The International Seismological Summary.
1945 January, February, March.

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 number constitutes the beginning of the ninth volume of the International Seismological Summary in which travel times and Epicentral distances are calculated with reference to "Geocentric" latitudes of epicentres and observing stations. The travel-times used in making determinations are those contained in "Seismological Tables" by H. Jeffreys and K. E. Bullen, Brit. Ass. for Advancement of Science—London, 1950, and residuals derived accordingly.

Distances are calculated from modified direction-cosines defined by :

$$A = \cos\phi' \cos\lambda$$
$$B = \cos\phi' \sin\lambda$$
$$C = \sin\phi'$$

λ being the east longitude from Greenwich and ϕ' the *geocentric* latitude whose relationship to the ordinary *geographic* latitude ϕ is :—

$$\tan\phi' = \cdot 99328 \tan\phi.$$

These formulae are used to determine direction-cosines of both epicentre and station, though the position is in every case referred to normal ϕ and λ.

The notation is that generally accepted. P and S stand for the times of onset of the direct longitudinal and transverse waves. Pg, Sg, P*, S* for short distances are used for times for these waves transmitted through the superficial "Granitic" and "Intermediate" layers respectively. Reflections of the direct waves at the earth's surface are denoted by PP, PS, PPP, SS . . . and at the outer surface of the central core by PcP, PcS . . .

The refracted logitudinal wave through the central core is known as K. Such waves as PKP, SKS, PKS, SKKS, are frequently recorded at great distances from the epicentre. All times are given as Greenwich Civil Time and are referred to the adopted T_0 as zero.

The arrangement of the " Summary " consists of :—

(1) Date and Time at Origin (T_0), calculated from the above-mentioned tables, together with the depth of focus where this is assumed not to be in the surface. The time calculated is that at which the P wave leaves the focus, not that when P arrives at the epicentre.

(2) Epicentre constants :—

$A=\cos\phi'\cos\lambda$ $\quad D=\sin\lambda$ $\quad G=\sin\phi'\cos\lambda$
$B=\cos\phi'\sin\lambda$ $\quad E=-\cos\lambda$ $\quad H=\sin\phi'\sin\lambda$
$C=\sin\phi'$ $\quad K=-\cos\phi'$

from which distances, Δ, and where necessary Azimuths, of stations with respect to the epicentre may be calculated by means of the formulae :—

$$\cos\ \Delta=aA+bB+cC$$
$$2-2\cos\ \Delta=(a-A)^2+(b-B)^2+(c-C)^2$$
$$2+2\sin\ \Delta\sin Az.=(a-D)^2+(b-E)^2+c^2$$
$$2+2\sin\ \Delta\cos Az.=(a-G)^2+(b-H)^2+(c-K)^2$$

a, b, c being related to the observing station in the same way as A, B, C are to the epicentre.

δ is defined as the nearest integer to $10^5(A^2+B^2+C^2-1)$ and may be used to compare distances calculated by the first two formulae above, whose equivalence depends on the assumption

$$A^2+B^2+C^2=1$$

h is the height, in kilometres, of the epicentre above the sphere of equal volume concentric with the earth and is given by

$$h=-3{\cdot}549+10{\cdot}738\cos 2\phi$$

(3) The tabular matter consisting of the station names arranged in order of epicentral distances, followed by this distance and the Azimuth measured round the epicentre from North through East. Other columns give the P phase and its residual, or PKP, in which the residual is shown in brackets [ ]. The S phase or an associated phase follows with its residual. If SKS is entered here the residual is shown in [ ], and if SKKS in { }. Under " Supp " is placed the time of some other, preferably well recorded phase such as PS, SS, or, in the case of deep focus shocks, pP. The final column, L, records the onset, if known, of Rayleigh waves R, or of the horizontally polarised surface waves Q.

(4) Readings for which space is not available in the tabular part, added at the foot.

The letters E, N, Z after a phase indicate that the reading was taken on an instrument recording East-West, North-South, or Vertical component of motion, though some stations have instruments oriented to record North-East or North-West components. Reflections near

the epicentre take place, and in the case of deep focus earthquakes can be distinguished from the direct phases. These are distinguished as pP, sS, sP, pPP—the small p and s referring to the initial portion of the path towards the surface.

The letters a, k after a P or PKP phase stand for the terms " Anaseismic " and " Kataseismic," and indicate whether the first longitudinal motion was one away from the focus or towards it.

The epicentres for earthquakes with abnormal focal depth are calculated from travel times appropriate to them in the tables cited above. The depth to be assumed can be obtained from these tables when the observational data are plentiful, and the epicentre then determined in the usual way. When the data are scanty an indication of depth can be obtained from the evidence of the readings of certain individual stations.

The first quarter for 1945 contains 115 epicentres, 75 of which are repetitions from previous epicentres.

Cases of abonormal focal depth are noted below :—

			°	°	
Jan.	1d.	8h.	37·8N.	141·4E.	0·010
	2d.	4h.	39·9S.	176·9E.	Suggested Deep.
	3d.	6h.	6·5S.	157·0E.	Suggested Deep.
	6d.	0h.	5·5N.	128·0E.	0·015
	11d.	1h.	19·0S.	169·5E.	0·030
	11d.	5h.	34·8N.	137·0E.	Suggested Deep.
	12d.	21h.	15·9N.	93·0W.	Suggested Deep
	14d.	11h.	33·7N.	135·8E.	0·010
	17d.	3h.	35·5S.	71·0W.	0·005
	23d.	19h.	49·5N.	142·3E.	0·080
	24d.	9h.	29·8N.	139·0E.	0·060
	25d.	1h.	Undetermined shock		Suggested Deep.
	25d.	6h.	27·6N.	139·7E.	0·060
	31d.	9h.	29·5S.	71·5W.	Suggested Deep.
Feb.	4d.	15h.	37·8N.	142·0E.	Base of Superficial Layers.
	10d.	4h.	41·1N.	142·2E.	Suggested Deep.
	12d.	16h.	31·5S.	71·0W.	0·005
	14d.	12h.	40·9N.	142·7E.	Base of Superficial Layers.
	17d.	22h.	40·9N.	142·7E.	Base of Superficial Layers.
	26d.	20h.	40·9N.	142·7E.	Base of Superficial Layers.

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March	2d.	19h. 34m.	24·5N.	141·0E.	0·090
	2d.	19h. 42m.	24·5N.	141·0E.	0·090
	5d.	12h.	18·1S.	170·6W.	Suggested Deep.
	11d.	17h.	4·5N.	125·5E.	0·010
	11d.	21h.	37·3N.	142·0E.	Base of Superficial Layers.
	12d.	10h.	37·3N.	142·0E.	0·005
	12d.	20h.	45·7N.	26·8E.	0·010
	12d.	23h.	41·4S.	173·4E.	0·010
	14d.	1h.	Undetermined shock		Suggested Deep.
	18d.	0h.	33·5S.	179·0W.	0·010
	28d.	13h.	5·9S.	146·7E.	0·015

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

KEW OBSERVATORY,
Richmond,
SURREY.

February, 1954.

1945 JANUARY, FEBRUARY, MARCH.

Jan. 1d. 1h. 20m. 42s. Epicentre 73°·0N. 69°·6W.

$A = +·1025$, $B = -·2757$, $C = +·9558$; $\delta = +7$; $h = -12$;
$D = -·937$, $E = -·349$; $G = +·333$, $H = -·896$, $K = -·294$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Seven Falls		26·0	182	5 38	+ 2	10 15	+ 9	—	—	13·3
Saskatoon		26·2	238	5 38	0	10 7	− 2	—	—	13·8
Shawinigan Falls		26·6	185	5 39	− 3	10 15	− 1	—	—	13·3
College		27·1	294	e 5 57	+11	e 10 35	+11	e 6 28	PP	e 11·5
Ottawa		27·8	189	5 51	− 2	10 36	+ 1	i 6 18	PP	14·0
Halifax		28·6	171	5 11?	−49	9 48?	−60	—	—	13·3
Sitka		29·5	274	—	—	i 11 33	+31	—	—	i 15·3
Aberdeen		30·4	84	i 6 9	− 7	i 11 11	− 5	—	—	14·2
Buffalo		30·5	193	i 6 26	+ 9	—	—	i 12 27	SS	i 15·2
Harvard		30·6	182	i 6 17	− 1	—	—	i 12 6	SS	—
Edinburgh		31·1	87	—	—	11 27	− 1	—	—	—
Fordham		32·3	185	e 7 32	PP	i 11 50	+ 4	—	—	—
Pennsylvania		32·5	192	i 6 31	− 3	e 11 31	−18	—	—	e 13·1
New Kensington		32·9	194	e 6 45	+ 7	e 11 54	− 2	—	—	e 14·2
Rapid City		33·0	227	i 6 38	− 1	i 11 56	− 1	i 7 37	PP	e 13·9
Stonyhurst		33·1	88	i 6 50	+10	i 12 5	+ 6	e 7 48	PP	e 15·6
Philadelphia		33·2	187	i 6 40	0	e 11 55	− 5	e 7 33	PP	e 13·9
Bozeman		33·3	238	e 6 38	− 3	e 11 55	− 7	—	—	e 15·1
Butte		33·3	240	e 6 42	+ 1	e 12 0	− 2	e 12 57	PcS	e 14·4
Grand Coulee		33·3	249	i 6 40	− 1	i 12 3	+ 1	i 13 1	PcS	i 17·4
Upsala		33·7	66	e 6 43	− 2	e 12 2	− 6	13 39	SS	e 16·3
Victoria	E.	34·0	254	e 7 41	+53	e 13 48	SS	—	—	16·3
Seattle		34·4	252	—	—	e 13 23	PcS	—	—	i 16·5
Georgetown		34·4	190	i 6 49	− 2	i 12 9	−10	7 42	PP	—
Lincoln		34·8	218	e 6 59	+ 5	e 11 59	−26	e 8 15	PP	e 16·5
Copenhagen		35·8	73	i 7 2	− 1	i 12 41	0	—	—	15·3
Kew		35·8	88	—	—	e 12 45?	+ 4	—	—	e 17·3
Florissant	E.	35·8	209	i 7 1	− 2	e 12 35	− 6	—	—	—
St. Louis		35·9	209	i 7 3	− 1	i 12 40	− 2	—	—	i 18·8
Uccle		37·8	85	e 7 21	+ 1	i 13 9	− 2	i 9 0	PPP	e 16·3
Salt Lake City		38·1	236	i 7 23	+ 1	e 13 10	− 6	e 9 17	PPP	e 16·2
Potsdam	E.	38·9	75	e 7 41?	+12	—	—	e 9 20	PP	e 17·3
Paris		39·0	87	e 7 32	+ 2	e 13 26	− 3	—	—	e 19·3
Columbia		39·5	196	e 7 32	− 2	e 13 32	− 5	e 8 51	PP	e 18·2
Jena		39·8	77	e 7 35	− 1	e 13 36	− 6	e 9 3	PP	—
Collmberg		39·9	76	e 7 35	− 2	—	—	e 9 7	PP	e 25·3
Bermuda		40·8	174	e 7 24	−21	e 13 31	−25	e 9 1	PP	e 18·5
Cheb		40·8	77	e 7 53	+ 8	e 14 10	+14	—	—	e 24·3
Strasbourg		40·8	82	e 7 45	0	—	—	i 9 23	PP	—
Shasta Dam		40·9	247	i 7 44	− 2	—	—	—	—	—
Prague		41·4	75	e 7 51	+ 1	e 13 58	− 7	e 9 28	PP	e 20·4
Basle		41·7	83	e 7 52	0	—	—	—	—	—
Clermont-Ferrand		41·9	89	e 7 54	0	—	—	—	—	—
Neuchatel		42·0	84	e 7 53	− 1	—	—	—	—	—
Zürich		42·1	83	e 7 53	− 2	—	—	—	—	—
Moscow		42·4	54	7 58	0	14 18	− 2	—	—	e 22·3
Ukiah		42·6	248	e 8 0	+ 1	e 14 23	0	e 17 54	ScS	e 20·4
Overton		42·7	237	i 8 1	+ 1	e 14 27	+ 3	e 14 47	PS	—
Chur		42·8	82	e 8 2	+ 1	—	—	—	—	—
Pierce Ferry		43·0	236	i 8 4	+ 1	i 14 28	− 1	i 21 47	Q	i 22·5
Tinemaha		43·2	242	i 8 5	+ 1	—	—	—	—	—
Boulder City		43·4	237	i 8 6	0	e 14 38	+ 3	—	—	—
Berkeley		43·5	246	i 8 6	− 1	e 14 29	− 7	e 17 54	SS	e 25·4
Mobile		43·5	204	8 10	+ 3	14 35	− 1	—	—	20·7
Santa Clara		43·9	246	i 8 13	+ 3	e 14 42	0	—	—	e 23·0

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Haiwee		44·0	241	i 8 11a	0	—	—	—	—	—
Lisbon		44·9	105	8 17	− 1	14 56	0	19 48	Q	23·7
Toledo		45·2	99	i 8 20	0	e 15 15	+14	—	—	—
Mount Wilson		45·8	240	i 8 27a	+ 2	—	—	—	—	—
Pasadena		45·9	240	i 8 27a	+ 1	i 15 12	+ 1	i 10 16	PP	e 20·6
Riverside		45·9	240	i 8 25a	− 1	—	—	—	—	—
Tucson		46·0	231	i 8 26	− 1	e 15 11	− 1	e 10 12	PP	e 20·7
Sverdlovsk		46·1	36	i 8 26	− 2	i 15 14	0	—	—	—
Santa Barbara		46·1	242	e 8 28	0	—	—	—	—	—
Palomar	z.	46·4	238	i 8 30a	0	—	—	i 10 21	PP	—
La Jolla		46·9	238	i 8 34a	0	—	—	—	—	—
Granada		47·9	100	i 8 44a	+ 2	i 15 43	+ 4	9 57	P_cP	21·6
Malaga	z.	48·1	101	i 8 44k	+ 1	i 16 5	+23	i 9 9	pP	e 23·8
Sofia		50·6	73	e 9 6	+ 4	e 16 18	+ 1	—	—	28·3
San Juan		54·7	176	e 9 34	+ 1	e 17 20	+ 7	e 11 26	PP	e 24·7
Ksara		62·3	65	e 10 27	+ 1	—	—	—	—	e 28·9
Tashkent		62·5	34	e 10 28?	0	e 18 57?	+ 3	—	—	—
Vladivostok		63·2	342	i 10 31	− 1	i 19 1	− 2	—	—	—
Andijan		63·5	32	10 35?	+ 1	19 12?	+ 5	—	—	—
Helwan		64·9	70	10 39	− 4	19 22	− 2	19 48	PS	—
Bogota		68·4	185	i 11 4	− 2	—	—	e 13 46	PP	—
New Delhi	N.	76·2	30	e 11 51	− 1	i 21 36	0	26 23	SS	—
Calcutta	N.	83·6	20	—	—	e 22 55	+ 2	—	—	—
Huancayo		84·9	186	e 12 38	0	e 23 5	− 1	e 15 53	PP	e 38·3
La Paz		89·3	178	i 12 58	− 1	23 53	+ 5	i 16 31	PP	46·8
Auckland		132·3	281	e 22 18?	PP	—	—	—	—	76·3

Additional readings :—
Ottawa iZ = 11m.3s.
Aberdeen i = 6m.19s.
Buffalo eSS = 12m.47s., e = 14m.22s.
Pennsylvania e = 7m.9s.
Rapid City iP_cP = 8m.53s., i = 13m.15s.
Stonyhurst eP_cS = 13m.8s.
Philadelphia e = 13m.2s.
Bozeman i = 6m.51s., e = 12m.18s.
Upsala iPE = 6m.50s., eE = 10m.53s., iE = 13m.7s., eSSSE = 14m.6s.
Grand Coulee i = 6m.51s. and 11m.21s.
Georgetown i = 12m.16s.
Lincoln e = 13m.57s.
Copenhagen 13m.26s.
Florissant ePZ = 7m.5s., iSE = 12m.44s.
St. Louis iZ = 8m.13s., 8m.36s., and 8m.43s., iSE = 12m.50s., iN = 15m.22s. and 16m.8s.
Columbia e = 16m.46s.
Jena eS?N = 13m.33s.
Collmberg e = 7m.40s., 7m.48s., 8m.51s., 9m.16s., 9m.41s., 17m.42s., and 18m.48s.
Bermuda ePPP = 9m.18s.
Strasbourg i = 8m.9s.
Moscow (alternative readings) eP = 8m.0s., e = 14m.12s.
Tinemaha iZ = 8m.26s. and 8m.52s.
Boulder City i = 10m.7s., eS = 14m.48s.
Berkeley eQ = 21·6m.
Haiwee iZ = 8m.25s.
Lisbon PN = 8m.27s., PE = 8m.54s.
Mount Wilson iZ = 10m.4s.
Pasadena iZ = 8m.34s., eSEN = 15m.6s., iZ = 19m.10s.
Tucson i = 9m.26s., eP_cP = 9m.46s., ePPP = 11m.10s., eSS = 18m.46s.
Malaga iP_cPZ = 10m.9s., iPPZ = 10m.41s.
San Juan e = 10m.1s. and 19m.52s.
Helwan eZ = 11m.4s., 12m.23s., and 13m.18s., eN = 20m.48s.
Huancayo e = 13m.29s. and 26m.33s., eSS = 28m.45s., e = 32m.8s.
La Paz iPPP = 18m.29s., iZ = 24m.52s., iSS = 29m.18s., SSS = 33m.11s.

Jan. 1d. 8h. 50m. 56s. Epicentre 37°·8N. 141°·4E. Depth of focus 0·010.
A = −·6191, B = +·4942, C = +·6103; δ = −2; h = −1;
D = +·624, E = +·782; G = −·477, H = +·381, K = −·792.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Sendai		0·6	320	0 17k	0	0 30	+ 1	—	—
Hukusima		0·7	266	0 17k	− 1	0 30	− 1	—	—
Onahama		0·9	205	0 10k	− 9	0 22	−12	—	—
Mizusawa		1·4	351	0 26	+ 1	0 42	− 2	—	—
Mito		1·6	208	0 26k	− 2	0 44	− 5	—	—
Utunomiya		1·8	224	0 31	+ 1	0 52	− 1	—	—
Morioka		1·9	355	0 32k	0	0 56	+ 1	—	—
Tukubasan		1·9	213	0 29	− 3	0 40	−15	—	—
Akita		2·2	332	0 39	+ 3	1 6	+ 4	—	—
Kumagaya		2·3	224	0 37	0	1 5	0	—	—
Aikawa		2·5	275	0 42	+ 2	1 12	+ 2	—	—
Tokyo		2·5	212	0 38a	− 2	1 6	− 4	—	—
Hatinohe		2·7	2	0 42	− 1	1 15	+ 1	—	—
Yokohama		2·7	211	0 42	− 1	1 14	0	—	—
Hunatu		3·1	223	0 47	− 1	1 23	− 1	—	—
Mera		3·1	204	1 14	?	—	—	—	—
Kohu		3·2	226	0 50	0	1 32	+ 5	—	—
Misima		3·3	216	0 53	+ 2	1 28	− 1	—	—
Osima		3·4	208	0 48	− 4	1 26	− 6	—	—
Shizuoka		3·7	221	0 56	0	1 38	− 1	—	—
Hikone		4·9	240	1 17	+ 4	2 8	− 1	—	—
Kameyama		5·0	235	1 18	+ 4	—	—	—	—
Tu		5·0	233	1 20	+ 6	—	—	—	—
Toyooka		5·8	248	1 23	− 2	—	—	—	—
Wakayama		6·2	236	1 25	− 5	—	—	—	—
Siomisaki		6·3	228	2 16	?	—	—	—	—
Sumoto		6·3	238	2 48	S	(2 48)	+ 5	—	—
Kôti		7·7	239	1 59	+ 8	2 56	−21	—	—
Vladivostok		9·0	309	i 2 10	+ 1	i 3 54	+ 5	—	—
Shasta Dam		70·7	54	i 11 6	− 1	—	—	—	—
Tinemaha		75·4	55	i 11 36	+ 1	—	—	e 11 58	pP
Santa Barbara	N.	76·0	58	i 11 37	− 1	—	—	—	—
Mount Wilson	Z.	77·2	57	i 11 44	− 1	—	—	i 12 6	pP
Pasadena		77·2	57	i 11 44	− 1	—	—	i 12 6	pP
Riverside		77·8	57	i 11 48	0	—	—	e 12 11	pP
Boulder City		78·2	54	e 11 50	0	—	—	—	—
Palomar	Z.	78·5	57	i 11 52	0	—	—	—	—
Tucson		83·1	55	i 12 17	+ 1	—	—	i 12 39	pP
La Paz	Z.	146·5	59	i 19 31	[+ 2]	—	—	—	—

Additional readings :—
Pasadena eZ = 12m.2s.
Tucson i = 12m.48s.

Jan. 1d. Readings also at 4h. and 11h. (La Paz), 13h. (Bombay, Calcutta, Hyderabad, New Delhi, and Tashkent), 15h. (Bombay, Calcutta, New Delhi, Kodaikanal, Hyderabad, Andijan, and Tashkent), 17h. (near Mizusawa), 19h. (Tucson).

Jan. 2d. 4h. 56m. 43s. Epicentre 39°·9S. 176°·9E.

Intensity V near the epicentre (Napier). Epicentre as adopted. Suggested depth 40km.

R. C. Hayes.
Earthquakes in New Zealand during the year 1945, New Zealand Journal of Science and Technology, Vol. 27, No. 6 (Sec. B.), 1946, Wellington, 1947, p. 437, isoseismic chart p. 435.

$A = -·7682$, $B = +·0416$, $C = -·6389$; $\delta = +6$; $h = -2$;
$D = +·054$, $E = +·999$; $G = +·638$, $H = -·035$, $K = -·769$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bunnythorpe	1·1	249	0 26?	+ 4	0 38	− 1	—	—	—
Tuai	1·1	10	0 21	− 1	0 34	− 5	—	—	—
Arapuni	2·1	332	—	—	1 5	+ 1	—	—	—
Wellington	2·1	230	0 40	+ 3	1 5	+ 1	—	—	—
New Plymouth	2·3	290	0 40	0	1 9	0	—	—	—
Auckland	3·5	331	0 52?	− 5	1 38	− 2	—	—	—
Christchurch	4·8	220	—	—	2 7	− 5	—	—	—
Kaimata	4·8	236	—	—	2 9	− 3	—	—	—
Riverview	21·4	278	e 4 55	+ 4	e 9 19	SS	e 5 8	PP	e 10·1
Sydney	21·4	278	e 4 5	?	—	—	—	—	—
Brisbane	23·3	295	i 5 9	− 1	—	—	—	—	—

Jan. 2d. 19h. 40m. 17s. Epicentre 13°·7N. 90°·2W.

$A = -·0034$, $B = -·9719$, $C = +·2354$; $\delta = +1$; $h = +6$;
$D = -1·000$, $E = +·003$; $G = -·001$, $H = -·235$, $K = -·972$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Merida		7·2	4	i 1 36	−13	i 3 0	−13	—	—	—
Vera Cruz	N.	7·9	314	e 2 2	+ 3	i 3 48	+18	—	—	—
Tacubaya	E.	10·3	304	e 2 43	+11	e 5 3	+33	—	—	—
St. Louis		24·8	0	e 5 25	0	e 10 9	+23	i 5 55	PP	—
Florissant	E.	25·0	0	—	—	e 10 36	SS	—	—	—
Tucson		26·4	319	i 5 40	0	e 12 35	P_cS	i 6 16	PP	e 16·5
Huancayo		29·5	150	—	—	e 10 55	− 7	e 13 11	SSS	e 14·1
Pierce Ferry		30·9	322	i 6 20	0	e 17 9	S_cS	—	—	—
La Jolla	Z.	31·2	313	e 6 21	− 2	—	—	—	—	—
Palomar		31·2	315	i 6 23	0	—	—	—	—	—
Boulder City		31·3	320	i 6 24	0	—	—	—	—	—
Riverside	Z.	31·9	315	i 6 27	− 2	—	—	—	—	—
Mount Wilson	Z.	32·5	315	i 6 34a	0	—	—	—	—	—
Pasadena		32·5	315	i 6 34a	0	—	—	e 9 18	P_cP	e 19·4
Haiwee		33·4	318	e 6 47	+ 5	—	—	—	—	—
Tinemaha	Z.	34·2	318	i 6 50	+ 1	—	—	i 9 24	P_cP	—
Grand Coulee		41·7	332	e 7 51	− 1	—	—	—	—	—

Additional readings :—
Tacubaya eSN = 5m.6s.
Tucson iPP = 7m.30s.
Pierce Ferry eS = 17m.20s.
Palomar iZ = 6m.32s. and 6m.40s.
Tinemaha iZ = 6m.59s.
Long waves were also recorded at San Juan, Bermuda, and Ukiah.

Jan. 2d. Readings also at 1h. (New Delhi), 2h. (Bombay, Calcutta, Tashkent, New Delhi, Tucson, near Pierce Ferry, Overton, and Boulder City), 3h. (Sofia and near Belgrade), 4h. (La Paz, Tucson, Tinemaha, Haiwee, Palomar, Riverside, Mount Wilson, Pasadena, Riverview, Christchurch, Wellington, Arapuni, and Auckland), 5h. (Auckland), 6h. (near Bogota), 10h. (near Trieste), 11h. (Tucson, La Jolla, Tinemaha, Haiwee, Palomar, Riverside, Mount Wilson, Pasadena, Shasta Dam, and Grand Coulee), 13h. (Tucson), 18h. (near Almeria), 19h. (La Paz, Mount Wilson, Palomar, Tucson, and Tinemaha), 22h. (Riverview, Auckland, and Granada), 23h. (near Tananarive).

Jan. 3d. 6h. 37m. 30s. Epicentre 6°·5S. 157°·0E.

Uncertain. Pasadena suggests deep focus.

$A = -·9147$, $B = +·3883$, $C = -·1125$; $\delta = +11$; $h = +7$;
$D = +·391$, $E = +·921$; $G = +·104$, $H = -·044$, $K = -·994$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane		21·2	190	i 4 47	− 2	i 8 36	− 5	—	—	—
Riverview	E.	27·7	190	—	—	i 10 20	−13	i 11 47	SS	e 13·3
Auckland		34·3	154	i 6 55	+ 5	—	—	—	—	—
Wellington	Z.	38·1	158	i 7 25	+ 3	—	—	—	—	—
Pasadena		89·4	56	i 13 0a	0	—	—	i 13 37	pP	—
Mount Wilson	Z.	89·5	56	i 13 1a	+ 1	—	—	i 13 37	pP	—
Tinemaha	Z.	89·7	53	i 13 1	0	—	—	i 13 37	pP	—
Haiwee	Z.	89·8	54	e 13 2	0	—	—	e 13 42	pP	—
La Jolla		89·9	57	e 13 2	0	—	—	—	—	—
Riverside		90·0	56	i 13 2a	− 1	—	—	i 13 36	pP	—
Palomar		90·3	57	i 13 5a	+ 1	—	—	i 13 41	pP	—
Grand Coulee		90·8	42	i 13 2	− 4	—	—	—	—	—
Boulder City		92·3	54	i 13 13	0	—	—	i 16 58	PP	—
Pierce Ferry		93·0	54	i 13 18	+ 1	—	—	—	—	—
Tucson		95·3	58	e 13 29	+ 2	—	—	—	—	—
Bogota		129·2	89	i 21 52	PP	—	—	—	—	—

Additional readings :—
Brisbane e = 8m.39s.
Pasadena i = 13m.40s.
Mount Wilson iZ = 13m.40s., eZ = 16m.43s.
Riverside i = 13m.41s.
Palomar iN = 13m.47s.
Grand Coulee i = 13m.38s.
Boulder City i = 13m.50s.
Pierce Ferry i = 13m.52s. and 13m.57s.
Tucson e = 14m.9s.
Long waves were also recorded at Christchurch.

Jan. 3d. 7h. 5m. 59s. Epicentre 43°·2N. 16°·4E. (as on 1943, January 20d.).
Intensity V at Vela Luka; IV at Vis and Hvar.
Epicentre 42°58′N. 16°43′E. (Adriatic Sea). Macroseismic radius 35km.

Prof. J. Mihailovic.
Annuaire de l'Institut Séismologique de Beograd microséisique et macroséismique, 1945. Beograd, 1950, p.35.

$A = +·7015$, $B = +·2065$, $C = +·6821$; $\delta = 0$; $h = -3$;
$D = +·282$, $E = -·959$; $G = +·654$, $H = +·193$, $K = -·731$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Triest	3·1	322	i 0 57	+ 6	i 1 35	+ 6	i 1 0	P_g	—
Sofia	5·1	93	e 1 4	−16	e 2 1	−19	—	—	—
Chur	6·0	307	e 1 33k	+ 1	e 3 2	S*	—	—	e 3·9
Zürich	6·9	309	e 1 42	− 3	e 3 33	S*	e 2 0	P*	—
Bucharest	7·1	77	e 2 13	P*	e 3 3	− 7	—	—	3·8
Basle	7·6	307	e 1 54	− 1	e 3 32	+ 9	—	—	—
Neuchatel	7·7	303	e 1 55	− 1	—	—	—	—	—
Strasbourg	8·1	315	e 2 44	P_g	e 3 28	− 7	—	—	—
Jena	8·4	338	e 1 56	−10	e 4 7	S*	—	—	e 4·4
Collmberg	8·5	344	e 1 52	−15	e 3 39	− 6	e 2 15	PP	i 4·6
Potsdam	9·5	347	—	—	e 5 7?	S_g	—	—	—
Clermont-Ferrand	9·8	289	—	—	4 1?	−16	—	—	—

Additional readings :—
Triest iS* = 1m.43s., iS_g = 1m.49s.
Belgrade (Δ = 3·3 Az. = 61) P = 7h.5m.27s., iP* = 7h.5m.34s., iP_g = 7m.5m.41s., i = 7h.5m.47s., iP_gS_g = 7m.6m.10s.
Jena eS?E = 4m.15s.
Collmberg e = 2m.1s., ePPZ = 2m.37s., e = 3m.13s., eZ = 3m.34s., i = 3m.52s. and 3m.59s.

Jan. 3d. 12h. 15m. 22s. Epicentre 34°·7N. 137°·9E.

Scale V at Kamisuwa ; IV at Shizuoka, Gihu, Tu, Kohu, and Iida ; II-III at Wakayama, Ibukyama, Yokohama, Hunatu, and Misima. Shallow.
Seismo. Bull. Cent. Met. Obs., Japan, for 1945. Tokyo, 1951, p.6. Epicentre as adopted.

$A = -·6114$, $B = +·5524$, $C = +·5667$; $\delta = +10$; $h = 0$;
$D = +·670$, $E = +·742$; $G = -·420$, $H = +·380$, $K = -·824$.

		Δ	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Shizuoka		0·5	57	0 9a	− 5	0 16	− 7
Misima		1·0	64	0 17a	− 4	0 29	− 7
Hunatu		1·1	42	0 16a	− 6	0 26	−13
Kohu		1·1	30	0 20a	− 2	0 37	− 2
Gihu		1·2	307	0 22k	− 2	0 38	− 3
Kameyama		1·2	277	0 23k	− 1	0 38	− 3
Osima		1·2	87	0 21	− 3	0 48	+ 7
Tu		1·2	272	0 29	+ 5	0 45	+ 4
Hikone		1·5	293	0 27k	− 1	0 44	− 5
Mera		1·6	82	0 29	− 1	0 58	+ 7
Yokohama		1·6	63	0 30	0	0 51	0
Kumagaya		1·9	40	0 34	0	—	—
Siomisaki		2·2	235	0 34	− 4	1 8	+ 2
Kobe		2·3	270	0 40	0	1 4	− 5
Tukubasan		2·3	29	0 40	0	1 13	+ 4
Wakayama		2·3	258	0 41	+ 1	—	—
Utunomiya		2·4	41	0 43	+ 2	1 25	S_g
Sumoto		2·5	262	0 44	+ 1	1 8	− 6
Mito		2·7	51	0 46	+ 1	1 26	S*
Toyooka		2·7	288	0 46	+ 1	1 30	S_g
Aikawa		3·3	5	1 4	P_g	1 47	S_g
Onahama		3·3	47	1 42	S	(1 42)	S*
Hukusima		3·7	33	1 4	+ 4	1 47	+ 2
Kôti		3·8	254	1 3	+ 2	1 52	+ 5
Sendai		4·3	33	1 8	0	2 10	S*
Hamada		4·8	274	1 15	0	2 29	S*
Mizusawa	N.	5·1	29	e 1 23	+ 3	2 44	S_g
Akita		5·3	18	1 17	− 5	2 15	−10
Morioka		5·6	26	1 30	+ 3	2 39	+ 6
Kumamoto		6·3	255	1 40	+ 4	3 2	+12
Grand Coulee		72·9	44	i 11 32	− 1	—	—
Shasta Dam		74·8	51	i 11 41	− 3	—	—
Tinemaha		79·5	53	i 12 12	+ 2	—	—
Santa Barbara	z.	80·0	55	i 12 15	+ 2	—	—
Haiwee		80·2	53	i 12 16k	+ 2	—	—
Pasadena		81·2	55	i 12 19	0	—	—
Mount Wilson	z.	81·3	55	i 12 20k	0	—	—
Riverside	z.	81·9	55	i 12 22	− 1	—	—
Boulder City		82·4	52	i 12 26	+ 1	—	—
La Jolla	z.	82·6	56	e 12 27	+ 1	—	—
Palomar	z.	82·6	55	i 12 26	0	—	—
Pierce Ferry		82·8	51	i 12 29	+ 2	—	—
Tucson		87·3	53	i 12 51	+ 1	—	—

Additional readings :—
Shasta Dam i = 11m.44s.
Tinemaha iZ = 12m.43s.
Tucson e = 13m.22s.

Jan. 3d. Readings also at 0h. (Palomar and Tucson), 2h. (Mount Wilson, Palomar, and Tucson), 3h. (La Paz), 12h. (Collmberg and Kew), 14h. (Bombay, Calcutta, and New Delhi), 17h. (near Harvard).

Jan. 4d. 5h. 20m. 50s. Epicentre 31°·0N. 83°·0E. Rough.

A = +·1046, B = +·8523, C = +·5125; δ = +1; h = +1;
D = +·993, E = −·122; G = +·062, H = +·509, K = −·859.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
New Delhi		5·6	246	e 2 0	P_n	i 2 16	−17	—	—	—
Calcutta	N.	9·7	149	e 2 26	+ 4	i 4 16	+ 1	—	—	—
Andijan		13·0	322	i 3 14	+ 5	—	—	—	—	—
Almata		13·2	340	e 3 14	+ 3	—	—	—	—	—
Hyderabad	N.	14·1	198	3 22	− 1	6 26	+24	—	—	7·8
Tashkent		15·1	317	e 3 31	− 5	6 10	−15	—	—	—
Bombay	N.	15·2	220	e 3 35	− 3	6 22	− 6	6 48	SSS	7·7
Irkutsk		26·4	30	e 5 31	− 9	e 9 55	−17	—	—	—
Sverdlovsk		30·2	336	—	—	e 11 33	+20	—	—	—

New Delhi gives also iN = 2m.54s., iEN = 3m.24s.

Jan. 4d. 18h. 27m. 36s. Epicentre 35°·4N. 140°·7E. (as on 1941, June 11d.).

A = −·6322, B = +·5174, C = +·5767; δ = −4; h = 0;
D = +·633, E = +·774; G = −·446, H = +·365, K = −·817.

		Δ	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Mizusawa		3·7	5	1 1	+ 1	1 35	−10
Vladivostok		10·3	321	i 2 27	− 5	i 4 20	−10
Andijan		52·8	298	e 9 19	0	i 16 35	−12
Grand Coulee		70·8	46	i 11 18	− 2	—	—
Shasta Dam		72·5	53	i 11 30	0	—	—
Tinemaha		77·2	54	i 11 58	+ 1	—	—
Haiwee	z.	78·0	55	i 12 3	+ 1	—	—
Mount Wilson	z.	79·0	57	i 12 8k	+ 1	—	—
Pasadena	z.	79·0	57	i 12 6	− 1	—	—
Riverside	z.	79·6	57	i 12 9	− 1	—	—
Boulder City		80·1	53	i 12 14	+ 1	—	—
La Jolla	z.	80·3	57	e 12 14	0	—	—
Palomar		80·3	57	i 12 15k	+ 1	—	—
Pierce Ferry		80·6	53	i 12 16	0	—	—
Tucson		85·0	54	i 12 38	0	i 13 56	?

Jan. 4d. Readings also at 5h. (near Andijan), 6h. (Andijan, Mizusawa, Haiwee, La Jolla, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Boulder City, Grand Coulee, Shasta Dam, Pierce Ferry, Tucson, and La Paz), 10h. (Andijan, Tashkent, Bombay, Calcutta, Irkutsk, New Delhi, and Hyderabad), 14h. (near La Paz), 19h. (near Mizusawa), 21h. (near Tucson).

Jan. 5d. 6h. Undetermined shock.

Huancayo e = 25m.3s., eS = 29m.37s., eL = 31m.12s.
Tucson eP = 25m.10s., ePP = 26m.30s., eS = 30m.47s., eL = 35m.50s.
Palomar iPZ = 25m.29s.
Riverside iPZ = 25m.35s.
Pasadena iP = 25m.38s., eLNZ = 36m.43s.
Mount Wilson ePZ = 25m.39s.
Boulder City eP = 25m.46s.
Pierce Ferry eP = 25m.46s.
Haiwee ePZ = 25m.53s.
Tinemaha ePZ = 26m.3s.
La Paz ePZ = 26m.14s., LZ = 35m.42s.
Tacubaya eE = 27m.21s. and 30m.7s.
Grand Coulee eP = 27m.23s.
St. Louis eSE = 33m.3s., eE = 36m.37s. and 44m.24s.
Florissant eSE = 33m.7s., eE = 36m.37s.
Bermuda eS? = 36m.1s., eL = 44m.48s.
Long waves were recorded at Christchurch and Riverview.

Jan. 5d. 20h. Undetermined shock.

Violent at Angra do Heroismo. Epicentre near 39°N. 27°W.
Anais do Observatorio Central Meteorológico do Infante D. Luis, 1945, Lisbon, 1948, p. 17.

Angra do Heroismo iP =44m.34s., iS =44m.43s.
Lisbon P?Z =45m.7s., QN =49·7m., LE =51·5m.
Coimbra eP =48m.45s., S =50m.56s., L =51m.44s.
Clermont-Ferrand eP =49m.32s.
Uccle eP =49m.52s., ePPEN =50m.30s., eSE =54m.38s., eL =56m.
Prague e =50m.48s. and 56m.18s.
St. Louis eP?Z =53m.16s.
Boulder City e =55m.15s. and 55m.26s.
Tucson eP =55m.18s., e =57m.38s.
Pierce Ferry eP =55m.21s.
Tinemaha ePZ =55m.35s.
Haiwee ePZ =55m.38s.
Riverside ePZ =55m.41s.
Pasadena ePZ =55m.44s.
Mount Wilson ePZ =55m.45s.
Palomar iPZ =55m.48s.
Copenhagen 56m.24s., L =59m.
Long waves were recorded at Bermuda, Kew, Moscow, and Huancayo.

Jan. 5d. 23h. 28m. 33s. Epicentre 47°·5N. 15°·0E. (as on 1944, March 15d.).

Intensity V-VI in the region of Admont and Ennstal.
Macroseismic epicentre 47°·6N. 14°·5E.

E. Trapp.
Makros. Beobachtungen in den Jahren, 1941-1945 ; Anhang 8 zum Jahrbuch für 1947 der Zentralanstalt für Meteorologie und Geodynamik, Neue Folge, 84 Band, Vienna, 1948, macroseismic chart, p. D, 51.

$A = +·6550$, $B = +·1755$, $C = +·7350$; $\delta = +5$; $h = -4$;
$D = +·259$, $E = -·966$; $G = +·710$, $H = +·190$, $K = -·678$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Prague	2·6	352	—	—	e 1 17	0	—	—	—
Chur	3·7	260	e 1 1	+ 1	e 1 53	S*	—	—	—
Collmberg	4·1	340	e 1 4	− 1	i 1 54	− 1	e 1 15	P*	i 2·2
Jena	4·1	328	e 1 7	+ 2	e 1 51	− 4	e 2 3	S*	—
Zürich	4·4	270	e 1 5	− 5	e 2 11	S*	—	—	—
Strasbourg	4·9	285	—	—	e 2 12	− 3	e 2 31	S*	—
Basle	5·0	271	e 1 19	+ 1	e 2 32	S*	—	—	—

Additional readings :—
Collmberg iP_gZ =1m.20s., i =1m.38s., 1m.44s., and 1m.51s., iS* =2m.2s., i =2m.5s., iS_g =2m.9s.
Jena eE =2m.6s., eN =2m.10s.
Strasbourg iS_g =2m.40s.

Jan. 5d. Readings also at 4h. (Haiwee, Mount Wilson, Palomar, Tinemaha, Tucson, Bogota, near Fort de France, near Andijan, and Tashkent), 6h. (Boulder City, Pierce Ferry, and Tucson), 8h. (Huancayo, Tacubaya, St. Louis, Tucson, Mount Wilson, Pasadena, Tinemaha, Christchurch, and Riverview), 11h. (Huancayo, La Paz, Tacubaya, St. Louis, Tucson, Boulder City, Pierce Ferry, Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Auckland, Christchurch, Wellington, and Riverview), 14h. (near Andijan), 17h. (near Tacubaya), 19h. (Bogota, St. Louis, Haiwee, Mount Wilson, Pasadena, Riverside, and Tinemaha), 21h. (Mount Wilson, Palomar, Tucson, and Riverside).

Jan. 6d. 0h. 19m. 20s. Epicentre 5°·5N. 128°·0E. Depth of focus 0·015.

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

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Vladivostok		37·6	5	—	—	i 12 47	+ 4	i 15 35	SS	—
Calcutta	N.	41·9	298	e 8 14	pP	—	—	—	—	—
Riverview		44·8	153	e 14 53	pS	e 18 12	SS	i 18 18	?	e 19·5
Irkutsk		50·6	342	e 8 48	0	e 15 49	− 2	—	—	—
Andijan		60·7	314	e 10 0	0	—	—	—	—	—
Tashkent		63·1	314	10 16	0	18 35	0	—	—	—
Sverdlovsk		73·1	329	11 18	0	i 20 32?	− 2	—	—	—
Moscow		85·7	35	12 26	0	22 43	− 2	12 55	pP	—
Helwan	z.	93·0	300	13 4	+ 4	—	—	e 13 40	pP	—
Collmberg	z.	101·0	323	e 13 34	− 2	—	—	—	—	—
Tinemaha	z.	105·3	49	e 29 57	PKKP	—	—	—	—	—
Haiwee	z.	105·8	49	i 29 55	PKKP	—	—	e 30 25	?	—
Riverside	z.	107·0	52	e 29 35	PKKP	—	—	—	—	—
Palomar	z.	107·6	52	i 29 46	PKKP	—	—	—	—	—
Tucson		112·7	51	i 29 24	PKKP	—	—	e 29 54	?	—
La Paz	z.	160·8	126	19 59	[+13]	—	—	—	—	—

Additional readings :—
Vladivostok iSSS = 15m.58s., iS_cS = 17m.11s.
Moscow sS = 23m.32s.

Jan. 6d. 9h. Undetermined shock.

Bogota e = 44m.2s.
La Paz iPZ = 44m.8s., S?Z = 50m.4s., LZ = 56m.
Tucson eP = 44m.33s., i = 44m.48s., eL = 57m.8s.
Palomar iPNZ = 44m.47s., eZ = 45m.20s.
Riverside ePZ = 44m.52s.
Huancayo e = 44m.55s., eS = 48m.45s., eL = 51m.13s.
Mount Wilson iPZ = 44m.55s.
Pasadena iPZ = 44m.56s., eLNZ = 58m.29s.
Boulder City eP = 45m.5s.
Pierce Ferry eP = 45m.6s.
Haiwee ePZ = 45m.8s.
Tinemaha ePZ = 45m.16s.
St. Louis eP?Z = 45m.52s., eZ = 46m.8s., eSN = 53m.40s., eN = 63m.
Tacubaya eN = 52m.46s., eE = 52m.49s.
Florissant eSE = 53m.39s.
Chicago eS = 54m.21s., eL = 64m.12s.
Long waves were also recorded at Bozeman, Ukiah, Rapid City, Uccle, Honolulu, Riverview, Wellington, and Christchurch.

Jan. 6d. 22h. 1m. 38s. Epicentre 36°·7N. 142°·5E.

Epicentre as given by Central Meteorological Observatory, Tokyo.

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

		Δ	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Onahama		1·3	280	0 7k	−18	0 26	−18
Mito		1·7	259	0 28	− 3	0 44	−10
Hukusima		1·9	303	0 31k	− 3	0 52	− 7
Sendai		2·0	321	0 33	− 2	0 55	− 7
Tukubasan		2·0	256	0 30	− 5	0 41	−21
Yokohama		2·6	241	0 44	0	1 25	+ 8
Kumagaya		2·6	258	0 39a	− 5	1 9	− 8
Mizusawa	E.	2·7	336	0 47	+ 2	1 17	− 2
Mera		2·8	230	0 54	+ 7	—	—
Osima		3·2	233	1 4	+12	—	—

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Morioka	3·2	341	0 52	0	—	—
Hunatu	3·2	248	0 49	− 3	1 29	− 3
Misima	3·3	241	0 51	− 2	1 37	+ 2
Kohu	3·4	253	1 42	S	(1 42)	+ 5
Akita	3·6	329	1 20	P_e	1 54	+12
Aikawa	3·7	292	1 5	+ 5	1 51	+ 6
Shizuoka	3·8	244	1 38	S	(1 38)	− 9
Hatinohe	3·9	350	0 42	−20	—	—
Kameyama	5·2	251	1 33	P*	—	—
Wakayama	6·4	250	1 56	P*	—	—

Jan. 6d. Readings also at 0h. (Kodaikanal), 3h. (Uccle), 8h. (near Andijan), 9h. (near Irkutsk), 10h. (near Angra do Heroismo), 20h. (Irkutsk, Tashkent, Erevan, Andijan, Moscow, New Delhi, Helwan, Ksara, Collmberg, La Plata, and near La Paz), 21h. (Sydney, Riverview, Arapuni, Auckland, Wellington, Christchurch, Tucson, Riverside, Haiwee, and Ksara), 22h. (Pasadena and near Mizusawa (2)).

Jan. 7d. 4h. Pacific Ocean.

Huancayo e = 26m.14s. and 29m.53s., eS = 30m.28s., eL = 32m.1s.
Tucson eP = 26m.22s., eL = 37m.0s.
La Paz eP?Z = 26m.34s., PZ = 27m., ?Z = 28m., SZ = 33m.46s., LZ = 37m.42s.
Palomar ePZ = 26m.39s.
Riverside ePZ = 26m.48s.
Mount Wilson ePZ = 26m.50s.
Pierce Ferry eP = 26m.56s.
Boulder City eP = 26m.58s.
Haiwee ePZ = 27m.5s.
Tinemaha ePZ = 27m.12s.
St. Louis eSE = 34m.1s., eE = 37m.30s.
Florissant eSE = 34m.4s.
Long waves were recorded at Riverview, Pasadena, and San Juan.

Jan. 7d. 22h. 25m. 32s. Epicentre 37°·0N. 121°·5W. (as on 1944, March 15d.).
Intensity VI at Hollister, Paicines, and San Benito; V at Carmel, Los Banos, Monterey, Moss Landing, and Snelling; VI at San Francisco, San José, and Salinas.
Epicentre 36°·5N. 121°·5W.
United States Earthquakes, 1945.
U.S. Coast and Geodetic Survey, Washington, 1947, p. 11. Map of epicentres, p. 2.

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

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Santa Clara		0·5	314	e 0 17	+ 3	i 0 29	+ 6	—	—	—
Ukiah		2·5	328	—	—	e 1 4	−10	—	—	i 1·7
Tinemaha		2·6	88	e 0 45	+ 1	i 1 22	+ 5	—	—	—
Haiwee		3·0	107	i 0 48	− 2	i 1 28	+ 1	—	—	—
Shasta Dam		3·8	349	e 1 4	+ 3	e 2 4	S_e	—	—	—
Mount Wilson		3·9	134	i 1 1	− 1	—	—	—	—	—
Pasadena		3·9	135	i 1 1	− 1	i 1 45	− 5	—	—	—
Riverside	z.	4·5	130	i 1 7	− 4	—	—	—	—	—
Palomar	z.	5·2	133	e 1 19	− 2	—	—	—	—	—
Boulder City		5·5	99	e 1 24	− 1	e 2 30	0	—	—	—
Overton		5·7	92	i 1 28	0	—	—	—	—	—
Pierce Ferry		6·1	96	i 1 33	− 1	e 3 7	S*	—	—	—
Logan		8·9	54	2 35	P*	e 4 1	+ 6	e 2 50	P_e	i 4·8
Tucson		10·0	115	e 2 25	− 2	e 4 39	+17	—	—	i 5·2
Grand Coulee		11·1	9	e 2 51	+ 8	—	—	e 5 49	S_e	—
Butte		11·2	34	—	—	e 4 12	−40	—	—	e 6·2
Rapid City		15·6	57	e 4 0	+17	—	—	—	—	e 8·3
Cheb		84·2	28	e 19 28?	?	—	—	—	—	—

For Notes see next page.

NOTES TO JANUARY 7d. 22h. 25m. 32s.

Additional readings :—
Ukiah e = 1m.25s.
Shasta Dam i = 1m.18s.
Boulder City iP = 1m.29s., i = 1m.40s., e = 2m.46s., iS = 3m.21s.
Overton i = 2m.9s.
Logan e = 3m.45s.
Pierce Ferry e = 1m.50s.
Tucson i = 2m.30s., e = 3m.0s., i = 3m.19s.
Grand Coulee i = 3m.56s.
Long waves were also recorded at Salt Lake City, Chicago, and Philadelphia.

Jan. 7d. Readings also at 3h. (Christchurch), 4h. (Auckland, Wellington, Riverview, and near Andijan), 6h. (Auckland, Christchurch, Wellington, Riverview, and Sydney), 7h. (Auckland, Palomar, Tucson, and Ksara), 8h. (La Paz), 11h. (Auckland and Riverview), 15h. (Riverview), 17h. (Haiwee, Mount Wilson, Pasadena, Tinemaha, Tucson, and near Shasta Dam), 18h. (Irkutsk and Riverview), 20h. (Auckland), 21h. (Riverview).

Jan. 8d. 22h. 42m. 12s. Epicentre 38°·8N. 20°·6E. (as on 1943, July 22d.).

$A = +\cdot7314$, $B = +\cdot2749$, $C = +\cdot6240$; $\delta = -11$; $h = -1$;
$D = +\cdot352$, $E = -\cdot936$: $G = +\cdot584$, $H = +\cdot220$, $K = -\cdot781$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Sofia		4·4	27	e 1 11	+ 1	i 2 0	− 2	i 1 21	P*	—
Belgrade		6·0	359	e 1 30	− 2	i 3 32	sS_g	e 2 0	P_g	—
Bucharest		7·0	35	e 1 47	+ 1	e 3 5	− 3	e 2 28	P_g	—
Triest		8·5	326	e 2 14	+ 7	e 3 37	− 8	—	—	—
Chur		11·4	318	e 2 46	− 1	e 4 53	− 3	—	—	—
Prague		12·1	341	e 2 27	−30	e 4 57	−17	—	—	e 6·3
Zürich		12·3	316	e 2 54	− 5	e 5 29	+11	—	—	—
Helwan	z.	12·6	132	3 0	− 3	5 27	+ 1	3 12	PP	—
Cheb		12·7	335	—	—	e 5 2	−26	—	—	e 7·3
Basle		12·9	317	e 3 1	− 6	e 5 32	− 1	—	—	—
Ksara		13·3	107	e 3 34?	+21	—	—	—	—	—
Strasbourg		13·5	321	e 3 14	− 1	e 5 58	+11	—	—	—
Collmberg		13·6	339	i 3 24	+ 7	e 6 8	+18	—	—	e 7·9
Jena		13·7	335	e 3 12	− 6	e 6 22	SSS	—	—	e 7·2
Potsdam		14·6	341	e 3 36	+ 6	—	—	—	—	e 7·8
Tortosa		15·6	284	e 4 44	+61	e 7 11	+34	—	—	e 10·8
Paris		16·4	313	i 4 5	+12	—	—	—	—	e 10·8
Uccle		16·6	324	e 3 59	+ 3	e 7 24	+24	—	—	e 8·8
Toledo		19·1	283	i 4 26	− 1	i 8 2	+ 5	—	—	9·2
Malaga		19·9	274	e 4 36	0	e 8 45	+30	i 5 43	PPP	e 11·6
Moscow		20·4	29	e 4 44	+ 3	8 21	− 4	—	—	—
Upsala		21·2	355	e 4 38	−11	e 8 51?	+10	e 9 13	SS	e 11·2
San Fernando	E.	21·3	273	—	—	e 8 48	+ 5	—	—	—
Coimbra		22·4	287	e 4 58	− 4	i 9 10	+ 6	—	—	13·9
Lisbon		23·2	281	5 8	− 1	9 28	+10	9 48	SS	11·9
Sverdlovsk		31·8	42	e 6 28	0	e 11 30	− 8	—	—	—
Tashkent		37·0	71	i 7 14	+ 1	e 13 0	+ 1	—	—	—
Irkutsk		57·0	47	—	—	e 17 44	+ 1	—	—	—

Additional readings :—
Sofia iS_gEN = 2m.31s.
Belgrade i = 3m.45s.
Bucharest iS*?N = 3m.36s., iE = 3m.43s., iN = 4m.1s., iE = 4m.26s.
Helwan SSNZ = 5m.42s.
Collmberg eZ = 1m.58s., e = 5m.7s., eZ = 7m.6s., e = 7m.18s.
Upsala eE = 8m.3s., eSS?E = 10m.25s., SS is given as eS?
Long waves were also recorded at other European stations.

Jan. 8d. Readings also at 1h. (Riverview), 4h. (Riverview, Boulder City, Pierce Ferry, Tucson, Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, and Collmberg), 5h. (Tananarive), 9h. (Riverview, Boulder City, Pierce Ferry, Bozeman, Grand Coulee, Shasta Dam, Tucson, Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, Santa Barbara, and Tinemaha), 17h. (Riverview and near Mizusawa), 22h. (Florissant, St. Louis, and New Delhi).

Jan. 9d. 12h. 17m. 43s. Epicentre 20°·0N. 73°·0W.

Intensity VI in Haiti at Marmelade, Pilate, Port de Paix.
Macroseismic epicentre near 20°N. 72.5°W.

J. P. Rothé.
Revue pour l'étude des Calamités—La Séismicité du Globe pendant les années 1945-1946, tome XI, No. 26-27 (janvier, 1948—décembre, 1949), Genève, p. 26.

A = +·2749, B = −·8993, C = +·3400 ; δ = −9 ; h = +4 ;
D = −·956, E = −·292 ; G = +·099, H = −·325, K = −·940.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Port au Prince		1·6	157	i 0 33	+ 3	—	—	—	—	i 0·8
San Juan		6·7	103	e 1 52	+10	i 2 51	− 9	—	—	—
Bogota		15·3	184	e 3 37	− 2	e 6 40	+10	—	—	—
Harvard		22·5	4	e 5 0	− 2	e 8 53	−12	—	—	—
Huancayo		31·9	185	—	—	e 12 56	SS	—	—	e 17·3
Tucson		35·9	298	i 7 4	0	—	—	—	—	—
La Paz	z.	36·6	171	7 13	+ 3	—	—	—	—	—
Pierce Ferry		39·3	303	i 7 31	− 1	—	—	—	—	—
Boulder City		39·9	303	i 7 37	0	—	—	—	—	—
Palomar	z.	41·1	298	i 7 47	0	—	—	—	—	—
Riverside	z.	41·6	300	i 7 51	0	—	—	—	—	—
Mount Wilson	z.	42·2	300	i 7 57	+ 1	—	—	—	—	—
Tinemaha		42·8	303	e 8 5	+ 4	—	—	—	—	—

Additional readings :—
San Juan i = 2m.56s., 3m.6s., and 3m.17s.
Harvard e = 25m.59s.
Long waves were also recorded at Bermuda.

Jan. 9d. 21h. 28m. 16s. Epicentre 9°·5S. 111°·3E.

A = −·3583, B = +·9191, C = −·1640 ; δ = +2 ; h = +7 ;
D = +·931, E = +·363 ; G = +·060, H = −·153, K = −·986.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Perth		22·7	170	5 4	0	9 7	− 2	9 54	SS	—
Kodaikanal	E.	38·9	300	(e 7 24)	− 5	(e 13 19)	− 9	—	—	—
Calcutta	N.	39·0	325	e 10 3	?	—	—	—	—	—
Riverview		43·9	130	e 8 11	+ 1	i 14 15	−27	e 9 55	PP	e 20·7
Bombay	N.	47·3	307	—	—	e 15 41	+10	—	—	—
New Delhi	N.	50·2	320	—	—	i 16 5	− 6	—	—	e 29·0
Andijan		61·6	327	e 10 22	0	e 18 39	− 4	—	—	—
Auckland		63·2	126	—	—	e 17 44?	?	—	—	—
Tashkent		63·6	326	e 10 34	− 1	e 19 4	− 4	i 20 24	S_cS	—
Wellington	Z.	63·9	131	—	—	e 19 44?	+32	—	—	34·7
Sverdlovsk		78·1	334	e 11 59	− 3	e 21 47	− 9	—	—	—
Ksara		83·3	305	i 12 35	+ 5	e 23 2	+12	23 53	PS	—
Helwan		86·1	301	12 46	+ 2	23 20	+ 2	24 22	PS	—
Moscow		88·8	327	e 12 54	− 3	e 23 36	− 8	e 23 18	SKS	—
Kew		110·8	321	i 18 24	[−11]	i 22 33	?	i 22 12	PKS	e 24·7
Grand Coulee		123·0	38	i 18 51	[− 8]	—	—	i 19 12	pPKP	—
Shasta Dam		123·4	47	i 18 52	[− 7]	—	—	—	—	—
Santa Barbara	Z.	127·2	53	i 19 1	[− 6]	—	—	—	—	—
Tinemaha		127·6	50	e 19 3	[− 4]	—	—	—	—	—
Haiwee		128·1	51	e 19 3	[− 5]	—	—	—	—	—
Pasadena		128·6	53	e 19 2	[− 7]	—	—	—	—	—
Riverside	Z.	129·2	53	i 19 5k	[− 6]	—	—	—	—	—
La Jolla	Z.	129·7	55	i 19 7	[− 4]	—	—	—	—	—
Palomar		129·8	54	i 19 6k	[− 6]	—	—	e 31 57	PS	—
Boulder City		130·6	50	i 19 8	[− 5]	—	—	—	—	—

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		131·2	49	e 19 0	[−14]	—	—	—	—	—
Tucson		135·0	53	i 19 16	[− 5]	e 31 34	?	i 22 37	PKS	—
Florissant	z.	145·0	30	i 19 29	[−10]	—	—	—	—	—
St. Louis	z.	145·1	30	i 19 29	[−10]	—	—	—	—	—
Harvard		147·0	2	i 19 39	[− 4]	—	—	—	—	—
Fordham		148·4	6	i 19 45	[0]	—	—	—	—	—
La Paz		154·2	182	19 57	[+ 4]	—	—	—	—	—

Additional readings :—
Kodaikanal readings have been increased by 13m.
Riverview eE =8m.15s., eN =10m.6s., eE =10m.14s., eN =17m.23s., iNZ =17m.33s., iE =17m.40s.
Bombay eN =16m.9s. and 18m.4s.
Helwan iZ =12m.59s., eZ =13m.50s.
Pasadena iZ =19m.23s. and 20m.47s.
Riverside iZ =19m.25s. and 20m.57s.
Palomar iZ =21m.5s.
Pierce Ferry i =19m.8s.
St. Louis iZ =19m.55s.
Harvard i =19m.57s.
Long waves were also recorded at Copenhagen and Christchurch.

Jan. 9d. Readings also at 0h. (Dehra Dun), 7h. and 10h. (near Mizusawa), 15h. (Mount Wilson, Pasadena, Tucson, Palomar, Riverside, and Tinemaha), 16h. (Auckland, Tuai, Wellington, Christchurch, Riverview, La Paz, Mount Wilson, Pasadena, Palomar, Riverside, Tucson, Boulder City, Grand Coulee, Pierce Ferry, and Shasta Dam), 17h. (Mount Wilson, Palomar, Tucson, Copenhagen, and Uccle), 23h. (Mount Wilson, and near Mizusawa).

Jan. 10d. Readings at 0h. (near Bogota), 1h. (near Mizusawa), 4h. (Auckland), 8h. (Boulder City, Pierce Ferry, Shasta Dam, Tucson, Haiwee, Mount Wilson, Palomar, Riverside, Pasadena, Tinemaha, and near Apia (2)), 13h. (Riverview), 17h. (near Andijan).

Jan. 11d. 1h. 6m. 10s. Epicentre 19°·0S. 169°·5E. Depth of focus 0·030.
(as on 1939, October 9d.).

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

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Auckland	18·4	168	—	—	7 26	+12	—	—	9·6
Riverview	22·0	225	i 4 38k	+ 1	i 8 25	+ 5	i 5 20	pP	—
Wellington	22·7	171	4 43	0	8 34	+ 2	6 0	pPP	9·8
Santa Barbara	85·7	53	i 12 14a	− 1	—	—	—	—	—
Shasta Dam	86·7	46	i 12 18	− 2	—	—	i 15 42	PP	—
Pasadena	86·7	53	i 12 19a	− 1	—	—	e 13 21	pP	—
Mount Wilson	86·8	53	i 12 20a	0	—	—	i 13 5	pP	—
La Jolla	86·9	55	i 12 20	− 1	—	—	—	—	—
Riverside	87·2	53	i 12 21a	− 1	—	—	e 15 47	PP	—
Palomar	87·4	55	i 12 22	− 1	—	—	i 15 49	PP	—
Haiwee	87·7	51	i 12 25	+ 1	—	—	—	—	—
Tinemaha	87·9	51	i 12 25	0	—	—	—	—	—
Boulder City	89·9	53	i 12 34	− 1	—	—	i 13 12	pP	—
Pierce Ferry	90·6	52	i 12 38	0	i 23 17	+ 5	i 16 9	PP	—
Tucson	91·6	57	i 12 42	− 1	—	—	e 16 21	PP	—
Grand Coulee	92·2	40	i 12 44	− 1	—	—	i 13 25	pP	—
Collmberg	142·8	335	e 19 2	[− 6]	—	—	e 22 20	PP	—
Zürich	147·7	336	e 19 12	[− 4]	—	—	—	—	—
Basle	147·9	337	—	—	e 34 18	PS	—	—	—

Additional readings :—
Riverview iEN =5m.28s. and 8m.32s, iZ =8m.36s., eN =8m.46s., iN =9m.2s.
Wellington iZ =6m.31s.
Pasadena iZ =12m.27s., iPPZ =15m.42s.
Mount Wilson iPPZ =15m.44s.
Boulder City i =16m.1s.
Pierce Ferry e =21m.59s., i =22m.47s.
Tucson i =12m.52s. and 12m.59s.
Grand Coulee i =12m,59s, and 16m,26s,

Jan. 11d. 1h. 43m. 17s. Epicentre 34°·8N. 137°·0E.

