PP	e 23 5	PKS	— —	—
Strasbourg		133·1	334	e 19 8	[0]	e 22 26	PKS	e 21 52 PP	e 61·7
Zürich		133·6	333	e 19 7	[− 2]	—	—	— —	—
Kew		133·7	342	e 19 11	[+ 2]	—	—	e 19 43 pPKP	e 58·7
Basle		133·9	333	e 18 49	[−21]	—	—	e 23 16 PKS	—
Florence		134·7	327	e 22 18	PP	—	—	e 23 16 PKS	—
Paris		135·0	337	e 19 14	[+ 2]	e 29 28	SKKS	e 19 46? pPKP	e 64·7
Rome		135·2	324	i 19 11a	[− 1]	e 31 53	PS	e 19 44 pPKP	e 63·8
Clermont-Ferrand		137·3	334	i 19 37	pPKP	i 22 41	PKS	i 22 31 PP	60·7
Tortosa		142·3	332	19 52	pPKP	26 37	[+10]	22 51 PP	—
Alicante		144·8	331	19 29	[− 1]	26 53	[+23]	20 5 pPKP	e 63·0
Toledo	Z.	145·1	336	i 19 30	[0]	—	—	i 20 2 pPKP	—
Granada		147·1	334	i 19 35k	[+ 1]	29 24	SKKS	20 9 pPKP	68·1
Lisbon	Z.	147·9	342	19 38k	[+ 3]	—	—	20 8 pPKP	—
Tamanrasset		150·4	303	e 19 40	[+ 1]	—	—	e 20 14 pPKP	—

Aditional readings :—
Brisbane iPN =4m.29s., iZ =4m.58s., iE =5m.2s., iZ =5m.33s. and 6m.10s., iSSEN = 8m.25s., iPePN =8m.54s.
Riverview iN =6m.15s., iPPZ =6m.23s., iPPP =6m.45s., iEN =7m.9s., iN =9m.4s. and 10m.15s., iE =10m.20s., iN =10m.29s. and 10m.39s., iZ =10m.58s., isS?N =11m.0s., iE =11m.18s., iSS?N =11m.32s., iSSSN =12m.2s.
Wellington PPPZ =8m.35s., SS =15m.7s.
Christchurch eNZ =9m.2s., iZ =16m.14s., eNZ =17m.41s.
Berkeley eN =12m.39s.
Mount Wilson iZ =13m.15s.
Palomar iZ =13m.23s.
Pierce Ferry ePP =17m.27s.
Tucson i =14m.36s. and 15m.6s.
Tashkent sSKS =24m.36s.
Sverdlovsk sS =26m.6s.
Scoresby Sund 26m.21s. and 30m.18s.
Warsaw eN =33m.35s. and 38m.8s.
Copenhagen 20m.49s.
Helwan e =28m.59s.
Potsdam iZ =22m.4s., eSSN =37m.59s.
Prague eSS? =38m.23s., eSSS? =42m.41s.?.
Jena eN =21m.12s., eE =22m.6s.
Durham iN =22m.56s.
Triest isPP =23m.57s., iSKKS =28m.12s., ePS =32m.33s., eSS =38m.51s., iPKP,PKP = 41m.11s., eSSS =41m.51s.
Stuttgart eZ =19m.6s. and 21m.58s., e =22m.19s., ePPP? =23m.10s., eZ =23m.20s,

Continued on next page.

Strasbourg e = 19m.42s., e = 23m.10s. and 23m.26s., ePS = 31m.31s., e = 31m.39s.
Kew eZ = 21m.43s., 22m.11s., and 22m.27s., eNZ = 23m.23s.
Paris ePP = 21m.51s., epPP? = 22m.14s., ePKS = 22m.46s., e = 23m.16s. and 23m.28s., eSS = 40m.46s., e = 41m.19s. and 48m.41s.?
Rome eZ = 21m.51s., eN = 23m.20s., e = 33m.54s.
Clermont-Ferrand i = 19m.53s., iSS = 40m.41s.?.
Tortosa SKPE = 23m.37s., PPPE = 25m.43s., SKKSN = 29m.15s., SKSPEN = 32m.46s., SSN = 40m.55s.
Alicante PP = 22m.9s., PKS = 22m.59s., PPP = 25m.9s.
Toledo iZ = 20m.6s.. and 20m.16s.
Granada sPKP = 20m.51s.k, PP = 22m.21s.a, pPP = 23m.36s.k, PPP = 26m.16s.k, iS = 31m.8s., SKSP = 33m.39s., SS = 40m.48s., sSS = 41m.58s.
Lisbon iZ = 20m.11s., Z = 20m.32s. and 20m.59s.
Tamanrasset iPKP = 19m.47s.k, i = 20m.21s.k.

Sept. 26d. 5h. 51m. 12s. Epicentre 82°·5N. 41°·5E. (as on 1948, Feb. 18d.).

$A = +\cdot0984$, $B = +\cdot0871$, $C = -\cdot9913$; $\delta = -6$; $h = -14$;
$D = +\cdot663$, $E = -\cdot749$; $G = +\cdot742$, $H = +\cdot657$, $K = -\cdot131$.

		Δ	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Sverdlovsk		26·3	156	5 40	+ 1	e 10 10	− 1
Stuttgart	z.	35·2	219	e 6 56	− 2	—	—
Paris		35·8	227	i 7 1	− 2	—	—
Hungry Horse		48·8	340	i 8 52	+ 3	—	—
Tinemaha	z.	60·2	342	i 10 12	0	—	—
Pierce Ferry		61·0	338	i 10 16	− 2	—	—
Haiwee	z.	61·2	342	e 10 18	− 1	—	—
Boulder City		61·2	339	e 10 18	− 1	e 21 16	?
Mount Wilson	z.	63·1	342	i 10 29	− 3	—	—
Pasadena	z.	63·2	342	i 10 39	+ 7	—	—
Tucson		64·7	336	i 10 43	+ 1	—	—

Additional readings :—
Tinemaha iZ = 10m.21s.
Haiwee eZ = 10m.28s.
Mount Wilson iZ = 10m.37s.
Tucson i = 10m.52s.
Long waves were recorded at Upsala, Warsaw, Potsdam, Rome and La Paz.

