The International Seismological Summary.

1948 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 twelfth 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, British Association 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 longitudinal 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 :—

$$\cos\Delta = aA + bB + cC$$
$$2 - 2\cos\Delta = (a-A)^2 + (b-B)^2 + (c-C)^2$$
$$\sin Az. = -(aD + bE)\ \text{cosec.}\ \Delta$$
$$\cos Az. = -(aG + bH + cK)\ \text{cosec.}\ \Delta$$

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 1948 contains 137 epicentres, 98 of which are repetitions from previous epicentres.

Cases of abnormal depth are noted below :—

Jan.	4d.	8h.	20·5S.	179·0W.	0·080
	9d.	14h.	36·5N.	71·0E.	0·030
	15d.	5h.	Undetermined shock.		Suggested Deep.
	16d.	11h.	49·0N.	172·8E.	0·015
	20d.	9h.	33·9S.	177·8W.	Suggested Deep.
	20d.	20h.	20·4S.	177·8W.	0·060
	22d.	13h.	22·3S.	176·8W.	0·010
	27d.	11h.	20·2S.	178·2W.	0·080
	28d.	3h.	1·1N.	126·4E.	0·010
Feb.	4d.	4h.	23·8N.	94·8E.	0·005
	6d.	1h.	18·3N.	145·2E.	0·030
	6d.	6d.	37·8N.	141·4E.	0·010
	9d.	14h.	0·1N.	122·7E.	Suggested Deep.
	14d.	10h.	28·0S.	63·5W.	0·070
	15d.	15h.	18·7N.	145·4E.	0·030
	17d.	9h.	38·4S.	176·5E.	0·040

Mar.	3d.	2h.	Undetermined shock.	Suggested Deep.
	6d.	13h.	17·8S. 178·8W.	0·070
	8d.	2h.	22·5S. 66·0W.	0·030
	8d.	11h.	Undetermined shock.	Suggested Deep.
	11d.	13h.	6·7S. 153·0E.	Base of Superficial Layers.
	13d.	5h.	15·2S. 74·9W.	0·010
	13d.	20h.	1·5N. 126·5E.	0·010
	13d.	21h.	45·7N. 26·8E.	0·025
	14d.	21h.	17·0S. 75·0W.	Suggested Deep.
	15d.	2h.	32·0N. 138·6E.	0·050
	15d.	14h.	14·0S. 167·0E.	0·010
	18d.	23h.	20·5S. 179·0W.	0·080
	22d.	0h.	15·6S. 74·6W.	0·010
	23d.	18h.	50·8N. 154·2E.	0·015
	29d.	11h.	22·0S. 171·7E.	Suggested Deep.

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

KEW OBSERVATORY,
Richmond,
SURREY.

March, 1956.

1948 JANUARY, FEBRUARY, MARCH.

Jan. 1d. 20h. Undetermined shock.

Huancayo eP = 25m.47s., ePP = 27m.9s., eS = 31m.35s., e = 33m.11s., eL = 36m.4s.
La Paz iPZ = 26m.0s., iPPZ = 27m.34s., iP_eP = 27m.56s., iSE = 32m.19s., iSSN = 35m.36s., S_eS = 35m.0s., LZ = 37m. 36s.
Tucson eP = 29m.8s., epP = 31m.2s.
Palomar iPZ = 29m.19s., iZ = 29m.28s., eZ = 31m.18s., iZ = 31m.26s.
Riverside iPZ = 29m.22s., eZ = 31m.29s.
Pasadena iPNZ = 29m.23s., epP?Z = 31m.23s., eL?N = 54·3m.
Mount Wilson iPZ = 29m.25s., eZ = 31m.33s.
Boulder City iP = 29m.33s.
Pierce Ferry eP = 29m.33s.
Haiwee iPZ = 29m.36s., eZ = 31m.44s.
Tinemaha iPZ = 29m.42s., iZ = 29m.57s.
Shasta Dam eP = 30m.5s.
Hungry Horse eP = 30m.41s.
Antarctica e = 32m.26s., L = 37m.
Auckland e = 45m.?
Wellington e = 45m.?
Long waves were recorded at Ksara.

Jan. 1d. Readings also at 0h. (Ville Marie), 1h. (Arapuni), 2h. (Paris, Stuttgart, Manzanillo, Tacubaya, Mount Wilson, Riverside, Tinemaha, Tucson, and Shasta Dam; several shocks), 3h. (near Berkeley, Branner, Lick, and San Francisco), 6h. (Kew, Paris, De Bilt, Stuttgart, and Cheb), 7h. (near Branner), 11h. (Paris and Clermont-Ferrand), 12h. (near Stalinabad), 13h. (Berkeley, Pasadena, Palomar, Tinemaha, Tucson, and Manzanillo), 15h. (Pierce Ferry), 16h. (Stuttgart, Paris (2), Clermont-Ferrand, Pierce Ferry, and Tucson), 17h. (Paris, Cheb, Palomar, Tinemaha, and Shasta Dam), 18h. (Pasadena, Mount Wilson, Riverside, Tinemaha, Boulder City, Pierce Ferry, Shasta Dam, near College, near Temiskaming, Kirkland Lake, Ottawa, Seven Falls (2), and Shawinigan Falls, and near Mizusawa), 20h. (Pierce Ferry), 21h. (La Paz and near Tacubaya), 23h. (Tucson and near Tacubaya).

Jan. 2d. 3h. Undetermined shock.

Riverview P?NZ = 15m.39s., eS?E = 21m.52s.
Brisbane eEN = 21m.40s.
Bombay eN = 25m., eE = 37m.
Triest eP? = 25m.15s.
Ksara e = 26m.34s.
Boulder City eP = 26m.52s.
Antarctica e = 27m.5s., eL = 38m.5s.
Palomar ePZ = 27m.7s., eZ = 27m.18s.
Pasadena ePZ = 27m.9s., iNZ = 27m.23s.
Mount Wilson ePZ = 27m.13s., iZ = 27m.24s.
Riverside ePZ = 27m.18s.
Shasta Dam eP = 27m.19s.
Santa Barbara ePZ = 27m.20s.
Pierce Ferry eP = 27m.23s.
Tucson eP = 27m.23s., i = 27m.34s.
Haiwee iPZ = 27m.27s.
Tinemaha iPZ = 27m.28s.
Istanbul e = 40m.12s., eL? = 64m.
Long waves were also recorded at Huancayo, La Paz, Wellington, and Arapuni.

Jan. 2d. Readings also at 0h. (Stuttgart, Paris, Clermont-Ferrand, Cheb, Toledo, Mount Wilson, Palomar, Riverside, Tinemaha, Tucson, and Pierce Ferry), 1h. (Tacubaya), 2h. (Mount Wilson, Palomar, Tinemaha, Tucson, Boulder City, Hungry Horse, Pierce Ferry, Vera Cruz, Merida, Tacubaya (3), and near Istanbul), 3h. (Cheb and near Istanbul (2)), 4h. (near Murgab), 7h. (Murgab, Obi-garm, Stalinabad, Tchimkent, Tashkent, near Almata, Andijan, and Frunse), 8h. (near Bogota), 9h. (near Berkeley), 10h. (Tinemaha, Tucson, Hungry Horse, and Pierce Ferry). 11h. (Stuttgart, Paris, Clermont-Ferrand, Toledo, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Boulder City, Grand Coulee, Hungry Horse, Pierce Ferry, Vera Cruz, and Tacubaya (2)), 13h. (Palomar, Tucson, Hungry Horse, Fort de France, Vera Cruz, and Tacubaya), 15h. (Berkeley, Pasadena, Mount Wilson, Haiwee, La Jolla, Palomar (2), Riverside, Tinemaha, Tucson (2), Boulder City, Grand Coulee, Huancayo, Hungry Horse (2), Pierce Ferry, Vera Cruz, Tacubaya (2), La Paz, and near Alicante), 18h. (near Kulyab and near Murgab), 19h. (near Ashkabad), 22h. (near Mizusawa), 23h. (Shasta Dam).

Jan. 3d. Readings at 1h. (Haiwee, La Jolla, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Pierce Ferry, and Shasta Dam), 3h. (Boulder City and Pierce Ferry), 4h. (Stuttgart and near Tacubaya), 6h. (near Batavia), 7h. (Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Pierce Ferry, and Shasta Dam), 9h. (Kulyab and Pierce Ferry), 10h. (Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Pierce Ferry, Shasta Dam, Grand Coulee, and near Manzanillo), 12h. (Palomar, Riverside, Tinemaha, Tucson, Pierce Ferry, Shasta Dam, near Alicante (2), and near Andijan (2)), 16h. (Tinemaha, Tucson, and Pierce Ferry), 19h. (Pierce Ferry), 20h. (near Mizusawa), 21h. (Belgrade, Pierce Ferry, and near Mizusawa), 22h. (near Ottawa).

Jan. 4d. 8h. 56m. 36s. Epicentre 20°·5S. 179°·0W. Depth of focus 0·080.
(as on 1947, Dec. 2d.).

A = −·9373, B = −·0164, C = −·3481 ; $\delta = -3$; $h = +5$;
D = −·017, E = +·1000 ; G = +·348, H = +·006, K = −·937.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		9·6	47	i 2 15a	0	i 3 59	− 3	—	—	—
Auckland		17·2	197	3 29	− 2	i 6 21	0	—	—	—
Arapuni		18·1	195	3 30	− 9	5 54	−42	—	—	—
Tuai		18·6	190	3 42	− 2	i 6 32	−13	—	—	—
New Plymouth		19·5	195	3 55	+ 2	6 20	−40	—	—	—
Wellington		21·4	193	4 7	− 3	6 37	−54	14 16	S_cS	—
Kaimata		23·4	198	4 26	− 2	i 7 54	−10	—	—	e 10·9
Christchurch		24·0	195	4 32	− 2	e 8 10	− 3	14 26	ScS	—
Brisbane		26·4	250	i 4 59	+ 4	i 8 52	+ 1	i 6 17	pP	—
Riverview		29·6	237	i 5 25a	+ 2	i 9 39	− 2	i 6 57	pP	—
Honolulu		46·4	28	e 7 36	− 3	i 13 44	− 4	e 12 41	sPP	—
Batavia		73·1	269	i 11 35	+58	i 20 25	+64	i 13 25	pP	—
Vladivostok		77·7	326	i 11 5	+ 3	i 20 15	+ 5	i 13 12	pP	—
Santa Barbara		78·5	47	i 11 6a	0	i 20 20	+ 2	i 13 10	pP	—
Branner		78·6	43	i 11 7	0	i 20 20	+ 1	i 14 23	PP	—
San Francisco		78·6	43	e 11 8	+ 1	e 20 19	0	—	—	—
Santa Clara		78·7	43	e 13 38	PP	e 20 32	+12	—	—	—
Berkeley		78·8	43	i 11 7	− 1	i 20 22	+ 1	i 11 14	pP	—
Antarctica		78·9	158	e 11 5	− 3	i 20 16	− 6	i 13 8	pP	—
Ukiah		79·0	41	—	—	i 20 22	− 1	e 20 42	SKS	—
La Jolla		79·3	49	i 11 9a	− 1	i 20 27	+ 1	e 13 11	pP	—
Pasadena		79·4	47	i 11 10a	− 1	i 20 28	0	i 13 12	pP	—
Mount Wilson		79·5	47	i 11 10a	− 2	i 20 29	0	i 13 15	pP	—
Riverside		79·8	47	i 11 12a	− 1	i 20 32	0	i 13 15	pP	—
Palomar		79·8	49	i 11 13a	0	i 20 33	+ 1	i 13 16	pP	e 40·6
Shasta Dam		80·4	39	i 11 16	0	i 20 37	− 1	i 13 20	pP	—
Haiwee		80·6	46	e 11 18	+ 1	i 20 41	+ 1	—	—	—
Mineral		80·7	40	e 11 19	+ 1	e 20 40	− 1	e 13 32	pP	—
Tinemaha		80·9	48	i 11 18a	− 1	i 20 42	− 1	i 13 27	pP	—
Boulder City		82·7	47	i 11 27	− 1	e 20 57	− 3	i 13 33	pP	—
Pierce Ferry		83·3	47	i 11 30	− 1	—	—	i 13 36	pP	—
Tucson		83·6	52	i 11 32a	0	i 21 14	+ 5	i 13 35	pP	—
Victoria		84·7	33	—	—	i 20 50	−30	—	—	—
Sitka		85·9	22	—	—	e 21 24	− 7	—	—	—
Grand Coulee		86·7	35	i 11 46	− 1	e 21 16	[− 5]	e 13 53	pP	—
Logan		87·6	43	i 12 8	+16	i 21 47	0	i 13 59	pP	—
Tacubaya		87·6	68	e 11 52	0	i 21 49	+ 2	i 21 24	SKS	—
College		88·4	13	—	—	i 21 48	− 6	e 25 32	sS	—
Butte	N.	89·3	40	—	—	i 21 59	− 3	e 25 48	sS	—
Hungry Horse		89·7	37	i 12 1	0	e 22 6	0	i 14 10	pP	—
Bozeman		90·1	41	e 14 20	pP	i 22 10	+ 1	e 21 37	SKS	—
Vera Cruz	E.	90·2	70	e 18 51	?	—	—	—	—	—
Huancayo		98·2	106	e 12 40	0	i 22 57	−21	e 14 46	pP	—
Irkutsk		98·2	322	16 46	PP	i 22 21	[− 5]	e 24 54	SP	—
St. Louis		101·6	53	e 12 56	+ 1	i 23 49	+ 3	i 15 5	pP	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m. s.			m.
Colombo	E.	102·8	272	17 24	PP	22 44	[− 4]	—		—	35·2
La Paz		102·8	113	e 12 59	− 1	i 22 44	[− 4]	i 15 9		pP	48·2
Chicago		104·4	50	—	—	e 24 16	+ 6	i 22 50		SKS	—
Bogota	Z.	105·6	90	e 15 21	pP	e 23 49	SKKS	e 17 42		PP	—
Kŏdaikanal	E.	106·1	275	—	—	e 23 24?	[+22]	—		—	—
Hyderabad	N.	107·3	282	—	—	25 15	S	32 58		SS	—
Columbia		107·6	59	e 13 40	P	e 23 2	[− 7]	e 17 52		PP	e 51·6
Cleveland		108·7	51	e 17 50	PP	i 23 8	[− 5]	e 20 18		pPP	—
Kirkland Lake		110·9	44	e 17 30	[− 2]	—	—	—		—	—
Temiskaming		111·3	46	e 17 30	[− 2]	e 23 18	[− 6]	—		—	—
Bombay	E.	112·9	282	18 24	PP	i 23 24	[− 6]	20 54		PPP	—
Ottawa		113·5	48	i 17 33	[− 3]	(24 24?)	SKKS	—		—	24·4
Almata		113·8	309	e 18 43	PP	—	—	—		—	—
Frunse		115·5	308	e 18 55	PP	—	—	—		—	—
Murgab		115·6	303	e 17 41	[+ 1]	—	—	e 18 47?		PP	—
Andijan		117·0	305	e 17 43	[0]	23 43	[− 2]	e 19 7		PP	—
San Juan		117·1	79	i 19 1	PP	i 23 39	[− 7]	i 21 4		pPP	—
Obi-garm		118·9	303	e 17 52	[+ 5]	—	—	—		—	—
Tashkent		119·4	307	e 17 47	[− 1]	29 7	PS	i 19 22		PP	—
Stalinabad		119·6	304	i 17 47	[− 1]	—	—	—		—	—
Bermuda		120·8	63	—	—	e 24 12	[+14]	e 29 42		PS	—
Fort de France		120·8	84	e 17 50	[− 1]	e 25 22	SKKS	—		—	—
Sverdlovsk		123·5	326	17 53	[− 3]	i 24 3	[− 4]	i 19 45		PP	—
Moscow		135·5	331	i 18 16	[− 3]	30 45	SP	e 20 38		pPKP	—
Grozny		136·4	313	e 18 23	[+ 3]	—	—	e 20 56		PP	—
Helsinki		136·9	343	e 21 53	PKS	e 24 39	[0]	e 24 6		pPKS	—
Erevan		138·1	307	e 21 6?	PP	—	—	—		—	—
Leninakan		138·4	309	i 18 25	[+ 1]	—	—	21 17		PP	—
Sotchi	N.	140·4	316	i 18 32	[+ 5]	—	—	—		—	—
Theodosia	N.	142·4	319	e 18 29	[− 3]	—	—	—		—	—
Simferopol	N.	143·4	320	i 18 33	[− 1]	—	—	—		—	—
Yalta		143·6	319	i 18 34	[0]	—	—	—		—	—
Copenhagen		143·8	351	i 18 32k	[− 2]	25 0	[+10]	39 54		SS	—
Warsaw	E.	144·7	340	18 34	[− 2]	e 25 33	[+42]	e 21 32		PP	—
Ksara		146·4	301	i 18 37k	[− 1]	—	—	i 20 55		pPKP	—
Potsdam		146·8	347	i 18 44	[+ 5]	—	—	—		—	—
Raciborzu		147·5	340	e 18 36	[− 4]	e 22 15	PKS	e 21 0		pPKP	—
De Bilt		148·3	355	i 18 43a	[+ 2]	—	—	i 21 3		pPKP	—
Jena	N.	148·5	347	e 18 41	[0]	—	—	—		—	—
Istanbul		148·6	317	18 41	[0]	25 55	SKKS	—		—	—
Prague		148·6	343	e 18 43	[+ 2]	e 35 46	?	e 40 42		SS	—
Kew		149·1	1	i 18 41k	[− 1]	e 24 54?	[− 3]	i 21 4		pPKP	—
Belgrade		150·9	330	e 18 44a	[− 1]	e 22 34	PP	e 21 1		pPKP	—
Stuttgart		151·0	350	i 18 44k	[− 1]	e 41 9	SS	e 21 6		pPKP	—
Helwan		151·1	295	i 18 43a	[− 2]	31 34	SKSP	21 4		pPKP	—
Strasbourg		151·4	351	e 18 43	[− 2]	e 33 21	PS	e 21 3		pPKP	—
Paris		151·7	358	i 18 46	[0]	i 22 42	PP	i 21 10		pPKP	—
Basle		152·5	351	e 18 45	[− 2]	—	—	e 22 42		PP	—
Zürich		152·5	351	e 18 45k	[− 2]	e 22 41	PP	e 21 16		pPKP	—
Triest		152·8	342	e 18 51	[+ 4]	e 44 15	SSS	e 21 19		pPKP	—
Clermont-Ferrand		154·7	357	i 18 50	[0]	e 41 46	SS	i 21 10		pPKP	58·4
Rome		156·5	338	i 18 51	[− 1]	e 26 12	[+66]	e 23 13		PP	—
Lisbon		159·8	23	18 58k	[+ 2]	28 31	SKKS	21 13		SKP	—
Toledo		160·2	11	i 18 57	[0]	23 26	PP	21 43		pPKP	—
Alicante		162·2	4	18 54	[− 5]	28 58	SKKS	23 8		PP	e 73·8
Granada		162·9	13	i 18 51a	[− 8]	43 23	SS	i 23 39		PP	64·2
Malaga	Z.	163·1	16	i 19 0a	[0]	36 38	PPS	i 23 46		PP	76·6
Almeria		163·4	10	i 18 59	[− 1]	25 58	[+46]	23 34		PP	—

Additional readings :—
Auckland S? =5m.51s.
Tuai S? =5m.52s.
Kaimata S? =6m.59s.
Christchurch i =4m.36s. and 4m.57s., S? =7m.1s., i =8m.39s.

Continued on next page.

Brisbane iSE =7m.36s., iE =9m.7s. and 11m.37s.
Riverview iPcPEZ =8m.11s., iN =10m.3s., iE =12m.34s. and 13m.0s., isScSEN = 14m.55s., iN =19m.3s., iE =19m.7s.
Honolulu i =14m.26s.
Batavia eSSEN =25m.5s.
San Francisco eE =20m.40s.
Berkeley iN =20m.41s.
Antarctica e =32m.16s.
Ukiah eSP? =21m.44s.
La Jolla ePcPZ =11m.27s.
Pasadena ePcPZ =11m.30s., isPZ =14m.16s., isPNZ =21m.17s., ePKP,PKP =38m.4s.
Mount Wilson iPcPZ =11m.28s., isPZ =14m.16s., ePKP,PKPZ =38m.1s.
Riverside ePKP,PKPZ =38m.5s.
Palomar iPcPZ =11m.35s., ipPEN =13m.22s., isPNZ =14m.19s., isPE =14m.24s., iE =20m.49s., isPE =21m.14s.
Shasta Dam i =13m.34s.
Tinemaha iZ =12m.1s., isPZ =14m.20s., iPKP,PKPZ =38m.5s.
Boulder City ePKKP =29m.48s., ePKP,PKP =37m.54s., eSKP,PKP =40m.17s.
Pierce Ferry ePKKP =29m.45s.
Tucson isP =14m.40s., esPP =17m.42s., iSKS =21m.2s., iSP =22m.8s., esPS =25m.32s., iPKKP =29m.45s., iPKP,PKP =37m.56s., eSKP,PKP =40m.14s.
Victoria iE =24m.43s.
Grand Coulee esP =14m.55s.
Logan isP =14m.51s., iPP =15m.21s., iSKS =21m.20s., i =23m.26s., esPS =26m.26s., esSS =31m.20s.
Tacubaya iSPN =22m.57s.
College esSS =31m.26s.
Hungry Horse i =14m.41s., eSKS =21m.37s., eSP =23m.6s., iPKKP =29m.31s.
Bozeman eSP =23m.32s., esS =25m.45s., esPS =26m.48s.
Vera Cruz eN =18m.57s., eE =19m.48s., eN =20m.18s.
Huancayo ePP =16m.48s., epPP =18m.31s., eSKS =22m.9s., iSKKS =22m.24s., eSP =24m.40s., ePS =26m.6s., esS =27m.4s., eSS =30m.31s., eSSS =35m.19s.
St. Louis iPP =17m.11s., iSKS =22m.35s., isSKS =26m.20s., isS =27m.40s.
La Paz iPPZ =17m.22s., ipPPZ =19m.10s., iSKKS =24m.3s., iSP =25m.34s., ipSKS = 25m.48s., SS =31m.20s.
Chicago iS =24m.22s., eSKP =26m.0s., esS =28m.4s., eSSS =35m.47s.
Bogota eZ =16m.32s., epPPZ =19m.31s., ePSZ =25m.49s.
Hyderabad N =62m.6s.
Columbia eSKKS =23m.50s., ePS =27m.28s.
Cleveland iSKKSE =24m.5s., eSN =24m.52s., iE =26m.45s., and 27m.4s., isSKSE = 27m.54s., isSN =28m.47s., iE =30m.14s., iN =32m.44s.
Temiskaming eZ =18m.20s.
Bombay SKSE =24m.32s., SKKSE =25m.32s., PSE =27m.39s., PPSE =28m.24s., iE =30m.54s., SSE =33m.24s.
Andijan SP =28m.0s.
San Juan iSKKS =24m.51s., eS =25m.47s.
Tashkent eSP =28m.2s.
Bermuda eSKKS =25m.16s., esPS =32m.24s., eSS =35m.34s., esSS =38m.34s., eSSS =40m.44s.
Sverdlovsk PPP =22m.36s.
Moscow iPP =20m.55s., i =21m.50s., PPP =24m.3s., pSP =33m.7s.
Helsinki esPKS =25m.7s., e =36m.10s., 43m.39s., and 47m.15s.
Leninakan i =24m.9s.
Copenhagen 20m.50s., 21m.41s., 22m.36s., and 35m.35s.
Warsaw eE =22m.38s. and 23m.42s., ePPPE =25m.4s., ePKKPE =27m.33s., SKKSE = 28m.29s., PSE =32m.17s., eE =39m.44s., SSE =40m.40s.
De Bilt iZ =22m.4s.
Raciborzu iZ =18m.39s., iEN =18m.42s., eEN =19m.43s.
Jena eN =18m.45s. and 19m.4s.
Prague ePKP =20m.6s.
Kew iZ =18m.47s., iPKP$_2$?EZ =19m.2s., ipPKP$_2$?Z =21m.12s., eSKP?N =21m.46s., esPKPZ =22m.2s., esPKP$_2$?NZ =22m.19s.?, epPP?NZ =24m.40s., esPP?N = 25m.34s., ePPP?E =26m.9s.?, eSKKS?EZ =27m.42s., epPP?N =28m.0s., eSKSP?E =31m.16s.?, ePSKS?N =32m.14s.?, eSPP?E =34m.12s., epPS?Z = 34m.48s., ePSP?N =35m.40s.?, esSP? =36m.12s.?, eSS =40m.44s.?, esSSEN = 44m.14s.?, eSSSE =46m.39s.?
Belgrade i =19m.0s.
Stuttgart ePKPZ =18m.51s., iPKPZ =19m.3s.k, ePP =esPKP =22m.10s., eZ =24m.7s., ePPP?Z =25m.34s., ePSKS? =32m.24s., ePPS? =36m.6s.
Helwan PP =22m.42s., pPP =25m.12s., PSKS =32m.42s.
Strasbourg iPKP =18m.47s., iPKP$_2$ =19m.4s., i =20m.4s., e =22m.21s., ePP =22m.26s., iPP =22m.32s., e =23m.54s., esPP? =25m.34s., e =25m.44s., 29m.16s. and 43m.24s.
Paris i =18m.52s., ePKP$_2$? =19m.6s., i =21m.20s., ipPKP$_2$ =21m.34s., e =38m.24s.
Basle i =18m.56s.
Zürich i =18m.54s.
Triest ePKP$_2$ =20m.19s., epPKP$_2$ =22m.38s.
Clermont-Ferrand iPKP$_2$ =19m.20s., iSSS =48m.7s.

Continued on next page.

Lisbon PKP?NZ = 18m.38s., PKP_2Z = 19m.33s. and 19m.40s., PPNZ = 23m.12s. E = 28m.39s., PPSEN? = 36m.16s., iSSPE = 42m.45s.
Alicante PKP_2 = 19m.38s., PPP = 26m.54s., PPS = 36m.46s., SS = 41m.54s., SSS = 47m.56s., Q = 63m.56s.
Granada PKP_2 = 19m.45s., pPP = 25m.48s., PPS = 26m.54s.
Malaga iPKP_2Z = 19m.57s., PKKPZ = 26m.50s., P_cP,PKPZ = 27m.28s., QZ = 68m.16s.
Almeria PKP_2 = 19m.51s., PKS = 22m.33s., PPP = 27m.19s., PPS = 36m.57s., SS = 43m.50s., SSP = 44m.47s., SSS = 50m.3s.

Jan. 4d. Readings also at 0h. (Hungry Horse), 1h. (Pierce Ferry (2)), 2h. (Hungry Horse and Basle), 4h. (Stalinabad, Tchimkent, near Andijan, Kulyab, Murgab, and Obi-garm), 5h. (Paris, Stuttgart, Mount Wilson, Palomar, Tinemaha, Tucson, Shasta Dam, and near Apia), 6h. (Pierce Ferry and Theodosia), 10h. (Grozny), 11h. (near Andijan), 12h. (Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson (2), Boulder City, Pierce Ferry (2), Shasta Dam, Hungry Horse, La Paz, Paris, and Stuttgart), 13h. (Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson (2), Boulder City, Pierce Ferry, Shasta Dam, Grand Coulee, Hungry Horse, Paris, Clermont-Ferrand, Toledo, Kew, and near Stuttgart (2)). 14h. (near Ottawa), 15h. (Theodosia), 16h. (Tucson), 17h. (La Paz and Tucson), 18h. (Ksara, Tucson, and Pierce Ferry), 19h. and 21h. (Pierce Ferry), 23h. (near La Paz).

Jan. 5d. Readings at 0h. (near Kulyab, Obi-garm, and Stalinabad), 1h. (Pierce Ferry), 2h. (Palomar, Tinemaha, Shasta Dam, Tucson, and Pierce Ferry, 3h. (Brisbane, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Boulder City, Pierce Ferry, Shasta Dam, and Grand Coulee), 6h. (Andijan, near Kulyab, Mungab and Stalinabad), 7h. (Tucson, Shasta Dam, and Hungry Horse), 10h. (near Alicante and near Stalinabad), 11h. (Shasta Dam and near Hungry Horse), 12h. (Tacubaya, Vera Cruz, Tucson, Pierce Ferry, near Kulyab, Obi-garm, and Stalinabad), 17h. (Andijan, Samarkand, Tashkent, Tchimkent, Kulyab (2), near Murgab, Obi-garm, and Stalinabad), 18h. (Andijan, Tashkent, Tchimkent, near Kulyab, Murgab, Obi-garm, and Stalinabad), 19h. (Mount Wilson and Shasta Dam), 20h. (Shasta Dam), 21h. (near Kulyab), 23h. (Paris, De Bilt, Kew, La Paz, and near Mineral).

Jan. 6d. 17h. 23m. 15s. Epicentre 16°·0N. 98°·4W. (as on 1945, Nov. 26d.).

Felt very strongly in the states of Guerrero and Oaxaca ; intensity IV at Mexico City.
Epicentre 16°10′N, 98°00′W.
Monthly seismic bulletin, Tacubaya.

A = −·1405, B = −·9515, C = +·2739 ; δ = +11 ; h = +6 ;
D = −·989, E = +·146 ; G = −·040, H = −·271, K = −·962.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Oaxaca		1·9	57	0 37	+ 3	—	—	—	—	1·1
Puebla		3·0	4	0 47	− 3	—	—	—	—	1·5
Tacubaya		3·5	347	0 51	− 6	1 31	− 9	i 1 3	P*	1·6
Vera Cruz	E.	3·8	33	1 1	0	—	—	—	—	2·0
Manzanillo		6·4	299	1 29	− 9	—	—	i 1 45	P*	2·9
Guadalajara		6·6	315	1 34	− 7	2 50	− 8	—	—	3·1
Merida	z.	9·7	58	2 22	0	4 19	+ 4	—	—	—
Chihuahua	z.	14·4	332	3 24	− 3	6 12	+ 3	—	—	7·1
Balboa Heights		19·7	107	e 4 45	+11	—	—	—	—	—
Tucson		19·7	328	i 4 29a	− 5	i 8 12	+ 2	i 5 36	?	e 9·1
St. Louis		23·7	15	i 5 13	− 1	i 9 24	− 3	i 5 27	pP	—
Columbia		23·8	37	e 5 13	− 2	e 9 37	+ 9	e 7 25	?	e 14·3
La Jolla	z.	23·9	318	e 5 15a	− 1	—	—	—	—	—
Palomar		24·0	319	i 5 15a	− 2	—	—	—	—	13·0
Pierce Ferry		24·4	328	i 5 19	− 2	—	—	—	—	i 12·8
Boulder City		24·7	327	i 5 22	− 2	—	—	—	—	—
Riverside		24·8	320	e 5 23a	− 2	—	—	—	—	—
Mount Wilson	z.	25·3	320	i 5 28a	− 2	—	—	—	—	—
Pasadena		25·4	320	i 5 28a	− 3	e 9 59	+ 3	e 11 25	Q	13·6
Bogota	z.	26·4	112	i 5 54	+14	i 10 34	+22	i 6 30	PP	—
Santa Barbara	z.	26·5	318	i 5 40	− 1	—	—	—	—	—
Haiwee	z.	26·6	323	i 5 39a	− 3	—	—	—	—	—
Chicago		27·3	16	e 5 46	− 2	i 10 32	+ 5	—	—	e 13·3
Tinemaha		27·4	324	i 5 47	− 2	—	—	—	—	14·3
Fresno		28·0	322	e 5 51	− 4	i 10 57	+19	i 6 7	pP	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Logan		28·1	339	e 5 51	− 4	i 10 43	+ 3	e 6 52	PP	i 12·3
Rapid City	E.	28·3	353	i 5 58	+ 1	e 10 41	− 2	e 7 23	PPP	e 13·6
Cleveland		29·3	26	i 6 5a	− 1	i 11 5	+ 6	i 7 1	PP	—
Georgetown		29·5	35	i 6 8	0	i 11 11	+ 9	—	—	15·7
Lick		29·6	321	e 6 10	+ 1	e 11 2	− 2	—	—	—
Berkeley		30·3	321	i 6 14	− 1	i 11 12	− 3	i 7 6	PP	e 15·3
San Francisco		30·3	321	—	—	e 12 21	+66	—	—	—
Pennsylvania		30·4	31	i 7 53	?	i 13 4	?	—	—	—
San Juan		30·9	80	i 6 22	+ 2	i 11 37	+13	e 7 43	PPP	e 12·9
Philadelphia		31·3	37	e 6 22	− 2	i 11 38	+ 7	e 7 28	PP	i 13·1
Bozeman		31·4	344	e 6 23	− 2	e 11 37	+ 5	e 7 5	PP	e 14·1
Mineral		31·5	325	e 6 28	+ 2	e 11 31	− 3	e 6 36	P	e 15·1
Butte	N.	32·2	343	e 6 24	− 8	e 11 44	− 1	e 7 49	PP	e 14·1
Shasta Dam		32·2	325	e 6 27	− 5	—	—	—	—	—
Fordham		32·6	35	e 6 34	− 1	i 12 4	+13	i 7 49	PP	—
Temiskaming		34·5	24	e 6 51a	− 1	—	—	e 7 4	?	—
Bermuda		34·6	55	i 7 4	+11	e 11 55	−27	—	—	e 16·3
Hungry Horse		34·7	342	e 7 14	+20	e 12 26	+ 2	i 8 6	PP	i 18·9
Ottawa		35·0	28	6 54	− 2	12 20	− 8	—	—	15·2
Harvard		35·0	35	e 6 54	− 2	—	—	e 8 28	PPP	e 21·7
Weston		35·1	35	i 6 56	− 1	e 12 36	+ 6	15 1	SSS	—
Fort de France		35·9	87	e 6 48	−16	e 12 49	+ 7	e 8 32	PP	—
Huancayo		36·0	139	e 7 15	+10	e 12 58	+14	i 7 21	?	e 15·4
Grand Coulee		36·1	337	i 7 2	− 3	e 12 48	+ 3	—	—	—
Saskatoon		36·6	351	7 6	− 4	12 49	− 4	8 28	PP	20·7
Seattle		37·2	333	e 9 9	PPP	—	—	—	—	e 16·2
Shawinigan Falls		37·2	29	7 15	0	13 11	+ 9	15 42	SS	19·7
Victoria		38·4	333	7 9	−16	13 0	−20	8 45	PP	18·8
Seven Falls		38·5	30	7 23	− 3	13 25	+ 3	8 57	PP	19·7
Halifax		40·9	38	7 43	− 3	14 7	+ 9	9 19	PP	22·7
La Paz		44·0	135	i 8 20k	+ 9	i 14 57	+14	10 5	PP	22·0
Sitka		49·8	335	—	—	i 16 8	+ 2	e 20 3	SS	e 20·6
Ivigtut		57·5	26	i 9 55	+ 2	e 17 42	− 8	i 18 2	PS	29·2
College		59·0	338	e 10 5	+ 1	e 18 9	− 1	e 12 20	PP	e 27·6
La Plata	E.	63·6	142	10 33	− 2	20 15	+67	28 57	Q	33·3
	N.	63·6	142	10 51	+16	19 20	+12	23 33	SS	32·8
Scoresby Sund		70·5	20	11 18a	0	20 33	+ 1	—	—	36·7
Lisbon		79·6	52	12 9a	− 1	22 21	+ 9	14 46	PP	41·3
Jersey		82·1	40	e 12 5	−19	e 22 45	+ 7	—	—	43·7
Kew		82·6	38	i 12 26?a	0	e 22 52	+ 9	e 15 44?	PP	—
Toledo		83·2	50	e 12 32	+ 3	22 58	+ 9	—	—	—
Malaga	z.	83·7	54	i 12 34k	+ 2	i 22 58	+ 4	12 54	pP	40·3
Granada		84·2	53	i 12 41k	+ 7	i 23 6	+ 7	i 15 50	PP	i 38·4
Paris		85·1	41	i 12 41	+ 2	i 23 11	+ 3	e 15 50	PP	e 42·7
Almeria		85·2	53	i 12 44	+ 5	23 6	[+ 4]	16 4	PP	45·2
De Bilt		85·6	36	i 12 44a	+ 3	e 23 5	[0]	i 16 3	PP	e 41·8
Uccle		85·6	38	e 12 46	+ 5	e 23 17	+ 4	e 16 3	PP	e 40·8
Alicante		86·3	51	e 12 55	+10	i 23 23	+ 3	16 15	PP	e 41·7
Clermont-Ferrand		86·5	43	i 12 48	+ 2	i 23 28	+16	i 24 31	PS	44·7
Antarctica		87·0	168	i 13 2	+14	23 20	[+ 6]	e 16 27	PP	e 42·1
Barcelona		87·2	47	e 11 51	−58	e 22 17	[−58]	—	—	e 50·5
Copenhagen		88·2	32	e 12 56	+ 2	23 32	− 6	16 21	PP	—
Strasbourg		88·5	39	e 12 57	+ 1	i 23 41	0	i 16 18	PP	e 45·8
Basle		88·7	40	e 13 1	+ 4	e 21 46	?	—	—	—
Upsala		88·7	27	e 15 57	PP	e 23 28	[+ 3]	e 29 45?	SS	e 40·8
Stuttgart		89·2	39	e 12 59	0	e 23 37	{+ 1}	e 16 29	PP	e 45·7
Zürich		89·4	40	e 13 3	+ 3	—	—	—	—	—
Jena	E.	89·8	37	e 13 5	+ 3	—	—	—	—	—
Potsdam		90·0	34	i 13 5k	+ 2	i 23 41	{− 1}	i 16 35	PP	e 49·7
Cheb		90·6	37	e 13 8	+ 3	e 23 45	{− 1}	e 16 39	PP	e 52·7
Helsinki		91·6	24	e 16 47	PP	e 23 51	{− 2}	—	—	e 43·8

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Prague		91·8	36	e 13 10	− 1	e 23 51	{− 4}	e 16 50	PP	...
Triest		93·4	40	e 13 27	+ 9	i 24 3	{− 4}	e 17 9	PP	—
Rome		94·2	44	13 23	+ 1	i 24 11	{− 1}	e 14 37	pP	—
Warsaw		94·3	33	e 13 32	+ 9	24 12	{− 1}	17 18	PP	e 44·8
Arapuni		96·6	233	—	—	23 45	[−25]	e 30 51	SS	46·3
Wellington		98·0	230	—	—	24 22	[+ 5]	25 19	S	46·8
Moscow		99·5	24	e 13 45	− 1	24 37	[+12]	17 43	PP	—
Bucharest		101·5	37	—	—	e 24 49	[+15]	e 27 10	PS	50·8
Istanbul		105·3	38	e 14 13	0	—	—	e 27 4	PS	—
Sverdlovsk		105·4	12	e 14 13	0	i 24 51	[− 1]	i 18 28	PP	—
Helwan		112·5	47	19 32	PP	—	—	22 5	PPP	—
Brisbane		113·4	247	—	—	(e 26 42)	S	—	—	e 26·7
Ksara		114·0	41	e 19 34	PP	e 29 14	PS	—	—	—
Erevan		114·3	30	e 22 26	PKS	—	—	—	—	—
Riverview		115·6	239	—	—	e 25 38	[+ 4]	e 29 35	PS	e 53·6
Baku		116·6	27	e 20 14	PP	—	—	—	—	—
Tashkent		121·9	11	e 20 16	PP	26 1	[+ 5]	—	—	—
Andijan		122·9	8	e 19 20?	[+22]	—	—	—	—	—
Stalinabad		124·4	12	i 19 7	[+ 6]	i 30 48	PS	—	—	—
Murgab		125·4	8	e 21 2	PP	—	—	—	—	—
Calcutta	E.	141·2	349	e 19 24	[− 9]	26 50	[+ 9]	e 22 46	PP	—
Bombay	E.	144·3	14	19 53	[+15]	30 23	{+37}	26 38	PPP	71·8
Hyderabad	N.	146·6	5	19 44	[+ 2]	30 3	{+ 3}	33 21	SKSP	—
Kodaikanal	E.	152·7	9	—	—	26 5	[−52]	—	—	—
Colombo	E.	157·2	5	19 19	[−38]	—	—	—	—	83·2

Additional readings and note :—
Tacubaya PEN =0m.57s., iE =1m.0s., iN =1m.9s.
Pasadena iS =10m.9s.
Fresno eE =5m.55s., iPZ =6m.1s., iE =6m.16s., iP$_c$PE =9m.35s., iSE =11m.22s., iP$_c$SN =12m.38s., iE =14m.44s. and 14m.54s., iN =15m.56s., iS$_c$SE =16m.30s.
Cleveland iE =6m.9s., iPPPE =7m.6s., iEN =11m.26s., iZ =12m.15s.
Lick eN =14m.3s., eE =14m.27s.
Berkeley iP =6m.17s., eSE =11m.20s., iZ =11m.41s.
Pennsylvania ePPNE =10m.36s., iPPNE =11m.34s., iNE =11m.46s. ; readings wrongly identified.
Philadelphia iP =6m.26s.
Hungry Horse i =7m.43s., iPPP =8m.29s., i =9m.2s., iP$_c$P =9m.24s.
Saskatoon SSS =15m.28s.
Seven Falls e =11m.21s., SS =16m.17s.
Halifax SS =16m.45s.
La Paz SS =17m.23s., SSS =19m.3s.
College eSS =22m.5s.
La Plata E. SKKS =21m.47s., SS =23m.45s., SSS =26m.57s., N. SKS =20m.33s., SKKS? =21m.51s., Q =29m.9s.
Lisbon S?E =21m.58s.
Kew ePPP =17m.59s.?, eS$_c$S?N =23m.14s., ePS?Z =23m.52s., eSS?E =28m.4s., eSSS?N =31m.14s.?
Malaga PPZ =15m.48s., PPPZ =17m.54s., PSZ =23m.54s., SSZ =28m.36s.
Granada P$_c$P =12m.54s., PPP =17m.24s., PS =23m.57s., SS =29m.9s.
Paris e =14m.2s., iPP? =16m.9s., iS =23m.14s., e =23m.25s., eSS =29m.21s.?
Almeria PPP =18m.4s., iS =23m.20s., PPS =24m.48s., SS =29m.12s., SSS =32m.44s.
De Bilt ePS =24m.10s., eSS =28m.45s.
Uccle ePS? =23m.27s., eSSE =28m.57s.
Alicante P$_c$P =12m.59s., PP =16m.23s., PPP =18m.7s., S$_c$S =23m.27s., PS =24m.27s., PPS =24m.41s., SS =25m.52s., SS =29m.5s., PKKP =30m.57s., SSS =31m.53s., PKKS =33m.59s., Q =38m.7s.
Clermont-Ferrand iPPS =24m.50s.
Antarctica e =24m.52s. and 25m.47s., eSS =29m.35s.
Copenhagen SS =29m.39s.
Strasbourg e =14m.19s., 17m.15s. and 17m.35s., ePPP =18m.22s. and 18m.27s., e =19m.39s., i =21m.36s., iSKS =23m.27s., iPS =24m.58s., iSS =29m.42s., eSSS =32m.58s. and 33m.2s.
Upsala ePPE =16m.20s., eS?N =23m.34s., eE =26m.6s., eN =26m.20s., eSSN =29m.18s.
Stuttgart eZ =14m.23s., ePPP? =19m.1s., ePS =25m.0s., ePPS =25m.45s., eSS =29m.59s.
Potsdam iN =16m.14s.?, iPPE =16m.41s., iPPPZ =18m.34s., iSKKSNZ =23m.47s., iSEN =24m.1s., iPSZ =25m.1s., iPPSZ =25m.43s., iZ =27m.41s., iSSE =30m.1s.
Cheb ePPP? =18m.35s., e =21m.35s. and 22m.33s., ePS =25m.14s., e =26m.15s., eSS? =29m.13s., eSSS =33m.45s.?
Helsinki eSKS =23m.26s., e =24m.14s., ePS =25m.26s., e =26m.48s., 30m.45s., 32m.10s., and 34m.31s.