Intensity V at Tu, Kameyama; IV at Hikone, Kashiwara, and Gihu; II-III at Kobe, Kohu, Wakayama, Toyooka, and Siomisaki
Epicentre 34°·9N. 137°·1E. Very shallow.

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

		△	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Kameyama		0·4	277	0 11	− 2	—	—
Gihu		0·6	342	0 16	+ 1	0 25	− 1
Hikone		0·8	307	0 18k	0	0 31	0
Kohu		1·5	57	0 28k	0	0 50	+ 1
Kobe		1·5	266	0 28	0	0 51	+ 2
Hunatu		1·6	64	0 27	− 3	0 50	− 1
Wakayama		1·6	249	0 31	+ 1	0 54	+ 3
Siomisaki		1·7	217	0 31k	0	0 58	+ 4
Sumoto		1·8	256	0 35k	+ 3	1 0	+ 4
Osima		1·9	91	0 33	− 1	0 56	− 3
Toyooka		2·0	298	0 35	0	0 58	− 4
Kumagaya		2·3	55	0 41k	+ 1	1 12	+ 3
Mera		2·3	87	0 43	+ 3	—	—
Yokohama		2·3	74	0 40	0	1 9	0
Wazima		2·6	358	0 43	− 1	1 21	+ 4
Tukubasan		2·9	61	0 47	− 1	1 21	− 3
Utunomiya		2·9	53	0 49	+ 1	1 25	+ 1
Koti		3·1	246	0 52	+ 1	1 33	+ 4
Mito		3·2	61	0 58	+ 6	1 38	+ 6
Aikawa		3·4	17	1 20	+25	2 7	+30
Hamada		4·1	273	1 7k	+ 2	1 57	+ 2
Hukusima		4·1	43	1 7	+ 2	2 8	S*
Sendai		4·7	41	1 13	− 1	2 13	+ 3
Mizusawa	E.	5·4	36	e 1 28	+ 4	2 34	+ 6
Kumamoto		5·6	251	1 27	0	—	—
Morioka		5·9	33	1 48	P*	2 48	+ 8
Hatinohe		6·8	31	2 0	P*	—	—
Grand Coulee		73·4	43	i 11 33	− 3	—	—
Shasta Dam		75·3	51	i 11 45	− 2	—	—
Mount Wilson	Z.	81·8	54	i 12 20	− 2	—	—
Pasadena	Z.	81·8	54	i 12 20	− 2	—	—
Riverside	Z.	82·4	54	i 12 24	− 1	—	—
Boulder City		82·9	51	i 12 27	− 1	—	—
Palomar	Z.	83·1	54	i 12 27	− 2	—	—
Pierce Ferry		83·3	50	i 12 29	− 1	—	—
Tucson		87·8	52	e 12 50	− 2	—	—

Tu (△ = 0°·4, Az. = 261°) P = 43m.5sk., S = 43m.19s.

Jan. 11d. 2h. 3m. 2s. Epicentre 26°·3N. 55°·4E.

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

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Baku		14·8	343	e 3 32	0	6 1	−17	—	—	—
Erevan		16·5	330	e 3 57	+ 3	—	—	—	—	—
Bombay	N.	17·7	111	i 4 27	+17	i 8 21	+55	i 4 40	PPP	—
Ksara		18·5	296	e 4 20	+ 1	e 7 54	+10	—	—	10·4
Tashkent		18·9	34	e 4 22	− 2	i 7 49	− 4	—	—	—
New Delhi	N.	19·5	79	e 4 43	+12	i 8 18	+12	8 50	SSS	—
Andijan		20·1	41	e 4 40	+ .2	e 8 27	+ 8	—	—	—
Helwan		21·5	285	4 55	+ 3	8 56	+ 9	5 24	PPP	—
Kodaikanal	E.	26·3	124	e 7 59	?	e 12 59	?	—	—	—
Calcutta	N.	30·2	90	e 6 32	+18	i 11 29	+16	i 12 22	SS	i 17·4

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Sverdlovsk		30·7	7	e 6 17	− 2	—	—	e 12 23	?	—
Moscow		32·1	341	6 28	− 3	e 11 31	−12	—	—	—
Prague		39·3	318	e 10 58?	?	e 13 58?	+24	—	—	—
Cheb		40·5	318	e 9 12	PP	—	—	e 14 47	?	e 24·0
Collmberg		40·6	319	i 7 41	− 2	—	—	i 8 0	?	—
Potsdam		41·0	322	e 8 4	+18	—	—	—	—	e 23·0
Chur		41·4	312	e 7 50	0	—	—	—	—	—
Zürich		42·2	313	e 7 54k	− 2	—	—	—	—	—
Upsala		42·4	333	—	—	e 14 9	−11	e 17 16	SS	e 24·0
Copenhagen		42·7	326	i 7 59	− 1	i 14 18	− 6	—	—	21·0
Basle		42·9	313	e 8 1	− 1	—	—	—	—	—
Irkutsk		44·8	42	e 8 15	− 2	e 14 49	− 6	—	—	—
Uccle		45·7	316	e 8 33	+ 9	e 14 49?	−19	e 17 58?	SS	e 25·0
Toledo	z.	50·8	301	e 9 5	+ 1	—	—	—	—	—
Malaga	z.	51·3	297	i 9 7a	− 1	—	—	—	—	—

Additional readings :—
Bombay PPPN =5m.0s., SSSN =9m.3s.
Helwan eZ =7m.12s.
Upsala eN =15m.17s., eE =17m.20s., eN =20m.50s.
Uccle e =20m.58s.?.
Malaga eP_gN =9m.18s., eP_gZ =9m.21s., iS_gZ =9m.28s., eS_gN =9m.38s.
Long waves were recorded at Dehra Dun, Bergen, and Kew.

Jan. 11d. 3h. Mexican shock.

Tacubaya PN =9m.54s., LE =10m.37s.
Vera Cruz PEN =10m.10s., SN =11m.3s.
Guadalajara iE =11m.55s.
Tucson iP =13m.13s., eL =17m.46s.
Palomar iPEZ =14m.0s., iZ =14m.11s.
Pierce Ferry iP =14m.6s., iS =20m.53s., e =22m.6s.
Riverside iPZ =14m.7s.
Boulder City iP =14m.10s.
St. Louis eP?Z =14m.13s.
Pasadena iPZ =14m.14s.
Mount Wilson iPZ =14m.16s.
Tinemaha ePEN =14m.35s.
Long waves were also recorded at La Paz.

Jan. 11d. 5h. 57m. 31s. Epicentre 34°·8N. 137°·0E. (as at 1h.).

Intensity V at Kameyama, Kashiwara, Tu ; IV at Gihu, Iida, Hikone, Kobe ; II-III at Kohu, Wakayama, Kanazawa, and Siomisaki.
Epicentre 34°·7N. 137°·2E. Depth 40km.
The Seismological Bulletin of the Central Meteorological Observatory, Japan, for the year 1945.

	Δ	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Tu	0·4	261	0 11	− 2	0 18	− 3
Kameyama	0·4	277	0 11k	− 2	0 20	− 1
Gihu	0·6	342	0 16	+ 1	0 24	− 2
Hikone	0·8	307	0 20k	+ 2	0 32	+ 1
Kohu	1·5	57	0 27a	− 1	0 54	+ 5
Kobe	1·5	266	0 29k	+ 1	0 53	+ 4
Hunatu	1·6	64	0 27k	− 3	0 49	− 2
Misima	1·6	79	0 27k	− 3	0 49	− 2
Wakayama	1·6	249	0 32	+ 2	0 54	+ 3
Siomisaki	1·7	217	0 31k	0	0 58	+ 4
Sumoto	1·8	256	0 36k	+ 4	1 0	+ 4
Osima	1·9	91	0 33	− 1	0 53	− 6
Kumagaya	2·3	55	0 40k	0	1 6	− 3
Mera	2·3	87	0 42	+ 2	1 7	− 2
Yokohama	2·3	74	0 40k	0	1 9	0
Tokyo	2·4	66	0 43	+ 2	1 13	+ 1
Wazima	2·6	358	0 46	+ 2	1 21	+ 4
Tukubasan	2·9	61	0 47	− 1	1 21	− 3
Utunomiya	2·9	53	0 49	+ 1	1 27	+ 3
Kôti	3·1	246	0 53	+ 2	1 33	+ 4

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Mito		3·2	61	0 58	+ 6	1 38	+ 6
Aikawa		3·4	17	0 53	− 2	—	—
Hamada		4·1	273	1 7k	+ 2	1 57	+ 2
Hukusima		4·1	43	1 9	+ 4	2 9	S*
Sendai		4·7	41	1 13	− 1	2 13	+ 3
Mizusawa		5·4	36	c 1 18	− 6	2 33	+ 5
Kumamoto		5·6	251	1 29	+ 2	—	—
Morioka		5·9	33	1 31	0	2 41	+ 1
Hatinohe		6·8	31	1 44	0	—	—
Grand Coulee		73·4	43	i 11 33	− 3	—	—
Shasta Dam		75·3	51	i 11 45	− 2	—	—
Mount Wilson	z.	81·8	54	i 12 22	0	—	—
Pasadena	z.	81·8	54	i 12 21	− 1	—	—
Boulder City		82·9	51	e 12 26	− 2	—	—
Palomar	z.	83·1	54	i 12 27	− 2	—	—
Pierce Ferry		83·3	50	i 12 29	− 1	—	—
Tucson		87·8	52	e 12 51	− 1	—	—

Mizusawa gives also ePN =1m.22s.

Jan. 11d. Readings also at 2h. (Vera Cruz and near Tacubaya), 4h. (Mizusawa), 6h. (Mount Wilson (2), Pasadena (2), Riverside (2), Palomar (2), Tucson (2), Pierce Ferry, near Mizusawa, and near Ksara), 9h. (near Andijan), 10h. (Riverview and Christchurch), 11h. (Tucson, near Pierce Ferry, and Boulder City), 19h. (Wellington), 20h. (Riverview, Auckland, Collmberg, Pasadena, Mount Wilson, Riverside, Shasta Dam, Boulder City, Pierce Ferry, Tucson), 21h. (Mount Wilson, Riverside, Boulder City, Pierce Ferry, Tucson, Bermuda, Balboa Heights, Bogota, San Juan, and Port au Prince), 22h. (near Andijan).

Jan. 12d. 18h. Pacific Ocean.

Apia iP =33m.45s., eS =34m.6s.
Sydney e =41m.12s.
Auckland P =43m.55s., i =50m.51s., S =51m.45s., L =60m.
Mount Wilson ePZ =45m.44s.
Riverside iPZ =45m.48s.
Pasadena eZ =45m.52s.
Shasta Dam eP =45m.54s.
Haiwee ePE =46m.1s.
Pierce Ferry iP =46m.1s.
Tucson eP =46m.2s.
Palomar iPZ =46m.3s.
Boulder City eP =46m.13s.
Grand Coulee eP =46m.28s.
Christchurch Q =48m.5s., R =50m.4s.
Wellington P?Z =48m.18s., iZ =50m.20s.
Arapuni e =50m.?

Jan. 12d. 18h. 38m. 24s. Epicentre 34°·8N. 137°·0E. (as on 11d.).

Intensity VII-VIII at Tu; VI at Gihu, Iida, and Nagoya; V at Matumoto, Hikone, Owase, and Sumoto; IV at Titibu, Kanazawa, Hunatu, and Nagano; II-III at Utunomiya, Yonaga, Tokyo, Hamada, and Kagosima.

Considerable damage caused, but the magnitude was small for an earthquake so widely recorded and so destructive. Many fore shocks and after shocks were recorded instrumentally, some of which were noticed.

H. Kawasumi.
"Seismology in Japan, 1939-1947." Bull. Seismo. Soc. Amer., July, 1949, Vol. 39, No. 3, p. 162.

A = −·6019, B = +·5612, C = +·5681; δ = −3; h =0;

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m.	s.	m.
Kamayama	0·4	277	0 10k	− 3	0 18	− 3	—	—	—
Nagoya	0·4	356	0 9a	− 4	0 15	− 6	—	—	—
Gihu	0·6	342	0 9a	− 6	0 15	−11	—	—	—
Hikone	0·8	307	0 17k	− 1	0 30	− 1	—	—	—
Omaesaki	1·0	101	0 46	S	(0 46)	+10	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Owase		1·0	222	0 18k	− 3	0 32	− 4	—	—	—
Kyoto		1·1	282	0 20k	− 2	0 31	− 8	—	—	—
Shizuoka		1·2	82	0 19k	− 5	0 33	− 8	—	—	—
Kohu		1·5	57	0 35k	+ 7	0 58	+ 9	—	—	—
Kobe		1·5	266	0 28k	0	0 54	+ 5	—	—	—
Hunatu		1·6	64	0 28	− 2	1 8	+17	—	—	—
Misima		1·6	79	0 27k	− 3	0 48	− 3	—	—	—
Wakayama		1·6	249	0 29k	− 1	0 58	+ 7	—	—	—
Siomisaki		1·7	217	0 29k	− 2	0 55	+ 1	—	—	—
Sumoto		1·8	256	0 31k	− 1	0 54	− 2	—	—	—
Osima		1·9	91	0 32	− 2	0 57	− 2	—	—	—
Toyama		1·9	5	0 34	0	1 3	+ 4	—	—	—
Nagano		2·1	28	0 39k	+ 2	1 18	+14	—	—	—
Kumagaya		2·3	55	0 40k	0	1 14	+ 5	—	—	—
Mera		2·3	87	0 39	− 1	—	—	—	—	—
Yokohama		2·3	74	0 39k	− 1	1 5	− 4	—	—	—
Wazima		2·6	358	0 55	+11	1 41	?	—	—	—
Tukubasan		2·9	61	0 46k	− 2	1 25	+ 1	—	—	—
Utunomiya		2·9	53	0 48	0	1 29	+ 5	—	—	—
Kakioka		3·0	61	0 48k	− 2	1 36	+ 9	—	—	—
Kôti		3·1	246	0 52	+ 1	1 34	+ 5	—	—	—
Mito		3·2	61	0 52	0	2 18	?	—	—	—
Aikawa		3·4	17	0 57	+ 2	—	—	—	—	—
Hirosima		3·8	265	1 1k	0	1 54	+ 7	—	—	—
Onahama		3·8	55	0 55	− 6	1 45	− 2	—	—	—
Simidu		3·9	241	1 3k	+ 1	2 4	S*	—	—	—
Hamada		4·1	273	1 6k	+ 1	2 4	S*	—	—	—
Hukusima		4·1	43	1 16	P*	2 10	S*	—	—	—
Sendai		4·7	41	1 14k	0	2 14	+ 4	—	—	—
Izuka		5·4	259	1 22k	− 2	2 32	+ 4	—	—	—
Mizusawa	E.	5·4	36	e 1 29	+ 5	2 43	S*	—	—	—
	N.	5·4	36	i 1 32	+ 8	2 46	S*	—	—	—
Akita		5·5	25	1 5	−20	2 22	− 8	—	—	—
Hukuoka		5·6	260	1 35	+ 8	—	—	—	—	—
Kumamoto		5·6	251	1 26k	− 1	2 42	+ 9	—	—	—
Morioka		5·9	33	1 33a	+ 2	—	—	—	—	—
Kagosima		6·3	241	1 19	−17	—	—	—	—	—
Hatinohe		6·8	31	1 41	− 3	3 6	+ 3	—	—	—
Sapporo		8·9	21	2 15	+ 3	4 6	+11	—	—	—
Vladivostok		9·2	336	i 2 24	+ 8	i 4 25	+22	—	—	—
Irkutsk		29·1	317	6 5	+ 1	11 0?	+ 4	—	—	—
Calcutta	N.	44·0	267	i 8 19k	+ 8	i 14 43	0	i 9 49	PP	21·0
Almata		46·5	300	8 32	+ 1	15 31	+12	—	—	—
Frunse		48·3	299	e 8 53	+ 8	—	—	—	—	—
Dehra Dun	N.	49·3	282	—	—	e 15 39	−20	e 19 39	SS	e 24·8
Andijan		50·4	297	9 6	+ 5	16 28	+14	—	—	—
New Delhi		50·6	281	i 9 8	+ 6	i 16 18	+ 1	11 3	PP	—
Tashkent		52·5	299	9 18	+ 1	i 16 50	+ 7	—	—	—
College		52·9	31	e 9 18	− 2	i 16 47	− 1	e 11 12	PP	e 21·4
Sverdlovsk		54·5	319	9 25	− 7	i 17 14	+ 4	—	—	—
Hyderabad	N.	54·6	268	9 31	− 1	17 15	+ 4	10 38	PcP	27·1
Honolulu		58·2	85	e 11 42	PP	e 18 2	+ 3	—	—	e 24·1
Bombay		58·5	272	e 10 0	0	18 4	+ 1	12 16	PP	—
Colombo	E.	59·3	256	9 41	−25	17 44	−30	—	—	31·6
Kodaikanal	E.	59·3	261	i 9 51	−15	i 17 56	−18	12 1	PP	28·8
Baku		66·5	304	10 59	+ 5	19 51	+ 7	—	—	—
Moscow		66·9	323	10 54	− 2	19 45	− 4	—	—	—
Perth		69·3	199	e 11 16	+ 5	20 21	+ 4	—	—	33·2
Riverview		69·5	167	i 11 14a	+ 2	i 20 30	+10	i 13 54	PP	e 34·2
Erevan		70·3	306	e 11 23	+ 6	e 20 35	+ 6	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Upsala		73·3	333	11 38?	+ 3	21 6	+ 2	e 25 36	SS	e 36·6
Grand Coulee		73·4	43	i 11 34	− 2	i 21 7	+ 2	i 14 11	PP	—
Shasta Dam		75·3	51	i 11 46	− 1	e 21 26	0	—	—	—
Ukiah		75·6	52	e 11 54	+ 6	i 21 36	+ 7	e 26 20	SS	e 31·7
Berkeley		76·9	53	e 11 55	− 1	i 21 50	+ 7	—	—	e 33·1
Bergen		77·2	338	11 57	0	21 55	+ 8	—	—	e 36·1
Saskatoon		77·2	35	—	—	e 21 48	+ 1	—	—	37·6
Santa Clara		77·4	53	i 12 6	+ 8	e 21 54	+ 5	—	—	e 33·4
Butte		78·0	41	e 12 2	0	e 21 58	+ 3	—	—	e 37·2
Copenhagen		78·2	332	e 12 4	+ 1	i 22 3	+ 6	—	—	—
Bozeman		79·1	42	e 12 13	+ 5	e 22 6	− 1	e 27 7	SS	e 35·9
Ksara		79·5	304	i 12 13	+ 3	e 22 18	+ 7	15 17	PP	39·6
Tinemaha		80·0	52	e 12 16	+ 3	e 22 18	+ 1	—	—	—
Potsdam	E.	80·4	329	i 12 23	+ 8	e 22 29	+ 8	—	—	e 39·6
Santa Barbara	Z.	80·6	55	i 12 19	+ 3	—	—	—	—	—
Haiwee		80·8	52	e 12 17	0	i 22 27	+ 2	—	—	—
Logan		81·1	45	i 12 30	+12	i 22 39	+11	e 15 59	PP	e 36·2
Collmberg		81·2	328	e 12 18	− 1	e 22 42	+13	i 15 30	PP	e 41·6
Prague		81·4	327	12 27	+ 7	e 22 37	+ 6	e 23 18	PS	e 33·6
Salt Lake City		81·7	46	e 12 25	+ 3	e 22 39	+ 5	i 23 36	PPS	e 34·1
Mount Wilson	Z.	81·8	54	i 12 22	0	—	—	—	—	—
Pasadena		81·8	54	e 12 20	− 2	i 22 38	+ 3	e 39 3	P'P'	i 37·0
Sofia		81·9	317	e 12 27	+ 4	e 22 47	+11	e 15 51	PP	e 42·1
Aberdeen		82·1	339	—	—	i 22 41	+ 3	—	—	i 44·5
Belgrade		82·1	320	e 12 24	0	e 22 30	− 8	e 17 32	PPP	e 47·5
Jena		82·1	328	e 12 24	0	e 22 41	+ 3	—	—	—
Cheb		82·3	328	e 12 32	+ 7	e 22 52	+12	—	—	e 45·6
Riverside	Z.	82·4	54	i 12 25	0	—	—	—	—	—
Boulder City		82·9	51	i 12 28	0	—	—	e 15 40	PP	—
Palomar		83·1	54	e 12 29	0	e 22 51	+ 3	—	—	—
La Jolla		83·2	55	e 12 34	+ 5	—	—	—	—	—
Pierce Ferry		83·3	50	i 12 28	− 2	e 22 52	+ 2	—	—	—
Wellington	Z.	83·3	152	i 12 33	+ 3	22 36	−14	e 15 41?	PP	38·6
Rapid City		84·3	39	i 12 42	+ 7	i 23 1	+ 1	e 16 0	PP	e 40·5
Christchurch		84·4	155	12 38	+ 2	23 10	+ 9	15 47	PP	41·1
Helwan		84·9	303	12 38	0	23 2	− 4	23 50	PS	—
Triest		84·9	324	i 12 45	+ 7	i 23 6	0	i 16 26	PP	e 43·2
Stonyhurst		85·0	338	i 12 49	+11	i 23 6	− 1	i 23 58	PS	e 35·1
Uccle		85·1	333	e 12 39	0	i 23 8	0	e 15 54	PP	—
Strasbourg		85·5	329	e 12 43	+ 2	e 23 21	+ 9	i 24 21	PS	45·6
Chur		86·0	327	e 12 23	−20	e 23 9	− 8	—	—	e 48·5
Zürich		86·0	328	e 12 42	− 1	e 23 13	− 4	—	—	—
Basle		86·3	329	e 12 45	0	e 23 16	− 4	—	—	—
Kew		86·3	334	i 12 51k	+ 6	i 23 34	+14	e 16 12?	PP	e 41·6
Neuchatel		87·0	328	e 12 42	− 6	e 23 11	[− 3]	—	—	—
Paris		87·4	332	12 55	+ 5	e 23 24	− 6	e 16 21?	PP	e 43·6
Tucson		87·8	52	i 12 52	0	e 23 30	− 4	e 18 26	PPP	e 50·4
Clermont-Ferrand		89·6	330	e 13 7	+ 6	e 23 54	+ 3	e 16 33	PP	e 43·6
Chicago		93·5	32	e 17 19	PP	e 23 53	[0]	e 25 33	PS	e 38·7
Barcelona		93·6	327	e 17 48	PP	i 38 18	Q	—	—	i 45·3
Florissant		94·6	35	e 13 24	0	i 24 46	+11	i 17 18	PP	e 43·1
Seven Falls		94·7	18	e 13 30	+ 6	e 24 6	[+ 7]	e 30 18	SS	41·6
Shawinigan Falls		94·7	19	e 13 24	0	e 24 6	[+ 7]	—	—	52·6
St. Louis		94·8	35	e 13 24	− 1	e 24 39	+ 3	e 17 15	PP	e 43·4
Ottawa		94·9	22	13 25	0	24 42	+ 5	25 58	PS	42·6
Toledo		97·4	330	i 13 37	0	24 29	{− 7}	30 42	SS	48·6
Pennsylvania		98·2	25	—	—	e 25 9	+ 4	—	—	e 39·8
Coimbra		98·8	334	e 13 34	− 9	24 29	[+ 8]	30 11	SS	47·6
Weston		98·9	20	e 13 50	+ 7	24 28	[+ 6]	17 57	PP	—
Fordham		99·5	22	e 23 25	?	i 24 30	[+ 5]	i 26 50	PS	53·1

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Granada		99·5	329	19 10	PP	—	—	—	—	34·7
Philadelphia		99·9	23	—	—	i 24 20	[− 7]	e 26 47	PS	e 43·3
Tananarive	E.	100·1	254	—	—	e 25 30	+ 9	e 32 36?	SS	—
Malaga		100·3	329	i 18 4k	PP	e 24 56	{ 0}	31 38	SS	58·6
Lisbon		100·4	333	13 22	−28	24 38	[+ 9]	17 26	PP	42·1
San Fernando		101·3	330	e 18 13	PP	—	—	—	—	51·6
Columbia		102·8	31	—	—	e 24 46	[+ 5]	e 26 29	PS	e 47·6
Bermuda		110·1	18	e 21 17	PPP	i 25 22	[+ 9]	e 28 37	PS	e 51·9
San Juan		122·7	25	e 20 30	PP	e 26 7	[+ 8]	e 30 19	PS	e 50·2
Huancayo		142·9	60	e 19 42	[+ 6]	e 41 59	SS	e 22 49	PP	e 62·0
La Paz		151·0	56	19 52	[+ 3]	i 30 49	{+25}	i 26 22	SKS	71·6
La Plata	E.	167·8	95	25 6	PP	31 54	{+ 2}	—	—	80·6

Additional readings :—
Calcutta iPPPN =10m.19s., iSSSN =18m.13s.
New Delhi PSN =16m.28s., iN =20m.18s.
College eSS =20m.19s.
Hyderabad PSN =17m.29s., S_cSN =19m.23s., SSN =21m.9s.
Honolulu iS =18m.10s.
Bombay ePE =10m.3s., iE =10m.6s., PPPEN =13m.40s., SPN =18m.12s., PPSN = 18m.28s., iS_cS?EN =19m.57s., SSE =21m.50s.
Kodaikanal SSE =21m.56s.
Moscow e =11m.19s. and 11m.52s.
Riverview iNZ =11m.18s., eEN =14m.34s., iE =20m.33s., iN =21m.23s., eQE = 30m.42s.
Upsala iSN =21m.9s., eN =21m.48s., eE =24m.3s., eN =27m.36s., eSSSE =28m.36s.?, eN =33m.0s.
Grand Coulee i =11m.40s., e =16m.49s. and 20m.22s., i =21m.52s.
Shasta Dam i =11m.52s. and 16m.21s., e =21m.54s.
Ukiah e =22m.23s.
Bergen iZ =12m.3s., e =30m.36s.
Saskatoon e =30m.48s.
Copenhagen i =12m.8s. and 22m.49s.
Bozeman e =14m.43s., and 27m.54s.
Logan i =12m.46s. and 13m.31s., ePPP =17m.17s., e =23m.53s., eSS? =28m.0s., eSSS =31m.32s.
Collmberg iZ =12m.24s., i =12m.28s., e =13m.12s., 15m.12s., 16m.8s., 16m.49s., 18m.44s., 24m.8s., and 25m.46s., eSS =27m.12s., e =38m.36s.?
Salt Lake City iP =12m.29s., iS =22m.44s., e =27m.29s., eSS =27m.36s., e =31m.52s.
Pasadena iZ =12m.26s.
Aberdeen eEN =34m.10s., iE =39m.7s.
Belgrade i =12m.31s., e =14m.3s.
Jena ePN =12m.28s., eSN =22m.45s.
Pierce Ferry i =12m.31s.
Wellington eZ =18m.51s.?, QZ =34·6m.
Rapid City ePPP =17m.43s., i =23m.18s., e =23m.49s., eSS =28m.11s., eSSS =32m.12s.
Christchurch eE =22m.36s., SSE =28m.36s., SSSEZ =32m.26s., QN =35m.8s.
Helwan eZ =13m.48s., PPZ =15m.51s.
Triest eS =24m.3s.
Stonyhurst i =16m.50s. and 20m.38s., iS_cS? =23m.19s.
Strasbourg eSKS =23m.6s.
Kew ePPPN =18m.30s., iSKSEN =23m.18s., iEN =24m.0s., iPSZ =24m.18s., eSSSEN = 33m.36s.?
Paris ePS =24m.30s., e =27m.54s.
Tucson i =12m.58s., e =15m.53s., iPS =24m.41s., eSS =29m.34s., eSSS =33m.6s.
Chicago eSS =30m.45s.
Florissant iZ =13m.31s., eSKS?E =24m.2s., eSSE =31m.7s.
St. Louis iZ =13m.32s., eSKS?N =24m.2s., ePSE =26m.1s., eSSE =31m.13s.
Ottawa SKSN =24m.2s., SSN =31m.36s.
Coimbra SSS =33m.39s.
Weston PS =26m.40s.
Fordham iSS =31m.49s., e =36m.36s.
Philadelphia e =26m.26s., eSS =32m.3s., eSSS =36m.9s.
Malaga PKP?Z =21m.36s., PPP?Z =22m.56s., SKKSZ =27m.8s., PKKP?Z =28m.6s., PS?Z =30m.10s., SS?Z =36m.38s., QZ =53·6m.
Lisbon S?N =24m.59s., SS?E =33m.30s.?
Bermuda i =26m.58s., eSS =34m.9s., eSSS =38m.37s.
San Juan e =23m.19s., ePS =31m.14s., eSS =37m.32s.
Huancayo e =23m.22s., and 34m.57s., eSSS =47m.3s.
La Paz iPKPZ =19m.58s., $iPKP_{ab}$ =20m.16s., iPP =23m.38s., PPP =26m.54s., PSKS = 33m.39s., PPS =36m.38s.
Long waves were also recorded at Auckland, Bucharest, and Tortosa.

Jan. 12d. 21h. 59m. 24s. Epicentre 15°·9N. 93°·0W. (as on 1944 Aug. 24d.).

Near the south coast of Mexico. Felt in the State of Chiapas.
Epicentre 16°N. 93°W. (U.S.C.G.S.). Pasadena suggests deep focus.
Annales de l'Institut de Physique du Globe de Strasbourg, 2ème partie, Séismologie, tome X, Strasbourg, 1951, p. 23.

$A = -·0504$, $B = -·9609$, $C = +·2722$; $\phi = -4$; $h = +6$;
$D = -·999$, $E = +·052$; $G = -·014$, $H = -·272$, $K = -·962$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Vera Cruz		4·5	318	1 15	+ 4	2 2	− 3	—	—	—
Merida		6·0	32	1 49	P*	3 3	S*	—	—	3·3
Tacubaya		6·9	302	1 49	+ 4	—	—	—	—	3·3
Columbia		21·0	28	e 5 8	+21	e 8 45	+ 8	—	—	e 12·2
Bogota		21·7	119	e 4 56	+ 1	—	—	—	—	—
St. Louis		22·8	5	i 5 5	0	e 9 8	− 3	i 5 26	pP	e 11·4
Florissant		22·9	5	i 5 8	+ 2	e 9 17	+ 4	e 5 27	pP	—
Tucson		23·0	319	i 5 7	0	e 9 22	+ 8	i 5 45	PP	e 12·0
San Juan		25·8	80	e 5 36	+ 2	—	—	e 6 21	PP	e 11·6
Pierce Ferry		27·5	323	i 5 50	0	—	—	—	—	e 14·8
La Jolla	N.	27·7	312	e 5 50	− 2	—	—	—	—	—
Palomar		27·7	313	i 5 50k	− 2	i 11 5	+32	—	—	—
Boulder City		27·9	322	i 5 53	− 1	—	—	—	—	e 15·2
Riverside	Z.	28·4	314	i 5 55	− 3	—	—	—	—	—
Philadelphia		28·6	31	—	—	e 10 40	− 8	—	—	e 14·0
Mount Wilson		29·0	314	i 6 2k	− 2	—	—	—	—	—
Pasadena		29·0	314	i 6 2k	− 2	—	—	—	—	e 17·2
Fordham		29·9	30	e 7 11	PP	—	—	—	—	e 14·7
Haiwee		30·0	318	e 6 18	+ 6	—	—	—	—	—
Tinemaha		30·8	318	e 6 19	− 1	—	—	—	—	—
Huancayo		32·8	147	e 6 36	− 1	e 11 49	− 5	—	—	e 14·2
Ottawa		32·8	23	e 6 36	− 1	—	—	—	—	15·6
Shasta Dam		35·5	321	e 6 56	− 4	—	—	—	—	—
Seven Falls		36·2	26	e 7 12	+ 6	—	—	—	—	20·6
Grand Coulee		38·5	332	i 7 24	− 2	—	—	i 7 44	pP	—
Clermont-Ferrand		83·0	45	e 12 24	− 4	—	—	—	—	—
Collmberg	Z.	87·4	38	e 12 50	0	—	—	—	—	—
Cheb		87·5	38	e 17 36?	PP	—	—	—	—	—

Additional readings :—
Bogota e = 6m.3s.
St. Louis eSSN = 9m.49s.
Florissant eE = 9m.39s.
Tucson i = 5m.15s., 5m.26s., and 6m.45s.
San Juan e = 5m.51s., 6m.51s., and 10m.42s.
Pierce Ferry i = 6m.7s. and 6m.29s.
La Jolla eNZ = 6m.9s.
Palomar i = 6m.9s., iZ = 6m.28s., iN = 11m.33s.
Boulder City i = 6m.11s., and 6m.33s.
Riverside i = 6m.15s., iZ = 9m.6s., eZ = 9m.45s.
Mount Wilson i = 6m.21s., iZ = 6m.30s., and 6m.41s., eZ = 7m.36s., iZ = 9m.31s.
Pasadena i = 6m.21s., iEZ = 6m.41s.
Tinemaha eE = 6m.37s.
Huancayo e = 7m.15s.
Shasta Dam i = 7m.16s.
Grand Coulee i = 8m.5s., 8m.58s., 9m.15s., and 10m.58s., e = 12m.39s.
Long waves were also recorded at Puebla.

Jan. 12d. Readings also at 3h. (La Paz, Balboa Heights, and near Bogota), 9h. (Rapid City), 11h. (near Andijan), 13h. (Moscow, Baku, Andijan, Tashkent, and near Frunse), 15h. and 17h. (near Apia), 21h. (St. Louis), 22h. (Mizusawa).

Jan. 13d. 5h. 36m. 23s. Epicentre 34°·8N. 137°·0E. (as on 12d.).

Intensity V at Tu, Kameyama, and Gihu; IV at Iida, Kashiwara, Hikone; II-III at Kobe, Ibukiyama, Omaesaki, Kohu, Toyooka, Yokohama, Kyoto, Misima, and Siomisaki.
Epicentre 34°·9N. 137°·1E. Very shallow.
Seismo. Bull. Cent. Met. Obs., Japan, 1945, Tokyo, 1951, p. 11.

$A = -·6019$, $B = +·5612$, $C = +·5681$; $\delta = -3$; $h = 0$;

		△	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Kameyama		0·4	277	0 47k	?	—	—
Tu		0·4	261	0 9k	− 4	0 17	− 4
Gihu		0·6	342	0 13	− 2	0 22	− 4
Hikone		0·8	307	0 18k	0	0 29	− 2
Omaesaki		1·0	101	0 19	− 2	0 33	− 3
Kyoto		1·1	282	0 21k	− 1	0 38	− 1
Kohu		1·5	57	0 28k	0	0 51	+ 2
Hunatu		1·6	64	(0 28)k	− 2	—	—
Misima		1·6	79	0 29k	− 1	0 50	− 1
Wakayama		1·6	249	0 29k	− 1	0 53	+ 2
Siomisaki		1·7	217	0 29	− 2	0 58	+ 4
Toyooka		2·0	298	0 36k	+ 1	1 2	0
Yokohama		2·3	74	0 42	+ 2	1 13	+ 4
Tukubasan		2·9	61	0 47	− 1	1 24	0
Kôti		3·1	246	0 52	+ 1	1 29	0
Mito		3·2	61	0 57	+ 5	1 38	+ 6
Aikawa		3·4	17	1 0	+ 5	1 46	+ 9
Onahama		3·8	55	1 7	+ 6	1 49	+ 2
Hukusima		4·1	43	1 10	+ 5	2 1	+ 6
Hamada		4·1	273	1 6	+ 1	1 53	− 2
Sendai		4·7	41	1 16	+ 2	2 3	− 7
Mizusawa		5·4	36	1 11	−13	2 32	+ 4
Kumamoto		5·6	251	1 29	+ 2	2 31	− 2
Morioka		5·9	33	1 27	− 4	2 31	− 9
Grand Coulee		73·4	43	e 11 35	− 1	—	—
Shasta Dam		75·3	51	i 11 45	− 2	—	—
Haiwee		80·8	52	e 12 16	− 1	—	—
Pasadena	z.	81·8	54	i 12 21	− 1	—	—
Mount Wilson	z.	81·8	54	i 12 21	− 1	—	—
Palomar		83·1	54	i 12 28	− 1	—	—
Pierce Ferry		83·3	50	i 12 19	−11	—	—
Tucson		87·8	52	e 12 43	− 9	—	—

Additional reading :—
Hunatu reading diminished by 1m.
Mizusawa PN = 1m.15s.

Jan. 13d. 8h. Undetermined shock.

Kodaikanal ePE = 21m.45s., PPE = 23m.55s., eSE = 29m.55s., SSE = 33m.35s., LE = 39m.50s.
Bombay eN = 22m.46s., 23m.29s., and 29m.59s., iN = 31m.2s.
Riverview e?Z = 23m.0s., eEZ = 29m.36s., eE = 30m.39s., eLN = 38m.12s.
Perth 1 = 23m.20s.
Calcutta eN = 23m.28s.
Ksara eP? = 24m.16s., ePS? = 35m.29s.
Tananarive E = 24m.46s., 25m.9s., 26m.34s., and 27m.23s., EN = 28m.6s.
Colombo eSE = 28m.0s.?
Hyderabad SN = 29m.38s.
Pierce Ferry e = 31m.53s. and 32m.53s.
New Delhi eN = 31m.54s. and 37m.22s.
Riverside ePZ = 32m.51s.
Boulder City e = 32m.55s.
Pasadena iPZ = 32m.56s., eLZ = 34m.0s.
Tucson e = 32m.56s., eL = 34m.32s.
Mount Wilson ePZ = 33m.0s.
Sydney e = 37m.0s. and 40m.3s.
Tacubaya iN = 40m.24s., iE = 40m.30s.
Wellington e = 45m.0s., L = 46m.0s.
Auckland e = 44m.0s.?
Long waves were also recorded at Cheb, Huancayo, and Christchurch.

Jan. 13d. 10h. 58m. 4s. Epicentre 34°·8N. 137°·0E. (as at 5h.).

Intensity V at Kera, Gihu Pref; IV at Kameyama and Iida; II-III at Hikone, Kashiwara, and Yokohama.
Epicentre 34°·9 137°·1E. Very shallow.
Seismo. Bull. Cent. Met. Obs., Japan, 1945, Tokyo, 1951, p. 12.

		△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.
Kameyama		0·4	277	0 10k	− 3	0 18	− 3
Gihu		0·6	342	0 10	− 5	0 18	− 8
Hikone		0·8	307	0 10	− 8	0 21	−10
Kyoto		1·1	282	0 20a	− 2	—	—
Kohu		1·5	57	0 26k	− 2	0 49	0
Kobe		1·5	266	0 28k	0	0 49	0
Hunatu		1·6	64	(0 26)	− 4	—	—
Misima		1·6	79	0 29	− 1	0 48	− 3
Wakayama		1·6	249	0 31k	+ 1	0 54	+ 3
Siomisaki		1·7	217	0 31	0	0 53	− 1
Sumoto		1·8	256	0 35	+ 3	1 0	+ 4
Osima		1·9	91	0 33	− 1	0 58	− 1
Toyooka		2·0	298	0 36	+ 1	0 59	− 3
Yokohama		2·3	74	0 39a	− 1	1 10	+ 1
Mera		2·3	87	0 46	+ 6	—	—
Tukubasan		2·9	61	0 47	− 1	1 21	− 3
Utunomiya		2·9	53	0 52	+ 4	1 28	+ 4
Kôti		3·1	246	0 52	+ 1	1 31	+ 2
Mito		3·2	61	0 55	+ 3	1 37	+ 5
Aikawa		3·4	17	1 2	+ 7	1 52	+15
Onahama		3·8	55	1 0	− 1	1 58	+11
Hukusima		4·1	43	1 13	+ 8	2 1	+ 6
Hamada		4·1	273	1 6	+ 1	2 6	+11
Sendai		4·7	41	1 6	− 8	1 58	−12
Mizusawa	E.	5·4	36	1 29	+ 5	2 27	− 1
Kumamoto		5·6	251	1 42	+15	2 50	+17

Hunatu reading diminished by 1m.

Jan. 13d. 11h. 57m. 2s. Epicentre 10°·9N. 128°·1E.

A = −·6061, B = +·7729, C = +·1879; δ = +4; h = +6;
D = +·787, E = +·617; G = −·116, H = +·148, K = −·982.

		△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C, s.	Supp. m. s.		L. m.
Vladivostok		32·3	6	i 6 51	+18	—	—	—	—	—
Calcutta	N.	39·7	292	e 7 32	− 4	e 13 30	−10	—	—	—
Perth		44·2	195	i 10 18	PPP	i 14 26	−20	—	—	—
Irkutsk		45·5	340	e 8 23	0	15 15	+10	—	—	—
Colombo	E.	47·8	269	8 33	− 8	15 18	−20	—	—	—
Hyderabad		48·5	284	—	—	14 57	−51	15 33	PS	—
Sydney		49·6	155	e 17 58	?	—	—	—	—	—
Riverview		49·6	155	i 8 55	0	i 15 57	− 6	i 10 48	PP	—
Kodaikanal	E.	49·7	275	i 9 43	+47	—	—	e 11 33	PP	25·1
New Delhi	N.	50·6	298	i 18 45	ScS	—	—	i 20 8	SS	—
Bombay	E.	53·8	286	e 9 19	− 7	e 16 49	−12	11 17	PP	—
Andijan		57·2	311	e 10 18	+27	—	—	—	—	—
Tashkent		59·6	312	10 7	− 1	18 17	0	—	—	—
Auckland		64·7	140	—	—	19 24	+ 2	—	—	33·0
Arapuni		65·9	141	—	—	e 24 58?	?	—	—	—
Wellington	z.	67·4	144	10 45	−14	20 54	+59	14 19	PP	37·5
Christchurch		67·6	147	—	—	27 58	SSS	—	—	—
Sverdlovsk		68·7	327	—	—	i 20 10	0	—	—	—
Baku		74·1	310	e 11 42	+ 2	i 21 8	− 4	—	—	—
Ksara		85·8	303	e 12 41	− 1	e 23 37	+22	—	—	—
Helwan		90·4	300	e 13 4	0	23 55	− 3	e 23 31	SKS	—
Cheb		97·5	324	e 7 58	?	e 24 13	[− 1]	e 33 58	?	e 56·0
Huancayo		157·0	95	e 25 35	?	e 31 10	{+13}	e 32 3	?	e 46·0
La Paz	z.	163·3	111	20 10	[+ 6]	—	—	i 30 32	?	80·0

For Notes see next page.

NOTES TO JANUARY 13d. 11h. 57m. 2s.

Additional readings :—
Hyderabad SSN =19m.35s.
Riverview iZ =9m.12s. and 11m.5s., iSE =15m.54s., iPSE =16m.12s., iS_cSEN = 18m.48s., iSSN =19m.21s., iE =19m.28s.
Kodaikanal iE =17m.11s., SS?E =20m.36s.
Bombay iSN =16m.46s., iE =17m.20s., S_cSEN =19m.5s., iE =20m.51s.
Wellington iZ =10m.58s., pP_cPZ =11m.38s., iZ =12m.21s.
Helwan eZ =13m.58s.
Long waves were also recorded at Tucson and other European stations.

Jan. 13d. 21h. 0m. 36s. Epicentre 34°·8N. 137°·0E. (as at 10h.).

Intensity VI at Tu ; V at Iida, Kameyama, and Gihu ; IV at Hikone, Kashiwara, Kohu, Hunatu, and Kobe ; II-III at Wakayama, Sumoto, Toyooka, and Siomisaki.
Epicentre 34°·9N. 137°·0E. Very shallow.
Seismo. Bull. Cent. Met. Obs., Japan, 1945, Tokyo, 1951, p. 12.

		Δ	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Kaneyama		0·4	277	0 6k	− 7	—	—
Tu		0·4	261	0 5	− 8	0 13	− 8
Gihu		0·6	342	0 12	− 3	0 21	− 5
Hikone		0·8	307	0 17	− 1	0 28	− 3
Kohu		1·5	57	0 28	0	0 51	+ 2
Kobe		1·5	266	0 29k	+ 1	0 50	+ 1
Hunatu		1·6	64	0 18k	−12	0 49	− 2
Misima		1·6	79	0 29k	− 1	0 50	− 1
Wakayama		1·6	249	0 31	+ 1	0 57	+ 6
Siomisaki		1·7	217	0 30	− 1	0 59	+ 5
Sumoto		1·8	256	0 34	+ 2	0 56	0
Osima		1·9	91	0 33a	− 1	0 56	− 3
Toyooka		2·0	298	0 36	+ 1	1 1	− 1
Yokohama		2·3	74	0 40	0	1 10	+ 1
Mera		2·3	87	0 43	+ 3	1 4	− 5
Tukubasan		2·9	61	0 48	0	1 27	+ 3
Utunomiya		2·9	53	0 48	0	1 34	+10
Kôti		3·1	246	0 53	+ 2	1 32	+ 3
Mito		3·2	61	0 55	+ 3	1 41	+ 9
Aikawa		3·4	17	0 54	− 1	1 39	+ 2
Onahama		3·8	55	1 23	P_g	2 11	S_g
Hukusima		4·1	43	1 2	− 3	1 58	+ 3
Hamada		4·1	273	1 12	+ 7	2 2	+ 7
Sendai		4·7	41	1 15	+ 1	2 5	− 5
Mizusawa	E.	5·4	36	1 29	+ 5	2 32	+ 4
Kumamoto		5·6	251	1 24	− 3	2 33	0
Hatinohe		6·8	31	1 46	+ 2	—	—
Grand Coulee		73·4	43	i 11 33	− 3	—	—
Shasta Dam		75·3	51	i 11 44	− 3	—	—
Pasadena	Z.	81·8	54	i 12 20	− 2	—	—
Mount Wilson	Z.	81·8	54	i 12 21	− 1	—	—
Boulder City		82·9	51	i 12 26	− 2	—	—
Palomar	Z.	83·1	54	i 12 28	− 1	—	—
Pierce Ferry		83·3	50	i 12 29	− 1	—	—
Tucson		87·8	52	e 12 52	0	—	—

Jan. 13d. Readings also at 1h. (Auckland), 4h. (Vera Cruz and near Tacubaya), 5h. (Mount Wilson, Pasadena, Riverside, Tinemaha, Palomar, Tucson, Pierce Ferry, Grand Coulee, Shasta Dam, Boulder City, Haiwee, Mizusawa, and Riverview), 9h. (La Paz), 13h. (Huancayo), 15h. (Tashkent), 20h. and 21h. (near Mizusawa), 22h. (Ksara, Balboa Heights, Christchurch, Riverview, and Auckland).

Jan. 14d. 11h. 16m. 44s. Epicentre 33°·7N. 135°·8E. Depth of focus 0·010.
(as on 1944 Dec. 16d.).

Intensity VI at Kôiindake ; V at Siomisaki and Gihu ; IV at Wakayama, Kashiwara, Sumoto, and Hikone ; II-III at Toyooka and Ibukiyama.
Epicentre 33°·7N. 136°·3E. Focal depth 60km.

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

		△	Az.	P	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Siomisaki		0·3	186	0 4k	−11	0 6	−20
Wakayama		0·7	310	0 15a	− 3	0 27	− 4
Hikone		1·6	13	0 30	+ 2	0 48	− 1
Gihu		1·9	24	0 33	+ 1	0 59	+ 4
Kôti		1·9	268	0 29	− 3	0 58	+ 3
Toyooka		2·0	336	0 33	0	1 1	+ 4
Hirosima		2·9	283	0 47	+ 2	1 25	+ 6
Hunatu		3·0	53	0 57	+10	—	—
Kohu		3·0	49	0 57k	+10	—	—
Misima		3·0	61	0 46	− 1	—	—
Osima		3·1	69	0 49	+ 1	1 21	− 3
Hamada		3·3	298	0 51	0	1 43	+14
Yokohama		3·6	61	1 12	+17	—	—
Izuka		4·2	271	1 2a	− 1	2 8	+17
Tukubasan		4·3	53	1 26	+21	2 7	+13
Kumamoto		4·4	260	1 9k	+ 3	2 17	+21
Utunomiya		4·4	48	1 20	+14	2 16	+20
Mito		4·7	54	1 30	+20	2 32	+28
Aikawa		4·8	24	0 46	−25	1 26	−40
Onahama		5·2	51	3 0	?	3 41	?
Hukusima		5·5	42	1 45	+24	2 42	+19
Sendai		6·1	41	2 8?	+39	—	—
Mizusawa		6·9	37	2 6	+26	3 36	+38
Pasadena	z.	83·2	54	i 12 23	+ 6	—	—
Mount Wilson	z.	83·3	54	e 12 24	+ 7	—	—
Riverside		83·9	54	e 12 25	+ 5	—	—
Palomar	z.	84·6	53	i 12 40	+16	—	—

Additional readings :—
Mizusawa PN =2m.11s.
Pasadena iZ =12m.31s., 12m.47s., and 13m.3s.
Mount Wilson iZ =12m.31s.
Riverside iZ =12m.33s., 12m.50s., and 13m.3s.
Long waves were recorded at Cheb.

Jan. 14d. 12h. 52m. 49s. Epicentre 34°·8N. 137°·0E. (as on 13d.).

Intensity VI at Tu ; V at Gihu, Hikone, Iida, and Kashiwara ; IV at Hamamatu, Omaesaki, Ibukiyama, Kohu, Toyooka, and Kobe ; II-III at Wakayama, Kanazawa, Siomisaki, and Matumoto.
Epicentre 34°·9N. 137°·0E. Very shallow.
Seismological Bulletin of the Central Meteorological Observatory, Japan, for the Year 1945, Tokyo, 1951, p. 14.

$A = -·6019$, $B = +·5612$, $C = +·5681$; $\delta = -3$; $h = 0$.

	△	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Gihu	0·6	342	0 12k	− 3	0 19	− 7
Hamamatu	0·6	98	0 13k	− 2	0 20	− 6
Hikone	0·8	307	0 16k	− 2	0 27	− 4
Omaesaki	1·0	101	0 19a	− 2	0 37	+ 1
Kohu	1·5	57	0 30k	+ 2	0 53	+ 4
Kobe	1·5	266	0 28k	0	0 49	0
Hunatu	1·6	64	0 28	− 2	0 56	+ 5
Wakayama	1·6	249	0 29k	− 1	0 59	+ 8
Siomisaki	1·7	217	0 29	− 2	0 57	+ 3
Osima	1·9	91	0 33	− 1	1 1	+ 2

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.			L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Toyooka		2·0	298	0 35k	0	1 1	− 1			
Yokohama		2·3	74	0 43k	+ 3	1 13	+ 4			
Wazima		2·6	358	0 47a	+ 3	1 27	S_g			
Tukubasan		2·9	61	0 51	+ 3	1 30	S*			
Utunomiya		2·9	53	0 49	+ 1	1 32	S*			
Kôti		3·1	246	0 51	0	1 32	+ 3			
Mito		3·2	61	0 57	+ 5	1 41	S*			
Onohama		3·8	55	1 8	P*	2 4	S_g			
Hamada		4·1	273	1 5	0	1 57	+ 2			
Hukusima		4·1	43	1 9	+ 4	2 7	S*			
Sendai		4·7	41	1 13	− 1	2 13	+ 3			
Mizusawa	E.	5·4	36	1 23	− 1	2 46	S*			
Akita		5·5	25	1 58	P_g	2 50	S*			
Kumamoto		5·6	251	1 28k	+ 1	2 31	− 2			
Hatinohe		6·8	31	1 46	+ 2	3 5	+ 2			
Calcutta	N.	44·0	267	—	—	e 15 31	PPS			
Grand Coulee		73·4	43	i 11 33	− 3	—	—			
Shasta Dam		75·3	51	e 11 43	− 4	—	—			
Ksara		79·5	304	e 28 42	?	—	—			
Haiwee		80·8	52	e 12 17	0	—	—			
Mount Wilson	Z.	81·8	54	i 12 20	− 2	—	—			
Pasadena	Z.	81·8	54	i 12 21	− 1	—	—			
Riverside	Z.	82·4	54	i 12 23	− 2	—	—			
Palomar	Z.	83·1	54	i 12 26	− 3	—	—			
Pierce Ferry		83·3	50	i 12 29	− 1	—	—			
Tucson		87·8	52	e 12 51	− 1	—	—			

Additional readings :—
Mizusawa SN =2m.38s.
Pasadena iZ =12m.44s. and 13m.6s., eZ =13m.23s.
Riverside eZ =13m.24s.
Palomar iZ =12m.31s.
Long waves were recorded at Cheb, Prague, and Uccle.

Jan. 14d. Readings also at 1h. (Helwan, Ksara, Bucharest, and Sofia), 6h. (Bombay and Calcutta), 14h. (near Mizusawa), 17h. (Almata, near Frunse, Tashkent, and Andijan (2)), 22h. (Balboa Heights).

Jan. 15d. 5h. 30m. 1s. Epicentre 38°·0N. 43°·5E.

A = +·5730, B = +·5438, C = +·6131 ; δ = −6 ; h = −1 ;
D = +·688, E = −·725 ; G = +·445, H = +·422, K = −·790.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Baku		5·5	62	1 24	− 1	2 36	+ 6	—	—	—
Ksara		7·5	238	e 2 26	P_g	5 2	L	—	—	(5·0)
Helwan		13·0	235	e 3 31	PPP	7 54	L	—	—	(7·9)
Moscow		18·2	349	—	—	e 7 37	0	—	—	—
Tashkent		20·1	72	4 39	+ 1	8 23	+ 4	—	—	—
Sverdlovsk		22·0	25	i 4 57	− 1	8 43	−13	—	—	—
Andijan		22·4	76	e 5 6	+ 4	—	—	—	—	—
Triest		23·4	299	e 5 41	PP	i 9 44	+23	e 10 35	SSS	—
Cheb		25·2	309	e 4 59?	−30	e 10 12	+20	—	—	e 16·0
Collmberg	Z.	25·2	310	e 5 35	+ 6	—	—	—	—	—
Zürich		27·1	303	e 5 52	+ 6	—	—	—	—	—
New Delhi	N.	29·6	99	e 10 9	?	—	—	—	—	e 17·8
Granada		37·0	284	e 14 20	?	—	—	—	—	19·8
Calcutta	N.	41·3	101	—	—	e 13 37	−27	—	—	—

Helwan gives also PPPZ =4m.11s., eZ =5m.14s. and 6m.40s.
Long waves were also recorded at other European stations,

Jan. 15d. 9h. 49m. 43s. Epicentre 34°·8N. 137°·0E. (as on 14d.).

$A = -\cdot6019$, $B = +\cdot5612$, $C = +\cdot5681$; $\delta = -3$; $h = 0$.

		Δ	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Gihu		0·6	342	(0 22)	+ 7	(0 28)	+ 2
Hamamatu		0·6	98	0 10k	− 5	0 15	−11
Hikone		0·8	307	0 17	− 1	0 26	− 5
Omaesaki		1·0	101	0 18a	− 3	0 32	− 4
Kohu		1·5	57	0 27	− 1	0 50	+ 1
Hunatu		1·6	64	0 28	− 2	0 51	0
Misima		1·6	79	0 30k	0	0 50	− 1
Wakayama		1·6	249	0 33	+ 3	0 56	+ 5
Siomisaki		1·7	217	0 30	− 1	0 55	+ 1
Sumoto		1·8	256	0 33a	+ 1	0 56	0
Osima		1·9	91	0 35	+ 1	0 59	0
Mera		2·3	87	0 51	P_g	1 23	S_g
Yokohama		2·3	74	0 40k	0	1 12	+ 3
Tokyo		2·4	66	0 40	− 1	1 14	+ 2
Tukubasan		2·9	61	0 48	0	1 23	− 1
Utunomiya		2·9	53	1 37	S_g	—	—
Kôti		3·1	246	0 53	+ 2	1 29	0
Mito		3·2	61	1 1	P*	1 36	+ 4
Aikawa		3·4	17	1 6	P_g	1 38	+ 1
Hirosima		3·8	265	1 4	+ 3	2 0	+13
Onahama		3·8	55	1 18	P_g	—	—
Hamada		4·1	273	0 32	−33	1 18	−37
Hukusima		4·1	43	1 11	P*	2 11	S*
Sendai		4·7	41	1 2	−12	2 2	− 8
Mizusawa	N.	5·4	36	e 1 29	+ 5	2 32	+ 4
Kumamoto		5·6	251	1 15	−12	2 22	−11

Gihu readings increased by one minute.
Mizusawa gives also SN = 2m.35s.

Jan. 15d. 17h. 21m. 21s. Epicentre 26°·3N. 55°·4E. (as on 11d.).

$A = +\cdot5098$, $B = +\cdot7389$, $C = +\cdot4407$; $\delta = +9$; $h = +3$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Baku		14·8	343	3 31	− 1	6 17	− 1	—	—	—
Erevan		16·5	330	e 3 47	− 7	6 46	−12	—	—	—
Bombay		17·7	111	i 4 27	PP	i 8 3	SSS	e 4 39	PPP	i 8·8
Ksara		18·5	296	i 4 20	+ 1	7 49	+ 5	—	—	10·5
Tashkent		18·9	34	4 25	+ 1	7 49	− 4	—	—	—
Andijan		20·1	41	e 4 40	+ 2	—	—	—	—	—
Helwan		21·5	285	4 55	+ 3	8 51	+ 4	5 37	PPP	—
Frunse		22·8	39	e 5 16	+11	—	—	—	—	—
Hyderabad	N.	23·1	109	e 5 23	+15	e 9 59	SS	—	—	—
Almata		24·4	40	e 5 32	+11	—	—	—	—	—
Kodaikanal	E.	26·3	124	e 2 1	?	e 8 16	?	—	—	14·1
Calcutta	N.	30·2	90	—	—	e 11 34	+21	—	—	—
Sofia		30·8	310	e 8 22	?	e 11 39?	+16	—	—	e 17·7
Prague		39·3	318	—	—	e 18 9	S_0S	—	—	e 23·1
Cheb		40·5	318	—	—	e 13 39?	−13	e 17 39	S_eS	e 23·7
Collmberg	z.	40·6	319	e 7 40	− 3	—	—	—	—	—
Chur		41·4	312	e 7 51	+ 1	—	—	—	—	—
Zürich		42·2	313	e 7 54	− 2	—	—	—	—	—
Copenhagen		42·7	326	i 7 59	− 1	—	—	—	—	21·7
Basle		42·9	313	e 8 1	− 1	—	—	—	—	—
Neuchatel		43·2	312	e 8 5	+ 1	—	—	—	—	—
Uccle		45·7	316	e 8 25k	+ 1	e 15 1	− 7	(e 18 39)	S_eS	e 18·7
Almeria		49·7	297	8 56	0	—	—	—	—	—
Malaga	z.	51·3	297	1 9 11k	+ 3	—	—	—	—	—

For Notes see next page.

NOTES TO JANUARY 15d. 17h. 21m. 21s.

Additional readings :—
Bombay iN = 4m.59s. and 8m.20s.
Helwan SSN = 9m.33s.
Collmberg i = 7m.47s., e = 9m.17s.
Malaga iP_gZ = 9m.15s., iZ = 9m.22s., iS_gZ = 9m.35s.
Long waves were also recorded at Kew.

Jan. 15d. Readings also at 0h. (Tucson, Palomar, Riverside, Mount Wilson, Pasadena, Pierce Ferry, Boulder City, Shasta Dam, Grand Coulée, and Ksara), 1h. (near Cape Girardeau, Florissant, and St. Louis), 3h. (La Paz), 5h. (Ksara), 7h. (Boulder City, Pierce Ferry, Pasadena, Mount Wilson, Riverside, Palomar, and Tucson), 18h. (near Erevan), 17h. (La Paz), 18h. (near Apia), 19h. (Chihuahua and La Paz), 20h. (Mizusawa).

Jan. 16d. 7h. 45m. 23s. Epicentre 34°·8N. 137°·0E. (as on 15d.).
Intensity V at Iida ; II-III at Ibukiyama, Kashiwara, Kohu, Wakayama, Toyooka, and Gihu.
Epicentre 35°·0N. 137°·0E. Very shallow.

A = −·6019, B = +·5612, C = +·5681 ; $\delta = -3$; $h = 0$.