Sept. 26d. 8h. Undetermined Shock.

Stalinabad iP = 3m.7s., iS_g = 4m.21s.
Murgab P = 3m.14s., S = 4m.11s.
Obi-garm P = 3m.18s.?, iS_g = 4m.31s.?.
Samarkand eP = 3m.26s.?, eS* = 4m.49s.?.
Ashkabad e = 3m.28s.
Andijan eP = 3m.44s.
Tashkent eP = 3m.52s.?, iS = 5m.41s.?.
Tchimkent iP = 3m.55s., iS_g = 6m.17s.
Frunse eP = 4m.12s.
Grozny P = 6m.26s.
Bombay eE = 6m.53s., eEN = 8m.15s., eN = 9m.21s.
Sverdlovsk P = 7m.0s.
Helwan e = 8m.0s. and 9m.15s.
Moscow eP = 8m.58s.
Warsaw eZ = 9m.9s. and 10m.44s., eLN = 23m.
Potsdam eZ = 9m.47s., eLN = 27m.
Stuttgart eP?Z = 10m., eL = 33m.
Hyderabad SN = 10m.2s.
Calcutta ePE = 10m.12s., S?E = 12m.16s.
Paris e = 10m.39s.
Kodaikanal P?E = 10m.52s., E = 13m.34s., LE = 14m.50s.
Mizusawa SE = 16m.0s.
Long waves were also recorded at Rome, Copenhagen, Upsala, and Kew.

Sept. 26d. Readings also at 4h. (Hungry Horse, Nanking, and near Vladivostok), 5h. (near Rome), 6h. (Paris, Stuttgart, Rome, Boulder City, Pierce Ferry, Tucson, and near Tacubaya), 7h. (Clermont-Ferrand, Mizusawa, and near Tacabuya), 8h. (near Grozny (2)), 9h. (near Andijan, Murgab, Obi-garm, Samarkand, Stalinabad, Sotchi, near Erevan, and Leninakan), 11h. (near Murgab), 12h. (near Obi-garm and Stalinabad), 13h. (near Huancayo), 14h. (La Paz and near Huancayo), 18h. (Haiwee, Mount Wilson, Pasadena, Tinemaha, and Tucson,) 21h. (Brisbane, Riverview, Haiwee, Mount Wilson, Riverside, Tinemaha, Tucson, Boulder City, and Pierce Ferry), 22h. (Pierce Ferry).

Sept. 27d. 20h. 37m. 39s. Epicentre 46°·3N. 15°·2E. (as on 25d.).

$A = +·6690$, $B = +·1818$, $C = +·7206$; $\delta = -12$; $h = -4$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Triest		1·2	237	e 0 19	− 5	i 0 36	− 5	—	—	—
Kalossa		2·6	84	e 0 58	P_g	i 1 31	S_g	—	—	e 2·3
Budapest		2·9	64	1 0	P_g	—	—	e 1 11	?	1·8
Bologna		3·3	238	e 1 0	P*	e 1 39	+ 4	e 1 12	P_g	e 2·0
Salo		3·3	260	1 0 a	P*	i 1 45	S*	—	—	—
Florence		3·8	229	—	—	e 1 43	− 4	e 1 58	S*	e 2·2
Prague		3·8	353	1 25	P_g	e 1 37	−10	e 2 1	S*	—
Belgrade		4·0	110	e 0 57 a	− 7	e 1 46	− 6	e 1 25	P_g	e 2·1
Chur		4·0	280	e 1 4	0	e 1 51	− 1	—	—	—
Cheb		4·3	335	e 1 21	P_g	e 2 9	S*	—	—	—
Raciborzu		4·3	27	—	—	e 2 3?	+ 3	—	—	—
Pavia		4·4	257	e 1 25	P_g	e 2 24	S_g	—	—	—
Zürich		4·7	286	e 1 12k	− 2	e 2 7	− 3	e 1 26	P*	—
Stuttgart		4·8	303	e 1 15	0	e 2 10	− 2	e 1 26	P*	i 2·8
Rome		4·9	205	e 1 18	+ 1	2 5	−10	e 1 27	P*	e 2·6
Jena	N.	5·2	334	e 1 18	− 3	e 2 30	+ 8	e 2 40	S*	e 2·9
Collmberg		5·3	345	e 1 48	P_g	i 2 29	+ 4	i 2 58	S_g	—
Basle		5·4	286	e 1 22	− 2	e 2 51	S_g	—	—	—
Strasbourg		5·5	297	e 1 41	P*	e 2 44	S*	e 2 58	S_g	—
Neuchatel		5·7	280	e 1 26	− 2	e 3 11	S_g	—	—	—
Potsdam		6·2	348	—	—	i 3 29	S_g	—	—	—
Clermont-Ferrand		8·4	271	e 2 5	− 1	—	—	—	—	—
Paris		9·0	291	e 2 18	+ 5	e 5 4	S_g	e 2 46	P*	i 5·1
Tamanrasset		24·7	202	4 30	−54	—	—	—	—	—

Additional readings :—
Kalossa iN = 1m.41s., eE = 2m.4s.
Bologna eNZ = 1m.43s., S_g? = 1m.50s.
Prague e = 1m.32s., eS_g = 2m.11s.
Belgrade e = 1m.13s.
Raciborzu eEN = 2m.54s. and 3m.36s.
Stuttgart e = 1m.35s., eP_g = 1m.39s., e = 1m.45s., eZ = 2m.16s., e = 2m.31s., 2m.36s., and 2m.39s., iS_g = 2m.47s.
Rome e = 2m.29s.
Jena eE = 1m.25s.
Collmberg iS_gE = 3m.22s., iEZ = 3m.34s., e = 4m.23s.
Strasbourg e = 1m.51s., eP_g = 1m.58s., iS_g? = 3m.9s.
Long waves were also recorded at Warsaw.