Continued on next page.

Prague ePPP =19m.21s., ePS =25m.21s., eSS =30m.21s., eSSS =34m.3s.
Triest iPS =25m.49s.
Rome e =16m.39s., iPP =17m.11s., eE =23m.23s., iSKSE =24m.3s., iSEN =24m.46s., iPS =25m.53s., SS =30m.59s.
Warsaw SE =24m.5s., PPSN =25m.55s., iE =26m.33s., eSSE =30m.38s., eN =33m.3s., eSS?E =33m.22s., eN =34m.20s., eE =24m.34s. and 38m.20s.
Moscow PPP =19m.55s., PS =26m.47s.
Sverdlovsk iPPP =20m.47s., iPS =27m.26s., iPPS =28m.37s.
Helwan i =19m.53s.
Riverview iE =25m.54s., eSKKSE =26m.51s., ePPSZ =30m.53s., eE =35m.14s.
Calcutta PKSE =23m.16s., PPPE =25m.53s., PKKPE =28m.42s., SKKSE =29m.18s., SKSPE =32m.25s., PS?E =32m.55s., PPSE =34m.10s., iSSE =40m.47s., SSPE =41m.17s., iSSSE =45m.54s.
Bombay PPE =20m.23s., PKKPE =28m.23s., SKKKSE =30m.53s., PKKSE =32m.8s., SKSPE =33m.53s., PPSE =36m.23s., iSSE =42m.23s., SSPE =42m.53s. SSSE =47m.53s.
Long waves were also recorded at Ferndale, Besançon, and Auckland.

Jan. 6d. 17h. 25m. 48s. Epicentre 16°·0N. 98°·4W. (as at 17h. 23m.).

		△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	Supp. m. s.		L. m.
Oaxaca	z.	1·9	57	—	—	i 1 0	+ 1	—	—	—
Guadalajara		6·6	315	—	—	i 3 3	+ 5	i 3 19	S*	—
Balboa Heights		19·7	107	e 4 44	+10	—	—	—	—	—
Tucson		19·7	328	i 4 30	− 4	—	—	—	—	—
Columbia		23·8	37	e 5 17	+ 2	i 9 47	+19	—	—	e 11·7
La Jolla	z.	23·9	318	e 5 14	− 2	—	—	—	—	—
Palomar	z.	24·0	319	i 5 13	− 4	—	—	—	—	—
Pierce Ferry		24·4	328	i 5 20	− 1	—	—	—	—	—
Boulder City		24·7	327	i 5 23	− 1	e 10 9	+25	—	—	—
Riverside	z.	24·8	320	i 5 23	− 2	—	—	—	—	—
Mount Wilson		25·3	320	i 5 29	− 1	—	—	—	—	—
Pasadena		25·4	320	i 5 28	− 3	—	—	—	—	—
Haiwee	z.	26·6	323	i 5 41	− 1	—	—	—	—	—
Chicago		27·3	16	i 5 44	− 4	e 10 27	0	—	—	i 15·6
Tinemaha	z.	27·4	324	i 5 47	− 2	—	—	—	—	—
Rapid City	E.	28·3	353	i 5 59	+ 2	e 10 27	−16	—	—	e 11·9
Cleveland	z.	29·3	26	i 6 6	0	—	—	—	—	—
Lick		29·6	321	e 6 14	+ 5	—	—	—	—	—
Berkeley	z.	30·3	321	i 6 16	+ 1	—	—	—	—	—
San Juan		30·9	80	i 7 50	PPP	—	—	—	—	—
Philadelphia		31·3	37	i 6 22	− 2	i 11 39	+ 8	i 7 47	PPP	i 13·6
Bozeman		31·4	344	e 6 34	+ 9	e 11 30	− 2	—	—	e 13·5
Butte	N.	32·2	343	—	—	e 11 31	−14	—	—	—
Shasta Dam		32·2	325	e 7 40	PP	—	—	—	—	e 14·6
Fordham		32·6	35	i 6 36	+ 1	i 12 3	+12	—	—	—
Ferndale		33·2	323	—	—	e 12 12	+12	—	—	—
Temiskaming		34·5	24	e 6 51	− 1	—	—	e 16 51	Q	18·2
Bermuda		34·6	55	i 6 57	+ 4	—	—	—	—	e 14·9
Hungry Horse		34·7	342	i 6 58	+ 4	—	—	—	—	—
Ottawa		35·0	28	e 6 56	0	—	—	—	—	—
Huancayo		36·0	139	e 7 18	+13	e 12 53	+ 9	—	—	e 15·3
Grand Coulee		36·1	337	i 7 2	− 3	—	—	—	—	—
Shawinigan Falls		37·2	29	e 7 13	− 2	—	—	—	—	—
Scoresby Sund		70·5	20	11 18	0	—	—	—	—	—
Paris		85·1	41	i 12 42	+ 3	e 23 24	+16	—	—	—
De Bilt		85·6	36	i 12 42	+ 1	e 23 17	+ 4	—	—	—
Copenhagen		88·2	32	12 57	+ 3	23 46	+ 8	—	—	—
Strasbourg		88·5	39	i 12 55	− 1	e 23 39	− 2	e 23 23	SKS	—
Stuttgart		89·2	39	e 12 58	− 1	—	—	—	—	—
Potsdam	z.	90·0	34	i 13 5k	+ 2	—	—	—	—	—
Helsinki		91·6	24	e 16 43	PP	e 23 23	[−19]	e 25 14	PS	—
Prague		91·8	36	e 16 51	PP	e 29 30	SS	e 33 12	SSS	e 43·2

Additional readings :—
Guadalajara iN =3m.11s.
Strasbourg ePP =16m.22s., iPP =16m.31s., eS =23m.47s., ePS =25m.9s., iSS =29m.45s.
Prague e =18m.51s.
Long waves were also recorded at Tacubaya, Honolulu, Logan, and Sitka.

Jan. 6d. 17h. 39m. 48s. Epicentre 16°·0N. 98°·4W. (as at 17h. 25m.).

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Oaxaca	Z.	1·9	57	0 42	P_g	—	—	—	—	1·2
Puebla	E.	3·0	4	0 52	+ 2	—	—	—	—	1·5
Vera Cruz		3·8	33	i 1 6	P*	—	—	—	—	—
Manzanillo		6·4	299	—	—	i 3 3	+10	i 3 12	S*	—
Gudalajara		6·6	315	1 39	− 2	—	—	—	—	3·1
Tucson		19·7	328	i 4 32	− 2	i 8 41	SS	—	—	i 10·2
La Jolla	Z.	23·9	318	i 5 16	0	—	—	—	—	—
Palomar		24·0	319	i 5 17	0	—	—	—	—	—
Pierce Ferry		24·4	328	i 5 21	0	—	—	—	—	—
Boulder City		24·7	327	i 5 23	− 1	—	—	—	—	i 13·1
Riverside	Z.	24·8	320	i 5 25	0	—	—	—	—	—
Mount Wilson	Z.	25·3	320	i 5 30	0	—	—	—	—	—
Santa Barbara	Z.	26·5	318	i 5 43	+ 2	—	—	—	—	—
Haiwee	Z.	26·6	323	i 5 41	− 1	—	—	—	—	—
Tinemaha	Z.	27·4	324	i 5 48	− 1	—	—	—	—	—
Hungry Horse		34·7	342	e 6 52	− 2	—	—	—	—	—

Jan. 6d. 17h. 59m. 59s. Epicentre 16°·0N. 98°·4W. (as at 17h. 39m.).

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Oaxaca	Z.	1·9	57	0 48	P_g	—	—	—	—	1·3
Puebla	E.	3·0	4	1 3	P_g	—	—	—	—	1·6
Tacubaya		3·5	347	1 1	+ 4	—	—	i 1 7	P_g	1·7
Vera Cruz		3·8	33	1 7	P*	—	—	—	—	2·1
Manzanillo		6·4	299	1 40	+ 2	i 2 38	−15	—	—	3·1
Guadalajara		6·6	315	1 40	− 1	i 2 36	−22	—	—	3·2
Merida	Z.	9·7	58	e 3 32	?	i 4 23	+ 8	—	—	—
Balboa Heights		19·7	107	e 4 50	PP	—	—	—	—	—
Tucson		19·7	328	i 4 32	− 2	e 8 11	+ 1	—	—	e 9·3
La Jolla	Z.	23·9	318	i 5 17	+ 1	—	—	—	—	—
Palomar		24·0	319	i 5 17	0	—	—	—	—	—
Pierce Ferry		24·4	328	i 4 20	−61	—	—	i 5 56	PP	e 12·8
Boulder City		24·7	327	i 5 46	PP	—	—	—	—	e 12·7
Riverside	Z.	24·8	320	i 5 24	− 1	—	—	—	—	13·4
Mount Wilson	Z.	25·3	320	i 5 29	− 1	—	—	—	—	—
Pasadena		25·4	320	i 5 29	− 2	i 10 13	+17	—	—	13·6
Santa Barbara	Z.	26·5	318	e 5 40	− 1	—	—	—	—	—
Haiwee	Z.	26·6	323	i 5 41	− 1	—	—	—	—	—
Tinemaha	Z.	27·4	324	i 5 47	− 2	—	—	—	—	14·4
Fresno		28·0	322	i 5 54	− 1	—	—	e 9 14	P_cP	i 14·6
Logan		28·1	339	e 5 52	− 3	—	—	—	—	e 11·9
Rapid City	E.	28·3	353	e 5 59	+ 2	e 11 2	+19	—	—	i 14·9
Cleveland	Z.	29·3	26	i 6 5	− 1	i 12 14	SS	—	—	—
Shasta Dam		32·2	325	e 6 31	− 1	—	—	—	—	—
Temiskaming		34·5	24	e 6 53	+ 1	—	—	—	—	—
Hungry Horse		34·7	342	e 6 51	− 3	—	—	—	—	—
Grand Coulee		36·1	337	e 7 3	− 2	e 10 47	−118	—	—	—
Toledo		83·2	50	e 12 33	+ 4	—	—	—	—	—
Paris		85·1	41	i 12 43	+ 4	—	—	—	—	—
Stuttgart	Z.	89·2	39	e 13 1	+ 2	—	—	—	—	—

Additional readings :—
Tucson i = 6m.7s. and 7m.10s.
Fresno iZ = 6m.11s., iN = 6m.14s., eP_cPE = 9m.36s., eE = 11m.16s.
Long waves were also recorded at Chihuahua, Bozeman, and Strasbourg.

Jan. 6d. Readings also at 1h. (Alicante, Paris, and Grand Coulee), 2h. (near Erevan and Leninakan), 3h. (Lick and Shasta Dam), 4h. (near Malaga (2)), 7h. (Kulyab, near Andijan, Tchimkent, and Frunse), 8h. (Paris), 9h. (La Paz, Vera Cruz, Bogota, Tacubaya, Pasadena, Mount Wilson, Palomar, Riverside, Tinemaha, Tucson, Boulder City, Grand Coulee, Huancayo, Hungry Horse (2), Pierce Ferry, Shasta Dam, Temiskaming, and Kirkland Lake), 12h. (Toledo, near Granada, Malaga (2), Almeria, and Alicante), 13h. (Brisbane and Granada), 14h. (Auckland, Wellington, Paris, Pasadena, Mount Wilson, Palomar, Riverside, Tinemaha, Tucson, Boulder City, Hungry Horse, Pierce Ferry, and Shasta Dam), 15h. (Tucson), 17h. (Puebla and near Tacubaya (2)), 18h. (Tacubaya, Puebla, and Shasta Dam), 19h. (Tucson, near Vera Cruz, and Tacubaya (3)), 20h. (Paris, Clermont-Ferrand, Pierce Ferry, Temiskaming, near Ottawa, Seven Falls, and Shawinigan Falls), 21h. (near Tacubaya (3)), 22h. (Mount Wilson, Palomar, Tinemaha, Tucson, Grand Coulee, Pierce Ferry, Stuttgart, Paris, and near Obi-garm), 23h. (Pierce Ferry and Barcelona).

Jan. 7d. Readings at 0h. (near Istanbul), 4h. (near Tacubaya), 5h. (near Fort de France, Balboa Heights, Tacubaya, and Bogota (2)), 6h. (near Tacubaya (3)), 7h. (near Tacubaya (2)), 10h. (Hungry Horse, La Paz, and near Mizusawa), 13h. (near Kulyab), 14h. (near Mizusawa and near Tacubaya), 15h. (near Grozny), 16h. (Kew, near Obi-garm, Murgab, Stalinabad, and Andijan), 18h. (Batavia and Hungry Horse), 19h. (near Kulyab), 20h. (near Ottawa), 21h. (Pasadena, Palomar, Riverside, Tinemaha, Tucson, Pierce Ferry, and Shasta Dam).

Jan. 8d. 23h. 33m. 23s. Epicentre 16°·0N. 98°·4W. (as on 6d.).

$A = -\cdot1405$. $B = -\cdot9515$, $C = +\cdot2739$; $\delta = +11$; $h = +6$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Puebla	E.	3·0	4	0 58	P_g	—	—	—	—	1·6
Tacubaya		3·5	347	1 4	P*	—	—	—	—	1·8
Vera Cruz		3·8	33	1 14	P_g	2 4	S_g	—	—	2·2
Tucson		19·7	328	e 4 31	− 3	e 10 12	?	e 4 49	PP	e 12·1
Palomar		24·0	319	e 5 17	0	—	—	i 5 24	P	—
Pierce Ferry		24·4	328	e 5 21	0	—	—	—	—	—
Boulder City		24·7	327	e 4 54	−30	—	—	—	—	—
Riverside	Z.	24·8	320	e 5 25	0	—	—	—	—	—
Pasadena	Z.	25·4	320	e 5 31	0	—	—	—	—	—
Haiwee	Z.	26·6	323	e 5 43	+ 1	—	—	—	—	—
Tinemaha		27·4	324	e 5 48	− 1	—	—	—	—	—

Jan. 8d. Readings also at 0h. (Hungry Horse), 1h. (Pierce Ferry, Toledo, and near Almeria, Granada, and Malaga), 2h. (near Tacubaya), 3h. (Balboa Heights), 4h. (Batavia, Brisbane, Riverview, Wellington, Palomar, Pasadena, Riverside, Tinemaha, Shasta Dam, and near Tchimkent), 5h. (near Tacubaya (2)), 6h. (La Paz), 7h. (near Tacubaya (2)), 8h. (Bogota, Hungry Horse, Pierce Ferry, Tucson, Pasadena, Riverside, Tinemaha, and near Port au Prince), 9h. (near Tchimkent), 10h. (Temiskaming), 12h. (Palomar, Pasadena, Pierce Ferry, Shasta Dam, Tucson, Huancayo, near Tacubaya, Ksara, Andijan, Samarkand, near Kulyab, Obi-garm, and Stalinabad), 13h. (La Paz, Hungry Horse, Tinemaha, near Tacubaya, Erevan, Samarkand, and near Leninakan, Kulyab, Andijan, Obi-garm, and Stalinabad), 14h. (Palomar, Pasadena, Riverside, Tinemaha, Pierce Ferry, Shasta Dam, Tucson (2), near Tacubaya, La Paz, and near Tchimkent), 16h. (near La Paz), 18h. (Andijan, Samarkand, near Kulyab, Murgab, Obi-garm, and Stalinabad), 19h. (Haiwee, Pasadena, Riverside, Tinemaha, Pierce Ferry, Tucson, Sverdlovsk, and near Batavia), 21h. (near Tchimkent and near Mineral), 23h. (Hungry Horse, Tucson, Pierce Ferry, Puebla, and near Tacubaya).

Jan. 9d. 2h. 6m. 22s. Epicentre 15°·5S. 173°·0W. (as on 1947, December 31d.).

$A = -\cdot9569$, $B = -\cdot1175$, $C = -\cdot2656$; $\delta = +1$; $h = +6$;
$D = -\cdot122$, $E = +\cdot993$; $G = +\cdot264$, $H = +\cdot032$, $K = -\cdot964$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		2·1	35	e 1 1?	S	(e 1 1)	− 3	—	—	—
Santa Barbara	Z.	70·9	45	i 11 36	+15	—	—	—	—	—
Pasadena	Z.	71·8	46	i 11 26	0	—	—	i 11 41	pP	—
Fresno	Z.	72·2	43	i 11 30	+ 1	—	—	i 11 45	pP	—
Palomar		72·3	47	i 11 30	+ 1	—	—	i 11 44	pP	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Riverside	z.	72·3	46	i 11 29	0	—	—	i 11 44	pP	—
Shasta Dam		73·0	38	e 11 34	+ 1	—	—	—	—	—
Haiwee	z.	73·1	44	i 11 34a	0	—	—	i 11 49	pP	—
Tinemaha	z.	73·4	43	i 11 36a	0	—	—	i 11 51	pP	—
Boulder City		75·1	45	e 11 45	− 1	—	—	—	—	—
Pierce Ferry		75·7	46	i 11 49	0	—	—	—	—	—
Tucson		76·1	51	i 11 51	0	—	—	i 12 6	pP	—
Grand Coulee		79·4	34	e 12 9	0	—	—	—	—	—
Stuttgart		145·5	357	e 19 40	[0]	—	—	—	—	—

Additional readings :—
Apia eSEN = 1m.44s., S_cS?E = 17m.53s.
Palomar iZ = 11m.59s.
Tinemaha iZ = 11m.57s.

Jan. 9d. 9h. 0m. 5s. Epicentre 11°·4S. 75°·4W.

A = +·2472, B = −·9489, C = −·1964 ; δ = +9 ; h = +7 ;
D = −·968, E = −·252 ; G = −·050, H = +·190, K = −·981.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Huancayo		0·7	174	i 0 22	+ 5	i 0 37	+ 9	—	—	i 0·9
La Paz		8·7	126	i 2 19	+ 9	i 4 18	S*	i 4 55	S_g	i 5·4
Bogota	z.	16·0	5	i 3 43	− 5	i 7 34	SSS	i 4 18	PPP	—
St. Louis		51·7	344	e 9 11	0	—	—	—	—	—
Tucson		55·1	323	e 9 34	− 2	—	—	—	—	—
Palomar	z.	59·5	320	i 10 9	+ 2	—	—	i 10 52	pP	—
Pierce Ferry		59·6	324	i 10 8	0	—	—	—	—	—
Riverside	z.	60·2	320	i 10 13	+ 1	—	—	e 10 58	pP	—
Pasadena	z.	60·8	320	i 10 17	+ 1	—	—	i 10 59	pP	—
Haiwee	z.	62·0	321	e 10 25	+ 1	—	—	—	—	—
Tinemaha	z.	62·8	322	i 10 30	0	—	—	—	—	—
Hungry Horse		68·6	333	e 10 35	−32	—	—	—	—	—
Grand Coulee		70·6	330	e 11 18	− 1	—	—	—	—	—
Toledo		83·3	47	e 12 25	− 5	—	—	—	—	—

Bogota also gives iZ = 3m.50s., iPPPZ = 4m.33s., iSZ = 8m.18s., iSSZ = 8m.35s., iSSS?Z = 8m.49s., iZ = 9m.23s.

Jan. 9d. 14h. 52m. 27s. Epicentre 36°·5N. 71°·0E. Depth of focus 0·030.
(as on 1947, December 20d.).

A = +·2623, B = +·7619, C = +·5922 ; δ = −1 ; h = 0 ;
D = +·946, E = −·326 ; G = +·193, H = +·560, K = −·806.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Kulyab		1·7	325	i 0 37	− 1	i 1 5	− 2	—	—	—
Stalinabad		2·7	319	i 0 47	− 1	i 1 19	− 6	—	—	—
Andijan		4·4	15	1 8	0	2 1	0	—	—	—
Samarkand		4·5	317	i 1 1	− 8	i 1 43	−20	—	—	—
Frunse		7·0	23	i 1 42	+ 1	i 3 1	+ 1	—	—	—
Almata		8·2	33	i 1 58	+ 1	i 3 32	+ 4	—	—	—
Ashkabad		10·2	282	2 20	− 2	i 3 57	−17	—	—	—
Baku		17·0	291	e 3 57	+11	—	—	—	—	—
Bombay		17·6	176	i 3 58	+ 6	7 5	+ 6	7 27	SS	7·8
Hyderabad	N.	20·1	159	4 19	+ 1	7 59	+13	—	—	—
Grozny		20·5	298	e 4 27?	+ 5	8 3	+10	—	—	—
Calcutta	E.	20·5	129	e 4 36	+14	(8 10)	+17	e 5 51	?	8·2
Erevan		21·1	288	e 4 56?	+28	—	—	—	—	—
Sverdlovsk		21·5	345	i 4 32	0	i 8 20	+ 9	—	—	—
Kodaikanal	E.	26·8	168	—	—	e 9 53	+14	11 15	SS	12·4

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Irkutsk		28·2	45	e 5 39	+ 5	e 10 20	+18	e 6 32	pP	—
Ksara		29·4	275	e 6 23	+38	e 11 48	+87	—	—	—
Moscow		29·7	322	5 47	0	e 10 24	− 1	e 6 39	pP	—
Copenhagen		43·4	317	7 43	+ 1	—	—	—	—	—
Stuttgart	z.	45·9	306	e 8 2	0	—	—	e 13 7	?	—
Toledo		57·4	298	i 9 28	+ 1	—	—	—	—	—
Hungry Horse		95·4	4	e 13 2	+ 2	—	—	—	—	—
Tinemaha	z.	106·3	8	e 18 14	PP	—	—	i 18 25	PP	—
Pasadena	z.	109·2	8	e 18 16	PP	—	—	i 18 37	PP	—
Riverside	z.	109·4	8	i 18 45	PP	—	—	—	—	—
Palomar	z.	110·1	7	e 18 25	[+21]	—	—	e 18 35	PP	—

Additional readings :—
Kodaikanal QE = 10m.53s., SSSE = 11m.38s.
Irkutsk sS = 11m.51s.
Moscow sS = 11m.53s.

Jan. 9d. 22h. Undetermined shock. U.S.S.R. suggest depth of 60kms.

Vladivostok eS = 24m.15s.?
Andijan eP = 25m.8s., S = 33m.9s.
Obi-garm eP = 25m.20s., eS = 33m.37s.
Stalinabad iP = 25m.22s., epP = 25m.39s., eS = 33m.43s.
Sverdlovsk iP = 25m.42s., S = 34m.21s.
Grand Coulee eP = 26m.24s.
Shasta Dam iP = 26m.27s.
Mineral ePEN = 26m.32s.
Branner eE = 26m.34s.
Santa Barbara iPZ = 26m.47s.k.
Tinemaha iPZ = 26m.49s., iZ = 27m.24s.
Haiwee iPZ = 26m.52s., iZ = 27m.31s.
Pasadena iPEZ = 26m.53s.
Mount Wilson ePN = 26m.54s.
Riverside iP = 26m.56s.k.
Palomar iP = 26m.59s.
Boulder City iP = 27m.3s.
Tucson iP = 27m.24s.k, i = 27m.40s., ePP = 31m.9s.
Fresno iPZ = 27m.43s.
La Paz P = 34m.1s.

Jan. 9d. Readings also at 0h. (near Stalinabad, Kulyab, Andijan, Obi-garm, and near Mineral). 2h. (Basle), 3h. (near Kulyab, Obi-garm, Samarkand, and Stalinabad), 4h. (near Tacubaya, Kulyab, Stalinabad, near Andijan, Frunse, and Obi-garm), 5h. (Palomar, Tinemaha, Tucson, Bogota, La Paz (2), Arapuni, Wellington, Ksara, Istanbul, and near Helwan), 6h. (near Bogota), 8h. (Palomar, Tinemaha, Pierce Ferry, Tucson, and near Apia), 9h. (Huancayo and Temiskaming), 12h. (Fresno), 13h. (near Batavia), 14h. (Auckland, Ashkabad, near Samarkand, Obi-garm (2), Stalinabad (2), and Kulyab), 15h. (Ksara and near Tashkent), 16h. (La Paz (2), Lick, near Fresno and Branner), 17h. (near Andijan, Obi-garm, Stalinabad, and Tashkent), 18h. (Bombay, Calcutta, Hyderabad, Kodaikanal, Colombo, Ksara, Baku, Sverdlovsk, Tashkent, Stalinabad, and near Tacubaya), 19h. (near Berkeley and Branner), 20h. (Tucson, Pierce Ferry (2), Paris, and near Kulyab), 21h. (Obi-garm, Stalinabad, near Andijan, Mineral, and near Fresno (2), San Francisco (2), Lick (2), Berkeley, and Branner (2)), 23h. (Pierce Ferry, Fresno, Berkeley, near San Francisco, Lick (2), and Branner (2)).

Jan. 10d. 0h. 45m. 51s. Epicentre 41°·8N. 126°·8W. (as on 1945, September 28d.).
$A = -·4479$, $B = -·5987$, $C = +·6641$; $\delta = +8$; $h = -2$;
$D = -·801$, $E = +·599$; $G = -·398$, $H = -·532$, $K = -·748$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ferndale	E.	2·3	123	e 0 44	+ 4	i 1 4	− 5	—	—	—
Shasta Dam		3·5	107	i 0 53	− 4	i 1 29	−11	—	—	—
Ukiah		3·8	133	—	—	e 1 32	−15	—	—	e 2·2
Mineral		4·2	108	i 1 5	− 2	i 1 50	− 7	i 1 13	P*	e 3·8
San Francisco		5·2	138	e 1 25	+ 4	i 2 26	+ 4	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Berkeley		5·2	137	e 1 20	− 1	i 2 17	− 5	—	—	—
Branner		5·6	139	e 1 27	0	e 2 27	− 6	—	—	—
Lick		6·0	136	e 1 33	+ 1	i 2 39	− 4	—	—	—
Fresno		7·4	131	i 1 54	+ 2	i 3 14	− 4	i 2 33	P_g	—
Tinemaha		8·1	122	i 2 6	+ 4	i 3 46	+11	i 2 25	P*	—
Grand Coulee		8·3	39	e 2 0	− 4	e 3 30	−10	—	—	i 4·2
Haiwee	Z.	8·9	127	e 2 11	− 1	e 4 16	+21	—	—	—
Pasadena		10·2	136	e 2 32	+ 1	—	—	—	—	e 5·6
Riverside	Z.	10·8	133	i 2 39	0	e 4 38	− 4	—	—	—
Boulder City		11·0	118	e 2 14	−28	—	—	—	—	—
Butte	N.	11·1	63	—	—	e 5 32	S*	—	—	—
Hungry Horse		11·2	50	e 2 38	− 6	—	—	—	—	—
Salt Lake City		11·3	90	—	—	e 6 14	S_g	—	—	e 6·8
Palomar	Z.	11·5	134	e 2 48	0	—	—	—	—	—
Pierce Ferry		11·5	115	e 2 47	− 1	—	—	—	—	—
Bozeman		12·0	66	—	—	e 6 2	+51	—	—	e 6·6
Tucson		15·9	122	i 3 49	+ 2	e 7 5	+21	—	—	—
Rapid City	E.	17·4	75	e 4 2	− 4	—	—	—	—	e 10·7

Additional readings :—
Shasta Dam i = 1m.33s.
Mineral iN = 1m.41s. and 1m.48s.
San Francisco iE = 2m.30s., eN = 5m.19s.
Branner iN = 2m.34s.
Lick iE = 1m.36s., eN = 2m.35s.
Fresno iZ = 1m.57s. and 2m.58s., iSE = 3m.19s.
Tucson i = 3m.55s.
Long waves were also recorded at Seattle and Cleveland.

Jan. 10d. 5h. 14m. 54s. Epicentre 20°·5S. 174°·0E. (as on 1946, March 20d.).

$A = -·9323$, $B = +·0980$, $C = -·3481$; $\delta = -4$; $h = +5$;
$D = +·105$, $E = +·995$; $G = +·346$, $H = -·036$, $K = -·937$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m.	s.	m.
Apia		15·1	66	e 3 29	− 7	e 7 23	+58	—	—	e 12·1
Auckland		16·3	178	3 50	− 2	7 14	+21	—	—	—
Arapuni		17·6	175	—	—	7 30	+ 7	—	—	—
New Plymouth		18·5	180	4 23	+ 4	7 54	+10	—	—	—
Tuai		18·5	172	4 20	+ 1	7 52	+ 8	—	—	—
Brisbane	N.	20·4	246	i 4 42	+ 1	i 8 20	− 5	i 5 3	PP	—
Wellington		20·7	180	4 45	+ 1	8 46	+15	—	—	10·1
Kaimata		22·1	184	5 4	+ 5	9 4	+ 6	—	—	—
Riverview		24·2	232	i 5 19	0	e 9 27	− 8	i 5 28	pP	e 11·2
Perth		52·9	245	—	—	i 20 41	SS	i 25 11	Q	i 28·4
Batavia		66·5	272	i 10 56	+ 2	i 19 48	+ 4	i 11 38	P_cP	—
Vladivostok		74·2	329	e 11 36	− 4	i 21 17	+ 3	—	—	—
Antarctica		81·2	160	12 17	− 2	i 22 30	+ 1	e 23 14	PS	e 38·1
Berkeley		83·4	46	—	—	i 22 48	− 3	i 23 54	PS	e 36·4
Santa Barbara	Z.	83·4	50	e 12 33	+ 3	—	—	—	—	—
Pasadena		84·3	51	i 12 34	− 1	e 23 48	PS	—	—	e 34·4
Mount Wilson	N.	84·4	51	e 12 34	− 2	—	—	—	—	—
Fresno	Z.	84·5	48	i 12 33	− 3	—	—	—	—	—
Riverside	Z.	84·8	51	i 12 36	− 1	—	—	—	—	—
Shasta Dam		84·8	43	e 12 35	− 2	—	—	—	—	—
Palomar		84·9	52	i 12 36	− 2	—	—	—	—	—
Mineral	N.	85·1	44	e 12 42	+ 3	—	—	—	—	—
Haiwee	Z.	85·4	49	i 12 37	− 3	—	—	—	—	—
Tinemaha	Z.	85·7	48	e 12 40	− 2	—	—	—	—	—
Boulder City		87·6	50	e 12 48	− 3	—	—	—	—	—
Pierce Ferry		88·3	50	e 12 51	− 4	—	—	—	—	—
Sitka		88·5	25	—	—	e 23 37	− 4	e 29 17	SS	e 36·3
Victoria		88·5	37	—	—	e 23 6	[−18]	—	—	36·1
Tucson		88·9	55	e 12 55	− 3	e 23 49	+ 5	e 29 50	SS	—
Salt Lake City		91·8	47	—	—	e 23 59	−12	e 25 14	PS	e 37·8

Continued on next page,

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Hungry Horse		93·8	39	e 12 47	−33	—	—	—	—	—
Irkutsk		94·3	324	e 16 59	PP	25 48	PS	—	—	—
Bozeman		94·5	43	—	—	e 25 47	PS	e 31 25	SS	e 40·4
Kodaikanal	E.	99·6	278	—	—	e 24 36	[+11]	—	—	—
Hyderabad	N.	101·0	285	e 14 56	+63	25 33	+ 4	32 40	SS	—
Huancayo		104·6	109	e 17 48	PKP	e 26 15	+16	e 27 36	PS	e 43·4
Bombay		106·5	284	e 19 45	PP	(26 24)	+ 9	47 6?	Q	53·1
St. Louis		106·9	55	—	—	e 24 56	[− 3]	e 33 6	SS	—
La Paz		108·8	117	e 18 19	[−12]	25 13	[+ 6]	i 19 22	PP	45·3
Chicago		109·5	51	—	—	e 29 45	PS	—	—	e 45·1
Bogota	Z.	112·1	94	e 19 26	PP	—	—	—	—	—
Cleveland	E.	113·9	53	—	—	e 29 15	PS	e 34 42	SS	52·3
Stalinabad		114·1	305	i 19 30	PP	—	—	i 30 22	PPS	—
Tashkent		114·1	307	e 19 36	PP	e 29 17	PS	i 35 30	SS	—
Sverdlovsk		119·7	324	e 20 37	PP	36 54	SS	—	—	—
Bermuda		126·7	64	—	—	e 25 41	[−30]	e 31 16	PS	e 58·8
Grozny		131·4	310	e 22 36	PKS	—	—	—	—	—
Leninakan		133·3	307	e 19 39	[+21]	—	—	—	—	—
Upsala	E.	137·2	343	—	—	e 45 6?	SSS	—	—	e 61·1
Ksara		140·7	298	e 19 58?	[+26]	—	—	e 23 28	PKS	—
Warsaw		142·0	333	e 19 45	[+11]	e 26 19	[−23]	e 22 49	PP	e 71·1
Copenhagen		142·2	343	—	—	e 46 48	SSS	—	—	—
Istanbul		143·9	312	e 19 6?	[−31]	—	—	—	—	—
Potsdam		144·9	340	i 19 39	[0]	—	—	e 47 30	SSS	65·1
Helwan		145·1	293	i 19 38a	[− 1]	—	—	22 50	PP	—
Kew		148·8	353	—	—	e 26 48?	[− 4]	e 41 33?	SS	—
Stuttgart		149·3	340	e 19 50	[+ 4]	e 48 26	SSS	e 27 24	PPP	78·1
Strasbourg		149·9	341	e 21 41	?	e 42 56	SS	e 23 25	PP	e 69·1
Triest		150·1	331	e 19 19	[−29]	e 26 16	[−38]	e 22 30	PP	—
Zürich		150·7	340	e 19 52	[+ 4]	—	—	—	—	—
Basle		150·9	340	e 19 56	[+ 7]	e 30 32	?	—	—	—
Paris		150·9	348	e 19 55	[+ 6]	—	—	—	—	e 72·1
Rome		153·6	328	e 19 43	[−10]	e 26 44	[−14]	i 23 16	PP	e 76·2
Toledo		160·6	354	e 20 47	[+46]	—	—	—	—	—
Granada		163·2	353	20 5	[+ 1]	—	—	51 27	SSS	85·6
Almeria		163·4	348	e 19 36	[−28]	26 36	[−31]	24 8	PP	77·1
Malaga	Z.	163·8	354	i 20 33k	[+28]	—	—	47 54	SS	76·6

Additional readings :—
New Plymouth i = 5m.2s.
Brisbane iPN = 4m.45s., iSS?N = 9m.1s.
Riverview iPP = 5m.52s., eN = 9m.36s., isSE = 9m.41s., iSSN = 10m.8s., iSSSE = 10m.30s., iN = 10m.35s., iEN = 10m.58s.
Batavia PPEN = 13m.3s., iSKSEN = 20m.41s., iSSEN = 23m.35s.
Fresno eE = 12m.37s. and 13m.11s., iZ = 13m.39s.
Palomar iNZ = 12m.41s., iZ = 12m.48s.
Mineral eN = 13m.27s.
Tinemaha iZ = 12m.49s.
Tucson iP = 13m.1s., eSSS? = 33m.21s.
Salt Lake City eSS = 30m.22s. eSSS = 34m.9s.
Huancayo eSS = 33m.20s.
Bombay SKSE = 30m.31s., SE = 31m.59s., SSE = 38m.31s., phases wrongly identified. S is given as PPPE.
St. Louis eSS = 37m.57s.
La Paz SKKS = 26m.47s., PS = 28m.22s., iSSN = 34m.21s.
Bermuda eSS = 37m.36s.
Upsala eN = 48m.6s.?
Warsaw eZ = 21m.5s., eN = 21m.15s., eZ = 23m.53s., eE = 24m.19s., eN = 24m.22s., eZ = 25m.11s., eN = 25m.22s., eE = 27m.20s., eN = 27m.31s., eNZ = 29m.31s.
Potsdam iZ = 20m.18s. and 21m.6s.
Kew eZ = 31m.48s.?, eE = 36m.38s.?, e = 47m.8s.?
Stuttgart ePKPZ = 19m.53s., eZ = 21m.6s., eQ? = 74·1m.
Strasbourg e = 51m.46s.
Triest ePPP = 25m.43s., ePPS = 35m.43s., eSS = 41m.42s.
Paris e = 20m.42s.
Rome ePKP?Z = 18m.15s., eSKP?Z = 22m.0s., ePPZ = 22m.56s., eE = 26m.9s., eSSE = 43m.21s., eSSS?N = 50m.10s.?
Almeria PKP_2 = 20m.26s., PKS = 23m.4s., PPP = 27m.52s., PPS = 37m.28s., SS = 44m.16s.
Malaga iPKP_2Z = 22m.28s., PPZ = 26m.10s., PPPZ = 30m.56s.
Long waves were also recorded at Tananarive, Honolulu, and other American and European stations.

Jan. 10d. Readings also at 0h. (Erevan, Sotchi, near Grozny, and Leninakan), 2h. (Pierce Ferry and Tucson), 4h. (Pierce Ferry, Grozny, and near Leninakan), 7h. (Pierce Ferry, Frunse, Murgab, Obi-garm, and Stalinabad), 9h. (Palomar, Riverside, Tinemaha, Tucson, Boulder City, and Pierce Ferry), 12h. (Pierce Ferry), 14h. (Pierce Ferry, Tucson, and Tacubaya), 16h. (Kaimata, Christchurch, Tuai, Wellington, Almata, Frunse, near Murgab, Obi-garm, Samarkand, Stalinabad, and Tashkent), 17h. (Ashkabad), 18h. (Antarctica), 20h. (Fresno), 22h. (Fresno, Tucson, Pierce Ferry, Hungry Horse, and near Mizusawa), 23h. (Pierce Ferry).

Jan. 11d. 5h. 37m. 27s. Epicentre 36°·5N. 121°·5W. (as on 1940, Sept. 7d.).

$A = -\cdot4210$, $B = -\cdot6871$, $C = +\cdot5922$; $\delta = +5$; $h = 0$;
$D = -\cdot853$, $E = +\cdot522$; $G = -\cdot309$, $H = -\cdot505$, $K = -\cdot806$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
	°	°	m. s.	s.	m. s.	s.	m. s.	
Lick	0·9	352	i 0 19	− 1	i 0 30	− 4	i 1 22	P_g
Fresno	1·4	80	i 0 26	− 1	i 0 42	− 4	—	—
Berkeley	1·5	336	i 0 28	0	i 0 50	+ 1	—	—
San Francisco	1·5	329	i 0 28	0	i 0 51	+ 2	—	—
Boulder City	5·4	94	e 1 31	P*	—	—	—	—
Pierce Ferry	6·1	91	e 1 34	0	—	—	—	—
Tucson	9·8	113	e 2 27	+ 3	—	—	e 5 25	S_g

Additional readings :—
Fresno iZ = 1m.46s., iN = 2m.8s.
Berkeley iS_gN = 55s.
San Francisco iE = 42s., iN = 53s.

Jan. 11d. Readings also at 1h. (Alicante, Pierce Ferry, and Sverdlovsk), 3h. (near Leninakan), 4h. (Tucson, near Tacubaya, and Manzanillo), 6h. (Samarkand, near Kulyab, Murgab, Obi-garm, and Stalinabad), 7h. (near Bogota and near Mineral), 8h. (Tucson, Tinemaha, Pierce Ferry, Bogota, Huancayo, and La Paz), 9h. (Pierce Ferry, near Berkeley, Lick, Fresno, and San Francisco), 10h. (Apia, Ksara, and Warsaw), 11h. (near Lick), 12h. (near Bogota), 14h. (near Alicante), 15h. (Tinemaha, Tucson, and near Ashkabad (2)), 16h. (Brisbane, Riverview, Auckland, and Batavia), 17h. (Antarctica and near Hungry Horse), 18h. (Stalinabad, near Murgab and Obi-garm), 21h. (Belgrade, Triest, and Hungry Horse), 22h. (Tashkent, Tchimkent, near Andijan, Murgab, Obi-garm, Samarkand, and Stalinabad).

Jan. 12d. 10h. 16m. 28s. Epicentre 3°·5S. 152°·5E.