	△	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Gihu	0·6	342	0 13	− 2	0 22	− 4
Hikone	0·8	307	0 18	0	0 29	− 2
Kobe	1·5	266	0 29	+ 1	0 49	0
Wakayama	1·6	249	0 29	− 1	0 55	+ 4
Siomisaki	1·7	217	0 32	+ 1	0 55	+ 1
Osima	1·9	91	0 35	+ 1	0 57	− 2
Toyooka	2·0	298	0 38	+ 3	—	—
Mera	2·3	87	0 48	P_g	—	—
Yokohama	2·3	74	0 41 a	+ 1	1 9	0
Tukubasan	2·9	61	0 50	+ 2	1 27	+ 3
Utunomiya	2·9	53	0 51	+ 3	1 50	+26
Kôti	3·1	246	0 52	+ 1	1 32	+ 3
Mito	3·2	61	1 2	P_g	1 48	S_g
Aikawa	3·4	17	1 13	P_g	1 51	S_g
Onahama	3·8	55	0 39	−22	1 31	−16
Hamada	4·1	273	1 6	+ 1	1 56	+ 1
Hukusima	4·1	43	1 17	P_g	2 31	S_g
Sendai	4·7	41	1 20	+ 6	2 14	+ 4
Mizusawa	5·4	36	e 1 40	P*	e 2 51	S*

Jan. 16d. 13h. 36m. 40s. Epicentre 34°·8N. 137°·0E. (as at 7h.).
Intensity VI at Tu, Gihu, and Iida ; V at Omaesaki, Kashiwara, Ibukiyama, Kohu, Hikone, Misima, and Matumoto ; IV at Osima, Toyooka, Kanazawa, Yokohama, and Siomisaki ; II-III at Hirosima, Wakayama, Titibu, Yonago, Niigata, Wazima, and Koti.
Epicentre 34°·8N. 137°·1E. Very shallow.
Seismological Bulletin of the Central Meteorological Observatory, Japan, 1945, Tokyo, 1951, p. 16.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Gihu	0·6	342	0 14 a	− 1	0 20	− 6	—	—	—
Hikone	0·8	307	0 18 a	0	—	—	—	—	—
Omaesaki	1·0	101	0 20 a	− 1	0 32	− 4	—	—	—
Kohu	1·5	57	0 29	+ 1	0 54	+ 5	—	—	—
Kobe	1·5	266	0 29 k	+ 1	0 49	0	—	—	—
Misima	1·6	79	0 29 k	− 1	0 50	− 1	—	—	—
Wakayama	1·6	249	0 31 k	+ 1	0 56	+ 5	—	—	—
Siomisaki	1·7	217	0 30 k	− 1	0 57	+ 3	—	—	—
Osima	1·9	91	0 24 a	−10	0 53	− 6	—	—	—
Toyooka	2·0	298	0 35	0	1 3	+ 1	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Mera		2·3	87	0 46	+ 6	—	—	—	—	—
Yokohama		2·3	74	0 42k	+ 2	1 12	+ 3	—	—	—
Wazima		2·6	358	1 23	S*	—	—	—	—	—
Utunomiya		2·9	53	0 51	+ 3	1 29	+ 5	—	—	—
Kôti		3·1	246	0 52k	+ 1	1 31	+ 2	—	—	—
Mito		3·2	61	0 56	+ 4	1 44	S_g	—	—	—
Hirosima		3·8	265	1 17	P_g	—	—	—	—	—
Hamada		4·1	273	1 6k	+ 1	1 58	+ 3	—	—	—
Hukusima		4·1	43	1 7k	+ 2	2 9	S*	—	—	—
Sendai		4·7	41	1 12k	− 2	2 11	+ 1	—	—	—
Izuka		5·4	259	1 23	− 1	2 32	+ 4	—	—	—
Mizusawa		5·4	36	1 27	+ 3	2 26	− 2	—	—	—
Akita		5·5	25	1 24	− 1	3 6	S_g	—	—	—
Kumamoto		5·6	251	1 24k	− 3	2 26	− 7	—	—	—
Morioka		5·9	33	1 20k	−11	2 34	− 6	—	—	—
Hatinohe		6·8	31	1 45	+ 1	3 8	+ 5	—	—	—
Vladivostok		9·2	336	i 2 22	+ 6	i 4 28	+25	—	—	—
Calcutta	N.	44·0	267	e 8 43	+32	i 15 15	+32	i 19 9	SSS	—
Andijan		50·4	297	9 4	+ 3	e 16 18	+ 4	—	—	—
New Delhi	N.	50·6	281	—	—	i 16 11	− 6	i 21 2	SSS	22·2
Tashkent		52·5	299	9 20	+ 3	16 45	+ 2	—	—	—
College		52·9	31	e 9 20	0	e 16 50	+ 2	e 11 18	PP	e 24·8
Hyderabad	N.	54·6	268	9 31	− 1	17 9	− 2	20 48	SS	26·7
Bombay		58·5	272	e 9 59	− 1	i 18 1	− 2	19 51	S_cS	—
Kodaikanal	E.	59·3	261	(i 10 0)	− 6	(18 30)	PS	(12 10)	PP	(29·5)
Sitka		60·2	39	i 10 16	+ 4	e 18 27	+ 2	i 18 31	PS	e 25·6
Baku		66·5	304	e 11 2	+ 8	i 19 47	+ 3	—	—	—
Riverview		69·5	167	—	—	e 20 18	− 2	e 21 15	PPS	e 34·1
Grand Coulee		73·4	43	i 11 33	− 3	e 21 2	− 3	—	—	—
Shasta Dam		75·3	51	i 11 44	− 3	e 21 25	− 1	—	—	—
Copenhagen		78·2	332	e 12 3	0	—	—	—	—	41·3
Bozeman		79·1	42	—	—	e 22 7	0	e 22 52	PS	e 39·0
Ksara		79·5	304	—	—	e 22 51	PS	—	—	e 32·9
Tinemaha		80·0	52	e 12 14	+ 1	—	—	—	—	—
Santa Barbara	Z.	80·6	55	i 12 14	− 2	—	—	—	—	—
Haiwee	E.	80·8	52	e 12 19	+ 2	—	—	—	—	—
Mount Wilson		81·8	54	i 12 21	− 1	—	—	i 12 25	P_cP	—
Pasadena		81·8	54	i 12 21	− 1	e 23 26	PS	i 12 26	P_cP	e 37·1
Sofia		81·9	317	e 13 20?	+57	e 22 38	+ 2	—	—	e 46·8
Belgrade		82·1	320	e 12 25	+ 1	e 24 7	PPS	—	—	e 51·4
Cheb		82·3	328	e 13 20?	+55	e 22 39	− 1	—	—	e 44·3
Riverside	Z.	82·4	54	i 12 23	− 2	—	—	—	—	—
Boulder City		82·9	51	i 12 26	− 2	—	—	—	—	—
Palomar		83·1	54	i 12 27	− 2	—	—	i 12 32	P_cP	—
Pierce Ferry		83·3	50	i 12 29	− 1	i 22 54	+ 4	—	—	—
Helwan		84·9	303	12 38	0	23 2	− 4	15 56	PP	—
Uccle		85·1	333	e 12 39?	0	e 23 3	− 5	—	—	e 41·3
Basle		86·3	329	e 12 43	− 2	e 24 13	PS	—	—	—
Kew		86·3	334	—	—	e 23 24	+ 4	—	—	e 45·3
Tucson		87·8	52	e 12 48	− 4	—	—	e 16 32	PP	—
Florissant	E.	94·6	35	i 17 21	PP	e 24 43	+ 8	—	—	—
Seven Falls		94·7	18	—	—	e 24 38	+ 2	—	—	42·3
Ottawa		94·9	22	—	—	e 24 38	+ 1	—	—	45·3
Bermuda		110·1	18	—	—	e 26 50	{+44}	e 32 55	?	e 52·7
Huancayo		142·9	60	e 20 22	?	e 29 34	{− 4}	e 22 44	PP	e 69·6
La Paz		151·0	56	(19 39)	[−10]	(26 41)	[−14]	(20 0)	PKP_2	(79·3)

Additional readings :—
Mizusawa SN =2m.24s.
College eS_cS =19m.8s.
Bombay SSE =21m.58s.
Kodaikanal readings decreased by 5½ minutes.
Riverview iE =20m.24s., eQE =30m.44s.
Pasadena iZ =14m.24s.
Belgrade e =13m.8s. and 25m.50s.
Helwan eZ =15m.13s.
Huancayo e =23m.28s.
La Paz iPP =(24m.52s.), readings increased by 5 minutes.
Long waves were also recorded at Colombo and at other European stations.

Jan. 16d. Readings also at 7h. (near Apia), 13h. (Auckland, Wellington, Arapuni, Christchurch, Riverview, and Sydney), 14h. (Riverside and Tucson), 16h. (Riverview, Christchurch, Wellington, and Auckland), 17h. (near Malaga and Granada, and near Andijan), 18h. (near San Juan), 19h. (La Paz), 23h. (Palomar, Mount Wilson, Tucson, and Riverside).

Jan. 17d. 3h. 59m. 24s. Epicentre 35°·5S. 71°·0W. Depth of focus 0·005.
(as on 1940 October 24d.).

Intensity V-VI near the coast. Epicentre 35½°S. 72°W. Depth about 60kms.

Federico Greve.
Instituto Sismológico de la Universidad de Chile, año 1945. Lista de Sismos sensibles al Hombre recolectados por medio del Servicio de Postales Informativas, p. 1.

$A = +·2657$, $B = -·7715$, $C = -·5781$; $\delta = +1$; $h = 0$;
$D = -·946$, $E = -·326$; $G = -·188$, $H = +·547$, $K = -·816$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
La Plata	N.	10·7	90	2 36	+ 3	4 36	+ 4	—	—	5·2
La Paz	Z.	19·1	10	4 18	− 2	7 48	+ 1	—	—	9·6
Huancayo		23·7	350	e 5 9	+ 2	e 9 13	− 1	5 53	PPP	e 11·3
Bogota		40·0	355	i 7 24	− 6	—	—	e 8 44	PP	—
St. Louis		75·9	345	e 11 39	− 2	e 22 13	PPS	i 11 54	pP	—
Florissant	Z.	76·1	345	i 11 41	− 1	—	—	i 11 57	pP	—
Tucson		77·1	326	i 11 47	− 1	—	—	i 12 3	pP	—
Palomar		80·8	323	i 12 8k	0	—	—	i 12 23	pP	—
Riverside		81·6	322	i 12 12k	0	—	—	i 12 28	pP	—
Pierce Ferry		81·7	326	i 12 12	− 1	i 22 18	− 1	i 12 28	pP	—
Boulder City		82·0	325	i 12 14	0	—	—	i 12 30	pP	—
Mount Wilson		82·1	322	i 12 15k	0	—	—	i 12 30	pP	—
Pasadena		82·1	322	i 12 14k	− 1	—	—	i 12 30	pP	—
Haiwee		83·6	323	e 12 25	+ 2	—	—	—	—	—
Tinemaha		84·5	323	i 12 28	+ 1	—	—	—	—	—
Shasta Dam		89·3	323	i 12 49	− 1	—	—	i 13 4	pP	—
Grand Coulee		93·5	330	i 13 8	− 2	—	—	i 13 24	pP	—

Additional readings:—
La Plata PE = 2m.40s.
Huancayo i = 5m.24s.
Bogota i = 7m.45s.
Mount Wilson iZ = 12m.24s.

Jan. 17d. 15h. 1m. 27s. Epicentre 9°·8S. 119°·1E. (as on 1938 December 21d.).

$A = -·4793$, $B = +·8612$, $C = -·1691$; $\delta = -1$; $h = +7$;
$D = +·874$, $E = +·486$; $G = +·082$, $H = -·148$, $K = -·986$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Perth		22·3	187	5 1	0	9 3	+ 1	5 23	PP	—
Brisbane	E.	36·5	123	e 7 9	0	e 12 37	−14	i 15 15	SS	e 21·7
Riverview		37·9	135	i 7 25a	+ 5	i 13 8	− 5	e 8 49	PP	e 19·8
Sydney		37·9	135	e 7 36	+16	e 13 9	− 4	—	—	e 21·0
Colombo	E.	42·5	292	7 57	− 2	14 33	+11	—	—	—
Calcutta	N.	44·1	318	e 10 54	PPP	i 14 41	− 4	—	—	—
Kodaikanal	E.	45·9	295	(8 22)	− 4	(14 52)	−19	(17 52)	SS	(21·5)
Bombay	E.	53·8	302	e 9 27	+ 1	i 17 0	− 1	—	—	24·6
New Delhi	N.	55·6	314	—	—	i 17 32	+ 7	—	—	—
Christchurch		57·2	137	17 39	S	(17 39)	− 7	24 21	SSS	31·0
Andijan		66·2	323	e 10 51	− 1	—	—	—	—	—
Tashkent		68·4	322	11 6	0	e 20 5	− 2	—	—	—
Ksara		89·8	304	i 13 4	+ 2	e 24 24	+31	—	—	—
Shasta Dam		117·9	49	e 18 54	[+ 6]	—	—	—	—	—
Grand Coulee		118·4	40	e 18 48	[− 2]	—	—	i 20 10	PP	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tinemaha		121·8	52	e 19 9	[+13]	—	—	e 20 47	PP	—
Haiwee		122·2	53	e 19 8	[+11]	—	—	—	—	—
Pasadena	z.	122·4	56	i 19 9	[+12]	—	—	—	—	—
Mount Wilson		122·5	56	i 19 3	[+ 5]	—	—	i 19 9	?	—
Riverside	z.	123·1	56	e 19 2	[+ 3]	—	—	e 20 45	PP	—
Palomar	z.	123·7	57	i 19 11	[+11]	—	—	i 20 49	PP	—
Boulder City		124·7	52	e 19 7	[+ 5]	—	—	i 20 48	PP	—
Pierce Ferry		125·3	52	e 19 3	[0]	—	—	—	—	—
Tucson		128·9	56	e 19 18	[+ 8]	—	—	—	—	e 92·0
St. Louis	z.	141·1	37	e 19 38	[+ 6]	—	—	—	—	—

Additional readings :—
Brisbane eE = 17m.38s.
Riverview eSN = 13m.3s., iSSNZ = 15m.50s.
Kodaikanal readings decreased by 11 minutes.
Christchurch Q = 27m.13s.
Grand Coulee e = 18m.59s.
Riverside iZ = 19m.10s.
Boulder City iP = 19m.14s.
Pierce Ferry i = 19m.14s., e = 19m.50s.
Tucson i = 19m.23s., e = 19m.51s.
Long waves were also recorded at Auckland, Arapuni, Wellington, and Uccle.

Jan. 17d. Readings also at 2h. (Mizusawa), 5h. (near Bogota), 9h. (Chur), 10h. (Uccle and St. Louis), 11h. (St. Louis, Uccle, and Riverview), 17h. (near Andijan), 20h. (Copenhagen and Tananarive), 21h. (Auckland).

Jan. 18d. 3h. 12m. 48s. Epicentre 61°·5N. 30°·0W. (as on 1942 May 15d.).

Doubtful identification :

$A = +\cdot4153$, $B = -\cdot2398$, $C = +\cdot8775$; $\delta = -2$; $h = -9$;
$D = -\cdot500$, $E = -\cdot866$; $G = +\cdot760$, $H = -\cdot439$, $K = -\cdot480$

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Reykjavik		4·5	51	(e 1 51)	P_g	(e 2 22)	S*	—	—	(e 3·2)
Stonyhurst		16·5	105	i 4 22	+28	—	—	—	—	e 8·8
Paris		22·2	111	e 5 47	PP	—	—	—	—	e 11·2
Upsala		23·0	74	e 6 12?	?	—	—	—	—	e 12·2
Coimbra		25·1	138	e 5 9	−19	9 37	−14	—	—	11·3
Collmberg	z.	25·4	95	e 5 56	+25	—	—	—	—	—
Neuchatel		25·6	107	e 5 52	+20	—	—	—	—	—
Cheb		25·9	97	—	—	e 10 12?	+ 8	—	—	e 16·2
Zürich		26·1	105	e 5 57k	+20	—	—	—	—	—
Lisbon		26·2	141	5 29a	− 9	10 0	− 9	—	—	11·1
Toledo		26·8	133	i 5 44	0	—	—	6 14	PP	—
Chur		26·9	106	e 6 5	+20	—	—	—	—	e 15·7
Granada		29·4	134	6 3k	− 4	9 29	?	11 27	SS	12·6
Malaga	z.	29·5	135	e 6 2	− 6	e 9 43	−79	e 6 18	PP	e 12·0
Triest		29·7	102	—	—	i 7 55	PPP	—	—	—
Ottawa		30·8	261	—	—	e 9 54	?	—	—	14·2
Philadelphia		34·8	252	—	—	e 11 38	−47	—	—	e 15·1
Florissant		42·9	266	e 9 24	PP	e 13 56	−31	—	—	e 20·0
St. Louis		42·9	266	e 7 46	−16	e 14 2	−25	—	—	e 19·5
Grand Coulee		49·1	297	e 8 56	+ 5	—	—	—	—	—
Ksara		49·5	93	e 9 23?	+29	e 17 41?	?	—	—	—
San Juan		50·0	227	e 11 3	PP	e 15 5	−64	—	—	e 18·8
Helwan		50·6	99	e 9 21	+19	16 54	+37	e 10 53	PP	—
Pierce Ferry		56·2	284	i 9 41	− 3	—	—	—	—	—
Shasta Dam		56·3	294	i 9 48	+ 3	—	—	—	—	—
Boulder City		56·8	285	e 9 46	− 2	—	—	—	—	—
Tinemaha	E.	57·4	289	e 9 56	+ 3	—	—	—	—	—
Tucson		57·9	279	i 9 52	− 4	e 17 51	− 4	e 11 42	PP	e 27·7
Riverside	z.	59·6	287	i 10 6a	− 2	—	—	e 11 54	PP	—
Mount Wilson	z.	59·7	287	i 10 8a	− 1	—	—	—	—	—
Pasadena		59·8	287	e 10 8	− 1	—	—	—	—	e 30·8
Palomar		59·9	285	i 10 9a	− 1	—	—	e 11 45	PP	—

For Notes see next page.

NOTES TO JANUARY 18d. 3h. 12m. 48s.

Additional readings :—
Reykjavik eE =(2m.0s.) readings all diminished by 3m.
Coimbra ? =8m.1s.
Lisbon PP?E =5m.45s.?, S?E =7m.31s.?, S?N =8m.4s.?
Malaga PPPZ =6m.35s., eZ =8m.35s.
St. Louis eZ =9m.26s.
Helwan PPP?Z =12m.3s.
Boulder City i =10m.41s.
Long waves were also recorded at Christchurch, Wellington, and other American and European Stations.

Jan. 18d. 3h. 45m. 12s. Epicentre 61°·5N. 30°·0W. (as at 3h. 12m.).

		△	Az.	P.	O−C.	S.	O−C.		Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m.	s.		m.
Reykjavik		4·5	51	—	—	(i 2 21)	S*	(e 2 30)	S_e	(e 3·1)	
Coimbra		25·1	138	e 4 43	?	7 55	?	—	—	10·9	
Collmberg	z.	25·4	95	e 5 59	+28	—	—	—	—	—	
Lisbon		26·2	141	5 30k	− 8	9 26	−43	5 39	P	11·5	
Toledo		26·8	133	i 5 45	+ 1	—	—	i 6 15	PP	—	
Granada		29·4	134	6 6k	− 1	(11 0)	− 1	—	—	11·0	
Malaga	z.	29·5	135	e 6 4	− 4	i 9 41	?	—	—	11·8	
Ottawa		30·8	261	e 9 48?	?	—	—	—	—	14·8	
Philadelphia		34·8	252	—	—	e 11 41	−44	—	—	e 17·3	
St. Louis		42·9	266	i 7 50	−12	e 14 3	−24	—	—	e 20·0	
Ksara		49·5	93	e 11 15	PP	—	—	—	—	—	
San Juan		50·0	227	—	—	e 15 8	−61	—	—	e 18·9	
Helwan		50·6	99	e 9 24	+22	16 54	+37	—	—	—	
Pierce Ferry		56·2	284	i 9 43	− 1	—	—	—	—	—	
Boulder City		56·8	285	e 9 50	+ 2	—	—	—	—	—	
Tinemaha	E.	57·4	289	e 10 3	+10	—	—	—	—	—	
Tucson		57·9	279	i 9 55	− 1	—	—	—	—	e 31·6	
Riverside	z.	59·6	287	e 10 8	0	—	—	—	—	—	
Mount Wilson	z.	59·7	287	i 10 10	+ 1	—	—	—	—	—	
Pasadena		59·8	287	i 10 13	+ 4	—	—	—	—	e 32·4	
Palomar		59·9	285	i 10 12	+ 2	—	—	—	—	—	

Additional readings :—
Reykjavik readings have been diminished by 3m.
Coimbra ? =5m.21s.
Toledo iP_cPN =9m.16s.
Granada S =9m.23s.
Long waves were also recorded at other American and European stations.

Jan. 18d. 3h. 58m. 34s. Epicentre 61°·5N. 30°·0W. (as at 3h.45m.).

		△	Az.	P.	O−C.	S.	O−C.		Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m.	s.		m.
Coimbra		25·1	138	e 5 21	− 7	7 28	?	—	—	10·5	
Collmberg	z.	25·4	95	e 6 2	+31	—	—	—	—	—	
Toledo		26·8	133	i 5 45	+ 1	—	—	—	—	—	
St. Louis		42·9	266	i 7 52	−10	—	—	—	—	e 20·8	
Grand Coulee		49·1	297	i 14 21	?	—	—	—	—	—	
Pierce Ferry		56·2	284	i 9 48	+ 4	—	—	e 14 2	?	—	
Boulder City		56·8	285	i 9 48	0	—	—	e 13 58	?	—	
Tucson		57·9	279	i 9 57	+ 1	—	—	—	—	e 32·8	
Riverside	z.	59·6	287	i 10 11	+ 3	—	—	—	—	—	
Mount Wilson	z.	59·7	287	i 10 13	+ 4	—	—	—	—	—	
Pasadena		59·8	287	e 10 12	+ 3	—	—	—	—	e 35·0	
Palomar		59·9	285	i 10 13	+ 3	—	—	—	—	—	

Long waves were recorded at Chicago and Rapid City.

Jan. 18d. 18h. 6m. 17s. Epicentre 17·°5N. 94°·1W. (as on 1943 Jan. 31d.).

Strong at Coatzacoalos. Tacubaya gives 17°42′N, 94°7′W.

A = −·0682, B = −·9519, C = +·2989; δ = +11; h = +5;
D = −·997, E = +·071; G = −·021, H = −·298, K = −·954.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Vera Cruz		2·6	311	0 46	+ 2	e 1 12	− 5	—	—	—
Puebla	N.	4·2	292	e 1 9	+ 2	2 1	+ 4	—	—	—
Tacubaya	Z.	5·2	292	1 22	+ 1	—	—	—	—	2·6
Merida		5·4	50	e 1 28	+ 4	i 2 20	− 8	—	—	i 2·8
Tucson		21·1	319	i 4 48	0	e 9 6	+27	i 5 11	PP	e 12·6
St. Louis		21·3	9	i 4 50	0	i 8 48	+ 5	—	—	—
Florissant		21·5	9	i 4 50	− 2	e 8 48	+ 1	—	—	—
Pierce Ferry		25·6	321	i 5 32	0	—	—	—	—	e 15·1
Palomar		25·8	313	i 5 35k	+ 1	—	—	—	—	—
La Jolla		25·9	311	e 5 35	0	—	—	—	—	—
Boulder City		26·0	320	i 5 34	− 2	—	—	—	—	e 14·6
Riverside		26·5	314	i 5 41k	0	—	—	—	—	—
San Juan		26·6	83	e 5 41	− 1	e 10 31	+15	—	—	e 14·7
Mount Wilson		27·1	314	i 5 47k	+ 1	—	—	—	—	—
Pasadena	Z.	27·2	314	i 5 47	0	—	—	—	—	e 13·8
Haiwee	N.	28·1	317	e 5 58	+ 3	—	—	—	—	—
Tinemaha	Z.	28·9	318	i 6 2	− 1	—	—	—	—	—
Grand Coulee		36·5	332	e 7 7	− 2	—	—	—	—	—

Additional readings :—
Vera Cruz iZ = 0m.49s.
Tacubaya PN = 1m.25s.
Tucson i = 4m.52s. and 5m.54s.
St. Louis eZ = 5m.3s., iZ = 5m.18s., iE = 9m.6s.
Florissant eE = 9m.8s.
Pierce Ferry i = 5m.41s.
Boulder City i = 5m.46s.
Riverside i = 5m.43s. and 5m.52s.
Mount Wilson iZ = 5m.58s. and 6m.15s.
Pasadena iZ = 5m.49s.
Grand Coulee i = 7m.17s.
Long waves were also recorded at Bermuda and Shasta Dam.

Jan. 18d. Readings also at 3h. (Stonyhurst and Kew), 4h. (Mount Wilson, Pasadena, Palomar, Riverside, Tucson, Riverview, Auckland, and near Apia), 6h. (near Bogota), 18h. (near Mizusawa), 19h. (Merida, Tacubaya, and near Vera Cruz), 21h. (near Granada), 22h. (Andijan, Kodaikanal, and Ksara).

Jan. 19d. Readings at 1h. (Tacubaya, near Almeria, Malaga, and Granada (2)), 3h. (near Malaga (2) and near Apia), 4h. (Tananarive), 5h. (Tucson, Pierce Ferry, Boulder City, near Andijan), 6h. (Tucson, Shasta Dam, Palomar, Riverside, Mount Wilson, Pasadena, and near Granada), 7h. (near Granada and near Andijan), 9h. (near Malaga), 11h. (near Malaga and Granada), 14h. (Mizusawa and near La Paz), 15h. (Tacubaya), 16h. (Bucharest), 18h. (Auckland and near Mizusawa), 19h. (Riverview), 22h. (Grand Coulee, Shasta Dam, Tinemaha, Pasadena, Mount Wilson, Riverside, Palomar, Boulder City, Pierce Ferry, and Tucson), 23h. (Bucharest, Pierce Ferry, Tinemaha, Riverside, Tucson, Harvard, Huancayo, Bogota, near San Juan, and near Andijan).

Jan. 20d. 16h. Undetermined shock.

Wellington eZ = 1m., Q? = 17m.?, RZ = 18m.
Apia eP = 3m.59s., iS = 4m.28s.
Arapuni e = 4m.?, L? = 12m.
Auckland P = 8m.11s., S = 12m.46s., L = 15·3m.
Riverview ePZ = 10m.13s., eZ = 12m.33s., eN = 19m.42s., eLE = 22m.12s.
Pierce Ferry iP = 14m.26s., i = 15m.6s.
Mount Wilson iP = 14m.43s.
Pasadena iP = 14m.43s., eZ = 14m.54s., eLZ = 38·8m.
Riverside iPZ = 14m.45s.
Palomar iPZ = 14m.47s., iZ = 14m.59s.
Shasta Dam iP = 14m.50s.
Haiwee ePEN = 14m.53s.
Tinemaha iPEZ = 14m.53s.

Continued on next page.

Boulder City iP =15m.3s., i =15m.16s.
Tucson iP =15m.8s., e =15m.26s., eL =41m.28s.
Grand Coulee iP =15m.27s.
Collmberg eZ =22m.53s.
Ksara e =23m.3s. and 26m.13s.
Long waves were also recorded at Christchurch.

Jan. 20d. Readings also at 1h. (La Plata), 2h. (Ksara), 6h. and 7h. (near Tacubaya), 17h. (Wellington), 22h. (Clermont-Ferrand, near Basle, and near Malaga), 23h. (near Granada).

Jan. 21d. Readings at 0h. and 2h. (near Ksara), 7h. (near Mizusawa), 11h. (Zürich), 14h. (near College), 15h. (near Andijan), 21h. (near Mizusawa).

Jan. 22d. 7h. 47m. 48s. Epicentre 20°·0N. 69°·5W.

Felt at Ciudad Trujillo. Epicentre 20°N. 70°W. (U.S.C.G.S.).
Annales de l'Institut de Physique du Globe de Strasbourg, 2ème partie, Séismologie, Tome X, Strasbourg, 1951, p. 23.

$A = +\cdot3293$, $B = -\cdot8808$, $C = +\cdot3400$; $\delta = -15$; $h = +5$;
$D = -\cdot937$, $E = -\cdot350$; $G = +\cdot119$, $H = -\cdot318$, $K = -\cdot940$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Port au Prince		3·0	242	i 0 18	−32	1 15	−12	0 45	P	—
San Juan		3·6	116	i 1 7	+ 9	1 44	+ 2	i 1 25	P_g	i 2·2
Bermuda		13·1	19	e 3 9	− 1	e 5 33	− 5	i 3 30	PPP	e 5·9
Balboa Heights		14·7	223	e 3 9	−22	e 6 2	−14	—	—	—
Bogota		15·9	197	i 3 47	0	e 6 41	− 3	i 3 55	PP	—
Columbia		17·3	326	—	—	e 7 20	+ 4	—	—	—
Philadelphia		20·5	349	i 4 42	0	i 8 28	+ 1	—	—	e 11·8
Fordham		21·1	351	e 4 53	+ 5	i 8 33	− 6	i 9 8	SS	—
New Kensington		22·3	339	e 5 18	+17	i 9 15	+13	—	—	e 12·2
Pittsburgh		22·3	339	e 4 7	−54	—	—	—	—	8·1
St. Louis		25·8	321	e 5 33	− 1	e 10 11	+ 9	—	—	e 12·7
Ottawa		25·9	350	e 5 37	+ 2	(10 12)	+ 8	—	—	10·2
Florissant	E.	26·0	321	—	—	e 10 9	+ 3	—	—	e 12·4
Chicago		26·6	328	e 6 11	+29	e 10 18	+ 2	e 6 28	PP	e 12·8
Shawinigan Falls		26·6	356	e 5 45	+ 3	—	—	—	—	18·2
Seven Falls		27·1	358	e 6 1	+15	—	—	—	—	11·2
Huancayo		32·4	191	e 6 33	− 1	i 11 54	+ 6	i 7 52	PPP	e 15·3
La Paz		36·3	178	i 7 8	+ 1	12 50	+ 2	8 35	PP	20·2
Rapid City		36·9	318	e 7 12	0	e 12 39	−19	e 9 0	PPP	e 18·7
Tucson		38·8	297	i 7 27	− 1	e 13 34	+ 8	i 8 50	PP	e 22·3
Pierce Ferry		42·0	302	i 7 54	0	—	—	—	—	—
Boulder City		42·7	302	i 8 0	0	—	—	—	—	—
Palomar	Z.	44·0	298	i 8 10a	− 1	—	—	i 10 7	PP	—
La Jolla	Z.	44·3	297	e 8 13	0	—	—	—	—	—
Riverside	Z.	44·5	299	i 8 14a	− 1	—	—	—	—	—
Pasadena	Z.	45·2	299	i 8 18	− 2	—	—	e 19 14	SSS	e 28·5
Tinemaha	Z.	45·6	303	i 8 22	− 2	—	—	i 9 50	PP	—
Grand Coulee		48·5	317	e 8 45	− 1	—	—	—	—	—
Shasta Dam		49·3	307	e 8 49	− 4	—	—	—	—	—
Lisbon		54·9	56	—	—	17 24	+ 8	24 0	Q	25·1
Coimbra		55·5	54	e 9 56	+17	17 37	PPS	13 7	PPP	e 26·6
Malaga		58·6	58	e 10 11	+10	e 18 44	PPS	—	—	e 29·2
Toledo		58·8	55	e 10 11	+ 9	e 18 12	+ 5	—	—	—
Granada		59·3	58	10 30a	+24	19 17	+63	23 29	?	28·4
Ksara		91·1	53	e 13 50	+42	e 25 34	PPS	—	—	—
Colombo	E.	139·7	53	e 28 12?	?	—	—	—	—	—

Additional readings :—
Port au Prince iNW? =0m.32s., S* =1m.39s., i =2m.32s.
Bogota iPP? =3m.50s., i =7m.2s.
Fordham iP =4m.57s., e =8m.50s., i =8m.59s.
St. Louis iPZ =5m.38s., iSN =10m.18s.
Chicago eS =10m.32s.
Rapid City e =15m.23s.
Tucson i =7m.51s., e =10m.26s.
Long waves were also recorded at College and at other American and European stations.

Jan. 22d. Readings also at 2h. (near Andijan), 6h. (near Mizusawa), 7h. (Palomar, Riverside, Tucson, and Pasadena), 8h. (Fordham), 11h. (near Apia), 23h. (near Bogota).

Jan. 23d. 19h. 31m. 16s. Epicentre 49°·5N. 142°·3E. Depth of focus 0·080.

$A = -\cdot5159$, $B = +\cdot3987$, $C = +\cdot7582$; $\delta = -2$; $h = -5$;
$D = +\cdot612$, $E = +\cdot791$; $G = -\cdot600$, $H = +\cdot464$, $K = -\cdot652$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Vladivostok		9·6	232	i 2 15	0	i 4 4	+ 2	—	—
Mizusawa	E.	10·4	185	2 23	0	4 14	− 3	—	—
Irkutsk		24·0	292	e 4 32	− 2	—	—	14 14	ScS
Sverdlovsk		46·7	312	7 43	+ 1	13 53	+ 1	9 33	pP
Tashkent		50·0	290	e 8 9	+ 3	i 14 38	+ 1	e 9 59	pP
Moscow		57·9	320	i 9 0	− 2	i 16 15	− 5	i 10 54	pP
Grand Coulee		60·3	51	e 11 17	pP	—	—	—	—
Shasta Dam		63·5	58	e 9 38	− 1	—	—	i 11 41	pP
Tinemaha	z.	68·3	58	i 10 8	− 1	—	—	i 12 14	pP
Mount Wilson	z.	70·5	60	i 10 22a	0	—	—	i 12 23	pP
Pasadena	z.	70·5	60	i 10 21	− 1	—	—	i 12 22	pP
Riverside	z.	71·0	60	i 10 25	0	—	—	i 12 27	pP
Boulder City		71·0	57	i 10 26	+ 1	—	—	e 12 26	pP
Pierce Ferry		71·3	56	i 10 27	+ 1	—	—	i 12 29	pP
Palomar		71·8	60	i 10 29	0	—	—	i 12 34	pP
Basle		75·7	330	e 10 51	0	—	—	—	—
Tucson		76·0	57	i 10 53	0	—	—	i 12 59	pP

Additional readings :—
Mizusawa SN = 4m.17s.
Moscow sS = 19m.34s.
Pasadena iZ = 12m.44s.
Boulder City i = 12m.30s.
Pierce Ferry i = 12m.33s.

Jan. 23d. Readings also at 0h. (near Bogota and near Tacubaya), 6h. (Riverview and Christchurch), 7h. (Mount Wilson, Tucson, and Palomar), 11h. (near Tucson), 13h. (near San Juan), 18h. (near Andijan), 21h. (Tucson, near Boulder City, and Pierce Ferry), 23h. (La Paz, La Plata, St. Louis, Mount Wilson, Pasadena, Palomar, Riverside, Tucson, Tinemaha, and near Bogota).

Jan. 24d. 9h. 30m. 44s. Epicentre 29°·8N. 139°·0E. Depth of focus 0·060.
(as on 1943, Nov. 12d.).

$A = -\cdot6560$, $B = +\cdot5702$, $C = +\cdot4945$; $\delta = -1$; $h = +2$;
$D = +\cdot656$, $E = +\cdot755$; $G = -\cdot373$, $H = +\cdot324$, $K = -\cdot869$.

	△	Az.	P.	O−C.	S.	O−C.	Supp.	
	°	°	m. s.	s.	m. s.	s.	m. s.	
Siomisaki	4·6	324	1 5	−14	2 9	−13	—	—
Osima	4·9	4	1 22	0	2 27	0	—	—
Kameyama	5·5	338	1 31	+ 3	—	—	—	—
Wakayama	5·5	325	1 30	+ 2	—	—	—	—
Yokohama	5·6	5	1 30	0	2 40	0	—	—
Hunatu	5·7	358	1 32	+ 1	—	—	—	—
Kobe	5·8	327	1 34	+ 2	2 45	+ 1	—	—
Gihu	5·9	342	1 29	− 4	2 41	− 5	—	—
Hikone	5·9	338	1 36	+ 3	—	—	—	—
Tokyo	5·9	6	1 33	0	2 46	0	—	—
Tukubasan	6·4	8	1 38	0	2 50	− 5	—	—
Mito	6·7	10	1 42	+ 1	2 59	− 2	—	—
Utunomiya	6·7	6	1 42	+ 1	—	—	—	—
Onahama	7·2	12	1 36	−11	2 58	−14	—	—
Kumamoto	7·7	295	1 54k	+ 1	3 24	+ 2	—	—
Hamada	7·8	312	1 53	− 1	3 24	0	—	—
Hukusima	8·0	8	1 59	+ 3	3 28	0	—	—
Aikawa	8·2	356	3 35	S	(3 35)	+ 3	—	—
Sendai	8·6	10	2 0a	− 3	3 38	− 2	—	—
Mizusawa	9·5	10	2 14	+ 1	3 59	0	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Akita		9·9	5	2 29	+11	4 15	+ 8	—	—
Morioka		10·0	10	2 21	+ 2	4 10	+ 1	—	—
Hatinohe		10·9	10	2 50	+21	4 47	+19	—	—
Sapporo		13·3	8	3 47	+51	—	—	—	—
Frunse		52·3	303	e 8 31	− 2	—	—	—	—
Andijan		54·3	301	e 8 43	− 5	15 48	− 4	—	—
Tashkent		56·5	303	9 0	− 3	16 16	− 5	—	—
Sverdlovsk		59·4	322	i 9 17	− 6	i 16 50	− 8	—	—
Riverview		64·3	169	e 8 28	?	—	—	—	—
Moscow		71·9	325	10 35	− 6	19 17	−11	—	—
Grand Coulee		75·9	43	i 11 2	− 2	—	—	—	—
Shasta Dam		77·2	50	i 11 15	+ 4	—	—	—	—
Tinemaha		81·7	53	i 11 35a	0	—	—	e 14 44	PP
Santa Barbara		82·1	55	i 11 36	− 1	—	—	—	—
Haiwee		82·4	53	i 11 38	0	—	—	—	—
Pasadena		83·3	55	i 11 40	− 3	—	—	—	—
Mount Wilson		83·4	55	i 11 42a	− 1	—	—	e 13 16	pP
Riverside		84·0	55	i 11 44a	− 2	—	—	—	—
La Jolla		84·6	56	i 11 50	+ 1	—	—	—	—
Boulder City		84·7	52	i 11 49	− 1	—	—	—	—
Palomar		84·7	55	i 11 48a	− 2	—	—	—	—
Pierce Ferry		85·2	51	i 11 51	− 1	—	—	i 13 27	pP
Tucson		89·5	53	i 12 11	− 1	—	—	e 15 50	PP
La Paz	z.	151·8	68	19 0	[+ 1]	—	—	—	—

Additional readings :—
Grand Coulee i =11m.40s.
Tinemaha iZ =12m.9s., eZ =13m.37s.
Mount Wilson iZ =12m.11s.
Riverside iZ =12m.6s.
Palomar iNZ =12m.4s., eZ =14m.9s.
Pierce Ferry i =15m.12s.
Tucson e =12m.38s.

Jan. 24d. Readings also at 0h. (Auckland and Christchurch), 1h. (New Delhi), 2h. (near Apia), 5h. (Mizusawa), 11h. (Riverside, Tinemaha, and Palomar), 2h. (near Andijan), 13h. (near Andijan, Frunse, and Tashkent), 16h. (Mount Wilson, Tucson, Palomar, Riverside, and Tinemaha), 17h. (near Mizusawa), 20h. (Collmberg, Riverview, and near Ottawa).

Jan. 25d. 0h. Undetermined shock.

Grand Coulee eP =38m.32s., e =38m.37s., eS =49m.3s., e =49m.34s.
Pierce Ferry iP =39m.18s., e =49m.50s.
Shasta Dam eP =39m.18s.
Tinemaha iPZ =39m.59s., iZ =42m.7s.
Sitka eS =40m.5s., eL =42m.11s.
Haiwee ePN =40m.10s.
Boulder City eP =40m.16s., i =40m.54s.
Pasadena ePZ =40m.19s., i =40m.25s., iZ =42m.20s. and 42m.38s., eZ =44m.9s., eLNZ = 54m.59s.
Mount Wilson iPZ =40m.20s., i =40m.26s., iZ =41m.44s.
Riverside iPZ =40m.21s.
Palomar iPZ =40m.28s.
Tucson iP =40m.53s., e =44m.47s., eL =59m.22s.
Victoria e =41m.0s.?, L =47m.0s.?
Ottawa eZ =41m.6s., eN =52m.24s., L =57m.
Florissant ePN =41m.9s., eSSN =52m.13s., eLE =58·6m.
St. Louis iPZ =41m.10s., iZ =41m.28s., eSSN =52m.10s. and 52m.32s., LN =59·1m.
Moscow eP =41m.41s., eS =49m.34s.
Collmberg eZ =42m.28s.
Bozeman eS =45m.5s., eL =51m.0s.
Salt Lake City eS =46m.23s., e =49m.43s., eL =53m.8s.
Irkutsk eS =46m.24s.
Saskatoon e =46m.25s., L =50m.
Copenhagen eS =50m.0s., 51m.30s., and 53m.48s., L =58m.
Cheb eS? =51m.15s., eL =67m.
Chicago e =51m.51s., eL =55m.35s.

Continued on next page.

Ksara e =52m.22s., L? =78m.
San Juan eS =54m.19s., eL =72m.41s.
Bombay eN =iE =54m.59s., LEN =76m.
Granada S? =56m.20s., L =64·0m.
Long waves were also recorded at Christchurch, Auckland, Wellington, Riverview, Colombo, Uccle, Triest, and other American stations.

Jan. 25d. 1h. Pasadena suggests deep focus.

Shasta Dam iP =29m.44s., e =30m.31s., i =30m.36s.
Pasadena iPZ =29m.50s., ipPZ =30m.42s.
Mount Wilson iPZ =29m.51s.a, ipPZ =30m.40s.
Riverside iPZ =29m.51s.a, ipPZ =30m.39s., iZ =30m.44s.
La Jolla eP =29m.52s.
Palomar iPNZ =29m.53s.a, ipPNZ =30m.42s., eZ =31m.6s.
Tinemaha iPEZ =29m.54s.a, ipPEZ =30m.46s., iZ =31m.16s.
Haiwee ePE =29m.55s.
Boulder City iP =30m.4s., i =30m.54s.
Grand Coulee iP =30m.8s., i =30m.55s.
Pierce Ferry iP =30m.8s., i =30m.57s.
Tucson iP =30m.15s., ipP =31m.8s., eL =66m.44s.
Collmberg eZ =36m.34s.
Colombo PE =39m.?
Long waves were also recorded at Seattle, Bombay, Moscow, Copenhagen, and Uccle.

Jan. 25d. 6h. 1m. 2s. Epicentre 27°·6N. 139°·7E. Depth of focus 0·060.

A = −·6768, B = +·5740, C = +·4609; δ = −4; h = +3;
D = +·647, E = +·763; G = −·351, H = +·298, K = −·887.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Mizusawa		11·6	6	2 38	+ 1	4 36	− 6	—	—	—
Vladivostok		16·7	340	i 3 1	−30	i 5 15	−67	—	—	—
Irkutsk		36·1	323	i 6 27	+ 1	—	—	—	—	—
Calcutta	N.	46·5	276	e 9 37	PP	e 14 5	− 1	—	—	—
Andijan		56·0	302	e 8 59	− 1	e 16 17	+ 3	—	—	—
College		57·9	28	—	—	e 16 33	− 6	—	—	e 25·2
Bombay		61·4	278	i 9 38	+ 2	i 17 26	+ 3	—	—	—
Sverdlovsk		61·5	322	i 9 36	− 1	17 23	− 1	—	—	—
Moscow		74·0	325	i 10 51	− 2	i 19 47	− 4	—	—	—
Grand Coulee		77·1	43	i 11 10	0	i 20 18	− 6	e 12 36	pP	—
Shasta Dam		78·1	51	i 11 15	− 1	i 20 31	− 4	i 12 44	pP	—
Tinemaha		82·6	52	i 11 40k	+ 1	—	—	i 14 53	PP	—
Santa Barbara	z.	82·8	54	i 11 40	0	—	—	—	—	—
Haiwee		83·3	52	i 11 40	− 3	—	—	—	—	—
Mount Wilson		84·1	54	i 11 47k	0	—	—	i 13 19	pP	—
Pasadena		84·1	54	i 11 46k	− 1	—	—	i 13 18	pP	—
Riverside	z.	84·7	54	i 11 49k	− 1	—	—	e 13 20	pP	—
La Jolla		85·4	55	e 11 55	+ 2	—	—	—	—	—
Palomar		85·4	54	i 11 53k	0	—	—	i 13 25	pP	—
Ksara		85·5	305	e 11 54	0	—	—	e 17 27	PPP	—
Boulder City		85·6	51	i 11 54	0	—	—	i 13 26	pP	—
Copenhagen		85·7	333	e 11 48	− 7	e 21 40	−11	17 16	PPP	—
Pierce Ferry		86·1	51	i 11 56	0	e 20 39	−75	i 13 27	pP	—
Collmberg		88·5	329	i 12 5	− 3	—	—	e 15 38	PP	—
Cheb		89·7	330	—	—	e 24 58?	PS	—	—	e 49·0
Tucson		90·3	53	i 12 17	+ 1	—	—	—	—	—
Chur		93·3	328	e 12 29	− 1	—	—	—	—	—
Basle		93·7	329	e 12 30	− 2	—	—	—	—	—
La Paz	z.	152·0	72	i 19 3k	[+ 4]	—	—	—	—	—

Additional readings :—
Bombay eE =20m.1s.
Shasta Dam e =20m.45s.
Tinemaha iZ =12m.27s. and 13m.11s., eZ =19m.1s.
Mount Wilson iZ =14m.0s. and 14m.9s., ePKP,PKPZ =40m.45s.
Pasadena iZ =13m.59s. and 14m.7s., eEZ =21m.34s., ePKP,PKPZ =40m.46s.
Palomar eN =21m.36s.
Copenhagen 27m.34s.
Pierce Ferry iS =20m.52s.
Tucson i =12m.43s.
Long waves were also recorded at Uccle.

Jan. 25d. 22h. 2m. 7s. Epicentre 29°·0N. 143°·0E. (as on 1941 Oct. 8d.).

A = −·6996, B = +·5272, C = +·4823; δ = −1; h = +2;
D = +·602, E = +·799; G = −·385, H = +·290, K = −·876.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Mizusawa	E.	10·2	352	4 27	S	(4 27)	0	—	—
Andijan		57·7	302	e 9 57	+ 2	e 18 1	+ 8	—	—
Tashkent		59·8	303	e 10 12	+ 3	e 18 17	− 3	—	—
Grand Coulee		74·0	44	i 11 39	0	—	—	—	—
Moscow		74·5	326	e 11 43	+ 1	—	—	—	—
Shasta Dam		74·9	52	i 11 44	0	—	—	—	—
Tinemaha		79·4	54	i 12 10k	+ 1	—	—	—	—
Haiwee	E.	80·1	54	e 12 13	0	—	—	—	—
Pasadena	Z.	80·9	57	i 12 16k	− 1	—	—	—	—
Mount Wilson		81·0	57	i 12 17k	− 1	—	—	—	—
Riverside	Z.	81·6	57	i 12 19	− 2	—	—	—	—
Palomar	Z.	82·2	57	i 12 23	− 1	—	—	—	—
Boulder City		82·4	54	i 12 24	− 1	—	—	i 15 33	PP
Pierce Ferry		82·9	53	i 12 27	− 1	—	—	e 15 31	PP
Ksara		87·0	307	e 12 49	+ 1	e 24 13	PS	—	—
Tucson		87·2	55	i 12 49	0	—	—	—	—
La Paz	Z.	148·8	73	i 19 49k	[+ 4]	—	—	—	—

Additional readings :—
Mizusawa PN = 4m.12s., SEN = 8m.20s.; readings wrongly identified.
Tinemaha iZ = 12m.16s. and 12m.24s.
Pasadena iZ = 13m.1s.
Palomar iZ = 12m.37s. and 12m.44s.
Pierce Ferry i = 12m.40s.
Long waves were also recorded at Cheb, Copenhagen, and Uccle.

Jan. 25d. Readings also at 0h. (Bermuda, La Paz, and Moscow), 1h. (Ksara), 2h. (near Almata, Andijan, and Tashkent), 7h. (Chur), 20h. (near Andijan), 23h. (Boulder City, Pierce Ferry, Mount Wilson, Pasadena, Palomar, Tinemaha, and Tucson).

Jan. 26d. 21h. 6m. 11s. Epicentre 34°·0N. 138°·2E. (as on 1941 Aug. 3d.).

Intensity IV at Hunatu, Gihu; II-III at Hamamatu and Osima.
Epicentre 34°·0N. 138°·6E. Very shallow.

A = −·6193, B = +·5538, C = +·5566; δ = +3; h = 0;
D = +·667, E = +·745; G = −·415, H = +·371, K = −·831.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Hamamatu		0·8	331	0 26k	+ 8	0 43	+12	—	—
Osima		1·3	52	0 24a	− 1	0 36	− 8	—	—
Hunatu		1·6	17	0 30	0	0 53	+ 2	—	—
Mera		1·6	56	0 26	− 4	—	—	—	—
Gihu		1·8	320	0 42	+10	1 10	+14	—	—
Yokohama		1·8	40	0 30	− 2	0 50	− 6	—	—
Tokyo		2·1	37	0 37	0	1 0	− 4	—	—
Wakayama		2·5	275	0 53	P_g	—	—	—	—
Mito		3·0	38	0 50	0	1 10	−17	—	—
Hukusima		4·2	26	1 8	+ 1	2 3	+ 6	—	—
Sendai		4·8	26	1 14	− 1	2 14	+ 2	—	—
Mizusawa	E.	5·6	24	e 1 31	+ 4	2 38	+ 5	—	—
Akita		5·9	15	1 40	+ 9	2 37	− 3	—	—
Morioka		6·2	22	1 37	+ 2	2 51	+ 3	—	—
Kumamoto		6·4	261	1 46	+ 8	3 3	+10	—	—
Hatinohe		7·1	21	1 49	+ 1	—	—	—	—
Calcutta	N.	45·0	268	—	—	e 15 40	+42	—	—
Grand Coulee		73·3	43	e 11 33	− 2	—	—	—	—
Shasta Dam		75·0	50	e 11 42	− 3	—	—	i 11 55	P_cP
Tinemaha	Z.	79·7	52	e 12 9	− 2	—	—	e 12 43	?

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		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Ksara		80·7	304	e 6 8	?	—	—	e 15 22	PP
Pasadena	z.	81·5	54	i 12 20	− 1	—	—	—	—
Riverside	z.	82·1	54	e 12 21	− 3	—	—	—	—
Collmberg	z.	82·4	327	e 12 25	0	—	—	—	—
Boulder City		82·6	51	e 12 27	+ 1	—	—	e 13 22	?
Palomar	z.	82·8	54	e 12 29	+ 2	—	—	—	—
Pierce Ferry		83·0	50	e 12 27	− 1	—	—	—	—
Tucson		87·5	52	e 12 53	+ 2	—	—	—	—

Long waves were recorded at Cheb, Uccle, and Moscow.

Jan. 26d. Readings also at 4h. (Tucson, near Overton, Pierce Ferry, and Boulder City), 6h. (Tinemaha, Riverside, Palomar, St. Louis, near Tacubaya, and Vera Cruz), 7h. (Tananarive), 8h. (Tinemaha, Riverside, Palomar, and Pasadena), 11h. (near Andijan), 21h. (Copenhagen).

Jan. 27d. 19h. 5m. 12s. Epicentre 9°·5N. 126°·7E. (as on 1941 July 26d.).

A = −·5895, B = +·7909, C = +·1640; δ = −7; h = +7;
D = +·802, E = +·598: G = −·098, H = +·131, K = −·986.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Calcutta	N.	38·9	295	e 8 55	PP	13 48?	+20	—	—	—
Irkutsk		46·4	341	8 29	− 1	15 13	− 5	—	—	—
Kodaikanal	E.	48·5	276	e 9 50	+64	—	—	—	—	—
Riverview	N.	49·0	153	—	—	e 15 52	− 3	—	—	—
Bombay	E.	52·9	287	e 9 18	− 2	e 16 54	+ 6	e 11 14	PP	—
	N.	52·9	287	e 9 10	−10	i 16 50	+ 2	—	—	—
Andijan		57·1	313	e 9 51	+ 1	e 17 43	− 2	—	—	—
Tashkent		59·5	314	e 10 6	− 1	—	—	—	—	—
Baku		73·9	310	e 11 47	+ 8	e 21 14	+ 4	—	—	—
Moscow		81·7	326	i 12 19	− 3	22 25	− 9	e 23 19	PS	e 52·8
Ksara		85·5	303	e 12 42	+ 1	e 23 28	+16	—	—	—

Bombay gives also eE = 20m.31s.
Long waves were also recorded at Wellington and Christchurch.

Jan. 27d. 22h. 9m. 2s. Epicentre 34°·8N. 137°·0E. (as on 16d.).

Intensity IV at Gihu, Hikone, Iida; II-III at Hamamatu, Kyoto, Kashiwara, and Toyooka.
Epicentre 34°·9N. 137°·1E. Very shallow.
The Seismological Bulletin of the Central Meteorological Observatory, Japan, for the Year 1945, Tokyo 1951, p. 18.

A = −·6019, B = +·5612, C = +·5681; δ = −3; h = 0.

	Δ	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Gihu	0·6	342	0 9a	− 6	0 17	− 9
Hamamatu	0·6	98	0 11	− 4	0 17	− 9
Hikone	0·8	307	0 15a	− 3	0 25	− 6
Kyoto	1·1	282	0 20	− 2	—	—
Hunatu	1·6	64	0 28	− 2	0 47	− 4
Misima	1·6	79	0 29	− 1	0 49	− 2
Wakayama	1·6	249	0 32	+ 2	0 55	+ 4
Siomisaki	1·7	217	0 33	+ 2	0 55	+ 1
Toyooka	2·0	298	0 35	0	1 0	− 2
Mera	2·3	87	1 7	S	(1 7)	− 2
Yokohama	2·3	74	0 40	0	1 9	0
Tukubasan	2·9	61	0 52	+ 4	1 22	− 2
Utunomiya	2·9	53	0 53	+ 5	—	—
Mito	3·2	61	0 59	+ 7	1 27	− 5
Aikawa	3·4	17	1 0	+ 5	1 43	+ 6
Hirosima	3·8	265	1 1	0	1 46	− 1
Onahama	3·8	55	0 48	−13	—	—
Hamada	4·1	273	1 5	0	1 55	0
Hukusima	4·1	43	1 13	P*	2 5	S*
Sendai	4·7	41	1 14	0	2 4	− 6
Mizusawa E.	5·4	36	e 1 45	P_g	2 50	S*

Jan. 27d. Readings also at 0h. (near Apia), 3h. (Ksara and near Helwan), 5h. (Tinemaha and Tucson), 6h. (Port au Prince), 13h. (Tinemaha, Haiwee, Tucson, Palomar, Riverside, Mount Wilson, Pasadena, Ksara, near Helwan, and near Bogota), 21h. (Uccle), 22h. (near Andijan).

Jan. 28d. 19h. Undetermined shock.

La Plata PE = 52m.30s., N = 58m., LN = 60·6m.
Huancayo eP = 53m.15s., e = 54m.2s., eS = 58m.27s., e = 61m.28s.
La Paz iPZ = 53m.22s., SZ = 58m.14s., LZ = 62m.30s.
Bogota i = 55m.14s.
Tucson iP = 57m.54s., e = 65m.28s., eL = 73m.56s.
Palomar iPZ = 58m.7s., eZ = 58m.39s.
Riverside ePZ = 58m.12s.
Pasadena iPNZ = 58m.15s., eLNZ = 80·8m.
Mount Wilson ePZ = 58m.16s.
Pierce Ferry eP = 58m.19s.
Boulder City eP = 58m.20s.
Overton iP = 58m.23s.
Tinemaha iPZ = 58m.31s., eZ = 59m.33s.
Santa Barbara ePZ = 58m.36s.
Shasta Dam iP = 58m.54s., eS = 69m.4s.
Grand Coulee eP = 59m.27s.
Moscow e = 66m.20s.
Ksara e = 67m.24s.
Riverview eN = 70m.42s. and 75m.30s., eLNZ = 86m.6s.
Christchurch eN = 75m.10s.?, L = 77m.1s.
Cheb e = 86m., eL = 112m.
Long waves were also recorded at Wellington and New Delhi.

Jan. 28d. Readings also at 1h. (near Malaga), 2h. (near Triest and Bucharest), 7h. (Ksara, Riverview, Sydney, Arapuni, Auckland, Kaimata, Christchurch, and Wellington), 11h. (Tucson, Tinemaha, Palomar, Mount Wilson, Pierce Ferry, Overton, and near Apia), 12h. (Mizusawa), 23h. (near Apia).

Jan. 29d. 21h. 0m. 48s. Epicentre 6°·7N. 124°·1E. (as on 1942 June 10d.).

$A = -·5568$, $B = +·8225$, $C = +·1159$; $\delta = -3$; $h = +7$;
$D = +·828$, $E = +·561$; $G = -·065$, $H = +·096$, $K = -·993$.

		△	Az.	P.	O−C.	S.	O−C.		Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.			m.
Vladivostok		36·9	10	8 14	PP	e 12 3	−55	—	—		—
Calcutta	N.	37·9	298	e 7 25	+ 5	e 13 7	− 6	e 15 22	SS		—
Brisbane	N.	44·0	142	e 8 41	+30	e 14 33	−10	—	—		e 17·8
Hyderabad	N.	45·8	288	—	—	15 18	+ 9	19 0	SS		—
Kodaikanal	E.	46·2	279	e 8 0	−28	i 14 50	−25	9 48	PP		22·6
Riverview		47·8	150	e 8 35	− 6	e 15 18	−20	i 8 44	pP		—
Sydney		47·8	150	—	—	e 15 24	−14	—	—		—
Irkutsk		48·3	344	i 8 48	+ 3	15 42	− 3	—	—		—
New Delhi	N.	49·3	303	e 8 49	− 4	i 15 52	− 7	16 16	PS		23·6
Bombay	E.	51·3	290	e 9 6	− 2	i 16 24	− 2	e 11 9	PP		—
	N.	51·3	290	e 9 9	+ 1	16 28	+ 2	20 9	SS		—
Andijan		57·1	315	e 9 58	+ 8	—	—	—	—		—
Tashkent		59·5	315	10 7	0	18 18	+ 2	—	—		—
Christchurch		66·5	144	—	—	e 24 47	SS	27 10	Q		32·2
Baku		73·7	311	11 42	+ 4	21 11	+ 3	—	—		—
Moscow		82·5	325	12 22	− 4	22 35	− 7	—	—		—
Ksara		84·8	303	e 12 37	0	e 23 20	+15	—	—		—
Helwan		89·1	300	e 12 54	− 4	23 50	+ 4	16 27	PP		—
Upsala		92·4	331	—	—	e 23 42	[− 5]	—	—		e 47·2
Collmberg		97·7	323	e 13 30	− 8	—	—	17 30	PP		—
Cheb		98·5	323	e 15 12?	+90	e 24 12?	[− 8]	e 37 12?	Q		e 53·2
Grand Coulee		102·5	38	e 13 56	− 4	—	—	e 18 0	PP		—
Shasta Dam		103·1	47	e 13 55	− 7	—	—	e 18 12	PP		—
Tinemaha	z.	107·4	49	e 18 22	[− 6]	—	—	e 18 45	PP		—
Mount Wilson	z.	108·6	51	e 18 44	PP	—	—	—	—		—
Riverside	z.	109·2	51	e 18 53	PP	—	—	—	—		—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Boulder City		110·4	49	e 18 59	PP	—	—	—	—	—
Pierce Ferry		110·9	48	e 19 17	PP	—	—	—	—	—
Granada		114·5	316	—	—	42 10	?	—	—	62·3
Tucson		115·0	50	e 18 45	[+ 2]	—	—	e 19 40	PP	e 56·5
Malaga	z.	115·3	316	e 19 37	PP	e 25 45	[+12]	—	—	e 64·2
La Paz	z.	164·6	130	20 12	[+ 7]	—	—	—	—	83·2

Additional readings :—
Hyderabad PSN =15m.33s.
Kodaikanal SSE =18m.15s.
Riverview ePSN =15m.30s., iN =19m.4s., eE =19m.18s., iN =19m.33s.
New Delhi SSSN =20m.15s.
Bombay PPP?E =12m.18s., iE =18m.39s.
Helwan eZ =13m.21s. and 14m.39s., eN =24m.22s., PPSN =25m.24s.
Long waves were also recorded at Wellington, Pasadena, Clermont-Ferrand, Kew, Uccle, Bergen, and Toledo.

Jan. 29d. Readings also at 19h. (Auckland), 22h. (Tinemaha and Palomar).

Jan. 30d. Readings at 0h. (Mount Wilson, Tucson, Palomar, Riverside, Santa Barbara, and Tinemaha), 2h. (Riverview), 3h. (Riverview and near La Paz), 11h. (near Andijan), 13h. (near Mizusawa), 14h. (near Andijan), 20h. (near La Paz).

Jan. 31d. 9h. 35m. 29s. Epicentre 29°·5S. 71°·5W. (as on 1943 Feb. 16d.).

Scale V-VI on the Coast of Chile. Pasadena suggests deep focus.

Federico Greve.
"Lista de Sismos sensibles al Hombre recolectados por medio del Servicio de Postales Informativas," p. 1. Institutio Sismologico de la Universidad de Chile. Epicentre 29°S. 71°·5W.
U.S.C.G.S. Seismo. Bull., M.S.I. 121, p. 26.

$A = +\cdot2766$, $B = -\cdot8267$, $C = -\cdot4899$; $\delta = -6$; $h = +2$:
$D = -\cdot948$, $E = -\cdot317$; $G = -\cdot155$, $H = +\cdot465$, $K = -\cdot871$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
La Plata	N.	12·7	119	2 55	−10	5 31	+ 3	—	—	5·9
La Paz		13·3	14	3 15	+ 2	5 48	+ 6	—	—	6·5
Huancayo		17·8	347	e 4 5	− 6	i 7 23	− 5	e 4 37	PP	e 7·7
Bogota		34·0	357	i 6 43	− 5	—	—	—	—	—
Tucson		71·9	326	i 11 27	0	—	—	i 11 40	pP	—
Palomar		75·8	324	i 11 51	+ 1	—	—	—	—	—
La Jolla	z.	76·3	322	e 11 49	− 3	—	—	—	—	—
Pierce Ferry		76·5	327	i 11 54	0	—	—	i 12 9	pP	—
Riverside		76·6	322	i 11 54a	0	—	—	12 8	pP	—
Boulder City		76·8	326	i 11 56	+ 1	—	—	i 12 10	pP	—
Overton		77·1	327	i 11 58	+ 1	—	—	i 12 13	pP	—
Mount Wilson	z.	77·1	323	i 11 59	+ 2	—	—	i 12 13	pP	—
Pasadena	z.	77·2	323	i 11 58a	+ 1	—	—	i 12 11	pP	—
Santa Barbara	z.	78·2	321	i 12 3	0	—	—	—	—	—
Haiwee	E.	78·6	324	e 12 8	+ 2	—	—	—	—	—
Tinemaha		79·4	324	i 12 11a	+ 2	—	—	i 12 25	pP	—
Shasta Dam		84·3	324	i 12 34	− 1	—	—	—	—	—
Grand Coulee		88·1	331	e 12 54	0	—	—	—	—	—

Additional readings :—
La Plata PE =3m.11s.
Riverside iZ =12m.38s., eZ =13m.3s.
Pasadena eZ =13m.8s.
Tinemaha eZ =14m.47s.
Shasta Dam i =12m.39s.