Sept. 27d. 21h. 14m. 55s. Epicentre 6°·0S. 110°·0E. Depth of focus 0·100.

$A = -·3402$, $B = +·9346$, $C = -·1038$; $\delta = -1$; $h = +7$;
$D = +·940$, $E = +·342$; $G = +·035$, $H = -·098$, $K = -·995$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Kodaikanal	E.	36·2	296	i 6 19	+ 8	i 11 19	+10	—	—	—
Hyderabad	N.	38·9	307	6 18	−15	11 31	−17	—	—	—
Bombay		44·2	305	e 7 14	− 1	e 12 58	− 5	—	—	—
Brisbane	Z.	46·1	123	i 7 32	+ 3	—	—	i 8 20	?	—
Riverview	N.	47·1	132	i 7 36	− 1	i 13 54	+11	e 20 9	?	—
Vladivostok		52·8	21	e 8 15	− 3	i 14 56	− 3	—	—	—
Mizusawa		53·3	30	8 24	+ 2	15 2	− 4	—	—	—
Murgab		55·4	326	8 34	− 2	—	—	—	—	—
Almata		57·5	332	e 8 53	+ 3	—	—	—	—	—
Kulyab		57·5	323	e 8 55?	+ 5	e 16 0?	0	—	—	—
Andijan		57·9	327	e 8 51	− 2	—	—	—	—	—
Obi-garm		58·1	324	9 12?	+18	16 20?	+13	—	—	—
Frunse		58·3	330	i 8 55	− 1	i 16 9	− 1	—	—	—
Stalinabad		58·5	323	i 8 53	− 4	i 16 5	− 7	—	—	—
Tashkent		60·0	325	i 9 5	− 2	i 16 24	− 7	e 9 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.
Samarkand		60·3	322	e 9 8	− 1	i 16 30	− 5	—	—	—
Tchimkent		60·5	327	i 9 10	0	i 16 34	− 3	—	—	—
Ashkabad		64·9	317	e 9 35	− 3	e 17 25	− 5	—	—	—
Baku		71·8	316	10 27	+ 8	—	—	—	—	—
Sverdlovsk		74·4	335	10 33	− 1	i 19 16	− 1	—	—	—
Grozny		75·9	318	i 10 42	0	—	—	—	—	—
Leninakan		76·2	315	11 16?	+32	—	—	—	—	—
Sotchi		80·1	316	e 11 6	+ 2	—	—	—	—	—
Ksara		80·3	306	e 11 10	+ 5	e 20 22	+ 4	—	—	—
Helwan		83·2	301	e 11 20	0	e 20 47	0	—	—	—
Moscow		85·1	327	11 29	0	21 5	+ 1	—	—	—
Stuttgart	z.	101·6	319	e 16 11	?	—	—	e 17 5	PP	—
Tamanrasset		105·6	293	16 21	?	—	—	e 17 23	PP	—
Paris		106·0	319	i 17 36	PP	—	—	—	—	—
Grand Coulee		121·0	37	i 17 33	[− 6]	—	—	—	—	—
Branner	z.	123·3	48	i 17 48a	[+ 5]	—	—	e 20 4	pPKP	—
Hungry Horse		123·7	34	i 17 47	[+ 3]	—	—	—	—	—
Santa Barbara	z.	126·2	52	e 17 55	[+ 6]	—	—	—	—	—
Tinemaha		126·3	48	i 17 54	[+ 5]	e 30 48	?	i 20 13	pPKP	—
Haiwee	z.	126·9	49	i 17 56	[+ 6]	—	—	i 20 18	pPKP	—
Pasadena		127·4	51	i 17 57	[+ 6]	e 31 18	?	i 20 18	pPKP	—
Mount Wilson	z.	127·5	51	i 17 57a	[+ 6]	—	—	i 20 18	pPKP	—
Riverside	z.	128·1	51	i 17 58a	[+ 6]	e 30 43	PS	i 20 21	pPKP	—
Palomar		128·8	51	i 18 0a	[+ 6]	e 30 39	PS	i 20 23	pPKP	—
Boulder City		129·7	47	e 17 52	[− 4]	e 31 10	PS	i 20 26	pPKP	—
Pierce Ferry		129·8	47	e 17 48	[− 8]	—	—	i 20 26	pPKP	—
Tucson		133·8	50	e 17 55	[− 8]	—	—	i 20 30	pPKP	—
St. Louis		142·7	27	i 18 20	[− 1]	e 24 23	[− 3]	i 21 4	pPKP	—
Harvard		143·6	2	i 18 24	[+ 2]	—	—	i 21 7	pPKP	—
Fordham	z.	145·1	5	e 18 26	[+ 2]	—	—	i 21 10	pPKP	—
Tacubaya	E.	148·6	62	i 18 40	[+11]	—	—	—	—	—
La Paz	z.	157·6	186	i 18 47k	[+ 5]	—	—	—	—	—

Additional readings :—
Tashkent isS = 16m.59s.
Branner iZ = 17m.53s. and 20m.28s.
Mount Wilson iZ = 18m.2s., ePPZ = 20m.2s., eZ = 30m.38s.
Palomar iZ = 31m.9s.
Boulder City i = 18m.1s., ePP? = 22m.9s.
Pierce Ferry iPKP$_2$ = 18m.1s., iPP = 22m.5s., ePPP? = 25m.5s.
Tucson i = 18m.11s., 18m.54s., and 20m.43s., isP = 21m.20s., i = 21m.51s., iPP? = 22m.42s., e = 23m.33s. and 23m.56s., epPP? = 25m.41s., eSKKS? = 29m.41s., e = 30m.16s.
St. Louis eN = 32m.5s., eE = 39m.25s.
Harvard i = 18m.27s.
Fordham iPZ = 18m.29s., eZ = 20m.45s.