$A = -\cdot8854$, $B = +\cdot4609$, $C = -\cdot0606$; $\delta = +3$; $h = +7$;
$D = +\cdot462$, $E = +\cdot887$; $G = +\cdot054$, $H = -\cdot028$, $K = -\cdot998$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane		23·9	178	i 5 16	0	e 9 35	+ 5	i 5 42	PP	i 12·9
Riverview		30·2	182	e 6 19	+ 5	e 11 5	− 8	i 7 13	PP	e 15·1
Batavia		45·6	264	i 14 24	S	(i 14 24)	−42	—	—	(i 23·2)
Vladivostok		50·0	340	e 8 57	− 1	e 16 1	− 8	—	—	—
Murgab		83·2	309	i 12 30	+ 1	—	—	—	—	—
Andijan		84·8	311	e 12 43	+ 6	—	—	—	—	—
Tchimkent		87·1	312	i 12 48	− 1	—	—	—	—	—
Tashkent		87·2	311	e 12 49	0	e 23 27	− 1	—	—	—
Stalinabad		87·3	309	i 12 48	− 2	—	—	—	—	—
Shasta Dam		88·5	49	e 13 7	+11	—	—	—	—	—
Pasadena	z.	91·4	56	i 13 21	+12	—	—	—	—	—
Tinemaha	z.	91·5	53	i 13 22	+12	—	—	—	—	—
Riverside	z.	91·8	56	i 13 24	+13	—	—	—	—	—
La Jolla	z.	92·1	57	e 13 25	+13	—	—	—	—	—
Palomar	z.	92·4	57	i 13 26	+12	—	—	—	—	—
Hungry Horse		94·9	42	e 13 34	+ 9	—	—	—	—	—
Pierce Ferry		94·9	54	i 13 38	+13	—	—	—	—	—
Tucson		97·5	58	e 14 22	+45	—	—	e 17 56	PP	—
Ksara		113·9	306	—	—	e 25 48	[+20]	—	—	—

Additional readings :—
Brisbane iSEN = 9m.42s., iSSEN = 10m.14s.
Riverview iPP?N = 7m.16s.
Batavia gives S and L as P and S respectively.
Long waves were also recorded at Arapuni, Wellington, Auckland, and Lick.

Jan. 12d. Readings also at 1h. (Antarctica), 2h. (Hungry Horse), 3h. (Boulder City and Pierce Ferry), 4h. (La Paz, Bogota, La Jolla, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Pierce Ferry, and Shasta Dam), 5h. (Hungry Horse), 8h. (La Paz, Toledo, near Almeria, Granada, Malaga, and near Istanbul), 10h. (Pierce Ferry), 12h. (La Paz), 14h. (near Murgab), 17h. (Pierce Ferry and near Boulder City), 18h. (Pierce Ferry, near Hungry Horse and near Mizusawa), 20h. (near Murgab, Obi-garm, Stalinabad, and near Alicante).

Jan. 13d. 17h. 14m. 58s. Epicentre 35°·9N. 140°·3E. (as on 1944, June 16d.).

Intensity V at Kakioka and Tukubasan; IV at Tokyo, Mito, Onahama, and Utunomiya; II-III at Kumagaya, Maebasi, and Hukusima. Epicentre 35°·8N. 140°·4E. Shallow.

Seismo. Bull. Cent. Met. Obs., Japan, 1948. Tokyo, 1950, p.5 with chart of intensities.

$A = -·6241$, $B = +·5181$, $C = +·5850$; $\delta = +15$, $h = 0$;
$D = +·639$, $E = +·769$; $G = -·450$, $H = +·374$, $K = -·811$.

		Δ	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Kakioka		0·3	344	0 11k	0	0 18	0
Tukubasan		0·3	333	0 11	0	—	—
Mito		0·4	16	0 12	− 1	0 19	− 2
Tokyo		0·5	245	0 4	−10	0 12	−11
Utunomiya		0·6	332	0 16k	+ 1	0 26	0
Kumagaya		0·8	289	0 17k	− 1	0 28	− 3
Maebasi		1·1	297	0 24	+ 2	0 37	− 2
Mera		1·1	201	0 21	− 1	0 38	− 1
Onahama		1·1	25	0 35a	+13	0 54	+15
Hunatu		1·4	252	0 28	+ 1	0 49	+ 3
Misima		1·4	235	0 29	+ 2	—	—
Osima		1·4	213	0 26	− 1	0 42	− 4
Shizuoka		1·8	239	0 39k	+ 7	1 3	+ 7
Hukusima		1·9	4	0 30k	− 4	1 4	+ 5
Sendai		2·4	11	0 38	− 3	1 15	+ 3
Aikawa		2·6	322	0 36	− 8	—	—
Toyama		2·6	287	0 48	+ 4	1 44	S_g
Nagoya		2·8	255	0 52	+ 5	1 36	S_g
Gihu		3·0	260	0 57	P_g	1 45	S_g
Wazima		3·1	299	0 53	P*	1 41	S_g
Kameyama		3·2	251	1 7	P_g	1 53	S_g
Mizusawa		3·2	12	0 54	+ 2	1 48	S_g
Hikone		3·4	259	0 43	−12	1 33	− 4
Akita		3·7	357	1 6	+ 6	2 11	S_g
Morioka		3·8	11	1 0	− 1	1 51	+ 4
Kyoto		3·9	256	1 8	P*	1 55	+ 5
Miyako		3·9	20	0 57	− 5	1 45	− 5
Owase		3·9	241	1 18	P_g	2 13	S_g
Osaka		4·2	253	1 26	P_g	2 18	S_g
Kobe		4·4	255	1 32	P_g	2 29	S_g
Toyooka		4·5	266	1 22	P*	—	—
Sumoto		4·7	252	1 26	P*	2 21	S*
Tinemaha	Z.	77·1	55	i 11 54	− 3	—	—
Pasadena	Z.	78·9	56	e 12 2	− 5	—	—
Pierce Ferry		80·5	52	i 12 12	− 3	—	—
Tucson		84·9	54	e 12 34a	− 4	—	—

Tucson gives also e = 12m.44s.

Jan. 13d. 17h. Undetermined shock. Tonga.

Apia iP = 23m.56s., iS = 24m.20s.
Auckland P = 29m.30s., pP? = 29m.49s., S = 33m.46s., i = 34m.29s., L = 35m.
Riverview iPZ = 30m.28s.a, ePPP = 32m.9s., iN = 32m.47s., eSE = 36m.2s., iE = 36m.26s., eQ = 39m.0s., eRZ = 41·2m.
Arapuni e = 32m.48s., L = 35m.
Berkeley iPZ = 34m.38s., iSN = 43m.56s., iSE = 44m.0s., eLE = 55·9m.
Mount Wilson ePN = 34m.39s.
La Jolla ePZ = 34m.40s.
Pasadena iPZ = 34m.40s.k, iZ = 35m.0s., eZ = 35m.20s. and 38m.0s.
Riverside iPZ = 34m.44s.k, iZ = 35m.3s.
Fresno iPZ = 34m.45s., iZ = 35m.4s., iN = 35m.17s., iZ = 35m.27s.
Shasta Dam eP = 34m.48s.
Haiwee iPZ = 34m.48s.k, iZ = 34m.58s. and 35m.9s.
Tinemaha ePZ = 34m.50s.k, iZ = 35m.17s. and 35m.33s.
Boulder City iP = 35m.1s.
Pierce Ferry, iP = 35m.4s.
Tucson iP = 35m.6s.k, ePP = 38m.44s., eL = 58m.0s.
Grand Coulee iP = 35m.25s., i = 35m.34s.
Hungry Horse eP = 35m.37s., i = 36m.39s.
Brisbane eEN = 35m.40s.
Rapid City eP? = 36m.30s., eL = 66m.58s.
Istanbul P = 42m.10s.?, S_g = 43m.2s.?
Stuttgart eZ = 43m.0s.
Strasbourg ePKP = 43m.2s. and 43m.5s., e? = 43m.27s., e = 45m.12s.
Zürich ePKP = 43m.4s., e = 52m.54s.
Clermont-Ferrand ePKP = 43m.8s.
Ksara ePKP = 43m.8s., ePP = 46m.53s.?
Toledo e = 43m.16s., i = 43m.53s.
Basle ePKP = 43m.33s., e = 52m.23s.
Triest eP? = 43m.50s.
Bozeman eS = 46m.23s., eL = 62m.8s.
Long waves were also recorded at Wellington, College, Rome, Paris, and Malaga.

Jan. 13d. Readings also at 0h. (Pierce Ferry and Stuttgart), 1h. (Samarkand, near Murgab, Obi-garm, and Stalinabad), 2h. (Boulder City and Pierce Ferry (2)), 3h. (Samarkand, near Murgab, Obi-garm, Stalinabad, and near Batavia), 4h. (near Mineral and near Andijan), 5h. (Alicante, Toledo, near Almeria, and Malaga), 6h. (near Granada, near Grand Coulee, and Hungry Horse), 7h. (near Andijan), 9h. (Auckland), 10h. (Brisbane, Pasadena, Riverside, and Tucson), 11h. (Ksara), 14h. (Tucson, Granada, Toledo, Belgrade, Bucharest (2), Warsaw (2), Ksara (2) and near Istanbul (2)), 15h. (near Istanbul), 19h. (Huancayo), 20h. (Frunse, near Andijan, Murgab, Obi-garm, Samarkand, Stalinabad, Tashkent, and Tchimkent), 21h. (Pasadena, Tucson, Tinemaha, Pierce Ferry, Shasta Dam, Hungry Horse, and near Mineral).

Jan. 14d. 2h. 25m. 28s. Epicentre 9°·7S. 108°·9W.

A = −·3193, B = −·9328, C = −·1674; δ = +9; h = +7;
D = −·946, E = +·324; G = +·054, H = +·158, K = −·986.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Manzanillo		28·9	8	—	—	e 12 4	SS	—	—	e 13·7
Tacubaya		30·4	19	e 6 28	+12	e 11 33	+17	e 13 2	SS	e 14·9
Vera Cruz		31·4	24	—	—	i 13 38	SS	i 13 50	SSS	i 15·6
Huancayo		33·0	97	e 6 42	+ 3	e 11 33	−24	e 7 50	PP	e 13·5
Bogota		37·5	68	e 7 14	− 3	e 13 2	− 5	—	—	—
La Paz		40·2	103	i 7 44k	+ 4	i 13 52	+ 4	i 9 18	PP	19·7
Tucson		41·7	357	e 7 53	+ 1	e 14 19	+ 9	e 9 28	PP	e 17·0
Palomar	z.	43·5	351	e 7 58	− 9	—	—	i 8 6	P	—
Riverside	z.	44·2	349	e 8 10	− 2	—	—	i 8 23	P	—
Pasadena		44·5	349	i 8 13	− 2	i 14 54	+ 3	i 8 30	?	i 18·3
Haiwee	z.	46·4	350	e 8 29	− 1	—	—	e 8 38	?	—
Fresno		47·3	348	e 8 49	+12	—	—	—	—	e 23·9
Tinemaha	z.	47·4	350	e 8 36	− 2	—	—	—	—	—
Santa Clara	z.	48·4	346	e 8 48	+ 2	—	—	—	—	—
Berkeley		49·0	346	i 8 54	+ 4	i 16 0	+ 5	i 16 4	PS	e 21·5
Denver		49·4	4	—	—	—	—	21 29	Q	23·1
Salt Lake City		50·3	357	—	—	e 16 11	− 2	—	—	e 20·3
San Juan		50·6	56	—	—	i 15 59	−18	—	—	e 20·8
Columbia		50·9	30	—	—	e 16 8	−13	e 20 6	SS	e 24·6
St. Louis		51·1	18	i 9 3	− 3	i 16 21	− 3	i 11 3	PP	e 22·8

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Mineral	N.	51·2	348	e 9 28	+21	—	—	—	—	e 22·4
Logan		51·3	357	e 9 3	− 5	e 16 21	− 5	e 11 3	PP	e 20·6
Shasta Dam		51·7	347	e 9 8	− 3	—	—	—	—	—
La Plata	E.	52·7	126	8 43	−35	16 49	+ 3	9 18	P	25·9
Rapid City	E.	53·8	6	e 9 34	+ 8	17 1	0	e 20 35	SS	e 23·7
Butte	N.	55·6	357	—	—	e 18 3	+38	—	—	e 28·5
Cleveland	E.	56·8	25	e 9 49	+ 1	e 17 48	+ 7	e 21 36	SS	e 26·4
Honolulu		57·1	303	—	—	e 18 6	+21	—	—	e 25·7
Hungry Horse		58·0	356	i 9 24	−33	—	—	—	—	—
Grand Coulee		58·1	352	e 9 55	− 3	—	—	—	—	—
Philadelphia		58·5	30	—	—	e 17 56	− 7	e 21 53	SS	e 29·8
Bermuda		59·4	43	e 10 4	− 2	i 18 10	− 5	e 13 47	PPP	e 24·4
Victoria		59·4	349	—	—	e 18 18	+ 3	—	—	24·5
Ottawa		62·4	26	10 32	+ 5	18 48	− 5	22 56	SS	30·5
Kirkland Lake		63·0	21	e 10 32	+ 1	—	—	—	—	—
Antarctica		64·6	164	—	—	i 19 40	+19	e 23 20	SS	e 30·3
College		79·8	344	e 12 32	+20	—	—	—	—	e 36·8
Brisbane	E.	92·6	242	—	—	e 24 47	+29	e 25 52	?	—
Triest		119·5	43	e 30 1	PS	—	—	—	—	—
Rome	N.	119·6	47	—	—	e 36 31	SS	—	—	e 59·3
Ksara		139·8	48	e 19 43?	[+13]	—	—	e 22 49?	PP	—
Batavia	E.	141·1	248	i 16 50	?	—	—	—	—	—
Bombay	E.	170·7	350	e 36 7	SKSP	—	—	—	—	—

Additional readings :—
Tacubaya ePE = 6m.32s., eE = 6m.42s., ePPPE = 7m.33s., eSN = 11m.37s., eSSE = 13m.5s., eE = 13m.35s., eN = 13m.44s., eE = 14m.37s.
La Paz iNZ = 8m.0s., iPPP = 9m.52s., iP_cS = 13m.44s., iSSEN = 16m.52s., iSSS = 17m.23s., S_cS = 17m.54s.
Tucson e = 8m.11s., ePPP = 10m.7s.
Palomar iZ = 8m.12s. and 8m.29s.
Fresno eN = 9m.13s., eE = 9m.20s., eZ = 9m.25s., eSE = 18m.2s., eSN = 18m.5s.
Tinemaha eZ = 8m.47s. and 8m.53s.
Berkeley iSSE = 18m.51s.
St. Louis eS = 16m.15s., iSS = 20m.1s.
La Plata PPPE = 11m.32s.
Cleveland eP?Z = 9m.54s., iSN = 17m.33s., eN = 21m.46s.
Bermuda eSS? = 22m.52s.
Ottawa SSS = 25m.8s.
Antarctica eSSS = 27m.4s.
Rome eN = 50m.30s.
Long waves were recorded at Kodaikanal, Wellington, Arapuni, Auckland, and at other American and European stations.

Jan. 14d. 4h. 56m. 58s. Epicentre 37°·9N. 121°·7W. (as on 1946, May 2d.).

Intensity VI at Brentwood, Byron, Stockton, and Waterman; V at Hollister, Holt, and Monteca. Macroseismic area 3,000 sq. miles.
Epicentre as adopted.

L. M. Murphy and F. P. Ulrich.
United States Earthquakes, 1948. Serial No. 746, Washington 1951, p. 11.

A = −·4157, B = −·6731, C = +·6117 ; δ = +5 ; h = −1 ;
D = −·851, E = +·526 ; G = −·321, H = −·520, K = −·791.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
	°	°	m. s.	s.	m. s.	s.	m. s.	
Berkeley	0·5	266	i 0 12	− 2	i 0 20	− 3	—	—
San Francisco	0·6	258	e 0 15	0	i 0 24	− 2	i 0 19	P_g
Lick	0·6	176	i 0 14	− 1	i 0 23	− 3	i 0 17	P*
Santa Clara	0·6	203	e 0 52	?	i 1 1	?	—	—
Mineral	2·4	3	e 0 43	+ 2	i 1 10	− 2	i 1 16	S*
Shasta Dam	2·9	349	e 0 48	0	—	—	—	—
Boulder City	5·8	106	e 1 52	P_g	—	—	—	—
Pierce Ferry	6·4	102	e 1 45	+ 7	—	—	e 2 1	P_g

Additional readings :—
Mineral iP_gN = 0m.52s., iEN = 1m.1s., iN = 1m.22s.

Jan. 14d. Readings also at 1h. (Hungry Horse and Huancayo), 2h. (Shasta Dam, Pasadena, Tinemaha, Hungry Horse, near Lick, near Obi-garm and Stalinabad), 4h. (Pierce Ferry and Hungry Horse), 5h. (Hungry Horse), 7h. (Hungry Horse and near Murgab), 8h. (Hungry Horse, Bogota, and near Balboa Heights), 12h. (Rome), 13h. (Belgrade and Tucson), 19h. (near Ottawa), 21h. (Grand Coulee and Hungry Horse), 22h. (Bombay, Andijan, Obi-garm, Stalinabad, Tashkent, Tchimkent, Samarkand, and near Murgab (2)), 23h. (Andijan, Stalinabad, Tchimkent, near Obi-garm (2), and Murgab).

Jan. 15d. 5h. Undetermined shock. Pasadena suggest depth of 80km.

Brisbane iPN =6m.37s., eN =10m.37s.
Riverview iPP?Z =6m.44s., iSN =10m.1s., eLZ =10·7m.
La Jolla ePZ =15m.4s.a.
Pasadena iPZ =15m.4s., eZ =15m.52s., iPPZ =19m.1s.
Mount Wilson ePZ =15m.5s., iPPZ =18m.58s.
Palomar iPNZ =15m.6s.a, iZ =15m.28s., iNZ =18m.59s., eZ =19m.39s.
Riverside iPZ =15m.6s.a, iPPZ =18m.59s.
Fresno ePZ =15m.11s., eZ =18m.55s.
Tucson eP =15m.20s.a, e =15m.25s. and 19m.23s.
Haiwee ePZ =15m.21s.
Pierce Ferry eP =15m.22s., e =19m.26s.
Tinemaha ePZ =15m.22s., eZ =15m.37s., iPPZ =19m.15s.
Hungry Horse eP? =19m.45s.
Ksara e =21m.34s. and 25m.10s.
Temiskaming i =21m.39s.
Kirkland Lake i =21m.40s.

Jan. 15d. Readings also at 3h. (Mount Wilson, Palomar, Riverside, Tinemaha, Hungry Horse, Boulder City, Pierce Ferry, Shasta Dam, and Tucson), 4h. (Paris), 6h. (near Lick, Fresno, Berkeley, and near Andijan), 8h. (Nanking and Hungry Horse), 9h. (near Ashkabad), 10h. (Palomar, Tucson, Shasta Dam, and Tacubaya), 11h. (Mount Wilson, Palomar, Pasadena, Tinemaha, Hungry Horse, Boulder City, Pierce Ferry, Shasta Dam, Tucson, and near Ashkabad), 12h. (Ksara), 13h. (Mount Wilson, Palomar, Pasadena, Tinemaha, Boulder City, Pierce Ferry, Tucson, Auckland, Arapuni, Wellington, and near Batavia), 18h. (Frunse, Tashkent, near Andijan, Murgab, Obi-garm, Samarkand, Stalinabad, and Tchimkent), 19h. (Tucson and near Pierce Ferry (2)), 21h. (Pierce Ferry), 22h. (Pierce Ferry, Ksara, Piatigorsk, Sotchi, Grozny, near Erevan, and Leninakan), 23h. (Pierce Ferry (2), Stuttgart, and Istanbul).

Jan. 16d. 4h. 42m. 53s. Epicentre 8°·3S. 79°·8W. (as on 1945, November 13d.).

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

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Huancayo		5·8	131	e 1 28	− 1	—	—	i 1 59	P_g	e 2·8
La Paz		14·0	127	3 30	+ 8	6 27	SSS	—	—	7·7
Bogota	E.	14·1	24	i 3 25	+ 2	i 6 16	SS	—	—	i 7·5
St. Louis		47·7	350	i 8 42	+ 2	—	—	e 18 2	?	—
Tucson		50·0	326	e 8 54	− 4	—	—	e 10 20	PP	e 25·3
Palomar	Z.	54·4	322	e 9 25	− 6	—	—	—	—	—
Boulder City		55·0	325	e 9 30	− 5	—	—	—	—	—
Riverside	Z.	55·1	322	i 9 40	+ 4	—	—	—	—	—
Pasadena	Z.	55·7	322	e 9 40	0	—	—	—	—	—
Tinemaha	Z.	57·8	324	i 9 59	+ 4	—	—	—	—	—
Shasta Dam		62·6	324	e 10 27	− 1	—	—	—	—	—
Hungry Horse		64·0	335	e 10 30	− 8	—	—	—	—	—
Toledo		84·5	49	e 12 32	− 4	—	—	i 12 43	P_cP	—

Additional readings :—
Huancayo iP =1m.32s.
Tucson e =9m.3s.
Palomar iZ =9m.46s.
Riverside eZ =10m.0s.
Pasadena eZ =9m.58s.
Long waves were recorded at Bombay, Istanbul, Rome, and Alicante.

Jan. 16d. 11h. 8m. 34s. Epicentre 49°·0N. 172°·8E. Depth of focus 0·015.

$A = -·6534$, $B = +·0825$, $C = +·7525$; $\delta = -1$; $h = -5$;
$D = +·125$, $E = +·992$; $G = -·747$, $H = +·094$, $K = -·659$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Mizusawa		24·6	259	e 5 50	PP	10 28	SS	10 33	SSS	—
College		26·1	38	e 5 14	− 9	e 9 24	−19	e 5 48	PP	e 10·7
Vladivostok		28·7	274	—	—	i 11 8	+43	—	—	—
Sitka		31·5	55	e 6 2	−10	i 11 14	+ 5	e 6 22	pP	e 15·1
Victoria		40·9	66	7 0?	−31	13 11?	−22	8 41?	PP	18·4
Irkutsk		42·1	302	e 7 51	+10	14 6	+16	e 9 23	PP	—
Grand Coulee		43·8	65	e 7 49	− 6	—	—	e 9 58	PP	—
Shasta Dam		45·4	75	e 8 6	− 1	e 14 42	+ 4	e 18 4	sS	—
Ukiah		45·8	77	e 8 46	+35	e 14 48	+ 4	e 10 41	PPP	e 18·8
Mineral		46·1	75	e 8 14	+ 1	—	—	—	—	e 23·1
Hungry Horse		46·5	62	i 8 11	− 5	e 8 56	sP	i 8 33	pP	—
San Francisco		47·0	78	e 8 24	+ 4	—	—	—	—	—
Berkeley		47·1	78	i 8 22	+ 1	e 15 7	+ 5	i 10 20	PP	e 24·5
Santa Clara		47·6	78	i 8 27	+ 2	e 15 37	PS	—	—	—
Butte	N.	48·6	63	—	—	e 18 44	SS	—	—	e 20·9
Saskatoon		48·8	55	—	—	e 15 26?	0	—	—	22·4
Bozeman		49·7	63	—	—	e 18 40	SS	e 19 34	sSS	e 20·6
Tinemaha		50·1	77	i 8 44a	0	—	—	—	—	—
Santa Barbara	Z.	50·8	80	i 8 52	+ 3	—	—	—	—	—
Haiwee	Z.	50·9	77	e 8 50	0	—	—	i 10 3	P_cP	—
Mount Wilson		52·0	79	i 8 58	0	—	—	—	—	—
Pasadena		52·0	79	i 8 59a	+ 1	i 16 15	+ 5	e 11 8	PP	e 22·4
Salt Lake City		52·0	69	—	—	e 17 4	+54	—	—	e 20·2
Riverside	Z.	52·6	79	e 9 3	0	—	—	—	—	—
Boulder City		53·0	76	i 9 5	− 1	e 16 29	+ 5	i 9 23	pP	—
Palomar		53·3	79	i 9 9a	+ 1	i 16 35	+ 7	—	—	—
La Jolla	Z.	53·4	80	i 9 9	0	—	—	—	—	—
Pierce Ferry		53·4	75	i 9 9	0	—	—	—	—	—
Rapid City	E.	55·2	61	i 9 19	− 3	—	—	e 11 6	PP	e 24·6
Tucson		57·9	77	i 9 42	+ 1	e 17 40	+11	e 9 57	pP	e 24·0
Scoresby Sund		60·4	7	9 52	− 6	18 4	+ 3	13 36	PPP	—
Sverdlovsk		60·5	325	i 10 2	+ 3	18 4	+ 2	—	—	—
Almata		62·3	305	e 10 20	+ 9	—	—	—	—	—
Frunse		63·8	306	e 10 20	− 1	—	—	—	—	—
Apia	E.	64·0	162	e 11 2	+40	—	—	—	—	—
Kirkland Lake		64·6	45	e 10 21	− 5	—	—	e 10 29	P	—
Chicago		65·3	54	—	—	e 18 59	− 3	e 23 24	SS	e 32·0
St. Louis		66·1	58	i 10 33	− 3	e 19 5	− 7	i 10 54	pP	—
Temiskaming		66·1	46	e 10 31	− 5	—	—	e 10 38	P	—
Tashkent		67·7	308	—	—	e 19 40	+ 9	—	—	—
Helsinki		68·1	344	e 10 45	− 3	e 19 33	− 3	e 24 7	SS	e 34·4
Cleveland		68·7	51	e 10 48a	− 4	i 19 50	+ 7	20 41	ScS	—
Ottawa		68·7	45	10 44	− 8	19 26	−17	26 26?	SSS	31·4
Moscow		69·1	335	10 55	+ 1	19 48	0	—	—	—
Seven Falls		69·5	41	e 10 52	− 5	—	—	—	—	21·4
Upsala		69·6	348	e 10 55	− 2	e 19 45	− 9	e 20 45	ScS	31·4
Calcutta	E.	69·8	282	e 11 25	+27	i 20 40	PS	20 55	PPS	—
Stalinabad		70·0	306	—	—	i 20 21	PS	—	—	—
Fordham		73·0	47	e 11 14	− 3	—	—	—	—	—
Philadelphia		73·1	48	—	—	e 21 36	PS	—	—	e 35·1
Tacubaya	E.	74·3	78	e 11 30	+ 5	e 20 51	+ 4	e 21 45	PS	—
Copenhagen		74·4	349	e 11 24	− 2	20 52	+ 4	—	—	37·4
Warsaw		76·3	343	e 11 38a	+ 2	—	—	e 14 45	PP	e 36·4
Grozny		77·0	323	—	—	e 21 40	+24	—	—	—
Baku		77·7	319	e 11 45?	+ 1	e 21 53?	+29	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane		78·2	198	—	—	e 22 26	PS	e 22 11	?	—
De Bilt		78·7	353	e 11 51	+ 1	e 21 32	− 3	e 26 38	SS	e 36·4
Jena	N.	79·2	348	e 11 52	0	—	—	—	—	—
Prague		79·6	346	e 11 57	+ 3	e 21 56	+12	e 27 8	SS	e 37·9
Kew		79·7	356	e 12 10	+15	e 21 42	− 3	—	—	e 31·4
Simferopol	N.	79·7	332	e 12 10	+15	—	—	—	—	—
Hyderabad	N.	79·8	285	12 14	+19	22 23	+37	27 52	SS	—
Cheb		79·9	348	e 19 21	?	e 21 46	− 1	e 22 29	PS	e 37·9
Leninakan		79·9	323	11 56	0	—	—	—	—	—
Yalta		80·1	331	e 12 0	+ 3	e 22 1	+12	—	—	—
Uccle		80·1	354	e 11 59k	+ 2	e 21 45	− 4	e 27 9	SS	e 37·4
Erevan		80·2	323	e 12 8	+10	—	—	—	—	—
Budapest	E.	81·2	342	12 6	+ 3	e 21 56	− 5	—	—	e 46·4
Stuttgart		81·6	349	e 12 4	− 1	e 22 31	+26	e 23 31	PPS	e 40·4
Strasbourg		81·9	350	e 12 6	− 1	e 22 9	+ 1	e 15 18	PP	e 39·1
Paris		82·2	354	e 12 8	0	e 22 9	− 2	e 22 27	pS	e 38·4
Bombay		82·3	290	e 12 41	+32	i 23 1	PS	—	—	—
Zürich		83·0	350	i 12 12a	0	e 22 19	0	—	—	—
Basle		83·0	350	e 12 10	− 2	e 23 42	PS	—	—	—
Triest		84·0	346	e 12 11	− 6	e 22 57	+28	e 15 16	PP	e 40·4
Riverview		84·7	198	e 13 3	+42	e 23 14	+38	e 24 4	PPS	41·4
Istanbul		84·8	334	12 28	+ 7	21 54	?	—	—	—
Clermont-Ferrand		85·2	353	e 12 25	+ 2	e 22 56	+15	e 23 48	PS	39·4
Kodaikanal	E.	85·8	282	—	—	e 23 26	[+50]	—	—	—
Colombo	E.	86·8	277	23 30	S	(23 30)	+34	—	—	52·4
Rome		87·8	346	e 12 44	+ 8	e 23 6	+ 1	—	—	—
Ksara		89·1	325	i 12 51k	+ 9	24 45	PS	—	—	—
Helwan		94·3	327	—	—	i 23 56	− 7	—	—	—
San Juan		95·0	55	e 12 53	−16	e 23 32	[+ 1]	e 24 12	S	e 37·2
La Paz		121·3	78	e 19 6	[+28]	—	—	—	—	62·7
Antarctica		145·3	146	e 19 44	[+22]	—	—	e 38 16	?	e 73·3

Additional readings :—
Sitka ePcP =8m.56s.
Victoria SS =15m.50s.?.
Irkutsk PP =9m.38s.
Hungry Horse ePP =9m.59s.
Berkeley iN =10m.34s., iSEN =15m.25s.
Tinemaha iZ =9m.14s.
Haiwee iZ =8m.53s., 9m.10s., and 9m.16s.
Mount Wilson iZ =9m.15s.
Pasadena ePcPZ =10m.9s., eScPZ =14m.8s., iE =16m.54s., eSSN =20m.2s.
Riverside iZ =9m.7s., 9m.14s., and 9m.22s.
Boulder City eScS? =19m.3s.
Palomar iZ =9m.12s. and 9m.19s., eN =16m.51s.
Tucson i =9m.51s., isP =10m.7s., ePPP =12m.50s.
St. Louis e =26m.37s.
Temiskaming e =10m.49s. and 11m.34s.
Helsinki e =20m.53s.
Cleveland iZ =10m.57s., iN =11m.2s.
Upsala eE =22m.14s.
Calcutta PPS =21m.22s., SS =25m.25s.
Warsaw ePN =11m.44s., PcPZ =11m.56s., eE =13m.47s., eZ =13m.54s., eE =21m.31s.
Jena eN =12m.16s.
Prague e =15m.44s. and 20m.44s.
Kew eSS?EN =26m.32s. ?
Cheb eSSS =30m.35s., e =32m.56s.
Stuttgart eZ =14m.26s.
Strasbourg eP =12m.22s., e =18m.16s., ePS =22m.56s., eSS =27m.32s., e =34m.52s. and 35m.1s.
Paris i =12m.24s. e =14m.35s., ePP =15m.26s., ePS =22m.51s.?, eSSS =29m.57s.
Bombay PSE =24m.31s., SSE =28m.37s.
Triest ePPP =17m.12s.
Riverview eZ =15m.29s., eSN =23m.42s., iScS?E =23m.51s., eN =24m.28s., eSSE =29m.37s., eSSN =29m.40s., eQE =36m.8s.
Clermont-Ferrand e =14m.54s.
Alicante (Δ =91°·8) gives readings as follows : P? =11h.3m.33s., PP =11h.7m.4s., PPP =11h.9m.16s., S =11h.14m.16s., SKS =11h.14m.54s., PS =11h.15m.28s., Q =11h.27m.30s., eL =11h.33m.48s.
Long waves were recorded at Lincoln, Bermuda, Honolulu, Potsdam, and Malaga.

Jan. 16d. Readings also at 2h. (Tucson), 3h. (Pierce Ferry and Boulder City), 4h. (Pierce Ferry, Hungry Horse, and Stuttgart), 6h. (Fresno, Lick, Boulder City, Pierce Ferry, near Ottawa, Seven Falls, and Shawinigan Falls), 7h. (Mount Wilson, Pasadena, Riverside, Tinemaha, Pierce Ferry, Tucson, Hungry Horse, La Paz, and near Andijan), 9h. (Almata, near Andijan, Murgab, Obi-garm, Samarkand, Stalinabad, and Tashkent), 11h. (Ashkabad, Frunse, Tchimkent (2), Andijan (3), near Tashkent (2), Stalinabad (3), Samarkand (3), Obi-garm (3), and Murgab), 12h. (Wellington, Mineral, and Hungry Horse), 14h. (Mount Wilson, Palomar, Pasadena, Riverside, Pierce Ferry, Shasta Dam, Tucson, Hungry Horse, Ksara, Sverdlovsk, and near Mineral (2)), 15h. (Mount Wilson, Riverside, Tinemaha, Boulder City, Hungry Horse, Tucson, and Istanbul), 20h. (La Paz), 21h. (La Paz and Huancayo), 22h. (Hungry Horse, Shasta Dam, Ksara, Istanbul, Bombay, Kodaikanal, Rome, Paris, Strasbourg, De Bilt, Uccle, Tananarive, and Antarctica), 23h. (near Balboa Heights, and near Ashkabad).

Jan. 17d. 2h. Undetermined shock. Pacific.
Apia eP?EN =0m.21s.
Riverview eP?Z =4m.23s., eEZ =5m.36s., eE =10m.32s., eLEZ =13·1m.
Brisbane eS?E =4m.50s., iSS?E =5m.9s.
Auckland e =5m., L =6·5m.
Arapuni S? =5m.48s.
Mount Wilson ePZ =10m.4s.
Pasadena iPZ =10m.5s., eLEZ =35·2m.
Riverside iPZ =10m.7s.
Palomar iPZ =10m.8s.
Shasta Dam eP =10m.12s.
Haiwee ePZ =10m.13s.
Tinemaha iPZ =10m.13s.
Boulder City eP =10m.22s.
Tucson eP =10m.23s., e =10m.40s., eS? =18m.42s., eL =23m.0s.
Pierce Ferry eP =10m.25s.
Hungry Horse eP =11m.0s.
Istanbul e =15m.18s. and 18m.0s.
Warsaw eZ =17m.45s. and 18m.35s.
Ksara ePKP? =17m.54s., PP? =21m.33s., e =23m.21s.
Stuttgart eZ =17m.55s.?
Antarctica eS =19m.23s., eL =34m.26s.
Long waves were also recorded at Wellington, Huancayo, La Paz, Harvard, and Uccle.

Jan. 17d. 2h. 26m. 23s. Epicentre 38°·2N. 21°·5E. (as on 1947, April 16d.).

$A = +·7330$, $B = +·2887$, $C = +·6159$; $\delta = -3$; $h = -1$;
$D = +·367$, $E = -·930$; $G = +·573$, $H = +·226$, $K = -·788$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Istanbul		6·5	61	1 45	+ 6	3 46	S_g	—	—	—
Belgrade		6·6	354	i 1 39	− 2	i 3 39	S_g	e 2 18	P_g	i 4·1
Bucharest		7·1	28	e 1 41	− 7	e 3 8	− 2	—	—	i 3·7
Rome		7·8	301	e 1 53	− 5	e 3 48	S*	e 2 58	P_g	4·5
Kalossa		8·5	348	e 2 46	P_g	3 45	0	—	—	—
Budapest	E.	9·4	350	e 2 32	+14	e 5 21	?	5 32	SS	e 6·1
	N.	9·4	350	e 2 29	+11	e 5 18	?	5 33	SSS	6·6
Triest		9·4	325	e 2 6	−12	i 3 50	−17	e 2 56	P*	i 4·9
Raciborzu		12·1	350	e 3 37?	+40	—	—	—	—	—
Prague		12·9	340	e 2 45	−22	e 5 14	−19	—	—	e 6·2
Zürich		13·2	318	e 3 18	+ 7	e 5 47	+ 7	—	—	—
Cheb		13·6	334	—	—	e 5 5	?	e 5 27	?	e 6·3
Basle		13·8	317	e 3 18	− 1	—	—	—	—	e 8·2
Stuttgart		13·8	324	e 3 10	− 9	—	—	e 3 48	PP	e 7·6
Warsaw		14·0	359	e 3 24	+ 2	e 6 43	Q	—	—	e 7·6
Strasbourg		14·4	321	—	—	e 5 10	−59	—	—	e 7·7
Jena	N.	14·5	334	e 3 42	+14	—	—	—	—	e 7·8
Clermont-Ferrand		15·6	305	e 3 39	− 4	—	—	—	—	—
Paris		17·4	315	e 4 0	− 6	—	—	i 4 21	PP	e 10·6
De Bilt		18·0	327	—	—	e 7 25	− 7	—	—	e 9·6
Copenhagen		18·5	344	—	—	7 48	+ 4	—	—	10·6
Toledo		19·9	283	e 4 28	− 8	—	—	—	—	—
Hungry Horse		85·2	332	e 11 35	−64	—	—	—	—	—

For Notes see next page.

NOTES TO JANUARY 17d. 2h. 26m. 23s.

Additional readings :—
Bucharest eEN = 1m.52s., eE = 2m.51s., eN = 3m.4s,. eEN = 3m.21s., iN = 3m.33s.
Kalossa eE = 3m.6s., 3m.41s., and 3m.58s.
Budapest SSSN = 5m.43s., eSSSE = 5m.57s.
Paris i = 4m.3s.
Long waves also recorded at Helwan and other European stations.

Jan. 17d. 5h. 6m. 46s. Epicentre 43°·2N. 0°·6W.

Intensity VI-VII at Oloron, Sainte Marie, macroseismic radius 30km. Epicentre given by Strasbourg.

J. P. Rothé and N. Dechevoy.
La Séismicité de la France de 1940 à 1950. Annales de l'Institut de Physique du Globe de Strasbourg 3e partie : Géophysique. Nouvelle série Tome VII, pp. 47, 48 with macroseismic chart.

A = +·7313, B = −·0077, C = +·6821 ; δ = +12 ; h = −3 ;
D = −·010, E = −1·000 ; G = +·682, H = −·007, K = −·731.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Clermont-Ferrand		3·7	45	e 0 59	− 1	i 1 41	− 4	i 1 14	P_g	2·0
Toledo		4·2	219	i 1 11	+ 4	—	—	—	—	—
Alicante		4·8	179	i 1 50	P_g	—	—	—	—	—
Paris		6·0	20	e 1 32	0	e 2 42	− 1	i 1 54	P_g	—
Besançon		6·2	47	—	—	e 3 4	S*	—	—	—
Basle		7·2	50	e 2 18	P_g	e 3 39	S*	—	—	—
Zürich		7·6	54	e 2 10	P*	e 3 53	S*	—	—	—
Strasbourg		7·9	44	—	—	e 3 56	S*	i 4 8	S_g	i 4·3
Uccle		8·3	22	e 2 31	P*	e 4 15	S*	—	—	—
Stuttgart		8·8	47	e 3 19?	?	e 4 18	S*	e 4 41	S_g	—

Additional readings :—
Clermont-Ferrand iS? = 1m.50s., iS_g = 1m.58s.
Paris eP = 1m.36s., i = 1m.39s., e = 2m.18s., and 2m.24s., i = 2m.33s. and 2m.55s., iS? = 3m.1s., i = 3m.7s., eS_g = 3m.19s.
Stuttgart e = 4m.38s.

Jan. 17d. 7h. 11m. 6s. Epicentre 15°·5N. 146°·4E.