Jan. 31d. Readings also at 2h. (Mount Wilson, Palomar, Tucson, and Tinemaha), 3h. (near Clermont-Ferrand, Basle, and Zürich), 6h. (Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Boulder City, Grand Coulee, Overton, Pierce Ferry, and Shasta Dam), 8h (near Andijan, Stalinabad, and near La Paz), 15h. (near La Paz), 17h. and 18h. (near Alicante), 19h. (near Balboa Heights), 21h. (near Alicante), 22h. (La Paz).

Feb. 1d. 8h. European shock.

Triest eP_g =6m.34s., iP_gP_g =6m.42s., iS_g =6m.47s.
Zürich eP =7m.29s., eS_g =8m.45s.
Prague eP_g =7m.34s.?, iP_gS_g? =8m.15s., eS_g? =8m.26s.
Basle eP =7m.37s., eS_g =9m.10s.
Collmberg iPZ =7m.38s., i =7m.47s., iP* =7m.52s., iP_g =8m.2s., i =8m.5s., 8m.10s., 8m.25s., 8m.34s., and 8m.41s., iS* =9m.2s., iZ =9m.8s., iS_g =9m.11s., iL =9m.14s.
Jena ePE =7m.38s., eE =8m.56s., eS?N =9m.8s., eN =9m.13s.
Chur e =8m.11s.
Strasbourg e =8m.28s., eS =8m.47s., iS_g? =9m.16s.
Helwan iZ =16m.54s., iEN =17m.42s., iZ =18m.42s.

Feb. 1d. 10h. 19m. 53s. Epicentre 21°·4S. 169°·3E. (as on 1944, June 21d.).

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

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane		16·0	244	i 3 50	+ 2	e 6 22	−24	—	—	—
Auckland		16·1	164	—	—	e 6 52	+ 3	—	—	—
Sydney		20·2	229	e 7 13	?	—	—	—	—	—
Wellington		20·4	169	2 57?	?	8 34	+ 9	i 3 54	?	i 10·2
Riverside	z.	88·8	52	i 12 58	+ 1	—	—	—	—	—
Palomar	z.	88·9	53	i 12 53	− 5	—	—	—	—	—
Tinemaha	z.	89·6	50	e 13 1	0	—	—	—	—	—
Tucson		93·1	57	e 13 17	0	—	—	—	—	—
Collmberg		144·9	333	e 19 39	[0]	—	—	e 18 5	?	—

Feb. 1d. 10h. 24m. 44s. Epicentre 21°·4S. 169°·3E. (as at 10h. 19m.).

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane		16·0	244	i 3 45	− 3	i 8 14	L	i 6 56	SS	(8·2)
Auckland		16·1	164	3 51	+ 2	i 6 46	− 3	—	—	8·3
Riverview		20·2	229	i 4 43k	+ 4	i 8 28	+ 7	i 8 55	SS	e 9·8
Wellington		20·4	169	4 41	0	8 31	+ 6	i 9 16	SSS	10·3
Christchurch		22·2	173	6 1	+61	e 8 39	−21	9 55	SS	11·6
Pasadena	z.	88·3	52	i 12 54	− 1	—	—	—	—	—
Shasta Dam		88·5	46	i 12 56	0	—	—	—	—	—
Riverside	z.	88·8	52	i 12 57	0	—	—	—	—	—
Palomar		88·9	53	i 12 57	− 1	—	—	—	—	—
Tinemaha		89·6	50	i 13 2	+ 1	—	—	—	—	—
Boulder City		91·6	51	i 13 10	0	—	—	—	—	—
Overton		92·1	52	e 13 2	−10	—	—	—	—	—
Pierce Ferry		92·3	53	i 13 14	+ 1	—	—	—	—	—
Tucson		93·1	57	i 13 17	0	—	—	—	—	—
Collmberg		144·9	333	i 19 39	[0]	—	—	e 24 3	PKS	—
Prague	z.	145·2	331	e 20 40	[+61]	—	—	—	—	—

Riverview gives also iZ =8m.34s., iN =8m.44s. and 8m.58s.
Long waves were also recorded at Arapuni.

Feb. 1d. 10h. 35m.48s. Epicentre 21°·4S. 169°·3E. (as at 10h. 24m.).

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

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane		16·0	244	i 3 45	− 3	i 6 58	+12	i 3 55	pP	e 7·9
Auckland		16·1	164	3 47	− 2	6 12	−37	7 7	SS	8·0
Arapuni		17·5	163	—	—	7 18	− 3	—	—	—
New Plymouth		18·1	168	4 23	+ 9	9 34	L	—	—	(9·6)
Tuai		18·6	162	4 21	0	9 12?	L	—	—	(9·2)
Apia		19·5	72	e 4 32	+ 1	i 8 6	0	—	—	e 8·8
Riverview		20·2	229	i 4 39a	0	i 8 32	+11	i 5 11	PPP	e 9·5
Sydney		20·2	229	e 4 48	+ 9	e 8 21	0	—	—	—
Wellington	z.	20·4	169	4 36	− 5	8 46	SS	4 46	pP	10·2
Kaimata		21·1	177	4 43	− 5	8 42	+ 3	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Christchurch		22·2	173	i 4 54	− 6	i 8 58	− 2	—	—	10·8
Mizusawa	E.	65·7	337	(e 11 3)	+15	e 11 3	P	—	—	—
Pasadena		88·3	52	i 12 54	− 1	e 22 50	[−32]	i 13 5	PcP	e 40·5
Mount Wilson	Z.	88·4	52	i 12 57	+ 2	—	—	—	—	—
La Jolla	Z.	88·4	54	e 12 58	+ 3	—	—	—	—	—
Shasta Dam		88·5	46	i 12 54	− 2	—	—	—	—	—
Riverside		88·8	52	12 57	0	—	—	i 13 8	PcP	—
Palomar		88·9	53	i 12 57	− 1	i 23 33	{ 0}	i 13 8	PcP	—
Haiwee	E.	89·4	51	e 13 4	+ 4	—	—	—	—	—
Tinemaha		89·6	50	i 13 1	0	—	—	i 13 10	PcP	—
Calcutta	N.	90·2	294	e 13 28	+24	e 24 28	+32	—	—	—
Sitka		91·2	26	—	—	e 25 15	PS	e 30 24	SSP	e 38·4
Boulder City		91·6	51	i 13 11	+ 1	e 23 49	[+ 7]	—	—	—
Victoria		91·8	38	—	—	e 23 42	[− 1]	—	—	46·2
College		92·1	16	—	—	e 23 45	[0]	e 30 29	SS	e 40·5
Overton		92·1	52	e 13 13	+ 1	—	—	i 13 17	PcP	—
Pierce Ferry		92·3	53	e 13 13	0	e 24 23	+ 8	i 23 49	SKS	—
Irkutsk		92·5	326	e 13 22	+ 8	e 24 34	+17	23 53	SKS	—
Tucson		93·1	57	i 13 16a	− 1	e 23 32	[−19]	e 25 42	PS	e 41·3
Salt Lake City		95·7	48	—	—	e 24 10	[+ 5]	e 31 38	SSP	e 44·2
New Delhi	N.	101·7	296	—	—	i 25 43	+ 8	—	—	i 60·6
Bombay	E.	102·5	285	e 17 28	?	e 24 47	[+ 8]	i 18 16	PP	—
Rapid City		102·8	47	—	—	e 24 44	[+ 4]	—	—	e 56·9
Huancayo		108·4	111	—	—	e 26 38	S	e 34 19	SS	e 53·0
St. Louis	E.	111·0	56	—	—	e 25 22	[+ 6]	e 26 22	SKKS	e 52·6
Tashkent		111·1	307	e 19 29	PP	e 28 58	PS	e 39 30	SSS	—
La Paz		112·3	119	19 39	PP	—	—	—	—	—
Chicago		113·5	53	—	—	e 28 25	PS	e 35 51	SSP	e 59·8
Columbia		117·5	61	—	—	e 29 54	PS	—	—	e 56·7
Moscow		130·6	326	21 37	PP	—	—	—	—	—
Bermuda		131·1	65	—	—	e 22 52	SKP	e 41 42	?	e 62·7
Ksara		137·2	297	e 19 46	[+21]	—	—	e 23 20?	SKP	—
Helwan	Z.	141·3	291	e 19 32	[− 1]	e 23 15	SKP	e 22 42	PP	—
Copenhagen		141·7	339	e 19 32	[− 1]	—	—	—	—	—
Sofia		144·5	315	e 19 42	[+ 4]	e 26 28	[−18]	—	—	—
Collmberg		144·9	333	i 19 39	[0]	—	—	i 19 44	PKP$_2$	—
Belgrade		145·3	319	e 19 37a	[− 3]	e 27 0	[+13]	i 19 56	PKP$_2$	—
Jena	N.	145·7	334	e 19 46	[+ 6]	—	—	e 20 42	?	—
Triest		148·6	327	i 19 53	[+ 8]	e 23 6	SKP	i 21 23	PKP$_2$	—
Strasbourg		149·1	336	e 19 54	[+ 8]	—	—	e 20 12	PKP$_2$	—
Chur		149·8	333	e 19 49	[+ 2]	—	—	—	—	—
Zürich		149·8	334	e 19 52k	[+ 5]	—	—	—	—	—
Basle		150·0	335	e 19 52	[+ 5]	—	—	—	—	—
Paris		150·7	342	e 19 55	[+ 7]	—	—	—	—	—
Clermont-Ferrand		153·2	338	e 21 1	PKP$_2$	—	—	—	—	—
Toledo	Z.	160·7	344	e 20 4	[+ 3]	—	—	—	—	—
Granada		163·1	340	i 20 7	[+ 3]	27 30	[+23]	i 21 15	PKP$_2$	95·2
Malaga	Z.	163·8	342	i 20 4k	[− 1]	—	—	i 21 14	PKP$_2$	82·6
San Fernando	Z.	164·5	347	20 26	[+21]	—	—	e 21 43	PKP$_2$	—

Additional readings :—
Riverview i = 4m.46s., lN = 5m.48s., lE = 8m.29s., lP$_c$PE = 8m.36s., lSS?N = 8m.54s.
Wellington sPZ = 4m.57s., lZ = 5m.32s. and 7m.12s., sS = 9m.9s., l = 9m.32s.
Palomar iZ = 13m.18s.
Irkutsk PPS = 26m.18s.
Tucson eSS = 31m.7s.
Bombay eEN = 25m.17s., eE = 33m.7s.
Huancayo e = 38m.54s.
St. Louis eE = 29m.7s., 35m.26s., 39m.23s., and 42m.30s.
Collmberg i = 19m.52s. and 20m.13s.
Belgrade e = 21m.53s.
Granada iPP = 24m.45s., SS = 44m.12s., Q = 88·2m.
Malaga iPPZ = 24m.46s.
Long waves were also recorded at Honolulu, Colombo, Tananarive, and at other European and American stations.

Feb. 1d. 12h. 13m. 39s. Epicentre 21°·4S. 169°·3E. (as at 10h.).

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane		16·0	244	i 3 43	− 5	e 6 31	−15	e 3 48	P	i 7·8
Auckland		16·1	164	3 37	−12	6 52	+ 3	4 2	pP	8·2
Arapuni		17·5	163	—	—	7 21	0	—	—	9·9
New Plymouth		18·1	168	4 16	+ 2	9 29	L	—	—	(9·5)
Tuai		18·6	162	4 12	− 9	9 27?	L	—	—	(9·5)
Apia		19·5	72	e 4 33	+ 2	i 8 6	0	i 8 1	?	e 8·9
Riverview		20·2	229	i 4 36k	− 3	i 8 27	+ 6	i 4 51	pP	e 9·5
Sydney		20·2	229	i 4 39	0	i 8 30	+ 9	—	—	—
Wellington	z.	20·4	169	4 32	− 9	8 21	− 4	4 48	pP	10·4
Kaimata		21·1	177	3 46	−62	7 47	−52	—	—	—
Christchurch		22·2	173	4 54	− 6	8 46	−14	9 0	Q	10·8
Mizusawa	E.	65·7	337	10 57	+ 9	19 43	+ 9	—	—	—
Santa Barbara	z.	87·3	52	i 12 52	+ 2	—	—	—	—	—
Pasadena		88·3	52	i 12 54	− 1	i 23 21	[− 1]	i 13 4	P_cP	e 40·4
Mount Wilson	z.	88·4	52	i 12 55	0	—	—	—	—	—
La Jolla		88·4	54	e 12 56	+ 1	—	—	—	—	—
Shasta Dam		88·5	46	e 12 56	0	e 23 23	[− 1]	i 13 14	P_cP	—
Riverside		88·8	52	i 12 57k	0	—	—	i 13 8	P_cP	—
Palomar		88·9	53	i 12 58k	0	i 23 32	{− 1}	—	—	—
Haiwee		89·4	51	e 13 3	+ 3	—	—	—	—	—
Tinemaha		89·6	50	i 13 1	0	e 23 56	+ 5	i 13 4	P_cP	—
Sitka		91·2	26	e 20 23	?	i 23 40	[0]	i 25 21	PS	37·4
Boulder City		91·6	51	i 13 11	+ 1	e 24 20	+11	e 23 47	SKS	—
Victoria		91·8	38	—	—	e 23 36	[− 7]	—	—	45·4
Colombo	E.	92·0	276	13 21?	+ 9	23 51?	[+ 7]	—	—	44·4
College		92·1	16	—	—	e 23 33	[−12]	e 24 3	S	e 42·6
Overton		92·1	52	i 13 13	+ 1	e 24 20	+ 7	e 23 48	SKS	—
Pierce Ferry		92·3	53	e 13 13	0	e 24 18	+ 3	e 23 47	SKS	—
Irkutsk		92·5	326	13 16	+ 2	24 22	+ 5	17 3	PP	—
Tucson		93·1	57	i 13 17k	0	i 25 25	PS	e 31 6	SSP	e 42·4
Grand Coulée		94·1	40	e 13 21	− 1	—	—	—	—	—
Salt Lake City		95·7	48	—	—	e 24 6	[+ 1]	e 26 3	PS	e 44·4
Bozeman		98·1	44	—	—	i 24 21	[+ 3]	i 26 37	PS	e 45·7
New Delhi	N.	101·7	296	—	—	i 25 7	{ 0}	—	—	e 65·0
Bombay	E.	102·5	285	e 17 42	PP	e 24 43	[+ 4]	i 32 59	SSP	—
	N.	102·5	285	e 18 29	PP	e 24 52	[+13]	—	—	—
Rapid City		102·8	47	—	—	e 24 40	[0]	e 26 53	PS	e 52·1
Saskatoon		103·1	38	—	—	e 27 26	PS	—	—	48·4
Huancayo		108·4	111	e 18 54	PP	e 25 56	{+ 2}	e 26 42	S	e 54·7
St. Louis	E.	111·0	56	—	—	i 25 20	[+ 4]	e 29 1	PS	e 52·6
Tashkent		111·1	307	e 19 15	PP	e 28 52	PS	—	—	—
Chicago		113·5	53	e 19 11	PP	—	—	—	—	e 53·9
Moscow		130·6	326	19 12	[− 1]	—	—	21 26	PP	—
Bermuda		131·1	65	e 22 42	SKP	e 26 13	[−10]	—	—	e 61·5
Upsala	N.	136·7	340	—	—	e 22 53	SKP	e 32 35	PS	e 68·4
Ksara		137·2	297	e 19 21	[− 4]	—	—	—	—	—
Bergen		139·4	348	e 21 21	?	—	—	e 36 21	?	e 69·4
Helwan	z.	141·3	291	e 19 30	[− 3]	—	—	e 22 36	PP	—
Copenhagen		141·7	339	e 19 34	[+ 1]	—	—	—	—	—
Sofia		144·5	315	e 19 41	[+ 3]	—	—	—	—	—
Collmberg		144·9	333	e 19 38	[− 1]	—	—	i 19 49	PKP_2	—
Prague		145·2	331	e 19 36	[− 3]	e 29 41	{−10}	e 20 57	?	—
Belgrade		145·3	319	i 19 37k	[− 3]	—	—	e 19 53	PKP_2	—
Jena	N.	145·7	334	e 18 57	?	—	—	e 19 43	PKP	—
Triest		148·6	327	i 19 46	[+ 1]	e 22 52	SKP	i 21 7	PKP_2	—
Strasbourg		149·1	336	e 19 49	[+ 3]	—	—	—	—	—
Chur		149·8	333	e 19 49	[+ 2]	—	—	—	—	—
Zürich		149·8	334	e 19 46	[− 1]	—	—	—	—	—
Basle		150·0	335	e 19 44	[− 3]	—	—	—	—	—
Neuchatel		150·7	335	e 19 50	[+ 2]	—	—	—	—	—
Paris		150·7	342	i 19 49	[+ 1]	—	—	—	—	—

Continued on next page.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Clermont-Ferrand	153·2	338	e 21 8?	PKP$_2$	—	—	—	—	—
Toledo	160·7	344	i 20 2	[0]	26 47	[−18]	i 20 48	PKP$_2$	80·4
Coimbra	161·2	352	—	—	e 26 41	[−25]	—	— e	97·4
Lisbon	162·7	357	20 55k	PKP$_2$	51 54	SSS	24 38	PP	80·1
Granada	163·1	340	i 20 3k	[− 1]	28 16	[+69]	21 0	PKP$_2$	90·4
Malaga	163·8	342	i 20 7s	[+ 2]	—	—	i 21 1	PKP$_2$	86·0
San Fernando	164·5	347	e 20 9	[+ 4]	—	—	e 24 32	PP	80·4

Additional readings :—
Brisbane eZ = 7m.5s.
Auckland i = 4m.11s. and 7m.11s.
Riverview iPPEN = 5m.9s., iZ = 5m.38s., iE = 5m.42s., iP$_c$PEN = 8m.35s., iSSE = 9m.9s., iSSSN = 9m.24s.
Wellington sPZ = 5m.5s., iZ = 5m.16s., 5m.44s., 5m.55s., 6m.33s., and 7m.11s., pP$_c$PZ = 9m.1s., i = 9m.28s., iZ = 9m.51s.
Christchurch i = 4m.58s.
Pasadena iZ = 13m.20s.
Sitka iSS = 29m.57s.
Boulder City i = 13m.21s.
Pierce Ferry i = 13m.16s., e = 23m.33s., 24m,45s., and 25m.27s.
Irkutsk SKS = 23m.48s.
College ePS = 25m.28s., eSS = 29m.57s., e = 30m.51s.
Salt Lake City eSS = 31m.49s.
Bozeman e = 38m.48s.
Bombay eE = 36m.39s.
Rapid City eSS = 33m.14s.
Huancayo ePP = 19m.7s., e = 23m.41s. and 32m.52s.
St. Louis eE = 28m.4s., 34m.57s., and 38m.20s.
Upsala eE = 23m.0s., eN = 34m.50s. and 39m.21s.?, eE = 45m.21s.?
Collmberg e = 22m.1s.
Belgrade e = 20m.15s. and 22m.57s.
Jena eE = 19m.2s.
Triest ePP = 25m.2s., eSKS = 28m.54s., eSKKS = 32m.9s., ePSKS = 35m.10s.
Toledo iPP = 24m.31s.
Granada iPP = 24m.41s., eSS = 45m.21s., Q = 79·3m.
Malaga iZ = 21m.34s., iPPZ = 24m.46s.
Long waves were also recorded at Tananarive, Honolulu, Kew, and other American stations.

Feb. 1d. 19h. 53m. 33s. Epicentre 36°·5N. 57°·7E.

A = +·4306, B = +·6811, C = +·5922 ; δ = +1 ; h = 0 ;
D = +·845, E = −·534 ; G = +·316, H = +·501, K = −·806.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Baku		7·2	304	1 49	0	3 24	+11	—	—	—
Tashkent		10·2	58	e 2 30	− 1	e 4 19	− 8	—	—	—
Andijan		12·2	65	e 2 59	+ 1	e 5 17	+ 1	—	—	—
Ksara		18·0	267	e 4 17	+ 4	e 7 50	+18	—	—	—
New Delhi	N.	18·2	110	e 4 16	0	—	—	—	—	10·4
Sverdlovsk		20·4	4	4 41	0	8 30	+ 5	—	—	—
Bombay		22·0	139	i 4 57	− 1	9 14	+18	—	—	—
Helwan	z.	23·0	260	e 5 10	+ 3	—	—	—	—	13·3
Moscow		23·6	330	5 12	− 1	9 32	+ 7	5 57	PP	—
Collmberg	z.	34·9	308	e 6 55	0	—	—	—	—	—
Irkutsk		36·2	48	—	—	13 27	+40	e 15 27	SS	—
Chur		36·9	301	e 7 11s	− 1	—	—	e 7 16	i	—
Zürich		37·6	302	e 7 21	+ 3	—	—	—	—	—

Moscow also gives SS = 10m.46s.
Long waves were also recorded at Copenhagen.

Feb. 1d. 23h. 12m. 10s. Epicentre 41°·2N. 142°·5E.

Intensity V at Urakawa ; IV Aomori, Hakodate, Hatinohe, and Morioka ; II-III at Mori. Seismo. Bull. Cent. Met. Obs., Japan, for 1945, Tokyo, 1951. Epicentre as adopted. Shallow.

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

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Hatinohe		1·0	228	0 20 a	− 1	0 33	− 3	—	—
Aomori		1·4	254	0 22	− 5	0 40	− 6	—	—
Miyako		1·6	194	0 29	− 1	0 49	− 2	—	—
Morioka		1·8	214	0 32	0	0 56	0	—	—
Sapporo		2·1	335	0 29	− 8	0 47	−17	—	—
Mizusawa	E.	2·3	207	0 41	+ 1	1 11	+ 2	—	—
Akita		2·4	231	0 47	+ 6	1 11	− 1	—	—
Sendai		3·2	203	0 52	0	1 28	− 4	—	—
Onahama		4·4	197	1 59	+49	2 57	+55	—	—
Aikawa		4·6	228	1 4	− 8	1 54	−13	—	—
Mito		5·1	199	1 27	+ 7	2 19	− 1	—	—
Maebasi		5·5	210	1 30	+ 5	—	—	—	—
Kumagaya		5·6	207	1 31	+ 4	2 38	+ 5	—	—
Tokyo		5·9	202	1 29	− 2	2 50	+10	—	—
Yokohama		6·2	202	1 43	+ 8	2 44	− 4	—	—
Hunatu		6·4	208	1 50	+12	3 3	+10	—	—
Mera		6·6	199	2 23	+42	2 40	−18	—	—
Misima		6·7	206	1 53	+11	3 6	+ 6	—	—
Shizuoka		7·0	209	2 20	P_g	3 22	S*	—	—
Gihu		7·4	220	1 41	−11	—	—	—	—
Hikone		7·7	222	1 57	+ 1	—	—	—	—
Kameyama		7·9	219	2 7	+ 8	—	—	—	—
Kyoto		8·2	223	1 45	−18	2 44	−54	—	—
Wakayama		9·1	222	2 18	+ 4	—	—	—	—
Irkutsk		28·1	307	e 5 42?	−13	e 10 20?	−20	—	—
Tashkent		53·4	296	e 9 13?	−11	—	—	—	—
Grand Coulée		65·8	47	e 10 39	−10	—	—	—	—
Shasta Dam		68·0	55	i 10 54	− 9	—	—	—	—
Tinemaha	z.	72·7	55	i 12 24	+52	—	—	—	—
Mount Wilson	z.	74·6	58	i 11 54	+11	—	—	—	—
Riverside	z.	75·2	58	i 11 58	+12	—	—	—	—
Overton		75·4	54	i 11 40	− 7	—	—	—	—
Boulder City		75·6	55	i 11 41	− 7	—	—	—	—
Palomar	z.	76·0	57	i 12 2	+11	—	—	—	—
Pierce Ferry		76·0	54	i 11 43	− 8	—	—	—	—
Collmberg	z.	77·9	330	e 11 49	−12	—	—	—	—
Tucson		80·5	55	i 12 8	− 7	i 28 59	SS	e 15 24	PP

Additional readings :—
Grand Coulée e = 10m.58s.
Shasta Dam i = 11m.14s.
Overton i = 11m.59s.
Boulder City i = 12m.0s.
Pierce Ferry i = 12m.3s.
Tucson i = 12m.28s.

Feb. 1d. Readings also at 0h. (near Malaga), 1h. (near Bogota), 7h. (Tinemaha, Tucson, near Tashkent, Stalinabad, and Andijan), 10h. (Tinemaha, Tucson, Pierce Ferry, Overton, Boulder City, Palomar, Riverside, Shasta Dam, and Pasadena), 11h. (Brisbane, Collmberg, Tinemaha (2), Tucson (2), Ukiah, Pierce Ferry, Overton, Boulder City, Palomar (2), Fordham, Riverside (2), Shasta Dam, and Mount Wilson (2)), 12h. (Prague, Coimbra, Tinemaha (2), and Bozeman), 13h. (Prague, Ukiah, Huancayo, Tinemaha, and Pasadena), 14h. (Tinemaha (4)), 15h. (near Triest (2)), 16h. (Tucson, Tinemaha (3), and near Bogota), 17h. (Collmberg, Wellington, Auckland, and near Tucson), 18h. (near Andijan), 20h. (Bogota and near Ottawa).

Feb. 2d. 2h. Widely recorded in America, but not elsewhere.

College eP =3m.35s., iS =4m.27s. and 4m.36s.
Sitka eP =4m.8s., eL =6m.33s.
Grand Coulée iP =7m.6s., i =7m.10s. and 7m.18s., eS =13m.45s., iS =14m.9s., e = 14m.46s.
Shasta Dam eP =7m.52s.
Tinemaha iPZ =8m.34s.
Overton eP =8m.52s.
Boulder City eP =8m.54s.
Pierce Ferry eP =8m.55s., i =8m.58s.
Pasadena iPZ =8m.57s.
Mount Wilson iPZ =8m.58s.
Riverside iPZ =9m.0s.
Palomar iPZ =9m.7s.
Tucson iP =9m.37s., i =11m.54s.
St. Louis iPZ =10m.13s., eE =19m.12s., eLN =25m.0s.

Feb. 2d. 21h. 37m. 50s. Epicentre 0°·5S. 80°·8W.

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

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bogota		8·4	53	e 2 5	− 1	i 3 50	+ 7	i 2 38	P_g	—
Huancayo		12·7	155	e 3 7	+ 2	i 5 22	− 6	—	—	e 6·4
La Paz	z.	20·2	142	i 4 38a	− 1	i 8 35	+14	—	—	12·4
San Juan		23·7	37	e 5 16	+ 2	e 9 30	+ 3	—	—	—
St. Louis		39·9	348	e 7 32	− 5	e 12 30	−73	—	—	—
Tucson		43·2	322	e 8 2	− 2	—	—	—	—	e 24·3
Pierce Ferry		47·7	324	e 8 38	− 2	—	—	—	—	—
Palomar	z.	47·8	318	i 8 44	+ 3	—	—	—	—	—
Boulder City		48·2	323	i 8 42	− 2	—	—	—	—	—
Overton		48·3	324	i 8 48	+ 3	—	—	—	—	—
Riverside	z.	48·5	319	i 8 49	+ 3	—	—	—	—	—
Tinemaha	z.	51·0	321	i 8 49	−17	—	—	—	—	—

Additional readings :—
Bogota i =2m.9s., iP*? =2m.14s., iS*? =4m.18s.
Huancayo e =5m.17s. and 5m.48s.
St. Louis iZ =7m.37s.
Tucson i =8m.7s.
Pierce Ferry e =8m.42s.
Boulder City i =8m.46s.
Long waves were also recorded at La Plata.

Feb. 2d. 23h. 27m. 49s. Epicentre 0°·5S. 80°·8W. (as at 21h.).

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bogota		8·4	53	e 2 7	+ 1	i 3 59	+16	i 4 9	S*	—
Balboa Heights		9·5	7	e 2 19	− 1	e 3 59	−11	—	—	—
Huancayo		12·7	155	i 3 7	+ 2	i 5 25	− 3	—	—	i 6·0
La Paz		20·2	142	i 4 41a	+ 2	i 8 39	+18	5 15	PP	12·2
San Juan		23·7	37	i 5 12	− 2	e 9 25	− 2	—	—	e 10·8
Bermuda		36·1	24	—	—	e 12 1	−44	—	—	e 15·6
St. Louis		39·9	348	i 7 35	− 2	i 13 36	− 7	e 16 31	SS	—
Florissant		40·1	348	i 7 44	+ 5	i 13 38	− 8	e 16 34	SS	—
La Plata		40·3	150	7 42	+ 2	13 47	− 2	9 23	PP	23·3
Chicago		42·6	352	—	—	e 17 24	SS	—	—	e 23·5
Tucson		43·2	322	i 8 5	+ 1	—	—	i 10 6	PP	e 23·2
Ottawa		45·9	5	e 8 23	− 3	—	—	(16 11?)	SS	16·2
Pierce Ferry		47·7	324	i 8 40	0	—	—	—	—	—
La Jolla		47·8	317	e 8 41	0	—	—	—	—	—
Palomar	z.	47·8	318	i 8 42k	+ 1	—	—	i 10 38	PP	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Boulder City		48·2	323	e 8 41	− 3	—	—	—	—	—
Overton		48·3	324	i 8 45	0	—	—	—	—	—
Riverside	Z.	48·5	319	i 8 47k	+ 1	—	—	—	—	—
Pasadena		49·1	319	i 8 52k	+ 1	—	—	e 10 49	PP	e 24·2
Haiwee	N.	50·2	320	e 9 3	+ 3	—	—	—	—	—
Tinemaha	Z.	51·0	321	i 9 6	0	—	—	—	—	—
Shasta Dam		55·7	322	i 9 37	− 3	—	—	—	—	—
Grand Coulée		58·5	331	e 9 59	− 1	—	—	i 12 12	PP	—
Victoria		61·1	329	—	—	e 18 41	+ 4	—	—	35·2
Malaga		79·4	53	i 12 8a	− 1	e 22 9	− 1	12 36	PcP	48·6
Granada		80·1	52	i 12 7k	− 6	i 22 18	0	15 28	PP	e 43·0
Toledo		80·2	50	i 12 14	0	31 30	SSS	—	—	—
Triest		93·5	44	e 21 12	?	i 24 31	+ 6	—	—	—
Auckland		101·2	232	e 17 11?	PP	—	—	—	—	—
Ksara		112·3	53	—	—	e 28 52	PS	e 40 11?	SSS	—

Additional readings :—
Bogota i =2m.13s. and 2m.21s.
Huancayo i =3m.42s., 4m.17s., and 5m.4s.
La Paz SN =8m.42s., iSS =9m.39s.
San Juan i =5m.57s., iS =9m.36s.
St. Louis iZ =7m.39s. and 7m.44s.
Tucson i =8m.9s.
La Jolla eZ =8m.45s.
Boulder City i =8m.45s.
Riverside iZ =8m.51s. and 8m.57s.
Pasadena iNZ =8m.56s.
Shasta Dam e =10m.38s.
Grand Coulée e =10m.51s.
Malaga eZ =18m.59s.
Granada SKS =22m.4s.
Long waves were also recorded at Riverview, Kew, and Upsala.

Feb. 2d. Readings also at 1h. (Boulder City, Overton, and Tucson), 4h. (Auckland, Wellington, Christchurch, Pasadena, Palomar, Tucson, and Riverside), 11h. (near Fort de France), 12h. (Bombay and Ksara), 13h. (Kew), 15h. (near Ksara and Helwan), 16h. (Copenhagen), 19h. (Auckland, Wellington, and Mizusawa), 20h. (New Delhi, Almata, near Andijan and Tashkent), 23h. (Ksara, Palomar, and Tucson).

Feb. 3d. 14h. 59m. 57s. Epicentre 21°·4S. 169°·3E. (as on Feb. 1d.).

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane		16·0	244	e 3 46	− 2	—	—	—	—	9·2
Auckland		16·1	164	3 49	0	7 38	+49	—	—	10·0
Arapuni		17·5	163	—	—	e 7 3?	−18	—	—	—
Riverview		20·2	229	i 4 39k	0	i 8 26	+ 5	i 4 47	pP	e 10·6
Wellington	Z.	20·4	169	—	—	8 32	+ 7	—	—	13·0
Christchurch		22·2	173	—	—	9 12	+12	11 35	Q	13·6
Pasadena	Z.	88·3	52	i 12 55	0	—	—	i 13 5	pP	—
Mount Wilson	Z.	88·4	52	i 12 57a	+ 2	—	—	i 13 7	pP	—
Shasta Dam		88·5	46	e 12 57	+ 1	—	—	i 13 7	pP	—
Riverside	Z.	88·8	52	i 12 58a	+ 1	—	—	i 13 9	pP	—
Palomar		88·9	53	i 12 59a	+ 1	—	—	i 13 10	pP	—
Haiwee		89·4	51	e 13 2	+ 2	—	—	e 13 21	pP	—
Tinemaha		89·6	50	i 13 1	0	—	—	i 13 12	pP	—
Boulder City		91·6	51	i 13 10	0	—	—	i 13 21	pP	—
Overton		92·1	52	i 13 5	− 7	—	—	i 13 15	pP	—
Pierce Ferry		92·3	53	i 13 13	0	—	—	i 13 25	pP	—
Tucson		93·1	57	e 13 17	0	—	—	i 13 29	pP	—

Additional readings :—
Riverview iPPPEZ =5m.12s., iPcP?EZ =8m.33s.
Wellington iZ =8m.59s., e =11m.3s.?
Christchurch eN =10m.27s.

Feb. 3d. 19h. 1m. 30s. Epicentre 21°·4S. 169°·3E. (as at 14h.).

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Riverview		20·2	229	e 4 38	− 1	e 8 25	+ 4	i 4 46	pP	e 10·7
Pasadena	Z.	88·3	52	i 12 54	− 1	—	—	i 13 0	pP	—
Mount Wilson	Z.	88·4	52	i 12 55	0	—	—	i 13 5	pP	—
Shasta Dam		88·5	46	i 12 56	0	—	—	—	—	—
Riverside	Z.	88·8	52	i 12 57 a	0	—	—	i 13 8	pP	—
Palomar		88·9	53	i 12 59	+ 1	—	—	i 13 9	pP	—
Haiwee	E.	89·4	51	e 13 3	+ 3	—	—	—	—	—
Tinemaha		89·6	50	i 13 1	0	—	—	—	—	—
Boulder City		91·6	51	i 13 10	0	—	—	i 13 20	pP	—
Overton		92·1	52	e 13 21	+ 9	—	—	—	—	—
Pierce Ferry		92·3	53	i 13 14	+ 1	—	—	i 13 24	pP	—
Tucson		93·1	57	i 13 18	+ 1	—	—	i 13 28	pP	—

Additional readings :—
Riverview ePZ = 4m.42s., iP$_c$P ? E = 8m.33s.
Pasadena iZ = 13m.5s.

Feb. 3d. Readings also at 1h. (Kew), 4h. (near Triest), 5h. (Auckland, Christchurch, Wellington, Riverview, Tucson, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, and near Alicante), 9h. (Riverside and Tinemaha), 11h. (Ksara and Helwan), 15h. (Collmberg and near Malaga), 16h. (Bucharest, Collmberg, Triest (2), and near Sofia), 17h. (Auckland and Wellington), 18h. (near Malaga), 21h. (La Paz), 22h. (Zürich and near Belgrade).

Feb. 4d. 15h. 46m. 25s. Epicentre 37°·3N. 142°·0E. Focus at Base of superficial layers.

Intensity VI at Koriyama, Tori ; V Tomioka ; IV Tukubasan, Sendai, Mito, and Utunomiya ; II-III Onahama. Suggested focal depth 70km.
Seismo. Bull., Cent.-Met. Obs., Japan, 1945, Tokyo, 1951, p. 20. Epicentre as adopted.

$A = -·6284$, $B = +·4910$, $C = +·6034$; $\delta = +6$; $h = -1$;
$D = +·616$, $E = +·788$; $G = -·476$, $H = +·372$, $K = -·797$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
	°	°	m. s.	s.	m. s.	s.	m. s.	
Onahama	1·0	247	0 3	−15	0 27	− 4	—	—
Sendai	1·3	318	0 20 a	− 2	0 35	− 3	—	—
Mito	1·5	233	0 23	− 1	0 44	0	—	—
Tukubasan	1·8	235	0 27	− 2	1 14	+23	—	—
Utunomiya	1·9	246	0 31	0	0 52	− 2	—	—
Mizusawa	2·0	340	0 31	− 1	0 55	− 1	—	—
Miyako	2·3	0	0 37 a	+ 1	1 7	+ 3	—	—
Kumagaya	2·4	241	0 37	− 1	1 6	0	—	—
Tokyo	2·4	228	0 40	+ 2	1 5	− 1	—	—
Maebasi	2·5	249	0 39	0	1 10	+ 1	—	—
Morioka	2·5	345	0 38	− 1	1 7	− 2	—	—
Akita	2·8	328	0 50	+ 7	1 28	+12	—	—
Nagano	3·1	258	1 9	+21	1 33	+ 9	—	—
Hunatu	3·2	235	1 46	?	2 23	?	—	—
Kohu	3·2	239	0 55	+ 6	1 28	+ 1	—	—
Hatinohe	3·3	354	0 52	+ 1	1 26	− 3	—	—
Misima	3·3	228	0 51	0	1 33	+ 4	—	—
Osima	3·3	220	0 49	− 2	1 24	− 5	—	—
Shizuoka	3·7	232	0 57	+ 1	1 39	0	—	—
Omaesaki	4·1	249	1 6	+ 4	1 43	− 6	—	—
Kyoto	5·5	247	1 23	+ 1	2 34	+ 9	—	—
Sapporo	5·8	356	1 27	+ 1	—	—	—	—
Wakayama	6·3	243	1 34	+ 1	—	—	—	—
Kôti	7·9	244	3 15	S	(3 15)	−10	—	—
Vladivostok	9·7	310	e 2 19	− 1	i 4 22	+13	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Tinemaha	z.	75·2	56	i 11 41 a	0	—	—	i 11 50	pP
Haiwee	z.	76·0	56	i 11 45	− 1	—	—	i 11 53	pP
Pasadena	z.	77·0	58	i 11 51	0	—	—	i 12 1	pP
Mount Wilson	z.	77·1	58	i 11 51	− 1	—	—	i 11 59	pP
Riverside	z.	77·7	58	i 11 53	− 2	—	—	—	—
Boulder City		78·1	54	i 11 57	0	—	—	—	—
Overton		78·1	54	i 11 57	0	—	—	—	—
Palomar	z.	78·4	58	i 11 58	− 1	—	—	—	—
Pierce Ferry		78·6	54	i 12 0	0	—	—	—	—
Collmberg	z.	81·1	330	i 12 11	− 2	—	—	—	—
Tucson		83·1	55	i 12 24	0	—	—	e 13 18	sP

Onahama and Tukubasan readings increased by 1m.

Feb. 4d. Readings also at 0h. (near Chur and Zürich), 1h. (Bucharest, Helwan, and Zürich), 4h. (near Almata), 13h. and 14h. (La Paz), 15h. (Basle and near Mizusawa), 17h. (Haiwee, Mount Wilson, Pasadena, Riverside, Tucson, and Tinemaha), 20h. (Haiwee, Mount Wilson, Pasadena, Riverside, Palomar, Tinemaha, Tucson, and near La Paz), 21h. (near Triest), 22h. (Auckland, Wellington, and Riverview), 23h. (Brisbane and Christchurch).

Feb. 5d. 8h. State of Columbia, South America.

Bogota iP=3m.23s., iP*=3m.33s., iP_g=3m.43s., iS?=4m.9s., iS*?=4m.20s., iS_g=4m.34s.
Huancayo e=6m.31s. and 7m.10s., i=7m.14s., e=9m.35s., iS=9m.37s., eL=10m.17s.
La Paz eP=7m.48s.
St. Louis iPZ=9m.36s.
San Juan i=9m.41s., iS=9m.44s.
Tucson iP=10m.34s.k
Pierce Ferry iP=11m.8s.
Overton iP=11m.12s.
Palomar iPNZ=11m.13s.k
Riverside iPZ=11m.18s.
Mount Wilson iPZ=11m.23s.
Pasadena iPZ=11m.24s.
Haiwee ePZ=11m.31s.
Tinemaha iPNZ=11m.34s.

Feb. 5d. Readings also at 2h. (Auckland, Wellington, Christchurch, Riverview, near Apia, and near Andijan), 3h. (Bogota), 4h. (near Chur and Zürich), 5h. (Mount Wilson, Pasadena, Tucson, Palomar, Riverside, and Tinemaha), 6h. (near Mizusawa), 7h. (Tananarive), 11h. (Huancayo, La Paz, Bogota, San Juan, Mount Wilson, Palomar, Tucson (2), and Riverside), 12h. (La Paz), 16h. (near Malaga), 19h. (near Tucson).

Feb. 6d. 5h. 0m. 26s. Epicentre 2°·2N. 126°·9E. (as on 1941 March 6d.).

A = −·6000, B = +·7991, C = +·0382; δ = +2; λ = +7;
D = +·800, E = +·600; G = −·023, H = +·031, K = −·999.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane		38·8	141	i 6 32 a	−56	i 13 24	− 2	i 16 16	SS	—
Vladivostok		41·0	6	e 8 21	+35	i 14 37	+38	—	—	—
Riverview		42·5	149	—	—	e 14 23	+ 1	i 17 39	SS	—
Irkutsk		53·3	343	e 9 23	0	16 49	− 5	—	—	—
Bombay	E	55·4	291	i 9 34?	− 4	i 17 3	−19	—	—	—
Almata		60·3	321	e 10 14	+ 1	—	—	—	—	—
Andijan		62·3	316	e 10 26	0	18 44	− 8	—	—	—
Tashkent		64·4	315	10 41	+ 1	19 12	− 6	—	—	—
Sverdlovsk		75·3	329	i 11 45	− 2	21 11	−15	—	—	—
Moscow		87·8	326	i 12 51	− 1	23 23	−11	—	—	—
Collmberg	z.	103·0	323	e 14 1	− 1	—	—	—	—	—
Mount Wilson	z.	109·2	53	e 19 24	PP	—	—	—	—	—
Riverside	z.	109·8	53	e 19 39	PP	—	—	—	—	—
Palomar	z.	110·4	54	i 19 19	PP	—	—	—	—	—
Tucson		115·6	52	e 18 49	[+ 5]	i 29 22	PS	—	—	—

Additional readings:—
Brisbane iSN=13m.21s.
Bombay iN=17m.6s.

Feb. 6d. 19h. 5m. 40s. Epicentre 0°·5S. 80°·8W. (as on 2d.).

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Huancayo		12·7	155	i 3 8	+ 3	i 5 28	0	i 3 46	PPP	i 6·4
La Paz	z.	20·2	142	i 4 42a	+ 3	i 8 47	+26	5 11	PP	12·5
San Juan		23·7	37	i 5 13	− 1	i 9 36	+ 9	—	—	i 10·6
Bermuda		36·1	24	e 8 22	PP	e 12 48	+ 3	—	—	e 15·6
St. Louis		39·9	348	e 7 34	− 3	e 13 35	− 8	e 16 27	SS	—
Florissant	E.	40·1	348	—	—	i 13 38	− 8	e 16 30	SS	—
Philadelphia		40·6	8	—	—	i 13 50	− 4	(e 16 50)	SS	e 16·8
Tucson		43·2	322	i 8 4k	0	e 14 37	+ 5	—	—	e 23·4
Pierce Ferry		47·7	324	i 8 40	0	—	—	—	—	—
Palomar		47·8	318	i 8 41k	0	—	—	—	—	—
Boulder City		48·2	323	i 8 44	0	—	—	i 10 5	PP	—
Overton		48·3	324	i 8 45	0	—	—	—	—	—
Riverside	z.	48·5	319	i 8 45	− 1	—	—	—	—	—
Mount Wilson	z.	49·1	319	i 8 51	0	—	—	—	—	—
Pasadena		49·1	319	i 8 51	0	—	—	—	—	e 31·2
Grand Coulée		58·5	331	e 10 1	+ 1	—	—	—	—	—
Malaga	z.	79·4	53	e 12 5	− 4	—	—	—	—	24·8
Granada		80·1	52	i 12 10k	− 3	22 16	− 2	—	—	41·6
Toledo	z.	80·2	50	i 12 13	− 1	—	—	—	—	—
Cheb		93·3	40	—	—	e 23 20?	[−32]	—	—	—

Additional readings :—
Huancayo i = 4m.34s.
La Paz iZ = 6m.15s., SSZ = 9m.29s.
San Juan e = 6m.40s.
St. Louis eZ = 7m.41s., iZ = 7m.47s. and 7m.52s.
Florissant eE = 14m.33s. and 17m.52s.

Feb. 6d. Readings also at 3h. (Tananarive), 5h. (near Bogota (2)), 6h. (Mount Wilson, Palomar, Tucson, and Riverside), 10h. (Bucharest and Sofia), 11h. (near Andijan), 15h. (Bombay and Calcutta), 22h. (Boulder City, Overton, Pierce Ferry, and Tucson), 23h. (College and St. Louis).

Feb. 7d. Readings at 0h. (St. Louis, Grand Coulée, Overton, Pierce Ferry, Butte, Salt Lake City, Shasta Dam, Philadelphia, Tucson, Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, and Sitka), 2h. (near Almeria, Granada, and Malaga), 4h. (Zürich and near Chur), 5h. (Zürich and near Triest), 7h. (Mount Wilson, Tucson, and Tinemaha), 8h. (near Ksara), 10h. (near Mizusawa), 12h. (Kew), 16h. (Bombay and Calcutta), 17h. (La Paz), 23h. (Auckland, Christchurch, Wellington, and Riverview).

Feb. 8d. 13h. 54m. 52s. Epicentre 21°·4S. 169°·3E. (as on 3d.).

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane		16·0	244	e 3 46	− 2	e 6 54	+ 8	—	—	i 7·9
Auckland		16·1	164	3 50	+ 1	6 58	+ 9	—	—	7·8
Arapuni		17·5	163	—	—	8 8?	+47	—	—	—
Apia		19·5	72	i 4 30	− 1	i 8 13	+ 7	—	—	—
Riverview		20·2	229	i 4 41a	+ 2	i 8 31	+10	i 4 59	pP	e 10·6
Sydney		20·2	229	e 4 38	− 1	e 8 29	+ 8	—	—	e 11·1
Wellington	z.	20·4	169	4 39	− 2	8 33	+ 8	i 5 28	PP	10·1
Christchurch		22·2	173	5 0	0	8 57	− 3	9 38	Q	11·3
Santa Barbara	z.	87·3	52	e 12 54	+ 4	—	—	—	—	—
Pasadena	z.	88·3	52	i 12 58a	+ 3	—	—	i 13 10	pP	e 40·1
Mount Wilson		88·4	52	i 12 58	+ 3	—	—	i 13 10	pP	—
Shasta Dam		88·5	46	i 12 49	− 7	—	—	—	—	—
Riverside	z.	88·8	52	i 13 0a	+ 3	—	—	i 13 11	pP	—
Palomar		88·9	53	i 13 0a	+ 2	—	—	i 13 12	pP	—
Haiwee		89·4	51	e 13 3	+ 3	—	—	i 13 14	pP	—
Tinemaha		89·6	50	i 13 4	+ 3	—	—	i 13 15	pP	—
Boulder City		91·6	51	i 13 14	+ 4	—	—	i 13 25	pP	—
Colombo	E.	92·0	276	e 15 8?	?	—	—	—	—	—
Pierce Ferry		92·3	53	i 13 16	+ 3	—	—	i 13 28	pP	—
Tucson		93·1	57	i 13 20	+ 3	—	—	—	—	e 45·3

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bombay	E.	102·5	285	e 18 32	PP	e 22 28	PKS	e 32 17	SS	—
La Paz		112·3	119	e 19 40	PP	—	—	—	—	76·1
Helwan	Z.	141·3	291	e 19 38	[+ 5]	e 23 20	PKS	e 27 23	SKS	—
Sofia		144·5	315	e 19 43	[+ 5]	—	—	e 23 49	PP	—
Collmberg		144·9	333	e 19 42	[+ 3]	—	—	i 23 48	PP	e 61·1
Belgrade		145·3	319	e 19 43a	[+ 3]	e 30 44	{+52}	e 23 52	PP	—
Chur		149·8	333	e 19 56	[+ 9]	—	—	—	—	—
Zürich		149·8	334	e 19 59	[+12]	—	—	—	—	—
Basle		150·0	335	e 24 2	PP	—	—	—	—	—
Granada		163·1	340	e 24 41a	PP	—	—	i 28 55	PPP	e 91·4
Malaga	Z.	163·8	342	e 24 45	PP	—	—	—	—	82·1

Additional readings :—
Brisbane iPE =3m.49s., iE =4m.29s.
Apia ePN =4m.36s.
Riverview i =4m.44s., iPPEN =5m.9s., iE =8m.34s., iP_cPZ? =8m.37s., sS?Z =9m.4s., iSS?NZ =9m.21s., iP_cSEN =12m.37s.
Wellington sS?Z =9m.3s., P_cP?Z =9m.38s., iZ =10m.3s., P_cS? =13m.3s.
Palomar iZ =13m.29s.
Collmberg i =24m.0s.
Belgrade e =35m.18s.
Long waves were also recorded at Tananarive.

Feb. 8d. Readings also at 0h. (Boulder City, Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, Santa Barbara, Tinemaha, Tucson, Granada, and Huancayo), 1h. (near Bogota), 2h. (Boulder City, Grand Coulee, Pierce Ferry, Shasta Dam, Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, Santa Barbara, Tinemaha, and Tucson), 9h. (La Paz), 10h. (Palomar and Riverside), 13h. (Brisbane, Chur, and Zürich), 14h. (Huancayo, Boulder City (2), Pierce Ferry (2), Shasta Dam, Tucson (3), Haiwee (2), Mount Wilson (3), Pasadena (2), Palomar (3), Riverside (3), Santa Barbara, and Tinemaha (3)), 16h. (Tucson, Mount Wilson, Pasadena, Palomar, Riverside, and Tinemaha), 17h. (Riverview, Mount Wilson, Pasadena, Palomar, Riverside, and near Tucson), 18h. (near New Delhi and near Tananarive), 20h. (near Tucson), 22h. (near Apia), 23h. (Riverview).

Feb. 9d. Readings at 0h. (near San Juan), 2h. (La Paz), 3h. (Collmberg, Palomar, Pasadena, and Riverside), 6h. (Tucson and Riverside), 13h. (Bucharest and Sofia), 22h. (Tucson, Port au Prince, and near Tacubaya), 23h. (Port au Prince).

Feb. 10d. 4h. 57m. 49s. Epicentre 41°·1N. 142°·2E. (as on 1944, June 6d.).

Seismological notes, Bull. Seismo. Soc. Amer., April, 1945, Vol. 35, No. 2, p. 82 : "The shock extended from Hokkaido in the north down through Honshu. Hatinohe, inland from the eastern coast, suffered the full force of the earthquake, which was also felt throughout Eastern and Central Honshu. This area includes ten prefectures and the Kwanto district, in which Tokyo and Yokohama are situated."

Suggested epicentres : C.M.O. 40°·9N. 142°·1E. ; U.S.C.G.S. 41°·5N. 142°·0E.

Pasadena suggests depth of focus 60km.

$A = -·5972$, $B = +·4632$, $C = +·6548$; $\delta = -3$; $h = -2$;
$D = +·613$, $E = +·790$; $G = -·517$, $H = +·401$, $K = -·756$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Hatinohe		0·8	222	0 27k	+ 9	—	—	—	—	—
Aomori		1·1	255	0 37k	+15	—	—	—	—	—
Miyako		1·5	186	0 34	+ 6	0 51	+ 2	—	—	—
Morioka		1·6	209	0 34	+ 4	0 51	0	—	—	—
Sapporo		1·8	342	0 43k	+11	1 10	+14	—	—	—
Akita		2·1	229	0 45k	+ 8	1 4	0	—	—	—
Mizusawa	E.	2·1	203	0 41	+ 4	1 2	− 2	—	—	—
Sendai		3·0	199	0 51k	+ 1	1 26	− 1	—	—	—
Onahama		4·3	194	1 20	P*	2 6	+ 6	—	—	—
Mito		4·9	207	1 18	+ 1	2 17	+ 2	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Utunomiya		4·9	203	1 21	+ 4	2 20	+ 5	—	—	—
Tukubasan		5·2	200	1 25	+ 4	2 27	+ 5	—	—	—
Kumagaya		5·4	205	1 27a	+ 3	—	—	—	—	—
Nagano		5·4	217	1 17	− 7	2 30	+ 2	—	—	—
Wazima		5·6	230	1 27	0	2 43	+10	—	—	—
Tokyo		5·7	200	1 18	−10	2 10	−25	—	—	—
Toyama		5·9	223	1 46a	P*	3 9	S_g	—	—	—
Yokohama		6·0	201	1 36	+ 4	2 55	+12	—	—	—
Hunatu		6·2	207	1 38	+ 3	2 57	+ 9	—	—	—
Kohu		6·2	209	1 39	+ 4	2 57	+ 9	—	—	—
Mera		6·4	198	1 34	− 4	2 30	−23	—	—	—
Osima		6·7	200	1 42	0	2 23	−37	—	—	—
Shizuoka		6·8	207	1 49	+ 5	3 14	+11	—	—	—
Omaesaki		7·2	207	1 55	+ 6	—	—	—	—	—
Kameyama		7·7	219	1 48	− 8	3 25	0	—	—	—
Kyoto		7·9	222	2 0	+ 1	3 44	+14	—	—	—
Vladivostok		7·9	288	i 2 2	+ 3	—	—	—	—	—
Toyooka		8·0	229	2 4	+ 4	3 37	+ 4	—	—	—
Owase		8·4	216	2 3	− 3	3 23	−20	—	—	—
Hamada		10·1	236	2 33a	+ 5	4 27	+ 2	—	—	—
Kôti		10·2	225	2 31	0	—	—	—	—	—
Simidu		11·1	225	2 42	− 1	4 44	− 5	—	—	—
Hukuoka		12·0	235	(2 58a)	+ 3	(5 17)	+ 6	—	—	—
Kumamoto		12·3	232	3 3	+ 4	5 32	+14	—	—	—
Miyazaki		12·6	227	3 0	− 3	5 39	+13	—	—	—
Irkutsk		28·0	307	i 5 54	− 1	—	—	—	—	—
Pehpei		31·0	261	e 3 8	?	e 10 57	−29	—	—	—
College		45·4	35	e 9 18	+56	e 14 55	− 9	i 18 46	S_cS	e 20·0
Calcutta	N.	48·6	266	i 8 48a	+ 1	i 15 45	− 4	i 10 33	PP	—
Andijan		51·4	295	9 10	+ 1	16 26	− 2	—	—	—
Dehra Dun	N.	52·1	280	e 8 52	−22	i 16 14	−24	e 10 49	PP	e 26·2
Sverdlovsk		52·6	317	i 9 18	0	i 16 37	− 7	—	—	—
Sitka		52·8	43	e 14 46	?	e 16 43	− 4	—	—	e 22·3
Tashkent		53·3	296	i 9 22	− 1	i 16 49	− 5	—	—	—
New Delhi		53·7	279	i 9 23	− 3	i 16 48	−11	11 23	PP	26·2
Honolulu		53·9	93	e 9 47	+20	i 16 58	− 4	—	—	e 22·5
Hyderabad	N.	59·1	267	9 58	− 6	18 9	− 2	11 58	PP	28·8
Bombay		62·4	272	i 10 24	− 3	i 18 48	− 5	12 39	PP	—
Victoria		63·2	48	10 40	+ 8	18 57	− 6	25 47	SSS	29·8
Kodaikanal		64·3	262	i 10 43	+ 4	i 19 15	− 2	13 3	—	30·8
Moscow		64·4	323	10 39	− 1	19 16	− 2	e 10 59	pP	—
Colombo	E.	64·8	257	10 41	− 2	19 18	− 5	—	—	39·2
Grand Coulée		66·0	47	e 10 47	− 3	e 19 26	−12	i 11 10	pP	—
Baku		66·5	305	i 10 54	0	19 39	− 5	—	—	—
Shasta Dam		68·2	55	e 11 2	− 2	i 20 1	− 3	i 11 20	pP	—
Ukiah		68·6	57	e 11 14	+ 7	i 20 7	− 2	—	—	e 28·0
Brisbane	Z.	69·0	170	i 11 6	− 3	e 20 21	+ 7	—	—	—
Apia		69·2	131	e 11 25	+15	e 20 17	+ 1	i 13 48	PP	e 28·8
Upsala		69·6	335	11 11	− 2	20 11	−10	i 13 45	PP	e 30·2
Saskatoon		69·7	39	e 11 33	+19	i 20 20	− 2	e 24 51	SS	28·2
Berkeley		70·0	58	i 11 15	0	e 20 3	−23	i 11 27	pP	e 31·8
Santa Clara		70·5	58	i 11 37	+19	e 20 31	− 1	—	—	e 32·6
Butte		70·7	46	e 11 32	+12	e 20 16	−18	i 21 23	S_cS	e 28·6
Bozeman		71·7	45	i 11 31	+ 5	i 20 42	− 3	e 12 35	PP	e 30·7
Bergen		72·9	340	i 11 33	0	20 57	− 2	14 32	PP	32·4
Tinemaha		73·0	55	i 11 35	+ 2	e 20 56	− 4	i 11 50	pP	—
Yalta		73·2	315	i 11 33	− 2	i 20 57	− 5	—	—	—
Haiwee		73·7	56	i 11 40	+ 2	e 21 0	− 8	i 11 55	pP	—
Santa Barbara		73·7	59	i 11 40	+ 2	e 21 5	− 3	i 11 54	pP	—
Logan		73·8	49	i 11 41	+ 3	i 21 8	− 1	i 21 44	S_cS	e 29·3
Salt Lake City		74·4	50	e 11 43	+ 1	e 21 10	− 6	i 21 39	S_cS	e 29·3
Copenhagen		74·6	334	i 11 41	− 2	i 21 6	−12	14 29	PP	—
Mount Wilson		74·9	58	i 11 44	0	e 21 17	− 5	i 12 0	pP	—
Pasadena		74·9	58	i 11 44	0	i 21 16	− 6	e 25 47	SS	e 29·2
Riverview		75·0	173	i 11 48k	+ 3	i 21 19	− 4	i 12 5	P_cP	e 34·5

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Sydney		75·0	173	e 12 11	+26	i 21 20	− 3	—	—	—
Riverside		75·5	58	i 11 46	− 2	e 21 23	− 5	i 12 3	pP	—
Overton		75·7	54	i 11 48	− 1	i 21 28	− 2	i 16 20	PPP	—
Boulder City		75·8	55	i 11 49	− 1	e 21 24	− 7	i 14 29	PP	—
Palomar		76·2	57	i 11 53a	+ 1	e 21 32	− 4	i 12 2	pP	—
Pierce Ferry		76·2	54	i 11 50	− 2	e 21 20	−16	i 24 50	SS	—
La Jolla		76·3	58	e 11 53	+ 1	e 21 35	− 2	i 12 8	pP	—
Perth		76·7	203	11 59	+ 4	22 1	+20	25 54	SS	35·6
Rapid City		76·9	43	i 11 58	+ 2	i 21 36	− 7	i 22 13	S_cS	e 32·3
Campulung		77·3	320	e 11 59	+ 1	e 21 47	− 1	—	—	37·2
Bucharest		77·4	319	e 11 58	0	i 21 45	− 4	i 14 42	PP	37·2
Aberdeen		77·6	342	i 11 59	− 1	i 21 49	− 2	i 27 1	SS	36·1
Collmberg		77·9	330	i 12 0	− 1	i 21 49	− 5	i 14 51	PP	e 35·2
Prague		78·3	329	i 12 3a	0	e 21 47	−12	e 15 5	PP	e 34·2
Jena		78·7	331	12 11?	+ 5	—	—	—	—	—
Edinburgh		79·0	342	—	—	22 2	− 4	22 52	PS	—
Cheb		79·1	331	e 12 9	+ 1	e 22 27	+20	e 15 21	PP	e 44·2
Ksara		79·3	305	e 12 9	0	e 22 9	0	i 12 26	pP	—
Belgrade		79·8	322	i 12 12a	0	e 22 29	+15	i 14 48	PP	e 45·4
Sofia		80·0	319	e 12 14	+ 1	i 22 11	− 6	i 15 17	PP	—
Stonyhurst		80·7	340	i 12 19	+ 3	i 22 18	− 6	i 15 17	PP	e 37·0
Tucson		80·7	55	i 12 16	0	i 22 16	− 8	i 12 34	pP	e 45·8
Uccle		81·3	335	i 12 17a	− 3	e 22 23	− 7	i 15 27	PP	e 36·2
Strasbourg		82·1	332	i 12 21	− 3	i 22 47	+ 9	i 12 37	pP	38·2
Triest		82·1	327	i 12 22	− 2	i 23 0	+22	i 15 24	PP	—
Kew		82·2	338	i 12 27	+ 3	i 22 35	− 4	i 15 26	PP	e 40·2
Chur		82·8	330	e 12 27a	0	e 22 43	− 2	—	—	—
Zürich		82·8	331	e 12 25a	− 2	e 22 41	− 4	—	—	—
Basle		83·0	331	e 12 27a	− 1	e 22 43	− 4	—	—	—
Auckland		83·1	155	12 38	+ 9	22 48	0	23 11	S_cS	39·2
Neuchatel		83·7	331	e 12 31	− 1	—	—	—	—	—
Arapuni		84·5	155	12 59	+23	22 53	− 9	28 11?	SS	35·2
Helwan		84·8	305	i 12 37k	0	23 2	− 3	15 53	PP	—
Chicago		86·0	36	e 12 37	− 6	i 23 1	−16	e 16 7	PP	e 37·0
Clermont-Ferrand		86·1	333	i 12 44	0	e 23 34	+16	e 16 8	PP	e 42·2
Florissant		87·1	39	i 12 48	− 1	i 23 9	[− 6]	i 16 11	PP	—
Wellington		87·2	156	12 51?	+ 2	23 11	[− 4]	13 18	pP	40·2
St. Louis		87·3	39	e 12 45	− 5	23 11	[− 5]	i 16 13	PP	—
Shawinigan Falls		87·3	24	12 51	+ 1	23 25	− 4	—	—	45·2
Seven Falls		87·4	22	12 51	+ 1	i 23 25	− 5	29 19	SS	39·2
Ottawa		87·4	26	12 48	− 2	i 23 23	− 7	29 11	SS	e 43·2
Christchurch		88·6	159	12 58	+ 2	23 9	[−15]	16 36	PP	41·2
Cape Girardeau	E.	88·7	40	—	—	e 23 23	[− 2]	—	—	—
Barcelona		90·3	332	13 28	+24	24 24	+27	16 54	PP	42·0
Pittsburgh	Z.	90·3	31	i 12 51	−13	—	—	—	—	—
Pennsylvania		90·7	30	—	—	i 24 7	+ 6	i 23 50	SKS	—
Harvard		91·4	24	i 13 9	0	—	—	—	—	—
Tortosa		91·4	332	i 13 9	0	24 9	+ 2	17 6	PP	e 39·2
Halifax		91·6	19	—	—	e 22 11?	?	—	—	40·2
Weston		91·6	24	e 13 7	− 3	e 24 3	− 6	e 13 22	pP	—
Fordham		92·1	27	i 13 11	− 1	i 24 9	− 4	i 23 43	SKS	e 46·2
Philadelphia		92·4	28	e 13 13	− 1	i 23 43	[− 4]	e 17 4	PP	e 39·8
Georgetown		92·7	30	e 13 15	0	i 23 7	[−41]	31 3	SS	37·2
Toledo		93·7	335	i 13 20	0	i 24 29	+ 2	i 17 9	PP	43·2
Mobile		94·7	42	—	—	23 57	[− 2]	31 43	SS	46·9
Coimbra		94·8	338	e 13 30	+ 5	24 30	− 6	17 20	PP	47·8
Columbia		95·3	36	e 13 33	+ 6	e 24 1	[− 2]	e 17 19	PP	e 46·4
Granada		96·0	333	i 13 30a	0	i 24 8	[+ 1]	i 13 44	pP	52·1
Lisbon		96·4	338	13 32k	0	24 2	[− 7]	i 17 28	PP	42·1
Malaga	Z.	96·7	333	i 13 34a	+ 1	i 24 39	−14	i 13 48	pP	e 47·2

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m. s.			m.
Tacubaya		97·2	57	e 13 40	+ 4	i 25 12	+15	e 13 56	pP		e 45·3
Bermuda		102·8	23	e 18 23	PP	i 25 44	0	i 33 51	SS		e 42·3
Tananarive		105·6	259	e 18 45	PP	e 25 8	[+15]	28 9	PS		e 51·0
San Juan		115·2	30	e 19 43	PP	e 27 21	{+40}	e 29 11	PS		e 48·8
Bogota		123·7	46	i 19 2	[+ 2]	—	—	e 21 0	PP		—
Huancayo		136·2	60	e 19 21	[− 2]	e 40 7	SS	e 22 23	PP		e 48·9
La Paz	Z.	144·2	55	i 19 36	[− 2]	i 26 40	[− 6]	i 23 15	SKP		68·9
La Plata	E.	163·0	76	20 11	[+ 7]	31 17	{−11}	24 55	PP		58·2
	N.	163·0	76	20 5	[+ 1]	31 23	{− 5}	24 53	PP		58·8

Additional readings :—
Hukuoka readings have been diminished by 1m.
Pehpei e =4h.55m.56s.
College i =9m.31s., e =15m.41s.
Calcutta iP_cPN =10m.21s., iSSN =18m.58s.
Dehra Dun eSS?N =20m.14s., eN =25m.44s.
Sitka i =20m.36s.
New Delhi iE =11m.56s., S_cSN =19m.17s., S_cSE =19m.26s., SSN =19m.55s., SSSN = 21m.9s., iE =21m.21s.
Hyderabad PSN =18m.23s., SSN =21m.51s.
Bombay P_cPN =10m.57s., PPE =12m.44s., PPPEN =14m.11s., SPN =19m.1s., SPE = 19m.4s., SSN =22m.53s.
Kodaikanal SS =23m.15s.
Grand Coulée iP =10m.50s., i =13m.34s. and 14m.26s., esS =20m.2s., e =20m.49s., i = 25m.29s., iPKP,PKP =39m.29s.
Shasta Dam iP =11m.5s., iPP =13m.49s., esS =20m.32s., isPS =21m.35s., eSS = 24m.22s., eSSS =27m.51s., ePKP,PKP =39m.12s.
Upsala i =11m.27s. and 11m.43s., iE =14m.59s., iPPPN =15m.33s., iE =15m.55s., iPS?E =20m.43s., eSS?E =24m.25s., eSSN =24m.47s., eE =26m.28s., eSSSE = 27m.35s., eSSSN =27m.47s.
Saskatoon e =22m.53s.
Berkeley isS =20m.25s.
Butte e =12m.29s., i =20m.28s. and 23m.56s.
Bozeman e =11m.45s., eS_cS =21m.21s., i =22m.15s., iSS =25m.5s., i =28m.55s.
Bergen iZ =11m.47s., PPP =15m.59s., SS =25m.35s.
Tinemaha iZ =12m.4s. and 12m.28s.
Haiwee iZ =11m.45s.
Logan i =12m.0s., 15m.0s., and 25m.1s.
Salt Lake City e =12m.18s., i =22m.3s., 23m.5s., and 23m.25s.
Copenhagen i =11m.56s. and 14m.42s., SS =25m.52s.
Pasadena iZ =11m.52s. and 11m.59s., i =12m.2s., iPKP,PKPZ =39m.28s.
Riverview iSKSE =21m.49s., isSE =22m.0s., iPPSE =22m.29s., iSSN =26m.22s., eQE =31·8m.
Overton i =12m.5s., iSKS =22m.13s., iPKP,PKP =39m.35s.
Boulder City i =11m.52s., 12m.8s., and 15m.5s., e =21m.40s., iPKP,PKP =40m.9s.
Palomar i =12m.19s.
Pierce Ferry i =11m.53s. and 12m.7s., iS =21m.32s., i =36m.0s. and 39m.0s., iPKP, PKP =39m.18s.
Rapid City i =21m.52s., 22m.30s., and 23m.51s., eSS =26m.29s., e =27m.43s., eSSS = 29m.55s.
Bucharest iE =12m.15s., iN =16m.38s., eS?E =21m.34s., iPSE =22m.17s.
Collmberg iPPPZ =16m.40s., e =22m.2s., ePS =22m.36s., iPPS =22m.44s., eSS = 26m.50s., eSSS =30m.18s., ePKP,PKPZ =39m.11s., with very many other readings without phase.
Prague ePPP =16m.41s., eSS =26m.47s., eSSS =29m.41s.
Edinburgh PS =22m.29s.
Cheb eSS =27m.26s.
Belgrade i =12m.27s., e =34m.2s.
Sofia iEN =12m.27s., iPSEN =22m.46s., iSSEN =27m.29s.
Stonyhurst iP_cP =12m.28s., iS_cS =22m.33s., iPS =23m.9s., iPPS =23m.20s., eSS = 27m.27s., eSSS =30m.44s., eQ =33m.26s.
Tucson iPP =15m.27s., e =23m.21s. and 25m.27s., eSS =27m.51s., ePKP,PKP =39m.2s., e =42m.29s.
Uccle PPP =16m.59s., SSE =27m.48s., eE =33m.41s.
Strasbourg isP =12m.55s., ePP =15m.33s., esS =23m.11s., eSS =28m.7s.
Triest iPPP =17m.24s., iSKS =22m.32s., iPS =23m.39s., iSS =32m.51s.
Kew iEN =15m.43s., ePPP?N =17m.26s.?, eSKSN =22m.46s., ePSN =23m.12s., eSS?N =27m.26s.?, eQEN =37·2m.
Auckland i =13m.2s., 24m.26s.?, and 25m.11s., SS =28m.21s., Q =34m.53s.?.
Helwan PPPNZ =17m.47s., eE =22m.31s., PSE =23m.53s.
Chicago e =13m.17s., 16m.25s., 23m.23s., and 23m.49s., iSS =28m.55s., eSSS = 32m.15s.
Clermont-Ferrand eSKS =22m.59s.
Florissant iSSN =29m.16s., iN =33m.56s.