Sept. 27d. Readings also at 0h. (near Tacubaya), 2h. (College), 3h. (Hungry Horse, Boulder City and Pierce Ferry), 4h. (Mount Wilson, Pasadena, Palomar, Riverside, Haiwee, Tinemaha, Boulder City, Pierce Ferry, and Tucson), 5h. (La Paz, Mount Wilson, Pasadena, Palomar, Riverside, Haiwee, Tinemaha, Boulder City, Pierce Ferry, Tucson, Hungry Horse, and near Santa Clara), 6h. (near Berkeley, Branner (2), Lick, and San Francisco), 7h. (near Tacubaya), 8h. (La Paz), 9h. (La Paz and Tacubaya), 10h. (Tacubaya (3), near Kulyab, and near Obi-garm), 11h. (La Paz and near Huancayo), 13h. (Theodosia and near Stalinabad), 15h. (Stuttgart), 16h. (Belgrade, Taranto, Rome, Stuttgart, Apia, and near Grozny), 18h. (near Tacubaya), 21h. (near Ville Marie and Temiskaming).

Sept. 28d. 21h. 36m. 46s. Epicentre 22·3N. 94·1E. Depth of focus 0·005.

$A = -·0662$, $B = +·9237$, $C = +·3773$; $\delta = -4$; $h = +4$;
$D = +·997$, $E = +·071$; $G = -·027$, $H = +·376$, $K = -·926$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Calcutta	N.	5·3	274	e 2 16	+57	i 4 7	?	—	—	—
Hyderabad	N.	15·5	254	3 25	−11	6 6	−20	—	—	7·5
Dehra Dun	N.	16·4	303	e 3 44	− 3	e 6 16	−31	—	—	—
Kodaikanal	E.	20·0	237	i 4 37	+ 7	i 8 8	+ 2	—	—	9·6
Bombay		20·2	264	i 4 36	+ 4	i 8 23	+13	—	—	10·4
Murgab		23·6	317	5 2	− 4	9 10	− 2	—	—	—
Nanking		24·0	60	i 5 7	− 3	i 9 26	+ 7	5 23	pP	11·6
Almata		25·3	330	e 5 22	0	9 38	− 3	—	—	—
Andijan		26·0	320	e 5 31	+ 2	e 9 58	+ 6	—	—	—
Frunse		26·2	325	1 5 32	+ 2	—	—	—	—	—
Stalinabad		27·1	313	i 5 37	− 2	i 17 21	?	i 9 39	PcP	—
Tashkent		28·2	318	5 48	− 1	e 10 26	− 2	i 6 8	pP	—
Samarkand		28·8	312	i 5 58	+ 4	—	—	—	—	—
Irkutsk		30·9	12	6 13	0	i 11 5	− 6	—	—	—
Kagosima		33·7	66	6 35	− 2	—	—	—	—	18·1
Hukuoka		33·8	62	6 32	− 6	11 50	− 6	e 7 4	PP	17·3
Kumamoto		33·9	63	6 40	+ 1	—	—	—	—	—
Ashkabad		34·8	305	e 6 42	− 4	e 13 24	SS	—	—	—
Hamada		35·4	61	7 47	PP	12 31	+10	—	—	—
Koti		36·4	63	7 35	+35	12 41	+ 5	8 27	PP	19·4
Sumoto		37·6	61	i 7 7	− 3	12 52	− 2	—	—	—
Vladivostok		37·6	47	i 7 9?	− 1	—	—	—	—	—
Toyooka		37·7	60	7 14?	+ 3	—	—	—	—	—
Osaka		38·2	61	e 7 14	− 1	13 3	− 1	—	—	—
Owase		38·7	62	7 41	+22	—	—	—	—	—
Hikone		38·9	60	7 21	0	13 8	− 6	—	—	—
Kameyama		39·0	61	e 7 19	− 3	13 13	− 3	—	—	—
Gihu		39·3	61	8 14?	+50	—	—	—	—	—
Nagoya		39·4	61	7 21	− 4	13 19	− 3	—	—	—
Toyama		39·8	58	7 30	+ 2	13 26	− 2	—	—	—
Omaesaki		40·4	62	e 9 12	PP	13 32	− 5	—	—	—
Nagano		40·6	59	7 46	+11	—	—	—	—	—
Hunatu		40·9	60	8 15	+38	12 21	?	—	—	16·0
Misima		41·0	61	7 14?	−24	—	—	—	—	—
Maebasi		41·3	59	7 28	−13	14 3	+13	—	—	22·7
Baku		41·4	307	e 7 46	+ 5	13 58	+ 7	—	—	—
Yokohama		41·6	61	8 23	+40	13 43	−11	—	—	17·3
Tokyo		41·8	60	e 8 41	+56	15 21	?	—	—	22·5
Kakioka		42·2	59	7 44	− 4	—	—	—	—	—
Sverdlovsk		42·3	333	e 7 47	− 2	i 13 55	−10	i 8 8	pP	—
Yamagata		42·5	56	8 6	+15	13 59	− 9	—	—	18·1
Akita		42·6	55	7 48	− 3	14 24	+15	—	—	—
Sendai		43·0	57	e 7 54	− 1	14 5	−10	—	—	20·0
Aomori		43·3	53	e 8 13	+16	—	—	—	—	—
Mizusawa	N.	43·3	56	e 7 58	+ 1	14 15	− 4	—	—	—
Mori		43·4	51	7 14	−44	—	—	—	—	—
Grozny		45·0	310	i 8 12?	+ 1	—	—	—	—	—
Erevan		45·4	305	e 8 18	+ 4	—	—	—	—	—
Leninakan		46·0	306	8 35	+16	—	—	—	—	—
Piatigorsk		47·0	311	i 8 25?	− 2	—	—	—	—	—
Guam		48·8	91	e 8 42	+ 1	i 15 38	0	e 11 37	PPP	—
Sotchi		49·4	309	8 45	0	e 15 46	0	i 9 54	PcP	—
Ksara		52·0	296	e 9 10	+ 5	e 16 30	+ 8	—	—	—
Theodosia		52·6	310	i 9 8	− 1	16 28	− 2	—	—	—
Moscow		53·1	324	9 10	− 3	16 30	− 7	9 31	pP	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m. s.			m.
Helwan		56·3	292	i 9 38k	+ 2	i 17 16	− 4	10 8	pP		—
Istanbul		57·1	305	i 9 41	− 1	i 17 32	+ 2	—	—		—
Bucharest		59·2	310	e 10 2	+ 5	e 17 56	− 2	—	—		24·2
Warsaw		62·4	319	e 10 17	− 1	e 18 36	− 3	e 11 9	PcP		e 31·2
Belgrade		63·2	310	e 10 22k	− 2	i 18 49	0	i 12 45	PP		e 30·5
Budapest		63·9	313	10 29	+ 1	e 18 56	− 1	—	—		26·2
Kalossa		64·1	312	e 10 35	+ 5	—	—	i 11 15	PcP		—