A = −·8030, B = +·5335, C = +·2656 ; δ = −3 ; h = +6 ;
D = +·553, E = +·833 ; G = −·221, H = +·147, K = −·964.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Mizusawa	E.	24·0	350	5 23	+ 6	9 35	+ 3	—	—	—
Vladivostok		30·2	338	i 6 10	− 4	i 11 5	− 8	—	—	—
Brisbane		43·2	172	e 8 5	+ 1	i 14 31	− 1	—	—	i 18·0
Batavia		44·7	244	i 8 23	+ 7	i 14 27	−27	9 47	PP	e 21·4
Riverview		49·3	175	i 8 55a	+ 2	e 15 59	0	i 9 4	pP	23·0
Irkutsk		49·5	327	8 53	− 1	i 15 57	− 5	—	—	—
Auckland		58·6	153	—	—	e 18 54	+50	—	—	29·4
Arapuni		60·0	154	—	—	18 18	− 5	28 6	Q	30·9
Wellington		62·3	156	—	—	18 48	− 4	23 6	SS	31·7
Almata		64·6	311	10 43	+ 2	19 22	+ 1	—	—	—
Hyderabad	N.	64·9	283	e 10 40	− 3	19 24	0	—	—	31·8
College		65·9	25	e 11 2	+12	e 19 20	−17	e 14 48	PPP	e 26·4
Murgab		66·9	306	i 10 57	+ 1	i 19 49	0	—	—	—
Kodaikanal	E.	67·2	275	i 11 6	+ 8	20 51	PS	11 28	P_cP	35·9
Andijan		68·0	308	e 11 3	0	20 2	0	—	—	—
Bombay		69·9	285	e 11 15	0	20 41	PS	13 54	PP	34·7
Tchimkent		70·0	310	—	—	i 20 25	− 1	—	—	—
Obi-garm		70·2	306	i 11 19	+ 2	i 20 27	− 1	—	—	—
Tashkent		70·3	309	e 11 18	+ 1	20 26	− 3	—	—	—
Sitka		70·8	34	e 10 59	−21	e 20 20	−15	e 11 41	pP	e 28·9

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Stalinabad		70·9	306	i 11 22	+ 1	i 20 38	+ 2	—	—	—
Sverdlovsk		74·9	326	i 11 44	0	i 21 16	− 6	—	—	—
Victoria		78·7	43	11 54	−12	21 32	−30	26 30	SS	31·9
Ukiah		80·7	52	e 12 14	− 2	e 22 18	− 6	—	—	e 36·5
Shasta Dam		81·0	50	e 12 17	− 1	e 22 20	− 7	i 12 51	pP	—
Mineral	N.	81·6	50	e 12 29	+ 8	e 22 33	0	—	—	—
Berkeley		81·7	53	e 12 22	0	i 22 29	− 5	—	—	e 40·5
Grand Coulee		81·7	43	e 12 20	− 2	e 22 28	− 6	e 15 37	PP	—
Santa Clara		82·0	53	e 12 26	+ 3	e 22 34	− 3	—	—	—
Lick		82·3	53	e 12 30	+ 5	e 22 10	−30	—	—	—
Santa Barbara		84·5	56	e 12 34	− 2	e 22 51	−11	—	—	—
Hungry Horse		84·8	41	e 12 36	− 1	e 22 55	−10	—	—	—
Baku		84·9	311	e 12 42?	+ 4	e 23 12?	+ 6	—	—	—
Tinemaha		85·0	54	e 12 38	0	e 23 3	[+ 2]	—	—	—
Haiwee	Z.	85·5	54	i 12 45	+ 4	—	—	—	—	—
Pasadena		85·8	56	e 12 42	0	i 22 56	[−10]	i 16 2	PP	e 38·2
Mount Wilson	Z.	85·9	56	e 12 42	− 1	—	—	e 16 5	PP	—
Butte	N.	86·5	43	—	—	e 23 11	[0]	e 29 0	SS	e 35·4
Riverside	Z.	86·5	56	e 12 43	− 3	—	—	—	—	—
La Jolla	Z.	86·9	57	e 12 47	− 1	—	—	—	—	—
Grozny		87·0	314	e 12 49	+ 1	e 23 11	[− 3]	—	—	—
Palomar		87·1	56	e 12 47	− 2	e 23 10	[− 5]	—	—	—
Bozeman		87·6	43	e 13 8	+17	e 23 16	[− 2]	e 13 50	pP	e 36·1
Boulder City		87·9	53	e 12 52	− 1	e 23 49	+14	—	—	—
Saskatoon		88·0	37	—	—	i 23 13	[− 8]	—	—	35·9
Logan		88·3	47	e 12 54	− 1	e 23 18	[− 4]	i 13 38	pP	e 38·2
Pierce Ferry		88·5	53	e 12 56	0	e 23 25	[+ 1]	—	—	—
Salt Lake City		88·6	48	e 13 8	+12	e 23 22	[− 2]	e 16 36	PP	e 36·2
Leninakan		89·2	313	—	—	e 23 40	− 7	—	—	—
Tucson		92·3	56	e 13 14	+ 1	i 24 16	+ 1	e 17 3	PP	e 38·2
Rapid City	E.	93·3	42	e 13 24	+ 6	e 23 50	[− 2]	i 24 18	pSKS	e 37·2
Denver		93·9	47	—	—	24 28	− 1	23 57	SKS	—
Scoresby Sund		93·9	356	—	—	24 29	0	—	—	—
Upsala	E.	94·3	336	e 21 39	?	—	—	—	—	e 44·9
Ksara		97·7	308	e 13 40	+ 2	—	—	27 26	PPS	—
Warsaw		97·7	330	e 23 7	?	e 24 16	[+ 1]	e 27 15	PPS	e 50·9
Copenhagen		99·2	336	e 13 45	0	—	—	27 32	PPS	—
Istanbul		99·3	317	e 13 40	− 5	—	—	e 17 47	PP	—
Potsdam		101·3	333	e 13 54	0	e 32 54	SS	i 18 0	PP	e 47·9
Prague		102·3	331	e 18 36	PP	e 20 30	PPP	e 37 42	SSS	e 47·9
Cheb		103·2	332	e 18 54?	PP	—	—	e 28 54?	PPS	e 50·9
Chicago		104·3	38	e 18 48	PP	e 26 2	+ 6	e 24 53	SKS	e 47·0
Kirkland Lake		104·3	30	e 18 18	PP	—	—	—	—	—
St. Louis		104·5	42	e 18 36	PP	i 25 54	− 4	i 24 45	SKS	—
De Bilt		104·7	337	e 18 28a	PP	e 25 54	− 6	e 22 34	PKS	e 46·9
Stuttgart		105·6	332	e 18 24?	PP	e 24 12	[−41]	e 28 42	PPS	57·9
Triest		105·6	328	—	—	i 24 49	[− 4]	e 28 17	PS	—
Uccle		106·1	336	—	—	e 33 54	SS	—	—	e 49·9
Strasbourg		106·4	333	e 18 37	PP	e 24 54	[− 3]	e 28 0	PS	e 48·9
Kew		107·3	339	(17 54?)	PKP	—	—	—	—	e 17·9
Ottawa		108·4	30	19 24	PP	25 4	[− 1]	28 10	PS	48·9
Paris		108·4	336	—	—	e 27 50	PS	e 29 17	PPS	54·9
Rome		108·8	325	—	—	e 24 53	[−14]	e 28 5	PS	e 51·9
Seven Falls		109·3	26	—	—	e 28 30	PS	e 34 24	SS	43·9
Clermont-Ferrand		110·6	333	e 19 45	PP	—	—	—	—	48·9
Harvard		112·5	29	—	—	e 28 54?	PS	—	—	e 54·9
Fordham		112·6	32	e 19 26	PP	e 27 10	S	—	—	—
Philadelphia		112·6	33	e 20 15	?	e 28 42	PS	—	—	e 51·4
Columbia		113·2	42	e 19 30	PP	e 25 25	[0]	e 27 10	S	e 47·4
Alicante		118·1	331	—	—	27 4	{+ 3}	36 48	SS	e 51·3
Antarctica		123·2	165	e 20 42	PP	30 44	PS	—	—	e 54·9
Bermuda		123·9	32	—	—	e 30 36	PS	e 37 26	SS	e 57·3
San Juan		133·3	44	e 22 59	PKS	—	—	—	—	e 63·6
Bogota	Z.	135·2	67	e 20 3	[+41]	—	—	e 23 7	PKS	—
Huancayo		139·4	91	e 19 45	[+16]	e 26 29	[− 9]	e 22 37	PP	e 64·4
La Paz		146·8	97	i 19 46	[+ 4]	i 26 43	[− 6]	i 23 25	PP	68·9

For Notes see next page.

NOTES TO JANUARY 17d. 7h. 11m. 6s.

Additional readings :—
Brisbane iN =8m.27s., iSN =14m.38s.
Riverview iPSE =16m.14s., iS_cSE =18m.48s., iN =19m.53s., eQE =21m.6s.
College eSS =23m.24s.
Kodaikanal PSE =21m.21s., PPSE =21m.51s., SSE =25m.31s.
Bombay PSE =21m.26s., SSE =25m.34s.
Sitka isS? =21m.19s.
Shasta Dam ePP =15m.26s.
Mineral eN =12m.39s., eSN =22m.27s.
Berkeley ePZ =12m.27s., eN =32m.24s.
Lick eN =12m.37s., eSN =22m.32s.
Santa Barbara iZ =12m.48s.
Tinemaha iZ =12m.49s. and 12m.55s.
Haiwee iZ =12m.53s. and 13m.4s.
Pasadena i =12m.47s. and 12m.54s., eSSE =28m.12s., eZ =32m.24s.
Mount Wilson iZ =12m.48s. and 12m.54s.
Riverside iZ =12m.56s. and 13m.7s.
La Jolla eZ =12m.59s.
Palomar iZ =12m.52s., iNZ =12m.58s., iZ =13m.15s.
Bozeman ePS =24m.22s., eSS? =29m.26s., eSSS =32m.38s.
Logan ePP =16m.26s., iPS =24m.36s., eSS? =28m.28s., eSSS =33m.12s.
Salt Lake City isS =23m.39s., eSS =29m.14s.
Tucson i =13m.25s., ePPP =19m.8s., eSKS =23m.48s., iPS =25m.23s., eSS =30m.21s., eSSS =33m.55s.
Rapid City isS =24m.34s., ePS =25m.28s., eSS? =30m.40s.
Denver 26m.34s.
Upsala eN =22m.35s. and 23m.29s.
Warsaw eN =23m.11s., eZ =32m.30s., eE =33m.5s.
Potsdam iE =28m.44s.
Prague e =35m.24s.
Chicago epPS =27m.43s.
St. Louis iPS =27m.30s., iSS =32m.45s.
De Bilt eSS =33m.12s.
Stuttgart eSS =33m.34s., e =35m.54s., eSSS =37m.54s.?, eQ? =50·9m.
Triest iPPS =29m.7s.
Strasbourg ePP =18m.42s., eSKS =25m.6s.
Ottawa SE =26m.24s., SSE =33m.46s., SSSN =37m.54s.
Paris Q =51·9m.
Rome ePPS =28m.54s.?, eSS =34m.54s., eSSS =39m.54s.
Fordham i =27m.54s.
Columbia ePS =29m.1s.
Alicante SS =27m.32s., Q =44m.48s.
Huancayo epPP =23m.4s., eSKSP =32m.38s., eSS =41m.6s.
La Paz iE =20m.28s., and 30m.5s., PPS =35m.18s., iSSE =42m.10s., SSP =42m.42s.
Long waves were also recorded at Honolulu, Lincoln, and at other European stations.

Jan. 17d. Readings also at 0h. (Mount Wilson, Palomar, Riverside, Tinemaha, Tucson, Pierce Ferry, and Shasta Dam), 1h. (near Lick), 3h. (Mount Wilson, Pasadena, Palomar, Riverside, Boulder City, Pierce Ferry, and Shasta Dam), 7h. (Andijan, Samarkand, near Murgab, Obi-garm, and Stalinabad), 9h. (Mount Wilson, Pasadena, Riverside, Tinemaha, Tucson, Pierce Ferry, Hungry Horse, Bogota, La Paz, and near Huancayo), 10h. (near Alicante), 12h. (Hungry Horse, Tucson, and La Paz), 13h. (Istanbul and Mizusawa), 14h. (Hungry Horse), 15h. (near Granada), 16h. (Andijan, near Obi-garm, Samarkand, Stalinabad, and near Ottawa), 17h. (Haiwee, Mount Wilson (3), Pasadena, Palomar (3), Riverside (3), Tinemaha (3), Tucson (2), Boulder City, Pierce Ferry (3), Shasta Dam, Grand Coulee, Stuttgart, and near La Paz), 20h. (Pierce Ferry), 21h. (near Obi-garm), 22h. (Istanbul and Pierce Ferry).

Jan. 18d. 13h. 39m. 54s. Epicentre 17°·4S. 167°·9E. (as on 1947, August 1d.).

A = −·9336, B = +·2002, C = −·2972 ; δ = +2 ; h = +5 :
D = +·210, E = +·978 ; G = +·291, H = −·062, K = −·955.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	17·0	230	i 3 58	− 3	i 7 6	− 4	i 4 15	PP	e 8·8
Auckland	20·3	164	4 20	−20	9 47	?	—	—	12·1
Arapuni	21·7	163	—	—	e 8 54	+ 3	—	—	10·1
Riverview	22·2	218	i 5 3k	+ 3	i 9 9	+ 9	i 5 22	pP	e 10·9
Wellington	24·5	167	5 36	+14	9 54	+14	—	—	13·1

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Batavia		60·6	273	i 10 59	+44	i 19 10	+40	—	—	—
Vladivostok		68·7	333	e 11 1	− 6	i 20 3	− 7	—	—	—
Antarctica		86·0	162	e 12 53	+10	e 23 17	0	—	—	e 46·8
Shasta Dam		86·6	46	e 12 47	+ 1	—	—	i 13 4	pP	—
Pasadena	z.	87·0	53	e 12 48	0	—	—	e 13 39	?	—
Mount Wilson	z.	87·1	53	e 12 49	0	—	—	—	—	—
Riverside	z.	87·5	53	e 12 48	− 3	—	—	i 13 8	?	—
Palomar	z.	87·6	54	i 12 52	+ 1	—	—	i 13 11	?	—
Tinemaha	z.	88·1	50	e 12 53	− 1	—	—	—	—	—
Boulder City		90·2	52	e 13 4	0	—	—	—	—	—
Pierce Ferry		90·9	52	e 13 6	− 1	—	—	—	—	—
Tucson		92·0	57	e 13 14	+ 2	—	—	e 13 36	pP	—
Bombay		100·1	286	e 19 54	PPP	e 24 24	[− 3]	—	—	—
Ksara		134·2	300	e 21 54	PP	—	—	37 24	?	—
Helwan		138·5	295	i 23 9	PP	—	—	—	—	—
Stuttgart	z.	144·2	336	e 19 36	[− 2]	—	—	—	—	—
Zürich		145·6	335	e 19 41	[+ 1]	—	—	—	—	—
Basle		145·9	336	e 19 42	[+ 1]	—	—	—	—	—
Paris		146·5	342	i 19 44a	[+ 2]	—	—	i 19 50	PKP	—
Clermont-Ferrand		149·0	339	e 19 58	[+12]	—	—	e 20 19	PKP_2	—

Additional readings :—
Brisbane iSN =7m.18s., iSSN =7m.32s.
Riverview iPEN =5m.6s., iPPPNZ =5m.53s., iZ =6m.13s., iSE =9m.14s.
Long waves were recorded at Perth.

Jan. 18d. Readings also at 0h. (Pierce Ferry (2)), 1h. (Mount Wilson (2), Pasadena, Tinemaha (2), Shasta Dam, Tucson, Bogota, and La Paz), 3h. (Pierce Ferry, Bogota, and La Paz), 4h. (Hungry Horse and near Mineral), 6h. (near Obi-garm), 8h. (Samarkand near Frunse, Andijan, Almata, and near Balboa Heights), 9h. (Ksara), 15h. (Tucson, Stalinabad, Samarkand, Tchimkent, near Obi-garm, and Murgab), 16h. (near Belgrade), 17h. (Shasta Dam), 18h. (Mount Wilson, Palomar, Pasadena, Riverside, Pierce Ferry, Shasta Dam, Tucson, La Paz, and near Almeria), 21h. (near Berkeley and San Francisco).

Jan. 19d. 2h. 23m. 56s. Epicentre 22°·4S. 62°·5W. (as on 1947 August 31d.).

A = +·4273, B = −·8208, C = −·3789 ; δ = −14 ; h = +4 ;
D = −·887, E = −·462 ; G = −·175, H = +·336, K = −·925.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
La Paz		7·9	316	2 0	+ 1	i 3 36	+ 6	2 19	P*	—
La Plata	N.	13·1	163	4 27	+77	6 4	+26	—	—	7·7
Huancayo		16·0	308	e 3 46	− 2	e 6 46	0	e 4 9	PPP	e 8·2
Bogota	z.	29·2	337	e 6 8	+ 3	e 11 11	+13	—	—	—
St. Louis		66·1	338	i 10 52	+ 1	—	—	e 16 20	?	—
Temiskaming		70·4	350	e 11 22	+ 4	—	—	—	—	—
Tucson		71·3	319	i 11 24a	+ 1	—	—	e 15 19	PPP	—
Kirkland Lake		72·0	350	e 11 33	+ 5	—	—	—	—	—
La Jolla	z.	75·8	315	e 11 50	0	—	—	i 12 6	P_cP	—
Pierce Ferry		75·9	319	e 11 50	0	—	—	—	—	—
Palomar	z.	75·9	316	i 11 51a	+ 1	—	—	i 12 6	P_cP	—
Riverside	z.	76·6	316	i 11 54a	0	—	—	i 12 12	P_cP	—
Mount Wilson	z.	77·2	316	i 11 56	− 1	—	—	e 12 9	P_cP	—
Pasadena	z.	77·2	316	i 11 57a	0	—	—	i 12 9	P_cP	—
Haiwee	z.	78·3	318	i 12 3	0	—	—	—	—	—
Tinemaha		79·1	318	i 12 9a	+ 1	—	—	i 12 26	P_cP	—
Toledo		82·5	42	e 12 41	+15	—	—	—	—	—
Shasta Dam		83·9	319	e 12 32	− 1	—	—	—	—	—
Hungry Horse		84·2	329	i 12 38	+ 4	—	—	i 12 48	pP	—
Grand Coulee		86·4	326	e 12 47	+ 2	—	—	—	—	—

For Notes see next page.

NOTES TO JANUARY 19d. 2h. 23m. 56s.

Additional readings :—
La Paz iS = 4m.6s., iS_g = 4m.36s.
La Plata E. 5m.58s., 6m.28s., S = 7m.14s.
Tucson i = 11m.39s.
Palomar iZ = 12m.0s.
Riverside iZ = 12m.2s.
Pasadena iZ = 12m.4s.
Tinemaha iZ = 12m.39s.
Long waves were also recorded at Bombay and Ksara.

Jan. 19d. Readings also at 1h. (Tucson (2), Riverside, and Pasadena), 4h. (Tacubaya and Tucson), 5h. (near Mizusawa), 6h. (La Paz, Huancayo, Mount Wilson, Palomar (2), Tinemaha (2), Berkeley, Pasadena (2), Hungry Horse, Pierce Ferry, Shasta Dam (3), Tucson (2), Stuttgart, and Ksara), 7h. (Mount Wilson, Palomar, Pasadena, Riverside, Santa Barbara, Tinemaha, Grand Coulee, Hungry Horse, Pierce Ferry, Shasta Dam, Tucson, College, and near Ashkabad), 8h. (Stuttgart, Hungry Horse, Baku, Murgab, Obi-garm, Samarkand, Tashkent, and Tchimkent), 9h. (Hungry Horse), 10h. (Tucson and near Tacubaya), 11h. (Mizusawa and Vladivostok), 12h. (Batavia), 13h. (Stuttgart), 14h. (near La Paz), 16h. (Antarctica), 18h. (Tinemaha, Shasta Dam, and Tucson), 20h. (Hungry Horse and Shasta Dam), 22h. (Hungry Horse).

Jan. 20d. 9h. 44m. 5s. Epicentre 33°·9S., 177°·8W.

Pasadena suggests a depth of 60km.

A = −·8312, B = −·0319, C = −·5551 ; δ = +5 ; h = +1 ;
D = −·038, E = +·999 ; G = +·555, H = +·021, K = −·832.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		20·7	17	e 6 14	?	8 45	+14	—	—	e 10·9
Riverview		25·7	291	i 5 33a	0	i 10 3	+ 2	i 6 16	PP	e 12·2
Brisbane		25·8	276	e 5 35	+ 1	i 10 7	+ 5	i 10 47	SS	i 14·5
Honolulu		58·1	22	e 9 55	− 3	e 18 3	+ 5	i 10 45	PcP	e 25·6
Antarctica		66·1	157	i 10 52	+ 1	i 19 46	+ 7	i 13 21	PP	e 27·3
Batavia		74·4	273	i 11 51	+ 9	i 21 31	+15	14 35	PP	34·9
Santa Barbara		87·1	45	i 12 50	+ 1	—	—	—	—	—
La Jolla		87·5	47	e 12 53	+ 2	—	—	e 13 7	pP	—
Pasadena		87·8	46	i 12 52k	0	e 23 51	+17	i 13 6	pP	e 36·5
Mount Wilson	Z.	87·9	46	i 12 52	− 1	—	—	i 13 10	pP	—
San Francisco		87·9	41	e 12 54	+ 1	—	—	—	—	e 37·9
Santa Clara	Z.	87·9	41	e 12 51	− 2	—	—	—	—	—
Palomar	Z.	88·0	47	i 12 54k	+ 1	—	—	i 13 11	pP	—
Berkeley		88·1	41	i 12 54	0	i 24 31	+54	—	—	e 36·5
Lick		88·1	41	e 12 54	0	—	—	—	—	e 39·7
Riverside		88·2	46	i 12 54k	0	—	—	i 13 11	pP	—
Haiwee	Z.	89·3	44	i 12 59	0	—	—	i 13 16	pP	—
Vladivostok		89·4	326	12 56	− 4	i 23 24	[− 5]	i 13 3	PcP	—
Tinemaha		89·8	44	i 13 1	− 1	—	—	i 13 14	pP	—
Shasta Dam		90·1	38	e 13 1	− 2	—	—	i 13 17	pP	—
Mineral	N.	90·3	39	e 13 5	+ 1	e 24 9	+12	—	—	e 49·1
Boulder City		91·0	46	i 13 8	+ 1	—	—	i 13 25	pP	—
Tucson		91·1	51	e 13 8	0	e 23 55	− 9	i 13 36	pP	e 37·5
La Plata	E.	91·4	135	13 1	− 8	24 15	+ 8	25 21	PS	49·9
	N.	91·4	135	—	—	—	—	25 23	PS	50·2
Pierce Ferry		91·6	47	i 13 9	− 1	e 23 42	[0]	—	—	—
Tacubaya	E.	91·6	67	e 13 20	+10	e 24 49	S_cS	e 17 7	PP	—
Huancayo		93·5	107	e 13 34	+15	e 24 5	{− 3}	e 25 52	PS	e 43·4
Victoria		95·3	33	e 20 7	?	e 24 44	+ 3	e 43 55	Q	48·9
Salt Lake City		95·9	44	—	—	e 27 27	PPS	—	—	e 41·1
La Paz		96·4	114	i 13 31	− 1	i 24 11	[+ 2]	i 17 31	PP	45·3
Grand Coulee		97·0	35	e 13 34	− 1	—	—	e 13 50	pP	—
Hungry Horse		99·7	37	e 13 54	+ 7	—	—	e 17 56	PP	—
College		101·2	12	—	—	e 26 33	PS	e 32 5	SS	e 43·9
Bogota		104·0	93	e 18 32	PP	i 27 47	PS	e 21 22	PPP	48·9

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Colombo	E.	104·0	269	—	—	24 44	[− 2]	35 15	?	48·2
Calcutta	E.	105·3	287	e 18 51	PP	e 27 44	PS	—	—	—
Saskatoon		105·8	37	—	—	e 28 7	PS	e 33 37	SS	49·9
Kodaikanal	E.	107·8	271	—	—	e 25 15	[+12]	—	—	—
St. Louis		108·5	55	e 19 0	PP	i 28 27	PS	e 34 8	SS	—
Irkutsk		109·3	321	18 8	PP	25 1	[− 8]	—	—	—
Hyderabad	N.	110·7	278	—	—	25 11	[− 4]	28 43	PS	—
Chicago		111·8	53	—	—	i 28 55	PS	—	—	e 50·6
Columbia		113·0	63	—	—	e 29 10	PS	e 29 43	sPS	e 47·7
Cleveland		115·8	55	e 19 56	PP	i 29 37	PS	e 35 52	SS	47·6
Bombay	E.	116·1	276	e 18 51	[+ 6]	25 36	[0]	e 20 36	PP	—
San Juan		117·8	85	—	—	e 29 55	PS	e 36 9	SS	e 50·1
Ottawa		121·1	53	18 53	[− 2]	30 23	PS	20 28	PP	53·9
Almata		122·7	304	e 19 16	[+18]	—	—	—	—	—
Bermuda		124·9	71	—	—	e 31 5	PS	e 37 55	SS	e 52·6
Stalinabad		127·1	296	19 7	[+ 1]	—	—	—	—	—
Tashkent		127·5	299	e 18 40	[−27]	—	—	—	—	—
Sverdlovsk		134·6	319	i 19 20	[− 1]	i 22 51	PKS	—	—	—
Grozny		145·0	299	19 56	[+17]	—	—	—	—	—
Erevan		145·9	294	19 58	[+17]	22 52	PKS	—	—	—
Leninakan		146·4	295	20 11	[+30]	—	—	—	—	—
Piatigorsk		146·9	301	i 19 59	[+17]	—	—	—	—	—
Moscow		147·2	324	i 19 44	[+ 1]	—	—	—	—	—
Sotchi	N.	149·3	301	e 19 55	[+ 9]	—	—	—	—	—
Helsinki		149·8	339	e 20 2	[+15]	—	—	—	—	e 70·9
Ksara		152·1	279	i 19 54 a	[+ 3]	—	—	e 23 38	PP	—
Theodosia	N.	152·2	304	20 8	[+17]	—	—	—	—	—
Simferopol	N.	153·2	305	i 20 7	[+15]	—	—	—	—	—
Yalta		153·2	303	i 20 4	[+12]	—	—	—	—	—
Helwan		155·0	268	19 55	[+ 1]	23 22	SKP	24 10	PP	—
Copenhagen		157·1	346	20 27	[+30]	—	—	—	—	—
Warsaw		157·2	331	e 19 55	[− 2]	—	—	e 20 13	PKP_2	e 67·9
Istanbul		157·6	297	i 15 55?	?	—	—	—	—	—
Collmberg	Z.	160·9	341	e 20 4	[+ 2]	—	—	e 24 23	PP	—
Jena		161·6	341	e 20 34	[+32]	—	—	e 20 48	PKP_2	—
Belgrade		162·2	313	e 20 3	[0]	—	—	e 24 50	PP	—
Cheb		162·2	341	—	—	e 36 55	?	e 45 27	SSP	—
Stuttgart	Z.	164·3	342	e 20 3	[− 2]	e 30 12	?	e 24 50	PP	—
Strasbourg		164·7	345	e 21 15	PKP_2	—	—	—	—	e 78·3
Paris		165·1	359	i 20 7 a	[+ 1]	—	—	e 24 49	PP	e 87·9
Triest		165·3	326	—	—	i 34 56	PSKS	i 51 4	SSS	e 85·9
Zürich		165·7	342	e 20 3	[− 3]	—	—	e 24 52	PP	—
Basle		165·8	345	e 21 4	PKP_2	—	—	—	—	—
Clermont-Ferrand		168·2	357	i 20 9	[+ 1]	i 24 17	SKP	i 20 52	PKP_2	86·9
Rome		168·6	317	e 19 55?	[−13]	—	—	—	—	—
Toledo		172·2	38	e 20 15	[+ 5]	—	—	25 32	PP	—
Malaga	Z.	173·9	60	i 20 14 k	[+ 3]	27 14	[+ 1]	i 21 24	PKP_2	89·3
Almeria		175·2	51	i 20 10	[− 2]	27 6	[− 7]	21 42	PKP_2	—

Additional readings :—
Riverview i = 5m.38s.k, iZ = 6m.0s. and 6m.20s., iN = 10m.11s., eQN = 10m.55s., iSSN = 11m.13s.
Brisbane iN = 10m.17s., eE = 11m.10s.
Honolulu ePPP = 12m.59s.
Antarctica eSS = 25m.4s.
Batavia eSSEN = 26m.29s.
Pasadena iZ = 13m.18s., 14m.16s., and 14m.43s., ePPNZ = 16m.19s., eE = 24m.43s.
Mount Wilson i = 12m.55s., iPPZ = 16m.22s.
Palomar iNZ = 12m.57s.
Berkeley iZ = 13m.1s., 13m.11s., and 13m.42s., iPPZ = 17m.5s., iSKSE = 23m.53s.
Riverside iZ = 14m.16s., iPPZ = 16m.19s.
Vladivostok iS_cS = 23m.39s.
Tinemaha iZ = 13m.8s., 14m.16s., and 14m.31s., ePKKPZ = 30m.34s.
Tucson ePP = 16m.50s., eS = 24m.22s., ePS = 25m.12s., eSS = 30m.36s.
La Plata E. PPS = 27m.8s., SS? = 32m.47s., Q = 42m.49s.
La Plata N. 26m.49s., 38m.14s., 46m.14s.

Continued on next page.

Huancayo ePPS = 26m.30s., eSS = 31m.5s.
Victoria eN = 23m.43s.
La Paz iE = 20m.17s., iPSN = 26m.23s., iPPSN = 27m.3s., iSSN = 31m.35s.
St. Louis i = 28m.57s.
Columbia ePPS = 30m.27s.
Bombay SKSE = 26m.6s., PSE = 29m.56s., PPSE = 31m.12s., SSE = 36m.36s., SSPE = 37m.6s., SSS?E = 41m.12s.
San Juan i = 33m.11s., iPSPS? = 36m.46s.
Ottawa SSE = 37m.27s.
Helwan PKP_3 = 20m.31s., SKKS = 30m.55s.
Collmberg iZ = 20m.47s., $iPKP_3Z$ = 21m.0s.
Cheb e = 52m.32s.
Stuttgart $ePKP_3Z$ = 20m.57s. and 21m.12s.
Paris e = 20m.25s., $ePKP_3$ = 21m.0s.?
Zürich e = 21m.4s.
Malaga PPZ = 25m.44s., PPPZ = 29m.22s., SKKSZ = 32m.18s.
Almeria PP = 25m.30s., PPP = 29m.18s., SKKS = 32m.6s., SS = 46m.30s.
Long waves were also recorded at Tananarive and at other North American and European stations..

Jan. 20d. 20h. 17m. 2s. Epicentre 20°·4S. 177°·8W. Depth of focus 0·060.

A = −·9373, B = −·0360, C = −·3466; δ = −4; h = +5;
D = −·038, E = +·999; G = +·346, H = +·013, K = −·938.

		△	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Apia		8·7	48	e 2 4	0	3 32	−10	—	—
Tuai		18·9	193	3 51	− 2	6 58	− 4	i 7 19	?
New Plymouth		19·9	198	4 6	+ 3	7 28	+ 9	—	—
Wellington		21·8	196	4 20	− 1	7 50	− 1	i 8 3	?
Brisbane	N.	27·5	250	i 5 14	+ 2	i 9 27	+ 4	e 6 33	PP
Riverview		30·6	237	i 5 39k	0	i 10 12	+ 1	i 13 2	SSS
Santa Barbara		77·6	47	i 11 12a	− 1	—	—	i 12 49	pP
La Jolla		78·4	49	i 11 14a	− 3	—	—	i 12 48	pP
Pasadena		78·5	48	i 11 17a	− 1	—	—	i 12 49	pP
Mount Wilson		78·6	48	i 11 18a	0	—	—	i 12 54	pP
Fresno	Z.	78·9	44	i 11 20	0	—	—	i 14 24	PP
Palomar		78·9	49	i 11 19a	− 1	—	—	i 12 53	pP
Riverside		78·9	48	i 11 20a	0	—	—	i 12 54	pP
Shasta Dam		79·6	40	i 11 23	− 1	—	—	—	—
Haiwee	Z.	79·7	46	i 11 23a	− 1	—	—	i 13 0	pP
Tinemaha		80·1	45	i 11 26a	0	—	—	i 13 4	pP
Boulder City		81·8	47	i 11 34	− 1	e 21 17	+ 4	—	—
Pierce Ferry		82·4	48	i 11 38	0	—	—	—	—
Tucson		82·7	52	i 11 40a	0	—	—	e 11 49	PcP
Grand Coulee		86·0	36	i 11 54	− 2	—	—	i 13 32	pP
Hungry Horse		89·0	37	i 12 10	0	—	—	e 13 49	pP
Copenhagen		143·9	351	18 46	[− 1]	—	—	—	—
Warsaw	Z.	145·0	340	e 18 50	[+ 1]	—	—	e 20 36	pPKP
Potsdam	Z.	147·0	348	i 18 54	[+ 2]	—	—	—	—
Collmberg	Z.	148·0	348	i 18 53	[− 1]	—	—	i 20 48	pPKP
Jena		148·6	348	e 18 55	[0]	—	—	e 19 0	PKP
Stuttgart	Z.	151·1	351	e 18 58	[0]	—	—	—	—
Paris		151·7	0	e 19 0	[+ 1]	—	—	—	—
Basle		152·6	352	e 19 1	[+ 1]	—	—	e 19 20	PKP_3
Zürich		152·6	352	e 19 0	[0]	—	—	—	—
Clermont-Ferrand		154·7	358	e 19 4	[+ 1]	—	—	i 19 31	PKP_3

Additional readings :—
New Plymouth i = 5m.13s. and 6m.32s.
Brisbane iPP?N = 5m.41s., iN = 5m.49s., 6m.6s., 6m.14s., and 6m.45s., iE = 15m.27s.
Riverview iS_cSE = 15m.28s.
Pasadena eZ = 13m.40s., iZ = 14m.20s.
Mount Wilson iP_cPZ = 11m.28s., eZ = 14m.14s.
Fresno iPPZ = 12m.54s.
Palomar iZ = 14m.23s.
Riverside eZ = 14m.24s.
Grand Coulee eP_cP = 12m.5s., ePP = 15m.19s.
Hungry Horse iPP = 15m.44s., ePKKP = 29m.47s.
Collmberg iZ = 19m.0s., 19m.29s., and 19m.39s.
Stuttgart iZ = 19m.5sa, eZ = 19m.14s.
Paris iPKP = 19m.6s., i = 19m.16s.

Jan. 20d. Readings also at 0h. (Hungry Horse), 1h. (Bogota), 2h. (La Paz and near Murgab), 5h. (Auckland), 6h. (Pasadena, Mount Wilson, Riverside, Palomar, Tinemaha, Tucson, Boulder City, Pierce Ferry, and Shasta Dam), 9h. (Auckland and Batavia), 10h. (Stuttgart, near Clermont-Ferrand, Neuchatel, Zürich, and Basle), 11h. (Rome, Hungry Horse, and Tucson), 13h. (Tinemaha and Tucson (3)), 15h. (Tacubaya, Tucson, La Paz, and Vladivostok), 16h. (Palomar, Tinemaha, Hungry Horse, Pierce Ferry, and Shasta Dam), 17h. (Toledo), 18h. (near Erevan, Grozny, and Leninakan), 19h. (Auckland, Arapuni, and Wellington), 20h. (Pierce Ferry, Tucson, Bombay, Calcutta, Kodaikanal, Almata, Tashkent, and near Andijan), 22h. (Fresno).

Jan. 21d. 18h. 19m. 18s. Epicentre 10°·2N. 70°·2W.

A = +·3334, B = −·9262, C = +·1760; δ = −2; h = +7;
D = −·941, E = −·339; G = +·060, H = −·166, K = −·984.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bogota		6·8	215	i 1 39	− 5	i 3 15	+12	—	—	—
Port au Prince		8·6	345	—	—	i 3 55	+ 7	i 4 17	S*	—
San Juan		9·0	25	e 2 1	−12	e 3 34	−24	e 2 17	P	e 4·1
Balboa Heights		9·3	263	e 2 19	+ 2	i 3 58	− 7	—	—	—
Fort de France		9·9	62	e 2 18	− 7	e 4 7	−13	—	—	—
Huancayo		22·7	192	i 5 2	− 2	e 9 2	− 7	i 5 7	P	e 10·7
La Paz		26·6	174	i 5 42	0	i 10 30	+14	i 16 32	S_cS	13·4
Florissant		33·7	332	e 6 51	+ 6	—	—	—	—	e 15·4
Temiskaming		37·1	351	e 7 14a	0	—	—	—	—	—
Kirkland Lake		38·7	350	e 7 28a	+ 1	—	—	—	—	—
Tucson		43·4	307	i 8 6	0	—	—	i 9 55	PP	—
Pierce Ferry		47·3	311	i 8 37	0	—	—	—	—	—
Boulder City		47·8	310	i 8 41	0	—	—	—	—	—
Palomar		48·5	306	i 8 46	0	—	—	—	—	—
Riverside	z.	49·2	307	i 8 51	− 1	—	—	—	—	—
Mount Wilson	z.	49·8	307	e 8 55	− 1	—	—	e 9 4	?	—
Pasadena	z.	49·8	307	i 8 55	− 1	—	—	—	—	—
Haiwee	z.	50·3	310	i 9 6	+ 6	—	—	—	—	—
Tinemaha	z.	50·8	310	i 9 4	0	—	—	i 9 12	P	—
Santa Barbara	z.	51·1	306	e 9 10	+ 4	—	—	—	—	—
Fresno		51·9	310	i 9 11	− 1	—	—	e 9 17	P	—
Hungry Horse		52·8	325	e 9 20	+ 1	—	—	—	—	—
Shasta Dam		55·0	313	e 9 32	− 3	—	—	—	—	—
Grand Coulee		55·5	323	i 9 37	− 2	—	—	—	—	—
Paris		71·0	42	e 11 19	− 3	—	—	—	—	—
Clermont-Ferrand		71·1	45	e 10 59	?	—	—	i 11 29	P	—
Basle		74·3	43	e 12 9	+28	—	—	—	—	—
Zürich		75·0	44	e 11 46	+ 1	—	—	—	—	—
Stuttgart	z.	75·4	42	e 11 44	− 3	—	—	e 11 50	P	—

Additional readings :—
San Juan e = 2m.36s.
La Paz iSSN = 12m.5s., SSSN = 12m.31s.
Tucson e = 8m.30s. and 8m.54s.
Pasadena iZ = 9m.27s., eZ = 11m.31s.
Clermont-Ferrand i = 11m.49s., e = 13m.23s.
Stuttgart eZ = 16m.0s.
Long waves were recorded at Columbia and Bermuda.

Jan. 21d. Readings also at 0h. (Pierce Ferry and La Plata), 2h. (near Erevan and Leninakan), 3h. (Mount Wilson, Palomar, Tucson, Tinemaha, Pierce Ferry, and Shasta Dam), 8h. (Antarctica, Stalinabad, near Murgab and Obi-garm), 9h. (Ksara, Tacubaya, Auckland, Brisbane, and Wellington), 11h. (near Tacubaya (2), and near Stalinabad), 12h. (Auckland), 14h. (near Apia), 15h. (near Apia), 16h. (Huancayo, La Paz (2), and La Plata), 17h. (Mount Wilson, Palomar, Pasadena, Riverside, Tinemaha, and Tucson), 19h. (Stuttgart and near Ottawa), 20h. (near Istanbul), 21h. (Tucson (2), Pierce Ferry (3), and Auckland), 22h. (Haiwee, Mount Wilson, Palomar, Pasadena, Riverside, Santa Barbara, Tinemaha, Fresno, Hungry Horse, Grand Coulee, Pierce Ferry, Shasta Dam, Tucson, Huancayo, Antarctica, and Auckland).

Jan. 22d. 13h. 55m. 18s. Epicentre 22°·3S. 176°·8W. Depth of focus 0·010.