Continued on next page.

Wellington iZ =13m.48s., 14m.12s., and 15m.6s., PPZ =16m.21s., iZ =17m.34s. and 18m.26s., SKS?Z =22m.45s., i =22m.58s., S? =23m.21s., sS?Z =23m.46s., SPZ = 24m.31s., SSZ =29m.6s., sSS =29m.49s., SSS =32m.26s., Q =36·2m.
St. Louis iPZ =12m.48s., iZ =13m.11s. and 14m.59s., eZ =16m.25s., iZ =17m.7s., eN = 23m.43s., eSS?N =28m.33s., iN =34m.50s.
Seven Falls SSS =31m.41s.
Ottawa PS =24m.11s.
Christchurch i =13m.27s., PPPEZ =18m.13s., iN =24m.12s., SS =29m.25s., QN = 36·2m.
Barcelona PS =24m.50s.
Pennsylvania e =24m.30s., i =25m.19s., eSS =30m.7s.
Tortosa iP_cPN =13m.21s., PPPN =18m.55s., iN =19m.45s., SKS =23m.36s., S_cSN = 24m.26s., PSN =24m.55s., SSN =30m.26s., SSSE =33m.48s.
Weston PP =16m.49s., e =24m.51s., SS =30m.4s.
Fordham i =24m.41s.
Philadelphia iPS =24m.40s., eSS =30m.11s.
Coimbra e =18m.25s., i =19m.20s., 1 =27m.2s.
Columbia e =32m.21s.
Granada iPP =17m.20s., pPP =17m.28s., eSKS =23m.12s., iPPS? =28m.19s., iSS = 31m.24s., Q =45·1m.
Lisbon PE =13m.37s. and 13m.45s., PPE =17m.51s., PPZ =18m.29s., SSN =31m.53s., E =38m.5s.
Malaga sPZ =14m.8s., ePPZ =17m.22s., PPP?Z =19m.45s., ePS?Z =26m.33s., SS?Z = 28m.57s.
Tacubaya ePE =13m.44s., epPE =13m.59s., iE =19m.0s., iPPPN =19m.19s., eN = 23m.0s., eSKSE =23m.59s., eSKSEN =24m.7s., iSN =25m.15s., iPPSE =26m.21s.
Bermuda e =22m.18s. and 32m.9s., i =36m.42s.
Tananarive SS =34m.13s.
San Juan i =20m.51s., e =28m.23s., eSS =35m.38s., 1 =36m.1s.
Huancayo e =19m.26s. and 20m.11s., i =22m.57s., 23m.25s., and 24m.27s., e =30m.7s., eSSS =45m.31s.
La Paz iSKKS =30m.12s., iZ =33m.4s., PSKS =33m.46s., PPS =35m.48s., SS = 41m.46s., SSSZ =47m.28s.
La Plata E =21m.17s., SKSPE =34m.59s., SKSPN =35m.41s., PPSE =38m.35s., PPSN =38m.53s., E =42m.11s., SSN =44m.53s., SSE =45m.23s., E =48m.23s., SSSN =51m.23s.

Feb. 10d. 5h. 12m. 25s. Epicentre 41°·1N. 142°·2E. (as at 4h.).

		△	Az.	P.	O−C.	S.	O−C.		Supp.
		°	°	m. s.	s.	m. s.	s.	m.	s.
Mori		1·6	309	0 31k	+ 1	0 55	+ 4	—	—
Morioka		1·6	209	0 45	+15	1 4	+13	—	—
Sapporo		1·8	342	0 39	+ 7	1 6	+10	—	—
Akita		2·1	229	1 2	S	(1 2)	− 2	—	—
Mizusawa	E.	2·1	203	0 37	0	1 5	+ 1	—	—
Sendai		3·0	199	0 45	− 5	1 22	− 5	—	—
Mito		4·9	207	1 17	0	2 8	− 7	—	—
Tukubasan		5·2	200	1 15	− 6	2 11	−11	—	—
Kumagaya		5·4	205	1 19	− 5	2 33	+ 5	—	—
Kohu		6·2	209	1 26	− 9	2 44	− 4	—	—
Misima		6·5	205	1 38	− 1	3 11	+16	—	—
Shizuoka		6·8	207	1 45	+ 1	3 11	+ 8	—	—
Gihu		7·1	219	2 29	P_g	—	—	—	—
Omaesaki		7·2	207	1 58	+ 9	3 37	S*	—	—
Kyoto		7·9	222	1 58	− 1	3 38	+ 8	—	—
Shasta Dam		68·2	55	i 10 58	− 6	i 19 57	− 7	—	—
Mount Wilson	z.	74·9	58	i 11 50	+ 6	—	—	—	—
Pasadena	z.	74·9	58	11 38	− 6	—	—	i 11 51	pP
Overton		75·7	54	i 11 44	− 5	—	—	—	—
Boulder City		75·8	55	i 11 46	− 4	—	—	—	—
Palomar	z.	76·2	57	i 12 0	+ 8	—	—	—	—
Pierce Ferry		76·2	54	i 11 47	− 5	—	—	—	—
Tucson		80·7	55	i 12 12	− 4	—	—	i 12 22	pP
Basle		83·0	331	e 12 25	− 3	—	—	—	—
Toledo		93·7	335	i 12 47	−33	—	—	17 4	PP

Additional readings :—
Mizusawa PN =0m.40s.
Shasta Dam i =11m.17s. and 11m.28s.
Boulder City i =11m.56s.
Pierce Ferry i =11m.59s.

Feb. 10d. Readings also at 2h. (Bogota, Huancayo, and near La Paz), 3h. (Overton and Tucson), 7h. (Auckland), 10h. (Barcelona), 12h. and 15h. (near Mizusawa), 21h. (near Mizusawa and near Tucson), 22h. (San Juan).

Feb. 11d. 1h. 20m. 56s. Epicentre 41°·1N. 142°·2E. (as on 10d.).

Intensity IV at Hatinohe : II-III at Urakawa and Morioka.
Epicentre 41°·4N. 142°·3E. Very shallow.

		△	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Hatinohe		0·8	222	0 19k	+ 1	0 32	+ 1	—	—
Aomori		1·1	255	0 29	+ 7	0 51	+12	—	—
Miyako		1·5	186	0 27	− 1	0 42	− 7	—	—
Morioka		1·6	209	0 33	+ 3	0 58	+ 7	—	—
Sapporo		1·8	342	0 40k	+ 8	1 17	+21	—	—
Akita		2·1	229	0 43	+ 6	1 14	+10	—	—
Mizusawa	N.	2·1	203	0 37	0	i 1 4	0	—	—
Sendai		3·0	199	0 47a	− 3	1 26	− 1	—	—
Mito		4·9	207	1 14	− 3	2 5	−10	—	—
Tukubasan		5·2	200	1 16	− 5	2 10	−12	—	—
Macbasi		5·3	209	1 26	+ 4	2 32	+ 7	—	—
Kumagaya		5·4	205	1 22	− 2	2 32	+ 4	—	—
Nagano		5·4	217	1 28	+ 4	2 47	S*	—	—
Wazima		5·6	230	1 33	+ 6	2 42	+ 9	—	—
Tokyo		5·7	200	1 27	− 1	2 12	−23	—	—
Toyama		5·9	223	1 33	+ 2	—	—	—	—
Yokohama		6·0	201	1 45	P*	—	—	—	—
Hunatu		6·2	207	1 32	− 3	2 43	− 5	—	—
Shizuoka		6·8	207	1 51	+ 7	3 19	S*	—	—
Gihu		7·1	219	1 33	−15	—	—	—	—
Omaesaki		7·2	207	1 56	+ 7	—	—	—	—
Hikone		7·5	221	2 2	+ 9	—	—	—	—
Kameyama		7·7	219	2 0	+ 4	—	—	—	—
Kyoto		7·9	222	2 1	+ 2	3 43	+13	—	—
Vladivostok		7·9	288	i 2 5	+ 6	e 3 44	+14	—	—
Wakayama		8·8	221	2 4	− 7	—	—	—	—
Kôti		10·2	225	2 30	− 1	4 7	−20	—	—
Irkutsk		28·0	307	e 5 54	− 1	e 10 4	−34	—	—
Moscow		64·4	323	e 10 38	− 2	—	—	—	—
Grand Coulée		66·0	47	e 10 50	0	—	—	i 10 56	?
Baku		66·5	305	e 10 51	− 3	—	—	—	—
Shasta Dam		68·2	55	i 10 59	− 5	—	—	i 11 11	PcP
Tinemaha		73·0	55	11 41	+ 8	—	—	—	—
Haiwee		73·7	56	e 11 31	− 7	—	—	i 11 44	PcP
Santa Barbara	z.	73·7	59	i 11 44	+ 6	—	—	i 11 58	PcP
Mount Wilson		74·9	58	i 11 51	+ 7	—	—	i 12 5	PcP
Pasadena		74·9	58	e 11 34	−10	—	—	i 11 51	PcP
Riverside	z.	75·5	58	e 11 43	− 5	—	—	i 12 1	PcP
Overton		75·7	54	e 11 44	− 5	—	—	i 11 57	PcP
Boulder City		75·8	55	i 11 46	− 4	—	—	i 11 56	PcP
Palomar		76·2	57	i 11 54	+ 2	—	—	i 11 59	PcP
Pierce Ferry		76·2	54	i 11 47	− 5	—	—	i 12 0	PcP
Collmberg	z.	77·9	330	i 11 59	− 2	—	—	—	—
Tucson		80·7	55	e 12 12	− 4	—	—	i 12 22	PcP
St. Louis	z.	87·3	39	e 12 45	− 5	—	—	i 12 58	PcP
La Paz		144·2	55	e 20 4	[+26]	—	—	—	—

Additional readings :—
Mount Wilson iZ =12m.48s.
Pasadena eZ =11m.47s.
Riverside iZ =11m.54s., eZ? =14m.22s.
Overton e =11m.52s.
Pierce Ferry i =11m.56s.
Tucson i =12m.25s.

Feb. 11d. 3h. 36m. 31s. Epicentre 41°·1N. 142°·2E. (as at 1h.).

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Mizusawa	E.	2·1	203	i 0 43	+ 6	i 1 9	+ 5	—	—
Vladivostok		7·9	288	e 2 1	+ 2	i 3 37	+ 7	—	—
Grand Coulée		66·0	47	i 10 45	− 5	—	—	i 11 8	PcP
Shasta Dam		68·2	55	i 11 3	− 1	—	—	i 11 19	PcP
Tinemaha		73·0	55	i 11 50	PcP	—	—	—	—
Haiwee	Z.	73·7	56	i 11 37k	− 1	—	—	i 11 54	PcP
Mount Wilson	Z.	74·9	58	i 11 43a	− 1	—	—	i 12 0	PcP
Pasadena	Z.	74·9	58	i 11 59	PcP	—	—	—	—
Riverside	Z.	75·5	58	i 11 46	− 2	—	—	i 11 52	PcP
Overton		75·7	54	i 11 48	− 1	—	—	i 12 4	PcP
Boulder City		75·8	55	i 11 50	0	—	—	i 12 7	PcP
Palomar	Z.	76·2	57	i 12 8	PcP	—	—	—	—
Pierce Ferry		76·2	54	i 11 51	− 1	—	—	i 12 8	PcP
Collmberg	Z.	77·9	330	i 12 0	− 1	—	—	—	—
Tucson		80·7	55	i 12 17	+ 1	—	—	i 12 33	PcP
St. Louis	Z.	87·3	39	i 12 48	− 2	—	—	—	—
La Paz		144·2	55	e 20 46	[+68]	—	—	—	—

Additional readings :—
Grand Coulée i =10m.48s.
Overton i =11m.57s.

Feb. 11d. Readings also at 0h. (near Triest), 1h. (Copenhagen), 3h. (near Mizusawa), 4h. (near Tananarive), 7h. (near Andijan), 11h. (Auckland), 15h. (near Mizusawa), 17h. (Auckland and near Alicante), 19h. (Riverview), 20h. (near Almeria, Malaga, and Granada), 21h. (Aberdeen, Kew, Copenhagen, Bergen, Upsala, Granada, Collmberg, Riverview (2), Auckland (2), Bombay, New Delhi, Calcutta, Tashkent, Irkutsk, and Vladivostok), 23h. (near Mizusawa).

Feb. 12d. 16h. 24m. 49s. Epicentre 31°·5S. 71°·0W. Depth of focus 0·005.
(as on 1943 April 15d.).

Intensity VIII at Combarbalá. The macroseismic area is comprised between Freirina and Santiago. Macroseismic epicentre about 31°S. 71°W.

Federico Greve.
Determinación del Coeficiente de Seguridad Antisísmico para las Diferentes Zonas de Chile, p. 16.

$A = +·2781$, $B = -·8077$, $C = -·5199$; $\delta = +1$; $h = +3$;
$D = -·945$, $E = -·326$; $G = -·169$, $H = +·492$, $K = -·854$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
La Plata		11·4	111	2 45	+ 3	4 53	+ 4	—	—	5·4
La Paz		15·2	10	3 35	+ 3	6 38	+19	—	—	9·1
Huancayo		19·8	349	e 4 25	− 3	e 8 2	0	i 8 24	sS	e 10·1
Bogota		36·0	356	e 6 56	− 1	—	—	—	—	—
St. Louis		72·0	345	i 11 19	0	e 20 31	− 3	i 11 33	pP	—
Florissant		72·2	345	e 11 19	− 1	i 20 36	0	e 11 34	pP	—
Tucson		73·8	326	e 11 26	− 3	—	—	i 11 49	pP	—
Palomar		77·7	323	e 11 52	+ 1	—	—	i 12 7	pP	—
Pierce Ferry		78·4	326	i 11 54	− 1	—	—	i 12 15	pP	—
Riverside	Z.	78·4	323	i 11 56	+ 1	—	—	i 12 17	pP	—
Boulder City		78·7	326	e 11 57	0	—	—	i 12 13	pP	—
Overton		79·0	326	e 11 58	− 1	—	—	i 12 16	pP	—
Mount Wilson		79·0	323	e 11 56	− 3	—	—	i 12 15	pP	—
Pasadena		79·0	323	i 11 59	0	—	—	i 12 14	pP	—
Haiwee	Z.	80·4	324	i 12 7	+ 1	—	—	i 12 26	pP	—
Tinemaha		81·3	324	i 12 11	0	—	—	i 12 31	pP	—
Shasta Dam		86·1	324	i 12 35	0	—	—	i 12 50	pP	—
Grand Coulée		90·0	330	e 12 53	− 1	—	—	i 13 9	pP	—

For Notes see next page.

NOTES TO FEBRUARY 12d. 16h. 24m. 49s.

Additional readings :—
Huancayo i = 4m.43s. and 5m.21s.
St. Louis esSE = 20m.57s.
Florissant esSE = 21m.0s.
Tucson i = 11m.29s.
Mount Wilson i = 12m.0s., iZ = 12m.20s.
Pasadena iNZ = 12m.20s.
Tinemaha iZ = 13m.36s.

Feb. 12d. Readings also at 6h. (Riverview, Copenhagen, Collmberg, Triest, Bucharest, Belgrade, and near Sofia), 16h. (near Mizusawa), 21h. (near Almata), 22h. (Palomar and Riverside), 23h. (Helwan, Bucharest, near Sofia, and near Harvard).

Feb. 13d. 11h. 27m. 8s. Epicentre 33°·5N. 38°·5W.

$A = +\cdot6539$, $B = -\cdot5202$, $C = +\cdot5493$; $\delta = -8$; $h = +1$;
$D = -\cdot622$, $E = -\cdot783$; $G = +\cdot430$, $H = -\cdot342$, $K = -\cdot836$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bermuda		22·0	275	e 5 3	+ 5	i 8 59	+ 3	e 8 48	?	i 9·2
Lisbon		24·2	69	e 5 17a	− 2	9 35	0	—	—	12·2
Coimbra		24·9	65	5 28	+ 2	9 48	+ 1	5 59	PP	11·7
San Fernando		26·6	75	—	—	10 44	+28	12 32	SS	—
Harvard		27·4	299	e 5 48	− 1	—	—	—	—	—
Seven Falls		27·9	309	e 5 53	− 1	—	—	—	—	9·9
Malaga	z.	28·0	73	i 5 56k	+ 1	e 10 30	− 8	i 6 26	pP	e 13·3
Toledo		28·2	67	i 5 54	− 2	i 10 46	+ 5	—	—	—
Granada		28·6	73	i 6 3k	+ 3	i 10 53	+ 5	6 11	pP	13·1
San Juan		28·9	246	e 6 6	+ 3	e 10 43	−10	—	—	e 12·0
Philadelphia		29·9	293	e 6 52	PP	—	—	—	—	e 13·9
Ottawa		30·8	305	e 6 19	− 1	—	—	e 9 52?	?	13·9
Tortosa		31·7	66	e 6 39	+12	11 34	− 3	7 44	PPP	14·3
Stonyhurst		32·6	41	—	—	e 12 2	+11	i 13 56	SS	i 14·4
Kew		32·9	45	i 7 40	pP	e 11 53	− 3	i 8 4	PPP	e 14·9
Clermont-Ferrand		33·9	57	e 6 48	+ 1	e 12 14	+ 3	—	—	e 16·6
Paris		34·0	51	6 43?	− 5	e 11 32	−41	—	—	14·9
Aberdeen		34·2	35	—	—	i 14 17	SS	—	—	—
Columbia		35·2	284	—	—	e 12 38	+ 7	(e 15 0)	SSS	e 15·0
Strasbourg		37·4	52	e 7 22	+ 6	e 13 8	+ 3	—	—	17·9
Basle		37·6	54	e 7 14	− 4	—	—	—	—	—
Zürich		37·9	54	e 7 19k	− 1	—	—	e 8 46	PP	—
Chur		38·5	55	e 7 26	0	e 13 25	+ 3	—	—	—
Bergen		39·1	33	e 9 52	PcP	—	—	e 16 12	SS	—
Chicago		39·3	297	—	—	e 13 22	−12	(16 21)	SS	e 16·4
Jena		40·1	50	e 7 39	0	—	—	—	—	—
Cheb		40·6	50	e 9 27	PP	e 13 59	+ 5	e 17 8	SS	19·9
Collmberg		41·1	50	e 7 46	− 1	e 14 0	− 1	e 9 31	PP	e 19·4
Potsdam		41·2	47	—	—	e 14 5	+ 3	—	—	e 18·9
Copenhagen		41·3	42	e 7 52	+ 3	14 6	+ 2	16 52	SS	—
Triest		41·4	57	i 7 48	− 2	i 14 3	− 2	i 8 33	pP	—
St. Louis		41·7	293	e 7 50	− 2	e 14 8	− 2	e 17 9	SS	—
Florissant	N.	41·8	293	—	—	e 14 10	− 1	e 17 12	SS	—
Prague		41·9	50	e 7 35	−19	i 13 7	−66	e 7 56	P	e 17·9
Upsala	E.	44·8	37	e 8 22	+ 5	e 15 8	PPS	e 17 52?	SS	—
	N.	44·8	37	e 8 29	+12	e 14 52?	− 3	e 18 14	SS	—
Belgrade		46·2	58	e 8 32k	+ 4	—	—	e 10 37	PP	—
Sofia		48·6	61	e 8 50	+ 3	e 15 52	+ 3	e 12 52	?	—
Moscow		55·4	43	e 9 37	− 1	e 17 18	− 4	—	—	—
La Paz	z.	57·2	214	i 9 56a	+ 5	e 17 54	+ 8	—	—	28·9
Huancayo		57·3	224	—	—	e 17 38	− 9	(e 23 43)	SSS	e 23·7

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Salt Lake City		57·4	301	e 13 18	PPP	—	—	i 14 36	P_cS	e 26·3
Helwan		58·5	73	e 10 3	+ 3	18 4	+ 1	e 11 13	P_cP	—
Tucson		59·6	291	e 10 8	0	—	—	e 13 4	?	e 28·8
Grand Coulée		60·0	310	i 10 8	− 3	—	—	i 10 20	?	—
Pierce Ferry		60·5	296	i 10 14	0	—	—	—	—	—
Overton		60·7	296	i 10 16	+ 1	—	—	—	—	—
Boulder City		61·2	296	i 10 20	+ 1	—	—	—	—	—
Tinemaha	Z.	63·3	298	i 10 33	0	—	—	—	—	—
Haiwee		63·5	297	i 10 35	+ 1	—	—	—	—	—
Palomar		63·8	294	e 10 36	0	—	—	i 10 47	?	—
Riverside	Z.	63·9	295	e 10 37	0	—	—	—	—	—
Mount Wilson	Z.	64·3	295	i 10 39	0	—	—	i 11 21	P_cP	—
Pasadena		64·5	295	i 10 40	− 1	—	—	—	—	e 26·5
Shasta Dam		64·9	304	i 10 42	− 1	—	—	—	—	—
Baku		68·1	56	e 11 10	+ 6	20 10	+ 7	—	—	—
Tashkent		80·3	47	e 12 19?	+ 5	e 22 14?	− 6	—	—	—
Bombay	E.	96·4	63	—	—	—	—	e 26 9	PS	—

Additional readings :—
Lisbon PEZ =5m.20s., SN =9m.40s.
Coimbra i =6m.25s., 6m.45s., and 10m.3s., SS =11m.7s.
Malaga i =7m.56s., P_cP?Z =9m.22s., iS =11m.2s., iZ =11m.6s., S_cPZ =12m.10s.
Granada isPP? =7m.1s., P_cP =10m.12s.
Tortosa P_cP?N =10m.11s.
Kew iSS?E =13m.12s.?, iSSSNZ =14m.5s., iSSSE =14m.13s., iP_cSZ =15m.23s.
Jena eN =8m.18s. and 10m.24s.
Collmberg i =7m.49s., e =9m.48s.
Triest iPP =10m.30s., iS =16m.45s., iPS =17m.15s., isS? =18m.0s., eSS =22m.3s., iSSS =22m.52s.?
St. Louis eZ =7m.53s.
Belgrade e =11m.52s. and 16m.33s.
Salt Lake City e =13m.40s. and 13m.46s.
Haiwee iNZ =10m.43s., iZ =10m.53s.
Mount Wilson iZ =10m.48s.
Long waves were also recorded at Logan, Bozeman, Uccle, Tananarive, New Delhi, Riverview, Christchurch, and Wellington.

Feb. 13d. 13h. Undetermined shock.

Tucson iP =34m.51s., i =35m.7s., eS =35m.49s., i =35m.59s., iL? =36m.1s.
Palomar ePZ =35m.33s., iZ =35m.43s., iS =37m.15s.
Riverside ePZ =35m.39s., iZ =36m.10s., iSEN =37m.34s.
Mount Wilson iPZ =35m.44s., iS =37m.49s.
Pierce Ferry iP =35m.45s., i =35m.50s., e =37m.16s., eS =37m.49s., iS =38m.9s.
Boulder City iP =35m.46s., i =36m.9s., eS =38m.4s., iS =38m.12s.
La Jolla ePZ =35m.46s., eS =37m.6s.
Overton e =35m.50s., i =37m.50s., eS =38m.14s., iS =38m.21s.
Haiwee eP =36m.5s., eSEN =38m.49s.
Pasadena iZ =36m.18s., iS =37m.49s., iLZ =39m.10s.
Tinemaha ePZ =36m.22s., eSE =39m.16s.
Logan i =41m.4s., 41m.23s., and 41m.32s., eL =42m.1s.
Rapid City e =42m.1s., i =43m.16s., e =44m.48s.
St. Louis eN =42m.46s., eLN =44m.59s.
Philadelphia e =47m.5s., eL =50m.40s.
Long waves were also recorded at Bozeman, Florissant, Chicago, and Harvard.

Feb. 13d. Readings also at 1h. (Apia), 9h. (Riverview, Auckland, Wellington, Christchurch, Arapuni, Zürich, and near Mizusawa), 12h. (Tucson, Shasta Dam, Pierce Ferry, Overton, Boulder City, Tinemaha, Haiwee, Palomar, Riverside, Mount Wilson, Pasadena, and La Jolla), 13h. (Tucson, Pierce Ferry, Overton, Boulder City, Tinemaha, Haiwee, Palomar, Riverside, Mount Wilson, Pasadena, and Huancayo), 20h. (Pasadena, Tucson, Mount Wilson, Riverside, Palomar, and Tinemaha).

Feb. 14d. 3h. 1m.13s. Epicentre 44°·7N. 115°·2W. (as on 1944, July 12d.).

Intensity VI at Clayton, Idaho City, and Weiser; V at Atlanta, Big Creek, Boise, and Butte. Felt throughout most of the state of Idaho and parts of Washington and Oregon. Macroseismic area 60,000 square miles.
United States Earthquakes, 1945. U.S.C.G.S., Washington, 1947, p. 6; chart, p. 7.

$A = -·3037$, $B = -·6453$, $C = +·7010$; $\delta = +5$; $h = -3$;
$D = -·905$, $E = +·426$; $G = -·298$, $H = -·634$, $K = -·713$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Butte	2·3	55	i 0 41	+ 1	—	—	—	—	e 1·9
Bozeman	3·1	71	e 0 51	0	i 1 30	+ 1	i 0 55	P*	e 2·1
Spokane	3·4	334	(i 0 54)	− 1	(i 1 37)	0	(i 1 3)	P_g	1·8
Logan	3·8	139	e 1 0	− 1	—	—	—	—	—
Grand Coulée	4·2	322	i 1 6	− 1	i 1 56	− 1	i 1 21	P_g	—
Salt Lake City	4·6	147	i 1 20	+ 8	i 2 11	+ 4	—	—	—
Shasta Dam	6·6	235	i 1 40	− 1	i 3 8	+10	i 2 6	P_g	—
Tinemaha	7·9	198	i 2 0	+ 1	i 4 4	S*	i 2 27	P_g	—
Overton	8·2	176	i 2 2	− 1	e 3 55	+17	i 2 39	P_g	—
Pierce Ferry	8·6	174	e 2 8	− 1	e 3 47	− 1	—	—	—
Rapid City	8·6	90	i 2 7	− 2	i 4 8	S*	i 2 57	P_g	—
Boulder City	8·7	178	i 2 10	0	e 3 57	+ 7	i 2 44	P_g	—
Haiwee	8·8	195	i 2 11	0	i 4 33	S_g	i 2 45	P_g	—
Santa Clara	8·9	217	e 3 5	P_g	i 4 54	S_g	—	—	—
Saskatoon	9·4	34	2 53	P*	4 43	S*	i 4 57	P_g	5·8
Mount Wilson	10·7	193	i 2 39k	+ 1	i 5 34	S_g	—	—	—
Pasadena	10·8	193	i 2 38k	− 1	i 5 38	S_g	—	—	—
Riverside	10·8	190	i 2 39k	0	e 5 36	S_g	—	—	—
Santa Barbara	10·8	200	e 2 39	0	i 5 43	S_g	—	—	—
Palomar	11·4	187	i 2 47k	0	i 5 50	S_g	—	—	—
Tucson	12·9	163	i 3 7	0	i 5 39	+ 6	—	—	e 6·4
Florissant	19·4	99	e 4 24	− 6	—	—	—	—	e 9·6
St. Louis	19·6	99	e 4 27	− 5	—	—	—	—	e 10·2
Shawinigan Falls	29·5	71	e 6 11	+ 3	—	—	—	—	14·8

Additional readings :—
Bozeman i = 1m.19s. and 1m.33s.
Spokane readings have been increased by 1m.
Logan iP = 1m.4s.
Grand Coulée i = 1m.9s., 2m.1s., 2m.5s., 2m.13s., and 2m.24s.
Salt Lake City i = 1m.25s., 2m.19s., and 2m.27s.
Shasta Dam i = 1m.59s. and 2m.3s., e = 3m.31s., i = 3m.39s. and 3m.48s.
Overton i = 2m.9s., 2m.29s., and 4m.14s.
Pierce Ferry iP = 2m.13s., e = 2m.30s., i = 2m.38s., e = 4m.16s., i = 4m.25s.
Rapid City i = 2m.40s., 3m.31s., and 4m.33s.
Boulder City i = 2m.14s. and 2m.39s., e = 3m.28s. and 4m.29s., i = 4m.37s.
Mount Wilson iZ = 3m.18s.
Pasadena iZ = 3m.6s.
Riverside iZ = 3m.21s.
Tucson i = 3m.11s., 3m.30s., and 6m.11s.
St. Louis iZ = 4m.31s., eZ = 6m.58s., e = 7m.36s.
Long waves were also recorded at other American stations.

Feb. 14d. 12h. 46m. 57s. Epicentre 40°·9N. 142°·7E. Focus at base of superficial layers. (as on 1944, June 2d.).

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

		Δ	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Hatinohe		0·9	247	0 15k	− 1	0 26	− 2
Miyako		1·4	203	0 9	−14	0 24	−17
Aomori		1·5	267	0 26	+ 2	0 44	0
Morioka		1·7	224	0 26	− 2	0 46	− 3
Mizusawa	E.	2·1	214	0 32	− 1	0 57	− 2

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Akita		2·3	239	0 15	−21	0 41	−23
Sapporo		2·4	235	0 41	+ 3	1 8	+ 2
Sendai		3·0	208	0 45	− 1	1 19	− 3
Hukusima		3·6	209	0 55	0	1 36	− 1
Onahama		4·2	200	1 1	− 2	1 45	− 7
Mito		4·8	202	1 9	− 3	—	—
Kumagaya		5·4	210	1 22	+ 2	2 31	+ 9
Nagano		5·5	221	1 26	+ 4	—	—
Hunatu		6·2	211	1 38	+ 6	2 47	+ 5
Misima		6·5	208	1 35	− 1	3 10	+20
Vladivostok		8·3	289	e 2 2	+ 1	i 3 43	+ 8

Feb. 14d. Readings also at 4h. (near Tucson), 9h. (Reykjavik), 14h. (Auckland, Christchurch, and Riverview), 15h. (near Mizusawa), 16h. and 19h. (near Tucson), 20h. (Jena), 21h. (near Mizusawa), 23h. (Arapuni, Auckland, Christchurch, Wellington, Riverview, Sydney, Mount Wilson, Pasadena, Palomar, Riverside, Tucson, Ksara, and near Tacubaya).

Feb. 15d. Readings at 0h. (Huancayo and Malaga), 1h. (Arapuni, Auckland, Christchurch, Wellington, and Kew), 2h. (Mount Wilson, Palomar, Riverside, Tucson, Riverview, and near Mizusawa), 4h. (near Mizusawa), 6h. (near Ottawa), 9h. (Alicante and Toledo), 10h. and 11h. (Mizusawa), 13h. (near Andijan), 14h. (Mizusawa), 22h. (near Bogota), 23h. (near Zürich).

Feb. 16d. Readings at 8h. (Tucson, Boulder City, near Overton, and Pierce Ferry), 9h. (near Andijan), 10h. (Bogota, near Basle, Neuchatel, and Zürich), 11h. (Bombay, Calcutta, New Delhi, Sverdlovsk, near Almata, Andijan, Tashkent, Clermont-Ferrand, Collmberg, near Strasbourg, Basle, Neuchatel, and Zürich), 20h. (near Zürich), 21h. (Wellington and Christchurch).

Feb. 17d. 22h. 35m. 46s. Epicentre 40°·9N. 142°·7E. Focus at base of superficial layers. (as on Feb. 14d.).

Intensity V at Hatinohe, Urakawa, and Miyako; IV at Hakodate, Morioka, and Mizusawa; II-III at Obihiro, Muroran, and Onahama. Epicentre 40°·8N. 142°·5E.
Seismo. Bull. Cent. Met. Obs., Japan, 1945, Tokyo, 1951, p.24.

$A = -·6030$, $B = +·4594$, $C = +·6522$; $\delta = +2$; $h = -2$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m.	s.	m.
Hatinohe		0·9	247	0 17k	+ 1	0 28	0	—	—	—
Miyako		1·4	203	0 27	+ 4	0 40	− 1	—	—	—
Morioka		1·7	224	0 30k	+ 2	0 49	0	—	—	—
Mizusawa	E.	2·1	214	i 0 36	+ 3	i 1 1	+ 2	—	—	—
Sapporo		2·4	235	0 37	− 1	1 4	− 2	—	—	—
Sendai		3·0	208	0 47	+ 1	1 22	0	—	—	—
Hukusima		3·6	209	0 56	+ 1	1 41	+ 4	—	—	—
Onahama		4·2	200	0 56	− 7	2 0	+ 8	—	—	—
Mito		4·8	202	1 36	+24	2 32	+25	—	—	—
Tukubasan		5·1	204	1 14	− 2	2 15	0	—	—	—
Kumagaya		5·4	210	1 23	+ 3	2 28	+ 6	—	—	—
Nagano		5·5	221	1 25	+ 3	2 39	+14	—	—	—
Tokyo		5·7	205	1 35	+11	2 56	+26	—	—	—
Wazima		5·7	234	1 29	+ 5	2 40	+10	—	—	—
Yokohama		5·9	204	1 31	+ 4	2 47	+12	—	—	—
Hunatu		6·2	211	1 32	0	2 43	+ 1	—	—	—
Kohu		6·2	213	1 33	+ 1	2 50	+ 8	—	—	—
Mera		6·4	202	1 34	0	2 49	+ 2	—	—	—
Misima		6·5	208	1 36	0	2 56	+ 6	—	—	—
Osima		6·6	204	1 38	+ 1	2 25	−27	—	—	—
Shizuoka		6·8	211	1 42	+ 2	3 5	+ 8	—	—	—
Hikone		7·6	225	1 50	− 1	—	—	—	—	—
Kyoto		8·0	225	1 57	0	3 36	+ 9	—	—	—
Toyooka		8·2	232	2 1	+ 1	3 34	+ 2	—	—	—
Vladivostok		8·3	289	i 2 0	− 1	i 3 36	+ 1	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Kobe		8·6	226	2 4	− 1	3 46	+ 4	—	—	—
Owase		8·6	219	1 25	−40	—	—	—	—	—
Wakayama		8·9	224	2 11	+ 2	—	—	—	—	—
Siomisaki		9·3	219	2 12	− 3	—	—	—	—	—
Hamada		10·3	238	2 28	0	—	—	—	—	—
Koti		10·3	228	2 27	− 1	4 31	+ 7	—	—	—
Hukuoka		12·2	237	2 55	+ 1	—	—	—	—	—
Irkutsk		28·4	307	5 50	− 4	10 32	− 5	—	—	—
Almata		47·7	297	e 8 31	− 4	—	—	—	—	—
Andijan		51·8	294	e 9 3	− 4	—	—	—	—	—
Sverdlovsk		53·0	317	i 9 13	− 3	i 16 37	− 5	—	—	—
Tashkent		53·7	297	9 19	− 2	e 16 55	+ 4	—	—	—
Moscow		64·8	323	e 10 36	− 2	e 19 16	+ 2	—	—	—
Grand Coulee		65·9	47	e 10 57	+13	—	—	i 11 26	pP	—
Shasta Dam		68·0	55	i 10 58	0	—	—	i 11 13	pP	—
Tinemaha		72·8	56	e 11 29	+ 2	—	—	i 11 43	pP	—
Haiwee	Z.	73·5	56	i 11 31	0	—	—	i 11 41	pP	—
Santa Barbara	Z.	73·5	59	i 11 47	pP	—	—	—	—	—
Pasadena	Z.	74·7	58	e 11 38	0	—	—	i 11 53	pP	e 34·2
Riverside	Z.	75·3	58	i 11 42	0	—	—	i 11 56	pP	—
Overton		75·5	54	i 11 44	+ 1	—	—	i 11 57	pP	—
Boulder City		75·6	55	e 11 44	+ 1	—	—	i 11 56	pP	—
Palomar		76·0	58	e 11 46k	0	i 14 50	PP	i 12 1	pP	—
Pierce Ferry		76·0	54	e 11 47	+ 1	—	—	i 12 2	pP	—
La Jolla		76·1	59	e 12 1	+15	—	—	—	—	—
Collmberg	Z.	78·3	330	i 11 55	− 3	—	—	i 12 10	pP	—
Jena	E.	79·1	331	e 12 0	− 3	—	—	—	—	—
Cheb		79·5	331	—	—	e 21 14?	−49	—	—	e 44·2
Tucson		80·5	56	e 12 12	+ 2	—	—	i 12 23	pP	e 40·5
Zürich		83·1	331	e 12 23	− 1	—	—	—	—	—
Helwan		85·2	306	i 12 33	− 1	e 22 56	− 4	i 12 47	pP	—
Clermont-Ferrand		86·5	333	e 12 40	− 1	—	—	—	—	—
Florissant	E.	87·1	39	—	—	e 23 19	0	e 23 47	sS	—
St. Louis		87·3	39	e 12 44	− 1	e 23 19	− 2	i 13 0	pP	—

Additional readings :—
Haiwee i = 11m.47s.
Pasadena iZ = 12m.7s. and 12m.50s.
Overton i = 12m.2s.
Boulder City i = 12m.0s.
Helwan iZ = 13m.11s., eN = 23m.32s.
Long waves were also recorded at Copenhagen, Uccle, Paris, Kew, and La Paz.

Feb. 17d. Readings also at 0h. (near Tucson), 4h. (Haiwee, Mount Wilson, Palomar, Riverside, Tucson, Tinemaha, and near Tacubaya), 5h. and 9h. (Mizusawa), 17h. (Alicante and near Ksara), 18h.(Arapuni, Auckland, Christchurch, Wellington, Brisbane, Riverview, Sydney, Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Boulder City, Overton, and Pierce Ferry), 19h. (La Paz and near Harvard), 20h. (Palomar, Riverside, Tucson, Collmberg, Granada, Kew, Paris, Tashkent, Irkutsk, Vladivostok, and near Mizusawa), 21h. (near Andijan).

Feb. 18d. 6h. 46m. 23s. Epicentre 7°·1N. 82°·4W.

A = +·1313, B = −·9839, C = +·1214 ; δ = +4 ; h = +7 ;
D = −·991, E = −·132 ; G = +·016, H = −·120, K = −·993.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Balboa Heights	3·4	55	i 0 53	− 2	i 1 36	− 1	—	—	—
Bogota	8·6	104	e 2 9	0	i 4 21	S*	i 2 32	?	7·3
San Juan	19·5	53	i 4 28	− 3	e 8 7	+ 1	i 8 20	SS	e 9·8
Huancayo	20·2	161	i 4 39	0	i 8 31	+10	i 5 10	PPP	i 9·8
Tacubaya	20·4	309	e 4 43	+ 2	e 8 49	SS	i 5 1	PP	i 10·7

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
La Paz		27·3	148	5 48	0	i 10 37	+10	i 6 23	PP	15·2
Bermuda		30·1	31	e 6 18	+ 5	e 11 18	+ 6	—	—	e 14·1
St. Louis		32·3	349	i 6 31	− 2	e 11 46	0	e 13 37?	SS	—
Florisant		32·5	349	i 6 34	0	11 49	0	e (13 37)	SS	e 13·6
Philadelphia		33·4	11	—	—	e 12 10	+ 7	—	—	e 13·2
Fordham		34·5	12	—	—	i 12 23	+ 3	—	—	e 17·9
Chicago		34·9	353	—	—	e 12 19	− 8	—	—	e 15·1
Tucson		36·5	317	i 7 9	0	e 12 58	+ 7	i 8 36	PP	e 18·7
Harvard		36·6	14	e 7 9	− 1	—	—	—	—	—
Ottawa		38·7	8	7 24	− 3	13 19	− 8	16 19	SS	18·6
Pierce Ferry		40·9	320	i 7 45	− 1	e 14 14	+16	—	—	—
La Jolla		41·3	313	e 7 50	+ 1	—	—	—	—	—
Palomar		41·3	314	i 7 49a	0	—	—	i 9 28	PcP	—
Boulder City		41·4	319	e 7 47	− 3	—	—	e 7 50	P	—
Overton		41·4	320	i 7 51	+ 1	—	—	—	—	—
Riverside	z.	42·0	314	i 7 55	+ 1	—	—	e 9 35	PcP	—
Mount Wilson		42·6	314	i 8 0	+ 1	—	—	—	—	—
Pasadena		42·6	314	i 7 59	0	—	—	e 9 41	PcP	e 18·9
Salt Lake City		42·6	327	—	—	e 14 32	+ 9	—	—	e 25·2
Logan		43·3	328	e 8 6	+ 1	—	—	e 16 51	?	e 22·2
Santa Barbara	z.	43·9	313	e 8 11	+ 1	—	—	—	—	—
Tinemaha	z.	44·3	318	e 8 13	0	—	—	—	—	—
Saskatoon		49·2	341	—	—	15 55	− 3	—	—	26·6
Grand Coulee		51·3	330	e 9 7	− 1	—	—	—	—	—
Granada		76·9	53	i 12 8k	+12	21 52	+ 9	26 45	SS	32·3
Jena		87·1	39	e 16 10	PP	—	—	e 16 13	?	—

Additional readings :—
Huancayo i = 6m.54s. e = 7m.53s.
La Paz iPZ = 5m.51s., SSZ = 11m.43s.
St. Louis iZ = 6m.34s.
Tucson ePcP = 8m.45s.
Palomar iZ = 8m.11s.
Pasadena iZ = 8m.21s.
Long waves were also recorded at Coimbra, Kew, Paris, and Riverview.

Feb. 18d. 10h. 8m. 3s. Epicentre 41°·4N. 141°·7E.

Intensity V at Miyako and Urakawa ; IV at Obihiro, Hatinohe, Morioka, and Hakodate ; II-III at Akita, Muroran, Asahigawa, Yamagata, and Hukusima. Epicentre as adopted. Shallow.
Seismo. Bull. Cent. Met. Obs., Japan, 1945. Tokyo, 1951, p.26.

$A = -\cdot5904$, $B = +\cdot4663$, $C = +\cdot6588$; $\delta = +3$; $h = -2$;
$D = +\cdot620$, $E = +\cdot785$; $G = -\cdot517$, $H = +\cdot408$, $K = -\cdot752$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Hatinohe		0·9	188	0 22k	+ 2	0 39	+ 5	—	—	—
Mori		1·1	310	0 7k	−15	0 40	+ 1	—	—	—
Morioka		1·7	193	0 32a	+ 1	0 55	+ 1	—	—	—
Sapporo		1·7	351	0 41a	+10	1 17	+23	—	—	—
Miyako		1·8	173	0 25	− 7	0 50	− 6	—	—	—
Mizusawa	E.	2·3	191	0 37	− 3	1 6	− 3	—	—	—
Sendai		3·2	191	0 47a	− 5	1 24	− 8	—	—	—
Hukusima		3·8	195	0 58a	− 3	1 46	− 1	—	—	—
Onahama		4·5	188	0 48	−23	1 57	− 8	—	—	—
Mito		5·1	191	1 13	− 7	2 22	+ 2	—	—	—
Maebasi		5·4	203	1 33	+ 9	—	—	—	—	—
Nagano		5·4	211	1 27	+ 3	2 51	S*	—	—	—
Wazima		5·5	224	1 34	+ 9	2 50	S*	—	—	—
Yokohama		6·2	195	1 23	−12	3 1	+13	—	—	—
Hunatu		6·3	202	1 35	− 1	3 3	+13	—	—	—
Kohu		6·3	204	1 35	− 1	3 0	+10	—	—	—
Misima		6·6	200	1 43a	+ 2	3 15	+17	—	—	—
Osima		6·8	196	2 40	+56	—	—	—	—	—
Shizuoka		6·9	203	1 54	+ 9	3 30	S*	—	—	—
Omaesaki		7·3	203	1 49	− 1	3 48	L	—	—	(3·8)

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Hikone		7·5	217	1 16	−37	2 44	−36	—	—	—
Kameyama		7·7	213	2 4	+ 8	3 40	+15	—	—	—
Kyoto		7·9	218	2 0	+ 1	3 59	S*	—	—	—
Kobe		8·4	220	2 8	+ 2	3 59	+16	—	—	—
Wakayama		8·8	218	2 13	+ 2	4 18	+25	—	—	—
Siomisaki		9·2	212	2 23	+ 7	4 33	S*	—	—	—
Hamada		10·0	232	2 33	+ 6	—	—	—	—	—
Hirosima		10·1	229	2 42	+14	—	—	—	—	—
Koti		10·2	222	2 33	+ 2	4 45	+18	—	—	—
Simidu		11·1	222	2 18	−25	5 1	+12	—	—	—
Hukuoka		11·9	233	3 0	+ 6	5 44	SSS	—	—	—
Kumamoto		12·3	229	3 6k	+ 7	5 42	SSS	—	—	—
Miyazaki		12·5	224	3 6	+ 4	5 54	SSS	—	—	—
Kagosima		13·3	226	3 8	− 5	—	—	—	—	—
College		45·3	35	e 8 18	− 3	e 14 52	−10	e 18 9	SS	e 20·8
Almata		46·8	297	8 42	+ 9	—	—	—	—	—
Calcutta	N.	48·2	266	e 8 53	+ 9	i 16 2	+19	e 10 41	PP	23·5
Andijan		50·9	295	9 13	+ 8	—	—	—	—	—
Dehra Dun	N.	51·7	280	—	—	e 16 44	+12	—	—	29·4
Sverdlovsk		52·1	317	i 9 17	+ 3	i 16 46	+ 8	—	—	—
Sitka		52·8	43	e 9 25	+ 6	i 16 45	− 2	i 20 33	SS	e 20·8
Tashkent		52·8	296	i 9 29	+10	i 17 21	PPS	—	—	—
New Delhi	N.	53·2	279	e 9 21	− 1	i 17 1	+ 9	20 37	SS	25·0
Honolulu		54·3	93	e 9 49	+19	e 16 45	−22	e 10 36	?	e 23·4
Hyderabad	N.	58·7	267	10 3	+ 1	18 15	+ 9	18 25	PS	—
Bombay		62·0	271	e 10 27	+ 3	e 18 54	+ 6	11 1	PcP	—
Victoria		63·3	48	10 9	−24	18 48	−16	25 57	SSS	32·0
Moscow		63·9	323	10 40	+ 3	19 20	+ 8	i 13 2	PP	—
Kodaikanal		64·0	262	i 9 13	−85	18 12	−60	11 43	PP	31·4
Baku		66·0	305	i 10 55	+ 5	19 46	+ 8	—	—	—
Grand Coulee		66·1	47	e 10 42	− 9	i 19 26	−13	i 13 24	PP	—
Shasta Dam		68·3	55	e 10 56	− 9	i 19 54	−12	i 20 50	ScS	—
Ukiah		68·8	57	e 11 9	+ 1	e 20 3	− 8	—	—	e 27·8
Upsala		69·1	335	11 16	+ 6	20 15	0	e 13 48	PP	e 34·0
Apia		69·7	131	e 11 50	+36	e 20 44	+22	—	—	e 32·9
Saskatoon		69·7	39	—	—	e 20 13	− 9	e 24 33	SS	32·0
Berkeley		70·1	58	i 11 14	− 2	i 20 12	−15	e 28 10	SSS	e 30·1
Santa Clara		70·6	58	e 11 21	+ 2	e 20 26	− 7	—	—	e 33·4
Butte		70·7	46	—	—	e 20 25	− 9	e 21 17	ScS	e 29·8
Bozeman		71·7	45	—	—	i 20 37	− 8	—	—	e 29·1
Bergen		72·5	340	—	—	e 20 52	− 2	—	—	e 35·1
Yalta		72·7	315	11 33	+ 1	i 21 4	+ 7	—	—	—
Tinemaha		73·1	55	e 11 26	− 8	e 20 50	−11	—	—	—
Haiwee		73·9	56	e 11 33	− 6	e 20 57	−13	i 11 54	PcP	—
Logan		73·9	49	i 11 43	+ 4	e 21 1	− 9	e 14 8	PP	e 33·7
Santa Barbara	Z.	73·9	59	e 11 29	−10	—	—	e 11 41	P	—
Copenhagen		74·1	334	i 11 44	+ 4	i 21 17	+ 5	14 30	PP	36·0
Salt Lake City		74·5	50	e 11 48	+ 6	e 21 10	− 7	e 14 36	PP	e 30·8
Mount Wilson		75·0	58	i 11 35	−10	e 21 14	− 9	i 11 48	P	—
Pasadena		75·0	58	i 11 35	−10	i 21 11	−12	e 14 35	PP	e 30·3
Riverview		75·4	173	i 11 48a	+ 1	i 21 16	−11	i 21 58	pS	e 34·3
Riverside		75·6	58	e 11 39	− 9	—	—	i 11 50	P	—
Overton		75·8	54	e 11 42	− 8	i 21 20	−11	i 12 0	PcP	—
Boulder City		75·9	55	i 11 43	− 7	e 21 21	−11	i 11 51	P	—
Pierce Ferry		76·3	54	i 11 45	− 7	i 21 28	− 9	i 11 54	P	—
La Jolla		76·4	58	e 11 56	+ 3	e 21 26	−12	—	—	—
Palomar		76·4	57	e 11 44	− 9	—	—	i 11 52	P	—
Potsdam		76·5	331	e 11 57	+ 3	i 21 48	+ 9	—	—	e 40·0
Bucharest		76·9	319	e 11 58	+ 2	e 21 54	+11	i 14 58	PP	38·0
Rapid City		76·9	43	i 12 2	+ 6	e 21 29	−14	e 26 37	SS	e 37·6
Aberdeen		77·2	342	—	—	i 21 50	+ 3	e 31 13	?	36·6
Collmberg		77·4	330	e 11 57	− 1	e 21 54	+ 5	e 14 58	PP	e 41·0
Prague		77·9	329	12 0?	− 1	21 59	+ 5	e 27 27	SS	e 41·0
Jena	N.	78·3	331	e 12 5	+ 2	e 22 4	+ 5	—	—	—
Edinburgh		78·6	342	—	—	21 57	− 5	22 34	PS	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Cheb		78·7	331	e 12 10	+ 4	e 22 14	+11	—	—	e 43·0
Ksara		78·8	305	e 12 12	+ 6	e 22 16	+12	—	—	—
Belgrade		79·3	322	e 12 10a	+ 1	e 22 53	PS	i 15 18	PP	e 47·9
Sofia		79·5	319	i 12 16	+ 6	e 22 22	+11	i 15 22	PP	—
Stonyhurst		80·3	340	i 12 23	+ 9	i 22 26	+ 6	i 15 21	PP	e 37·9
Tucson		80·9	55	e 12 9	− 8	e 22 12	−14	i 12 19	P	e 34·5
Uccle		80·9	335	e 12 19	+ 2	e 22 29?	+ 3	—	—	e 43·0
Strasbourg		81·6	332	e 12 24	+ 3	e 22 34	+ 1	—	—	44·0
Kew		81·8	338	i 12 21k	− 1	i 22 35	0	i 15 28	PP	e 39·0
Zürich		82·3	331	e 12 25k	0	e 22 41	+ 1	e 15 35	PP	—
Chur		82·4	330	e 12 28	+ 3	—	—	e 15 35	PP	e 46·6
Basle		82·5	331	e 12 27	+ 1	e 22 50	+ 8	—	—	—
Lincoln		82·6	40	—	—	e 22 30	−13	—	—	e 40·2
Neuchatel		83·2	331	e 12 31	+ 2	e 22 53	+ 4	—	—	—
Paris		83·2	335	12 29	0	22 50	+ 1	i 15 48	PP	42·0
Auckland		83·6	155	—	—	21 57?	−56	—	—	37·0
Helwan		84·3	305	12 36	+ 1	22 47	−13	13 3	pP	—
Arapuni		85·0	155	11 57?	−41	—	—	28 57?	SS	36·0
Clermont-Ferrand		85·7	333	e 12 44	+ 2	e 23 13	− 1	e 17 3	?	e 40·6
Chicago		86·0	36	—	—	e 22 59	[− 9]	e 28 39	SS	e 35·7
Florissant		87·1	39	i 12 45	− 4	e 23 9	[− 6]	i 16 20	PP	e 40·0
Seven Falls		87·2	22	—	—	e 23 9	[− 6]	e 34 39	?	43·0
St. Louis		87·3	39	e 12 47	− 3	e 23 12	[− 4]	i 16 21	PP	—
Ottawa		87·3	26	12 44	− 6	23 13	[− 3]	28 57	SS	e 39·0
Wellington	z.	87·6	156	12 52	+ 1	23 37	+ 5	17 0	pPP	42·0
Christchurch		89·0	158	13 1	+ 3	23 16	[−11]	16 19	PP	41·3
Tortosa		90·9	332	e 13 36	+29	e 24 11	+ 8	—	—	e 45·0
Fordham		92·0	27	e 13 8	− 4	i 24 0	{+ 4}	i 25 30	PS	e 49·8
Philadelphia		92·4	28	—	—	e 23 41	[− 6]	i 24 5	S	e 40·1
Toledo		93·3	335	i 13 29	+11	i 23 29	[−23]	—	—	—
Coimbra		94·4	338	e 16 55	PP	26 37	PPS	19 17	PPP	45·3
Columbia		95·3	36	—	—	e 23 57	[− 6]	e 24 29	S	e 43·2
Granada		95·6	333	18 26k	?	23 8	[−56]	26 17	PS	i 46·5
Lisbon		95·9	338	14 7	+37	24 5	[− 1]	17 18	PP	36·0
Malaga		96·3	333	i 17 21k	PP	e 27 13	PPS	i 17 49	pPP	e 45·0
Bermuda		102·7	23	e 18 32	PP	e 25 34	− 9	e 27 22	PS	e 45·6
San Juan		115·2	30	e 22 27	PPP	e 29 20	PS	e 35 21	SS	e 46·2
Huancayo		136·4	60	e 23 3	?	e 32 6	PS	e 39 57	SS	e 56·0
La Paz	z.	144·3	55	i 19 41	[+ 3]	26 39	[− 7]	e 22 33	PP	69·0
La Plata		163·3	76	34 27	?	—	—	35 15	PS	76·6

Additional readings :—
Calcutta ePPPN =11m.29s., S_cSN =17m.47s., iSSN =19m.22s., iSSSN =20m.39s.
Bombay iPN =10m.31s., PPE =12m.39s., PPN =12m.43s., SPN =19m.1s., SPPEN = 19m.18s., SSN =22m.57s.?, SSE =23m.1s.
Kodaikanal SS? =22m.33s.
Shasta Dam iP =11m.9s., i =20m.58s., e =21m.55s.
Upsala eE =11m.39s., ePPE =13m.43s., eE =14m.31s., SE =20m.22s., eN =24m.16s., eSSE =24m.48s., eSSSN =27m.22s., eSSS?E =27m.57s.?, eN =28m.15s.
Saskatoon e =27m.51s.
Butte e =28m.14s.
Logan i =12m.4s., e =13m.27s., iS_cS =21m.43s., e =26m.25s., eSSS =28m.14s.
Copenhagen 26m.9s.
Salt Lake City eSS =25m.54s., e =29m.42s.
Pasadena iZ =11m.46s., iEZ =11m.58s., eSSN =25m.45s.?.
Riverview iP_cPZ =11m.59s., iSKSEN =21m.39s., eE =25m.56s., eSS?N =26m.54s., eQE =31m.39s.
Overton e =22m.8s.
Boulder City e =21m.57s.
Pierce Ferry i =12m.15s., 21m.28s., and 21m.59s.
Palomar iZ =12m.5s.
Rapid City i =12m.40s., e =15m.49s., i =21m.34s.
Collmberg i =12m.2s. and 12m.37s., e =13m.6s., 22m.4s., and 24m.11s.
Prague ePS =22m.15s., eSSS =29m.57s.?
Edinburgh SKS =22m.7s.
Belgrade i =12m.13s., ePPP =17m.5s., e =25m.40s.
Sofia eSSE =27m.57s.
Stonyhurst iS_cS =22m.44s., iPS =23m.7s., iSS =27m.49s.
Tucson i =14m.56s., iPP =15m.31s., e =23m.6s., eSSS =31m.6s.
Kew ePSZ =23m.24s., iZ =24m.5s., eSSEZ =27m.46s., eQ =33m.57s.
Basle e =22m.37s.