Upsala		64·2	327	10 30	0	i 18 55	− 6	e 23 20	SS		e 28·2
Raciborzu		64·3	317	e 10 31	0	e 20 16	?	e 10 49	pP		—
Taranto		66·1	306	10 16	−26	19 23	− 1	11 28	PP		—
Prague		66·7	317	10 42	− 4	e 19 28	− 3	e 11 8	pP		e 34·2
Copenhagen		67·2	323	e 10 49a	0	i 19 37	− 1	23 50	SS		—
Potsdam		67·3	320	i 10 54	+ 4	i 19 36	− 3	i 11 21	PcP		e 34·2
Collmberg		67·4	318	i 10 53	+ 2	e 19 38	− 2	i 13 33	PP		—
Messina		67·8	304	10 56	+ 3	e 20 22	+37	—	—		—
Triest		67·8	312	i 10 54	+ 1	i 19 40	− 5	i 11 26	pP		—
Cheb		68·0	317	e 10 54	0	19 37	−10	e 13 30	PP		e 35·2
Jena		68·4	317	e 10 56	− 1	e 19 50	− 2	e 15 11	PPP		e 34·8
Rome		69·4	308	e 11 2	− 1	i 19 59	− 5	e 14 12	PP		e 28·9
Bologna		69·7	311	e 11 6	+ 1	e 20 8	+ 1	i 11 16	pP		e 31·0
Florence		69·9	310	e 11 4	− 2	i 20 6	− 4	e 13 32	PP		—
Salo		70·0	313	i 11 6k	− 1	20 9	− 2	—	—		—
Stuttgart		70·3	316	i 11 8k	− 1	e 19 51	−23	e 11 37	PcP		e 37·2
Chur		70·5	314	e 11 8k	− 2	e 20 8	− 9	—	—		—
Zürich		71·0	315	e 11 11k	− 2	e 20 17	− 5	—	—		—
Pavia	z.	71·1	312	i 11 15k	+ 2	—	—	—	—		—
Strasbourg		71·3	316	e 11 14	− 1	e 20 23	− 3	e 13 50	PP		35·2
Basle		71·6	315	e 11 15k	− 1	e 20 28	− 1	e 14 24	PP		—
Neuchatel		72·1	315	e 11 18	− 1	—	—	—	—		—
De Bilt		72·1	320	e 11 26	+ 7	e 20 38	+ 3	e 25 14	SS		e 32·2
Uccle		72·9	319	e 11 26	+ 2	i 20 41	− 3	e 14 8	PP		e 38·2
Paris		74·6	317	i 11 33	− 1	e 20 58	− 5	i 11 54	PcP		e 37·2
Clermont-Ferrand		75·0	313	e 11 37	+ 1	i 21 7	− 1	i 26 1	SS		35·2
Brisbane		75·4	128	i 11 40	+ 2	i 21 17	+ 5	e 21 44	PS		—
Kew		75·5	320	i 11 39	0	e 21 16	+ 3	e 14 22	PP		e 42·2
Barcelona		77·0	310	e 12 14	pP	e 21 31	+ 2	e 23 5	PPS		e 31·8
Riverview		77·9	134	i 11 58a	+ 6	i 21 46	+ 7	i 12 10	PcP		36·7
Tortosa		78·4	309	i 11 56	+ 1	i 21 37	− 7	12 12	PcP		e 41·2
Alicante		79·9	308	12 8	+ 5	21 57	− 3	12 13	PcP		e 38·8
Tamanrasset		80·4	291	i 12 8k	+ 2	i 22 10	+ 5	i 12 36k	pP		e 42·1
Toledo		81·9	310	i 12 14	0	i 22 21	0	i 12 44	pP		—
Granada		82·6	307	i 12 21k	+ 4	i 22 35	+ 7	12 31k	PcP		39·5
Lisbon		86·0	310	12 34k	− 1	23 47	PS	i 13 5	pP		—
Sitka		90·8	25	e 13 0	+ 3	i 23 46	0	e 16 55	PP		e 36·9
Ivigtut		91·4	343	—	—	23 24	[− 1]	24 32	S		44·2
Victoria		101·9	25	e 18 13	PP	i 24 26	[+ 6]	i 25 24	S		33·2
Grand Coulee		104·0	22	e 13 47	−10	e 24 28	[− 2]	e 17 8	PP		—
Hungry Horse		105·3	19	i 14 4	P	—	—	—	—		—
Butte	N.	107·8	19	—	—	e 24 47	[+ 1]	e 27 59	PS		e 47·6
Bozeman		108·6	18	e 19 46	?	e 26 18	?	e 28 2	PS		e 51·0
Seven Falls	E.	109·6	349	—	—	e 27 46	PS	e 33 2	SS		41·2
Berkeley		111·1	30	—	—	i 26 44	?	e 28 38	PS		—
Ottawa		112·0	353	e 18 56	PP	e 26 43	?	28 38	PS		48·2
Vermont		112·5	351	e 19 40	PP	e 27 47	?	e 28 30	PS		e 49·9
Tinemaha		113·5	28	e 18 38	[+ 7]	e 19 26	PP	e 22 0	PPP		—
Harvard		114·2	349	e 18 37	[+ 5]	i 19 31	PP	—	—		—
Boulder City		115·9	26	e 18 40	[+ 4]	e 21 42	PPP	e 29 20	PKKP		—
Mount Wilson	z.	116·0	29	e 18 38	[+ 2]	—	—	i 22 13	PPP		—
Pasadena		116·0	29	e 18 40	[+ 4]	e 22 13	PPP	e 29 16	PKKP		e 50·7
Pierce Ferry		116·1	25	e 18 39	[+ 3]	e 29 12	PKKP	e 19 44	PP		—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Chicago		116·2	3	—	—	i 25 20	[0]	i 26 20	SKKS	e 47·2
Fordham		116·2	350	e 18 41	[+ 5]	e 25 21	[+ 1]	i 19 45	PP	—
Cleveland		116·4	357	e 19 50	PP	e 26 40	SKKS	i 29 11	PS	60·8
Riverside	z.	116·5	29	i 18 39	[+ 2]	—	—	i 22 6	PPP	—
Palomar	z.	117·3	29	e 18 43	[+ 5]	—	—	—	—	—
Philadelphia		117·3	351	—	—	e 26 38	SKKS	e 29 29	PS	e 46·1
St. Louis		119·2	4	e 18 44	[+ 3]	e 25 33	[+ 2]	i 20 1	PP	—
Tucson		120·7	25	i 18 49	[+ 4]	e 26 2	[+26]	i 22 17	PPP	e 50·6
Bermuda		122·0	340	e 20 27	PP	e 25 40	[0]	e 27 6	SKKS	e 47·6
San Juan		135·2	333	e 19 28	[+16]	e 28 11	SKKS	e 22 40	PKS	e 55·5
Fort de France		135·9	324	e 22 20	PP	—	—	—	—	—
Bogota		150·8	336	i 19 44	[+ 5]	i 20 11	pPKP	i 20 35	PKP_2	—
La Paz		162·3	287	i 20 1	[+ 7]	27 2	[+12]	i 24 34	PP	73·2
Huancayo		165·6	314	e 20 31	[+34]	e 31 32	SKKS	e 45 50	SS	e 67·5