$A = -·9246$, $B = -·0517$, $C = -·3773$; $\delta = -9$; $h = +5$;
$D = -·056$, $E = +·998$; $G = +·377$, $H = +·021$, $K = -·926$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		9·7	30	2 18	0	3 54	−12	—	—	5·0
Auckland		16·2	205	3 44	+ 1	6 41	+ 2	4 7	pP	—
Arapuni		17·0	200	4 30	PPP	7 30	SSS	—	—	—
Tuai		17·3	196	3 54	− 3	6 49	−15	15 34	S_eS	—
New Plymouth		18·5	202	4 10	− 1	7 29	− 1	i 4 33	PP	—
Wellington		20·2	199	4 26	− 3	7 47	−18	5 6	pP	—
Christchurch		22·9	200	—	—	8 51	− 3	—	—	15·4
Brisbane		27·8	253	i 5 42	0	i 10 13	− 3	i 6 25	PP	i 12·6
Riverview		30·4	240	i 6 6k	+ 1	i 10 55	− 2	i 6 36	pP	13·7
Honolulu		47·1	24	e 8 16	− 8	e 15 6	− 2	e 18 9	SS	—
Perth		59·9	245	i 11 27	?	i 17 58	− 2	—	—	—
Batavia	Z.	75·1	269	i 6 31	?	—	—	—	—	23·7
Antarctica		76·5	158	i 11 40	− 1	i 21 13	− 4	i 12 16	pP	e 35·2
Santa Barbara		78·3	45	i 11 52k	+ 1	i 21 41	+ 4	i 12 30	pP	—
Santa Clara		78·6	42	e 11 54	+ 1	e 21 48	+ 8	e 12 33	pP	—
San Francisco	E.	78·6	42	e 11 54	+ 1	e 21 42	+ 2	—	—	—
Lick		78·8	42	i 11 56	+ 2	e 21 45	+ 3	—	—	—
Berkeley		78·8	42	i 11 54	0	e 21 43	+ 1	i 12 33	pP	e 34·9
Ukiah		79·0	39	—	—	i 21 51	+ 7	e 26 52	SS	e 33·2
La Jolla		79·0	47	i 11 56k	+ 1	i 21 46	+ 2	i 12 30	pP	—
Mount Wilson		79·2	46	i 11 56k	0	—	—	i 12 33	pP	—
Pasadena		79·2	46	i 11 56k	0	i 21 43	− 3	i 12 31	pP	e 40·0
Palomar		79·5	47	i 11 58k	0	e 21 50	0	i 12 33	pP	i 42·2
Riverside		79·5	46	i 11 59k	+ 1	i 21 53	+ 3	i 12 36	pP	—
Fresno		79·6	43	i 11 58	0	i 21 53	+ 2	i 15 22	PP	—
Vladivostok		80·4	324	i 12 2	0	i 22 1	+ 2	i 12 35	pP	—
Haiwee		80·4	44	i 12 2k	0	e 22 3	+ 4	i 12 41	pP	—
Shasta Dam		80·5	38	i 12 4	+ 1	e 22 2	+ 2	i 12 38	pP	—
Tinemaha		80·8	44	i 12 5k	+ 1	i 22 7	+ 4	i 12 42	pP	—
Boulder City		82·4	46	i 12 13	0	e 22 23	+ 4	—	—	—
Pierce Ferry		83·0	47	i 12 17	+ 1	—	—	—	—	—
Tucson		83·1	51	i 12 18k	+ 2	e 22 29	+ 3	i 12 56	pP	—
Victoria		85·1	32	—	—	i 22 36	[− 2]	—	—	34·7
Tacubaya	E.	86·4	67	e 15 5	?	e 22 57	− 2	e 22 50	SKS	—
Sitka		86·8	21	—	—	i 23 0	− 2	i 24 6	PS	e 40·9
Salt Lake City		87·0	43	e 13 18	+42	i 22 56	[+ 5]	i 24 11	PS	e 36·2
Grand Coulee		87·0	35	i 12 36	0	e 23 5	+ 1	e 13 14	pP	—
Logan		87·6	42	e 12 36	− 2	i 23 10	0	i 13 13	pP	e 35·9
Spokane		87·7	36	e 13 19	pP	i 23 14	+ 3	i 24 20	sS	—
Vera Cruz		88·9	69	i 12 29	−16	i 23 8	[+ 5]	i 13 8	pP	—
Butte	N.	89·4	38	—	—	e 24 9	sS	i 24 31	PS	e 37·3
College		89·7	11	e 12 44	− 4	i 23 24	− 6	e 24 31	sS	e 37·1
Hungry Horse		89·9	36	i 12 50	+ 1	e 23 9	[0]	i 13 29	pP	—
Bozeman		90·1	39	e 13 30	+40	e 23 13	[+ 3]	e 24 37	sS	—
Rapid City	E.	94·2	43	e 13 10	+ 1	i 23 36	[+ 2]	e 25 18	PS	—
Huancayo		95·8	105	i 13 19	+ 3	e 23 44	[+ 1]	e 13 59	pP	e 41·2
Lincoln	E.	97·2	49	—	—	i 23 47	[− 3]	i 24 43	S	—
La Paz		100·2	112	e 13 12a	−24	i 24 2	[− 3]	i 17 44	PP	49·9
Irkutsk		100·8	322	13 39	0	25 5	0	i 24 4	SKS	—
Florissant		101·0	53	e 13 41	+ 1	i 24 8	[− 1]	i 14 19	pP	—
Calcutta	E.	102·5	289	e 13 55	+ 8	i 24 27	[+11]	i 17 55	PP	—
Bogota		103·5	90	e 18 23	PP	i 24 19	[− 1]	e 18 39	pPP	49·7
Chicago		103·9	50	—	—	e 24 18	[− 4]	e 32 54	SS	e 49·8
Colombo	E.	104·9	271	17 1	?	24 24	[− 3]	(32 46)	SS	32·8
Columbia		106·7	59	—	—	e 25 58	+ 4	e 24 31	SKS	e 47·8
Kodaikanal	E.	108·3	274	e 17 42	?	—	—	—	—	—
Hyderabad	N.	109·7	281	e 18 50	PP	24 43	[− 4]	28 26	PS	—
Kirkland Lake		110·7	45	e 19 0	PP	—	—	—	—	—
Philadelphia		112·6	55	—	—	i 25 0	[+ 1]	i 34 53	SS	—
Fordham		113·8	54	e 19 19	PP	i 25 5	[+ 1]	e 19 53	pPP	51·8

Continued on next page,

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bombay		115·3	281	e 19 37	PP	i 25 21	[+11]	29 22	PS	—
San Juan		115·4	79	e 19 22	PP	e 25 7	[− 3]	e 26 1	SKKS	—
Frunse		118·2	308	e 19 56	PP	25 19	[− 1]	—	—	—
Bermuda		119·7	64	e 20 57	PP	e 25 40	[+14]	e 36 32	SS	e 50·8
Andijan		119·7	305	e 18 41	[+ 2]	25 26	[0]	—	—	—
Obi-garm		121·6	303	i 18 46	[+ 4]	—	—	—	—	—
Tashkent		122·1	306	e 18 43	[0]	i 25 32	[− 1]	28 54	sS	—
Stalinabad		122·3	303	i 18 46	[+ 2]	e 36 35	SS	19 29	pPKP	—
Sverdlovsk		126·1	325	i 18 51	[0]	i 25 45	[− 1]	i 20 42	PP	—
Baku		136·8	306	e 19 19	[+ 8]	e 32 9	PS	e 22 59	PP	—
Moscow		138·0	332	i 19 14	[0]	i 23 45	PKS	i 22 0	PP	—
Grozny		139·1	311	e 19 9	[− 6]	—	—	e 23 49	PKS	—
Helsinki		139·2	344	e 22 51	PKS	e 26 14	[0]	e 32 34	PS	—
Upsala		141·1	349	e 19 4	[−15]	(e 40 42)	SS	i 22 55	PKS	e 40·7
Leninakan		141·2	308	e 19 18	[− 1]	—	—	—	—	—
Theodosia	N.	145·3	319	i 19 30	[+ 3]	—	—	—	—	—
Copenhagen		146·0	351	i 19 30	[+ 2]	—	—	—	—	—
Simferopol	N.	146·1	320	i 19 31	[+ 3]	—	—	i 19 43	pPKP	—
Yalta		146·3	318	i 19 25	[− 3]	—	—	i 22 53	PP	—
Warsaw		147·1	341	e 19 30k	[0]	41 53	SS	i 22 55	PP	—
Potsdam		149·0	350	e 19 35	[+ 2]	i 29 50	SKKS	i 20 15	pPKP	—
Ksara		149·1	299	i 19 36k	[+ 3]	—	—	i 20 14	pPKP	—
Raciborzu		149·9	342	e 19 37	[+ 3]	—	—	—	—	—
Collmberg	Z.	150·1	349	i 19 37	[+ 3]	—	—	20 27	pPKP	—
De Bilt		150·2	358	i 19 43s	[+ 9]	e 43 24	SSP	—	—	—
Jena		150·7	349	e 19 38	[+ 3]	—	—	e 19 45	PKP_2	—
Kew		150·7	4	—	—	e 34 42	SKSP	—	—	—
Prague		150·9	345	e 19 40?	[+ 5]	e 26 42	[+11]	e 23 12	PP	—
Istanbul		151·4	318	e 19 6	[−30]	—	—	27 12	PPP	—
Uccle		151·5	359	e 19 40	[+ 4]	e 42 42	SS	—	—	—
Budapest		151·8	338	19 44	[+ 7]	(e 31 12)	SKKS	—	—	e 31·2
Kalossa		152·6	337	e 19 22	[−16]	—	—	e 19 48	PKP_2	—
Stuttgart		152·7	352	e 19 40k	[+ 2]	e 30 13	SKKS	e 20 22	pPKP	e 49·7
Belgrade		153·4	332	i 19 39	[0]	—	—	e 22 52	PP	—
Paris		153·5	1	i 19 40	[+ 1]	e 43 35	SS	e 20 30	pPKP	—
Strasbourg		153·5	353	i 19 40	[+ 1]	e 42 42	SS	i 20 13	pPKP	—
Helwan		153·7	293	19 40	[+ 1]	26 21	[−14]	20 19	pPKP	—
Basle		154·6	354	e 19 42	[+ 1]	30 0	SKKS	i 20 6	pPKP	—
Zürich		154·6	353	e 19 41k	[0]	e 30 13	SKKS	i 20 21	pPKP	—
Besançon		155·0	356	e 20 9	[−32]	—	—	—	—	—
Chur		155·0	350	e 19 42k	[+ 1]	—	—	e 20 8	pPKP	—
Triest		155·2	344	i 19 58	PKP_2	—	—	i 21 0	pPKP	—
Neuchatel		155·2	354	e 19 43	[+ 2]	—	—	e 20 9	pPKP	—
Clermont-Ferrand		156·6	0	i 19 45	[+ 2]	—	—	i 24 49	sPP	—
Rome		159·0	342	e 19 47	[+ 1]	e 30 4	SKKS	i 20 26	pPKP	e 73·7
Toledo		161·4	18	i 19 51	[+ 2]	—	—	27 59	PPP	—
Alicante		163·7	11	19 49	[− 2]	26 27	[−17]	24 11	PP	e 69·5
Granada		164·0	21	i 20 24s	PKP_2	44 58	SS	28 24	PPP	—
Malaga	Z.	164·2	23	i 19 53s	[+ 1]	37 59	PPS	i 20 49	PKP_2	74·1
Almeria		164·7	17	i 19 52	[0]	26 48	[+ 3]	24 16	PP	69·7

Additional readings :—
Auckland sP = 4m.29s., i = 4m.50s., 5m.5s., 5m.35s., 6m.47s., and 7m.14s., sS = 7m.35s., P_cP? = 8m.3s., i = 8m.44s., 9m.3s., 9m.47s., 10m.28s., and 10m.58s., S_cP = 11m.46s.
New Plymouth i = 4m.13s., 5m.24s., 7m.53s., and 7m.56s.
Wellington sPZ = 5m.26s., i = 5m.33s., sPP = 5m.55s., sS = 9m.2s., S_cP = 11m.27s., S_cSZ = 15m.37s., sS_cS = 16m.34s., S_cS,S_cS = 28m.22s.
Brisbane iE = 6m.32s., iSSN = 11m.13s., iEN = 11m.51s.
Riverview iZ = 6m.46s., isPEZ = 6m.57s., iPP = 7m.12s., iP_cPE = 9m.0s., isSE = 11m.56s., iS_cPN = 12m.16s., iZ = 12m.34s., iSSN = 12m.48s., iSSSN = 13m.18s., iS_cS? = 16m.32s.
Honolulu e = 9m.24s.
Antarctica iPP = 14m.32s., esS = 22m.13s., e = 24m.38s., eSS = 25m.20s.
Santa Clara esSE = 22m.50s.
Berkeley iP_cPE = 12m.4s., iN = 13m.5s., iNZ = 22m.11s.
Ukiah eSSS? = 30m.12s.

Continued on next page.

Mount Wilson e =13m.28s.
Pasadena iP_cPZ =12m.3s., iZ =12m.47s., eSZ =21m.35s., eSSN =27m.0s., eSSSE = 30m.18s., eQ =33m.24s., ePKP,PKPZ =38m.55s., epPKP,PKPZ =39m.31s.
Palomar iZ =12m.6s., 12m.24s., and 12m.50s., iSN =21m.53s., ePKP,PKP =38m.52s., iZ =39m.36s.
Riverside i =12m.20s., iPKP,PKPZ =39m.3s., eZ =39m.30s.
Fresno iZ =12m.37s., iN =12m.41s.
Haiwee iZ =12m.12s., ePKP,PKP =38m.45s., eZ =39m.33s.
Tinemaha ePKP,PKPZ =38m.38s.
Tucson esP =13m.12s., ePP =15m.31s., epPP =15m.58s., isPP =16m.16s., esS =22m.56s. iPS =23m.20s., epPS =23m.36s., ePKKP =30m.38s., ePKP,PKP =38m.50s.
Tacubaya ePSE? =23m.47s., eE =24m.48s.
Salt Lake City eSS =28m.50s.
Grand Coulee ePKP,PKP =38m.36s.
Logan isP =13m.33s., iPP =16m.2s., epPP =16m.35s., esPP =16m.56s., eSKS = 22m.55s., ePS =24m.10s.
Spokane eSKS =22m.58s., esSKS =24m.4s.
Vera Cruz eSKSN =22m.32s., iSE =22m.48s.
Hungry Horse eS =23m.38s., ePS =24m.2s.
Bozeman iS =23m.37s., epS =24m.25s., esPS =25m.23s., eSS? =28m.53s.
Rapid City eS =24m.14s., eSS =30m.30s.
Huancayo ePP =17m.22s., iS =24m.35s., ePS =25m.53s.
Lincoln eSKKS =24m.17s., eSS =31m.19s.
La Paz iPZ =13m.39s., iZ =14m.14s. and 18m.14s., iPPPZ =19m.42s., iSKKS =25m.4s., PS =26m.48s., PPS =27m.32s., iSSEN =32m.2s.
Irkutsk ePP =17m.31s., PS =26m.44s., PPS =27m.35s., eSS =31m.4s.
Florissant iPPZ =17m.50s., ipPPZ =18m.20s., iSKKSE =24m.44s., iS =25m.13s.
Calcutta iE =18m.33s. and 24m.57s., iSE =25m.27s., PPSE =27m.57s., SSE =32m.18s., SSPE =32m.42s., SSSE =36m.33s.
Bogota ePSN =27m.59s.
Chicago iS =25m.9s., i =25m.35s., iPS =26m.50s., ipPS =27m.37s., ePPS =27m.55s., eSSS? =37m.50s.
Columbia eSS =33m.1s.
Hyderabad SKKSN =25m.41s.
Philadelphia iS =26m.49s., ePS =29m.13s.
Fordham iS =27m.3s., iSS =35m.3s.
Bombay PPPE =21m.52s., iE =26m.7s., PPSE =30m.12s., SSE =35m.22s., SSPE = 36m.17s., SSSE =39m.52s.
San Juan ePPP? =22m.12s., eS =27m.15s., ePS =28m.58s.
Bermuda ePS =29m.33s., ePPS =30m.38s.
Tashkent ePP =20m.11s., ePPP =23m.4s.?, SKKS =26m.23s., ePS =30m.12s.
Stalinabad iPP =20m.19s., pPP =20m.53s., PS =30m.19s.
Sverdlovsk ipPP =21m.18s., sPP =21m.31s., SKKS =26m.50s., PPS =32m.2s., SS = 37m.30s.
Moscow i =19m.54s., ipPP =22m.36s.
Helsinki e =23m.4s., 23m.48s. and 29m.56s., eSKKS =35m.28s., e =35m.52s. and 37m.25s.
Upsala eN =28m.59s.
Copenhagen e =20m.7s. and 20m.12s.
Warsaw iPZ =19m.33s., iZ =20m.11s., 20m.48s., 21m.22s., 21m.49s., 22m.9s., and 23m.26s., eE =23m.57s., PPPZ =25m.58s., ePPPE =26m.5s., iZ =27m.6s., eE = 27m.48s. and 30m.6s., $ePPP_2$?E =34m.2s., $ePPP_2$?Z =34m.9s., eE =36m.36s. and 42m. 55s.
Potsdam iPKPNZ =19m.38s.k, $iPKP_2NZ$ =19m.57s., ipPKP?E =20m.18s., isPKPE = 20m.59s., iZ =22m.54s., iPPPZ =26m.59s., iN =31m.0s., iZ =33m.16s., iN=33m.19s.
Raciborzu e =19m.45s., eE =23m.55s. and 24m.54s.
Collmberg PPZ =23m.17s.
Prague e =29m.12s., eSKKS =30m.3s., eSS =42m.42s.?, eSSS =49m.12s.
Uccle iZ =19m.44s., eEN =39m.42s.
Budapest iN =20m.34s.
Kalossa eN =20m.40s., eE =20m.46s.
Stuttgart iZ =19m.48s.k and 20m.0s.a, eZ =20m.28s.
Belgrade eS =29m.42s.
Paris ePKP =19m.47s., $iPKP_2$ =19m.58s. and 20m.2s., epPKP =20m.27s. and 20m.34s., iPP =23m.32s., epPS =35m.27s., ePPS =36m.59s.
Strasbourg $iPKP_2$ =20m.2s., isPKP =20m.30s., ePP =23m.27s.
Helwan PKP_2 =20m.32s., $pPKP_2$ =21m.12s., PP =24m.10s., pPP =24m.34s., PPP = 27m.52s.
Zürich ePP =23m.33s.
Clermont-Ferrand $iPKP_2$ =20m.15s., eSS =42m.42s.
Rome $iPKP_2Z$ =20m.40s., iPPZ =24m.6s., ePSKS =34m.54s., eSS =35m.52s., eSSS = 51m.42s.?
Alicante PKP_2 =20m.41s., SS =42m.51s., SSS =49m.45s., Q =66m.11s.
Granada PP =25m.6s., PPS =37m.36s.
Malaga iPPZ =24m.37s., PPPZ =28m.23s., QZ =65m.15s.
Almeria PKP_2 =20m.40s., PKS =23m.20s., PPP =28m.2s., SKKS =31m.7s., PPS = 37m.32s., SS =54m.20s.

Jan. 22d. 20h. 9m. 55s. Epicentre 27°·5S. 70°·5W. (as on 1947, Feb. 2d.).

Intensity VI-VII between latitudes 28° and 29°S. Macroseismic radius 300km. Boletin del año 1948. Instituto sismologico, Santiago p. 6.

$A = +·2965$, $B = -·8373$, $C = -·4593$; $\delta = -6$; $h = +3$;
$D = -·943$, $E = -·334$; $G = -·153$, $H = +·433$, $K = -·888$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
La Paz		11·2	12	i 2 48	+ 4	i 5 5	SS	i 5 30	SSS	i 6·6
La Plata		13·0	128	3 7	− 2	5 29	− 6	—	—	6·0
Huancayo		16·1	342	e 3 57	+ 8	e 7 5	SS	e 4 11	PPP	e 9·4
Bogota	Z.	32·1	354	e 6 30	− 1	—	—	—	—	—
Antarctica		40·8	177	e 7 35	−10	e 13 42	−14	e 16 54	SS	e 19·1
Fort de France		42·9	15	e 8 21	+19	—	—	—	—	—
Tacubaya	E.	54·3	327	i 9 34	+ 4	—	—	—	—	—
Tucson		70·7	325	i 11 20a	0	—	—	i 11 32	PcP	—
Temiskaming		74·2	355	i 11 42	+ 2	—	—	—	—	—
La Jolla	Z.	74·7	321	e 11 44a	+ 1	—	—	—	—	—
Palomar	Z.	74·8	322	i 11 44a	0	—	—	i 12 1	PcP	—
Pierce Ferry		75·4	325	i 11 47	0	—	—	—	—	—
Riverside	Z.	75·6	322	i 11 47a	− 1	—	—	i 12 3	PcP	—
Boulder City		75·7	325	i 11 48	− 1	—	—	—	—	—
Kirkland Lake		75·8	354	e 11 50	0	—	—	—	—	—
Pasadena	Z.	76·1	322	i 11 50a	− 1	—	—	i 12 3	PcP	—
Mount Wilson	Z.	76·1	322	i 11 51a	0	—	—	i 12 0	PcP	—
Santa Barbara	Z.	77·2	320	i 12 2a	+ 5	—	—	—	—	—
Haiwee	Z.	77·5	323	i 11 59a	0	—	—	—	—	—
Tinemaha		78·4	323	i 12 3a	− 1	—	—	i 12 16	PcP	—
Fresno		78·9	323	e 12 5	− 2	—	—	—	—	—
Shasta Dam		83·3	324	i 12 27	− 3	—	—	i 12 40	PcP	—
Grand Coulee		86·8	330	e 12 46	− 1	—	—	i 13 3	PcP	—
Cheb		106·3	41	—	—	e 30 5	?	—	—	—
Helwan		112·7	67	e 19 37	[+59]	e 30 17	PPS	—	—	—
Istanbul		115·3	55	e 13 24	?	—	—	—	—	e 57·1
Ksara		117·6	65	e 20 3	PP	e 30 10	PS	—	—	—

Additional readings :—
La Plata E = 3m.30s., N = 4m.23s., SN = 5m.26s.
Antarctica ePPP = 9m.30s., e = 10m.21s.
Palomar iZ = 12m.11s.
Riverside iZ = 11m.57s.
Pasadena iZ = 12m.7s.
Tinemaha iZ = 12m.20s.
Long waves were recorded at Bombay, Uccle, and De Bilt.

Jan. 22d. Readings also at 0h. (near Apia), 1h. (near Murgab), 2h. (Pierce Ferry and Antarctica), 6h. (Andijan, near Frunse and Almata), 11h. (Palomar, Pasadena, Riverside, Tinemaha, Pierce Ferry, and Tucson), 12h. (Nanking), 13h. (Haiwee, La Jolla, Mount Wilson, Palomar, Pasadena, Riverside, Santa Barbara, Tinemaha, Boulder City, Grand Coulee, Pierce Ferry, Shasta Dam, Tucson, Hungry Horse, Logan, Fresno, Brisbane, Stuttgart, and near Stalinabad), 14h. (Boulder City, Pierce Ferry (2), Hungry Horse, Fresno, Stuttgart, Chur, Basle, and near Zürich), 15h. (Huancayo (2) and near Mizusawa), 17h. (Istanbul (2), near Andijan, Samarkand, Tashkent, Murgab, Obi-garm, and Stalinabad), 18h. (Shasta Dam, near Andijan, and Murgab), 19h. (near Mineral, near Samarkand, Andijan, Murgab, Obi-garm, Stalinabad, and Tashkent), 20h. (Brisbane), 21h. (La Jolla, Mount Wilson, Riverside, Palomar, Pasadena, Tucson, Fresno, Boulder City, Grand Coulee, Pierce Ferry, and Shasta Dam), 23h. (near College and near Huancayo).

Jan. 23d. Readings at 0h. (Stuttgart), 2h. (Belgrade, Bucharest, and Istanbul), 3h. (Fresno), 5h. (near Andijan, Murgab, Obi-garm, Samarkand, Stalinabad, and Tashkent), 6h. (Bogota), 8h. (Mizusawa and near Almeria), 15h. (Kew), 17h. (Pierce Ferry and Tucson), 18h. (Mount Wilson, Palomar, Pasadena, Tinemaha, Boulder City, Pierce Ferry (2), Shasta Dam, Tucson, La Paz, and Huancayo), 19h. (Mount Wilson, Pasadena, Boulder City, Pierce Ferry, Brisbane, and Stuttgart), 20h. (Pierce Ferry), 21h. (Pierce Ferry and near Branner), 22h. (Andijan and near Stalinabad), 23h. (near Mineral).

Jan. 24d. 17h. 46m. 43s. Epicentre 10°·9N. 122°·1E.

Destructive on the Island of Panay (Philippines), especially at Ilo-Ilo and Jaro. Many casualties. Crevasses more than 100 metres long were formed, large landslides on the hillsides and the lower plantations, cracking of the principal water conduits, and destruction of fishing banks by sea action.
Epicentre 10°·5N. 122°·0E. (Gutenburg).

Seismological Notes, Bulletin of the Seismological Society of America, Vol. 38, No. 2, April, 1948, p. 154.

$A = -\cdot5219$, $B = +\cdot8320$, $C = +\cdot1879$; $\delta = -9$; $h = +6$;
$D = +\cdot847$, $E = +\cdot531$; $G = -\cdot100$, $H = +\cdot159$, $K = -\cdot982$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Kagosima		22·0	19	e 4 58	0	8 58	+ 2	—	—	11·2
Guam		22·3	81	i 6 59	?	—	—	—	—	—
Batavia	z.	22·8	223	i 5 5	0	i 9 3	− 8	i 9 32	SS	i 15·3
Hukuoka		23·8	18	5 15	0	9 28	0	—	—	10·9
Kôti		24·9	23	5 25	− 1	10 8	+21	—	—	—
Hirosima		25·2	20	5 15	−14	9 40	−12	—	—	13·5
Hamada		25·6	19	6 31	+59	11 3	+64	—	—	13·7
Kobe		26·5	25	e 5 38	− 3	10 25	+11	—	—	13·6
Kameyama		27·2	27	5 47	0	10 25	0	—	—	—
Nagoya		27·7	27	4 54	−58	9 8	−85	—	—	—
Shizuoka		28·2	29	5 54	− 2	10 34	− 7	—	—	—
Tokyo		29·4	29	6 3	− 4	11 1	0	—	—	14·7
Wazima		29·5	24	6 11	+ 3	10 46	−16	—	—	13·3
Sendai		32·0	29	6 29	− 1	11 16	−26	—	—	13·6
Mizusawa		32·8	28	6 37	0	e 13 54	SS	6 40	P	—
Vladivostok		33·2	13	i 6 39	− 1	i 12 5	+ 5	—	—	—
Morioka		33·3	27	6 40	− 1	12 3	+ 1	—	—	16·4
Calcutta	E.	34·2	294	i 6 50k	+ 1	i 12 9	− 7	i 8 5	PP	—
Sapporo		36·2	24	7 6	0	12 43	− 4	—	—	18·5
Nemuro		38·2	27	7 15	− 8	13 6	−11	—	—	17·7
Colombo	E.	41·9	268	7 51	− 3	14 9	− 4	—	—	24·3
Hyderabad	N.	42·7	284	e 8 0	0	14 25	+ 1	17 52	S_cS	21·2
Irkutsk		43·7	344	i 8 8	0	i 14 42	+ 3	—	—	—
Kodaikanal	E.	43·8	274	i 8 13	+ 4	i 14 53	+13	17 43	SS	18·6
Dehra Dun	N.	45·2	303	e 11 1?	PPP	i 17 28?	SS	i 20 47	Q	e 27·7
Bombay		48·1	286	i 8 49	+ 6	i 15 46	+ 4	10 53	PP	—
Brisbane		48·5	142	i 8 44	− 2	i 15 34	−14	i 10 49	PP	—
Almata		50·6	319	e 9 6?	+ 4	16 28	+11	—	—	—
Murgab		50·9	311	i 9 4?	− 1	i 15 58?	−23	—	—	—
Frunse		52·0	317	e 9 16	+ 3	16 39	+ 3	—	—	—
Riverview		52·3	149	i 9 14a	− 1	i 16 37	− 3	i 10 21	P_cP	23·8
Andijan		52·8	314	e 9 22	+ 3	e 16 54	+ 7	—	—	—
Obi-garm		54·1	310	i 9 30	+ 1	i 17 7	+ 2	—	—	—
Stalinabad		54·8	310	e 9 33	− 1	i 17 13	− 1	—	—	—
Tashkent		55·2	313	i 9 36?	− 1	i 17 27?	+ 7	—	—	—
Samarkand		56·4	310	i 9 46?	+ 1	i 17 37?	+ 1	—	—	—
Ashkabad		62·7	307	e 10 30	+ 1	i 19 1	+ 4	—	—	—
Sverdlovsk		65·5	329	i 10 44	− 3	i 19 30	− 2	—	—	—
Auckland		68·6	137	11 3	− 4	19 55	−14	13 47	PP	—
Baku		69·5	309	11 17	+ 5	—	—	—	—	—
Arapuni		69·8	138	11 17	+ 3	20 59	PS	13 35	PP	37·6
Apia		70·0	108	e 11 23	+ 8	e 21 8	PPS	e 24 47	SS	e 29·3
Wellington		71·0	140	11 12	−10	20 27	−10	13 57	PP	33·1
Tuai		71·2	138	11 29	+ 6	20 37	− 3	—	—	—
Grozny		72·7	312	11 31	− 1	20 45	−12	i 15 45	PPP	—
Erevan		73·6	309	e 11 38?	+ 1	i 21 12?	+ 5	12 18	P_cP	—
Leninakan		74·1	310	e 11 44	+ 4	21 16	+ 4	—	—	—
Piatigorsk		74·6	313	e 11 46	+ 3	21 16	− 2	—	—	—
Honolulu		77·0	70	e 11 52	− 4	21 38	− 7	e 14 59	PP	e 31·3
Sotchi	N.	77·1	313	—	—	e 21 45	− 1	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Moscow		78·0	325	i 11 59	− 3	i 21 49	− 6	—	—	—
Tananarive		79·2	249	i 12 0	− 8	i 22 2	− 6	22 44	PS	33·7
Theodosia	N.	80·1	314	e 12 14	+ 1	22 16	− 2	—	—	—
Ksara		80·9	303	i 12 17	0	i 22 28	+ 2	—	—	—
Simferopol	N.	81·0	314	12 19	+ 1	22 25	− 2	i 15 41	PP	—
Yalta		81·0	313	i 12 16	− 2	22 22	− 5	i 15 51	PP	—
Helsinki		84·2	331	i 12 32	− 2	e 22 53	− 6	e 15 57	PP	e 35·3
Istanbul		85·2	310	i 12 40	+ 1	23 4	[+ 2]	—	—	—
Helwan		85·3	299	i 12 39k	− 1	—	—	—	—	—
Bucharest		86·7	315	e 12 48	+ 1	i 23 12	[0]	i 23 27	S	41·3
Sitka		87·5	32	i 12 50	− 1	i 23 12	[− 5]	i 29 13	SS	i 36·7
Upsala		87·8	331	12 49a	− 3	23 16	[− 3]	e 16 17	PP	e 38·7
Warsaw		88·2	323	i 12 51a	− 3	i 23 22	[0]	i 24 38	PS	e 36·3
Belgrade		90·5	316	e 13 3	− 2	i 23 34	[− 2]	e 16 35	PP	e 45·2
Raciborzu		90·5	322	e 13 4	− 1	i 23 57	− 2	e 24 57	PS	e 39·4
Budapest		90·7	318	13 6	0	24 6	+ 5	23 34	SKS	37·8
Kalossa		91·0	318	e 13 15	+ 8	23 38	[− 1]	e 16 35	PP	e 34·3
Copenhagen		91·8	328	e 13 10a	− 1	23 42	[− 1]	25 15	PS	—
Prague		92·8	322	e 13 14	− 2	e 23 47	[− 2]	e 25 29	PS	e 40·3
Potsdam		92·8	325	i 13 14a	− 2	i 23 48	[− 1]	i 24 14	S	e 40·3
Collmberg		93·2	323	i 13 27?	+10	e 24 12	−11	e 17 29	PP	e 38·7
Cheb		94·0	322	e 13 18	− 3	e 23 54	[− 2]	e 25 42	PS	e 43·3
Jena		94·2	323	e 13 21	− 1	e 24 31	0	e 17 21	PP	e 44·0
Triest		94·8	318	e 13 34	+ 9	i 23 57	[− 3]	e 25 54	PS	—
Scoresby Sund		95·2	348	13 25	− 2	24 8	[+ 6]	17 8	PP	—
Stuttgart		96·4	322	e 13 29	− 3	e 24 52	+ 2	e 17 29	PP	e 43·3
Chur		97·0	320	e 13 32a	− 3	e 24 7	[− 5]	—	—	—
Rome		97·0	315	i 13 33a	− 2	e 24 5	[− 7]	e 24 47	S	e 45·3
De Bilt		97·3	327	i 13 34a	− 2	i 23 57	[−16]	e 31 50	SS	e 43·8
Strasbourg		97·4	323	i 13 35	− 2	i 24 9	[− 5]	i 26 22	PS	44·3
Zürich		97·4	321	e 13 35a	− 2	e 25 4	+ 5	e 17 28	PP	—
Victoria		97·5	38	13 35	− 2	24 11	[− 3]	17 35	PP	44·3
Basle		97·9	322	e 13 36	− 3	e 24 1	[−15]	e 17 43	PP	—
Aberdeen		98·2	333	i 13 40	0	i 24 16	[− 2]	i 31 48	SS	50·2
Johannesburg		98·3	246	e 17 5	PP	i 25 5	− 1	e 31 47	SS	i 41·5
Uccle		98·3	326	e 13 37?	− 4	i 24 17	[− 2]	e 32 9	SS	e 46·3
Seattle		98·5	38	—	—	e 25 39	+31	e 26 37	PS	e 39·1
Neuchatel		98·6	321	e 13 39	− 3	e 24 10	[−10]	—	—	—
Besançon		99·0	322	e 13 45	+ 1	e 24 20	[− 2]	e 17 47	PP	e 45·3
Durham		99·4	331	i 13 41	− 5	i 24 22	[− 2]	i 26 38	PS	—
Edinburgh		99·5	332	e 13 41	− 5	25 13	− 3	32 10	SS	—
Ferndale		100·3	45	e 17 54	PP	e 24 50	[+22]	e 41 41	Q	e 46·8
Grand Coulee		100·4	37	e 13 49	− 1	—	—	i 18 6	PP	—
Paris		100·4	324	i 13 51a	+ 1	i 24 25	[− 4]	i 18 1	PP	46·3
Reykjavik		100·4	345	e 13 42	− 8	e 24 5	[−24]	e 18 6	PP	44·5
Kew		100·5	327	e 13 48?	− 3	i 24 28	[− 1]	i 26 52	PS	—
Shasta Dam		101·5	45	e 13 54	− 1	e 24 31	[− 3]	e 27 2	PS	—
Spokane		101·5	37	e 18 5	PP	i 24 30	[− 4]	i 32 45	SS	—
Clermont-Ferrand		101·5	321	i 13 56	+ 1	i 27 5	PS	i 14 13	pP	50·8
Ukiah		101·6	47	e 13 55	− 1	e 24 31	[− 4]	e 25 30	S	e 41·6
Mineral	N.	101·6	45	e 14 3	+ 7	e 24 35	[0]	e 27 9	PS	e 43·0
Jersey		102·7	327	13 57	− 3	—	—	—	—	44·3
San Francisco	N.	102·7	47	—	—	e 24 37	[− 3]	—	—	e 40·0
Berkeley		102·8	47	i 13 59	− 2	i 24 39	[− 1]	i 18 11	PP	e 41·7
Branner		103·0	47	e 16 1	?	e 23 42	[−59]	—	—	e 42·0
Hungry Horse		103·0	35	e 13 58	− 4	e 25 49	+ 3	e 18 12	PP	—
Santa Clara		103·2	47	e 14 2	− 1	e 24 42	[0]	e 32 55	SS	e 48·2
Lick		103·5	47	e 14 25	+21	e 25 52	+ 2	e 24 42	SKS	e 43·4
Barcelona		104·2	318	e 15 35	?	i 27 28	PS	e 37 28	SSS	47·0
Saskatoon		104·6	29	18 21	PP	25 59	0	24 44	SKS	50·3

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Fresno		105·1	47	i 14 9	P	e 28 30	PPS	e 18 44	PP	e 49·1
Butte	N.	105·1	36	e 14 7	P	e 26 3	0	e 27 50	PS	e 43·1
Tinemaha		106·0	47	e 14 16	P	e 24 59	[+ 4]	—	—	—
Santa Barbara		106·1	50	e 14 16	P	e 24 44	[−11]	—	—	—
Bozeman		106·2	36	e 14 20	P	e 24 54	[− 2]	e 18 38	PP	e 43·3
Pasadena		107·4	49	i 14 16	P	i 26 29	+ 6	i 24 48	SKS	43·6
Mount Wilson	Z.	107·5	49	e 14 21	P	—	—	e 30 8	PKKP	—
Alicante		107·5	316	18 15	[−13]	25 7	[+ 5]	28 19	PS	e 52·6
Ivigtut		107·7	355	e 18 45	PP	—	—	e 21 49	PPP	51·3
Logan		108·0	40	e 14 22	P	i 24 59	[− 5]	i 18 48	PP	i 43·3
Riverside	Z.	108·1	49	e 14 22	P	—	—	e 29 48	PKKP	—
Salt Lake City		108·5	40	e 14 29	P	i 25 8	[+ 2]	e 18 54	PP	e 44·4
Palomar	Z.	108·7	49	e 14 14	P	—	—	e 29 49	PKKP	—
Toledo		109·0	319	e 18 22	[− 9]	28 21	PS	—	—	—
Boulder City		109·0	46	e 14 29	P	e 28 23	PS	e 18 59	PP	—
Pierce Ferry		109·5	46	e 14 32	P	e 25 19	[+ 9]	e 19 3	PP	—
Almeria		109·6	316	e 18 29	[− 3]	25 4	[− 7]	i 19 11	PP	54·7
Granada		110·2	317	17 54k	[−40]	25 33	[+20]	18 43	PKP	i 50·7
Malaga	Z.	111·0	317	e 17 56	[−39]	i 24 58	[−18]	26 10	SKKS	53·0
Rapid City	E.	111·6	34	e 18 25	[−11]	e 38 56	SSS	e 19 17	PPP	e 44·9
Lisbon		112·9	321	e 19 24	PP	25 31	[+ 7]	26 30	SKKS	57·2
Denver		113·3	38	19 32	PP	26 18	{−10}	22 26	PKS	—
Tucson		113·7	47	e 14 43	P	e 25 43	[+16]	i 19 31	PP	e 45·5
Lincoln	E.	117·3	32	e 20 59	?	e 26 41	{−15}	e 29 40	PS	e 49·6
Kirkland Lake		118·0	16	e 18 49	[0]	—	—	e 20 2	PP	—
Chicago		118·7	26	e 18 53	[+ 3]	e 25 48	[+ 3]	i 20 17	PP	e 52·8
Temiskaming		119·7	16	e 18 53	[+ 1]	—	—	e 20 13	PP	—
Seven Falls		121·1	10	18 55	[0]	27 29	{+ 8}	20 26	PP	56·3
Shawinigan Falls		121·3	12	18 56	[+ 1]	25 47	[− 7]	20 26	PP	54·3
Ottawa		121·7	15	18 55	[− 1]	25 53	[− 3]	20 29	PP	54·3
Antarctica		122·5	177	e 15 25	P	i 30 35	PS	i 19 1	PKP	e 58·8
Cleveland		123·5	21	i 19 0	[0]	i 27 36	{− 1}	i 20 32	PP	—
Halifax		124·5	5	20 35	PP	26 17?	[+13]	30 35	PS	53·3
Manzanillo		125·4	57	e 21 18	PP	38 24	SSP	—	—	52·7
Harvard		125·4	12	i 18 54	[− 9]	i 27 50	{ 0}	i 20 43	PP	i 50·1
Pennsylvania		125·4	19	i 19 49	[+46]	—	—	—	—	—
Weston		125·6	12	19 4	[0]	26 17	[+ 9]	20 51	PP	52·1
Fordham		126·5	15	e 19 6	[+ 1]	i 37 58	SS	i 21 0	PP	58·4
Philadelphia		126·9	16	e 18 57	[− 9]	i 26 7	[− 5]	i 28 0	SKKS	e 56·1
Georgetown		127·3	18	i 19 7	[0]	—	—	i 21 2	PP	—
Tacubaya		129·4	53	e 19 6	[− 5]	i 26 23	[+ 5]	e 21 14	PP	60·1
Mobile		129·5	34	21 17	PP	28 37	{+21}	—	—	—
Columbia		130·2	25	e 21 25	PP	i 38 53	SS	e 22 38	PKS	e 52·5
Vera Cruz		131·9	51	e 19 19	[+ 3]	e 39 25	SS	i 22 45	PKS	e 54·6
Oaxaca	E.	132·6	53	—	—	e 38 46	SS	—	—	—
Port au Prince		147·5	25	e 19 42	[− 1]	—	—	—	—	78·3
San Juan		149·8	15	i 19 48	[+ 1]	e 42 40	SS	—	—	—
Balboa Heights		150·8	47	e 19 52	[+ 3]	—	—	—	—	—
Fort de France		154·4	6	e 19 53	[− 1]	—	—	e 27 22	PPP	—
La Plata	E.	156·2	180	20 23	[+27]	—	—	24 7	PP	76·0
	N.	156·2	180	19 44	[−12]	27 26	[+25]	23 58	PP	75·1
	Z.	156·2	180	19 56	[0]	—	—	24 1	PP	76·2
Huancayo		162·9	96	i 20 7	[+ 3]	i 27 2	[− 5]	e 24 43	PP	e 63·2
La Paz		168·6	120	i 20 12	[+ 4]	i 26 47	[−24]	i 25 17	PP	76·3

Additional readings :—
Batavia iPPZ = 6m.27s.
Calcutta iPPE = 7m.47s.
Hyderabad iPN = 8m.12s., PPN = 9m.5s.
Bombay PPPE = 11m.42s., PSE = 16m.16s.
Brisbane iSSEN = 19m.39s.
Riverview iN = 9m.51s. and 10m.40s., iPPEN = 11m.20s., iPSE = 16m.51s., iN = 17m.8s., iEN = 17m.18s., iN = 17m.34s., iE = 17m.39s., iSSN = 20m.6s., iSSE = 20m.18s., iSSSN = 22m.3s., Q = 22m.17s.
Auckland i = 9m.39s., PPP = 15m.18s., i = 17m.17s. and 19m.3s., S_cS = 20m.41s., SS = 24m.52s., sSS = 25m.13s., i = 27m.9s. and 29m.44s.

Continued on next page.