Continued on next page.

Paris iP =12m.35s., e =33m.26s. and 35m.14s.
Helwan sPZ =13m.12s., PPNZ =15m.57s., sSN =23m.30s.
Florissant iS?E =23m.12s., eSSE =29m.6s.
St. Louis iZ =12m.55s., 13m.7s., and 13m.27s., iE =23m.23s., eSSE =29m.12s.
Chicago e =29m.31s.
Wellington SKS =23m.4s., SKKS =23m.21s., SS? =29m.17s., Q =38m.27s.
Christchurch PPSE =24m.35s., SS =28m.59s., SSSE =32m.57s., QEN =36m.2s.
Fordham i =23m.41s.
Philadelphia iSKS =23m.44s., eSSS =33m.15s.
Coimbra SS =31m.37s.
Lisbon SS?E =31m.15s., SS?N =31m.51s.?
Malaga P_cPZ =17m.29s., eSSZ =32m.5s., SSSZ =35m.20s.
Bermuda eSKS? =25m.1s., eSS =32m.15s.
San Juan e =39m.17s.
Huancayo eSS =45m.50s., e =53m.34s.
La Paz iSKPZ =23m.5s., PSKS =32m.57s., PPS? =35m.37s.
Long waves were also recorded at San Fernando and Tananarive.

Feb. 18d. 13h. Undetermined shock.

Auckland P =13m.20s., S? =15m.5s.?, L =15·5m.
Arapuni S? =15m.48s.?
Wellington P?Z =15m.50s.?, iZ =17m.2s., S?Z =17m.30s., L =18·2m.
Riverview ePEZ =16m.10s., iPPE =17m.0s., iZ =17m.5s., eSN =20m.50s., iN=21m.0s., iE =21m.38s., iN =22m.42s., eRZ =23m.36s.
Apia eP =17m.11s., i =19m.12s., eS =23m.58s., eL =30·1m.
Christchurch SEN =17m.43s., QEN =17m.55s., RZ =19m.5s.
Sydney e =20m.24s., eL =24m.6s.
Shasta Dam eP =22m.9s.
Palomar iPZ =22m.45s.
Pasadena iPZ =22m.45s., eLEN =51·9m.
Mount Wilson iPZ =22m.48s.
Riverside iPZ =22m.48s.
Tinemaha ePZ =22m.51s.
Tucson eP =23m.1s., i =23m.7s., e =33m.49s., eL =50m.15s.
Boulder City eP =23m.2s.
Overton eP =23m.4s.
Pierce Ferry eP =23m.4s.
Bombay eE =32m.41s. and 41m.21s.
Huancayo e =34m.14s., 35m.53s., and 41m.23s., eL =56m.16s.
Victoria e =34m.15s., L =55m.
St. Louis eN =36m.18s.
Florissant eN =36m.19s., eL?E =63·5m.
Long waves were also recorded at Ottawa, San Juan, and at other American and European stations.

Feb. 18d. Readings also at 1h. (near Apia), 5h. (Riverside, Mount Wilson, Pasadena, Tucson, Palomar, and Riverview), 6h. (Jena), 7h. and 9h. (Tucson), 10h. (near Mizusawa), 12h. (Auckland, Arapuni, and Wellington), 15h. (Tucson, Tinemaha, Riverview, and Auckland), 16h. (Sofia and Bucharest), 17h. (Jena, Collmberg, Riverview, Arapuni, Wellington, and Auckland), 18h. (Tinemaha, Palomar, Pasadena, Mount Wilson, Riverside, Tucson, Shasta Dam, and Overton), 20h. (near Ottawa), 21h. (Bogota and La Paz), 22h. (Riverview, Sydney, Christchurch, Wellington, Auckland, Arapuni, near Almata, Tashkent, and Andijan), 23h. (Tinemaha, Pasadena, Tucson, and St. Louis).

Feb. 19d. 23h. 59m. 31s. Epicentre 37°·0N. 9°·7W.

Scale V at Gradil; II-III at Lisbon and Porto. Anais do Observatorio Central Meteorologico do Infante. D. Luis. Ano de 1945," Lisbon, 1948, p.17.

$A = +·7892$, $B = -·1349$, $C = +·5992$; $\delta = +8$; $h = -1$;
$D = -·168$, $E = -·986$; $G = +·591$, $H = -·101$, $K = -·801$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Lisbon	1·8	14	0 32	0	0 58	+ 2	1 6	S_g	—
Coimbra	3·3	17	0 56	+ 3	1 35	0	—	—	—
Malaga	4·2	92	i 1 2k	− 5	i 1 48	− 9	i 1 18	P_g	2·7
Granada	4·9	86	i 1 59a	?	(2 19)	+ 4	—	—	—
Toledo	5·3	55	i 1 21	− 1	i 3 7	S_g	—	—	—
Almeria	5·8	89	1 36	+ 7	—	—	—	—	—
Alicante	7·4	76	1 51	− 1	—	—	—	—	—

Additional readings :—
Malaga iPSNZ =1m.59s.
Granada S_g =3m.20s. True S is given as P_g.

Feb. 19d. Readings also at 0h. (Granada), 9h. (Christchurch, Wellington, Riverview, and near Apia), 14h. (Auckland, Wellington, and Riverview), 15h. (Christchurch), 16h. (near Andijan), 19h. (Auckland), 21h. (Alicante, near Toledo, and Tortosa), 22h. (near Mizusawa), 23h. (near Andijan).

Feb. 20d. Readings at 3h. (near Bucharest), 4h. (Wellington), 6h. (Riverview and Christchurch), 7h. (Pittsburgh), 9h. (Boulder City, Overton, Pierce Ferry, and Tucson), 10h. (near Tananarive), 12h. (Haiwee (2), Mount Wilson (2), Pasadena (2), Riverside (2), Tucson (2), Boulder City, Grand Coulée, Overton, Pierce Ferry, Shasta Dam, and St. Louis), 15h. (Haiwee, La Jolla, Mount Wilson, Palomar, Riverside, Tucson, Boulder City, Grand Coulée, Pierce Ferry, Florissant, St. Louis, San Juan (2), Tacubaya, and near Apia), 16h. (Philadelphia and Pasadena), 17h. (Haiwee, Mount Wilson, Pasadena, Riverside, Tucson, Butte, Grand Coulée, Overton, Pierce Ferry, Shasta Dam, Florissant, St. Louis, Philadelphia, and Riverview), 18h. (Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, and near Tucson), 22h. (Riverview).

Feb. 21d. Readings at 0h. (Tananarive), 1h. (near Mizusawa), 4h. (near Tacubaya), 8h. (near Mizusawa), 9h. (Overton, Pierce Ferry, and near Tucson), 12h. (near Apia), 14h. (near Tananarive), 17h. (Mizusawa), 19h. (near Mizusawa and near Tacubaya).

Feb. 22d. Readings at 3h. (Overton, Boulder City, and Tucson), 8h. (Riverview), 10h. (near Mizusawa), 11h. (Riverview, Sydney, Christchurch, Wellington, Auckland, and near Zürich), 15h. (near Tashkent, Andijan, and Almata), 17h. (Tucson, Palomar, and Mount Wilson), 18h. (Pasadena, Mount Wilson, Tucson, Riverside, Haiwee, Tinemaha, and Palomar), 21h. (Riverview), 22h. (Riverview, Tananarive, Overton, Tucson, Pierce Ferry, Boulder City, Tinemaha, Riverside, and Pasadena).

Feb. 23d. 9h. 41m. 44s. Epicentre 46°·8N. 10°·2E.

Intensity IV in the Engadine. Epicentre as adopted.

Dr. E. Wanner.

Jahresbericht des Erdbebendienstes der Schweiz im Jahre, 1945, Zürich, 1946, p. 2, with map, p. 16.

$A = +\cdot6761$, $B = +\cdot1217$, $C = +\cdot7267$; $\delta = +1$; $h = +6$;
$D = +\cdot177$, $E = -\cdot984$; $G = +\cdot715$, $H = +\cdot129$, $K = -\cdot687$.

	△	Az.	P.	O−C.	S.	O−C.	Supp.	
	°	°	m. s.	s.	m. s.	s.	m. s.	
Chur	0·5	276	i 0 8	P_g	i 0 14	S_g	—	—
Zürich	1·2	297	e 0 25	P_g	e 0 45	S_g	—	—
Basle	1·9	292	e 0 40	P_g	e 1 4	S_g	—	—
Neuchatel	2·2	275	i 0 43	P_g	i 1 13	S_g	—	—
Strasbourg	2·4	317	—	—	e 1 23	S_g	—	—
Collmberg	4·9	21	i 1 27	P*	i 2 41	S_g	i 1 40	P_g

Collmberg gives also i = 1m.48s.

Feb. 23d. Readings also at 2h. (St. Louis, Tucson, Pierce Ferry, Boulder City, Overton, La Jolla, Palomar, Riverside, Mount Wilson, Pasadena, Haiwee, Santa Barbara, Tinemaha, and Shasta Dam), 3h. (Riverview, Christchurch, Wellington, Auckland, and Mizusawa), 4h. (Tinemaha, Haiwee, Mount Wilson, Palomar, and near Apia), 10h. (Tananarive and near La Paz), 11h. (near La Paz), 18h. (Tucson, Tinemaha, Mount Wilson, Palomar, and Riverside).

Feb. 24d. Readings at 1h. (near Andijan), 4h. (St. Louis, Tucson, and Palomar), 5h. (Palomar, Mount Wilson, Riverside, Tucson,, Pierce Ferry, and Boulder City), 10h. (near Andijan and Almata), 13h. (Bogota), 20h. (near Apia).

Feb. 25d. Readings at 1h. (Calcutta, near Pehpei, and near Andijan), 2h. (New Delhi and Bombay), 5h. (Irkutsk), 6h. (near Mizusawa), 7h. (Tananarive), 9h. (near Zürich), 10h. (Mount Wilson, Riverside, Tucson, Shasta Dam, Pierce Ferry, Grand Coulée, and Boulder City), 12h. (Zürich and near Apia), 13h. (near Basle, Zürich (2), and Chur), 23h. (near Mizusawa).

Feb. 26d. 20h. 4m. 15s. Epicentre 40°·9N. 142°·7E. Focus at the base of the superficial layers. (as on 17d.).

Intensity V at Hobetsu Hokkaido, Okunakayama, Matsuo, and Iwate Prefecture ; VI at Hatinohe, Morioka, Urakawa, Hakodate; and Mito ; II-III at Muroran.
Epicentre 40°·8N. 142°·7E. Depth 50km.
Seismological Bulletin of the Central Meteorological Observatory, Japan, Tokyo, 1951, p. 26.

$A = -\cdot 6030$, $B = +\cdot 4594$, $C = +\cdot 6522$; $\delta = +2$; $h = -2$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Hatinohe		0·9	247	0 13k	− 3	0 21	− 7	—	—
Morioka		1·7	224	0 24k	− 4	0 50	+ 1	—	—
Mizusawa	N.	2·1	214	0 35	+ 2	0 55	− 4	—	—
Sapporo		2·4	235	0 39	+ 1	1 7	+ 1	—	—
Sendai		3·0	208	0 44	− 2	1 17	− 5	—	—
Hukusima		3·6	209	0 52a	− 3	1 27	−10	—	—
Mito		4·8	202	1 11	− 1	2 6	− 1	—	—
Kumagaya		5·4	210	1 18	− 2	2 17	− 5	—	—
Nagano		5·5	221	1 20	− 2	2 43	+18	—	—
Wazima		5·7	234	1 28	+ 4	2 34	+ 4	—	—
Yokohama		5·9	204	1 32	+ 5	2 28	− 7	—	—
Hunatu		6·2	211	1 42	+10	2 46	+ 4	—	—
Kohu		6·2	213	1 33	+ 1	2 52	+10	—	—
Mera		6·4	202	1 31	− 3	—	—	—	—
Misima		6·5	208	1 31	− 5	2 58	+ 8	—	—
Shizuoka		6·8	211	1 43	+ 3	2 58	+ 1	—	—
Gihu		7·2	222	1 52	+ 6	—	—	—	—
Omaesaki		7·2	211	1 50	+ 4	3 16	+ 9	—	—
Hikone		7·6	225	1 51	0	—	—	—	—
Kyoto		8·0	225	1 58	+ 1	—	—	—	—
Toyooka		8·2	232	2 53	+53	—	—	—	—
Vladivostok		8·3	289	e 1 54	− 7	i 3 35	0	—	—
Kobe		8·6	226	2 1	− 4	3 42	0	—	—
Wakayama		8·9	224	2 8	− 1	—	—	—	—
Kôti		10·3	228	2 27	− 1	—	—	—	—
Kumamoto		12·5	234	2 58	0	—	—	—	—
Grand Coulee		65·9	47	e 10 44	0	—	—	i 10 59	pP
Shasta Dam		68·0	55	i 10 59	+ 1	—	—	i 11 13	pP
Tinemaha		72·8	56	i 11 29	+ 2	—	—	i 11 44	pP
Haiwee		73·5	56	i 11 32	+ 1	—	—	i 11 48	pP
Santa Barbara	z.	73·5	59	e 11 24	− 7	—	—	—	—
Mount Wilson	z.	74·7	58	i 11 38	0	—	—	i 11 53	pP
Pasadena	z.	74·7	58	i 11 38	0	—	—	i 11 53	pP
Copenhagen		74·9	334	i 11 37	− 2	—	—	—	—
Riverside	z.	75·3	58	e 11 41	− 1	—	—	e 11 52	pP
Overton		75·5	54	i 11 43	0	—	—	i 11 59	pP
Boulder City		75·6	55	i 11 49	+ 6	—	—	i 12 1	pP
Pierce Ferry		76·0	54	i 11 46	0	—	—	i 12 3	pP
Collmberg		78·3	330	i 11 55	− 3	—	—	i 12 14	pP
Tucson		80·5	56	i 12 10	0	—	—	i 12 27	pP
Basle		83·4	331	e 12 22	− 3	—	—	—	—

Additional readings :—
Mount Wilson eZ = 14m.14s.
Pierce Ferry i = 14m.50s.

Feb. 26d. 22h. 14m. 23s. Epicentre 25°·8N. 143°·4E. (as on 1940, March 15d.).

$A = -\cdot7237$, $B = +\cdot5375$, $C = +\cdot4329$; $\delta = +5$; $h = +3$;
$D = +\cdot596$, $E = +\cdot803$; $G = -\cdot348$, $H = +\cdot258$, $K = -\cdot902$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Mizusawa	N.	13·4	353	3 32	+18	7 19	L	—	—	(7·3)
Vladivostok		19·7	334	i 4 29	− 5	i 8 22	+12	—	—	—
Irkutsk		39·5	323	—	—	14 25	+48	—	—	17·8
Calcutta	N.	50·0	279	e 9 18	+20	i 16 27	+18	e 11 6	PP	—
Honolulu		53·7	81	e 9 30	+ 4	e 16 59	0	e 11 50	PP	e 22·2
Brisbane		53·8	168	e 9 29	+ 3	e 16 53	− 8	e 17 11	PS	i 25·0
New Delhi	N.	58·3	289	e 10 20	+21	i 17 53	− 8	12 19	PP	26·8
Apia	E.	58·8	126	i 10 5	+ 3	e 18 18	+11	—	—	—
Andijan		59·7	303	e 10 14	+ 5	e 18 19	0	—	—	—
Riverview		59·8	172	i 10 9k	0	i 18 27	+ 7	i 10 20	pP	e 27·9
Sydney		59·8	172	—	—	i 18 19	− 1	—	—	e 27·8
Hyderabad	N.	60·4	276	e 10 12	− 1	e 18 29	+ 1	10 43	P_cP	—
Tashkent		61·9	305	i 10 25	+ 1	i 18 49	+ 2	—	—	—
Colombo	E.	63·2	265	10 34	+ 2	19 5	+ 2	—	—	—
Kodaikanal		64·0	270	i 10 39	+ 1	i 19 14	+ 1	23 44	SS	31·2
Sitka		64·1	36	e 10 44	+ 6	e 19 25	+11	e 23 57	SS	e 26·6
Bombay		65·0	280	10 43	− 1	19 25	− 1	13 16	PP	—
Sverdlovsk		65·3	323	i 10 42	− 4	i 19 34?	+ 5	—	—	—
Auckland		69·0	153	11 12	+ 3	20 17	+ 3	14 37	pPP	31·6
Arapuni		70·4	153	15 1	PPP	20 55	PS	25 49	SS	31·6
Wellington	Z.	72·8	156	11 33	+ 1	20 57	− 1	12 19	pP	34·6
Victoria		73·2	44	e 11 36	+ 1	e 20 43	−19	—	—	29·6
Christchurch		74·0	158	11 41	+ 2	?1 3	− 8	26 0	SS	36·0
Grand Coulée		76·1	43	i 11 49	− 2	e 21 38	+ 3	—	—	—
Shasta Dam		76·6	51	i 11 53	− 1	e 21 31	− 9	i 12 12	P_cP	—
Ukiah		76·7	53	e 12 17	P_cP	e 21 43	+ 2	—	—	e 35·1
Moscow		77·4	326	i 12 3	+ 5	21 55	+ 6	—	—	—
Berkeley		77·8	54	11 59	− 2	20 37	−76	31 7	Q	35·1
Santa Clara		78·3	54	i 12 15	P_cP	e 22 33	PS	—	—	e 36·3
Butte		80·9	43	e 12 18	+ 1	e 22 43	+17	e 23 15	PS	e 34·0
Santa Barbara		81·1	56	i 12 18k	0	e 22 39	+11	—	—	—
Tinemaha		81·1	53	i 12 18k	0	e 37 25	L	—	—	(e 37·4)
Saskatoon		81·3	36	—	—	e 22 36	+ 6	—	—	33·6
Haiwee		81·7	54	i 12 20k	− 2	e 22 40	+ 6	—	—	—
Bozeman		82·0	43	e 12 23	0	e 22 17	−20	e 23 48	PPS	e 34·1
Mount Wilson	Z.	82·4	56	i 12 24k	− 1	—	—	i 13 28	?	—
Pasadena		82·4	56	i 12 24k	− 1	e 22 35	− 6	i 12 35	P_cP	e 37·0
Riverside		83·1	56	i 12 27k	− 2	—	—	e 38 52	P′P′	—
Logan		83·4	46	e 12 31	+ 1	e 22 50	− 1	i 15 56	PP	e 34·5
La Jolla		83·7	57	e 12 30	− 2	e 22 56	+ 2	—	—	—
Palomar		83·7	56	e 12 31	− 1	—	—	—	—	—
Salt Lake City		83·8	47	e 12 44	+12	e 22 52	− 3	e 28 56	SS	e 34·8
Upsala		83·8	336	i 12 50	+18	i 23 3	+ 8	e 16 7	PP	e 38·6
Boulder City		84·0	53	i 12 33	0	e 22 54	− 3	i 15 51	PP	—
Overton		84·1	52	i 12 33	− 1	e 22 58	0	i 15 51	PP	—
Pierce Ferry		84·3	53	i 12 35	0	e 23 4	+ 4	i 15 42	PP	—
Bergen		87·6	340	i 12 50	− 1	e 23 45	+13	—	—	e 42·6
Rapid City		87·6	42	e 12 55	+ 4	e 23 27	− 5	e 16 5	PP	e 38·1
Copenhagen		88·7	335	i 12 54	− 3	—	—	18 2	PPP	38·6
Ksara		89·2	307	e 13 2	+ 3	e 23 51	+ 4	—	—	—
Tucson		89·3	55	i 12 56	− 3	e 23 44	− 4	i 16 29	PP	e 39·5
Bucharest		89·7	320	—	—	23 37?	[+ 6]	—	—	—
Collmberg		91·7	330	i 13 9	− 1	e 24 27	+17	i 16 50	PP	e 39·6
Prague		92·0	329	e 13 37	+25	e 24 31	+19	e 17 13	PP	e 41·6
Aberdeen		92·4	341	e 16 37?	PP	—	—	—	—	e 46·5

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Belgrade		92·6	322	e 13 12a	− 3	e 25 28	PS	i 13 26	PcP	e 58·8
Jena		92·6	331	e 13 12	− 3	e 24 50	+32	e 17 27	PP	—
Cheb		92·9	331	e 13 37	+21	e 24 12	− 8	e 17 6	PP	e 46·6
Helwan		94·6	305	i 13 22a	− 2	24 51	+16	17 16	PP	—
Stonyhurst		95·4	340	—	—	e 36 35	SS	—	—	46·5
Triest		95·5	327	e 13 57?	+29	e 24 17	[+13]	e 17 7	PP	e 42·1
Uccle		95·6	335	e 13 39?	+11	e 24 10	[+ 6]	e 26 7	PS	e 42·6
Strasbourg		96·0	332	e 13 41	+11	—	—	—	—	—
Chur		96·5	330	e 13 35	+ 3	e 24 12	[+ 3]	e 16 57	PP	—
Zürich		96·6	330	e 13 31	− 2	—	—	e 13 44	pP	—
Kew		96·7	338	e 17 8	PP	e 24 0?	[−10]	i 26 4	PS	e 45·6
Basle		96·9	331	e 13 32	− 2	e 25 33	+39	—	—	—
Neuchatel		97·6	331	e 13 36	− 2	—	—	e 17 24	PP	—
Chicago		97·9	36	(e 17 42)	PP	e 24 9	[− 7]	e 26 24	PS	e 43·2
Paris		97·9	335	e 13 37?	− 2	26 34	PS	e 17 36?	PP	48·6
Florissant		98·4	40	e 13 42	+ 1	e 24 16	[− 3]	i 18 7	PP	e 42·6
St. Louis		98·6	40	e 13 42	0	e 24 18	[− 2]	e 17 48	PP	41·6
Clermont-Ferrand		100·2	333	e 13 49	0	—	—	e 17 37?	PP	—
Ottawa		100·7	26	e 17 21	?	e 24 41	[+11]	e 18 9	PP	42·6
Seven Falls		101·1	22	—	—	e 24 39	[+ 7]	31 55	SS	47·6
Tananarive		103·1	256	19 44	?	e 24 49	[+ 7]	33 22	SSP	e 49·1
Fordham		105·2	27	i 18 47	PP	e 24 53	[+ 2]	e 34 7	SSP	48·6
Tortosa	N.	105·3	331	e 18 35	PP	—	—	e 34 4	SSP	e 48·6
Georgetown		105·3	31	e 18 46	PP	e 24 49	[− 3]	—	—	i 42·6
Toledo		108·0	334	e 18 4	[−25]	i 28 36	PS	18 45	pPKP	—
Coimbra		109·3	337	e 32 37	?	e 34 34	SSP	—	—	e 53·8
Granada		110·1	332	i 18 25k	[− 8]	i 28 22	PS	i 19 9	pPKP	55·1
Malaga	Z.	110·8	332	e 18 41	[+ 6]	28 51	PS	i 19 25	PP	e 56·6
Lisbon		110·9	337	—	—	28 17	PS	50 19	Q	52·6
Bermuda		116·2	27	e 19 49	PP	e 26 46	{− 2}	e 28 59	PS	e 47·7
San Juan		127·5	36	e 21 36	PP	e 28 9	{+ 5}	e 31 17	PS	e 53·0
Bogota		132·7	55	e 19 18	[+ 1]	—	—	—	—	—
Huancayo		141·1	76	e 19 25	[− 7]	e 41 48	SSP	e 23 18	PP	e 58·8
La Paz		149·2	78	i 19 51a	[+ 5]	42 23	SS	43 19	SSP	70·0

Additional readings :—
Calcutta S_cSN =19m.12s., iSSN =19m.46s., iSSSN =21m.7s.
Honolulu ePPP =12m.41s., e =13m.53s., eSS =21m.14s.
Brisbane eSS?N =21m.9s.
New Delhi PPPN =13m.19s., PSEN =18m.21s., iN =19m.17s., SSN =21m.40s., SSSN = 23m.23s.
Riverview iP_cPNZ =10m.57s., iN =18m.34s., iPSNZ =18m.49s., iE =18m.57s., iN = 19m.12s.
Hyderabad PSN =18m.48s., S_cSN =19m.38s., SSN =22m.48s.
Sitka iS =20m.0s.
Bombay iE =10m.58s., SPN =19m.36s., SPPN =19m.45s., iN =21m.5s., SSN =23m.52s.
Auckland i =17m.2s., PS =21m.7s., SP =22m.49s., SS =26m.37s., SSS =28m.37s., Q =29·6m.
Arapuni SSS? =29m.37s.?
Wellington P_cPZ =11m.42s., iZ =12m.7s., pP_cPZ =12m.31s., PPZ =14m.37s., pPP?Z = 15m.6s., S_cSZ =21m.10s., SPZ =21m.53s., PS =22m.17s., sS =22m.34s., sPS = 23m.3s., SSZ =26m.22s., SSS =30m.37s.?
Christchurch iEN =21m.17s., SSSZ =29m.45s., Q =31m.10s.
Grand Coulée i =13m.28s., e =20m.32s.
Shasta Dam i =21m.52s. and 22m.5s.
Berkeley eSS =25m.23s.
Butte e =24m.30s.
Bozeman eSSS =31m.56s.
Pasadena iPPZ =15m.46s., eE =27m.48s., iPKP,PKPZ =39m.13s.
Logan i =16m.27s., eSS =28m.49s.
Salt Lake City i =13m.10s.
Upsala ePPE =16m.10s., eE =25m.6s., eSSN =28m.23s., eE =29m.5s.
Boulder City eS =23m.9s., ePKKP =30m.52s., ePKP,PKP =38m.41s.
Overton eS =23m.10s., eS_cS =23m.30s., ePKKP =30m.51s., iPKP,PKP =38m.56s.
Pierce Ferry iS =23m.13s., eS_cS =23m.28s., iPKP,PKP =38m.53s.
Rapid City e =15m.18s., eSS =29m.19s., eSSS =33m.9s.
Tucson i =13m.11s., iPPP =18m.25s., eSS =29m.10s., e =34m.13s., ePKP,PKP = 38m.43s.

Continued on next page.

Collmberg i = 13m.17s., 13m.29s., and 13m.43s., iZ = 16m.59s. and 17m.9s., e = 22m.31s. and 22m.49s., eSKS = 23m.55s., ePS = 25m.13s., ePPS = 25m.55s., e = 26m.31s. and 27m.13s., ePKKPZ = 30m.37s., eSS = 31m.7s., e = 31m.19s.
Prague ePPP = 18m.43s., eSS = 29m.37s.?
Belgrade e = 17m.43s. and 26m.50s.
Cheb eSS? = 30m.37s.?
Helwan eZ = 13m.56s., 15m.8s., and 19m.7s., eN = 24m.16s.
Triest ePPP = 18m.56s.
Uccle eN = 13m.45s., eSSE = 31m.49s.
Zürich ePP = 17m.27s.
Kew eEZ = 21m.0s.?, eEN = 26m.20s., eSSEN = 31m.37s.?, eSSSZ = 35m.12s.
Florissant eE = 26m.11s. and 28m.29s.
St. Louis iSE = 25m.27s., eE = 29m.17s., eSSE = 31m.35s., eSSSE = 36m.3s.
Ottawa e = 32m.21s.
Tananarive eSKS = 24m.59s.
Fordham i = 25m.8s.
Coimbra iS = 42m.3s., SSS = 48m.44s.
Granada i = 19m.35s. and 28m.52s., Q = 50·3in.
Malaga iPKPZ = 19m.16s., iPPPZ = 21m.47s., PKKPZ = 29m.55s., PKP,PKPZ = 37m.53s.
Bermuda eSSS = 40m.0s.
San Juan eSS = 37m.53s.
Huancayo e = 21m.56s. and 23m.42s.
Long waves were also recorded at Potsdam, Barcelona, Pittsburgh, Columbia, and La Plata.

Feb. 26d. Readings also at 2h. (Mount Wilson, Palomar, Tucson, and Bogota), 8h. (near Mizusawa), 9h. (Auckland, Wellington, Christchurch, and Riverview), 15h. (Overton, Pierce Ferry, Boulder City, Haiwee, Palomar, Mount Wilson, Pasadena, Riverside, Tucson, Florissant, Tacubaya, La Paz, and Huancayo), 16h. (Tucson, Bozeman, Haiwee, Palomar, Riverside, Mount Wilson, Arapuni, Wellington, Christchurch, Auckland, and Riverview), 17h. (Rapid City, Boulder City, Tinemaha, Haiwee, Santa Barbara, Pasadena, Mount Wilson, Riverside, Palomar, La Jolla, Tucson, Florissant, and Tacubaya), 20h. (near Tacubaya (2)), 22h. (Mount Wilson, Tinemaha, and Toledo), 23h. (Shasta Dam, Overton, Pierce Ferry, Boulder City, Haiwee, Tinemaha (2), Riverside (2), Mount Wilson (2), Pasadena, Tucson (2), and La Paz).

Feb. 27d. 7h. 16m. 14s. Epicentre 14°·7N. 95°·2W.

$A = -·0877$, $B = -·9637$, $C = +·2522$; $\delta = +1$; $h = +6$;
$D = -·996$, $E = +·091$; $G = -·023$, $H = -·251$, $K = -·968$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Oaxaca	Z.	2·7	327	0 58	P_g	—	—	—	—	1·4
Vera Cruz		4·6	349	1 28	P_g	—	—	—	—	2·5
Tacubaya	N.	6·0	322	i 1 32	0	2 28	−15	—	—	2·6
Tucson		22·5	324	i 5 4	+ 2	e 9 12	+ 7	i 5 25	PP	e 11·5
Bogota		23·1	114	i 5 21	+13	—	—	—	—	—
St. Louis		24·2	10	i 5 20	+ 1	i 9 39	+ 4	1 6 5	PP	—
Florissant		24·4	10	i 5 20	− 1	i 9 41	+ 2	e 11 0	SS	—
La Jolla	Z.	27·0	316	e 5 44	− 1	—	—	—	—	—
Pierce Ferry		27·2	326	i 5 47	0	—	—	—	—	e 14·2
Boulder City		27·5	325	i 5 50	0	—	—	—	—	e 13·9
Overton		27·7	326	i 5 52	0	—	—	—	—	e 14·6
Riverside	Z.	27·8	318	i 5 54	+ 1	—	—	1 6 20	pP	—
Mount Wilson	Z.	28·4	318	i 5 58	0	—	—	i 6 13	pP	—
Pasadena		28·4	318	i 5 59	+ 1	—	—	—	—	—
Haiwee		29·5	322	e 6 8	0	—	—	—	—	—
Tinemaha		30·3	322	e 6 16	+ 1	—	—	—	—	—
Huancayo		33·1	143	—	—	e 12 18	+19	—	—	e 15·3
Bozeman		33·6	341	—	—	e 12 9	+ 3	—	—	e 14·1
Ottawa		34·7	25	e 6 53	− 1	e 12 26	+ 2	—	—	e 18·8
Shasta Dam		35·1	324	i 6 55	− 2	—	—	—	—	—
Grand Coulée		38·5	335	i 7 26	0	—	—	—	—	—

Additional readings :—
Tacubaya iE = 1m.36s.
Tucson e = 9m.40s.
St. Louis isS?N = 10m.52s.
Grand Coulée i = 7m.36s.
Long waves were also recorded at Puebla, La Paz, Salt Lake City, and Logan.

Feb. 27d. Readings also at 3h. (Haiwee, Mount Wilson, Pasadena, Riverside, Tinemaha, Tucson, Boulder City, Overton, Pierce Ferry, Shasta Dam, and Vladivostok), 4h. and 5h. (Riverview), 6h. (Tucson, Haiwee, Mount Wilson, Pasadena, and Tinemaha), 9h. (Boulder City, Overton, Pierce Ferry, and Tucson), 13h. (Auckland, Wellington, Christchurch, Brisbane, Riverview, Sydney, Haiwee (2), Mount Wilson, Pasadena (2), Riverside, Tinemaha (2), Tucson (2), Boulder City, Pierce Ferry, and Clermont-Ferrand), 16h. (Almata, near Andijan, and near Tananarive), 16h. (near Tacubaya), 19h. (La Plata), 21h. (Riverview).

Feb. 28d. 2h. 55m. 55s. Epicentre 25°·8N. 143°·4E. (as on 26d.).

$A = -\cdot7237$, $B = +\cdot5375$, $C = +\cdot4329$; $\delta = +5$; $h = +3$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Mizusawa	E.	13·4	353	3 15	+ 1	5 16	−29	—	—	—
Vladivostok		19·7	334	i 4 28	− 6	i 7 56	− 4	—	—	—
Andijan		59·7	303	e 10 12	+ 3	18 20	+ 1	—	—	—
Tashkent		61·9	305	e 10 28	+ 4	—	—	—	—	—
Grand Coulée		76·1	43	e 11 50	− 1	—	—	—	—	—
Shasta Dam		76·6	51	i 11 55	+ 1	—	—	i 12 11	P_cP	—
Tinemaha	z.	81·1	53	i 12 19	+ 1	—	—	—	—	—
Haiwee	z.	81·7	54	i 12 23	+ 1	—	—	i 12 40	P_cP	—
Mount Wilson	z.	82·4	56	i 12 25a	0	—	—	i 12 43	P_cP	—
Pasadena	z.	82·4	56	i 12 25a	0	—	—	i 12 36	P_cP	e 37·5
Riverside	z.	83·1	56	i 12 28a	− 1	—	—	i 12 43	P_cP	—
Palomar		83·7	56	i 12 33	+ 1	—	—	—	—	—
Boulder City		84·0	53	e 12 35	+ 2	—	—	—	—	—
Overton		84·1	52	12 34	0	—	—	i 15 35	PP	—
Pierce Ferry		84·3	53	i 12 37	+ 2	—	—	i 15 47	PP	—
Tucson		89·3	55	i 12 58	− 1	—	—	i 16 18	PP	—

Additional readings :—
Shasta Dam e =18m.6s. and 18m.52s.
Pasadena iZ =12m.42s.
Tucson i =13m.15s.
Long waves were also recorded at Cheb, Uccle, Kew, and Granada.

Feb. 28d. 12h. 51m. 1s. Epicentre 53°·6N. 159°·5E. (as on 1942 Aug. 29d.).

$A = -\cdot5583$, $B = +\cdot2087$, $C = +\cdot8030$; $\delta = +6$; $h = -7$;
$D = +\cdot350$, $E = +\cdot937$; $G = -\cdot752$, $H = +\cdot281$, $K = -\cdot596$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Vladivostok		21·0	251	e 4 44	− 3	i 8 48	+11	—	—	—
Shasta Dam		52·1	71	i 9 15	+ 1	—	—	—	—	—
Tinemaha		56·9	71	i 9 52	+ 3	—	—	—	—	—
Haiwee		57·7	72	i 9 56	+ 1	—	—	e 12 6	PP	—
Mount Wilson	z.	59·0	73	i 10 5	+ 1	—	—	—	—	—
Pasadena	z.	59·0	73	i 10 4	0	—	—	—	—	—
Overton		59·4	69	i 10 9	+ 3	—	—	—	—	—
Boulder City		59·6	70	i 10 9	+ 1	—	—	e 12 33	PP	—
Riverside		59·6	73	i 10 8	0	—	—	—	—	—
Pierce Ferry		59·9	69	i 10 12	+ 2	e 18 59	+38	—	—	—
Palomar		60·3	73	i 10 14a	+ 1	—	—	—	—	—
La Jolla		60·5	73	e 10 15	+ 1	—	—	—	—	—
Tucson		64·6	69	i 10 42	+ 1	—	—	—	—	—
St. Louis	z.	70·3	51	i 11 16	− 1	—	—	—	—	—
Collmberg	z.	71·8	338	e 11 24	− 2	—	—	—	—	—
Zürich		76·4	340	—	—	e 20 59?	−39	—	—	—

Additional readings :—
Tinemaha iZ =10m.28s.
Haiwee iZ =10m.44s.
Pasadena iZ =10m.42s.
Long waves were also recorded at Riverview and Christchurch.

Feb. 28d. Readings also at 3h. (near Fort de France and near Tacubaya), 10h. (Zürich), 11h.(Riverview), 12h. (Zürich), 16h. (near Tananarive), 17h. (New Delhi, Collmberg, Prague, Tashkent, Vladivostok, and Riverview), 18h. (Copenhagen, Kew, and Granada), 22h. (Bombay), 23h. (Almata, Andijan, Tashkent, Calcutta, Hyderabad, New Delhi, Copenhagen, Upsala, Prague, Kew, and Granada).

March 1d. Readings at 0h. (near Triest), 1h. (San Juan), 2h. (Huancayo, La Paz, Tacubaya, Berkeley, Mount Wilson, Pasadena, Palomar, Riverside, Tucson, and Riverview), 4h. (Bombay, Calcutta, and New Delhi), 5h. (Bombay), 11h. (Boulder City, Overton, Pierce Ferry, and Tucson), 13h. (Upsala), 20h. (near Almata and Andijan), 22h. (Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, and Tinemaha).

March 2d. 10h. 39m. 39s. Epicentre 41°·0N. 33°·5E. (as on 1940, Oct. 11d.).

Felt at Osmancik (40°59′N. 34°48′E.), Kargi (41°8′N. 34°30′E.), and at Ilgaz (40°59′N. 33°37′E.).

Epicentre : 440kms. from Istanbul.
42°N. 36°E. (U.S.C.G.S.).
41°·5N. 33°E. (U.S.S.R.).
41°N. 34°E. (Strasbourg).

A = +·6312, B = +·4178, C = +·6535 ; δ = +3 ; h = −2 ;
D = +·552, E = −·834 ; G = +·545, H = +·361, K = −·757.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bucharest		6·4	305	e 1 37	− 1	2 53	0	i 1 56	P*	—
Ksara		7·4	164	(e 1 55)	+ 3	(e 3 15)	− 3	—	—	(e 3·9)
Campulung		7·5	308	e 1 48	− 5	—	—	—	—	3·5
Sofia		7·8	286	e 1 54	− 4	i 3 56	S*	e 2 14	P*	i 4·4
Erevan		8·4	92	2 20	+14	—	—	—	—	—
Belgrade		10·3	297	e 2 29 a	− 3	e 4 42	+12	—	—	e 5·6
Moscow		15·0	9	3 28	− 7	6 9	−14	—	—	—
Triest		15·1	295	i 3 38	+ 2	i 6 45	+20	i 3 49	PP	—
Prague		16·1	314	e 3 49	0	e 7 3	+14	—	—	e 8·4
Cheb		17·3	308	e 4 9	+ 5	e 7 24	+ 8	—	—	e 10·4
Jena		18·1	309	e 4 12	− 2	—	—	—	—	e 9·1
Chur		18·2	297	e 4 13	− 3	—	—	—	—	—
Zürich		19·0	300	e 4 20	− 6	e 7 56	+ 1	—	—	—
Basle		19·6	300	e 4 29	− 3	e 8 55	+47	—	—	—
Strasbourg		19·7	304	e 4 32	− 2	e 8 12	− 2	—	—	13·4
Neuchatel		20·0	299	e 4 32	− 5	e 8 18	+ 1	—	—	—
Copenhagen		20·2	326	e 4 40	+ 1	8 22	+ 1	—	—	—
Upsala		21·3	339	e 5 3	+13	8 49	+ 6	—	—	e 11·3
Uccle		22·4	307	e 5 6	+ 4	i 9 6	+ 2	—	—	e 12·4
Clermont-Ferrand		22·5	292	e 5 0	− 2	e 9 5	0	—	—	e 12·2
Paris		23·2	301	e 5 21?	+12	e 9 15	− 3	—	—	13·4
Barcelona		23·5	282	—	—	e 9 34	+11	—	—	e 11·8
Sverdlovsk		23·6	39	i 5 14	+ 1	i 9 24	− 1	—	—	—
Tortosa	N.	24·9	280	i 5 26	0	9 52	+ 5	5 58	PP	e 12·4
Kew		25·4	306	e 5 21?	−10	e 10 0	+ 4	e 11 34	SS	e 12·4
Tashkent		26·8	78	5 51	+ 7	10 30	+11	—	—	—
Stonyhurst		27·2	311	i 5 45	− 2	i 10 30	+ 5	—	—	e 17·2
Aberdeen		28·0	318	—	—	i 10 30	− 8	—	—	16·2
Edinburgh		28·1	316	—	—	e 10 32	− 8	e 15 31	S_eS	—
Toledo		28·4	280	7 3	PP	i 11 16	+31	—	—	—
Granada		29·0	275	i 6 3 a	− 1	e 11 21	+27	7 30	PP	14·8
Andijan		29·2	78	e 6 8	+ 3	11 6	+ 8	—	—	—
Malaga	Z.	29·7	275	e 6 14	+ 4	e 10 51	−15	6 58	PP	15·4
Coimbra		31·6	283	e 7 31	PP	12 24	+49	e 8 54	PPP	17·6
Almata		32·0	71	e 6 53	+23	—	—	—	—	—
Lisbon		32·6	280	6 33	− 2	11 44	− 7	—	—	15·2
New Delhi	N.	37·6	95	—	—	i 16 40	Q	—	—	—
Bombay	N.	40·1	112	e 7 36	− 3	13 45	− 1	9 19	PP	—
Hyderabad	N.	45·1	108	8 12	− 8	14 48	−11	15 1	S	—
Irkutsk		48·1	51	8 42	− 1	15 38	− 4	—	—	—
Calcutta	N.	49·3	95	—	—	e 16 4	+ 5	—	—	—
Colombo	E.	53·4	117	9 24	0	16 47	− 8	—	—	32·6
St. Louis		85·6	319	e 12 41	0	e 23 17	+ 4	—	—	e 37·4
Grand Coulee		88·1	342	e 12 57	+ 3	—	—	—	—	—
Tucson		100·0	330	e 13 52	+ 4	—	—	—	—	e 55·4

For Notes see next page.

NOTES TO MARCH 2d. 10h. 39m. 39s.

Additional readings :—
Bucharest iN = 2m.21s., iSE = 2m.56s., iS*E = 3m.24s., iS_gEN = 3m.40s.
Ksara readings have been increased by 10m.
Belgrade e = 2m.43s., eP_gS_g = 4m.5s., e = 5m.1s.
Triest iPPP = 3m.53s.
Jena eE = 5m.55s.
Upsala iE = 6m.46s., eSN = 9m.1s., iN = 9m.50s., iE = 9m.57s.
Tortosa PPPE? = 6m.29s.
Stonyhurst i = 12m.38s. and 13m.35s.
Granada i = 12m.51s.
Malaga P_cP = 9m.23s., QZ = 13m.18s.
Coimbra SS = 14m.21s.
Lisbon E = 9m.56s., SE = 12m.1s.
Bombay SSN = 16m.41s.
Long waves were also recorded at Bergen, Pasadena, San Juan, Riverview, Huancayo, and La Paz.

March 2d. 19h. 34m. 29s. (I) | Epicentre 24°·5N. 141°·0E. Depth of focus 0·090.
19h. 42m. 35s. (II) | (as on 1940, April 5d.).

A = −·7080, B = +·5733, C = +·4124 ; δ = +1 ; h = +3 ;
D = +·629, E = +·777 ; G = −·320, H = +·260, K = −·911.

			△	Az.	P.	O−C.	S.	O−C.	Supp.	
			°	°	m. s.	s.	m. s.	s.	m. s.	
I	Mizusawa	E.	14·6	2	2 56	− 8	5 22	−10	—	—
II		E.	14·6	2	2 57	− 7	5 24	− 8	—	—
I	Vladivostok		20·0	341	i 3 51	− 4	7 1	− 3	—	—
II			20·0	341	i 3 52	− 3	7 1	− 3	—	—
I	Irkutsk		39·3	325	6 39	− 1	e 12 0	0	—	—
II			39·3	325	6 40	0	i 12 3	+ 3	—	—
I	Brisbane	Z.	53·0	167	i 8 29	+ 5	—	—	—	—
II		Z.	53·0	167	i 8 30k	+ 6	—	—	—	—
I	Almata		55·1	308	e 8 43	+ 5	—	—	—	—
II			55·1	308	e 8 41	+ 3	—	—	—	—
I	Andijan		58·6	304	e 9 3	+ 1	e 16 35?	+14	—	—
II			58·6	304	—	—	e 16 33	+12	—	—
I	Riverview		58·8	170	—	—	i 16 43	+19	—	—
II			58·8	170	—	—	i 16 43	+19	i 19 49	SS
II	Tashkent		60·9	306	i 9 23	+ 6	i 17 1	+11	—	—
II	Bombay	N.	63·0	280	i 9 24	− 7	i 17 30	+14	e 12 33	PP
II	Wellington		72·6	154	10 32	+ 3	19 12	+ 6	—	—
I	Moscow		77·2	326	e 10 55	+ 1	e 19 56	0	—	—
II			77·2	326	e 10 57	+ 3	e 19 58	+ 2	—	—
I	Grand Coulee		78·5	42	i 11 0	− 1	—	—	e 12 47	pP
II			78·5	42	i 11 0	− 1	i 20 5	− 4	i 12 43	pP
I	Shasta Dam		79·2	50	i 11 3	− 2	—	—	i 12 51	pP
II			79·2	50	e 11 3	− 2	i 20 14	− 2	i 12 51	pP
I	Tinemaha		83·6	53	i 11 27a	0	—	—	i 13 16	pP
II			83·6	53	i 11 27	0	e 20 59	− 1	i 13 28	pP
I	Haiwee		84·2	54	i 11 29	− 1	—	—	i 13 19	pP
II			84·2	54	i 11 30k	0	e 21 1	− 4	i 13 24	pP
I	Pasadena		84·9	56	i 11 34k	+ 1	—	—	i 13 23	pP
II			84·9	56	i 11 33k	+ 1	i 21 5	− 7	i 13 27	pP
I	Mount Wilson	Z.	85·0	56	i 11 34	0	—	—	—	—
II		Z.	85·0	56	i 11 33k	− 1	—	—	i 13 27	pP
I	Riverside	Z.	85·6	56	i 11 35	− 2	—	—	i 13 29	pP
II		Z.	85·6	56	i 11 35	− 2	—	—	i 13 28	pP
I	La Jolla	Z.	86·2	57	i 11 40	0	—	—	—	—
II		Z.	86·2	57	i 11 39	− 1	—	—	—	—
I	Palomar	Z.	86·2	56	i 11 40a	0	—	—	i 13 29	pP
II			86·2	56	i 11 40a	0	i 21 9	−15	e 13 32	pP
I	Boulder City		86·5	52	i 11 41	0	—	—	i 13 30	pP
II			86·5	52	i 11 41	0	e 21 29	+ 2	e 13 33	pP
II	Overton		86·6	52	i 11 42	+ 1	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
I	Pierce Ferry	87·1	52	i 11 44	0	—	—	—	—
II		87·1	52	i 11 44	0	—	—	e 13 38	pP
I	Tucson	91·2	54	i 12 4	+ 1	—	—	i 13 55	pP
II		91·2	54	i 12 4	+ 1	e 21 47	[+ 9]	i 13 58	pP
II	St. Louis	101·0	39	e 17 10	PP	e 22 33	[+ 6]	—	—

Additional readings :—
Riverview II iE = 15m.49s.
Bombay II eN = 10m.27s. and 20m.37s.
Grand Coulee II i = 11m.21s. and 20m.19s.
Shasta Dam II i = 12m.3s., 12m.9s., 13m.43s., 13m.48s., and 20m.23s.
Tinemaha I iZ = 11m.42s. and 11m.57s. ; II iZ = 11m.42s. and 11m.56s.
Pasadena II iEN = 21m.11s.
Mount Wilson II iZ = 14m.51s.
Boulder City II i = 21m.15s.
Tucson II ePP = 15m.34s., e = 22m.10s.

March 2d. Readings also at 0h. (Alicante and near Tacubaya), 5h. (near Almata and Andijan), 9h. (La Paz), 10h. (Bozeman), 12h. and 14h. (3) (near Berkeley), 19h. (La Plata), 20h. (Fresno, near Ottawa, and near Rapid City), 23h. (Ksara).

March 3d. Readings at 0h. (San Juan), 1h. (Tucson), 4h. (Bogota), 6h. (Granada and Malaga), 7h. (Collmberg and near Vladivostok), 12h. (near Mizusawa (2)), 14h. (Boulder City and near Tucson), 15h. (Almeria and near La Paz), 17h. (Port au Prince).

March 4d. 17h. 22m. 39s. Epicentre 35°·4N. 140°·7E. (as on Jan. 4d.).

		△	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Mizusawa	N.	3·7	5	0 58	− 2	1 42	− 3
Vladivostok		10·3	321	i 2 29	− 3	i 4 31	+ 1
Irkutsk		30·8	315	—	—	e 11 21?	− 2
Andijan		52·8	298	e 9 22	+ 3	16 45	− 2
Tinemaha	Z.	77·2	54	i 11 59	+ 2	—	—
Mount Wilson	Z.	79·0	57	i 12 8	+ 1	—	—
Copenhagen		79·1	334	e 12 6	− 2	—	—
Riverside	Z.	79·6	57	i 12 12	+ 2	—	—
Tucson		85·0	54	i 11 40	−58	—	—

Mizusawa gives also SE = 1m.39s.

March 4d. 21h. 0m. 41s. Epicentre 39°·7N. 119°·3W. (as on 1942, Dec. 3d.).

A = −·3776, B = −·6728, C = +·6362 ; δ = −1 ; h = −2 ;
D = −·872, E = +·489 ; G = −·311, H = −·555, K = −·772.

		△	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Mineral	E.	1·9	290	e 0 31	− 3	i 0 56	− 3	i 0 34	P
Berkeley	Z.	3·0	323	e 0 49	− 1	—	—	i 0 52	P*
Lick		3·0	218	e 0 51	+ 1	e 1 27	0	—	—
Fresno	N.	3·0	187	e 0 50	0	e 1 27	0	i 1 37	S_g
Branner		3·2	225	e 0 55	+ 3	e 1 37	+ 5	—	—

Mineral gives also iSE = 0m.51s.

March 4d. Readings also at 4h. (near Mizusawa), 6h. (near Triest), 7h. (near Triest), 13h. (Collmberg), 14h. (Copenhagen, Cheb, Kew, Uccle, Granada, and Malaga), 17h. (near Triest and near Ferndale), 18h. (near Andijan and Erevan), 21h. (Berkeley).

March 5d. 12h. 17m. 4s. Epicentre 18°·1S. 170°·6W. (as on 1944, Nov. 26d.).

Pasadena suggests deep focus.

$A = -·9384$, $B = -·1554$, $C = -·3088$; $\delta = +10$; $h = +5$;
$D = -·163$, $E = +·987$; $G = +·305$, $H = +·050$, $K = -·951$.

Rough.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		4·4	345	1 12	+ 2	e 2 10	+ 8	—	—	e 2·9
Auckland		22·7	212	4 52	−12	8 46	−23	5 7	pP	—
Wellington		26·3	205	—	—	9 33	−38	10 56?	SS	—
Christchurch		29·0	205	—	—	e 10 26	−28	13 8	Q	16·2
Riverview	N.	37·5	238	i 8 39	PP	—	—	(e 14 50)	SS	e 14·8
Pasadena	Z.	72·0	44	i 11 30	+ 2	—	—	—	—	e 37·9
Mount Wilson	Z.	72·2	44	i 11 29	0	—	—	—	—	—
Palomar	Z.	72·4	46	i 11 35	+ 5	—	—	i 11 58	pP	—
Riverside	Z.	72·5	44	i 11 30	0	—	—	i 11 57	pP	—
Haiwee		73·4	43	i 11 37	+ 1	—	—	—	—	—
Shasta Dam		73·7	37	e 11 38	0	—	—	e 11 49	pP	—
Tinemaha		73·8	42	i 11 39	+ 1	—	—	i 11 52	pP	—
Boulder City		75·3	44	e 11 46	− 1	—	—	—	—	—
Tucson		76·0	49	i 11 52	+ 1	—	—	—	—	e 39·2
Grand Coulee		80·3	33	e 12 11	− 3	—	—	—	—	—
Huancayo		91·2	103	e 18 52	PPP	e 25 14	PS	e 30 39	SS	e 44·2
St. Louis		93·9	51	e 13 14	− 7	e 23 32	[−23]	—	—	e 41·9
Kew	Z.	145·8	10	e 19 45	[+ 4]	—	—	—	—	e 80·4
Collmberg		146·7	355	e 19 39	[− 3]	—	—	e 20 0	pPKP	—
Uccle		147·1	7	e 19 38	[− 5]	—	—	e 20 1	pPKP	—

Additional readings :—
Auckland PP = 5m.17s., i = 5m.38s., SS = 9m.11s., i = 10m.12s.
Wellington i = 19m.36s., 20m.31s. and 22m.22s.
Tinemaha eN = 12m.32s.
Tucson i = 11m.56s. and 12m.18s.
Collmberg e = 20m.12s.
Long waves were also recorded at Sydney, Brisbane, Granada, and Malaga.

March 5d. Readings also at 0h. (La Paz, Tucson, and Riverside), 1h. (Granada and Malaga), 3h. (near Andijan), 4h. (near San Juan), 5h. (near Apia), 9h. (Brisbane, Mount Wilson, Pasadena, Riverside, Tucson, Boulder City, Grand Coulee, and Shasta Dam), 10h. (Honolulu, Tucson, Mount Wilson, and Palomar), 11h. (Alicante), 12h. (La Paz, near Berkeley, Branner, and Lick), 20h. (Brisbane, Alicante, and near Mizusawa (2)), 21h. (Bucharest, Cheb, near Yalta, and near Lick), 23h. (Rapid City).

March 6d. Readings at 0h. (Collmberg), 1h. (La Paz and near Mizusawa), 3h. (Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, Santa Barbara, Tinemaha, Tucson, Boulder City, Shasta Dam, Collmberg, Vladivostok, and near Mizusawa), 7h. (Bogota), 9h. (Alicante), 11h. (Bucharest), 15h. (Huancayo, Wellington, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, and Tucson), 16h. (La Paz, La Plata, and Wellington), 19h. (near Bogota).

March 7d. Readings at 0h. (Bombay, near Andijan, and near Berkeley (2)), 1h. (College, Tucson, Palomar, and Mount Wilson), 7h. (Haiwee, Mount Wilson, Palomar, Riverside, Tucson, Grand Coulee, Shasta Dam, and near Bogota), 8h. (near Mizusawa), 10h. (Alicante), 13h. (near La Paz), 16h. (Malaga), 17h. (Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Boulder City, and near Pierce Ferry), 18h. (Collmberg), 19h. (Mount Wilson, Tinemaha, Tucson, Collmberg, and Moscow), 20h. (Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, and San Juan),

March 8d. 10h. 7m. 5s. Epicentre 41°·5N. 32°·4E. (as on 1944 Feb. 10d.).

$A = +·6343$, $B = +·4025$, $C = +·6601$; $\delta = +7$; $h = -2$;
$D = +·536$, $E = -·844$; $G = +·557$, $H = +·354$, $K = -·751$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Yalta		3·3	24	e 0 52	− 1	1 35	0	—	—	—
Bucharest	E.	5·4	304	e 1 7	?	i 2 53	S_g	e 1 28	P	—
Campulung		6·5	307	1 55?	P*	—	—	—	—	—
Sofia		6·8	282	e 1 55	P*	i 3 29	S*	i 3 55	S_g	i 4·3
Ksara		8·2	159	e 1 54?	− 9	e 3 20	−18	—	—	—
Belgrade		9·3	295	e 2 22	+ 5	e 4 41	S*	e 2 37	PPP	i 5·8
Erevan		9·3	96	e 2 51?	+34	4 22?	+17	—	—	—
Triest		14·1	293	e 3 23	0	e 6 8	+ 6	i 3 32	PP	—
Moscow		14·6	11	e 3 28	− 2	6 10	− 3	—	—	i 7·1
Prague		15·1	310	e 3 31	− 5	e 6 47	+22	—	—	e 8·9
Cheb		16·3	308	—	—	e 6 22	−31	—	—	e 9·9
Collmberg		16·5	313	e 3 55	+ 1	e 7 19	+21	—	—	e 10·4
Chur		17·2	296	e 4 3	0	—	—	—	—	—
Jena		17·2	311	e 4 1	− 2	—	—	—	—	11·5
Zürich		18·0	298	e 4 13	0	—	—	—	—	—
Strasbourg		18·7	302	e 4 21	− 1	—	—	—	—	e 10·9
Neuchatel		19·0	296	e 4 23	− 3	—	—	—	—	—
Copenhagen		19·3	325	e 4 41	+12	—	—	—	—	—
Upsala		20·5	338	4 43	+ 1	8 21	− 6	5 8	PPP	e 10·5
Uccle		21·4	306	e 4 54	+ 3	e 8 55?	+10	e 5 17	PP	e 13·9
Clermont-Ferrand		21·6	291	e 4 56	+ 2	e 8 48	− 1	—	—	—
Sverdlovsk		23·8	41	4 55	−20	9 5	−23	—	—	—
Kew		24·4	307	—	—	—	—	(e 8 55?)	P_cP	e 8·9
Tashkent		27·5	79	5 51	+ 1	10 23	− 7	—	—	—
Andijan		29·9	79	e 6 27	+15	—	—	—	—	—

Additional readings :—
Sofia iE = 3m.20s.
Belgrade e = 5m.23s.
Triest iPPP = 3m.35s., eSS? = 6m.33s.

March 8d. Readings also at 3h. (La Plata), 7h. (near Mizusawa), 12h. (near Andijan), 13h. (Riverview), 14h. (Collmberg, Tinemaha, Haiwee, Palomar, Riverside, Mount Wilson, Pasadena, Valdivostok, and near Mizusawa), 18h. (near Bogota), 23h. (Berkeley).

March 9d. Readings at 0h. (Mineral, Boulder City, Grand Coulee, Pierce Ferry, Shasta Dam, Tinemaha, Tucson, Clermont-Ferrand, and near Apia), 1h. (near Andijan), 4h. (near Mizusawa), 6h. (near Lick), 8h. (Mount Wilson, Palomar, Tinemaha, Tucson, Boulder City, and St. Louis), 9h. (Andijan, Almata, and Tashkent), 13h. (Vladivostok), 14h. (Haiwee, Mount Wilson, Palomar, Riverside, Tinemaha, Tucson, Boulder City, Vladivostok, and near Mizusawa), 16h. (near Toledo and Tortosa), 18h. (near Apia, near Erevan, and near Malaga), 19h. (Ksara), 21h. (Mount Wilson, Palomar, Riverside, Tinemaha, Tucson, Bogota, La Paz, and near Huancayo), 22h. (near Malaga), 23h. (near Coimbra).

March 10d. 0h. 42m. 41s. Epicentre 0°·2N. 125°·2E. (as on 1942 March 25d.).

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

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	E.	38·4	138	e 7 22	− 3	i 13 11	− 9	i 8 50	PP	—
Riverview		41·7	147	i 7 52k	0	i 14 6	− 4	i 8 15	pP	e 22·4
Sydney		41·7	147	—	—	e 11 43	?	—	—	—
Vladivostok		43·2	7	i 8 5	+ 1	i 14 42	+10	—	—	—
Colombo	E.	45·7	279	9 49?	PP	—	—	—	—	—
Kodaikanal		48·5	284	e 7 49	−57	—	—	—	—	—
Bombay	E.	54·6	293	i 9 30	− 2	i 17 26	+15	i 11 41	PP	—
Auckland		58·8	134	i 12 29	PP	18 9	+ 2	—	—	—
Christchurch		60·7	142	10 33	+18	18 22	−10	22 28	SS	31·4
Wellington		60·9	140	i 10 24	+ 7	18 19	−15	—	—	32·3

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Andijan		62·5	317	e 10 29	+ 1	—	—	—	—	—
Tashkent		64·9	317	10 39	− 4	19 15	− 9	—	—	—
Sverdlovsk		76·3	330	10 50	−62	20 26	−71	—	—	—
Triest		104·7	318	e 24 42	SKS	(e 24 42)	[− 7]	—	—	—
Uccle		108·8	325	—	—	e 26 19?	S	—	—	e 57·3
Paris		110·8	324	e 19 7	PP	—	—	—	—	e 63·3
Kew	z.	111·1	327	e 19 11?	PP	e 28 31?	PS	—	—	e 58·3
Pasadena	z.	111·7	53	i 18 41	[+ 4]	—	—	—	—	—
Mount Wilson	z.	111·8	53	e 18 44	[+ 7]	—	—	—	—	—
Palomar	z.	113·0	53	e 18 44	[+ 5]	—	—	i 19 37	PP	—
Boulder City		113·8	50	e 18 39	[− 2]	—	—	—	—	—
Tucson		118·1	52	i 18 50	[+ 1]	e 32 12	PPS	e 20 7	PP	e 56·7
Granada		119·9	314	i 23 17k	PPP	e 26 57	{−16}	30 13	PS	62·4
St. Louis	z.	129·5	36	e 19 11	[0]	—	—	—	—	—
San Juan		158·4	29	e 20 37	PKP_2	e 37 8	PPS	e 24 41	PP	e 79·6
La Paz	z.	159·1	139	20 11	[+11]	—	—	—	—	—
Bogota		160·2	74	e 20 5	[+ 4]	—	—	e 20 49	PKP_2	—

Additional readings :—
Brisbane iSSE =15m.58s.
Riverview iPPEZ =9m.32s., iP_cPNZ =9m.38s., iSSZ =17m.13s., iE =17m.18s., iS_cSE = 17m.28s.
Bombay iE =13m.0s., eN =15m.27s., iN =19m.15s., eE =21m.40s.
Christchurch QN =25m.33s.
Wellington iZ =10m.32s., PPS?Z =18m.54s., i =19m.59s.
Granada SKSP =36m.50s.
Long waves were also recorded at New Delhi, Copenhagen, Cheb, and Clermont-Ferrand.