Additional readings :—
Calcutta iN = 3m.14s.
Nanking PP?E = 5m.39s., i = 10m.4s., SS? = 11m.18s.
Koti PPP = 8m.51s., SS = 14m.19s.
Helwan PPP = 13m.6s., sS = 18m.2s.
Bucharest iSE = 18m.1s.
Warsaw ePE = 10m.30s., ePPN = 12m.23s., ePPE = 12m.34s., ePPPZ = 14m.8s., ePSZ = 18m.55s., PSE = 19m.0s., eS_cSN = 20m.14s., eS_cSZ = 20m.17s., eSSE = 22m.29s., eSSN = 22m.43s., SSSE = 25m.23s., iSSSN = 25m.39s., and other readings without phase.
Belgrade e = 26m.19s.
Budapest iE = 10m.33s., eN = 11m.54s., iE = 14m.38s.
Kalossa PE = 10m.28s., iN = 11m.24s., iE = 11m.37s., eN = 11m.49s. and 11m.55s.
Upsala eN = 25m.14s., eSSSE = 26m.14s.
Prague e = 11m.40s., ePP = 13m.31s., ePPP = 14m.53s., ePS = 19m.47s., e = 20m.5s. and 21m.14s., eSS = 24m.28s., eSSS = 27m.14s.
Copenhagen 10m.52s., 10m.56s., and 20m.15s., SSS = 27m.14s.
Potsdam iPPE = 13m.16s., iE = 15m.10s., iP_cSN = 15m.24s., iPPSN = 20m.16s., eE = 24m.40s., eN = 27m.8m., iE = 27m.31s.
Collmberg iEZ = 11m.35s. and 15m.4s.
Triest iPS = 20m.6s., isS = 20m.41s., eSS = 24m.8s.
Cheb ePPP = 14m.56s., ePS = 20m.17s., ePPS = 21m.14s., eSS = 24m.32s., eSSS = 27m.49s.
Jena ePN = 11m.2s., eEN = 27m.30s.
Rome iPS?Z = 20m.14s., iN = 21m.26s., iZ = 21m.40s., eSS = 24m.22s.?.
Bologna eSSZ = 20m.25s.
Florence iZ = 11m.38s.
Stuttgart e = 11m.21s., ePP = 13m.34s., ePS = 20m.53s., e = 21m.39s., eSS = 24m.44s., eSSS = 28m.14s.
Pavia iS?E = 12m.12s.
Strasbourg e = 11m.44s. and 11m.59s., eSS = 24m.25s.
De Bilt eSSS = 28m.14s.?.
Uccle eE = 11m.53s., eN = 12m.25s., eSSE = 25m.5s., eSSSEN = 29m.8s., eE = 34m.42s., eN = 35m.33s., E = 35m.42s.
Paris e = 13m.46s., ePP = 14m.33s., PPP = 16m.3s., iPS = 21m.49s., eSS = 26m.7s., eSSS? = 29m.46s., e = 30m.59s. and 39m.8s.
Clermont-Ferrand iP = 11m.40s., i = 11m.49s. and 12m.8s.
Brisbane ePN = 11m.44s., iZ = 12m.12s. and 12m.58s., eSE = 21m.20s.
Kew ePPP?EZ = 17m.35s., eSKSEN = 21m.54s., eSSEN = 26m.3s., eE = 26m.34s., iSSS?EN = 30m.22s., eEN = 39m.25s., iE = 40m.13s.
Riverview ePPZ = 14m.50s., eZ = 15m.45s., SKSN = 22m.4s., ePSN = 22m.25s., iN = 22m.31s., iPPSN = 22m.53s., iSSN = 26m.41s., eQ = 32m.26s.
Tortosa PPN = 14m.47s., PPPEN = 16m.24s., S_cSE = 22m.9s., PSE = 22m.19s., PPSN = 22m.40s., SSEN = 26m.47s., SSSN = 29m.45s., Q?N = 31m.58s.
Alicante i = 12m.28s., PP = 15m.19s., PKP = 17m.16s., PS = 22m.40s., PPS = 23m.4s., SS = 27m.20s., SSS = 31m.16s., Q = 33m.44s.
Toledo iSSN = 28m.3s.
Tamanrasset iP_cP = 12m.16s., a isP = 12m.56s.
Granada iPP = 15m.31s., PPP = 17m.22s.,SKS = 22m.4s., PS = 23m.55s., iSS = 28m.22s. SSS = 32m.6s.
Lisbon iP_cPZ = 12m.39s., PP?Z = 15m.47s.k, SKS?E = 23m.4s., SS?E = 29m.15s.
Sitka ePPP = 18m.44s., iSKS = 23m.21s., iPS = 24m.30s., ePPS = 25m.36s., eSS = 29m.48s., i = 30m.20s., eSSS = 33m.42s.
Ivigtut SS = 30m.2s., 36m.56s.
Butte ePPSN = 29m.21s., eSSN = 33m.49s.
Bozeman eSS = 33m.56s., ePSPS? = 34m.34s.
Berkeley eN = 27m.40s., iN = 30m.13s., eE = 38m.36s.
Ottawa e = 34m.50s.