Arapuni i =23m.53s., SS? =25m.59s., e =33m.17s., i =36m.5s.
Apia ePPPE? =16m.41s.
Wellington sP_cPZ =11m.54s., iZ =12m.29s., i =12m.48s., PPP =15m.44s., i =19m.57s., S_cS =21m.4s., i =21m.44s., S_cSP? =23m.40s., SS =25m.9s., SSS =28m.29s., Q = 30m.41s.
Honolulu ePPP =16m.26s., iS_cS =22m.17s.
Tananarive P_cP =12m.8s., EN =14m.7s., PPE =14m.53s., PPPE =16m.52s., eSE = 22m.0s., SS =27m.18s., SSS =30m.47s.
Simferopol iP_cP =12m.33s.
Helsinki i =12m.45s., 13m.17s., 13m.37s., 13m.51s., and 14m.20s., e =20m.15s., 22m.7s., 24m.22s., 25m.40s., and 27m.12s., eSS =28m.32s., e =32m.17s.
Bucharest ePP?N =15m.40s., ePPE =15m.51s., iPPP?N =17m.45s., ePPPE =17m.56s., iSKSN =23m.16s., iSN =23m.31s., iN =23m.46s., iPSN =24m.1s., iPSE =24m.10s., iSSEN =28m.32s., iSSSE =32m.40s., eSSS?N =32m.54s.
The readings for Bucharest were reduced by 30 minutes.
Sitka ePP =15m.55s., iSSS? =33m.43s.
Upsala eSKSE =23m.8s., iSE =23m.30s., eSSE =29m.5s., eSSN =29m.17s.?, eSSS = 32m.51s.
Warsaw PE =12m.54s., iZ =14m.5s. and 14m.55s., iPPZ =16m.9s., iPPPZ =18m.9s., ePPPN =18m.16s., eE =19m.27s., iZ =22m.49s., iSEZ =23m.39s., iSN =23m.45s., iN =24m.17s., PSE =24m.34s., iPPSZ =25m.9s., iPPPSN =25m.15s., SSE = 29m.34s., iPKKP?Z =30m.7s., PKKP?N =30m.10s., iN =32m.14s., SSSE =33m.14s.
Belgrade eP_cP =13m.21s., e =14m.23s. and 15m.28s., i =25m.11s. and 34m.3s.
Raciborzu ePZ =13m.8s., eE =13m.19s., eN =13m.22s., eE =14m.10s., ePPE =17m.5s., ePPP?E =19m.3s., ePPP?N =19m.7s., eN =24m.42s., eE =25m.27s., 26m.16s., 29m.47s., and 30m.44s.
Budapest PN =13m.12s., PPE =15m.58s., iE =17m.0s., PSN =24m.18s., SSN = 29m.13s., SSSE =33m.47s., eSSSN =34m.47s.
Kalossa eE =17m.25s., eN =17m.35s., eE =17m.49s. and 18m.24s.
Copenhagen 13m.14s. and 13m.23s., PP =16m.32s.
Prague ePP =16m.17s., ePPP =18m.29s., eSKS =23m.17s., eS? =24m.11s., eSS = 29m.17s., eSSS =33m.59s.
Potsdam iPN =13m.17s., iPP?Z =16m.31s., iE =17m.46s., iSE =24m.9s., iN =24m.39s., iPS?E =25m.8s., eE =29m.35s., eSSSN =34m.10s., eSSSE =34m.17s.
Collmberg eEN =20m.57s., ePPSEN =26m.43s., eEN =28m.12s., eSSSEN =34m.57s.
Cheb eN =16m.32s., ePP =16m.51s., ePPP =19m.5s., eS? =24m.34s., e =28m.23s., eSS =31m.10s., eSSS =34m.23s.
Jena ePN =13m.25s., ePNZ =13m.33s., eSKS?N =23m.44s., eSKS?EN =23m.49s., eSE =24m.25s., eSSE =30m.57s., eSSN =31m.9s., and 31m.12s., eSSS?N =34m.29s., eSSS?E =34m.57s.
Triest iPP =17m.28s.
Scoresby Sund 20m.1s. and 21m.10s., SKS =23m.53s.
Stuttgart iP =13m.33s.k, eZ =13m.45s., eSKS =23m.46s., ePS =26m.4s., ePPS = 26m.51s., eSS =31m.27s., eSSS =34m.59s.
Rome ePPZ =17m.0s., ePS =25m.43s., ePPS =26m.17s.?, eSS =30m.57s., eSSS = 34m.57s.
De Bilt iPS =25m.55s.
Strasbourg i =16m.26s. and 16m.53s., iPP =17m.40s. and 17m.43s., iPPP =19m.19s. and 19m.22s., iSKS =23m.57s., iPS =26m.15s., iPPS =27m.4s., iSS =31m.56s. and 32m.10s., iSSS =35m.54s. and 36m.2s., iSSSS? =39m.17s. and 39m.22s.
Zürich eSKS =24m.8s.
Victoria SN =25m.5s., PSE =26m.11s., PPS =27m.16s., SS =31m.31s., SSS =35m.20s.
Aberdeen iPPEN =17m.8s., iEN =20m.45s., iSKKSN =25m.23s., iN =32m.8s., iEN = 35m.12s.
Johannesburg iSKSE =24m.11s., eSE =25m.17s., iEN =30m.17s., eEN =33m.47s.
Uccle e =17m.4s., iPP =18m.3s., eE =23m.5s., ePSZ =26m.24s., eSSSE =35m.34s.
Seattle eSS =31m.57s.
Besançon e =26m.39s., eSS =31m.59s.
Durham iE =13m.46s., iN =17m.21s., iEN =18m.4s., iE =23m.27s., iEN =32m.46s., iN =38m.10s.
Edinburgh PP =17m.34s., ePPP =19m.58s., eSKS =24m.17s., SKKS =24m.47s., PS =25m.46s., PPS =27m.33s., SSP =32m.18s., SSS =36m.0s.
Ferndale eN =18m.52s.
Paris iP =14m.3s., i =17m.9s., 18m.11s., 18m.21s., 18m.33s., and 18m.45s., eSKKS = 24m.49s., iS =25m.31s., ePS =26m.49s., iPPS =27m.41s., e =29m.41s. and 31m.47s., iSS =32m.53s., eSSS =36m.11s.
Reykjavik ePN =13m.50s., eSSEN =31m.44s., eSSSEN =36m.42s., eEN =39m.47s.
Kew eSZ =25m.15s., eSSEN =32m.22s.
Shasta Dam ePPS =27m.42s.
Spokane iS =25m.49s., i =37m.27s., e =42m.15s.
Clermont-Ferrand iPP =18m.11s., iSKS =24m.5s., iSS =33m.16s., iSSS =37m.17s.
Ukiah ePP =17m.41s., ePS =26m.47s., eSS =31m.28s.
Mineral eN =26m.0s.
Berkeley iPN =14m.4s., iPPZ =16m.21s., iZ =18m.33s., eSKSE =23m.46s., iSKSN = 24m.7s.
Branner eN =17m.16s., eSN =23m.45s.
Hungry Horse i =16m.6s. and 16m.48s., iPP =18m.29s., eSKKS =25m.19s.
Lick eE =14m.34s., eSKKSN =25m.4s., eN =26m.8s., eEN =32m.47s.

Continued on next page.

Barcelona e =17m.21s., iPPP? =24m.45s.
Saskatoon PPS =28m.29s., SS =33m.33s., SSS =37m.18s.
Fresno iZ =14m.25s., eE =14m.35s., iEZ =18m.48s., eN =20m.41s., eE =28m.26s., eZ =29m.56s.
Butte ePP =18m.39s., eSKS =24m.47s., iSKKS =25m.29s., ePPS =28m.37s., eSS =33m.19s., eSSS =37m.49s.
Tinemaha iPPZ =17m.51s., iPKKPZ =30m.3s.
Bozeman eS =26m.12s., ePS =27m.55s., eSS =33m.53s.
Pasadena eZ =17m.48s., iPPE =18m.35s., iPPZ =18m.47s., iPSZ =27m.57s., ePKKPZ =30m.0s., iZ =30m.19s., iSSEN =33m.17s.
Alicante PP =18m.43s., i =18m.55s., PPP =21m.5s., PKS =21m.33s., SKKS =25m.23s., PPS =29m.21s., PKKP =30m.21s., SS =33m.59s., SSP =34m.47s., SSS =37m.55s., Q =45m.1s.
Mount Wilson eZ =17m.50s.
Logan iPKP =18m.19s., ePPP =20m.29s., eS =26m.27s., iPS =28m.21s., eSS =33m.50s.
Riverside eZ =17m.27s., 18m.7s., and 30m.3s.
Salt Lake City eS =26m.49s., ePS =28m.33s., eSS =34m.8s.
Palomar iZ =14m.41s. and 18m.13s., eZ =18m.49s.
Almeria PPP =21m.33s., PKS =22m.4s., SKKS =26m.1s., PS =28m.35s., PPS =29m.41s., SS =34m.37s., SSS =38m.49s., Q =43m.25s.
Granada PPP =21m.20s., PS =28m.39s., iSS =34m.30s., SSS =38m.6s.
Malaga iPPZ =19m.14s.k, iPPPZ =22m.0s.k, PSZ =28m.50s., QZ =49m.8s.
Rapid City i =32m.49s.
Lisbon ipPPNZ =19m.42s., sPP =20m.11s., SKPN =22m.10s., N =22m.44s., PS =28m.58s., PPSZ =29m.52s., PPSEN =30m.1s., SSN =34m.42s., 35m.22s., isSSEN =36m.10s., SSSE =39m.13s., isSSSE =40m.1s., E =41m.39s., Z =44m.9s., QEN =50m.59s.
Denver 20m.42s.
Tucson ePKP =18m.11s., ePPP =21m.50s., eS =27m.23s., iPS =29m.5s., ePKKP =29m.23s., ePPS =30m.29s., eSS =35m.18s., eSSS =39m.27s.
Lincoln eSS =36m.4s.
Kirkland Lake e =29m.11s., i =33m.11s.
Chicago iSKKS =27m.19s., iPS =30m.21s., iSS =36m.43s.
Seven Falls SKP =21m.47s., PS =30m.35s., PPS =31m.35s., SS =36m.59s., SSS =40m.47s.
Shawinigan Falls SKP =21m.41s., SKS =24m.5s., PS =29m.29s.
Ottawa PPP =22m.47s., S =28m.19s., PS =30m.9s., SS =36m.55s., SSS =40m.47s.
Antarctica e =20m.17s., ePP =20m.23s., iPPP =23m.12s., eSKKS =27m.35s., eS =28m.47s., e =40m.22s., eSSS =41m.54s.
Cleveland iN =20m.35s., eZ =20m.39s., iZ =20m.42s. and 20m.53s., iSKPN =21m.51s., iN =22m.11s., iPSN =30m.35s., iE =30m.48s., iN =32m.29s., iSSN =37m.38s.
Halifax SS =37m.17s.?
Manzanillo eE =24m.52s. and 26m.58s., ePSE =31m.40s., eN =33m.58s., PSPSN =38m.58s.
Harvard iPKS =22m.31s., iSKSP =30m.37s., iPPS =32m.11s., iSS =37m.47s., iPSPS =38m.24s., iSSS =41m.39s
Pennsylvania iNE =25m.11s. and 28m.41s., eNE =29m.54s.
Weston SS =38m.0s., SSS =42m.23s.
Philadelphia iPP =20m.56s., iPKS =22m.12s., ePPP =23m.50s., ePS =30m.49s., iPPS =32m.57s., iPPPS =34m.36s., iSS =42m.56s., eSSS? =44m.6s.
Tacubaya eE =19m.15s. and 19m.18s., iN =19m.36s., iPPN =21m.7s., iN =21m.44s., iSKPN =22m.15s., eSKPE =22m.33s., iPPPE =24m.9s., eSKSE =26m.0s., eSKKSN =28m.11s., eSE =29m.11s., eSN =29m.19s., iPSZ =31m.34s., ePPSN =32m.57s., eZ =35m.43s., eSSN =38m.29s., eSSSE =43m.17s.
Mobile 22m.1s., 27m.14s.
Columbia ePPS =33m.21s.
Vera Cruz ePKPN =19m.25s., ePKSZ =22m.41s., iSKKSEN =27m.49s., eZ =29m.53s. and 35m.27s., eN =35m.35s., iSSE =39m.29s.
Port-au-Prince i =20m.6s. and 20m.52s.
San Juan eSKS =28m.23s., ePPS? =37m.26s., ePPPS =38m.2s., eSSS? =49m.39s.
La Plata N =20m.14s., Z =20m.25s., PP?E =22m.3s., PPN =22m.59s., PPP?N =26m.29s., PPP?E =28m.11s., SKKSN =30m.10s., SKKSE =32m.5s., SKSPE =33m.29s., SKSPN =33m.59s., PPSN =37m.11s., PPSE =37m.17s., SS?N =41m.25s., SSE =42m.59s., PSSE =44m.5s., PSSN =44m.18s., N =47m.18s., SSSE =48m.30s., SSSN =48m.38s., E =52m.41s., N =52m.47s. and 54m.31s., QE =59m.53s., QN =60m.31s.
Huancayo i =29m.43s., iSKSP =35m.9s., i =42m.29s., iSS =45m.31s., iSSS? =50m.7s.
La Paz iPKP$_2$N =21m.17s., iSKKS =31m.37s., iPSKS =35m.57s., SS =46m.2s., SSS =53m.29s., QN =62m.59s.
Long waves were also recorded at Bogota and Puebla.

January 24d. 23h. 8m. 1s. Epicentre 18°·5N. 99°·0W. (As on 1939 February 15d.).

A = −·1485, B = −·9373, C = +·3154; δ = +6; h = +5,
D = −·988, E = +·156; G = −·049, H = −·312, K = −·949.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Puebla		0·9	54	0 26	+ 6	—	—	—	—	0·7
Tacubaya		0·9	349	0 27	+ 7	i 0 42	+ 8	—	—	0·7
Oaxaca		2·6	125	0 39	− 5	—	—	i 0 50	P_g	1·2
Vera Cruz		2·8	76	0 50	+ 3	1 26	S*	i 1 2	P_g	1·5
Guadalajara		4·6	296	1 18	+ 6	2 19	S*	i 1 48	P_g	2·5
Manzanillo		5·0	272	e 1 37	P_g	2 27	S*	—	—	2·6
Tucson		17·3	323	i 4 9k	+ 5	i 7 32	SS	i 4 26	PP	e 9·6
St. Louis		21·5	19	e 4 50	− 2	e 8 51	+ 4	i 5 8	pP	—
La Jolla	z.	21·7	314	e 4 55	0	—	—	e 5 16	PP	—
Palomar		21·8	317	i 4 56	0	—	—	i 5 14	pP	—
Pierce Ferry		22·0	327	i 4 58	0	—	—	—	—	—
Boulder City		22·3	325	i 5 2	+ 1	—	—	—	—	—
Riverside		22·5	317	i 5 3k	+ 1	—	—	i 8 53	P_cP	—
Pasadena		23·1	316	i 5 8k	0	—	—	i 8 55	P_cP	—
Mount Wilson	z.	23·2	316	i 5 9k	0	—	—	i 5 30	PP	—
Haiwee	N.	24·3	321	e 5 21	+ 1	—	—	e 5 46	PP	—
Santa Barbara	z.	24·3	316	i 5 21	+ 1	—	—	i 5 42	PP	—
Salt Lake City		24·8	338	—	—	e 10 27	SS	—	—	e 14·1
Tinemaha		25·1	321	i 5 27	− 1	—	—	i 8 58	P_cP	—
Fresno		25·8	318	e 5 34	0	—	—	—	—	e 15·2
Cleveland		27·3	29	e 5 45	− 3	e 11 23	SS	i 6 35	PP	—
Bogota	z.	28·0	115	e 6 7	pP	—	—	i 6 14	pP	—
Shasta Dam		29·9	323	e 6 8	− 4	—	—	—	—	—
Hungry Horse		32·2	342	i 7 0	+28	—	—	—	—	—
Kirkland Lake		33·4	23	e 6 39	− 3	—	—	—	—	—
Grand Coulee		33·6	336	i 6 43	− 1	—	—	i 7 3	pP	—
Huancayo		38·3	140	e 7 36	+12	—	—	—	—	—
La Paz		46·2	136	i 8 37	+ 9	i 15 8	− 7	—	—	—
Clermont-Ferrand		85·2	43	i 12 37	− 2	—	—	i 12 59	P_cP	—
Stuttgart	z.	87·7	39	e 12 48	− 4	—	—	—	—	—

Additional readings :—
Oaxaca iZ = 0m.59s.
Vera Cruz iZ = 1m.6s.
St. Louis iP = 4m.56s.
Palomar eP_cPZ = 8m.59s.
Riverside iZ = 5m.16s. and 9m.10s.
Pasadena iZ = 5m.21s. and 5m.27s.
Santa Barbara iZ = 5m.28s.
Tinemaha iZ = 5m.48s. and 9m.16s.
Fresno eEN = 9m.37s., eSE = 14m.24s.
Cleveland ePZ = 6m.4s a.
Long waves were also recorded at Butte.

Jan. 24d. Readings also at 2h. (Pierce Ferry, Tucson, Mount Wilson, Pasadena, Riverside, Santa Barbara, near Palomar, Tinemaha, and near Boulder City), 5h. (Branner, Fresno, near Andijan, and Murgab), 6h. (Pierce Ferry (2), Tucson, Hungry Horse, and near Mineral), 7h. (Palomar, Tinemaha, Boulder City, Grand Coulee, Hungry Horse (2), Tucson, Tacubaya, and Vera Cruz), 8h. (Tinemaha, Hungry Horse, Pierce Ferry, and Tucson), 9h. (Hungry Horse, Pierce Ferry, and Mizusawa), 10h. (near Logan), 11h. (Mount Wilson, Palomar, Tinemaha, Tucson, Pierce Ferry, Shasta Dam, and near Mineral), 12h. (Mount Wilson, Palomar, Pasadena, Riverside, Tinemaha, Tucson, Hungry Horse, Pierce Ferry (2), Shasta Dam, and near Andijan), 15h. (Mount Wilson, Palomar, Pasadena, Riverside, Tinemaha, Hungry Horse, Grand Coulee, Shasta Dam, Tucson, and Paris), 18h. (Stuttgart), 19h. (Stuttgart, Batavia, Brisbane, Boulder City, Shasta Dam, and Tucson), 20h. (Brisbane), 21h. (Bogota, Huancayo, Pierce Ferry, Tucson, and Stuttgart), 22h. (Hungry Horse, Pierce Ferry, Huancayo, near Andijan, Almata, Frunse, and Murgab).

Jan. 25d. 5h. 58m. 0s. Epicentre 10°·9N. 122°·1E. (as on Jan. 24d.).

A = −·5219, B = +·8320, C = +·1879; δ = −9; h = +6;
D = +·847, E = +·531; G = −·100, K = +·159, K = −·982.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Batavia		22·8	223	i 5 46	PP	i 10 14	SS	e 6 26	PPP	—
Vladivostok		33·2	13	i 6 30	−10	e 11 48	−12	—	—	—
Calcutta	E.	34·2	294	e 6 55	+ 6	i 12 27	+11	e 8 18	PP	16·7
Colombo	E.	41·9	268	8 20	+26	e 14 50	+37	—	—	24·0
Hyderabad	N.	42·7	284	e 8 0	0	14 17	− 7	—	—	20·1
Irkutsk		43·7	344	e 8 2	− 6	14 31	− 8	—	—	—
Kodaikanal	E.	43·8	274	e 11 30	?	—	—	—	—	—
Bombay		48·1	286	i 8 45	+ 2	i 15 40	− 2	e 10 40	PP	—
Brisbane		48·5	142	e 8 40	− 6	e 15 42	− 6	—	—	—
Almata		50·6	319	e 9 11	+ 9	—	—	—	—	—
Murgab		50·9	311	e 9 0	− 5	—	—	—	—	—
Frunse		52·0	317	e 9 20	+ 7	—	—	—	—	—
Riverview		52·3	149	e 10 41	?	e 17 50	+70	e 12 37	PPP	—
Andijan		52·8	314	e 9 24	+ 5	e 16 58?	+11	—	—	—
Obi-garm		54·1	310	e 9 27	− 2	—	—	—	—	—
Stalinabad		54·8	310	i 9 31	− 3	i 17 17	+ 3	—	—	—
Tashkent		55·2	313	e 9 36?	− 1	e 17 10?	−10	—	—	—
Tchimkent		55·3	315	e 9 39	+ 1	—	—	—	—	—
Samarkand		56·4	310	e 9 37?	− 8	—	—	—	—	—
Sverdlovsk		65·5	329	10 43	− 4	19 23	− 9	—	—	—
Baku		69·5	309	e 11 26	+14	e 20 26	+ 6	—	—	—
Leninakan		74·1	310	12 4	PcP	—	—	—	—	—
Moscow		78·0	325	e 11 57	− 5	e 21 45	−10	—	—	—
Yalta		81·0	313	—	—	e 22 15	−12	—	—	—
Helwan		85·3	299	e 12 41	+ 1	e 23 12	+ 2	—	—	—
Prague		92·8	322	e 17 0	PP	e 25 36	PS	—	—	e 52·0
Cheb		94·0	322	—	—	e 23 13	[−43]	e 26 22	PS	e 52·0
Stuttgart		96·4	322	e 13 28	− 4	—	—	—	—	e 52·0
Strasbourg		97·4	323	e 12 30	−67	—	—	e 31 0	SS	e 40·0
Grand Coulee		100·4	37	e 13 53	+ 3	—	—	e 17 56	PP	—
Shasta Dam		101·5	45	e 13 49	− 6	—	—	—	—	—
Hungry Horse		103·0	35	e 13 2	−60	—	—	—	—	—
Fresno	Z.	105·1	47	e 17 31	PKP	—	—	e 18 38	PP	—
Tinemaha	Z.	106·0	47	e 14 18	+ 3	—	—	e 17 30	PKP	—
Mount Wilson	Z.	107·5	49	e 14 28	P	—	—	e 17 40	PKP	—
Pierce Ferry		109·5	46	e 14 36	P	—	—	—	—	—
Tucson		113·7	47	e 18 50	[+10]	—	—	e 19 38	PP	—
Antarctica		122·5	177	—	—	e 32 51	PPS	—	—	e 62·0
Huancayo		162·9	96	e 20 6	[+ 2]	e 26 5	[−62]	—	—	—
La Paz	Z.	168·6	120	e 20 40	[+32]	—	—	—	—	—

Additional readings :—
Batavia i = 7m.1s.
Riverview eE = 20m.15s., eNZ = 20m.48s.
Helwan e = 14m.33s.
Prague e = 22m.12s., e = 41m.0s.? and 46m.30s.
Cheb e = 31m.14s., e = 38m.0s.
Long waves were also recorded at other European stations.

Jan. 25d. Readings also at 3h. (Warsaw, Tchimkent, near Andijan, Obi-garm, Murgab, and near Istanbul), 6h. (near Mizusawa), 8h. and 9h. (Hungry Horse), 11h. (Brisbane), 12h. (near Mineral (2)), 13h. (Mount Wilson, Palomar, Riverside, and Tinemaha), 14h. (Hungry Horse, Samarkand, near Obi-garm, and Stalinabad), 15h. (near Boulder City and Pierce Ferry), 18h. (near Obi-garm, Samarkand, and Stalinabad), 22h. (Antarctica, Huancayo, La Paz, and Bogota), 23h. (Ksara and Shasta Dam).

Jan. 26d. 14h. 10m. 41s. Epicentre 10°·9N. 122°·1E. (as on 25d.).

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Nanking		21·3	351	4 51	+ 1	8 50	+ 7	—	—	10·4
Kagosima		22·0	19	4 56	− 2	9 2	+ 6	—	—	11·4
Guam		22·3	81	i 4 53	− 8	i 8 57	− 5	—	—	—
Batavia		22·8	223	i 4 57	− 8	e 8 52	−19	i 9 11	S	15·3
Izuka		24·0	18	5 15	− 2	9 37	+ 5	—	—	—
Kôti		24·9	23	5 23	− 3	9 45	− 2	—	—	—
Sumoto		26·1	25	5 41	+ 4	10 35	+28	—	—	11·7
Nagoya		27·7	27	5 56	+ 4	—	—	—	—	—
Toyama		29·1	25	e 6 52	+48	12 33	SS	—	—	—
Tokyo		29·4	29	e 6 42	+35	—	—	—	—	—
Nagano		29·5	26	6 20	+12	—	—	—	—	—
Sendai		32·0	29	6 26	− 4	10 37	−65	—	—	13·4
Mizusawa		32·8	28	6 44	+ 7	e 11 15	−39	—	—	—
Vladivostok		33·2	13	e 6 37	− 3	i 11 58	− 2	—	—	—
Calcutta	E.	34·2	294	e 6 56	+ 7	i 12 29	+13	i 8 7	PP	17·1
Hyderabad	N.	42·7	284	e 7 59	− 1	14 24	0	10 10	PPP	20·7
Perth		43·0	187	i 10 8	PPP	i 14 27	− 2	—	—	—
Irkutsk		43·7	344	i 8 16	+ 8	i 14 48	+ 9	—	—	—
Kodaikanal	E.	43·8	274	i 9 19	+70	e 16 9	?	—	—	23·0
Dehra Dun	N.	45·2	303	e 11 31?	?	e 21 20?	?	—	—	e 29·9
Bombay		48·1	284	i 8 42	− 1	e 15 40	− 2	i 10 38	PP	23·7
Brisbane		48·5	142	i 8 48	+ 2	e 15 32	−16	i 10 7	PP	—
Almata		50·6	319	e 9 2?	0	—	—	—	—	—
Frunse		52·0	317	i 9 13	0	—	—	—	—	—
Riverview		52·3	149	i 9 13$_a$	− 2	i 16 38	− 2	e 10 23	P_cP	e 26·7
Obi-garm		54·1	310	i 9 30	+ 1	i 17 4	− 1	—	—	—
Stalinabad		54·8	310	i 9 33	− 1	i 17 17	+ 3	—	—	—
Tashkent		55·2	313	i 9 36?	− 1	i 17 18?	− 2	—	—	—
Tchimkent		55·3	315	i 9 36	− 2	—	—	—	—	—
Samarkand		56·4	310	i 9 44	− 1	—	—	—	—	—
Ashkabad		62·7	307	10 29	0	i 18 56	− 1	—	—	—
Sverdlovsk		65·5	329	i 10 44	− 3	19 32	0	—	—	—
Auckland		68·6	137	—	—	20 10	+ 1	—	—	30·5
Baku		69·5	309	e 11 19?	+ 7	e 20 24?	+ 4	—	—	—
Wellington		71·0	140	—	—	e 19 19?	−78	—	—	—
Grozny		72·7	312	e 11 29	− 3	—	—	—	—	—
Erevan		73·6	309	—	—	e 21 20	+13	—	—	—
Piatigorsk		74·6	313	e 11 51	+ 8	—	—	—	—	—
Sotchi	N.	77·1	313	e 11 21?	−36	—	—	—	—	—
Moscow		78·0	325	12 0	− 2	21 49	− 6	—	—	—
Tananarive		79·2	249	—	—	e 22 6	− 2	e 27 11	SS	33·5
Theodosia	N.	80·1	314	e 12 12	− 1	e 22 15	− 3	—	—	—
Ksara		80·9	303	i 12 18k	+ 1	i 22 49?	+23	—	—	—
Simferopol	N.	81·0	314	e 12 20	+ 2	—	—	—	—	—
Yalta		81·0	313	e 12 16	− 2	22 22	− 5	—	—	—
Helsinki		84·2	331	e 12 31	− 3	e 22 51	− 8	e 28 40	SS	e 39·3
Istanbul		85·2	310	i 12 39	0	23 3	[+ 1]	—	—	—
Helwan		85·3	299	i 12 39$_a$	− 1	23 7	− 3	15 55	PP	—
Bucharest		86·7	315	e 12 50	+ 3	e 23 12	[0]	—	—	48·3
Sitka		87·5	32	—	—	i 23 35	+ 4	e 29 25	SS	e 36·1
Upsala		87·8	331	e 13 38	+46	e 23 31	− 3	16 43	PP	e 41·3
Warsaw		88·2	323	e 12 53	− 1	e 23 39	+ 1	e 16 14	PP	e 43·3
Belgrade		90·5	316	e 11 39	?	(23 28)	[− 8)	i 16 52	PP	23·5
Raciborzu	E.	90·5	322	e 4 13	?	—	—	—	—	e 56·5
Kalossa	E.	91·0	318	e 13 49	+42	—	—	—	—	e 56·8
Copenhagen		91·8	328	17 0	PP	24 0	−11	23 41	SKS	—
Potsdam		92·8	325	—	—	e 24 13	− 6	i 25 51	PS	e 46·3
Prague		92·8	322	e 16 49	PP	e 23 37	[−12]	e 24 16	S	e 48·3
Cheb		94·0	322	e 17 15	PP	e 23 58	[+ 2]	e 31 5	SS	e 47·3
Jena	N.	94·2	323	e 13 23	+ 1	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Triest		94·8	318	e 13 36	+11	i 23 56	[− 4]	i 26 7	PS	e 50·3
Stuttgart		96·4	322	e 13 31	− 1	—	—	e 17 31	PP	e 53·3
Rome		97·0	315	—	—	e 24 19	[+ 7]	e 26 27	PS	e 47·3
Strasbourg		97·4	323	e 15 19	?	e 24 13	[− 1]	e 32 5	SS	e 49·8
Zürich		97·4	321	e 13 34	− 3	—	—	—	—	—
Victoria		97·5	38	—	—	e 23 40	[−34]	—	—	46·3
Basle		97·9	322	—	—	e 28 37	?	—	—	—
Uccle		98·3	326	—	—	e 24 22	[+ 3]	e 26 43	PS	e 48·3
Paris		100·4	324	e 13 49	− 1	—	—	—	—	49·3
Grand Coulee		100·4	37	e 13 46	− 4	—	—	e 18 1	PP	—
Clermont-Ferrand		101·5	321	e 18 27	PP	e 25 18	−15	e 27 6	PS	47·3
Shasta Dam		101·5	45	e 13 53	− 2	e 24 31	[− 3]	—	—	—
Berkeley		102·8	47	i 19 51	PPP	i 24 41	[+ 1]	i 25 41	S	—
Hungry Horse		103·0	35	e 14 1	− 1	—	—	—	—	—
Saskatoon		104·6	29	—	—	e 26 0	+ 1	—	—	45·3
Butte	N.	105·1	36	—	—	e 33 18	SS	—	—	e 44·2
Tinemaha	Z.	106·0	47	e 18 36	PP	—	—	—	—	—
Bozeman		106·2	36	—	—	e 33 57	SS	—	—	e 43·9
Pasadena		107·4	49	e 18 24	PP	—	—	—	—	e 44·1
Mount Wilson	Z.	107·5	49	e 18 6	PKP	—	—	e 18 32	PP	—
Alicante		107·5	316	28 21	PS	—	—	34 39	SSP	e 62·7
Riverside	Z.	108·1	49	i 18 24	[− 5]	—	—	e 18 57	PP	—
Pierce Ferry		109·5	46	i 18 8	[−24]	—	—	e 28 26	PS	—
Almeria		109·6	316	18 35	[+ 3]	25 3	[− 8]	i 19 11	PP	63·3
Lisbon		112·9	321	—	—	29 0?	PS	—	—	60·8
Tucson		113·7	47	e 19 41	PP	—	—	—	—	—
Kirkland Lake		118·0	16	e 18 55	[+ 6]	—	—	e 19 55	PP	—
Chicago		118·7	26	—	—	e 28 44	?	e 30 30	PPS	e 50·4
Temiskaming		119·7	16	e 18 55	[+ 3]	—	—	—	—	—
Seven Falls		121·1	10	—	—	e 37 19	SS	—	—	49·3
Ottawa		121·7	15	e 18 55	[− 1]	27 19?	{− 6}	30 31	PS	50·3
Antarctica		122·5	177	e 20 33	PP	e 27 30	{ 0}	—	—	e 58·8
Cleveland		123·5	21	e 19 2	[+ 2]	25 48	[−13]	e 20 27	PP	—
Philadelphia		126·9	16	—	—	e 32 40	PPS	e 37 44	SS	—
Bermuda		136·5	8	e 22 51	PP	e 34 25	PPS	e 44 15	SSS	e 56·3
San Juan		149·8	15	—	—	e 43 1	SS	—	—	—
Huancayo		162·9	96	e 20 8	[+ 4]	e 31 28	{ 0}	e 45 12	SS	—
La Paz		168·6	120	i 20 11	[+ 3]	i 31 55	{− 1}	i 25 13	PP	79·3

Additional readings :—
Mizusawa PN =6m.48s.
Hyderabad S_cSN =18m.8s.
Riverview iZ =10m.36s., ePPPZ =12m.17s., iSN =16m.41s., eE =16m.46s., iN = 18m.47s., iSSSE =21m.56s.
Helsinki eSSS =30m.36s.
Helwan PPP =17m.51s., PPS =24m.19s.
Upsala SKSN =23m.36s., eE =25m.53s. and 28m.19s.?, eN =30m.55s.
Warsaw eZ =13m.36s. and 14m.36s., ePPZ =16m.20s., eSKSEN =23m.17s., eSZ = 23m.31s., eSE =23m.45s., ePSN =24m.33s., ePSE =24m.36s., ePPSE =25m.8s., eZ =26m.17s., SSSE =32m.49s.
Copenhagen PS =25m.22s.
Prague ePPS =26m.19s.?, eSS =31m.1s., eSSS =34m.55s.
Cheb ePPS =26m.31s., eSSS =35m.55s.
Stuttgart ePP =17m.43s.
Rome eSS =31m.19s.?
Uccle eSSEN =32m.6s.
Berkeley iZ =32m.53s., eEN =42m.31s.
Almeria PPP =21m.27s., PS =28m.25s., SS =34m.22s.
Chicago eSS =36m.51s.
Ottawa SSE =37m.1s., SSSN =40m.49s.
Cleveland iN =26m.15s., eSKKSN =27m.49s., ePSN =30m.43s., ePPSN =32m.23s., iN =37m.20s., iSSE =37m.35s., eE =40m.23s.
Bermuda ePPPS =35m.39s., eSS? =41m.37s.
Huancayo eSKSP =34m.21s.
La Paz PKS =23m.49s., iPSKSN =36m.3s., iPPSN =39m.7s., iSSN =46m.3s., iSSSN = 52m.59s.
Long waves were also recorded at Honolulu, Kobe, Sapporo, and other American and European stations,

Jan. 26d. 18h.-19h. Undetermined shock. North-East Pacific.

Shasta Dam eP =59m.44s.
Ferndale ePE =60m.4s., eN =60m.31s., eE =65m.19s.
Grand Coulee iP =60m.5s., eL =65m.17s.
Branner ePE =60m.19s., ePN =60m.23s., eSE =65m.29s., eSN =66m.4s., eN =68m.30s.
Berkeley eE =60m.20s., iEN =60m.56s., iE =62m.2s., and 62m.32s., eE =63m.20s., iE =65m.42s., eE =67m.18s.
Lick ePN =60m.30s., eE =60m.49s., eSN =64m.34s., eE =65m.35s., eN =67m.49s.
Fresno ePZ =60m.38s., eEN =60m.47s., iSZ =64m.13s., iE =64m.21s.
Hungry Horse eP =60m.56s.
Tinemaha iPZ =60m.57s., iZ =61m.26s. and 64m.23s.
Mount Wilson iPZ =61m.24s., iZ =61m.44s., 61m.52s. and 64m.57s.
Pasadena iPZ =61m.24s., iZ =61m.49s., 63m.12s., and 63m.53s.
Boulder City eP =61m.30s., i =61m.59s.
Pierce Ferry eP =61m.32s., i =62m.2s.
Palomar iPZ =61m.36s., i =61m.41s., iZ =62m.4s., iEZ =62m.11s., iZ =65m.9s.
Tucson iP =62m.32s., i =63m.5s. and 63m.47s., iS =66m.4s., eL =68m.11s.
Rapid City iP? =62m.33s., ePP =63m.6s., eS =66m.3s., eL =68m.21s.
Lincoln e =63m.36s., eL =71m.26s.
San Francisco eN =64m.48s.
Temiskaming e =65m.6s.
Ottawa eZ =65m.27s. and 69m.0s., L =78m.
Kirkland Lake e =68m.30s.
Denver 69m.38s., SSS =71m.44s., 73m.9s., 74m.40s.
Long waves were also recorded at other American stations.

Jan. 26d. Readings also at 2h. (Bogota, La Paz, Tucson, and Hungry Horse), 5h. (Hungry Horse, Andijan, near Murgab, and Obi-garm), 8h. (Johannesburg), 9h. (Kodaikanal, Obi-garm, Stalinabad, Tashkent, Sverdlovsk, Ksara, Helwan, Mizusawa, Mount Wilson, Riverside, Tucson, and Hungry Horse (2)), 10h. (near Obi-garm), 11h. (Brisbane, Riverview, Shasta Dam (2), Almata, Obi-garm, Samarkand, Stalinabad, Tashkent, near Andijan, Frunse, and Murgab), 12h. (Auckland, Wellington, and Stuttgart), 14h. (Zürich), 15h. (Samarkand, Piatigorsk, near Grozny, near Obi-garm and Stalinabad), 16h. (Samarkand, near Obi-garm and Stalinabad), 18h. (near Stalinabad), 19h. (Hungry Horse, Fresno, Shasta Dam, Pierce Ferry, and Palomar), 20h. (Rapid City (2), Palomar, Tucson, (2) Pierce Ferry, Shasta Dam, Fresno, and Hungry Horse), 21h. (La Paz), 22h. (Batavia), 23h. (Hungry Horse and near Batavia).

Jan. 27d. 3h. 17m. 1s. Epicentre 48°·2N. 9°·0E. (as on 1947, Sept. 14d.).

Intensity V-VI Jura Souabe ; IV in Canton Schaffhouse ; III at Zürich ; II-III in Alsace-Lorraine.

E. Wanner.
" Jahresbericht des Erdbebendienstes der Schweiz im Jahre, 1948. Zürich, 1949, p. 3.

$A = +\cdot6609$, $B = +\cdot1046$, $C = +\cdot7432$; $\delta = +8$; $h = -5$;
$D = +\cdot156$, $E = -\cdot988$; $G = +\cdot734$, $H = +\cdot116$, $K = -\cdot670$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
	°	°	m. s.	s.	m. s.	s.	m. s.	
Ebingen	0·0	—	i 0 5 a	− 2	i 0 6	− 5	—	—
Stuttgart	0·6	13	i 0 13 a	− 2	i 0 19	− 7	—	—
Strasbourg	0·9	295	i 0 21	+ 1	i 0 33	− 1	—	—
Zürich	0·9	198	i 0 21	+ 1	i 0 33	− 1	—	—
Basle	1·2	235	i 0 24	0	i 0 42	+ 1	—	—
Chur	1·4	165	e 0 30	+ 3	e 0 51	+ 5	—	—
Neuchatel	1·8	229	e 0 33	+ 1	e 1 6	S_g	e 0 38	P_g
Besançon	2·2	243	e 0 45	P_g	e 1 17	S_g	—	—
Cheb	2·9	50	0 59	P_g	e 1 51	?	—	—
Jena	3·2	32	e 0 56	+ 4	e 1 41	S_g	e 1 1	P_g
Uccle	4·0	311	e 0 50	−14	e 1 59	S*	—	—
Paris	4·4	278	e 1 27	P_g	e 2 5	+ 3	i 2 26	S_g
Clermont-Ferrand	4·7	236	e 1 32	P_g	i 2 40	S_g	—	—
Potsdam N.	4·9	33	—	—	i 2 41	S_g	—	—
Raciborzu	6·3	69	—	—	e 3 29	S_g	—	—

Additional readings :—
Stuttgart i =16s.
Paris e =1m.55s.
Clermont-Ferrand iS_g? =2m.47s., i =3m.2s. and 3m.56s,
Potsdam iZ =2m.44s,

Jan. 27d. 11h. 58m. 25s. Epicentre 20°·2S. 178°·2W. Depth of focus 0·080.
(as on 1945, April 30d.).

$A = -·9387$, $B = -·0295$, $C = -·3433$; $\delta = -12$; $h = +5$;
$D = -·031$, $E = +1·000$; $G = +·343$, $H = +·011$, $K = -·939$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		8·8	45	2 11	+ 5	3 55	+ 8	—	—	—
Auckland		17·7	200	3 43	+ 7	5 53	−36	7 43	PcP	—
Arapuni		18·6	196	e 3 59	+15	6 35	−10	14 23	ScS	—
Tuai		19·0	192	3 48	0	6 48	− 4	13 59	ScS	—
New Plymouth		20·0	198	4 2	+ 5	6 39	−29	14 7	ScS	—
Bunnythorpe		20·7	194	1 35?	?	—	—	—	—	—
Wellington		21·9	195	4 13	− 2	i 7 30	−10	4 22	PP	—
Kaimata		23·9	200	4 36	+ 3	i 8 5	− 7	14 15	ScS	—
Christchurch		24·5	197	4 40	+ 2	8 15	− 6	14 27	ScS	—
Brisbane		27·3	250	i 5 2	− 1	i 7 50	?	i 6 24	PP	—
Riverview		30·4	237	i 5 29k	− 1	i 9 48	− 5	i 7 8	pP	13·7
Honolulu		45·8	27	i 7 36	+ 1	i 13 37	− 2	i 9 9	pP	e 19·4
Guam		49·5	309	i 5 54	?	—	—	—	—	—
Perth		59·6	244	9 17	+ 3	i 16 37	− 5	—	—	—
Utunomiya		69·0	325	i 10 25	+12	18 48	+13	—	—	—
Sendai		69·7	327	10 18	+ 1	18 38	− 5	—	—	—
Nagano		70·0	324	10 22	+ 3	18 39	− 7	—	—	—
Osaka		70·1	321	e 10 14	− 5	18 45	− 2	—	—	26·8
Mizusawa	E.	70·2	327	10 25	+ 5	18 46	− 2	—	—	—
Kôti		70·5	318	e 10 18	− 4	18 50	− 2	—	—	—
Aikawa		70·9	325	e 10 17	− 7	18 46	−10	—	—	—
Kagosima		71·2	315	e 10 19	− 7	18 52	− 8	—	—	—
Hukuoka		72·5	317	i 10 35	+ 2	19 11	− 3	—	—	—
Batavia		73·8	270	e 10 38	− 3	e 19 16	−12	12 40	PP	—
Santa Barbara		77·7	47	i 11 3k	+ 1	i 20 15	+ 5	i 13 9	pP	—
Branner		77·9	43	e 10 59	− 4	e 20 8	− 4	—	—	—
San Francisco	E.	77·9	43	e 11 3	0	i 20 15	+ 3	—	—	—
Vladivostok		77·9	325	i 10 58	− 5	i 20 9	− 3	i 13 13	pP	—
Santa Clara		78·0	43	e 10 45	−19	i 20 3	−10	—	—	—
Berkeley		78·1	43	i 11 0	− 4	i 20 7	− 7	i 14 19	PP	—
Lick		78·2	43	e 11 0	− 5	e 20 19	+ 4	i 20 40	SKS	—
Ukiah		78·3	41	e 11 9	+ 4	e 20 11	− 5	e 14 16	PP	e 33·8
Ferndale		78·5	39	e 11 20	+14	i 20 25	+ 7	—	—	—
La Jolla		78·6	49	e 11 5	− 2	i 20 22	+ 3	i 13 21	pP	—
Pasadena		78·6	48	i 11 2k	− 5	i 20 21	+ 2	i 13 15	pP	—
Mount Wilson		78·7	48	i 11 3k	− 4	e 20 16	− 4	i 13 21	pP	—
Antarctica		79·0	159	i 11 6	− 3	i 20 17	− 6	i 13 20	pP	—
Palomar		79·1	49	e 11 5k	− 4	i 20 29	+ 5	i 13 20	pP	—
Riverside		79·3	48	i 11 4k	− 6	e 20 18	− 8	i 13 18	pP	—
Nanking		79·6	310	i 10 55	−17	e 20 12	−18	—	—	—
Shasta Dam		79·7	40	i 11 9	− 4	i 20 32	+ 1	i 13 25	pP	—
Haiwee		79·9	46	e 11 13	− 1	e 20 30	− 3	—	—	—
Mineral		80·0	40	i 11 7	− 7	e 20 26	− 8	e 20 35	SKS	—
Tinemaha		80·2	45	i 11 11k	− 4	e 20 32	− 4	i 13 33	pP	—
Boulder City		81·9	47	i 11 20	− 4	e 20 54	+ 1	i 13 28	pP	—
Pierce Ferry		82·6	48	i 11 23	− 4	i 20 58	− 2	i 21 33	SKP	—
Tucson		82·9	52	i 11 25k	− 4	e 20 57	− 5	i 13 42	pP	e 33·7
Victoria		84·0	33	(11 31)	− 3	(21 1)	−12	(e 13 39)	pP	(34·1)
Seattle		84·1	35	e 12 44	+69	e 22 21	+ 7	e 14 35	sP	—
Sitka		85·3	22	e 11 39	− 2	e 21 11	[− 1]	i 14 57	sP	—
Grand Coulee		86·0	36	i 11 38	− 6	i 21 32	0	—	—	—
Salt Lake City		86·4	44	i 11 51	+ 5	i 21 42	+ 6	e 15 1	sP	e 33·8
Tacubaya	E.	86·8	68	e 11 52	+ 4	i 21 46	+ 7	e 21 24	SKS	—
Logan		86·9	43	e 11 40	− 8	i 21 42	+ 2	e 13 56	pP	—
College		88·0	12	i 11 54	+ 1	i 21 45	− 5	e 15 14	sP	—

Continued on next page.