March 10d. Readings also at 0h. (near Mizusawa), 5h. (Jena), 9h. (near Fresno), 13h. (Boulder City, Tucson, Pierce Ferry, Haiwee, Mount Wilson, Palomar, and Tinemaha), 15h. (near Mizusawa), 19h. (Ferndale), 23h. (near Tacubaya).

March 11d. 17h. 45m. 3s. Epicentre 4°·5N. 125°·5E. Depth of focus 0·010.
(as on 1943 May 18d.).

$A = -·5790$, $B = +·8117$, $C = +·0779$; $\delta = +17$; $h = +7$;
$D = +·814$, $E = +·581$; $G = -·045$, $H = +·063$, $K = -·997$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Hukuoka		29·3	9	5 53	− 2	10 37	− 3	—	—	—
Kôti		29·9	14	e 6 0	− 1	10 45	− 5	—	—	—
Sendai		36·4	21	e 6 43	−14	12 22	− 8	—	—	—
Vladivostok		38·9	8	i 7 16	− 2	i 13 0	− 8	i 7 38	pP	—
Calcutta	N.	40·2	301	e 8 3	+35	i 14 11	+43	—	—	—
Riverview		45·2	149	e 8 11k	+ 2	i 14 42	+ 1	i 8 54	PP	e 24·6
Colombo	E.	45·5	275	8 13	+ 2	—	—	i 10 11	PP	—
Kodaikanal		47·9	281	(i 8 37)	+ 7	i 13 37	−102	—	—	20·9
Irkutsk		50·8	343	8 57?	+ 5	16 5	+ 6	—	—	—
Bombay	N.	53·3	290	e 9 16	+ 5	i 16 44	+10	11 30	PP	—
Almata		57·6	320	e 9 45	+ 3	—	—	—	—	—
Andijan		59·7	315	e 9 57	0	18 4	+ 6	—	—	—
Auckland		61·6	136	—	—	18 27	+ 5	—	—	—
Tashkent		62·0	315	10 12	0	18 35	+ 8	—	—	—
Christchurch		63·9	144	10 28	+ 3	18 49	− 2	e 10 42	pP	29·8
Wellington		64·0	141	10 19	− 6	19 27	+35	10 40	pP	32·0
Sverdlovsk		72·7	328	11 18	− 1	20 33	− 2	—	—	—
Erevan		80·2	309	e 12 2	+ 1	21 59	+ 2	—	—	—
Moscow		85·1	325	i 12 26	0	22 44	− 2	1 12 51	pP	—
Copenhagen		99·0	328	e 13 33	+ 2	—	—	e 13 58	pP	—
Collmberg	z.	100·3	323	e 13 38	+ 1	e 17 45	PP	e 14 4	pP	—
Cheb		101·1	323	—	—	e 24 16	[+ 6]	e 32 57?	SS	e 55·0
Triest		101·7	318	—	—	i 24 16	[+ 4]	—	—	—
Grand Coulee		103·4	38	e 13 49	− 1	e 25 45	+19	i 24 19	SKS	—
Shasta Dam		103·6	46	e 13 51	0	i 24 23	[+ 2]	e 18 14	PP	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Zürich		104·5	321	—	—	e 23 57?	[−28]	—	—	—
Paris		107·5	324	e 14 11	P	—	—	e 27 47	PS	e 59·0
Kew	z.	107·7	327	e 18 40?	PP	e 34 50?	SS	e 28 40?	PS	e 58·0
Tinemaha	z.	107·8	49	e 18 31	PP	—	—	e 18 40	pPKP	—
Haiwee	z.	108·4	49	i 18 22	[+ 5]	—	—	—	—	—
Clermont-Ferrand		108·6	321	e 17 57?	[−20]	e 28 57?	PPS	—	—	—
Mount Wilson	z.	108·9	51	i 18 21	[+ 3]	—	—	—	—	—
Pasadena		108·9	51	i 18 22	[+ 4]	—	—	i 18 40	pPKP	e 49·2
Riverside	z.	109·5	51	e 18 19	[0]	—	—	i 19 7	PP	—
Palomar		110·1	51	e 18 21	[+ 1]	—	—	e 18 57	PP	—
Boulder City		110·8	49	e 18 25	[+ 3]	—	—	e 18 38	pPKP	—
Overton		110·9	48	e 18 25	[+ 3]	—	—	—	—	—
Pierce Ferry		111·3	48	e 18 25	[+ 2]	—	—	e 18 48	pPKP	—
Tucson		115·3	51	e 18 34	[+ 4]	i 29 0	PS	e 18 16	PP	e 52·5
Granada		117·1	316	i 25 56	SKS	(i 25 56)	[+40]	29 53	PS	63·6
St. Louis		125·8	34	i 18 52	[+ 1]	e 27 27	SKKS	i 21 1	PP	—
Pittsburgh		129·5	24	i 18 50	[− 8]	—	—	e 21 34	PP	—
Harvard		130·7	16	i 19 3	[+ 3]	i 22 18	PKS	i 19 19	pPKP	—
San Juan		154·5	25	e 20 7	[+26]	e 24 11	PP	—	—	—
Huancayo		158·1	112	e 19 41	[− 4]	e 43 36	SS	e 24 20	PP	e 73·8
Bogota		158·5	64	e 19 54	[+ 8]	—	—	e 20 34	pPKP	—
Fort de France		159·8	18	e 19 53	[+ 5]	—	—	—	—	—
La Paz	z.	162·1	133	i 19 56a	[+ 6]	24 3	PP	i 20 31	pPKP	77·0

Additional readings and notes :—
Vladivostok isS = 13m.40s.
Riverview iP = 8m.15s.a, iS_cSN = 17m.54s., iSSE = 18m.0s.
Kodaikanal iP = 6m.37s., SS = 16m.47s., true P being recorded as PP.
Bombay iN = 9m.46s., PPPN = 13m.4s., SPPN = 17m.14s., iN = 17m.32s., SSN = 20m.11s.
Christchurch SSEN = 22m.50s., QN = 26m.12s.
Wellington sP_cPZ = 11m.12s., pPP = 13m.27s., PPP?Z = 14m.37s., i = 18m.52s., SP? = 20m.11s., i = 21m.52s., eZ = 26m.27s.?
Grand Coulee e = 14m.8s. and 17m.36s., i = 18m.21s., iS = 24m.53s.
Shasta Dam i = 23m.44s., e = 24m.54s.
Kew eQ?Z = 48·0m.
Tinemaha eZ = 19m.52s.
Palomar iEZ = 19m.7s.
Tucson e = 18m.51s., i = 19m.52s.
Granada SKS = 35m.59s., PPS = 40m.1s., SS = 44m.9s.; phases wrongly identified.
St. Louis iZ = 19m.9s. and 19m.14s.
Harvard i = 19m.32s., iPP = 21m.28s.
Huancayo e = 22m.25s., 25m.10s., 35m.22s., and 44m.53s.
Long waves were also recorded at Malaga, Potsdam, Prague, and Uccle.

March 11d. 21h. 37m. 56s. Epicentre 37°·3N. 142°·0E. Focus at Base of Superficial Layers. (as on 1945, Feb. 4d.).

Intensity VI at Koriyama and Tomioka; V at Hukusima, Sendai, Yamagata, Shirakawa, Mito, Utunomiya, and Onahama; IV Tukubasan, Morioka, Sakata, and Hatinohe; II-III at Kohu, Niigata, Maebasi, Kumagaya, Titibu, Takada, Kashiwara, and Tu.

Seismo. Bull. Cent. Met. Obs., Japan, 1945, Tokyo, 1951, p.27 (readings given as for 11h.).

A = −·6284, B = +·4910, C = +·6034; δ = +6; h = −1;
D = +·616, E = +·788; G = −·476, H = +·372, K = −·797.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Onahama		1·0	247	0 0k	−18	0 15	−16	—	—	—
Hukusima		1·3	290	−0 2k	−24	0 16	−22	—	—	—
Sendai		1·3	318	0 17k	− 5	0 37	− 1	—	—	—
Mito		1·5	233	0 27	+ 3	0 42	− 2	—	—	—
Tukubasan		1·8	235	0 30k	+ 1	0 51	0	—	—	—
Mizusawa	N.	2·0	340	i 0 25	− 7	0 43	−13	—	—	—
Kumagaya		2·4	241	0 43	+ 5	1 21	+15	—	—	—
Morioka		2·5	345	0 33	− 6	1 3	− 6	—	—	—
Maebasi		2·5	249	0 42k	+ 3	1 23	+14	—	—	—
Mera		2·9	216	0 49	+ 4	1 20	+ 1	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Nagano		3·1	258	0 50k	+ 2	1 27	+ 3	—	—	—
Hunatu		3·2	235	0 51a	+ 2	1 41	+14	—	—	—
Hatinohe		3·3	354	0 46k	− 5	1 22	− 7	—	—	—
Toyama		3·9	262	1 4	+ 5	1 59	+15	—	—	—
Wazima		4·1	272	1 5	+ 3	2 11	+22	—	—	—
Kameyama		5·1	242	1 22	+ 6	2 26	+11	—	—	—
Kyoto		5·5	247	1 26	+ 4	2 15	−10	—	—	—
Owase		5·7	237	1 25	+ 1	2 28	− 2	—	—	—
Toyooka		6·0	255	1 33	+ 4	2 46	+ 9	—	—	—
Kôti		7·9	244	1 57k	+ 2	3 35	+10	—	—	—
Hamada		8·4	256	2 8	+ 6	3 36	− 1	—	—	—
Simidu		8·7	241	2 11	+ 5	3 54	+ 9	—	—	—
Hukuoka		10·1	252	2 30	+ 4	5 16	+57	—	—	—
Kumamoto		10·3	247	2 30k	+ 2	5 48	?	—	—	—
Irkutsk		30·3	313	6 4?	− 6	i 11 2	− 5	—	—	—
Calcutta	N.	48·2	269	e 8 48	+ 9	i 15 38	+ 3	e 11 8	PP	e 22·6
College		48·6	32	e 8 41	− 1	e 15 31	−10	e 11 14	PP	e 23·0
Almata		48·9	299	8 46	+ 1	—	—	—	—	—
Andijan		52·9	294	e 9 13?	− 2	16 55?	+15	—	—	—
Honolulu		54·0	89	e 9 25	+ 2	e 16 56	+ 1	e 11 11	PP	e 23·2
New Delhi	N.	54·1	281	e 9 30	+ 6	i 16 55	− 1	17 8	PS	—
Tashkent		54·9	299	i 9 25	− 5	i 17 6	− 1	—	—	—
Sverdlovsk		55·3	319	9 48	+16	i 17 10	− 2	—	—	—
Sitka		55·7	41	—	—	e 17 22	+ 4	—	—	e 23·2
Bombay	N.	62·4	274	i 10 19	− 3	18 50	+ 5	12 44	PP	—
Kodaikanal		63·6	264	i 10 4	−26	i 18 29	−31	22 29	SS	29·5
Colombo	E.	63·8	259	10 33	+ 2	19 18	+16	—	—	—
Victoria		65·9	47	e 11 10	+26	e 18 52	−36	—	—	40·1
Moscow		67·3	324	e 10 49	− 4	e 19 41	− 4	—	—	—
Grand Coulée		68·7	45	e 10 54	− 8	e 20 4	+ 2	—	—	—
Shasta Dam		70·6	53	i 11 8	− 6	e 20 35	+11	—	—	—
Ukiah		70·9	55	—	—	e 20 36	+ 8	—	—	e 29·3
Riverview		71·3	172	i 11 18a	0	i 20 36	+ 4	—	—	e 30·0
Erevan		72·1	307	11 20	− 3	—	—	—	—	—
Berkeley		72·2	56	e 11 18	− 5	e 20 40	− 2	i 21 20	PS	e 33·6
Branner	N.	72·5	56	e 11 21	− 4	—	—	e 11 36	pP	—
Saskatoon		72·8	37	11 40	+13	20 48	− 1	—	—	32·1
Lick		72·9	56	e 11 23	− 5	—	—	—	—	—
Upsala	E.	72·9	335	11 32	+ 4	20 42	− 8	e 25 31	SS	e 33·1
	N.	72·9	335	e 11 25	− 3	20 46	− 4	e 25 40	SS	e 35·1
Butte		73·5	44	—	—	e 20 45	−12	21 29	S_cS	e 33·5
Bozeman		74·5	44	e 18 34	?	e 21 10	+ 2	—	—	e 32·5
Fresno	N.	74·5	55	e 11 33	− 4	—	—	—	—	—
Tinemaha		75·2	56	i 11 38	− 3	e 21 28	+12	i 14 46	PP	—
Santa Barbara	Z.	75·8	58	e 11 40	− 4	—	—	—	—	—
Haiwee	Z.	76·0	56	i 11 41a	− 5	—	—	—	—	—
Bergen		76·4	340	11 44	− 4	e 21 23	− 6	e 26 18	SS	e 36·2
Logan		76·5	47	e 11 47	− 1	e 21 40	+ 9	i 12 20	pP	e 34·5
Pasadena		77·0	58	i 11 45a	− 6	e 21 35	− 1	i 15 2	PP	e 31·5
Mount Wilson		77·1	58	i 11 46a	− 6	—	—	—	—	—
Salt Lake City		77·1	48	—	—	e 21 35	− 2	—	—	e 32·6
Riverside	Z.	77·7	58	i 11 49	− 6	—	—	—	—	—
Copenhagen		77·9	335	i 11 52k	− 4	i 21 39	− 7	—	—	30·4
Boulder City		78·1	54	i 11 53	− 4	e 21 47	− 1	—	—	—
Overton		78·1	54	i 12 52	+55	—	—	—	—	—
La Jolla		78·4	58	i 11 55	− 4	—	—	—	—	—
Palomar		78·4	58	i 11 53	− 6	e 22 26	PS	—	—	—
Pierce Ferry		78·6	54	i 11 55	− 5	—	—	i 12 7	pP	—
Auckland		79·8	154	i 14 9	PP	23 14	PPS	—	—	37·1
Bucharest	E.	80·1	319	—	—	e 22 4?	− 5	—	—	42·1
Potsdam		80·2	332	e 12 15	+ 6	i 22 21	+11	i 22 42	S_eS	e 41·1
Collmberg		81·1	330	i 12 9	− 4	e 22 4?	−15	e 15 4	PP	e 41·1
Arapuni		81·2	154	—	—	22 4?	−16	—	—	—
Ksara		81·4	306	e 12 28	+13	e 22 26	+ 4	—	—	—
Prague		81·5	329	12 19	+ 3	22 19	− 4	15 25	PP	e 38·1

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Jena		81·9	331	e 12 12	− 6	e 22 22	− 6	—	—	—
Cheb		82·3	331	e 11 49	−31	i 22 29	− 3	e 15 34	PP	e 44·1
Edinburgh		82·5	341	e 12 16?	− 5	22 30	− 4	22 42	S_cS	—
Belgrade		82·7	322	i 12 19a	− 3	e 23 21	PS	i 12 30	pP	e 52·0
Sofia		82·8	319	e 12 15	− 7	e 22 40	+ 3	—	—	—
Tucson		83·1	55	i 12 19	− 5	e 22 42	+ 2	e 12 31	pP	e 34·5
Wellington		83·8	156	12 24	− 3	22 44	− 3	15 45	PP	40·1
Stonyhurst		84·2	340	e 12 37	+ 8	i 22 50	− 1	e 15 41	PP	e 39·5
Uccle		84·7	335	e 12 28a	− 4	22 50	− 6	29 12	SS	40·1
Christchurch		85·1	158	12 31	− 3	22 58	− 1	15 57	PP	40·5
Triest		85·2	327	i 12 45	+11	i 22 50	−10	i 15 49	PP	—
Strasbourg		85·3	332	e 12 31	− 4	e 23 1	0	—	—	46·1
Kew		85·6	337	i 12 33a	− 3	i 23 4	0	e 15 47	PP	e 42·1
Chur		86·0	330	e 12 35	− 3	e 23 8	0	e 15 50	PP	e 45·0
Zürich		86·0	331	e 12 33a	− 5	e 23 0	[+ 1]	e 15 50	PP	—
Basle		86·2	331	e 12 36	− 3	e 23 5	− 5	—	—	—
Neuchatel		86·9	331	e 12 38	− 5	e 23 0	[− 4]	—	—	—
Paris		87·0	335	e 12 40	− 3	e 23 16	− 2	e 16 14	PP	e 49·1
Chicago		89·2	36	—	—	e 23 38	0	e 23 8	SKS	e 41·2
Clermont-Ferrand		89·4	333	e 12 51	− 4	e 23 41	+ 1	e 16 41	PP	e 43·1
St. Louis		90·4	39	i 12 55	− 4	i 23 54	+ 5	i 13 15	pP	40·1
Ottawa		90·9	25	12 57	− 5	23 32	[+ 3]	16 34	PP	e 43·1
Shawinigan Falls		90·9	23	e 12 57	− 5	e 23 28	[− 1]	—	—	—
Seven Falls		91·0	21	12 59	− 3	23 32	[+ 2]	—	—	40·1
Barcelona		93·5	331	—	—	e 24 10	− 7	—	—	e 46·0
Pittsburgh		93·6	30	i 13 6	− 8	e 23 41	[− 3]	e 16 56	PP	—
Tortosa		94·3	331	13 13	− 4	24 20	− 3	16 49	PP	e 44·1
Harvard		94·9	24	i 13 16	− 4	—	—	i 16 51	PP	—
Weston		95·1	24	i 13 17	− 4	e 24 35	+ 5	e 23 57	SKS	—
Fordham		95·6	26	e 13 18	− 5	e 23 56	[0]	e 24 10	sSKS	—
Philadelphia		95·9	27	—	—	e 24 31	− 6	i 24 0	SKS	e 40·0
Georgetown		96·1	30	e 17 14	PP	e 23 44	[−15]	—	—	43·1
Toledo		97·1	335	e 13 26	− 4	e 24 47	0	—	—	—
Coimbra		98·2	337	11 54	?	23 32	[−37]	29 52	SS	48·4
Columbia		98·5	35	e 17 33	PP	e 24 10	[− 1]	e 32 10	SSP	e 45·6
Granada		99·4	333	i 13 43a	+ 3	25 50	+44	13 55	pP	47·4
Lisbon		99·8	337	13 35	− 7	25 10	0	17 51	PP	50·0
Malaga	z.	100·0	333	i 17 40a	PP	i 27 40	PPS	31 33	SS	46·1
Bermuda		106·3	23	e 18 17	PKP	e 26 8	+ 4	e 27 39	PS	e 43·6
San Juan		118·6	30	e 19 59	PP	e 29 49	PS	e 20 24	PP	e 56·3
Huancayo		138·2	63	e 18 32	[−50]	e 40 23	SS	e 21 57	PP	e 60·2
La Paz		146·3	59	i 19 35a	[− 2]	26 30	[−10]	23 14	PP	71·1

Additional readings :—
Calcutta iSSN =18m.42s., iSSSN =19m.58s.
College e =15m.52s. and 16m.12s., eSS =19m.27s.
New Delhi S_cSN =19m.3s., SSN =20m.46s.
Sitka e =17m.39s.
Bombay iN =10m.31s., SPN =19m.7s.
Grand Coulee i =21m.53s.
Shasta Dam i =11m.18s. and 13m.43s., e =21m.15s. and 22m.14s.
Riverview iN =11m.22s., iZ =11m.28s., iSE =20m.39s., iE =21m.0s., eN =21m.15s., iN =21m.31s.
Berkeley ePN =11m.22s., eSE =20m.50s., iSE =21m.27s., iQEN =30m.31s.
Upsala eSSS =28m.31s.
Tinemaha iZ =11m.57s. and 12m.14s., eE =17m.45s., ePKP,PKPZ =39m.15s.
Bergen eSE =21m.31s.
Logan ePP =14m.43s., e =27m.52s. and 30m.46s.
Pasadena iZ =11m.53s. and 15m.19s., iEN =22m.20s., iE =26m.46s., ePKP,PKPZ =38m.57s.
Copenhagen 26m.40s.
Boulder City e =22m.23s.
Pierce Ferry e =14m.50s.
Potsdam iEN =22m.1s.
Collmberg ePPP =17m.5s., ePPS?Z =23m.10s., eSSS =31m.4s.?, ePKP,PKPZ =39m.4s., and many other readings without phase.
Prague eSKS =22m.16s., eSS =27m.34s., eSSS =31m.4s.
Edinburgh PS =23m.28s., SS =27m.49s.

Continued on next page.

Belgrade i =13m.18s., ePP =15m.39s.
Tucson iPP =15m.35s., i =15m.41s., eS$_c$S =23m.13s., e =23m.29s. and 30m.15s., ePKP, PKP =38m.43s.
Wellington iZ =12m.55s., 13m.24s., 13m.37s., and 15m.5s., sPPZ =16m.30s., sS = 23m.39s., SS?Z =28m.14s., SSS?Z =33m.4s.?
Stonyhurst eSS =28m.19s.
Christchurch PSE =23m.49s., SSEN =28m.16s., SSSE =32m.20s., QN =35m.4s.
Triest iPPP =17m.31s., ePS =23m.24s., eSS =27m.52s.
Kew eZ =14m.12s., eSE =22m.57s., iPSZ =24m.1s., iPPSE =24m.37s., eSS?E = 30m.19s., eSSSE =32m.4s.?
Paris ePS =24m.4s., eQ =45m.4s.
Chicago eSS =29m.32s.
St. Louis iZ =13m.37s., iPPZ =16m.30s., eSKSE =23m.24s., ePPSE =25m.19s., eSSE = 30m.24s., eSSSE =34m.22s.
Ottawa i =23m.51s.
Tortosa P$_c$PE =13m.22s., PPPE =18m.37s., SKSE =23m.45s., PPSEN =25m.39s.
Weston PS =25m.13s.
Philadelphia eSS =31m.20s.
Coimbra 21m.6s.
Granada iPP =17m.51s., pPP =18m.1s., SKS =24m.14s., PS =27m.28s., SS =32m.4s.
Lisbon PKPE =17m.45s., PSE =25m.56s., SSN =32m.4s., QE =38m.52s.?
Malaga P$_c$PZ =17m.54s., ePPZ =20m.34s., PKP,PKPZ =44m.48s.
Bermuda e =33m.51s. and 37m.44s.
San Juan e =23m.11s., 27m.24s., and 29m.26s.
Huancayo e =21m.37s., i =23m.8s., e =36m.11s., eSSS =45m.43s., e =52m.46s.
La Paz SS =43m.4s.
Long waves were also recorded at Tananarive and Rapid City.

March 11d. Readings also at 0h. (Tucson (2), near Pierce Ferry, and Boulder City), 2h. (near Stalinabad), 5h. (St. Louis, Tinemaha, Haiwee, Pasadena, Mount Wilson, Riverside, Palomar, Overton, Boulder City, Pierce Ferry, Tucson, and Tacubaya), 6h., 9h., and 10h. (near Stalinabad), 13h. (Almata, near Tashkent, and Andijan), 18h. (Huancayo, Shasta Dam, Tinemaha, Haiwee, Pasadena, Mount Wilson, Riverside, Palomar, Overton, Boulder City, Pierce Ferry, Tucson, and near Berkeley), 19h. (near Neuchatel, Zürich, and Basle), 20h. (Collmberg, Shasta Dam, Santa Barbara, Tinemaha, Haiwee, Pasadena, Mount Wilson, Riverside, Palomar, Overton, Boulder City, Pierce Ferry, and Tucson), 22h. (near Mizusawa (6)), 23h. (near Mizusawa).

March 12d. 1h. 38m. 56s. Epicentre 33°·4N. 47°·3E. (as on 1941 August 28d.).

A = +·5673, B = +·6148, C = +·5479; δ = 0; h = +1;
D = +·735, E = −·678; G = +·372, H = +·403, K = −·837.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Erevan		7·1	344	e 2 5	P•	3 32	S•	—	—	—
Ksara		9·5	275	e 2 41?	PPP	e 5 34	L	—	—	(e 5·6)
Tashkent		19·1	60	e 4 26	− 1	8 3	+ 6	—	—	—
Sofia		21·0	303	e 4 51?	+ 4	e 8 39	+ 2	—	—	e 11·4
Andijan		21·2	63	e 4 46	− 3	e 8 42	+ 1	—	—	—
Moscow		23·3	345	5 14	+ 4	9 27	+ 7	—	—	—
Belgrade		23·6	306	e 4 12	−61	e 9 50	+25	e 6 1	PPP	—
Almata		25·1	57	e 5 30	+ 2	—	—	—	—	—
New Delhi	N.	26·0	93	—	—	e 10 2	− 4	i 11 32	SSS	—
Triest		28·4	305	i 6 7	+ 9	i 10 42	− 3	e 6 51	PP	—
Prague		29·3	314	e 7 52	?	e 11 10	+11	—	—	e 13·6
Cheb		30·6	313	—	—	e 11 23	+ 3	—	—	17·1
Collmberg	Z.	30·7	315	e 6 14	− 5	—	—	—	—	—
Chur		31·5	306	e 6 21	− 5	—	—	—	—	—
Zürich		32·3	307	e 6 26	− 7	e 11 41	− 5	—	—	—
Copenhagen		32·8	323	i 6 35	− 2	—	—	—	—	16·1
Basle		33·0	307	e 6 33	− 6	—	—	—	—	—
Neuchatel		33·3	306	e 6 36	− 5	—	—	—	—	—
Uccle		35·7	312	e 7 7	+ 5	e 12 40	+ 1	e 15 22	SSS	e 18·1
Clermont-Ferrand		35·8	303	e 6 48?	−15	—	—	—	—	—
Paris		36·5	309	e 7 4	− 5	—	—	—	—	e 22·1
Kew	Z.	38·7	313	e 9 1	PP	—	—	(e 16 4?)	SS	e 16·1
Granada		41·3	290	i 7 45k	− 4	i 14 7	+ 3	9 54	PPP	20·5

Triest gives also iSS =10m.55s.
Long waves were also recorded at Bucharest and Potsdam.

March 12d. 10h. 21m. 44s. Epicentre 37°·3N. 142°·0E. Depth of focus 0·005.
(as on 11d.).

Intensity V at Kinkazan, Miyagi Pref., Koriyama, Hukusima Pref., and Tateoka, Yamagata Pref.; IV at Shirakawa, Mito, Hukusima, and Morioka; II-III at Sendai and Mizusawa. Epicentre 37°·4N. 142°·2E. Depth 40km.

$A = -·6284$, $B = +·4910$, $C = +·6034$; $\delta = +6$; $h = -1$;

		△	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Hukusima		1·3	290	0 30k	+ 7	0 53	+13	—	—
Sendai		1·3	318	0 19k	− 4	0 36	− 4	—	—
Mito		1·5	233	0 28	+ 2	0 53	+ 8	—	—
Utunomiya		1·9	246	0 35	+ 4	1 13	+19	—	—
Mizusawa	E.	2·0	340	i 0 29	− 3	i 0 52	− 5	—	—
Miyako		2·3	0	0 32k	− 5	1 0	− 4	—	—
Kumagaya		2·4	241	0 42	+ 4	1 21	+14	—	—
Morioka		2·5	345	0 35a	− 4	1 5	− 4	—	—
Maebasi		2·5	249	0 42	+ 3	1 34	+25	—	—
Nagano		3·1	258	0 48	0	1 47	+23	—	—
Hunatu		3·2	235	0 53	+ 4	1 35	+ 8	—	—
Kohu		3·2	239	0 56	+ 7	1 42	+15	—	—
Hatinohe		3·3	354	0 46	− 5	1 23	− 6	—	—
Toyama		3·9	262	1 14	+15	2 12	+28	—	—
Omaesaki		4·1	249	1 16	+14	2 7	+18	—	—
Kameyama		5·1	242	1 22	+ 6	2 51	+37	—	—
Owase		5·7	237	1 37	+13	3 3	+34	—	—
Kobe		6·1	246	1 39	+ 9	3 6	+27	—	—
Kôti		7·9	244	2 6	+11	3 50	+27	—	—
Hamada		8·4	256	2 17	+15	4 36	+60	—	—
Grand Coulee		68·7	45	e 10 57	− 2	—	—	i 11 23	pP
Shasta Dam		70·6	53	i 11 9	− 1	—	—	—	—
Tinemaha		75·2	56	i 11 38a	+ 1	—	—	e 12 20	pP
Santa Barbara	z.	75·8	58	e 11 42	+ 1	—	—	—	—
Haiwee		76·0	56	i 11 42a	0	—	—	i 11 51	pP
Pasadena	z.	77·0	58	i 11 47	− 1	—	—	e 11 59	pP
Mount Wilson	z.	77·1	58	i 11 48	0	—	—	—	—
Riverside	z.	77·7	58	i 11 51a	0	—	—	—	—
Boulder City		78·1	54	i 11 54	0	—	—	—	—
Overton		78·1	54	i 11 54	0	—	—	—	—
Palomar	z.	78·4	58	i 11 55	0	—	—	—	—
Pierce Ferry		78·6	54	i 11 56	0	—	—	—	—
Collmberg		81·1	330	i 11 10	−60	—	—	e 11 17	pP
Tucson		83·1	55	i 12 20	0	—	—	—	—
Basle		86·2	331	e 12 38	+ 3	—	—	—	—
St. Louis	z.	90·4	39	i 12 56	+ 1	—	—	—	—

Pasadena gives also iZ = 12m.18s.
Long waves were recorded at some European stations.

March 12d. 20h. 51m. 47s. Epicentre 45°·7N. 26°·8E. Depth of focus 0·010.
(as on 1942 April 13d.).

Intensity V-VI at Bucharest.
Epicentre 45°·5N. 27°E. Depth 150km. (Strasbourg).
Bulletin séismique de d'Observatoire de Bucarest, 1945, Vol. XI, p. 6.

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

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Campulung	1·3	254	i 0 25k	+ 1	i 0 41	− 1	i 0 28	?	—
Bucharest	1·4	198	i 0 25a	0	i 0 42	− 2	i 0 32	PP	—
Sofia	3·9	221	e 0 57	− 2	i 1 39	− 5	—	—	—
Belgrade	4·5	262	i 1 5a	− 2	i 1 41	−18	—	—	—
Yalta	5·3	101	e 1 23	+ 5	—	—	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Triest		9·1	275	e 2 22	+12	—	—	—	—	—
Prague		9·4	303	e 2 13?	− 1	e 4 32	+33	—	—	—
Collmberg	z.	10·8	306	e 2 30	− 3	—	—	e 3 4	pP	e 5·7
Potsdam		11·2	312	—	—	e 4 7	−35	—	—	e 6·2
Jena		11·4	303	e 2 42	+ 1	e 5 2	+15	—	—	e 6·4
Chur		12·0	282	e 2 51a	+ 2	—	—	—	—	—
Moscow		12·1	30	2 50	0	4 58	− 6	—	—	—
Zürich		12·7	284	e 2 54	− 4	—	—	—	—	e 7·4
Strasbourg		13·3	290	e 3 14	+ 8	—	—	—	—	—
Basle		13·4	285	e 3 4	− 3	e 5 43	+ 9	—	—	—
Copenhagen		13·5	323	i 3 6	− 3	—	—	—	—	7·4
Neuchatel		13·8	283	e 3 9	− 3	—	—	—	—	—
Upsala	E.	15·2	342	e 3 30	0	e 6 5	−11	i 6 49	SSS	i 7·0
Uccle		15·8	297	e 3 43	+ 5	e 6 49	+19	—	—	e 8·2
Clermont-Ferrand		16·6	279	e 3 47	− 1	—	—	e 4 10	PP	—
Kew		18·8	298	e 4 18	+ 4	i 7 45	+ 8	i 4 46	PPP	—
Tortosa		19·7	264	e 4 17	− 7	7 52	− 4	4 47	PPP	—
Toledo	z.	23·3	267	i 4 57	− 3	—	—	—	—	—
Sverdlovsk		23·7	50	e 5 22	PP	e 9 18	+10	—	—	—
Granada		24·2	261	i 5 9k	+ 1	i 9 26	+ 9	5 31	pP	12·5
Malaga	z.	25·0	261	i 5 11a	− 5	e 6 42	pPP	—	—	—
Tashkent		30·9	82	e 6 36	pP	—	—	—	—	—
Andijan		33·2	83	e 7 20	PP	—	—	—	—	—

Additional readings :—
Upsala iE =3m.40s., 6m.14s., and 6m.26s., iN =6m.29s.
Granada sS =10m.15s.
Malaga P_cSZ =15m.3s., S_cSZ =18m.17s.

March 12d. 23h. 49m. 30s. Epicentre 41°·4S. 173°·4E. Depth of focus 0·010.

Epicentre as adopted, depth 80km. (Wellington).

A = −·7473, B = +·0865, C = −·6588 ; δ = −4 ; h = −2 ;
D = +·115, E = +·993 ; G = +·655, H = −·076, K = −·752.

	Δ	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Takaka	0·7	321	0 20?	+ 2	0 31	0
Wellington	1·1	84	0 20	− 2	0 34	− 4
Kaimata	1·8	229	0 32	+ 2	0 55	+ 2
Christchurch	2·2	195	0 33	− 3	0 58	− 4
New Plymouth	2·4	12	0 42	+ 4	1 10	+ 3
Tuai	3·9	49	1 0?	+ 1	1 41	− 3
Auckland	4·7	13	1 11	+ 1	—	—

March 12d. Readings also at 0h. (near Andijan), 1h. (Almata, Bogota, and near Mizusawa), 2h. (near Vladivostok and near Mizusawa), 3h. (near Mizusawa), 4h. (Sofia and near Mizusawa), 6h. (near Mizusawa), 8h. (Apia, Riverview, Auckland, and Wellington), 11h. (Tucson, Overton, near Pierce Ferry, and Boulder City), 12h. (Tucson and Palomar), 14h. (Collmberg and near Mizusawa), 15h. (near Mizusawa), 16h. (Auckland, near Bucharest and Campulung), 17h. (near Bogota), 20h. (near Belgrade), 22h. (San Fernando and near Mizusawa), 23h. (near Ottawa and near Tananarive).

March 13d. Readings at 3h. (Mizusawa), 4h. (Brisbane), 5h. (La Plata, Huancayo, La Paz, Basle, Collmberg, Tucson, Boulder City, Tinemaha, Palomar, Riverside, Mount Wilson, Shasta Dam, Pasadena, Wellington, Riverview, and near Mizusawa), 7h. (near San Juan and near Mizusawa (2)), 8h. (Mizusawa), 9h. (Grand Coulee, Overton, Pierce Ferry, Boulder City, Shasta Dam, Tinemaha, Haiwee, Palomar, Riverside, Mount Wilson, Pasadena, Tucson, and Mizusawa), 11h. (Tashkent, Andijan, and near Almata), 12h. (La Jolla, Palomar, Riverside, Mount Wilson, Pasadena, and Brisbane), 18h. (near Malaga), 19h. (Collmberg), 21h. (near Mizusawa), 23h. (Neuchatel and near Lick).

March 14d. 1h. Mexican shock. Pasadena suggests deep focus.

Oaxaca P =45m.53s., LEN =46m.33s.
Vera Cruz PEN =46m.9s., SE =46m.59s.
Tacubaya PEN =46m.39s., SN =47m.55s.
Florissant iPN =49m.36s., eSN =53m.34s.
St. Louis iPZ =49m.40s., eZ =50m.16s., eSN =53m.37s.
Tucson iP =49m.44s., i =50m.3s. and 56m.47s., e =75m.18s.
Pierce Ferry iP =50m.25s.
La Jolla eP =50m.27s.
Palomar iP =50m.28s.k, iZ =50m.39s., iNZ =51m.7s., eN =58m.12s.
Boulder City iP =50m.29s., e =51m.4s.
Overton iP =50m.30s.
Riverside iPZ =50m.34s.k, iZ =51m.13s.
Mount Wilson iP =50m.39s.k, iZ =51m.19s. and 51m.37s., eZ =51m.48s.
Pasadena iP =50m.40s.k, i =50m.46s., iZ =51m.47s.
Haiwee iPZ =50m.48s.k, eZ =51m.13s. and 57m.8s.
Tinemaha iPZ =50m.54s.a, iZ =51m.1s., 51m.37s., and 57m.10s.
Shasta Dam iP =51m.2s.
Grand Coulee eP =51m.58s., i =52m.37s. and 53m.32s.
Collmberg eZ =58m.6s.

March 14d. Readings also at 4h. (Tucson and near Tacubaya), 5h. (Riverview and near Tananarive), 12h. (Alicante), 14h. (Malaga (2) and La Paz), 17h. (Tucson, Tinemaha, and Haiwee), 18h. (Mizusawa), 22h. (Collmberg), 23h. (Tucson, Riverside, near Berkeley, Lick, Branner, and Fresno).

March 15d. Readings at 3h. (Collmberg), 5h. (near Mizusawa), 8h. (Ksara), 9h. (Riverview, Tucson, Shasta Dam, Tinemaha, Haiwee, Santa Barbara, Palomar, Riverside, Mount Wilson, and Pasadena), 11h. (near Lick), 14h. (Granada).

March 16d. Readings at 4h. (Riverview and near Andijan), 6h. (Bogota), 10h. (Auckland), 12h. (near Berkeley, Lick, and Branner), 14h. (Mizusawa), 15h. (Collmberg), 16h. (Mount Wilson and Riverside), 17h. (near Andijan).

March 17d. 21h. Undetermined shock.

Ksara eP =55m.51s., eS =58m.22s.
Tashkent eP =57m.18s., eS =61m.0s.
Andijan eP =57m.39s.
Moscow eP =58m.2s., S =62m.18s.
Chur e =59m.15s.
Zürich e =59m.20s.
Basle e =59m.27s.
Neuchatel e =59m.30s.

March 17d. 23h. 57m. 54s. Epicentre 6°·6N. 78°·5W.

Intensity IV near the coast of Colombia.
Epicentre 6°·9N. 78°·0W.
Mapa sísmico y tectónico de Colombia (Banco de la República, Bol. gráfico 7, febrero de 1947).

$A = +\cdot1981$, $B = -\cdot9735$, $C = +\cdot1142$; $\delta = -1$; $h = +7$;
$D = -\cdot980$, $E = -\cdot199$; $G = +\cdot023$, $H = -\cdot112$, $K = -\cdot993$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Balboa Heights	2·6	336	i 0 40	− 4	e 1 9	− 8	—	—	—
Bogota	4·8	112	i 1 19	+ 4	i 2 5	− 7	i 1 38	P_g	i 3·2
Port au Prince	13·3	27	i 5 6	?	i 7 11	?	8 23	?	—
San Juan	16·8	45	e 3 51	− 7	i 7 8	+ 3	i 3 59	P	e 8·1
Huancayo	18·8	172	i 4 20	− 3	i 7 6	−44	i 4 29	PP	i 7·9
Fort de France	18·9	65	i 4 18	− 6	i 8 0	+ 7	4 38	PP	e 9·8
Tacubaya	23·8	305	e 5 16	+ 1	e 9 37	+ 9	e 9 55	eS	—
La Paz	25·1	156	i 5 28k	0	i 9 57	+ 6	—	—	13·5
Mobile	25·6	340	e 5 34	+ 2	i 10 5	+ 6	1 5 56	PP	—
Columbia	27·4	356	e 5 49	0	e 10 30	+ 2	e 6 46	PPP	e 12·5

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bermuda		28·7	26	i 6 2	+ 1	i 10 30	−20	i 6 59	PP	1 13·5
Cape Girardeau	N.	32·2	344	e 6 30	− 2	—	—	—	—	—
Georgetown		32·2	3	i 6 32	0	i 11 49	+ 4	i 7 29	PP	e 14·8
Philadelphia		33·3	7	i 6 42	+ 1	i 12 2	0	e 7 55	PP	e 15·5
St. Louis		33·6	344	i 6 43	− 1	i 12 4	− 2	e 7 33	PP	e 16·4
Pittsburgh		33·7	358	i 6 44	− 1	i 12 13	+ 5	i 7 54	PP	—
Florissant		33·8	344	i 6 44	− 2	i 12 7	− 3	e 7 44	PP	e 16·4
Fordham		34·3	7	e 6 50	0	i 12 23	+ 6	i 7 53	PP	e 16·1
Chicago		36·0	348	e 7 4	− 1	e 12 37	− 7	e 8 27	PP	e 14·9
Weston		36·2	11	i 7 8	+ 2	i 12 51	+ 4	e 8 21	PP	—
Harvard		36·3	11	i 7 8	+ 1	—	—	—	—	—
Lincoln		37·8	338	e 7 19	− 1	i 13 6	− 5	—	—	e 16·9
Ottawa		38·7	4	7 28	+ 1	13 25	0	8 50	PP	e 18·6
Tucson		39·5	316	i 7 32	− 2	e 13 32	− 5	i 9 12	PP	e 16·4
Shawinigan Falls		40·1	8	7 40	+ 1	13 50	+ 4	9 14	PP	20·1
Seven Falls		40·9	9	7 49	+ 3	14 1	+ 3	17 6	SS	20·1
Rapid City		43·1	335	i 8 2	− 2	e 14 26	− 4	i 9 43	PP	e 17·6
Boulder City		44·3	317	i 8 13	0	e 14 48	0	e 8 36	?	—
Overton		44·3	318	e 8 12	− 1	—	—	—	—	—
Palomar		44·4	313	i 8 14	0	e 14 49	0	—	—	—
La Jolla		44·5	312	i 8 12	− 3	—	—	—	—	—
Riverside		45·1	313	i 8 19k	− 1	e 15 7	+ 8	i 9 59	PP	—
Salt Lake City		45·2	325	e 8 22	+ 2	e 14 57	− 4	e 14 11	P_eS	e 18·3
La Plata	E.	45·6	157	e 8 23	− 1	15 2	− 4	18 12	SS	22·0
Mount Wilson		45·7	313	i 8 24k	0	e 15 8	0	—	—	—
Pasadena		45·7	313	i 8 24k	0	i 15 8	0	i 10 1	PP	e 22·0
Logan		45·8	326	e 8 23	− 2	e 14 53	−16	e 10 2	PP	e 20·0
Haiwee		46·5	316	e 8 31	0	e 15 21	+ 2	—	—	—
Santa Barbara		47·0	312	e 8 34	− 1	—	—	—	—	—
Tinemaha		47·2	316	i 8 35	− 1	e 15 34	+ 5	—	—	—
Bozeman		48·0	330	e 8 46	+ 3	e 15 32	− 9	e 9 26	?	e 20·4
Fresno	N.	48·1	316	e 8 43	0	—	—	—	—	—
Butte		49·0	330	e 8 51	+ 1	e 15 50	− 5	e 10 45	PP	e 23·5
Lick	E.	49·7	315	e 8 57	+ 1	—	—	—	—	—
Berkeley		50·4	315	i 8 59	− 2	e 16 15	+ 1	e 16 26	PPS	e 24·8
Saskatoon		51·0	339	9 16	+10	16 20	− 2	—	—	26·1
Ukiah		51·6	317	—	—	e 16 32	+ 1	—	—	e 26·5
Shasta Dam		51·8	319	i 9 8	− 4	—	—	—	—	—
Grand Coulee		53·7	328	e 9 22	− 4	e 19 6	S_cS	i 10 35	P_cP	—
Victoria		56·4	326	9 42	− 3	17 42	+ 6	—	—	24·1
Sitka		67·1	331	e 10 59	+ 2	e 19 49	− 2	e 24 7	SS	e 27·5
Lisbon		69·9	52	11 15a	0	20 27	+ 3	28 6	Q	32·7
Coimbra		70·6	50	i 11 22	+ 3	20 34	+ 1	25 21	SS	33·1
San Fernando	E.	71·9	55	11 51	+24	20 49	+ 1	—	—	34·1
Malaga	Z.	73·3	54	i 11 33k	− 2	e 21 13	+ 9	i 14 5	PP	34·9
Toledo		73·9	52	i 11 39	0	i 21 13	+ 3	—	—	—
Granada		74·0	54	i 11 41k	+ 2	i 21 17	+ 6	11 48	pP	35·9
College		75·3	337	e 12 11	+24	e 21 34	+ 8	e 26 22	SS	e 36·3
Edinburgh		76·3	35	e 12 1	+ 9	i 21 38	+ 1	i 22 10	pS	—
Stonyhurst		76·5	37	e 11 59	+ 5	i 21 42	+ 3	i 12 14	P_cP	e 35·8
Tortosa		77·4	51	12 1	+ 3	21 52	+ 3	12 7	P_cP	e 37·1
Kew		77·5	40	i 11 59k	0	e 21 48	− 2	i 12 9	P_cP	e 35·6
Paris		79·1	42	i 12 10	+ 2	e 22 12	+ 5	—	—	37·1
Clermont-Ferrand		79·4	46	i 12 10	+ 1	e 22 16	+ 6	—	—	e 37·1
Uccle		80·4	40	e 12 15k	0	i 22 24?	+ 3	12 36	pP	e 36·1
Bergen		81·2	30	e 12 20	+ 1	e 22 32	+ 3	—	—	e 39·4
Neuchatel		82·1	44	e 12 24	0	—	—	—	—	—
Basle		82·5	43	e 12 26	0	e 22 36	− 6	e 12 53	P_cP	—
Strasbourg		82·6	42	e 12 26	0	e 22 52	+ 9	—	—	—
Zürich		83·2	44	e 12 29k	0	e 22 54	+ 5	e 12 55	P_cP	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Chur		83·9	44	e 12 34k	+ 1	—	—	—	—	—
Copenhagen		85·1	35	i 12 40k	+ 1	23 12	+ 4	15 46	PP	—
Cheb		85·6	40	e 12 46	+ 5	e 23 16	+ 3	e 16 23	PP	e 40·1
Collmberg		85·8	39	i 12 43	+ 1	e 23 18	+ 3	e 16 5	PP	e 40·1
Prague		86·9	40	e 12 50	+ 2	e 23 21	− 5	e 15 54	PP	e 39·1
Triest		86·9	45	i 12 49	+ 1	i 23 27	+ 1	i 13 25	pP	e 41·3
Upsala		87·4	31	—	—	e 23 13	[− 4]	e 23 25	S	e 39·1
Sofia		94·2	46	e 13 26	+ 4	e 24 38	+ 7	24 4	SKS	—
Moscow		98·8	31	e 13 43	0	25 9	− 1	24 26	SKS	—
Sverdlovsk		108·5	22	e 18 30	[0]	e 25 1	[− 5]	28 20	PS	—
Irkutsk		121·3	358	e 20 21	PP	e 25 53	[− 1]	e 22 51	PPP	—
Taskhent		123·9	28	e 18 58	[− 2]	27 54	{+14}	i 20 45	PP	—
Andijan		125·8	27	e 19 16	[+12]	—	—	—	—	—
New Delhi	N.	137·9	32	e 22 17	PP	i 32 19	PS	—	—	e 66·0
Bombay	E.	142·0	47	e 19 35	[+ 1]	i 23 35	SKP	—	—	—
	N.	142·0	47	e 19 31	[− 3]	i 23 31	SKP	i 23 12	PP	—
Calcutta	N.	148·3	23	19 51	[+ 6]	—	—	—	—	—
Colombo	E.	154·6	59	i 32 6?	?	—	—	—	—	—

Additional readings :—
Bogota iS*? =2m.23s., iS_z =2m.30s., i =2m.47s.
San Juan i =4m.58s., iS =7m.18s.
Fort de France PPP =4m.44s., e =8m.17s., SS? =8m.23s.
Tacubaya epSN =10m.0s.
La Paz iSE =10m.9s., iSZ =10m.20s.
Mobile iP =5m.38s., i =10m.35s.
Bermuda i =6m.31s., e =7m.46s. and 11m.7s.
Philadelphia e =7m.0s. and 11m.36s., eS =11m.51s., e =13m.11s.
St. Louis eZ =7m.3s., iZ =8m.4s., eP_cPZ =9m.23s., eSS?N =13m.38s.
Florissant eZ =9m.6s. and 11m.17s., eS_cP?E =13m.12s., eE =15m.29s.
Fordham iP =6m.54s.
Chicago e =9m.37s., 10m.23s. and 12m.12s.
Ottawa SSSE =16m.6s.
Tucson i =7m.41s., iPPP =9m.51s., iS =13m.42s.
Shawinigan Falls SSS =16m.48s.
Rapid City i =8m.54s.
La Plata PP?N =9m.24s., N =18m.36s.
Pasadena i =8m.41s., iZ =14m.51s., eSSE =17m.51s.
Logan i =8m.55s. and 9m.19s., eS_cS =18m.16s.
Butte e =17m.29s.
Berkeley eN =19m.48s., eE =22m.30s.
Grand Coulee e =11m.35s.
Sitka e =11m.44s.
Coimbra i =12m.8s. and 21m.26s.
Malaga PPPZ =16m.12s., SKSZ =21m.38s., SSZ =25m.33s.
Granada PP =14m.30s., iSS =26m.16s.
College e =30m.22s.
Edinburgh i =21m.6s.
Stonyhurst iSKS =21m.59s., iPS =22m.19s., iSSS =29m.43s.
Tortosa PPN =14m.44s., PPPE =16m.19s., S_cSN =22m.40s., SSN =27m.38s., SSSE = 30m.25s., QN =32m.43s.
Kew ePPEZ =14m.52s., ePPPZ =16m.46s., ePSNZ =22m.18s.?, iPPSZ =22m.37s., eSSZ =26m.50s., eQN =32m.38s.
Copenhagen S =23m.24s., 24m.12s., 24m.42s., SS =28m.42s.
Collmberg ePS =24m.6s., ePPS =24m.42s., eSS =29m.6s., ePKP,PKPZ =38m.44s., and many other readings without phase.
Prague eS? =23m.40s., ePS =24m.23s., eSS =29m.6s.?, eSSS =32m.36s.
Triest ePP =16m.9s.?, ePPP =18m.12s., ePS =24m.24s., ipS =24m.45s.
Upsala eE =24m.26s., eN =24m.34s. and 27m.42s.
Sofia eN =18m.12s., eE =24m.48s.
Moscow PS =26m.33s.
Sverdlovsk SS =33m.44s.
Irkutsk ePS =30m.15s., ePPS =31m.46s., eSSS =40m.42s.
Tashkent ePPP =24m.8s.?
Bombay eN =24m.52s.
Long waves were also recorded at Tananarive.

March 17d. Readings also at 3h. and 4h. (near Andijan), 5h. (Sofia and near Mizusawa), 7h. (Sofia), 8h. (Almeria), 9h. (near Andijan), 11h. (Almeria), 16h. (near La Paz), 19h. (near Port au Prince), 21h. (near Andijan).

March 18d. 0h. 21m. 25s. Epicentre 33°·5S. 179°·0W. Depth of focus 0·010.
(as on 1940 Jan. 19d.).

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

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Auckland		6·1	235	1 31	+ 2	2 48	+10	i 1 50	pP	—
Tuai		6·2	209	1 32	+ 2	2 45	+ 4	—	—	—
Arapuni		6·3	222	1 53?	pP	3 11?	pS	—	—	—
New Plymouth		7·9	223	2 2	+ 8	3 55	sS	i 2 53	?	—
Bunnythorpe		8·1	211	—	—	4 21	+54	—	—	—
Wellington		9·2	211	2 40	+29	i 3 45	− 9	2 58	pP	—
Christchurch		12·0	211	2 55	+ 6	i 4 57	− 4	e 3 9	pP	5·8
Apia		20·7	22	e 4 33	− 1	e 8 17	+ 2	i 4 51	pP	—
Brisbane		24·8	277	i 5 15	+ 1	e 8 52	−35	—	—	—
Riverview		24·8	261	e 5 13	− 1	i 9 23	− 4	i 5 35	pP	e 11·2
Sydney		24·8	261	—	—	e 8 23	−64	—	—	e 12·0
Santa Barbara	z.	87·5	45	i 12 38	0	—	—	—	—	—
La Jolla		87·9	48	i 12 38	− 2	—	—	—	—	—
Pasadena		88·2	46	i 12 40a	− 1	—	—	i 12 52	pP	e 39·5
Mount Wilson		88·4	46	i 12 42a	0	—	—	e 16 18	PP	—
Palomar		88·5	48	i 12 43	0	—	—	—	—	—
Riverside	z.	88·6	46	i 12 43a	0	—	—	—	—	—
Fresno	N.	89·1	43	e 11 40	−66	—	—	e 11 54	pP	—
Haiwee	z.	89·7	45	i 12 48	0	—	—	i 13 1	pP	—
Tinemaha		90·2	44	i 12 51a	0	—	—	i 13 26	pP	—
Shasta Dam		90·4	39	i 12 49	− 3	—	—	—	—	—
Boulder City		91·5	46	i 12 57	0	e 23 54	+ 8	e 13 5	pP	—
Tucson		91·6	51	i 12 57	0	—	—	i 13 5	pP	—
Overton		92·1	46	e 13 0	0	—	—	—	—	—
Moscow		146·3	322	i 19 27	[− 2]	—	—	—	—	—
Ksara		151·0	281	e 19 45	[+ 9]	—	—	e 23 1	PP	—
Copenhagen		156·4	343	e 19 43	[0]	—	—	—	—	—
Collmberg	z.	160·2	336	e 19 47	[− 1]	—	—	i 20 26	pPKP	—
Basle		165·0	342	e 20 48	PKP_2	—	—	—	—	—
Zürich		165·0	340	e 20 47	PKP_2	—	—	—	—	—
Clermont-Ferrand		167·6	353	19 35?	[−20]	—	—	—	—	—
Toledo	z.	172·5	30	i 20 9	[+11]	—	—	—	—	—
Malaga		174·5	52	i 19 55k	[− 4]	—	—	i 21 28	PKP_2	98·4
Granada		174·7	44	i 21 31a	PKP_2	29 3	PPP	21 53	$pPKP_2$	—

Additional readings :—
Auckland i = 2m.25s., 3m.6s., 3m.46s., and 4m.51s.
Wellington sP?Z = 3m.20s. and 4m.10s., S = 4m.30s., sS?Z = 5m.2s., iZ = 5m.40s., 6m.0s., 6m.30s., and 7m.18s., P_cPZ = 8m.35s., i = 15m.5s.?, S_cS = 15m.50s.
Christchurch eN = 3m.29s.
Apia iEN = 5m.16s., eEN = 9m.31s.
Brisbane ePN = 5m.18s., eN = 10m.8s. and 12m.18s.
Riverview iPEZ = 5m.18s.k, iPP?EN = 5m.45s., iN = 5m.59s., iZ = 6m.8s., iN = 6m.13s. and 7m.39s., iZ = 9m.41s., iSS?EN = 10m.14s.
Pasadena iE = 17m.5s.
Boulder City e = 24m.22s.
Collmberg eZ = 20m.35s. and 24m.10s.
Malaga iPPZ = 25m.23s., P_cP,PKPZ = 29m.4s.
Granada PKP_2 = 22m.34s., $pPKP_2$ = 22m.59s., iPP = 25m.27s.
Long waves were also recorded at St. Louis and Upsala.

March 18d. 8h. 1m. 20s. Epicentre 0°·4S. 31°·2E.

$A = +·8554$, $B = +·5180$, $C = -·0070$; $\delta = +8$; $h = +7$;
$D = +·518$, $E = -·855$; $G = -·006$, $H = -·004$, $K = -1·000$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tananarive	24·4	140	5 21	0	e 9 52	+13	e 11 38	?	e 12·6
Johannesburg	25·8	187	e 5 16	−18	e 10 10	+ 8	e 10 58	SS	i 13·6
Ksara	34·3	7	e 7 20?	+30	—	—	e 15 15	SSS	—
Erevan	42·2	15	e 7 54	− 2	—	—	—	—	—
Sofia	43·5	351	e 8 9	+ 2	e 15 10?	PPS	e 17 52	SS	e 24·7

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bucharest		44·8	355	6 40?	?	—	—	—	—	—
Bombay		45·1	63	e 8 20	0	14 54	− 5	10 6	PP	—
Kodaikanal		47·2	75	—	—	e 15 39	+10	—	—	—
Triest		48·4	344	i 8 52	+ 6	e 19 20	SS	e 9 40?	pP	—
Barcelona		49·2	332	e 9 13	+21	—	—	—	—	e 24·5
Granada		49·3	323	i 8 57k	+ 4	16 9	+10	9 39	pP	—
Malaga	z.	49·5	322	e 8 55k	+ 1	e 15 17	−45	e 10 44	PP	22·0
Tortosa		49·6	330	8 58	+ 3	16 0	− 3	10 15	P_cP	e 21·8
Chur		50·7	341	e 9 5	+ 2	—	—	—	—	—
Toledo	z.	51·4	325	i 8 51	−18	—	—	—	—	—
Zürich		51·5	340	e 9 7	− 2	—	—	—	—	—
Neuchatel		51·8	339	e 9 12	0	—	—	—	—	—
Basle		52·0	340	e 9 11	− 2	—	—	—	—	—
Clermont-Ferrand		52·2	335	e 9 14	− 1	—	—	—	—	e 28·7
Prague		52·3	347	e 9 13	− 2	e 20 40?	?	e 20 16	SS	e 27·7
Strasbourg		52·8	341	e 9 16	− 3	—	—	—	—	—
Lisbon		53·7	321	9 29k	+ 3	—	—	23 34	Q	28·8
Collmberg	z.	53·8	346	e 9 22	− 4	—	—	e 11 27	PP	—
Tashkent		54·0	35	e 9 27	− 1	17 2	− 1	—	—	—
Coimbra		54·2	323	e 6 15	?	e 15 9	?	22 9	SSS	27·7
Paris		54·9	337	i 9 36	+ 1	—	—	—	—	e 28·7
Andijan		55·4	38	e 9 42	+ 4	17 28	+ 6	—	—	—
Moscow		56·2	5	e 9 45	+ 1	17 36	+ 3	—	—	—
Calcutta	N.	60·1	64	—	—	e 20 1	S_cS	—	—	—
Stonyhurst		60·8	338	—	—	—	—	e 22 25	SS	e 31·5
Upsala		61·0	352	i 10 17	− 1	e 18 37	+ 2	—	—	e 31·7
Sverdlovsk		61·8	18	—	—	18 40	− 6	—	—	—
Irkutsk		80·0	37	—	—	22 13	− 4	—	—	—

Additional readings :—
Johannesburg i?N = 10m.22s., eSSEN = 11m.22s.
Bombay PSN = 15m.7s., PPSE = 15m.19s., SSSN = 19m.1s.
Triest iPP = 12m.7s., eS = 19m.40s.?, ePS = 20m.34s.
Tortosa PPPN = 11m.6s., P_cSN = 15m.2s., SN = 15m.28s., SSSEN = 19m.47s.
Collmberg iZ = 9m.25s., eZ = 9m.38s. and 9m.58s.
Coimbra PP = 8m.39s., SS = 19m.7s.
Upsala eE = 10m.32s., eN = 21m.40s.?
Long waves were also recorded at Tucson, Huancayo, La Paz, San Juan, Bermuda, St. Louis, Florissant, New Delhi, Riverview, and at other European stations.

March 18d. 8h. 10m. 14s. Epicentre 6°·6N. 78°·5W. (as on 17d.).

A = +·1981, B = −·9735, C = +·1142; δ = −1; h = +7.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Balboa Heights		2·6	336	i 0 39	− 5	i 1 9	− 8	—	—	—
Huancayo		18·8	172	e 4 27	+ 4	—	—	—	—	e 11·6
La Paz	z.	25·1	156	5 35	+ 7	—	—	—	—	—
St. Louis	z.	33·6	344	e 6 42	− 2	—	—	—	—	—
Tucson		39·5	316	i 7 31	− 3	—	—	—	—	—
Pierce Ferry		43·8	318	e 8 8	− 1	—	—	—	—	—
Boulder City		44·3	317	e 8 13	0	—	—	—	—	—
Overton		44·3	318	e 8 14	+ 1	—	—	—	—	—
Palomar	z.	44·4	313	i 8 14	0	—	—	—	—	—
Riverside	z.	45·1	313	e 8 18a	− 2	—	—	—	—	—
Mount Wilson	z.	45·7	313	i 8 23	− 1	—	—	—	—	—
Pasadena	z.	45·7	313	i 8 24	0	—	—	—	—	—
Haiwee	z.	46·5	316	e 8 30	− 1	—	—	—	—	—
Tinemaha	z.	47·2	316	e 8 35	− 1	—	—	—	—	—

Additional readings :—
Tucson i = 7m.39s., e = 10m.38s.
Palomar iZ = 8m.19s.
Mount Wilson iZ = 8m.31s.
Tinemaha iZ = 8m.42s. and 8m.47s.
Long waves were also recorded at San Juan and Bucharest.

March 18d. 18h. 54m. 41s. Epicentre 55°·0N. 156°·5W.