Continued on next page.

Vermont ePPS =29m.29s., eSS? =35m.50s., eSSS =40m.7s.
Harvard i =19m.57s.
Pasadena eZ =28m.42s., eEN =35m.26s., iEN =36m.2s.
Pierce Ferry i =20m.18s., iPPP? =21m.31s., e =22m.5s.
Chicago eS =27m.18s., ePS =29m.0s., e =34m.30s., eSS =35m.20s., iSS =35m.40s., eSSS =39m.36s.
Fordham e =19m.8s., ePS =29m.10s.
Cleveland iSE =27m.18s., eE =27m.57s., iSSE =35m.42s.
Philadelphia eSS =35m.49s., ePSPS? =35m.58s., eSSS =40m.24s.
St. Louis esSKS =26m.25s., iSKKS? =26m.52s., iS? =27m.46s., isS =28m.28s., e =29m.4s., iPS =29m.53s., iSS =36m.29s.
Tucson i =21m.7s., e =21m.21s. and 23m.55s., iPS =29m.58s., ePPS? =31m.45s., eSS? =37m.36s., eSSS? =42m.34s.
Bermuda e =21m.20s., ePS =29m.56s., ePPS =31m.26s., eSS =35m.38s., ePSPS? =36m.44s., iPKP,PKP? =37m.30s., eSSS =40m.20s., e =43m.20s.
SanJuan eSKSP =31m.48s., ePPS =33m.42s., eSS =39m.29s., eSSS =44m.42s.
Bogota ePPEZ =30m.10s.
La Paz PPP =28m.46s., SKKS =31m.22s., iEN =35m.14s., PPS =38m.2s., SS =45m.2s.
Huancayo e =22m.2s., ePKS? =25m.26s., eSKSP? =35m.48s., iPPPS =38m.56s., e =44m.32s., ePSPS? =47m.30s., eSSS =52m.26s.
Long waves were also recorded at Arapuni, Wellington, Pennsylvania, Shawinigan Falls, Halifax, and Aberdeen.

Sept. 28d. Readings also at 1h. (near Basle, Zürich, and near Grozny), 2h. (Hungry Horse), 3h. (Tacubaya), 4h. (near Obi-garm), 6h. (near Tacubaya), 7h. (Pierce Ferry), 12h. (Hungry Horse, Tacubaya, and near La Paz), 16h. (Tucson), 17h. (La Paz), 18h. (Stuttgart), 22h. (Rome, Stuttgart, and near Branner).

Sept. 29d. Readings also at 0h. (near Murgab), 2h. (La Paz, Huancayo, Boulder City, Pierce Ferry, Tucson, Mount Wilson, Riverside, Tinemaha, Fort-de-France, Tamanrasset, near Murgab, Andijan, and Frunse), 3h. (Philadelphia), 4h. (Boulder City, Pierce Ferry (3), Tucson, Palomar, Mineral, near Berkeley, Branner, and Fresno), 5h. (Hungry Horse), 6h. (near Kulyab), 7h. (La Paz), 9h. (Pavia, Jena, Paris, near Clermont-Ferrand, Strasbourg, and Stuttgart (2)), 13h. (San Francisco, near Berkeley and Branner), 17h. (near Frunse), 19h. (Apia), 20h. (Basle, Zürich, Stuttgart, near Florence, and near Mizusawa), 21h. (near Berkeley and Branner (2)), 22h. (near Granada).

Sept. 30d. 2h. 2m. 57s. Epicentre 21°·0S. 174°·0W. (as on 21d.).