The scanned images of the bulletins of the International Seismological Summary (ISS) have been obtained thanks to funding provided by the US National Science Foundation through grant EAR-9725140 (Villaseñor et al., 1997) and collected by SGA Storia Geofisica Ambiente (Bologna) on behalf of the Istituto Nazionale di Geofisica e Vulcanologia (Rome), in the frame of the EUROSEISMOS project.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Butte	N.	88·6	39	e 11 55	− 1	e 21 46	−10	e 13 54	pP	e 38·6
Hungry Horse		89·0	37	i 11 53	− 5	i 22 27	+28	i 14 14	pP	—
Bozeman		89·4	40	e 12 9	+ 9	i 22 17	+14	e 14 31	pP	e 38·3
Vera Cruz		89·4	69	i 12 1	+ 1	i 22 4	+ 1	e 14 16	pP	—
Denver		90·5	48	18 52	?	21 47	[+ 3]	22 17	S	—
Rapid City	E.	93·6	44	e 12 17	− 2	i 22 47	+ 8	e 14 35	pP	—
Saskatoon		95·0	36	15 23	sP	22 57	+ 6	25 34	PS	—
Huancayo		97·7	106	e 12 44	+ 6	i 22 25	[+ 2]	e 14 54	pP	e 40·9
Irkutsk		98·4	323	e 12 40	− 1	i 22 14	[−13]	24 54	SP	—
Calcutta	E.	100·6	290	12 34	−17	i 22 37	[0]	i 17 11	PP	—
St. Louis		100·8	53	e 12 47	− 5	i 23 37	− 3	i 15 1	pP	—
La Plata	E.	101·2	134	13 51	+57	25 53	PS	18 11	PP	—
	N.	101·2	134	13 54	+60	25 23	SP	19 5	PP	—
La Paz		102·3	113	e 13 1	+ 3	i 23 47	− 5	e 15 11	pP	50·3
Colombo	E.	103·5	272	13 7	+ 4	22 40	[−11]	—	—	34·2
Chicago		103·6	50	e 15 18	pP	i 22 45	[− 6]	e 27 4	PS	e 49·8
Bogota		104·8	90	i 17 42	PP	i 22 52	[− 5]	i 23 47	SKKS	—
Columbia		106·8	59	e 21 15	?	e 24 39	S	e 23 3	SKS	e 44·9
Cleveland		108·0	52	e 17 28	[+ 2]	i 23 6	[− 4]	i 24 40	S	—
Hyderabad	N.	108·0	282	e 17 58	[+32]	24 38	S	—	—	—
Kirkland Lake		110·1	45	e 17 29	[− 1]	e 27 11	SP	e 18 16	PP	—
Temiskaming		110·6	47	e 17 33	[+ 2]	e 26 59	SP	e 18 22	PP	—
Philadelphia		112·5	54	e 18 39	PP	i 23 26	[− 3]	e 21 37	PPP	—
Ottawa		112·8	48	e 17 28	[− 7]	e 25 27	?	e 21 35	PPP	—
Bombay		113·6	282	17 3	[−33]	24 5	[+32]	i 18 29	PP	—
Fordham		113·6	53	e 17 36	[0]	e 23 22	[−11]	i 29 40	PPS	—
Almata		114·2	310	e 17 38	[+ 1]	e 23 31	[− 4]	—	—	—
Weston		115·6	51	i 17 41	[+ 1]	i 23 38	[− 2]	18 57	PP	—
Frunse		115·9	309	e 17 42	[+ 1]	23 37	[− 4]	—	—	—
Seven Falls		116·2	46	e 17 42	[0]	21 53	SKP	27 45	?	61·6
San Juan		116·3	79	—	—	i 23 36	[− 7]	e 24 31	SKKS	—
Andijan		117·4	306	e 17 48	[+ 4]	—	—	e 19 11	PP	—
Obi-garm		119·4	304	i 17 43	[− 5]	—	—	—	—	—
Tchimkent		119·6	308	17 45	[− 3]	i 23 49	[− 5]	—	—	—
Tashkent		119·8	307	17 38	[−10]	i 23 50?	[− 5]	i 19 0?	PP	—
Bermuda		120·0	63	e 22 35	sPP	e 23 49	[− 7]	e 25 23	SKKS	—
Fort de France		120·0	85	e 17 44	[− 5]	e 25 18	SKKS	—	—	—
Stalinabad		120·1	304	i 17 43	[− 6]	i 29 18	PS	i 19 20	PP	—
Samarkand		121·5	305	e 17 50	[− 2]	—	—	—	—	—
Sverdlovsk		123·6	326	i 17 50	[− 6]	23 59	[− 8]	i 19 44	PP	—
Scoresby Sund		127·8	10	20 12	PP	—	—	36 41	SS	—
Baku		134·5	308	18 22	[+ 5]	—	—	20 57	PP	—
Moscow		135·5	332	i 20 56	PP	i 24 12	[−25]	i 23 8	pPP	—
Grozny		136·7	312	e 18 13	[− 7]	i 22 1	PP	—	—	—
Helsinki		136·8	344	e 18 20	[− 1]	e 24 38	[− 1]	e 21 13	PP	—
Piatigorsk		138·3	315	e 18 30?	[+ 6]	—	—	i 21 2	PP	—
Erevan		138·5	308	18 21	[− 3]	—	—	e 21 0	PP	—
Leninakan		138·8	310	18 44	[+19]	—	—	e 21 36?	PP	—
Upsala		138·8	348	i 21 4	SKP	24 34?	[− 8]	31 30	PS	e 47·6
Theodosia	N.	142·8	320	18 21	[−12]	—	—	e 21 19	PP	—
Aberdeen	E.	143·0	4	i 18 30	[− 3]	—	—	—	—	—
Simferopol	N.	143·6	321	i 18 28	[− 6]	—	—	e 21 17	PP	—
Copenhagen		143·7	350	i 18 27	[− 7]	24 48	[− 2]	i 21 53	PP	—
Yalta		143·9	319	i 18 28	[− 6]	—	—	e 21 18	PP	—
Warsaw		144·7	340	i 18 29	[− 7]	—	—	i 20 59	PP	—
Potsdam	Z.	146·7	349	i 18 32k	[− 7]	i 22 3	PP	i 20 54	pPKP	—
Ksara		146·9	301	e 18 35k	[− 4]	—	—	i 21 7	pPKP	—
Raciborzu		147·5	341	e 18 38	[− 2]	—	—	i 21 53	PP	—
Collmberg	Z.	147·7	347	e 18 37	[− 3]	—	—	i 22 8	PP	—
De Bilt		148·0	356	i 18 42k	[+ 2]	—	—	i 22 10k	PP	—
Jena	Z.	148·4	347	e 18 39	[− 2]	—	—	e 22 9	PP	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bucharest		148·5	326	e 18 47	[+ 6]	(25 35?)	[+38]	—	—	25·6
Prague		148·6	345	i 18 42	[+ 1]	i 32 29	PS	i 22 10	PP	—
Kew		148·7	3	i 18 43k	[+ 2]	e 25 33	[+36]	e 22 10	PP	—
Istanbul		148·9	318	i 18 41	[− 1]	i 25 38	[+41]	—	—	—
Cheb		149·0	347	e 18 45	[+ 3]	e 28 57	SKKS	e 21 55	PP	e 51·6
Budapest		149·4	336	18 43	[+ 1]	—	—	i 22 14	PP	e 39·1
Uccle		149·4	358	e 18 43k	[+ 1]	e 40 59	SS	e 21 10	pPKP	e 46·6
Kalossa		150·2	336	18 51	[+ 7]	—	—	i 21 48	PP	e 37·6
Stuttgart		150·9	350	e 18 39k	[− 6]	e 32 45	PSKS	21 11	pPKP	—
Belgrade		151·0	332	i 18 51	[+ 6]	e 25 49	[+49]	—	—	—
Strasbourg		151·3	352	i 18 42	[− 3]	i 32 10	SKSP	i 21 19	pPKP	—
Paris		151·4	0	e 18 41	[− 4]	e 35 47	pSP	i 21 13	pPKP	51·6
Helwan		151·6	296	i 18 41a	[− 5]	—	—	20 56	pPKP	—
Basle		152·3	351	e 18 28	[−19]	—	—	e 20 59	pPKP	—
Zürich		152·3	350	e 18 41k	[− 6]	—	—	e 22 27	PP	—
Chur		152·7	349	e 18 42	[− 5]	—	—	—	—	—
Besançon		152·8	354	e 18 48	[+ 1]	—	—	—	—	—
Triest		152·8	343	i 18 59	[+12]	i 28 34	SKKS	i 21 40	pPKP	—
Neuchatel		152·9	352	e 18 49	[+ 1]	—	—	—	—	—
Clermont-Ferrand		154·5	357	i 18 45	[− 5]	i 41 18	SS	i 22 42	PP	51·6
Rome		156·5	341	i 18 53	[+ 1]	e 42 43	SS	e 22 46	PP	—
Lisbon		159·3	25	i 18 59k	[+ 3]	—	—	i 23 23	PP	—
Toledo		159·8	13	i 18 59	[+ 3]	—	—	—	—	—
Alicante		161·8	6	19 4	[+ 6]	—	—	i 22 36	PP	e 61·7
Malaga	z.	162·6	17	i 18 55a	[− 4]	i 26 58	SKKS	29 18	PS	47·7
Almeria		163·0	12	i 18 56	[− 3]	30 28	PS	22 20	PKS	—

Additional readings :—
Apia i = 2m.19s. and 2m.38s., iEN = 3m.30s., i = 3m.47s.
Auckland i = 4m.22s., 4m.56s., 5m.10s., 5m.26s., 5m.43s., and 9m.17s., S_cP = 10m.23s., P_cS = 11m.32s., i = 13m.38s. and 14m.43s., sS_cP? = 15m.35s.
Tuai S? = 6m.25s.
New Plymouth i = 5m.15s., 7m.8s., and 8m.41s.
Wellington i = 4m.18s. and 4m.39s., S = 6m.56s., i = 7m.11s., S_cS = 14m.11s., i = 15m.46s., sS_cSZ = 19m.19s.
Kaimata i = 4m.51s. and 5m.32s., S? = 7m.21s., i = 9m.19s., 14m.20s., and 14m.41s.
Brisbane iPN = 5m.6s., iE = 7m.9s., iSSEN = 7m.55s., iN = 8m.24s. and 8m.59s.
Riverview iN = 7m.14s. and 7m.23s., i = 7m.35s., iEZ = 7m.46s. and 8m.24s., iE = 8m.57s. and 9m.11s., iS_cPN = 10m.54s., isSN = 12m.44s., iE = 12m.58s., iZ = 13m.2s., iN = 13m.28s., iS_cSE = 14m.58s.
Honolulu i = 7m.50s. and 8m.14s., isP = 10m.38s., iS_cS = 16m.32s.
Perth i = 16m.10s. and 18m.5s.
Mizusawa SN = 18m.52s.
Batavia SSEN = 23m.24s.
Branner iEN = 11m.7s. and 20m.17s.
San Francisco iE = 20m.38s.
Vladivostok sS = 24m.2s.
Berkeley iPNZ = 11m.3s., iEZ = 11m.7s., iE = 11m.20s. and 11m.46s., iN = 11m.49s., iEN = 17m.6s., iN = 20m.18s., iEZ = 20m.41s., iEN = 24m.2s. and 24m.37s.
Lick iPEN = 11m.7s.
Ukiah esPP = 17m.11s., iS_cS = 20m.24s., iSKS = 20m.44s., esPS = 24m.38s., esSS = 29m.23s.
Ferndale iPE = 11m.24s.
La Jolla i = 11m.9s.
Pasadena iZ = 11m.5s., i = 11m.19s., iZ = 14m.0s., isP?Z = 14m.20s., esPPE = 16m.55s., eSN = 20m.11s., i = 20m.43s., iZ = 21m.12s., eSSE = 25m.41s., eSSSNZ = 28m.41s., ePKP,PKPZ = 38m.9s., iZ = 40m.28s.
Mount Wilson iZ = 11m.11s., isP?Z = 14m.23s., iSEN = 20m.23s., ePKP,PKPZ = 37m.57s., iZ = 40m.31s.
Antarctica eP = 11m.11s., eS = 20m.23s., ePS = 21m.11s., e = 24m.44s.
Palomar iEZ = 11m.13s., iZ = 14m.9s. and 14m.31s., iPKP,PKPZ = 38m.3s., iZ = 40m.24s.
Riverside i = 11m.12s., iS = 20m.31s.
Shasta Dam i = 11m.15s., iS? = 20m.53s., esS = 24m.23s., ePKP,PKP = 37m.57s., eSKP,PKP = 40m.23s., ePKP,PKP,PKP = 58m.2s.
Haiwee iEN = 11m.17s.
Tinemaha iZ = 11m.17s. and 14m.30s., iS = 20m.42s.
Mineral iN = 11m.17s. and 11m.20s., iE = 11m.25s.
Boulder City i = 11m.24s., eSP = 22m.34s., esS = 24m.43s.
Pierce Ferry i = 11m.30s., iSP = 22m.4s., ePKKP = 29m.50s., ePKP,PKP = 38m.6s., eSKP,PKP = 40m.22s.
Tucson i = 11m.32s., isP = 14m.48s., iSKS = 21m.7s., iSP = 22m.5s., eSS = 25m.3s., esPS = 25m.30s., iPKKP = 29m.39s., iPKP,PKP = 37m.59s., eSKP,PKP = 40m.22s.

Continued on next page.

Victoria e =(14m.46s.), SS =(25m.5s.). Clock correction of +30s. applied.
Seattle esS =25m.43s.
Sitka esS =25m.13s., iSS? =27m.15s.
Grand Coulee i =12m.49s. and 16m.52s.
Salt Lake City eSKS =21m.15s., isS =25m.35s., eSS? =27m.35s.
Logan iP =11m.47s., esP =14m.44s., ePP =15m.7s., eSKS =21m.19s., iSP =22m.43s., isS =25m.34s., eSS? =28m.44s.
College isS =25m.38s., isPS =26m.36s.
Butte iSKS =21m.55s., esS =25m.44s.
Hungry Horse i =11m.57s., iSKS =21m.33s., ePKKP =29m.58s., ePKP,PKP =37m.34s.
Bozeman ePP =15m.27s., esS =26m.11s.
Vera Cruz esPN =15m.13s., eSKSE =21m.31s., iSKKSN =21m.40s., iSPN =23m.10s., iSPE =23m.13s.
Denver 23m.35s., 25m.8s. and 26m.15s.
Rapid City eSKS =21m.59s., iSP =23m.59s., isS =26m.15s., esPS =27m.43s., eSS =29m.19s.
Saskatoon SKKS =26m.57s., S =28m.1s., readings wrongly identified.
Huancayo ePP =16m.41s., eSKKS =22m.5s., iS =22m.54s., eSP =24m.49s., esPS =28m.24s., eSS? =30m.20s.
Irkutsk PP =17m.4s., PS =26m.5s., sPS =28m.35s.
Calcutta ePPE =13m.5s., PPSE =23m.37s.
St. Louis iP =12m.55s., iSKS =22m.29s., isSKS =26m.39s., isS =27m.45s., i =30m.28s.
La Plata E. 16m.11s. and 19m.9s., i =19m.16s., PPP =20m.34s. and 21m.59s., PS =27m.41s., SS? =31m.35s., SSS =37m.53s.
La Plata N i =19m.17s., PPP =20m.11s. ,21m.47s., and 23m.11s., PS =27m.29s., SS =33m.11s., SSS =38m.47s.
La Paz isPNZ =16m.7s., iPPZ =17m.19s., ipPPE =18m.55s., PPP =19m.47s., iSKS =22m.39s., iSKKS =22m.59s., iSPEZ =25m.19s., pSKS =25m.35s., sSKS =26m.39s., sSN =27m.31s., iSSE =31m.5s., SSSE =35m.17s.
Chicago iS =24m.1s., iSP =25m.51s., esS =28m.1s., isPS =29m.27s., iSS =31m.34s.
Columbia eSP =26m.21s., ePS =27m.21s., esS =28m.42s., eSS =32m.3s.
Cleveland eN =17m.11s., iE =21m.4s., iSN =24m.44s., eE =26m.16s., iPSE =26m.31s., iE =27m.2s., isSKSE =27m.26s., isSEN =28m.53s., ipPSE =30m.11s., iE =32m.29s., iSSN =32m.32s., iE =32m.35s., 34m.17s., and 35m.56s., isSSN =36m.46s.
Kirkland Lake ? =17m.16s.
Philadelphia iS =25m.19s., eSP =27m.20s., isS =29m.25s., isPS =31m.3s., iSS =33m.34s.
Ottawa eE =27m.17s., eN =29m.25s., eE =31m.5s., eN =33m.35s., 37m.15s., and 41m.35s.
Bombay iPPPE =20m.43s., SKKSEN =25m.15s., SKKKSE =25m.30s., PKKPE =27m.15s., PSE =27m.45s., PPSE =29m.15s., PKKSE =31m.0s., SSE =34m.45s., SSSE =38m.45s.
Fordham iS =25m.28s., i =27m.24s. and 31m.9s.
Weston sPP =21m.59s., iS =25m.51s., SP =27m.41s., iPS =28m.53s. and 29m.59s., i =31m.55s.
Seven Falls, S =29m.11s., PPS =31m.37s., SS =37m.17s.
San Juan eS =25m.49s., eSP =27m.41s.
Tashkent PPP =25m.24s.?, SP =28m.5s., ePS =29m.12s.
Bermuda eSPP =30m.45s., esPS? =32m.10s., iSS =35m.16s.
Stalinabad ipPP =21m.20s.?, iPPP =21m.59s., sPS =32m.13s.
Sverdlovsk ipPP =21m.44s., PPP =22m.43s., iPS =29m.52s.
Scoresby Sund 21m.31s.
Moscow i =21m.51s.
Helsinki e =19m.16s., iSKP =20m.59s., iPKS =21m.55s., isSKP =25m.21s., ipSKS =31m.17s., e =33m.13s., 36m.3s., 39m.51s., 44m.5s., 47m.0s., and 51m.26s.
Upsala iPKS =21m.58s., eN =27m.12s., iE =30m.52s., eN =31m.58s. and 36m.35s.?
Aberdeen iN =16m.57s.
Copenhagen i =18m.32s. and 21m.18s., 23m.58s., 25m.2s., 28m.12s., and 35m.0s.
Warsaw PKPE =18m.37s., iZ =18m.47s.
Potsdam iPKP$_2$EN =18m.43s., iZ =19m.13s., iPPPZ =25m.24s., iN =27m.45s. and 32m.24s.
Ksara isPKP =22m.9s., PPP =25m.31s.
Raciborzu iN =18m.45s.
Collmberg iPKP$_2$Z =18m.44s., iZ =23m.9s., ipPPZ =23m.54s.
Jena eN =18m.43s., iZ =18m.47s., eZ =21m.7s.
Prague ePPP? =25m.35s., ePS? =34m.59s., iPPS? =35m.47s., eSS =41m.35s., eSSS =47m.17s.
Kew i =18m.48s., ePP?Z =19m.54s.?, eSKKS?N =26m.42s., ePS?N =29m.28s., ePKKS?N =33m.9s.?, eSS?NZ =35m.54s.?, eSSS?E =40m.44s.?
Cheb e =18m.15s., ePPP =25m.22s., eSKSP =32m.39s., ePPS? =35m.54s., eSS =40m.48s.
Budapest iN =18m.53s., 22m.27s., and 25m.44s.
Uccle e =19m.39s., ePPN =22m.17s., ePPP =25m.40s., eN =28m.47s., ePPSN =35m.47s.
Kalossa iN =19m.1s., iE =19m.17s.
Stuttgart iPKPZ =18m.47s.$_a$, iPKP$_2$Z =18m.53s. and 19m.3s.$_a$, ePP =22m.20s., ePPS =36m.6s.
Belgrade i =20m.12s.

Continued on next page.

Strasbourg iPKP = 18m.45s., e = 20m.44s., i = 21m.56s., isPKP = 22m.12s., iPP = 22m.35s., iPPP = 25m.48s., 25m.52s., and 25m.58s., i = 28m.54s., iPSKS = 32m.51s., iPPS = 35m.50s., 36m.8s., and 36m.13s., iSS = 40m.53s. and 41m.19s., esSS = 44m.35s.
Paris iPKP = 18m.46s., ePKP = 18m.51s., $iPKP_2$ = 19m.5s., e = 19m.33s. and 19m.41s., i = 19m.54s., 20m.10s., and 20m.59s., $ipPKP_2$ = 21m.17s., $csPKP_2$ = 22m.19s.?, iPP = 22m.36s., esPP = 25m.53s., e = 29m.9s., e = 39m.35s.?
Helwan $pPKP_2$ = 21m.23s., PP = 22m.43s., sPP = 25m.53s.
Basle i = 18m.49s., ePP = 22m.36s.
Zürich i = 18m.46s.
Triest iPPP = 27m.4s., iPSKS = 32m.56s.
Clermont-Ferrand iPKP = 18m.53s. and 19m.2s., ipPP = 25m.7s., i = 29m.31s., PSP = 36m.34s.
Rome ePPP? = 26m.10s.
Lisbon $iPKP_2Z$ = 19m.40s.
Alicante i = 23m.34s.
Malaga iPPZ = 19m.51s., PPPZ = 22m.17s., PPSZ = 30m.18s.
Almeria $iPKP_2$ = 19m.46s., PP = 23m.32s., PPP = 27m.18s., PPS = 36m.52s., SS = 43m.42s.

Jan. 27d. Readings also at 1h. (near Apia), 4h. (Branner and La Paz), 7h. (Hungry Horse), 8h. (Andijan), 9h. (near Berkeley), 12h. (Ottawa, Copenhagen, and Stuttgart), 14h. (Mount Wilson, Palomar, Riverside, Tucson, and Shasta Dam), 18h. (Batavia, Calcutta, Hyderabad, Ksara, Kew, Samarkand, near Obi-garm, and Stalinabad), 19h. (Samarkand, near Obi-garm, Stalinabad, and near Ottawa).

Jan. 28d. 3h. 47m. 26s. Epicentre 1°·1N. 126°·4E. Depth of focus 0·010.
(as on 1947, July 22d.).

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

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m.	s.		m.
Batavia		20·8	250	e 4 38	+ 3	i 8 35	+18	—		—	—
Guam		21·9	54	i 5 40	+54	e 9 15	SS	—		—	—
Hukuoka		32·5	6	i 6 21	− 2	11 26	− 4	—		—	15·2
Hamada		34·0	8	6 34	− 2	11 48	− 6	—		—	—
Perth		34·4	195	6 42	+ 2	12 9	+ 9	8	9 PP		—
Kameyama		34·9	15	6 42	− 2	12 0	− 7	—		—	—
Nagoya		35·3	16	6 45	− 2	12 6	− 8	—		—	—
Tokyo		36·6	18	e 7 0	+ 2	12 5	−28	—		—	12·7
Toyama		36·8	14	i 6 58	− 2	12 26	−10	—		—	—
Kakioka		37·2	18	6 57	− 6	12 36	− 7	—		—	—
Brisbane		38·3	140	i 7 12	0	i 12 59	0	i 8	44 PP		—
Sendai		39·3	18	7 18	− 3	13 14	0	—		—	19·4
Mizusawa		40·2	18	7 33	+ 5	13 29	+ 1	—		—	—
Morioka		40·7	17	7 30	− 2	13 31	− 4	—		—	—
Riverview		41·8	148	7 46a	+ 5	i 13 59	+ 7	i 8	6 pP		i 24·9
Vladivostok		42·1	6	i 7 43	− 1	i 13 52	− 4	—		—	—
Calcutta	E.	42·7	303	i 7 50k	+ 1	i 14 13	+ 8	i 9	41 PP		—
Mori		42·8	15	7 48	− 2	14 3	− 3	—		—	—
Sapporo		43·9	15	7 58	− 1	14 21	− 1	—		—	—
Colombo	E.	46·8	278	8 22	0	e 15 5	+ 1	—		—	26·4
Kodaikanal	E.	49·5	283	8 46	+ 4	i 15 46	+ 5	10	44 PP		22·9
Hyderabad	N.	49·8	292	—	—	15 48	+ 2	—		—	—
Irkutsk		54·3	343	i 9 17	− 1	i 16 45	− 2	—		—	—
Bombay		55·4	292	e 9 21	− 5	e 16 59	− 3	e 9	27 P		26·2
Auckland		58·6	135	10 2	+13	17 52	+ 8	12	9 PP		—
Almata		60·8	321	e 10 8	+ 4	e 18 12	0	—		—	—
Wellington		60·8	140	10 4	0	18 10′	− 2	12	14 PP		24·8
Tuai		61·2	136	10 10	+ 3	18 18	+ 1	—		—	—
Frunse		62·1	318	i 10 15	+ 2	i 18 35	+ 7	—		—	—
Andijan		62·7	315	e 10 17	0	—	—	—		—	—
Obi-garm		63·8	313	i 10 26	+ 2	i 18 53	+ 3	—		—	—
Stalinabad		64·4	313	i 10 27	− 1	i 18 57	0	—		—	—
Tashkent		65·1	315	i 10 29	− 3	i 18 58	− 8	—		—	—
Tchimkent		65·2	316	e 10 31	− 2	i 19 10	+ 3	—		—	—
Samarkand		66·1	313	i 10 39?	0	i 19 14?	− 4	—		—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m. s.			m.
Ashkabad		72·1	310	e 11 18	+ 2	i 20 36	+ 7	—		—	—
Sverdlovsk		76·0	329	i 11 38	0	i 21 9	− 3	i 12 0		pP	—
Honolulu		76·4	68	i 11 39	− 1	e 20 52	−24	—		—	—
Baku		79·0	311	e 11 58	+ 3	i 21 52	+ 8	—		—	—
Grozny		82·4	313	i 12 17	+ 4	i 22 24	+ 5	—		—	—
Erevan		83·1	310	e 12 18	+ 2	—	—	—		—	—
Leninakan		83·7	310	e 12 23	+ 4	i 22 39	+ 7	—		—	—
Piatigorsk		84·4	314	e 12 25	+ 2	e 22 41	+ 2	—		—	—
Sotchi	N.	86·8	313	e 12 42	+ 7	—	—	—		—	—
College		87·2	25	e 24 16	PS	e 22 52	[0]	e 28 21		SS	e 34·0
Moscow		88·4	326	12 42	0	23 16	− 2	—		—	—
Ksara		89·8	303	i 12 53a	+ 4	i 23 43	+13	—		—	—
Theodosia	N.	90·0	315	e 12 59	+ 9	i 23 37	+ 5	e 23 15		SKS	—
Yalta		90·8	314	e 12 47?	− 7	23 14?	[− 1]	i 23 37?		S	—
Simferopol	N.	90·9	314	e 13 6?	+12	23 28?	−12	—		—	—
Helwan		93·9	300	e 13 6	− 2	e 24 4	− 2	26 10		PPS	—
Helsinki		94·7	331	e 13 12	+ 1	e 23 37	[+ 1]	e 24 19		S	e 39·6
Istanbul		94·8	311	e 16 43	PP	i 24 21	+ 7	—		—	—
Bucharest		96·6	315	e 13 40	+20	e 23 46	[− 1]	—		—	40·6
Upsala		98·4	331	e 17 14?	PP	i 23 56	[− 1]	e 24 49		S	e 40·6
Warsaw		98·5	323	e 13 29	0	24 0	[+ 3]	i 24 52		S	44·6
Budapest		100·8	319	e 13 46	+ 7	e 25 10	+ 5	—		—	e 50·1
Copenhagen		102·4	328	18 29	PP	—	—	—		—	—
Victoria		102·4	40	—	—	e 23 45	[−30]	e 35 42		Q	41·6
Prague		103·1	322	e 26 57	PS	e 25 34	+10	e 32 34		SS	e 48·6
Potsdam		103·2	325	e 18 13	PP	i 27 2	PS	—		—	53·6
Cheb		104·3	323	e 18 40	PP	e 24 31	[+ 7]	e 32 55		SS	e 53·6
Jena	N.	104·5	323	e 14 2	P	—	—	e 18 19		PP	—
Triest		104·9	318	e 18 42	PP	i 25 42	+ 3	—		—	e 51·6
Ukiah		105·0	49	—	—	e 33 4	SS	—		—	e 46·9
Shasta Dam		105·2	47	e 14 0	P	e 24 33	[+ 4]	e 18 16		PP	—
Berkeley		106·0	50	i 18 26	PP	i 24 39	[+ 7]	i 27 30		PS	e 49·1
Santa Clara	N.	106·4	50	e 18 36	PP	—	—	—		—	—
Stuttgart		106·7	322	e 14 14	P	e 25 57	+ 3	e 18 36		PP	e 54·6
Rome		106·9	315	—	—	e 26 37	+42	—		—	—
Strasbourg		107·7	323	e 18 25	PP	e 27 52	PS	i 33 49		SS	44·6
De Bilt		107·7	327	—	—	e 33 34?	SS	—		—	52·6
Basle		108·2	322	e 16 41	?	e 27 53	PS	—		—	—
Hungry Horse		108·4	37	e 14 12	P	e 27 58	PS	e 18 41		PP	—
Uccle		108·8	326	e 18 17	PP	e 26 23	S	e 33 52		SS	e 52·6
Aberdeen		108·9	334	i 22 47	?	—	—	—		—	e 46·0
Tinemaha	Z.	109·3	50	i 14 19	P	—	—	i 18 42		PP	—
Butte	N.	110·2	39	—	—	e 25 49	SKKS	e 38 9		SSS	—
Pasadena		110·2	53	e 14 23	P	i 25 52	SKKS	i 18 58		PP	e 44·5
Mount Wilson	Z.	110·3	53	e 14 23	P	—	—	i 18 56		PP	—
Paris		110·8	324	e 18 33	PP	—	—	e 54 34		Q	e 59·6
Saskatoon		110·8	32	19 4	PP	25 0	[+ 8]	28 31		PS	59·6
Riverside	Z.	110·9	53	e 14 26	P	—	—	i 19 1		PP	—
Kew		111·0	328	i 29 23?	PPS	e 34 37?	SS	—		—	—
Bozeman		111·3	39	e 28 27	PS	e 26 45	?	e 29 59		PPS	e 42·7
Clermont-Ferrand		111·8	321	i 19 15	PP	i 28 30	PS	i 30 0		PPS	57·6
Boulder City		112·3	50	e 18 30	[+ 5]	e 26 12	SKKS	e 19 16		PP	—
Antarctica		112·4	174	e 19 17	PP	e 25 7	[+ 9]	e 29 20		PS	e 55·6
Salt Lake City		112·8	44	e 29 42	PPS	e 26 46	SKKS	e 28 42		PS	e 44·8
Pierce Ferry		112·9	50	e 18 12	[−14]	e 26 13	SKKS	e 28 42		PS	—
Tucson		116·6	53	i 18 38	[+ 5]	e 25 22	[+ 7]	e 19 41		PP	e 46·7
Rapid City	E.	117·0	37	e 19 6	[+32]	e 25 18	[+ 2]	e 26 34		SKKS	e 55·1
Alicante		117·4	315	e 22 17	PPP	—	—	—		—	e 43·4
Toledo		119·1	318	e 18 51	[+13]	—	—	—		—	—
Almeria		119·5	314	18 33	[− 6]	25 19	[− 6]	18 53		pPKP	59·6
Granada		120·1	315	e 20 30k	PP	29 38	PS	—		—	i 65·4
Malaga	Z.	120·9	315	e 18 46	[+ 5]	—	—	i 19 12		PKP_2	67·8
Kirkland Lake		125·8	21	e 18 58	[+ 7]	—	—	e 20 44		PP	—
Chicago		127·4	32	e 20 52	PP	e 37 50	SS	—		—	e 54·4
Temiskaming		127·4	21	e 18 57	[+ 3]	—	—	—		—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m. s.			m.
St. Louis		128·1	36	i 18 56	[+ 1]	i 27 45	SKKS	i 37 51	SS		—
Ottawa		129·7	20	19 0	[+ 2]	31 52	PS	21 2	PP		53·6
Cleveland		130·6	27	e 19 2	[+ 2]	e 38 37	SS	i 21 18	PP		—
Tacubaya		130·9	63	19 9	[+ 9]	i 22 22	SKP	e 21 26	PP		—
Harvard		133·7	18	e 19 9	[+ 3]	e 22 28	PKS	e 21 34	PP		—
Fordham		134·3	21	e 19 11	[+ 4]	i 22 31	PKS	e 21 35	PP		72·8
Philadelphia		134·6	23	i 22 44	PKS	e 39 15	SS	—	—		e 60·2
Bermuda		145·1	17	e 19 34	[+ 8]	e 29 34	SKKS	e 22 38	PP		e 60·1
La Plata	E.	146·1	174	—	—	26 19	[− 6]	58 46	Q		61·8
	N.	146·1	174	19 52	[+24]	26 24	[− 1]	—	—		58·6
Huancayo		155·8	117	e 19 52	[+10]	e 30 40	SKKS	e 23 34	PP		—
San Juan		157·0	31	e 20 34	[+50]	i 35 19	SKSP	i 24 17	PP		—
Bogota		158·8	73	e 19 53	[+ 7]	i 25 55	[−45]	i 24 10	PP		50·6
La Paz		159·0	138	19 55	[+ 9]	i 30 53	SKKS	—	—		76·8
Fort de France		162·6	25	e 20 1	[+11]	—	—	—	—		—

Additional readings :—
Brisbane iPEN =7m.17s., iSSN =15m.50s.
Riverview iP$_c$PZ =9m.38s., ipPP?EN =9m.53s., iP$_c$S?Z =13m.26s., iSSE =17m.5s., iEN =17m.10s., iS$_c$SZ =17m.37s., i =20m.33s., iE =22m.3s., 22m.23s., and 23m.35s., iN =23m.42s., iE =24m.7s.
Calcutta iSSE =17m.0s.
Kodaikanal PPPE =11m.44s., PSE =15m.56s., PPSE =16m.11s.
Bombay iPPE =13m.0s., iSE =16m.56s.
Auckland P$_c$P =10m.57s., i =11m.39s., PPP =13m.23s., i =17m.13s., 19m.13s., 19m.30s. and 20m.31s., SSS =24m.10s.
Wellington P$_c$P? =11m.11s., PPP? =13m.44s., S$_c$S =19m.48s. , SS =22m.0s.
Sverdlovsk sS =21m.46s.
Helsinki ePS =25m.27s., e =30m.38s.
Upsala ePKSN =21m.27s., PS =26m.6s., ePPSN =27m.19s., eE =28m.58s., eSSN =31m.10s., eSSE =31m.34s.?, eSSSE =35m.34s.?
Warsaw ePN =13m.50s., eZ =16m.36s., PPZ =17m.24s., eE =17m.35s. and 18m.50s., eZ =20m.19s., eN =20m.29s., eSKSN =24m.3s., iSE =24m.56s., ePSN =25m.56s., PSE =26m.4s., PPSN =26m.37s., PPSZ =26m.47s., ePKKPZ =29m.36s., SSZ =31m.27s., SSE =31m.30s., SSSZ =35m.24s., SSSN =35m.29s.
Budapest eN =14m.19s., eE =14m.31s., iN =18m.13s.
Copenhagen 26m.51s., 28m.36s., and 32m.28s.
Potsdam ePPSN =27m.54s., eN =29m.18s.
Cheb e =19m.37s., ePPP? =21m.46s., ePS =28m.3s.
Jena eN =17m.14s.
Shasta Dam ePS =27m.19s.
Berkeley iE =25m.24s., iSE =28m.14s., iPSE =29m.2s., iZ =32m.40s., iE =33m.15s., iN =37m.19s., eN =43m.16s.
Stuttgart ePKP?Z =17m.24s., eSSS? =37m.31s.
Strasbourg eSKP =21m.34s., e =28m.26s. and 37m.14s., eSSS =37m.34s.
Uccle ePPSE =28m.38s.
Tinemaha eZ =18m.31s.
Pasadena eZ =15m.12s., and 17m.46s., iPPZ =18m.27s., eZ =28m.10s., iZ =28m.41s., eZ =31m.59s., iZ =34m.15s., eZ =38m.22s.
Saskatoon SKKS =25m.56s., SS =34m.21s.
Kew eN =33m.43s.?
Bozeman eSSS =39m.9s.
Boulder City eS =26m.48s.
Antarctica eS =26m.8s., ePPS =30m.48s., eSS =35m.26s., eSSS =39m.32s.
Salt Lake City eSS =34m.50s.
Pierce Ferry ePP =19m.13s.
Tucson i =19m.27s., eS =27m.23s., iPS =29m.14s., eSS =35m.13s., eSSS =39m.15s.
Rapid City ePP =19m.46s., ePPS =30m.58s.
Alicante i =27m.31s. and 33m.1s.
Almeria iPP =20m.6s., PKS =22m.7s., PPP =22m.36s., PS =29m.42s., PPS =31m.16s., SSS =40m.49s.
Granada PP =21m.56s., S =30m.44s., PS =33m.5s., PSS =33m.58s., iSS =39m.38s., readings wrongly identified.
Malaga iPPZ =22m.50s., PPPZ =26m.14s., QZ =63m.30s.
St. Louis i =21m.32s., esSKKS? =28m.21s., iPPS =32m.31s.
Ottawa SKP =22m.15s., eN =33m.58s., SSS =42m.58s.
Cleveland iPPZ =22m.17s., iS?EN =28m.2s., ePPSE =31m.53s., eN =32m.8s., eE =33m.9s.
Bermuda ePPS =35m.11s., ePPPS =36m.46s., eSS =41m.53s., eSSS =46m.46s.
La Plata SKSE =26m.52s., PPPE =28m.5s., PPSE =38m.16s., PPSN =39m.22s., SSN =43m.16s., SSSE =54m.16s.
Huancayo ePPPS =38m.48s., eSS =43m.34s.
San Juan i =23m.5s., and 29m.14s. iSKKKS? =31m.54s., ePPPS =38m.49s.
Bogota ePKP$_2$EZ =20m.27s.
La Paz i =19m.59s., PPNZ =25m.9s., SS =45m.46s.
Long waves were also recorded at Arapuni and Besançon.

Jan. 28d. 15h. 51m. 17s. Epicentre 36°·5N. 67°·5E.