$A = -·5284$, $B = -·2298$, $C = +·8173$; $\delta = -1$; $h = -7$;
$D = -·399$, $E = +·917$; $G = -·750$, $H = -·326$, $K = -·576$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
College		10·8	20	e 2 51	+12	e 4 33	− 9	e 5 18	SSS	i 5·7
Sitka		12·0	69	e 2 57	+ 2	—	—	—	—	i 6·1
Victoria		21·3	93	e 5 26	PPP	e 8 55	+12	—	—	—
Grand Coulee		24·2	90	i 5 20	+ 1	i 9 39	+ 4	i 16 15	S_cS	e 15·5
Shasta Dam		26·7	107	i 5 43	0	—	—	e 16 24	S_cS	—
Berkeley		28·8	111	—	—	e 10 59	+ 8	e 11 57	SS	e 12·7
Bozeman		30·0	88	—	—	e 11 15	+ 5	—	—	e 13·7
Haiwee	z.	32·4	108	i 6 28	− 6	—	—	—	—	—
Mount Wilson	z.	33·7	111	i 6 45	0	—	—	—	—	—
Pasadena	z.	33·7	111	i 6 45	0	—	—	i 8 4	PP	e 16·2
Overton		34·0	104	e 7 47	+59	—	—	—	—	—
Boulder City		34·2	105	i 6 50	+ 1	—	—	e 17 12	S_cS	—
Riverside	z.	34·3	111	i 6 50	0	—	—	e 7 51	PP	—
Pierce Ferry		34·5	104	i 6 55	+ 3	—	—	—	—	—
Palomar		35·0	111	i 6 57k	+ 1	—	—	—	—	—
La Jolla		35·2	112	i 6 59	+ 1	—	—	—	—	—
Tucson		39·2	105	i 7 32	+ 1	e 14 8	+36	i 9 5	PP	e 17·7
Lincoln		41·2	84	—	—	e 14 1	− 1	—	—	e 17·8
Chicago		45·8	76	—	—	e 15 5	− 4	e 18 18	S_cS	e 21·6
Florissant		46·2	81	e 8 27	− 1	i 15 13	− 2	e 8 42	pP	e 22·3
St. Louis		46·4	81	i 8 28	− 2	i 15 15	− 3	i 8 43	pP	e 22·5
Vladivostok		46·4	286	i 8 28	− 2	i 15 17	− 1	—	—	—
Ottawa		49·8	65	8 55	− 1	16 1	− 5	—	—	23·3
Shawinigan Falls		50·6	62	e 9 7	+ 5	—	—	—	—	27·3
Seven Falls		51·2	60	—	—	e 16 25	0	—	—	27·3
Fordham		53·9	68	e 8 55	−32	e 16 35	−27	—	—	—
Philadelphia		53·9	69	—	—	e 16 57	− 5	e 19 11	S_cS	e 26·0
Irkutsk		54·0	311	i 9 26	− 2	17 0	− 3	—	—	—
Weston		54·2	65	i 9 28	− 1	e 17 3	− 3	—	—	—
Sverdlovsk		64·5	338	10 39	− 2	i 19 18	− 1	—	—	—
Bermuda		65·2	68	—	—	e 19 18	−10	e 26 30	SS	e 34·4
Moscow		69·0	351	11 7	− 2	20 9	− 5	e 20 21	PS	—
Copenhagen		69·3	7	e 11 10	− 1	e 20 22	+ 5	—	—	—
Almata		72·1	322	e 11 24	− 4	—	—	—	—	—
Kew		72·1	15	—	—	e 20 59?	+ 9	—	—	e 37·3
Uccle		73·4	13	—	—	(e 25 19)	SS	—	—	e 25·3
Paris		75·1	14	11 44	− 2	—	—	—	—	44·3
San Juan		75·4	78	—	—	i 21 25	− 2	—	—	e 38·7
Andijan		75·9	323	11 51	+ 1	—	—	—	—	—
Tashkent		76·4	326	i 11 52	− 1	21 38	0	—	—	—
Basle		77·0	10	e 11 55	− 1	—	—	e 16 44	PPP	—
Zürich		77·2	10	e 11 53	− 4	—	—	—	—	—
Neuchatel		77·4	10	e 11 57	− 1	—	—	—	—	—
Chur		77·8	9	e 12 0	− 1	—	—	—	—	—
Toledo		82·6	21	i 12 26	0	e 22 44	+ 1	—	—	—
New Delhi	N.	84·9	314	—	—	i 22 58	− 8	—	—	e 46·5
Granada		85·3	21	i 12 47k	+ 7	i 23 11	+ 1	16 5	PP	38·0
Malaga	z.	85·6	22	i 12 42a	+ 1	e 23 18	+ 5	i 12 51	pP	—
Bombay		95·3	313	—	—	23 59	[− 4]	—	—	51·3
Wellington	z.	99·0	201	e 20 19?	PPP	—	—	—	—	—

Additional readings :—
College e = 3m.33s.
Berkeley eSN = 11m.5s., eZ = 11m.17s.
Florissant ePP?Z = 10m.7s., eSSE = 18m.19s.
St. Louis ePP?Z = 10m.15s., eE = 15m.29s., eSSE = 18m.21s., eE = 18m.58s.
Philadelphia eSS = 20m.57s.
Granada SS = 28m.52s., SSS = 32m.22s.
Malaga iPPZ = 16m.15s., PPPZ = 18m.2s.
Long waves were also recorded at Honolulu, Columbia, and Clermont-Ferrand,

March 18d. 22h. 27m. 5s. Epicentre 6°·7N. 124°·1E. (as on 1945, Jan. 29d.).

$A = -\cdot5568$, $B = +\cdot8225$, $C = +\cdot1159$; $\delta = -3$; $h = +7$;
$D = +\cdot828$, $E = +\cdot561$; $G = -\cdot065$, $H = +\cdot096$, $K = -\cdot993$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		
		°	°	m. s.	s.	m. s.	s.	m.	s.	
Mizusawa	E.	35·8	23	(e 7 19)	+16	e 7 19	P	—		—
Vladivostok		36·9	10	e 7 9	− 3	13 3	+ 5	—		—
Calcutta	N.	37·9	298	—	—	13 20	+ 7	—		—
Colombo	E.	43·9	273	8 7	− 3	14 47	+ 5	—		—
Irkutsk		48·3	344	e 7 55	−50	—	?	—		—
Bombay		51·3	290	9 5	− 3	16 34	+ 8	—		—
Andijan		57·1	315	e 9 49	− 1	—	—	—		—
Tashkent		59·5	315	e 10 5	− 2	18 26	+10	—		—
Sverdlovsk		70·1	329	e 11 9	− 7	e 20 25	− 2	—		—
Moscow		82·5	325	e 12 18	− 8	e 22 37	− 5	—		—
Bogota		158·7	58	e 19 45	[−14]	—	—	e 24	0	PP

Long waves were recorded at Copenhagen.

March 18d. 23h. 18m. 7s. Epicentre 48°·5N. 29°·0W.

$A = +\cdot5817$, $B = -\cdot3224$, $C = +\cdot7467$; $\delta = -12$; $h = -5$;
$D = -\cdot485$, $E = -\cdot875$; $G = +\cdot653$, $H = -\cdot362$, $K = -\cdot665$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Coimbra		16·9	112	e 4 0	+ 1	7 14	+ 7	—	—	8·3
Lisbon		17·4	117	4 9	+ 3	—	—	—	—	8·4
Stonyhurst		17·4	62	i 3 43	−23	i 7 11	− 8	i 4 8	P	e 8·4
Kew		18·6	70	i 4 16	− 5	(e 7 46)	0	—	—	e 7·8
Toledo		19·8	108	i 4 35	0	8 26	+13	4 49	PP	—
Paris		20·7	78	4 41	− 3	e 8 24	− 7	—	—	9·4
Malaga	z.	21·5	104	i 5 0	+ 8	e 9 6	+19	—	—	10·4
Uccle		21·6	71	e 4 56	+ 2	e 8 53	+ 4	—	—	e 9·9
Granada		21·7	103	i 4 56k	+ 1	i 8 51	0	5 21	pP	10·9
Clermont-Ferrand		21·9	85	e 4 59	+ 2	e 9 1	+ 7	—	—	e 10·9
Tortosa		22·2	99	5 2	+ 2	9 0	0	5 27	PP	11·5
Bergen		22·9	45	e 8 8	?	e 8 53	−20	—	—	—
Neuchatel		24·1	80	e 5 16	− 2	—	—	—	—	—
Strasbourg		24·2	76	e 5 21	+ 2	—	—	e 6 34	PPP	—
Basle		24·4	79	e 5 19	− 2	e 9 36	− 3	—	—	—
Zürich		25·1	79	e 5 41	+13	—	—	—	—	—
Chur		25·8	80	e 5 33	− 1	—	—	—	—	—
Copenhagen		26·1	58	e 5 30	− 7	1 10 6	− 1	11 5	SS	—
Cheb		26·8	71	e 5 53?	+ 9	e 10 22	+ 3	—	—	e 13·9
Seven Falls		27·9	284	e 5 23	−31	e 10 47	+10	—	—	13·9
Prague		28·1	70	e 8 33	?	e 10 53	+13	—	—	—
Upsala		28·9	50	—	—	e 10 35	−18	e 12 30	SSS	e 14·9
Triest		29·0	79	e 7 3	PP	e 10 53?	− 1	—	—	—
Weston		30·0	275	e 6 14	+ 2	e 11 12	+ 2	—	—	—
Ottawa		31·7	283	—	—	e 11 41	+ 4	—	—	15·9
Philadelphia		33·7	273	e 8 0	PP	e 12 17	+ 9	e 14 35	SSS	e 16·9
Moscow		40·1	54	e 7 47	+ 8	e 13 43	− 3	e 9 4	PP	—
San Juan		42·5	239	e 9 13	PP	—	—	(e 18 3)	SSS	e 18·1
Florissant		44·4	282	e 8 16	+ 2	e 14 54	+ 5	e 10 0	PP	e 22·4
St. Louis		44·4	282	i 8 16	+ 2	e 14 52	+ 3	e 18 16	SS	e 21·6
Sverdlovsk		51·2	45	e 9 12	+ 5	e 16 13	−12	—	—	—
Tucson		61·5	288	e 10 21	0	—	—	—	—	e 32·9
Boulder City		61·5	294	i 10 21	0	—	—	—	—	—
Tinemaha	z.	62·9	297	i 10 29	− 1	—	—	—	—	—
Haiwee	z.	63·4	296	i 10 34	0	—	—	—	—	—
Riverside	z.	64·5	294	i 10 40	− 1	—	—	—	—	—
Palomar	z.	64·6	293	i 10 40	− 1	—	—	—	—	—
Pasadena	z.	64·8	294	i 10 37	− 6	—	—	—	—	e 34·9
Tashkent		65·2	55	10 43	− 2	—	—	—	—	—

For Notes see next page.

NOTES TO MARCH 18d. 23h. 18m. 7s.

Additional readings :—
Malaga iZ = 6m.31s. and 6m.58s.
Granada P_eP = 9m.4s., sS = 9m.47s.
Tortosa PPPN = 5m.33s., iE = 9m.5s., iN = 9m.11s., SSEN = 9m.58s.
Copenhagen 12m.29s.
Florissant eSS?E = 18m.18s.
St. Louis iZ = 8m.28s., eSE = 14m.55s.
Long waves were also recorded at Potsdam, Collmberg, Bucharest, Bermuda, and Berkeley.

March 18d. Readings also at 0h. (near Balboa Heights), 2h. (Zürich, Basle, Neuchatel, and near Tacubaya (2)), 3h. (Sofia and Ksara), 5h. (Tucson, Mount Wilson, Haiwee, and Tananarive), 7h. (La Paz, Tucson, Tinemaha, Haiwee, Riverside, and Mount Wilson), 8h. (Granada, Malaga, Tortosa, and San Fernanado), 11h. (Pasadena, Haiwee, Palomar, Riverside, Tucson, and Tacubaya), 13h. (Tucson, Riverside, Bucharest, and Sofia), 16h. (Tucson, Boulder City, Riverside, Palomar, Mount Wilson, Pasadena, Riverview, Auckland, and Wellington), 17h. (Ukiah), 19h. (Moscow), 20h. (Sofia and Bucharest), 22h.(2) and 23h. (Reykjavik).

March 19d. 14h. 49m. 57s. Epicentre 36°·9N. 121°·7W. (as on 1941 Feb. 2d.).

A = −·4213, B = −·6821, C = +·5978 ; δ = +12 ; h = −1 ;
D = −·851, E = +·525 ; G = −·314, H = −·509, K = −·802.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Lick		0·4	6	i 0 11	− 2	i 0 17	− 4	—	—
Santa Clara		0·5	336	e 0 20	+ 6	e 0 27	+ 4	—	—
Branner		0·6	323	i 0 16	+ 1	i 0 25	− 1	e 0 35	?
San Francisco		1·0	325	i 0 21	0	i 0 37	+ 1	—	—
Berkeley		1·1	335	i 0 22	0	i 0 37	− 2	i 0 23	P*
Fresno	N.	1·5	96	e 0 34	+ 6	e 0 51	+ 2	—	—

March 19d. 19h. 0m. 20s. Epicentre 36°·9N. 121°·7W. (as at 14h.).

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Lick		0·4	6	i 0 11	− 2	i 0 19	− 2	—	—
Branner		0·6	323	e 0 15	0	i 0 27	+ 1	—	—
San Francisco		1·0	325	i 0 23	+ 2	i 0 37	+ 1	e 0 28	?
Berkeley		1·1	335	i 0 22	0	i 0 38	− 1	i 0 28	?
Fresno	N.	1·5	96	e 0 29	+ 1	e 0 44	− 5	—	—

March 19d. Readings also at 0h. (Angra do Hirosimo and near Reykjavik (4)), 1h. (Angra do Hirosimo (2), Kew, and near Reykjavik (3)), 2h. and 3h. (Reykjavik), 6h. (Haiwee, Palomar, Tucson, and Tinemaha), 10h. (near Apia), 12h. (Zürich (2)), 13h. (Boulder City, Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, Tucson, St. Louis, Tinemaha, Huancayo, La Paz, near Bogota, and near Montezuma), 15h.(near Mizusawa), 17h. (near Mizusawa and near Triest), 19h. (Brisbane and Riverview), 20h. (Collmberg, Basle, Chur, Zürich, Brisbane, Riverview, Grand Coulee, Pierce Ferry, Shasta Dam, Boulder City, Haiwee, La Jolla, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Santa Barbara, Tucson, near Fresno, Berkeley, Lick, and near Tacubaya), 21h. (near Oaxaca and Tacubaya), 23h. (San Fernando).

March 20d. 7h. 58m. 49s. Epicentre 37·°4N. 35°·8E.

Many casualties in the vicinity of Adana. Felt as far as Alep.
Communiqué from the Observatory of Kandilli which gives epicentre 745km. from Istanbul, position as adopted.

A = +·6459, B = +·4658, C = +·6048 ; δ = −6 ; h = 0 ;
D = +·585, E = −·811 ; G = +·491, H = +·354, K = −·796.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ksara	3·6	179	e 0 55	− 3	1 52	S*	—	—	—
Yalta	7·2	351	1 53	+ 4	—	—	—	—	—
Erevan	7·3	65	e 2 7	P*	3 55	S_e	—	—	—
Bucharest	10·1	317	e 2 33	+ 5	e 4 22	− 3	—	—	—
Sofia	10·9	303	e 2 44	+ 4	e 4 59	+15	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Campulung		11·3	317	e 2 48	+ 2	—	—	—	—	6·2
Belgrade		13·7	307	e 3 21	+ 3	e 6 2	+10	—	—	—
Moscow		18·4	4	4 16	− 2	7 49	+ 8	—	—	—
Triest		18·4	304	i 4 46	+28	i 7 54	+13	i 5 36	PP	i 11·1
Prague		19·9	317	i 4 33	− 3	e 8 20	+ 5	i 4 40	PP	e 9·7
Cheb		21·0	315	e 5 0	+13	e 8 44	+ 7	—	—	e 13·2
Collmberg		21·3	319	e 4 47	− 3	e 8 38	− 5	i 5 10	PP	11·8
Chur		21·6	304	e 4 52	− 2	e 8 32	−17	—	—	—
Jena	N.	21·9	317	e 7 11?	?	e 11 11?	L	—	—	(e 11·2)
Potsdam		21·9	321	i 5 3	+ 6	i 8 59	+ 5	—	—	11·2
Zürich		22·3	306	e 4 58	− 3	e 8 44	−18	—	—	—
Basle		23·0	306	e 5 7	0	e 8 49	−25	—	—	e 13·4
Strasbourg		23·2	309	e 5 14	+ 5	—	—	—	—	—
Neuchatel		23·3	305	e 5 13	+ 3	—	—	—	—	—
Copenhagen		24·1	327	e 5 17	− 1	i 9 37	+ 3	i 5 27	pP	—
Upsala	E.	25·3	338	e 5 35	+ 5	9 54	0	—	—	e 13·0
	N.	25·3	338	5 28	− 2	9 58	+ 4	—	—	e 13·0
Sverdlovsk		25·5	33	i 5 32	0	1 9 57	0	—	—	—
Clermont-Ferrand		25·7	299	i 5 37	+ 4	e 10 4	+ 3	—	—	e 12·7
Tashkent		26·1	71	5 40	+ 3	i 10 10	+ 3	—	—	—
Barcelona		26·2	290	5 38	0	10 17	+ 8	—	—	e 15·0
Paris		26·7	306	5 41	− 2	e 10 35	+18	e 13 41	Q	e 15·2
Tortosa		27·5	287	5 54	+ 4	10 40	+10	6 34	PP	15·0
Andijan		28·4	72	e 6 1	+ 3	—	—	—	—	—
Kew		29·0	312	e 6 3k	− 1	i 10 53?	− 1	i 6 56	PP	e 11·2
Bergen		30·0	331	i 6 38	+26	e 11 25	+15	e 12 56	SS	e 15·8
Stonyhurst		30·9	315	i 7 10	+50	i 12 19	+55	i 7 54	PP	e 18·6
Toledo		31·0	286	e 6 15	− 6	—	—	7 38	PP	—
Granada		31·2	282	i 6 20k	− 3	11 33	+ 4	6 59	pP	16·6
Malaga		31·9	282	i 6 26k	− 3	i 11 34	− 6	7 28	PP	18·2
Edinburgh		32·0	318	—	—	e 11 32	−10	17 0	S_eS	—
Coimbra		34·3	289	e 10 1	?	e 15 31	?	—	—	20·9
Lisbon		35·1	286	6 45	−12	12 25	− 5	14 24	Q	17·0
New Delhi	N.	35·6	92	e 8 23	PP	15 20	SS	18 58	S_eS	17·4
Bombay		37·2	110	i 7 12	− 3	e 12 59	− 3	8 42	PP	20·2
Hyderabad	N.	42·3	106	7 55	− 2	14 15	− 4	9 43	PP	—
Kodaikanal	E.	46·2	115	e 1 41	?	e 8 41	?	—	—	16·4
Calcutta	N.	47·3	93	e 9 26	PP	i 15 32	+ 1	—	—	—
Irkutsk		49·0	49	8 55	+ 5	15 56	+ 1	—	—	—
Colombo	E.	50·2	117	9 11?	+11	—	—	—	—	—
Vladivostok		69·5	51	e 11 8	− 4	e 20 11	− 9	—	—	—
Seven Falls		73·4	317	—	—	e 21 11	+ 6	—	—	32·2
Harvard		76·6	313	i 11 52	− 2	—	—	—	—	—
Weston		76·6	313	e 11 50	− 4	e 21 32	− 8	—	—	—
Ottawa		77·1	318	11 51	− 6	21 44	− 2	30 11?	SSS	e 34·2
Bermuda		78·5	302	e 12 13	+ 9	e 21 57	− 4	—	—	e 33·7
Fordham		79·0	313	e 12 7	0	—	—	—	—	e 42·9
San Juan		88·1	292	e 12 52	− 2	e 23 14	[− 7]	—	—	e 42·5
Florissant		89·4	320	e 12 59	− 1	e 23 23	[− 6]	e 24 1	S	e 40·2
St. Louis		89·5	320	e 12 59	− 1	e 23 28	[− 1]	e 24 0	S	e 38·7
Grand Coulee		92·1	343	e 13 17	+ 5	—	—	—	—	—
Tinemaha	Z.	102·1	338	e 14 4	+ 6	e 30 16	PKKP	i 18 21	PP	—
Haiwee	Z.	102·9	338	e 14 7	+ 6	e 30 17	PKKP	—	—	—
Tucson		104·0	331	e 14 13	+ 7	i 30 13	PKKP	e 18 23	PP	e 51·8
Mount Wilson	Z.	104·7	337	i 14 15	+ 6	e 30 9	PKKP	—	—	—
Riverside	Z.	104·7	337	e 18 8	PP	e 30 7	PKKP	—	—	—
Pasadena		104·8	337	i 14 15	+ 5	e 30 2	PKKP	e 18 10	PP	e 49·3
Palomar	Z.	105·1	336	e 14 19	+ 8	i 30 7	PKKP	e 18 24	PP	—
Huancayo		114·0	272	—	—	e 29 27	PS	—	—	e 48·2

Additional readings :—
Bucharest iN = 3m.14s., iE = 4m.44s., iN = 4m.54s.
Belgrade i = 3m.28s., e = 4m.40s.
Triest ipP? = 5m.22s., iPPP = 5m.42s., iSS = 8m.24s.
Prague e = 5m.8s., 5m.29s., and 6m.11s.

Continued on next page.

Cheb e =7m.15s.
Collmberg iZ =4m.53s. and 4m.59s., i =5m.7s., iPPPZ =5m.19s., iZ =5m.24s., 5m.48s., and 6m.9s., e =6m.23s., iZ =6m.40s. and 7m.5s., e =7m.20s., iZ =7m.28s., e = 8m.42s. and 8m.53s., i =9m.1s., eZ =9m.19s., iSS =9m.24s.
Upsala iN =5m.51s., iE =10m.7s.
Clermont-Ferrand e =5m.29s.
Tortosa PPPEN =6m.51s., P_cPN =9m.21s., SSEN =11m.46s.
Bergen eE =13m.2s.
Stonyhurst e =11m.33s., iSSS? =14m.26s.
Toledo iP =6m.22s.
Granada PP =7m.38s., P_cP =9m.31s., iSS =13m.33s.
Malaga PPPZ =7m.55s., iP_cPZ =8m.50s., sSZ =12m.42s., SSZ =14m.4s., SSSZ = 14m.32s., S_cSZ =16m.35s.
Coimbra SS =17m.1s, i =18m.36s.
Lisbon PZ =6m.59s.
New Delhi eN =9m.20s., iN =13m.34s.
Bombay iE =7m.32s. and 8m.35s., iSN =13m.5s., iE =16m.8s., S_cSN =17m.29s.
Kodaikanal PPE =3m.41s., SSE =12m.41s.
Weston i =11m.58s.
Fordham iP =12m.13s.
Florissant eE =25m.46s.
St. Louis iPZ =13m.6s., iZ =13m.16s., eN =25m.41s.
Pasadena iZ =18m.27s.
Palomar iNZ =18m.38s.
Long waves were also recorded at La Paz, Tananarive, Riverview, and other American stations.

March 20d. 21h. 55m. 6s. Epicentre 34°·1N. 116°·3W. (as on 1942, August 7d.).

$A = -·3677$, $B = -·7439$, $C = +·5580$; $\delta = -5$; $h = 0$;
$D = -·896$, $E = +·443$; $G = -·247$, $H = -·500$, $K = -·830$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Palomar		0·9	212	i 0 21k	+ 1	—	—	—	—	—
Riverside		0·9	263	i 0 21k	+ 1	i 0 34	0	—	—	—
La Jolla		1·5	213	i 0 31k	+ 3	i 0 52	+ 3	—	—	—
Mount Wilson		1·5	275	i 0 30a	+ 2	i 0 51	+ 2	—	—	—
Pasadena		1·6	275	i 0 31a	+ 1	i 0 53	+ 2	—	—	—
Boulder City		2·2	47	i 0 37	− 1	i 1 8	+ 2	i 0 42	P*	—
Haiwee		2·4	326	i 0 41a	0	—	—	—	—	—
Pierce Ferry		2·8	43	i 0 45	− 2	—	—	—	—	—
Santa Barbara	Z.	2·8	277	i 0 49a	+ 2	—	—	—	—	—
Overton		2·9	32	i 0 46	− 2	—	—	—	—	—
Tinemaha		3·4	332	i 0 54a	− 1	—	—	—	—	—
Fresno	N.	3·9	314	e 1 2	0	i 1 58	+ 8	i 1 25	P_g	—
Tucson		4·9	110	i 1 15	− 2	i 2 12	− 3	i 1 36	P_g	i 2·6
Lick		5·4	308	e 1 24	0	i 2 46	S*	i 1 34	P*	—
Berkeley		6·1	309	e 1 33	− 1	e 2 54	+ 9	e 1 36	?	—
Shasta Dam		8·2	326	e 2 6	+ 3	i 4 14	S*	e 2 30	P*	—
Logan		8·4	24	e 1 59	− 7	e 2 56	P_g	(i 4 31)	S_g	i 4·5

Additional readings :—
Fresno iS_gN =2m.5s., iSN =2m.25s., eN =2m.31s.
Tucson i =2m.19s.
Lick iN =1m.42s.

March 20d. Readings also at 1h. (Collmberg), 2h. (Huancayo and La Paz), 3h. (Berkeley, Boulder City, Pierce Ferry, Haiwee, Mount Wilson, Tucson, Pasadena, Palomar, Riverside, and Tinemaha), 5h. (near Tananarive), 8h. (Ksara, and near Mizusawa), 9h. (Zürich, Ksara (2), and Wellington), 13h. (Ksara, near Reykjavik, and near Triest), 18h. (Almeria, New Delhi, and near Branner), 22h. (New Delhi).

March 21d. Readings at 1h. (Chur), 4h. (near Mizusawa), 12h. (Tananarive, Collmberg, Malaga, Haiwee, Palomar, Tinemaha, Tucson, Auckland, Riverview, and near Apia), 13h. (Tashkent, near Andijan, and Stalinabad (2)), 17h. (Almeria), 18h. (Mount Wilson, Riverside, Tucson, and Tinemaha).

March 22d. 8h. 33m. 42s. Epicentre 35°·1N. 136°·7E.

A = −·5968, B = +·5624, C = +·5724; δ = +11; h = 0;
D = +·686, E = +·728; G = −·417, H = +·393, K = −·820.

	Δ	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Kameyama	0·3	217	0 11	0	0 18	0
Owase	1·1	202	0 21k	− 1	0 37	− 2
Kohu	1·6	71	0 27	− 3	0 50	− 1
Toyooka	1·6	286	0 37	+ 7	1 2	+11
Hunatu	1·7	77	0 29	− 2	0 50	− 4
Misima	1·8	90	0 30	− 2	0 49	− 7
Siomisaki	1·8	205	0 31	− 1	1 2	+ 6
Nagano	2·0	38	0 38	+ 3	1 4	+ 2
Wazima	2·3	4	0 48	+ 8	1 22	+13
Kumagaya	2·4	64	0 42	+ 1	1 13	+ 1
Hukusima	4·0	48	1 21	P_g	2 18	S_g
Sendai	4·6	46	1 24	P^*	2 32	S_g

March 22d. Readings also at 2h. (near Ksara, and near San Juan), 3h. (Mount Wilson, Pasadena, and Riverside), 4h. (Haiwee, Mount Wilson, Pasadena, Riverside, Tinemaha, Tucson, Shasta Dam, St. Louis, San Juan, Bogota, Huancayo, La Plata, and near La Paz), 6h. (Triest), 14h. (near Oaxaca, and Tacubaya), 18h. (Collmberg), 19h. (Kew and near Ottawa), 21h. (near Mizusawa).

March 23d. 6h. Undetermined shock.

Collmberg eZ = 4m.52s., e = 6m.21s.
Granada P = 6m.5s., L = 28·0m.
Malaga iZ = 7m.1s., eLZ = 27m.0s.
Tinemaha iPZ = 7m.23s.
Haiwee ePZ = 7m.30s
Riverside eZ = 7m.31s.
Mount Wilson iZ = 7m.40s. and 7m.51s.
Pasadena iZ = 7m.43s., 7m.52s., and 8m.18s., eLZ = 29·9m.
Santa Barbara iZ = 7m.45s.
Tucson eP = 7m.56s., eL = 33m.14s.
Upsala e = 9m.
Moscow ePKP = 9m.22s., e = 10m.48s., 14m.54s., 16m.24s., and 20m.54s.
Prague e = 10m.19s., 13m.42s., and 16m.24s.
Cheb e = 11m.
Bucharest EN = 24m.? and 54m.?
Long waves were also recorded at Copenhagen and Kew.

March 23d. 23h. 14m. 10s. Epicentre 61°·5S. 153°·0E.

A = −·4273, B = +·2177, C = −·8775; δ = −2; h = −9;
D = +·454, E = +·891; G = +·782, H = −·398, K = −·480.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Christchurch		21·4	43	4 44	− 7	8 48	+ 3	i 4 53	P	10·0
Wellington		24·2	43	5 14k	− 5	9 50	+15	5 20	pP	11·5
Arapuni		27·3	42	5 26?	−22	10 32	+ 5	—	—	10·8
Riverview		27·7	357	e 5 53	+ 1	i 10 31	− 2	i 10 53	sS	e 12·8
Sydney		27·7	357	e 6 17	+25	i 11 2	+29	e 12 8	SSS	—
Auckland		28·2	40	5 56	0	10 30	−11	11 34	sS	13·3
Brisbane		34·0	1	i 6 45	− 3	i 12 29	+16	i 6 52	pP	i 15·8
Perth		38·1	304	7 35	+13	13 38	+22	8 43	PP	18·7
Apia		53·9	45	e 9 32	+ 5	e 17 10	+ 8	—	—	i 27·0
La Plata	E.	80·7	154	—	—	22 20	− 4	27 20	SS	33·6
	N.	80·7	154	—	—	22 14	−10	31 2	SSS	33·4
Tananarive		80·7	248	13 12	+56	22 38	+14	30 18	SSS	e 36·0
Colombo	E.	88·1	288	e 13 28	+34	23 33	− 4	—	—	40·5
Honolulu		91·4	45	—	—	e 26 8	PPS	—	—	e 37·5
La Paz	Z.	95·7	141	13 27	− 2	23 55	[−10]	16 21	PP	44·8
Huancayo		97·5	132	e 14 6	+29	e 24 59	0	e 17 12	PP	e 40·7

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Calcutta	N.	98·3	302	—	—	24 31	[+12]	i 26 42	PS	e 47·8
Bombay		101·8	288	e 18 14	PP	24 39	[+ 3]	i 27 22	PS	48·1
New Delhi		108·3	296	e 19 2	PP	i 25 12	[+ 7]	28 32	PS	—
Tacubaya		115·4	96	e 17 55	?	e 29 42	PS	e 21 41	PPP	e 51·7
Tucson		120·6	78	e 18 22	[−32]	e 30 20	PS	—	—	e 53·1
Ukiah		120·7	64	—	—	e 36 55	SS	e 41 30	SSS	e 49·9
Boulder City		121·9	73	e 19 0	[+ 4]	—	—	—	—	—
Salt Lake City		127·1	71	—	—	e 38 17	SS	e 43 1	SSS	e 52·6
Fort de France		127·3	137	e 18 47	[−20]	—	—	—	—	—
Logan		127·9	70	e 19 9	[+ 1]	e 38 25	SS	e 21 24	PP	e 52·8
Victoria		128·3	57	—	—	e 38 32	SS	—	—	52·8
San Juan		128·9	129	e 19 58	[+48]	e 38 12	SS	e 21 22	PP	e 53·3
Grand Coulee		129·7	60	e 19 13	[+ 2]	—	—	e 21 51	PP	—
Butte		130·9	66	—	—	e 39 3	SS	—	—	e 64·1
Bozeman		131·4	68	—	—	e 39 6	SS	e 43 58	SSS	e 61·1
Ksara		131·9	264	e 19 43	[+27]	e 23 1	SKP	—	—	—
College		133·5	30	—	—	e 22 56	SKP	e 32 7	PS	e 54·7
Rapid City		133·7	75	e 20 16	[+57]	e 29 20	{+37}	e 22 4	PP	e 54·6
St. Louis		135·6	91	e 19 23	[+ 1]	e 26 48	[+16]	e 22 22	PP	—
Florissant		135·7	91	e 22 46	SKP	i 26 48	[+16]	e 32 38	PS	—
Columbia		136·2	103	e 23 3	SKP	e 32 35	PS	e 40 23	SS	e 64·1
Chicago		139·3	89	—	—	e 40 17	SS	e 45 57	SSS	e 58·2
Bermuda		142·1	123	e 23 18	SKP	i 29 32	{− 2}	i 35 2	PPS	e 56·4
Philadelphia		143·8	104	e 23 22	SKP	e 41 50	SS	e 46 25	SSS	—
Bucharest		144·9	266	e 19 44	[+ 5]	—	—	—	—	43·8
Sofia		144·9	262	e 19 42	[+ 3]	e 41 50	SS	—	—	e 60·8
Fordham		145·1	104	e 19 40	[+ 1]	e 24 1	SKP	i 23 12	PP	—
Moscow		147·1	290	i 19 50	[+ 7]	e 26 49	[− 1]	—	—	—
Harvard		147·5	105	e 19 34	[− 9]	—	—	—	—	—
Ottawa		147·7	97	e 19 45	[+ 1]	e 42 25	SS	e 23 12	PP	61·8
Belgrade		147·9	261	e 19 49a	[+ 5]	—	—	i 22 48	PP	e 91·2
Seven Falls		151·3	100	e 19 57	[+ 8]	e 42 8	SS	e 48 14	SSS	60·8
Malaga	Z.	151·4	221	i 19 53k	[+ 4]	34 8	SKSP	i 20 2	pPKP	72·8
Granada		151·6	222	i 20 5k	[+15]	e 31 5	{+38}	20 47	pPKP	i 78·3
San Fernando	E.	151·7	217	21 3	pPKP	—	—	—	—	65·8
Triest		151·7	256	e 20 18	[+28]	—	—	i 21 15	PKP_2	—
Barcelona		153·3	235	—	—	e 43 27	SS	—	—	e 70·9
Tortosa		153·4	233	—	—	43 37	SS	44 31	SSP	e 74·8
Toledo		154·2	224	e 20 9	[+16]	27 19	[+20]	i 20 32	PKP_2	—
Chur		154·5	252	e 19 56	[+ 2]	—	—	—	—	e 88·8
Prague		154·5	263	e 20 44	PKP_2	e 30 51	{+ 8}	e 27 1	PPP	e 63·8
Lisbon		154·6	215	17 47	?	37 7	PPS	19 49	PKP	69·8
Zürich		155·3	251	e 20 22a	PKP_2	—	—	—	—	—
Cheb		155·5	260	e 21 23	?	e 31 4	{+15}	e 43 50?	SS	e 87·8
Coimbra		155·8	217	e 37 0	PPS	48 41	?	43 30	SS	75·5
Neuchatel		155·8	250	e 20 12	[+16]	—	—	—	—	—
Basle		155·9	251	e 20 21	[+25]	—	—	—	—	—
Collmberg		156·0	264	e 20 0	[+ 4]	e 31 2	{+11}	e 20 28	PKP_2	e 65·8
Jena	N.	156·4	263	e 25 50	?	—	—	—	—	—
Clermont-Ferrand		156·5	242	e 20 31	PKP_2	e 44 16	SSP	e 50 6	SSS	e 65·8
Strasbourg		156·6	254	e 20 46	PKP_2	—	—	—	—	—
Potsdam		156·7	266	—	—	e 43 50	SS	—	—	e 76·8
Upsala		158·4	286	e 28 12	PPP	e 37 20	PPS	e 44 28	SS	e 66·3
Copenhagen		158·9	273	e 20 14	[+14]	31 5	{− 2}	24 24	PP	—
Paris		159·1	248	e 20 37?	PKP_2	e 31 32	{+24}	e 45 19	SSP	75·8
Uccle		159·7	253	e 21 26	?	—	—	—	—	e 79·8
Kew		162·3	249	—	—	(34 50?)	PS	—	—	34·8
Bergen		164·3	280	—	—	e 31 49	{+14}	e 45 14	SS	73·8
Stonyhurst		164·9	250	i 33 5	?	i 39 9	PPS	e 45 50	SS	70·2
Edinburgh		166·5	256	e 28 50	PP	46 3	SS	46 35	SSP	—
Aberdeen		166·6	262	i 36 18	?	i 46 20	SSP	71 15	Q	74·3

For Notes see next page.

NOTES TO MARCH 23d. 23h. 14m. 10s.

Additional readings :—
Wellington sP? =5m.47s., PP? =6m.5s., i =6m.28s. and 6m.50s., iZ =7m.8s. and 7m.25s., P_cPZ =8m.45s., sSZ =10m.7s., iZ =10m.27s., SS? =10m.57s.
Riverview ePZ =5m.56s., iPNZ =6m.0s.k, iPPNZ =6m.39s., iN =7m.7s., 10m.48s., and 11m.4s., eQ?E =11m.14s., iSSE =11m.49s., iN =11m.59s., iSSSE =12m.7s.
Auckland PP =6m.35s., i =7m.35s., S_cP =12m.20s., i =12m.45s.
Brisbane ePPN =8m.12s., eQ?E =13m.59s.
Perth SSS =16m.26s.
Tananarive N =24m.42s., SSN =27m.31s., QEN =33m.48s.
La Paz PPZ =18m.1s., SZ =23m.15s., SSZ =28m.15s.
Huancayo e =23m.37s., iSKS =24m.18s., iPS =26m.19s., iSS =31m.33s., e =35m.7s.
Calcutta iPPSN =27m.34s., iSSN =32m.14s.
Bombay PPPN =20m.29s., iE =20m.59s., PPSEN =28m.14s., SSEN =33m.4s., Q?E =42m.44s.
New Delhi iSSN =34m.22s., SSSN =38m.25s.
Tacubaya eN =21m.36s., ePPS? =32m.17s.
Tucson e =19m.26s. and 29m.20s.
Logan e =23m.56s.
San Juan e =33m.22s.
College eSS =39m.50s.
St. Louis ePPE =22m.56s., eE =24m.12s. and 25m.55s., ePPSE =33m.58s., eE =35m.14s., eSSE =40m.4s., eSSSE =44m.20s.
Florissant eZ =35m.12s., eE =37m.35s., eSSE =40m.32s., eSSSE =44m.32s.
Columbia eSSS =44m.51s.
Bermuda i =41m.37s.
Philadelphia e =32m.53s. and 40m.36s.
Sofia eN =20m.15s. and 43m.16s.
Fordham ePKP? =19m.59s., e =31m.1s., eSS? =42m.26s., eSSS? =47m.2s.
Harvard i =19m.42s. and 20m.28s.
Ottawa e =20m.12s., eE =28m.54s.
Belgrade i =20m.9s., e =25m.23s. and 31m.29s.
Seven Falls e =21m.42s.
Malaga iPKP$_2$Z =20m.24s., ePPZ =23m.52s., iPPPZ =27m.50s., PKKPZ =28m.16s., P_cP,PKPZ =30m.30s., SKSP?Z =38m.50s., SSZ =43m.16s., QZ =66m.38s.
Granada PP =24m.6s., eSKSP =34m.13s., SS =43m.20s.
Triest i =21m.43s., iPP =24m.59s., iPPP =29m.4s., ePSKS =35m.47s., eSSS =53m.24s.
Tortosa SSSEN =49m.19s., QE =61m.27s.
Toledo PP =24m.11s.
Prague e =33m.50s., 34m.50s., and 49m.20s.
Lisbon N =17m.51s., E =23m.1s., Z =23m.4s., E =37m.11s., N =44m.30s., QN =58·6m.
Cheb e =24m.42s.
Coimbra PP =41m.0s., ? =44m.10s., SKS =47m.31s., PS =50m.5s. ; readings wrongly identified.
Collmberg eZ =20m.11s., 20m.53s., 21m.19s., 22m.11s., 22m.20s., 22m.54s., 23m.50s 25m.2s., 29m.59s., and 33m.14s., e =37m.50s.?, 40m.14s., and 44m.8s.
Upsala PPE =33m.18s., eSKSN =38m.30s., eSKSE =38m.40s., eN =41m.12s., eE =41m.19s., eN =48m.50s.?, eSSE =50m.38s., eSSSN =55m.20s.
Copenhagen ePKP =21m.1s. and 37m.50s., SS =44m.38s. and 45m.56s., SSS =50m.14s.
Paris e =25m.23s., eSSS? =50m.28s.
Bergen eE =46m.35s., eN =51m.47s.
Stonyhurst ePP =34m.9s., iPPP =37m.55s., i =41m.19s., e =42m.37s., ePS =44m.19s., eSS =52m.4s., eSSS =57m.0s. ; readings wrongly identified.
Aberdeen iEN =57m.26s.
Long waves were also recorded at Lincoln, Ferndale, and Pasadena.

March 23d. Readings also at 1h. (Edinburgh, St. Louis, and near Tananarive), 2h. (Zürich, Pasadena, Mount Wilson, Riverside, Palomar, Santa Barbara, Haiwee, Tinemaha, Tucson, Riverview, Brisbane, and Auckland), 8h. (Tinemaha, Haiwee, Riverside, Tucson, Mount Wilson, Fort de France, Bogota, La Paz, and Montezuma), 12h. (near Malaga (2), Granada, Almeria, Alicante, and near Stalinabad), 15h. (Collmberg), 16h. (Sitka and near Balboa Heights), 17h. (Zürich), 23h. (New Delhi, Collmberg, and near Tacubaya).

March 24d. 12h. 13m. 22s. Epicentre 43°·7N. 15°·9E.

Intensity V at Sibenik ; IV at Skradin.
Epicentre 43°44′N. 15°55′E. Macroseismic radius 5km.

Prof. J. Mihailovic.
Annuaire de l'Institut Séismologique de Beograd, microséismique et macroséismique, 1945, Belgrade, 1950, p. 35.

$A = +·6976$, $B = +·1987$, $C = +·6884$; $\delta = +2$; $h = -3$;
$D = +·274$, $E = -·962$; $G = +·662$, $H = +·189$, $K = -·725$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Triest	2·5	322	i 0 46	+ 3	i 1 16	+ 2	i 0 51	P_g	i 1·6
Belgrade	3·5	70	e 0 50	− 7	e 1 37	− 3	e 0 57	P	—
Chur	5·5	307	e 1 25	0	—	—	—	—	—
Sofia	5·5	94	e 1 34	+ 9	e 2 44	+14	—	—	—
Zürich	6·3	307	e 1 34	− 2	e 3 3	S*	e 1 42	P*	—
Basle	7·0	307	e 1 51	+ 5	e 3 12	+ 4	—	—	—
Strasbourg	7·5	314	—	—	e 3 48	S*	—	—	—
Collmberg	7·8	346	e 1 51	− 7	e 3 21	− 7	e 1 57	P	i 4·2

Additional readings :—
Triest $iP_gP_g = 0m.57s.$, $iPS? = 1m.6s.$, $iS_g = 1m.26s.$
Belgrade $e = 1m.8s.$, $iP_gS_g = 1m.21s.$, $e = 1m.25s.$
Collmberg $i = 2m.14s.$ and $2m.24s.$, $iP_g? = 2m.27s.$, $eZ = 2m.41s.$ and $3m.39s.$, $eS^*Z = 3m.51s.$, $iS_g = 4m.3s.$

March 24d. 14h. 24m. 23s. Epicentre 13°·0N. 92°·0W.

$A = -·0340$, $B = -·9741$, $C = +·2235$; $\delta = -2$; $h = +6$;
$D = -·999$, $E = +·035$; $G = -·008$, $H = -·223$, $K = -·975$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tacubaya		9·4	314	2 18	0	—	—	—	—	3·8
Columbia		23·2	24	—	—	e 9 19	+ 1	—	—	e 13·1
San Juan		25·5	75	e 5 49	+17	i 10 59	+62	e 9 2	P_cP	e 14·1
St. Louis		25·6	4	e 5 34	+ 2	e 10 4	+ 5	i 5 53	PP	—
Florissant	N.	25·7	4	e 5 35?	+ 2	e 10 9	+ 8	—	—	—
Tucson		25·8	322	i 5 33	− 1	e 9 55	− 7	i 5 48	PP	e 13·1
Huancayo		29·9	146	e 7 14	PP	—	—	—	—	e 12·2
Philadelphia		30·7	28	e 10 10	?	e 11 48	+27	—	—	e 15·8
Boulder City		30·8	323	i 6 19	− 1	—	—	—	—	—
Riverside	z.	31·1	317	i 6 21	− 1	—	—	—	—	—
Mount Wilson	z.	31·7	317	i 6 27	0	—	—	—	—	—
Tinemaha	z.	33·6	320	i 6 44	0	—	—	—	—	—
Grand Coulee		41·5	332	e 7 50	0	—	—	—	—	—

Additional readings :—
San Juan $e = 10m.30s.$
St. Louis $eN = 10m.57s.$
Tucson $e = 10m.49s.$
Long waves were also recorded at Bermuda, Bozeman, Kew, Copenhagen, and La Paz.

March 24d. Readings also at 0h. (Almata, near Tashkent, and Andijan), 4h. (Almeria, and near Tacubaya), 12h. (Riverview), 17h. (near Andijan), 18h. (Tinemaha, Pasadena, Riverside, Boulder City, Tucson, St. Louis, Huancayo, and near Balboa Heights), 19h. (near Almata and near Andijan), 20h. (Auckland), 21h. (Balboa Heights).

March 25d. Readings at 12h. (Fresno), 13h. (near Malaga), 17h. and 19h. (near Apia), 22h. (near Berkeley), 23h. (near Tacubaya).

March 26d. Readings at 0h. (Pehpei, Bombay (2), and Kew), 10h. (Ksara), 12h. (Kew), 16h. (Bucharest), 19h. (near Triest), 21h. (Mount Wilson, Riverside, Tucson, Palomar, and Tinemaha), 23h. (near Andijan).

March 27d. Readings at 0h. (near Basle and Zürich), 9h. (La Paz), 15h. (near Mizusawa), 17h. (near Berkeley, Ferndale, and Mineral), 23h. (La Paz).

March 28d. 13h. 3m. 25s. Epicentre 5°·9S. 146°·7E. Depth of focus 0·015.
(as on 1939, March 22d.).

A = −·8314, B = +·5462; C = −·1021; δ = −2; h = +7;
D = +·549, E = +·836; G = +·085, H = −·056, K = −·995.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane		22·3	163	i 4 48	+ 1	i 8 58	+19	i 9 30	SS	e 11·5
Riverview		28·1	172	i 5 43k	+ 1	i 10 31	+15	i 11 21	sS	e 13·8
Sydney		28·1	172	e 8 29	PcP	—	—	(e 12 11)	SSS	e 12·2
Perth		38·8	224	13 5	S	(13 5)	+ 3	13 38	sS	19·0
Auckland		40·1	144	e 10 35?	?	—	—	e 16 35?	SS	22·6
Wellington		43·2	148	7 50	0	14 13	+ 7	8 15	sP	21·6
Christchurch		43·9	153	7 58	+ 3	14 31	+15	17 56	SS	21·2
Mizusawa	E.	45·1	354	e 8 0	− 5	e 8 24	pP	—	—	—
Vladivostok		50·6	346	e 8 45	− 3	i 15 50	− 1	—	—	—
Irkutsk		68·2	333	e 10 40	− 9	—	—	—	—	—
Bombay	N.	76·8	290	e 11 35?	− 4	e 21 9	− 5	21 49	PS	—
Almata		79·5	317	e 12 5	+11	—	—	—	—	—
Andijan		82·1	312	e 12 16	+ 8	—	—	—	—	—
Tashkent		84·5	312	12 13	− 7	e 22 32	− 2	—	—	—
Shasta Dam		94·5	50	e 13 4	− 3	—	—	—	—	—
Grand Coulee		97·2	43	e 13 15	− 4	—	—	—	—	—
Tinemaha	Z.	97·5	54	e 13 22	+ 2	—	—	—	—	—
Pasadena	Z.	97·5	57	i 13 21k	+ 1	—	—	i 13 40	pP	e 44·5
Mount Wilson	Z.	97·6	57	i 13 23	+ 2	—	—	i 13 41	pP	—
Haiwee	Z.	97·8	55	e 13 22	0	—	—	e 13 37	pP	—
Riverside	Z.	98·2	57	i 13 24	0	—	—	i 13 48	pP	—
Palomar	Z.	98·6	57	i 13 27	+ 2	—	—	i 14 28	sP	—
Moscow		105·6	327	e 18 17	PP	—	—	—	—	e 61·6

Additional readings :—
Riverview iZ = 10m.57s.
Wellington PPZ = 9m.35s., PPPZ = 10m.20s., iZ = 10m.55s., sSZ = 15m.1s., SSZ = 17m.50s., sSSZ = 18m.15s.
Bombay PPSN = 22m.12s.
Pasadena iZ = 14m.8s.
Riverside eZ = 16m.46s.
Long waves were also recorded at Arapuni, Tucson, and some European stations.

March 28d. Readings also at 1h. (near Cape Girardeau, Florissant, and St. Louis, and near Balboa Heights), 2h. (Auckland), 3h. (Collmberg (2)), 4h. (Almata, Stalinabad, and near Andijan), 6h. (Mount Wilson, Riverside, Tucson, Huancayo, and Bogota), 8h. (San Juan and Almeria), 9h. (near La Paz), 10h. (Shasta Dam, Haiwee, Tinemaha, Riverside, Mount Wilson, Pasadena, Tucson, Montezuma, Huancayo, and near La Paz), 11h. (near La Paz), 12h. (Mount Wilson, Tucson, Palomar, and Uccle (2)), 15h. (near Andijan and Stalinabad), 16h. (Palomar, Tucson, and Mount Wilson).

March 29d. 8h. Undetermined shock. Pacific Ocean, probably about 30° S. latitude. The readings of Apia, Riverview, and New Zealand are not sufficiently in agreement to determine the position.

Apia iP = 55m.31s., iS = 57m.49s.
Auckland P? = 55m.35s., S = 58m.0s.
Tuai P = 55m.49s., S = 58m.19s.
New Plymouth P = 55m.59s., S? = 58m.45s.
Wellington P = 56m.15s., S = 59m.2s.
Kaimata e = 56m.37s., i = 56m.45s. and 56m.54s., S = 59m.44s.
Christchurch P = 56m.39s., S = 59m.48s.
Riverview iPEZ = 60m.8s.k, iS?N = 64m.18s., iE = 64m.33s., eL?Z = 64·5m.
Boulder City iP = 63m.58s.
Palomar iP = 64m.10s.k.
Pasadena iP = 64m.11s.
Mount Wilson iPZ = 64m.12s.
Riverside iP = 64m.13s., iZ = 64m.22s.
Haiwee iPZ = 64m.18s., iZ = 64m.35s.
Shasta Dam iP = 64m.18s.
Pierce Ferry iP = 64m.31s.
Tucson iP = 64m.33s.
Grand Coulee eP = 64m.45s.
Collmberg eZ = 71m.24s., iZ = 71m.31s., i = 71m.40s. and 72m.19s., e = 73m.37s., i = 73m.42s.

March 29d. Readings also at 3h. (near La Paz), 4h. (Shasta Dam, Tucson, near Pierce Ferry, Fresno, and Boulder City), 10h. (Boulder City, Palomar, Tucson, and Bogota), 11h. (near Mizusawa), 12h. (Collmberg), 13h. (near Malaga), 15h. (near La Paz), 17h. (Fresno, Tucson, and Boulder City), 23h. (Almata, near Stalinabad, Tashkent, and Andijan).

March 30d. 4h. Undetermined shock.

Bucharest EN = 55m. and 65m.
Sofia ePEN = 55m.12s., eSEN = 56m.41s.
Zürich eP = 57m.7s., eS? = 59m.52s.
Basle eP = 57m.15s., e = 58m.18s.
Collmberg eZ = 57m.22s., i = 57m.36s., e = 58m.2s. and 64m.
Triest eP = 58m.26s., eS? = 59m.49s., eQ = 60m.49s.
Moscow eP = 58m.32s.

March 30d. 21h. Undetermined shock.

Fort de France P = 26m.57s., P_g = 27m.1s., iS_g = 27m.25s.
San Juan eP = 29m.21s., i = 29m.25s. and 29m.28s., iS = 30m.12s.
Bogota eP = 32m.14s., i = 32m.25s.
Tucson iP = 36m.38s.
Palomar iPZ = 37m.17s.
Pasadena iPZ = 37m.24s.
Tinemaha iPZ = 37m.33s.
Grand Coulee eP = 37m.42s.
Shasta Dam iP = 37m.50s.
Collmberg eZ = 39m.0s.
Long waves were recorded at Bermuda and Huancayo.

March 30d. Readings also at 4h. (Riverview and Ksara), 11h. (Palomar, Tucson, Riverview, and Wellington), 14h. (Collmberg and Riverview), 20h. (Boulder City and Tucson).

March 31d. 6h. 45m. 13s. Epicentre 7°·5N. 126°·7E. (as on 1944 March 5d.).

A = −·5926, B = +·7950, C = +·1297; δ = +2; h = +7;
D = +·802, E = +·598; G = −·078, H = +·104, K = −·992.

		Δ	Az.	P.	O − C.	S.	O − C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Mizusawa		34·1	19	e 6 47	− 1	12 30	+16	e 6 51	P	—
Vladivostok		35·8	6	—	—	i 13 5	+24	—	—	—
Calcutta	N.	39·7	297	e 8 57	PP	i 14 2	+22	—	—	—
Perth		40·6	194	i 7 52	+ 9	13 42	−12	i 17 22	SSS	—
Brisbane	N.	43·1	144	i 8 24	+20	e 14 31	+ 1	i 14 9	?	i 22·1
Colombo	E.	46·4	272	8 27	− 3	—	—	—	—	—
Riverview		47·2	152	i 8 51 a	+15	i 15 29	0	i 10 39	PP	e 21·4
Sydney		47·3	152	e 14 8	P_cS	—	—	—	—	e 21·1
Hyderabad	N.	48·0	287	e 8 15	−28	16 0	+19	10 27	PP	25·7
Kodaikanal		48·7	278	(e 8 47)	− 1	(15 47)	− 3	(10 37)	PP	(23·1)
Bombay		53·5	288	i 9 24	0	16 48	− 9	11 26	PP	—
Almata		56·2	319	e 9 43	− 1	—	—	—	—	—
Andijan		58·4	313	e 10 5	+ 5	—	—	—	—	—
Tashkent		60·8	313	10 15	− 1	i 18 28	− 5	—	—	—
Auckland		63·0	139	i 16 32?	?	20 40	S_cS	—	—	29·8
Wellington		65·5	142	13 32k	PP	22 17?	?	—	—	32·8
Christchurch		65·6	145	10 44	− 4	19 35	+ 2	23 37	SS	31·6
Sverdlovsk		70·8	328	i 11 17	− 3	i 20 24	−11	—	—	—
Baku		75·1	310	i 11 47	+ 1	i 21 19	− 5	—	—	—
Erevan		79·3	310	e 12 16	+ 7	—	—	—	—	—
Moscow		83·4	326	i 12 27	− 3	22 42	− 9	—	—	—
Ksara		86·6	303	e 12 48?	+ 2	e 23 2	[−10]	—	—	—
Upsala		93·0	332	—	—	e 24 15	− 6	—	—	e 44·8
Collmberg		98·6	325	e 13 47	+ 5	—	—	e 17 59	PP	—
Grand Coulee		100·3	38	i 14 3	+13	i 24 43	[+15]	i 18 4	PP	—

Continued on next page,

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Shasta Dam		100·6	47	e 14 5	+14	—	—	e 18 13	PP	—
Mount Wilson	z.	106·1	51	e 14 29	P	—	—	e 17 57	PKP	—
Pasadena	z.	106·1	51	i 18 1	[−24]	—	—	—	—	e 45·3
Riverside	z.	106·7	51	e 14 17	P	—	—	e 18 11	PKP	—
Palomar	z.	107·4	51	i 19 8	PP	—	—	—	—	—
Boulder City		107·9	49	e 17 41	?	—	—	—	—	—
Tucson		112·5	50	e 18 54	[+16]	e 29 33	PS	i 29 49	PPS	e 52·0
Granada		115·7	317	i 17 26	?	i 28 4	?	35 41	SS	63·6
Florissant		122·5	34	i 20 32	PP	e 30 28	PS	—	—	—
St. Louis		122·7	34	i 20 45	PP	e 30 24	PS	—	—	—
Seven Falls		123·4	14	—	—	e 30 23	PS	—	—	62·8
Pittsburgh	z.	126·3	25	i 19 18	[+13]	—	—	—	—	—
Bermuda		138·9	15	e 22 45	PP	—	—	e 46 25	SSS	e 70·8
Balboa Heights		149·1	58	e 19 47?	[+ 1]	—	—	—	—	—
San Juan		151·3	25	e 19 54	[+ 5]	—	—	e 33 56	?	e 74·8
Bogota		156·0	300	e 19 58	[+ 2]	—	—	e 20 13	PKP_2	—
Huancayo		157·8	103	e 20 21	PKP_2	—	—	e 34 53	?	e 74·7
La Paz		163·0	123	20 20	[+16]	—	—	21 20	PKP_2	79·8

Additional readings :—
Riverview i = 8m.58s., iSN = 15m.22s., iS_cSE = 28m.40s., iE = 18m.46s., iN = 18m.50s., iSSSE = 19m.24s.
Hyderabad P_cPN = 9m.20s., SSN = 19m.50s.
Kodaikanal SS = (18m.57s.), readings decreased by four minutes.
Bombay iE = 9m.36s. and 11m.36s., eN = 13m.2s., iN = 17m.17s. and 21m.2s., iE = 21m.8s.
Christchurch PEZ = 11m.3s., QEN = 26m.24s.
Collmberg eZ = 13m.53s.
Riverside eZ = 14m.39s.
Boulder City i = 29m.55s. and 30m.6s.
Bogota e = 24m.17s.
La Paz PP = 24m.28s.
Long waves were also recorded at Arapuni, Berkeley, Tananarive, and at other European stations.

March 31d. 18h. 50m. 48s. Epicentre 31°·0N. 114°·0W.

A = −·3493, B = −·7845, C = +·5125; δ = +11; h = +2;
D = −·914, E = +·407; G = −·208, H = −·468, K = −·859.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tucson		3·0	65	e 0 43	− 7	i 1 27	0	—	—	i 2·9
Palomar		3·4	314	i 0 55	0	i 1 50	S_g	—	—	—
Riverside		4·1	319	i 1 17	P*	i 2 18	S_g	—	—	—
Pasadena		4·7	313	e 1 14	0	i 2 28	S*	—	—	—
Boulder City		5·0	353	e 1 16	− 2	—	—	—	—	e 3·3
Fresno	N.	7·4	322	e 3 59	S_g	—	—	—	—	e 5·7
Berkeley		9·7	317	—	—	e 5 12	S_g	—	—	e 6·3
Logan		10·9	9	e 3 16	PPP	—	—	—	—	e 6·2

Tucson gives also i = 0m.57s.
Long waves were also recorded at other American stations.

March 31d. 19h. 27m. 39s. Epicentre 31°·0N. 114°·0W. (as at 18h.).

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tucson		3·0	65	i 0 44	− 6	i 1 29	+ 2	i 0 50	P*	i 3·2
La Jolla		3·3	305	e 0 56	+ 3	i 1 47	S_g	—	—	—
Palomar		3·4	314	i 0 51	− 4	i 1 44	+ 7	—	—	—
Riverside		4·1	319	e 1 2	− 3	i 2 10	S*	—	—	—
Pasadena		4·7	313	i 1 15	+ 1	i 2 27	S*	—	—	—
Boulder City		5·0	353	i 1 16	− 2	e 2 32	S*	i 1 47	P_g	—
Pierce Ferry		5·1	0	i 1 17	− 3	—	—	i 1 23	P*	—
Fresno	N.	7·4	322	e 2 31	P_g	e 3 59	S_g	—	—	e 4·6
Lick		8·9	317	—	—	e 4 35	S*	e 4 42	S_g	e 6·5
Berkeley		9·7	317	—	—	e 4 57	S*	e 5 3	S_g	e 6·2

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Logan	10·9	9	e 2 46	+ 6	e 5 33	SSS	—	—	e 6·4
Shasta Dam	11·8	328	e 6 19	SSS	—	—	—	—	e 6·9
Rapid City	15·6	30	e 3 43	0	—	—	—	—	8·4
Grand Coulee	17·3	349	e 5 11	+67	e 8 4	SSS	—	—	9·7

Long waves were also recorded at other American stations.

March 31d. 22h. 7m. 48s. Epicentre 14°·5N. 39°·5E.

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

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ksara		19·5	351	e 4 30	− 1	e 8 13	+ 7	—	—	—
Erevan		26·4	10	5 39	− 1	—	—	—	—	—
Baku		27·3	17	6 6	+18	10 27	+20	—	—	—
Sofia		31·4	337	e 6 24	− 1	e 11 30	− 2	e 7 32	PP	—
Bombay	N.	32·2	78	e 6 36	+ 4	e 11 47	+ 2	e 7 41	PP	—
Tashkent		37·2	39	i 7 16	+ 1	i 13 2	0	—	—	—
Kodaikanal		37·3	92	(e 7 7)	− 9	(e 13 7)	+ 3	(8 37)	PP	(19·0)
Hyderabad	N.	37·5	81	8 42	PP	13 45	+38	—	—	—
New Delhi	N.	37·6	62	e 7 18	0	13 14·	+ 6	15 50	SS	—
Triest		37·9	331	i 7 20	0	i 13 11	− 2	—	—	—
Andijan		38·7	42	e 7 28	+ 1	—	—	—	—	—
Colombo	E.	40·3	98	7 44	+ 4	—	—	—	—	—
Chur		40·8	329	e 7 44	− 1	—	—	—	—	—
Moscow		40·9	359	i 7 45	− 1	13 56	− 2	e 8 13	pP	—
Prague		40·9	336	—	—	e 13 54	− 4	—	—	—
Zürich		41·6	329	e 7 51	0	—	—	—	—	—
Cheb		41·8	335	e 8 12?	+19	e 14 12?	+ 1	—	—	e 25·2
Basle		42·3	329	e 7 56	− 1	—	—	—	—	—
Collmberg		42·5	337	e 7 56	− 3	—	—	e 9 35	PP	e 21·6
Tortosa	N.	42·8	316	e 8 28	+27	14 30	+ 4	—	—	e 23·2
Clermont-Ferrant		43·7	323	e 8 9	+ 1	—	—	—	—	—
Granada		44·4	310	i 8 13a	− 1	14 43	− 6	10 15	P_cP	24·5
Malaga	Z.	44·9	309	i 8 19k	+ 1	i 14 59	+ 3	i 8 37	pP	24·4
Sverdlovsk		45·2	17	i 8 18	− 2	i 14 53	− 8	—	—	—
Toledo	Z.	45·6	313	i 8 25	+ 1	—	—	—	—	—
Paris		45·7	327	e 8 12?	−12	—	—	—	—	e 26·2
Copenhagen		46·1	340	—	—	15 12	− 2	—	—	28·2
Calcutta	N.	46·8	73	e 8 45	+12	—	—	—	—	—
Upsala		48·1	345	—	—	—	—	e 19 12?	SS	e 27·2

Additional readings :—
Bombay eN = 13m.10s.
Kodaikanal readings increased by 14 minutes.
New Delhi iS = 12m.44s.
Granada S_cS = 18m.51s.
Malaga P_cPZ = 9m.53s., iSSZ = 18m.10s.
Long waves were also recorded at Barcelona, Kew, Potsdam, Riverview, Huancayo, and San Juan.

March 31d. Readings also at 6h. (Balboa Heights), 7h. (Pasadena, Mount Wilson, Riverside, Tucson, Palomar, and Haiwee), 9h. (Bogota and Balboa Heights), 10h. (Palomar, Riverside, Tucson, Mount Wilson, Pasadena, Tinemaha, Pittsburgh, Fordham, and Harvard), 12h. (Collmberg, Fresno, and near Lick), 13h. (Collmberg, Zürich, Basle, St. Louis, Boulder City, and Tucson), 15h. (near Collmberg), 21h. (Collmberg, Tananarive, Auckland, Christchurch, Wellington, Riverview, Sydney, and Brisbane), 22h. (Coimbra).

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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/

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