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

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		7·4	16	e 1 44	− 8	e 2 53	−25	—	—	e 3·3
Auckland	N.	18·6	209	i 4 40	PP	i 6 43	−63	—	—	8·1
Tuai	N.	19·3	201	e 4 21	− 8	8 12	+10	—	—	—
Wellington		22·3	204	5 7	+ 6	9 17?	+15	i 5 17	PP	11·1
Christchurch		25·1	203	—	—	11 7	SSS	12 13	Q	13·9
Brisbane		30·7	251	i 7 24	PPP	—	—	—	—	e 13·6
Riverview		33·7	240	i 8 6	PPP	e 12 16	+ 8	i 17 13	S_cS	16·0
Santa Barbara	Z.	75·5	44	e 11 58	+10	—	—	—	—	—
Branner	Z.	75·9	40	i 11 53	+ 3	—	—	—	—	—
Berkeley	Z.	76·1	40	i 11 32a	−19	—	—	—	—	—
Pasadena	Z.	76·3	45	i 11 53	+ 1	—	—	—	—	—
Mount Wilson	Z.	76·5	45	i 11 53	− 1	—	—	—	—	—
Palomar		76·7	46	i 11 51	− 4	—	—	—	—	—
Riverside	Z.	76·8	45	i 11 56a	+ 1	—	—	—	—	—
Haiwee		77·7	44	i 12 1a	+ 1	—	—	—	—	—
Tinemaha		78·1	43	i 12 3a	+ 1	—	—	—	—	—
Pierce Ferry		80·3	46	i 12 15	+ 1	—	—	—	—	—
Tucson		80·3	50	i 12 16a	+ 2	e 22 45	+25	—	—	e 40·1
Vladivostok		80·9	323	e 12 16	− 1	e 22 24	− 2	—	—	—
Grand Coulee		84·5	33	e 12 37	+ 1	—	—	—	—	—
Hungry Horse		87·3	36	i 12 49	− 1	—	—	—	—	—
St. Louis		98·2	52	e 13 42	+ 2	e 25 10	+ 5	—	—	—
La Paz		98·3	112	i 13 33	− 8	—	—	—	—	47·5
Potsdam	Z.	148·2	353	e 19 50	[+ 5]	—	—	—	—	e 83·0
Jena	N.	149·8	354	e 19 54	[+ 7]	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Istanbul		152·0	323	e 19 3?	[−47]	—	—	—	—
Stuttgart	z.	152·2	356	e 19 53	[+ 2]	—	—	e 20 13 PKP_2	—
Strasbourg		152·4	358	e 20 1	[+10]	—	—	e 20 13 PKP_2	e 86·0
Paris		152·8	5	i 20 0	[+ 8]	—	—	i 20 13 PKP_2	e 79·0
Basle		153·5	0	e 20 1	[+ 8]	—	—	—	—
Zürich		153·6	359	e 20 2	[+ 9]	—	—	—	—
Clermont-Ferrand		155·2	6	e 20 7	[+12]	—	—	—	82·0
Helwan		155·5	296	e 20 7	[+12]	—	—	—	—
Alicante		161·8	18	25 47	?	—	—	i 20 24 PKP_2	e 67·4
Granada		161·8	27	i 20 54 a	PKP_2	45 39	SSP	25 9 PP	77·5
Tamanrasset		178·2	—	i 20 17 k	[+ 5]	—	—	i 22 4 k PKP_2	—

Additional readings :—
Riverview eQN = 14m.21s.
Pasadena iZ = 12m.3s. and 12m.10s.
Mount Wilson iZ = 12m.14s.
Palomar iZ = 12m.35s.
Riverside iZ = 12m.12s. and 12m.39s.
Tinemaha iZ = 12m.30s. and 12m.48s.
Tucson i = 12m.33s., e = 13m.47s., ePP? = 16m.33s., eSS = 29m.8s., eSSS? = 34m.23s.
Hungry Horse i = 13m.2s. and 13m.51s.
Stuttgart eZ = 20m.0s.
Helwan e = 20m.47s.
Granada PKP_2 = 21m.37s.k, SSS = 52m.9s.
Tamanrasset ePP = 26m.3s., ePPP = 29m.17s.
Long waves were also recorded at Arapuni, Chicago, Ottawa, Seven Falls, Kew, Uccle, and De Bilt.

Sept. 30d. 18h.-19h. Region of the Ryukyu Islands.

Vladivostok eP = 54m.38s., eS = 58m.5s.
Andijan eP = 59m.21s.
Stalinabad eP = 59m.27s., eS = 66m.49s.
Sverdlovsk P = 60m.11s.
Moscow eP = 61m.51s.
Helwan i = 62m.51s. and 63m.12s.
Grand Coulee eP = 63m.1s.
Mineral ePZ = 63m.13s.
Hungry Horse iP = 63m.14s.
Stuttgart ePZ = 63m.14s., eQ = 99m.
Jena eN = 63m.15s.
Paris e = 63m.31s., eL = 108m.
Tinemaha iPZ = 63m.33s.
Haiwee iPZ = 63m.36s.
Pasadena iPZ = 63m.40s.
Mount Wilson iPZ = 63m.41s.
Riverside iPZ = 63m.42s.k.
Palomar iPZ = 63m.46s.k, eZ = 63m.55s.
Boulder City iP = 63m.47s.
Pierce Ferry eP = 63m.48s.
Tucson eP = 64m.10s.
Berkeley iPZ = 64m.18s.
Tashkent iS = 66m.41s.
Long waves were also recorded at Potsdam, Strasbourg, Clermont-Ferrand, Uccle, De Bilt, and Kew.

Sept. 30d. Readings also at 3h. (Rome and Hungry Horse), 3h. (Dehra Dun, Hungry Horse, Pierce Ferry (2), Tucson, (2) Mount Wilson (2), Riverside (2), Palomar (2), Haiwee, and Tinemaha (2)), 5h. (Merida (2), and near Murgab), 6h. (near Murgab, Andijan, Frunse, and Tashkent), 8h. (Hungry Horse), 9h. (near Mizusawa), 10h. (Strasbourg, Stuttgart, near Pavia, and near Murgab), 12h. (Sotchi and near Apia, 13h. (Tucson), 14h. (Hungry Horse, Tucson, Pasadena, Mount Wilson, Riverside, Palomar, Haiwee, Mineral, Tamanrasset, and Stuttgart), 16h. (Boulder City, Hungry Horse, Pierce Ferry, Tucson, Pasadena, Mount Wilson, Riverside, Palomar, near Branner, and near Tacubaya), 18h. (near Andijan), 20h. (near Andijan, Tchimkent, Frunse, Tashkent, Murgab, and Almata), 23h. (Stuttgart, Stalinabad, near Frunse, Almata, Andijan, Tchimkent, and Tashkent.)

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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.

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