A = +·3084, B = +·7445, C = +·5922 ; δ = +9 ; h = 0 ;
D = +·924, E = −·383 ; G = +·227, H = +·547, K = −·806.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Stalinabad		2·3	26	i 0 41	P_g	—	—	—	—	—
Obi-garm		2·8	37	i 0 50	P_g	—	—	—	—	—
Samarkand		3·2	354	i 0 53	P*	i 1 29	S*	—	—	—
Tashkent		5·0	16	i 1 19?	+ 1	i 2 16	− 2	i 1 49	P_g	—
Murgab		5·4	68	i 1 28	+ 4	i 2 35	+ 7	—	—	—
Andijan		5·7	40	i 0 58	−30	i 2 31	− 4	i 1 45	P_g	—
Tchimkent		6·0	15	i 1 31?	− 1	i 2 39?	− 4	i 2 23	?	—
Ashkabad		7·4	280	e 1 49	− 3	3 19	+ 1	—	—	—
Frunse		8·3	38	i 2 3	− 1	i 3 36	− 4	i 3 14	?	—
Almata		9·8	44	i 2 24	0	4 12	− 5	i 3 53	?	—
Baku		14·3	291	e 3 37	PP	—	—	—	—	—
Grozny		18·0	299	i 4 13	0	—	—	i 4 42	PPP	—
Bombay		18·1	163	e 4 7	− 7	e 7 43	+ 8	e 4 14	P	9·9
Erevan		18·4	288	e 4 21	+ 3	8 1	SS	—	—	—
Leninakan		18·9	290	i 4 40	PPP	7 56	+ 3	—	—	—
Piatigorsk		20·0	300	4 35?	− 2	8 15?	− 2	—	—	—
Sverdlovsk		20·8	349	i 4 43	− 2	i 8 25	− 8	—	—	—
Hyderabad	N.	21·3	149	4 43	− 7	8 49	+ 6	—	—	11·3
Sotchi	N.	22·3	297	i 4 59	− 2	e 9 13	+11	—	—	—
Calcutta	E.	22·7	121	i 5 1k	− 3	i 9 8	− 1	i 5 40	PP	—
Theodosia	N.	25·6	300	e 5 33	+ 1	—	—	—	—	—
Ksara		25·9	273	e 5 36	+ 1	i 10 27	+23	—	—	—
Yalta		26·4	298	i 5 40	0	i 10 10	− 2	i 6 30	PP	—
Simferopol	N.	26·5	299	5 41	0	i 11 35	SS	—	—	—
Kodaikanal	E.	27·6	157	e 6 8	+17	e 11 18	SS	—	—	—
Moscow		27·9	323	e 5 52	− 2	i 10 36	− 1	e 6 8	P	—
Istanbul		30·1	291	6 14	+ 1	11 13	+ 1	—	—	—
Irkutsk		30·3	46	6 14	− 1	11 6	− 9	—	—	—
Helwan		30·8	267	6 25	+ 5	11 25	+ 2	—	—	—
Colombo	E.	31·5	155	6 24	− 2	11 32	− 2	—	—	16·1
Bucharest	N.	32·2	298	e 5 37	−55	e 12 23	+38	—	—	19·7
Helsinki		35·9	325	i 7 2	− 2	i 12 41	− 1	e 8 25	PP	e 16·7
Warsaw		36·1	312	e 7 5k	0	i 12 44	− 1	e 8 29	PP	e 19·7
Belgrade		36·2	298	i 7 4k	− 2	e 12 43	− 4	e 11 16	?	e 21·8
Budapest		37·1	303	7 13	− 1	13 0	− 1	8 28	PP	17·1
Kalossa		37·1	302	7 20	+ 6	e 13 2	+ 1	—	—	e 26·2
Upsala		39·3	322	7 31	− 1	e 13 33	− 1	8 53	PP	e 19·1
Prague		40·1	307	e 7 42?	+ 3	e 13 43?	− 3	e 9 15	PP	e 16·7
Triest		40·9	301	i 7 49	+ 3	i 13 57	− 1	i 9 25	PP	25·7
Collmberg		41·0	308	e 7 47	+ 1	e 17 56	S_eS	i 9 31	PP	e 20·2
Potsdam		41·0	310	i 7 45?	− 1	i 14 1	+ 2	i 9 24	PP	—
Copenhagen		41·4	316	i 7 52	+ 2	14 5	0	9 33	PP	—
Cheb		41·4	307	i 7 59	+ 9	i 14 9	+ 4	i 9 35	PP	—
Jena		41·9	308	e 7 52	− 2	e 14 11	− 2	e 9 39	PP	e 21·2
Nanking		42·2	80	e 7 53	− 3	—	—	—	—	—
Rome		42·4	295	e 8 0	+ 2	e 14 14	− 6	e 17 40	SS	e 20·5
Stuttgart		43·6	305	e 8 6	− 2	e 14 37	− 1	e 9 53	PP	e 25·2
Chur		43·6	302	e 8 6	− 2	—	—	—	—	—
Zürich		44·2	303	e 8 12k	0	e 14 35	−11	e 9 58	PP	—
Strasbourg		44·6	305	i 8 16	0	i 14 53	+ 1	i 10 7	PP	e 21·7
Basle		44·8	304	e 8 15	− 2	e 18 32	SS	e 10 8	PP	—
Neuchatel		45·3	303	e 8 20	− 1	—	—	—	—	—
Besançon		45·9	303	e 8 27	+ 1	—	—	—	—	22·7
Uccle		46·5	309	e 8 36a	+ 5	e 15 20	+ 1	e 10 28	PP	e 22·7
Paris		48·0	306	i 8 41k	− 2	e 15 31	−10	e 9 4	pP	e 24·0
Clermont-Ferrand		48·2	302	i 8 45	+ 1	i 15 51	+ 8	i 19 36	SS	23·7
Vladivostok		48·8	60	e 8 45	− 4	—	—	—	—	—
Kew		49·3	310	i 8 53	0	e 15 53	− 6	e 10 27	PP	e 19·7
Aberdeen		49·5	318	—	—	i 15 58	− 4	i 19 36	SS	i 27·8
Edinburgh		50·2	316	14 6	P_cS	15 55	−16	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Jersey		50·9	309	—	—	e 16 23	+ 2	—	—	—
Alicante		52·9	294	i 9 23	+ 3	i 16 47	− 1	11 23	PP	26·2
Almeria		54·9	293	i 9 40	+ 5	17 12	− 4	11 44	PP	33·5
Toledo		54·9	297	i 9 37	+ 2	—	—	—	—	—
Scoresby Sund		55·9	336	—	—	17 32	+ 3	21 24	SS	—
Batavia		56·2	129	e 9 46	+ 2	i 17 47	+14	e 21 42	SS	—
Malaga	z.	56·4	294	i 9 42a	− 3	i 17 36	0	12 6	PP	29·8
Kirkland Lake		90·9	338	e 13 8	+ 1	—	—	—	—	—
Ottawa		92·0	335	e 13 11	− 1	23 53	[+ 9]	e 41 3	Q	48·7
Hungry Horse		95·5	1	e 13 2	−26	—	—	i 14 1	P	—
Cleveland		97·4	337	e 13 34	− 3	e 24 14	[0]	—	—	—
Bermuda		98·2	321	—	—	e 24 13	[− 5]	e 31 58	SS	e 46·2
Chicago		98·8	342	—	—	e 24 17	[− 4]	—	—	e 49·6
Shasta Dam		102·7	8	e 13 57	− 3	e 24 38	[− 2]	—	—	—
Riverview		104·7	121	e 18 33	[+12]	e 24 59	[+10]	e 27 53	PS	e 55·7
Tinemaha	z.	106·6	4	e 18 24	[− 2]	—	—	i 18 59	PP	—
Mount Wilson	z.	109·5	4	e 18 19	[−13]	—	—	i 19 4	PP	—
Pasadena		109·5	4	i 18 51	[+19]	—	—	i 19 6	PP	—
San Juan		110·0	313	e 19 35	PP	e 28 43	PS	e 21 29	PPP	e 45·3
Palomar	z.	110·4	3	e 17 57	[−37]	—	—	e 18 23	PKP	—
Tucson		111·6	358	e 18 45	[+ 9]	—	—	e 19 48	PP	—
La Paz		136·1	285	i 19 25	[+ 2]	i 28 57	{− 1}	i 22 3	PP	72·4
Huancayo		138·7	297	e 19 29	[+ 1]	e 40 45	SS	e 21 49	PP	e 60·0
Antarctica		139·5	205	e 22 43	PP	e 40 52	SS	e 46 34	SSS	e 68·7

Additional readings :—
Andijan i = 2m.7s.
Bombay iSE = 7m.49s.
Calcutta iSSE = 10m.4s.
Helsinki e = 8m.9s., 14m.41s., and 15m.39s.
Warsaw ePE = 7m.12s., PPN = 8m.20s., iPPZ = 8m.42s.?, PPPN = 8m.54s., PPPZ = 9m.1s., eE = 9m.9s., P_cPZ = 9m.26s., eSNZ = 12m.40s., eEN = 14m.43s., iSSZ = 14m.56s., SSN = 15m.8s., SSSN = 15m.26s., SSSZ = 15m.33s., SSSE = 15m.44s., eN = 16m.37s., eE = 16m.40s.
Budapest iE = 7m.19s., iN = 7m.25s., iE = 7m.34s., PPPE = 8m.43s., iPPPN = 8m.49s., SSE = 14m.59s., SSN = 15m.8s., eSSSN = 15m.36s., eSSSE = 15m.46s., eN = 16m.25s., iE = 16m.53s.
Kalossa iN = 9m.13s., iE = 10m.7s., eSE = 13m.7s.
Upsala eSE = 13m.28s., eSSN = 15m.43s.
Triest iSSS = 16m.59s.
Collmberg eZ = 7m.56s., ePcPEN = 9m.23s., eN = 16m.13s.
Potsdam iPE = 7m.49s., iPPEZ = 9m.15s., iPPPN = 10m.9s., iSN = 13m.56s., e = 16m.43s., iSSSN = 18m.3s.
Copenhagen 16m.49s. and 17m.11s.
Cheb eSS = 17m.31s.
Jena ePP?EZ = 9m.31s., eSSE = 17m.13s.
Stuttgart iP = 8m.13s.a, eS_cS = 17m.57s.
Strasbourg eP = 8m.20s., iPP = 10m.21s., iS = 14m.59s., eSS = 18m.18s. and 18m.22s., i = 18m.33s., iSSS = 19m.7s.
Uccle eSSN = 18m.58s.
Paris i = 8m.47s. and 8m.51s., iPP = 10m.35s., e = 10m.52s., eSS = 19m.16s., i = 19m.53s., e = 22m.43s.
Kew eSS?E = 18m.53s.
Aberdeen iE = 20m.32s.
Edinburgh S = 15m.42s., PS = 15m.49s., S_cS = 18m.36s., SS = 19m.5s.
Alicante PPP = 13m.37s., PS = 16m.59s., PPS = 17m.17s., S_cS = 19m.21s., SS = 20m.48s., Q = 21m.59s.
Almeria P_cP = 10m.36s., PPP = 12m.56s., P_cS = 14m.36s., S_cS = 19m.12s., SS = 21m.7s., SSS = 23m.12s.
Scoresby Sund 23m.36s.
Malaga P_cPZ = 10m.28s., PPPZ = 13m.44s., S_cSZ = 19m.0s.
Cleveland ePSE = 25m.57s., eN = 36m.8s., eE = 36m.20s.
Bermuda ePS? = 26m.37s.
Riverview eSSE = 33m.28s.
San Juan i = 22m.40s.
La Paz iPPSE = 34m.23s., iSSE = 39m.57s.
Huancayo ePKS = 23m.12s.
Antarctica e = 63m.24s.
Long waves were also recorded at Berkeley, Bozeman, Butte, College, Philadelphia, Rapid City, Mizusawa, and Dehra Dun.

Jan. 28d. Readings also at 0h. (Pasadena, Mount Wilson, Tinemaha, Shasta Dam, Tucson, Riverside, Tuai, and Wellington), 1h. (Paris, Clermont-Ferrand, La Paz (2), and near Huancayo), 2h. (Simferopol, Theodosia, Yalta, Raciborzu, Warsaw, Budapest, Stuttgart, Belgrade, Copenhagen, Hungry Horse, near Tacubaya, and near Bucharest), 4h. (La Plata, Stuttgart, and near Obi-garm), 8h. (Shasta Dam), 9h. (La Paz, near Tacubaya, and near Ashkabad), 10h. (Bogota), 14h. (Bogota, La Paz, near Huancayo (3), Tchimkent, Frunse, near Andijan, Murgab, Obi-garm, Stalinabad, Samarkand, and Tashkent), 18h. (Boulder City, Pierce Ferry, Shasta Dam, Tucson, Palomar, Tinemaha, Stuttgart, near Triest, and near Mizusawa), 19h. (Andijan, Samarkand, near Stalinabad, and Obi-garm (2), 20h. (Hungry Horse, Pierce Ferry, Shasta Dam, Tucson, Mount Wilson, Palomar, and Tinemaha), 21h. (Pierce Ferry), 22h. (Hungry Horse, Pierce Ferry (2), Shasta Dam (2), Tucson (2), Mount Wilson, Palomar, Tinemaha (2), Stuttgart, Basle, and near Zürich), 23h. (near Berkeley).

Jan. 29d. Readings at 0h. (Shasta Dam and near Mizusawa), 1h. (Stuttgart, Cheb, Clermont-Ferrand, Kew, Reykjavik, Scoresby Sund, Pierce Ferry, and Hungry Horse), 2h. (Kodaikanal), 3h. (Pasadena, Mount Wilson, Riverside, Palomar, Tinemaha, Tucson, Boulder City, Hungry Horse, Pierce Ferry, Shasta Dam, Huancayo, Bogota, La Paz, and Fort de France), 4h. (Stuttgart), 5h. (near Mineral), 6h. (Mizusawa and La Paz), 7h. (near Bogota), 8h. (La Paz), 10h. (Palomar, Riverside, Tinemaha, Tucson, Hungry Horse, near Obi-garm, Stalinabad, Murgab, Samarkand, and Andijan), 11h. (Antarctica), 13h. (Kirkland Lake, Temiskaming, Saskatoon, Pasadena, Mount Wilson, Riverside, Palomar, Tinemaha, Tucson, Hungry Horse, Salt Lake City, Shasta Dam, near College, and near Malaga), 14h. (near Murgab), 16h. (La Paz, Murgab, Andijan, Samarkand, near Obi-garm, and Stalinabad), 18h. (Hungry Horse, Andijan, Tchimkent, near Murgab (2), Obi-garm, Stalinabad, Samarkand, and Tashkent), 19h. (Mount Wilson, Riverside, Tinemaha, Tucson, and Pierce Ferry), 21h. (Stuttgart and Pierce Ferry), 22h. (Pierce Ferry), 23h. (Hungry Horse).

Jan. 30d. 2h. 57m. 40s. Epicentre 28°·5S., 113°·5W. (as on 1944, November 18d.).

$A = -\cdot3510$, $B = -\cdot8072$, $C = -\cdot4747$; $\delta = +11$; $h = +2$;
$D = -\cdot917$, $E = +\cdot399$; $G = +\cdot189$, $H = +\cdot435$, $K = -\cdot880$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Huancayo		39·2	73	e 7 32	+ 1	e 13 36	+ 4	e 9 0	PP	e 16·4
La Paz		43·4	84	i 8 5	− 1	i 14 37	+ 2	i 9 52	PP	20·3
Tacubaya	N.	49·6	18	e 9 13	+18	e 16 21	+18	—	—	e 24·2
Bogota		50·2	56	e 9 0	0	i 16 20	+ 9	—	—	27·3
Tucson		60·5	2	e 10 15	+ 1	—	—	e 13 55	PPP	e 25·5
Palomar		61·6	357	i 10 30	+ 8	—	—	—	—	—
Riverside	z.	62·3	356	e 10 26	0	—	—	i 10 40	?	—
Mount Wilson	z.	62·5	356	e 10 26	− 2	—	—	i 11 14	P_cP	—
Pasadena		62·5	356	e 10 28	0	—	—	i 11 12	P_cP	i 29·9
Boulder City		64·1	359	e 10 41	+ 3	—	—	—	—	—
Pierce Ferry		64·3	0	e 10 41	+ 2	—	—	—	—	—
Haiwee	z.	64·4	355	e 10 44	+ 4	—	—	—	—	—
San Juan		65·3	50	—	—	e 19 32	+ 3	—	—	e 27·8
Tinemaha	z.	65·4	355	i 10 49	+ 2	—	—	e 11 1	?	—
Shasta Dam		69·3	353	e 11 5	− 6	—	—	—	—	—
St. Louis		70·2	19	e 11 13	− 4	i 20 33	+ 5	—	—	—
Hungry Horse		76·5	359	e 11 55	+ 1	—	—	—	—	—
Kirkland Lake		82·0	22	e 12 23	0	—	—	—	—	—
Stuttgart	z.	132·1	48	e 19 19	[+ 3]	—	—	—	—	—
Helwan		149·4	79	e 19 53	[+ 6]	—	—	—	—	—
Ksara		153·3	71	e 19 59	[+ 7]	—	—	e 23 46?	PP	—

Additional readings :—
La Paz iPPZ = 9m.31s., iSS = 18m.4s.
Bogota iPPEZ = 9m.49s., eSSEZ = 20m.25s.
Mount Wilson iZ = 10m.32s.
Long waves were also recorded at Honolulu, Berkeley, Bozeman, Butte, Salt Lake City, Bermuda, Cheb, and Clermont-Ferrand.

Jan. 30d. 8h. 43m. 48s. Epicentre 24°·9N. 63°·5E. (as on 1947, December 9d.).

$A = +\cdot4052$, $B = +\cdot8127$, $C = +\cdot4187$; $\delta = -2$; $h = +3$;
$D = +\cdot895$, $E = -\cdot446$; $G = +\cdot187$, $H = +\cdot375$, $K = -\cdot908$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bombay		10·5	123	i 2 37	+ 2	4 22	−13	2 47	PP	i 4·8
Ashkabad		13·7	343	e 3 20	+ 2	5 55	+ 3	—	—	—
Dehra Dun	N.	14·0	64	e 4 40?	+78	e 6 57	+58	—	—	e 8·8
Stalinabad		14·3	17	i 3 24	− 2	6 17	+11	—	—	—
Obi-garm		14·7	19	i 3 36	+ 5	6 38	SS	—	—	—
Samarkand		15·0	10	3 33	− 2	—	—	—	—	—
Hyderabad	N.	15·8	115	3 45	0	7 3	SS	—	—	—
Murgab		16·1	31	i 3 46	− 3	i 6 52	+ 3	—	—	—
Tashkent		17·1	15	i 3 58	− 4	—	—	—	—	—
Andijan		17·4	23	e 4 7	+ 1	—	—	—	—	—
Tchimkent		18·1	15	i 4 11	− 3	e 7 58	SS	—	—	—
Baku		19·2	327	e 4 28?	0	e 8 3?	+ 4	—	—	—
Kodaikanal	E.	19·7	135	i 4 38	+ 4	i 8 23	+13	—	—	10·2
Frunse		20·1	24	4 39	+ 1	—	—	—	—	—
Almata		21·4	27	4 51?	0	9 0?	+15	—	—	—
Erevan		22·0	319	5 4	+ 6	e 9 8	+12	—	—	—
Leninakan		22·8	319	5 9	+ 4	—	—	—	—	—
Calcutta	E.	22·9	90	e 5 1	− 5	i 9 51	SS	—	?	i 11·2
Grozny		23·4	326	e 5 16	+ 5	i 9 33	+12	i 5 54	PPP	—
Colombo	E.	23·8	137	5 19	+ 4	9 46	+18	—	—	12·6
Piatigorsk		25·3	324	e 5 30	0	—	—	—	—	—
Ksara		25·6	297	i 5 38a	+ 6	e 10 38	SS	—	—	—
Helwan		28·9	288	e 5 49	−14	10 56	+ 3	—	—	—
Yalta		30·8	317	—	—	11 23	0	—	—	—
Simferopol	N.	31·1	318	e 6 22	0	e 11 24	− 4	—	—	—
Sverdlovsk		32·0	357	i 6 30	0	—	—	—	—	—
Istanbul		32·8	308	6 49	+12	12 54	+60	—	—	—
Bucharest		36·0	313	e 7 6	+ 1	—	—	—	—	19·2
Moscow		36·2	336	i 7 5	− 1	12 43	− 4	8 31	PP	—
Belgrade		40·0	311	e 7 34	− 4	—	—	—	—	32·2
Irkutsk		41·2	38	7 46	− 2	e 14 5	+ 3	9 22	PP	—
Budapest		41·6	315	7 42	− 9	e 13 42	−26	e 7 52	P	17·7
Warsaw		42·1	322	7 55a	0	14 14	− 2	9 39	PP	e 20·2
Helsinki		44·1	334	e 8 12	0	e 14 32	−13	i 10 1	PP	e 17·2
Triest		44·8	311	e 8 30	+13	e 15 16	+21	i 10 15	PP	—
Rome		45·2	306	8 26	+ 6	14 59	− 2	e 18 57	SSS	e 21·2
Prague		45·3	318	e 8 20	− 1	e 15 0	− 2	e 10 12	PP	e 20·2
Tananarive		46·2	202	e 8 33	+ 5	e 15 21	+ 6	e 10 18	PP	e 21·8
Collmberg	Z.	46·5	319	e 8 35	+ 4	—	—	—	—	—
Cheb		46·5	317	e 8 33	+ 2	16 12?	+53	e 12 0	?	e 24·2
Potsdam		46·7	320	i 8 33	+ 1	i 15 23	+ 1	i 10 28	PP	e 26·2
Upsala		47·1	330	e 8 12?	−23	e 15 12?	−16	e 10 24	PP	e 22·2
Jena		47·3	318	e 8 36	− 1	e 15 30	− 1	e 10 25	PP	e 24·0
Chur		47·8	312	e 8 41	0	—	—	—	—	—
Copenhagen		48·1	324	e 8 44	+ 1	15 41	− 1	—	—	—
Stuttgart		48·4	315	e 8 38?	− 8	e 18 36	ScS	e 10 28	PP	e 27·2
Zürich		48·6	313	e 8 46	− 1	—	—	—	—	—
Nanking		48·7	68	e 7 9	?	—	—	—	—	—
Basle		49·3	313	e 8 56	+ 3	e 16 54	+55	—	—	—
Strasbourg		49·3	315	e 8 46	− 7	e 15 58	− 1	e 10 43	PP	—
Neuchatel		49·6	312	e 8 55	0	—	—	—	—	—
De Bilt		51·4	319	i 9 10	+ 1	e 16 27	− 1	e 11 12	PP	e 26·2
Uccle		51·7	317	e 9 19	+ 8	e 16 35	+ 3	e 11 23	PP	e 26·2
Clermont-Ferrand		52·2	320	i 9 20	+ 5	e 16 45	+ 6	i 11 26	PP	25·7
Batavia		52·3	120	e 9 18	+ 3	i 16 48	+ 8	e 10 51	SS	—
Paris		52·8	314	i 9 19	0	e 16 42	− 5	i 12 28	PPP	29·2
Kew		54·7	317	i 9 34a	+ 1	i 17 19?	+ 6	i 10 31	PcP	e 26·2
Alicante		55·1	301	8 34	−62	17 29	+11	11 54	PP	29·6
Durham		55·7	321	i 11 53	PP	i 17 24	− 2	i 17 45	PPS	i 25·3
Aberdeen		56·3	324	i 9 45	0	i 17 26	− 8	i 28 5	Q	33·2

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Edinburgh		56·8	322	—	—	e 17 31	−10	19 25	ScS	—
Almeria		56·9	299	9 48	− 1	i 17 47	+ 5	12 3	PP	29·1
Granada		57·7	300	—	—	27 12	?	29 52	?	38·4
Toledo		57·7	302	e 11 45	PP	—	—	i 12 0	?	—
Vladivostok		58·0	54	i 9 57	0	i 18 4	+ 7	—	—	—
Malaga	z.	58·4	300	i 10 1k	+ 1	e 18 5	+ 3	—	—	30·9
Lisbon		61·8	302	—	—	18 47	+ 1	19 35?	?	26·1
Scoresby Sund		65·3	339	10 46a	0	19 31	+ 2	13 23	PP	—
Mizusawa		65·5	57	17 9	?	26 40	SSS	26 43	SSS	—
Ivigtut		78·2	333	—	—	e 22 0	+ 3	—	—	37·2
College		87·3	13	e 17 32	?	e 23 15	[− 1]	e 29 12	SS	e 36·0
Sitka		96·4	10	e 17 39	PP	e 24 14	[+ 5]	e 26 28	PS	e 39·9
Brisbane		100·7	115	—	—	i 24 34	[+ 4]	i 25 29	+ 3	e 51·3
Ottawa		100·8	332	—	—	e 27 12	PS	e 32 12?	SS	49·2
Riverview		101·6	122	—	—	e 25 3	{− 3}	e 33 16	SSP	49·3
Saskatoon		102·8	353	—	—	e 24 52	[+12]	e 32 54	SS	e 44·2
Fordham		103·5	328	—	—	e 24 46	[+ 2]	—	—	50·2
Bermuda		104·6	316	e 14 18	P	e 24 52	[+ 3]	e 18 32	PP	—
Philadelphia		104·9	328	—	—	e 24 57	[+ 7]	e 33 38	SS	e 53·6
Hungry Horse		106·3	358	e 14 5	P	—	—	e 17 49	?	—
Cleveland		106·6	333	e 18 53	PP	e 25 58	[+60]	e 28 5	PS	51·7
Victoria		106·7	4	e 17 27	?	e 23 42	[−76]	e 27 49	PS	52·2
Chicago		108·5	338	—	—	e 28 18	PS	e 34 24	SS	i 44·7
Butte	N.	109·3	357	—	—	e 28 27	PS	—	—	e 43·0
Bozeman		109·6	355	—	—	e 24 42	[−29]	—	—	e 46·2
St. Louis		112·2	338	e 19 32	PP	i 25 28	[+ 7]	i 28 50	PS	—
Salt Lake City		114·5	355	—	—	e 29 12	PS	e 40 30	SSS	e 47·4
Shasta Dam		114·5	4	e 19 41	PP	e 20 14	?	—	—	—
San Juan		114·7	306	—	—	e 29 32	PS	e 30 32	PPS	—
Berkeley		117·3	5	i 20 8	PP	e 25 48	[+ 8]	i 29 50	PS	e 59·5
Tinemaha	z.	118·3	1	e 18 54	[+ 5]	—	—	e 20 10	PP	—
Fresno	z.	118·6	3	e 19 19	[+29]	—	—	—	—	—
Haiwee	z.	119·3	1	e 18 56	[+ 5]	—	—	—	—	—
Pierce Ferry		119·3	357	e 18 54	[+ 3]	e 23 55	?	—	—	—
Boulder City		119·4	358	e 19 1	[+ 9]	—	—	—	—	—
Mount Wilson	z.	121·2	1	e 18 54	[− 1]	—	—	e 20 24	PP	—
Pasadena	z.	121·3	1	e 20 6	[+71]	—	—	e 20 26	PP	e 68·6
Palomar	z.	122·1	0	e 19 25	[+28]	—	—	e 20 39	PP	—
Tucson		122·9	353	e 19 2	[+ 4]	e 30 37	PS	e 20 18	PP	e 55·5
La Plata	E.	128·9	244	19 12	[+ 2]	38 0	SS	53 24	Q	65·7
	N.	128·9	244	—	—	38 24	SS	54 54	Q	65·9
Bogota		129·4	299	i 22 11	PP	e 22 51	PKS	—	—	64·2
La Paz		134·2	270	19 36	[+16]	i 23 5	PKS	i 39 40	SS	66·6
Huancayo		139·1	280	e 19 56	[+27]	e 26 33	[− 5]	e 22 36	PP	e 55·4

Additional readings :—
Belgrade ePP? =8m.41s., e =10m.2s.
Irkutsk PP =9m.35s.
Budapest eE =9m.42s.
Warsaw ePE =8m.3s., ePN =8m.9s., PPZ =9m.25s., PPE =9m.42s., PPPZ =10m.7s., PPPN =10m.11s., PPPE =10m.18s., PcSN =13m.40s., SE =14m.25s., SSE =17m.22s., SSZ =17m.25s., SSN =17m.32s., S_cSZ =17m.43s., S_cSE =17m.52s., SSSN =18m.12s.
Triest iSS =17m.55s.
Prague eSS =18m.24s.
Tananarive e =8m.49s., E =10m.23s., SS =18m.48s., SSS =19m.58s.
Collmberg iZ =8m.57s. and 9m.27s.
Potsdam iPE =8m.38s., iSE =15m.27s., iSS =19m.9s.
Upsala eN =17m.36s., eSSE =18m.46s., eSSN =18m.58s.
Jena eS?E =15m.38s., eSS?N =18m.49s. and 19m.0s.
Copenhagen 8m.51s. and 15m.56s.
Stuttgart eP =8m.50s., eSSS? =19m.54s., e =21m.36s.
Strasbourg eP =8m.50s. and 8m.54s., ePP =10m.49s., i =18m.17s., iS_eS =18m.48s., eSS =19m.16s., iSSS =20m.51s.
De Bilt eSS =20m.12s., eSSS =22m.30s.
Uccle eSSE =20m.33s.
Clermont-Ferrand iSS =20m.44s.
Paris iP =9m.24s. and 9m.28s., i =9m.43s., iS_eS =19m.6s., SS =20m.40s., Q =24·2m.

Continued on next page.

Kew ePPEZ =11m.51s., ePPPEZ =12m.44s.?, iZ =17m.39s.?, eS$_c$SEN =19m.24s.?, eSSE =21m.12s.?, eQEN =23m.42s.?, ePKKP?Z =31m.15s.
Alicante PPP =13m.18s., PS =17m.46s., PPS =18m.2s., SS =20m.54s., SSS =23m.10s.
Durham iEN =17m.33s. and 23m.10s.
Edinburgh PS =17m.43s., SS =21m.21s., SSS =23m.33s.
Almeria P$_c$P =10m.41s., PPP =13m.19s., P$_c$S =14m.39s., S$_c$S =19m.32s., SS =21m.33s., SSS =23m.46s.
Malaga P$_c$PZ =10m.29s., eS$_c$SZ =19m.19s.
Scoresby Sund 14m.53s.
Sitka eSS? =31m.58s.
Riverview eE =36m.27s. and 37m.44s., eQ?E =41m.12s.
Bermuda ePPS =28m.24s., eSS =33m.27s., eSSS =36m.52s., e =43m.37s.
Philadelphia ePS? =28m.5s., eSSS? =38m.3s.
Cleveland ePPP?N =20m.27s., eE =22m.53s., eSKSN =26m.1s., eSSN =33m.43s., eE =33m.56s., eN =34m.40s., eE =34m.48s., 38m.18s., and 46m.28s., eN =46m.31s.
Bozeman ePS =28m.2s., eSSS? =39m.12s.
St. Louis iSKKS =26m.23s., eS =27m.14s.
San Juan iSS =34m.45s., ePSPS? =36m.42s., eSSS =39m.39s.
Berkeley iN =22m.31s., iE =30m.2s., iN =31m.12s., iE =31m.22s., and 36m.16s.
Pasadena eNZ =30m.19s.
Tucson eSS? =38m.58s., eSSS =42m.0s.
La Plata E. 20m.0s., PPP =24m.48s., PPP (Δ >180°) =35m.6s., SSS =44m.42s., 61m.48s.
La Plata N. PPP (Δ >180°) =35m.12s., 50m.12s.
Huancayo ePKS =23m.22s., eSS =40m.38s., eSSS? =46m.2s.
Long waves were also recorded at Besançon, Columbia, Rapid City, Ukiah, Arapuni, Auckland, and Wellington.

Jan. 30d. Readings also at 2h. (Andijan, Murgab (2), Samarkand (2), near Obi-garm (2) and Stalinabad (2)), 4h. (near Obi-garm), 5h. (Samarkand, near Stalinabad and Obi-garm), 6h. (Stuttgart, Mount Wilson, Haiwee, Palomar, Riverside, Tinemaha, Tucson, Hungry Horse, Pierce Ferry, Shasta Dam, near Murgab, Andijan, Obi-garm, Stalinabad, and Samarkand), 12h. (Mount Wilson, Haiwee, Palomar, Riverside, Tinemaha, Tucson, Hungry Horse and La Paz), 16h. (Balboa Heights, Murgab, Stalinabad, Samarkand, near Tashkent, Andijan, and Tchimkent), 17h. (near Tashkent, Obi-garm, Stalinabad, Samarkand, Andijan, Murgab, and near Malaga), 19h. (near Branner), 22h. (Fresno).

Jan. 31d. Readings at 2h. (near Berkeley, Branner, Lick (2), and San Francisco), 3h. (Bogota), 4h. (Bogota and near Huancayo), 6h. (Shasta Dam), 7h. (Kew and near Mineral), 8h. (near Murgab), 9h. (La Paz, Hungry Horse, Tucson, near Samarkand, Stalinabad, and Obi-garm), 14h. and 17h. (Kew), 19h. (Hungry Horse), 21h. (La Paz, Bogota, Hungry Horse, Pierce Ferry, and Tucson), 22h. (Clermont-Ferrand), 23h. (Hungry Horse and Tucson).

Feb. 1d. 20h. 27m. 48s. Epicentre 30°·1S. 177°·8W. (as on 1947, October 10d.).

$A = -\cdot8660$, $B = -\cdot0333$, $C = -\cdot4990$; $\delta = +7$; $h = +2$;
$D = -\cdot038$, $E = +\cdot999$; $G = +\cdot499$, $H = +\cdot019$, $K = -\cdot867$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Auckland		9·2	221	e 2 12?	− 4	—	—	—	—	—
Arapuni		9·6	213	—	—	4 12?	0	—	—	—
New Plymouth		11·2	215	2 27?	−17	—	—	—	—	—
Wellington		12·7	207	2 52	−13	6 28	+60	—	—	8·2
Kaimata		15·1	212	3 39	+ 3	7 29	L	—	—	(7·5)
Apia	E.	17·1	22	—	—	e 6 42?	−30	—	—	—
Brisbane		25·7	268	i 5 23	−10	(i 10 5)	+ 4	i 6 8	PP	e 11·3
Riverview		26·5	254	e 5 43	+ 2	i 10 14	0	e 6 15	PP	11·7
Antarctica		69·6	158	i 11 16	+ 3	e 20 24	+ 3	—	—	32·7
Pasadena	z.	85·1	46	i 12 43	+ 4	—	—	—	—	—
Berkeley		85·2	41	—	—	i 24 19	PS	i 24 34	PPS	e 40·5
Mount Wilson	z.	85·3	46	i 12 44	+ 4	—	—	—	—	—
Palomar	z.	85·4	47	i 12 51	+11	—	—	—	—	—
Riverside	z.	85·5	46	i 12 43	+ 2	—	—	—	—	—
Vladivostok		86·3	325	e 12 41	− 4	e 23 5	[− 4]	e 15 56	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		87·1	39	e 12 50	+ 1	—	—	—	—	—
Tucson		88·7	51	i 12 59	+ 2	—	—	e 16 57	PP	e 48·2
Colombo	E.	104·1	270	18 21	PP	33 11	SS	—	—	53·0
Kodaikanal	E.	107·8	272	e 15 55	?	—	—	—	—	—
Bombay		115·7	277	—	—	e 24 12?	?	—	—	—
Ottawa		118·8	51	e 18 55	[+ 4]	—	—	—	—	63·2
Ksara		151·3	285	e 19 51?	[+ 2]	—	—	23 44	PP	—
Helwan		154·8	276	e 20 12	[+18]	—	—	—	—	—
Istanbul		155·7	303	e 19 12?	[−43]	—	—	—	—	81·2

Additional readings and notes :—
Wellington i = 3m.8s., e = 6m.45s.
Brisbane iPP?N = 5m.47s., eN = 5m.57s., iSE = 9m.10s. ; true S is given as iSS.
Riverview eS?E = 9m.57s., iN = 10m.36s., eQN = 10m.48s.
Pasadena iZ = 12m.49s. and 12m.55s.
Berkeley iZ = 24m.22s., iN = 29m.14s. and 29m.30s., eE = 37m.30s., eN = 39m.30s.
Mount Wilson iZ = 12m.51s. and 12m.59s.
Riverside iZ = 12m.52s. and 12m.59s.
Vladivostok PS = 24m.4s., iSS = 28m.53s.
Tucson i = 13m.2s. and 13m.8s.
Long waves were also recorded at Upsala, Cheb, and Granada.

Feb. 1d. 23h. 38m. 24s. Epicentre 27°·0N. 58°·0E.

$A = +·4728$, $B = +·7566$, $C = +·4516$; $\delta = -7$; $h = +3$;
$D = +·848$, $E = -·530$; $G = +·239$, $H = +·383$, $K = -·892$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ashkabad		10·9	1	e 2 42	+ 2	e 5 22	+38	—	—	—
Samarkand		14·7	28	e 3 1	−30	—	—	—	—	—
Stalinabad		14·7	35	i 3 35	+ 4	i 6 23	+ 7	—	—	—
Tashkent		17·1	30	e 3 54	− 8	e 7 11	− 1	—	—	—
Andijan		18·1	37	e 4 20	+ 6	e 7 41	+ 6	—	—	—
Leninakan		18·1	323	e 4 14?	0	—	—	—	—	—
Ksara		20·2	294	i 4 39	0	e 8 14?	− 7	—	—	—
Piatigorsk		20·8	328	e 4 45	0	—	—	—	—	—
Helwan		23·6	283	e 5 15	+ 2	—	—	—	—	i 13·3
Collmberg	z.	41·6	317	i 7 53	+ 2	—	—	—	—	—
Stuttgart	z.	43·3	314	e 8 3	− 2	—	—	—	—	—
Zürich		43·5	312	e 8 4a	− 3	—	—	—	—	—
Basle		44·2	312	e 8 11	− 1	—	—	—	—	—
Clermont-Ferrand		47·0	309	e 8 29	− 6	—	—	—	—	—
Toledo		52·4	301	i 9 19	+ 3	—	—	—	—	—
Shasta Dam		112·6	0	i 17 1	?	—	—	—	—	—
Berkeley		115·4	359	e 34 54	?	e 35 42	SS	e 36 6	SSP	—
Pierce Ferry		116·8	352	i 17 16	?	—	—	—	—	—
Mount Wilson	z.	119·0	355	i 16 56	?	—	—	—	—	—
Riverside	z.	119·2	355	i 16 58	?	—	—	—	—	—
Tucson		120·1	348	i 17 18	?	—	—	—	—	—

Additional readings :—
Stuttgart eZ = 18m.12s.
Clermont-Ferrand i = 8m.45s. and 9m.7s., e = 10m.5s.
Riverside eZ = 18m.18s.
Tucson e = 19m.3s.
The Californian readings are included here tentatively.

Feb. 1d. Readings also at 3h. (near Bogota and near Mizusawa), 5h. (near La Paz), 7h. (Huancayo), 8h. (near Leninakan), 9h. (near Alicante), 10h. (La Paz), 11h. (Belgrade, Bucharest, Helwan, Ksara, Yalta, and Stuttgart), 12h. (Hungry Horse), 13h. (Tashkent, near Andijan, Murgab, Obi-garm, and Stalinabad), 16h. (La Paz, Wellington, Mount Wilson, Pasadena, Palomar, Riverside, Tucson, Pierce Ferry, and Shasta Dam), 18h. (Huancayo and Pierce Ferry (2)), 19h. (Ksara and Pierce Ferry), 21h. (Riverside, Tucson, and Pierce Ferry), 22h. (Alicante and Hungry Horse), 23h. (near Branner and near Pavia).

Feb. 2d. 5h. 31m. 59s. Epicentre 11°·4S. 75°·4W. (as on 1948, January 9d.).

$A = +·2472$, $B = -·9489$, $C = -·1964$; $\delta = +9$; $h = +7$;
$D = -·968$, $E = -·252$; $G = -·050$, $H = +·190$, $K = -·981$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Huancayo		0·7	174	i 0 21	+ 4	—	—	—	—	—
La Paz		8·7	126	i 2 10	0	i 5 16	S_g	i 2 25	P*	—
Bogota		16·0	5	e 3 41	− 7	i 6 52	+ 6	i 3 57	PP	8·5
St. Louis		51·7	344	i 9 0	−11	—	—	—	—	—
Tucson		55·1	323	e 9 35	− 1	—	—	—	—	—
Kirkland Lake		59·4	357	e 10 1	− 5	—	—	—	—	—
Palomar	z.	59·5	320	i 10 7a	0	—	—	—	—	—
Pierce Ferry		59·6	324	e 10 4	− 4	—	—	—	—	—
Riverside	z.	60·2	320	e 10 11	− 1	—	—	—	—	—
Mount Wilson	z.	60·8	320	e 10 17	+ 1	—	—	—	—	—
Pasadena	z.	60·8	320	e 10 21	+ 5	—	—	—	—	—
Shasta Dam		67·6	324	e 10 53	− 8	—	—	—	—	—
Hungry Horse		68·6	333	e 11 34	+27	—	—	—	—	—
Toledo		83·3	47	e 12 20	−10	—	—	—	—	—
Stuttgart	z.	94·9	41	e 13 21	− 4	—	—	—	—	—

Additional readings and note :—
La Paz iS_g = 5m.37s., P* is given as S and S_g as S*.
Bogota i = 3m.44s., iS = 6m.21s.
Tucson i = 9m.58s.
Palomar iZ = 10m.12s. and 10m.55s.
Long waves were also recorded at Auckland.

Feb. 2d. Readings also at 0h. (Stuttgart, Collmberg, Istanbul, Brisbane, and Shasta Dam), 1h. (Rome), 2h. (Toledo and Rome), 6h. (Palomar, Tucson, near Oaxaca, Tacubaya, and Vera Cruz), 9h. (La Paz), 13h. (Antarctica and Pavia), 16h. (Mizusawa), 19h. (Hungry Horse), 20h. (La Paz), 22h. (Fresno, Hungry Horse, and near Grozny (2)), 23h. (Hungry Horse and near Grozny).

Feb. 3d. 0h. 28m. 18s. Epicentre 21°·0S. 174°·0W. (as on 1938, June 29d.).

Very rough.

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

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m
Apia		7·4	16	e 1 30	−22	e 2 57	−21	—	—	—
Riverview		33·7	240	—	—	—	—	e 14 48	Q	16·5
Santa Barbara	z.	75·5	44	e 11 49	+ 1	—	—	—	—	—
Berkeley		76·1	40	i 11 52	+ 1	i 21 40	+ 5	i 15 28	PP	e 32·3
Pasadena		76·3	45	e 11 53	+ 1	—	—	—	—	e 34·7
Mount Wilson	z.	76·5	45	i 11 51	− 3	—	—	—	—	—
Palomar	z.	76·7	46	i 11 53	− 2	—	—	—	—	—
Riverside	z.	76·8	45	i 11 55	0	—	—	—	—	—
Fresno	z.	76·9	42	i 11 57	+ 1	—	—	—	—	—
Haiwee	z.	77·7	44	e 12 1	+ 1	—	—	—	—	—
Shasta Dam		77·9	38	e 11 59	− 2	—	—	—	—	—
Pierce Ferry		80·3	46	e 12 13	− 1	—	—	—	—	—
Tucson		80·3	50	i 12 14	0	e 22 22	+ 2	e 15 1	PP	e 40·4
Vladivostok		80·9	323	i 12 18	+ 1	i 22 31	+ 5	e 23 23	PS	—
Huancayo		93·7	104	—	—	e 30 57	SS	—	—	e 45·2
Irkutsk		101·4	322	e 18 14	PP	24 37	[+ 3]	e 27 20	PS	—
Stalinabad		123·8	304	e 20 45	PP	—	—	—	—	—
Ksara		150·7	302	e 19 52	[+ 4]	—	—	23 37?	PP	—
Stuttgart	z.	152·2	356	e 19 57	[+ 6]	—	—	—	—	—
Paris		152·8	5	e 19 58	[+ 6]	—	—	—	—	—
Helwan		155·5	296	e 20 6	[+11]	23 58	PP	20 23	PKP,	—

For Notes see next page.

NOTES TO FEBRUARY 3d. 0h. 28m. 18s.

Additional readings :—
Santa Barbara iZ = 12m.1s.
Pasadena iZ = 12m.22s.
Mount Wilson iZ = 12m.19s.
Riverside iZ = 12m.21s.
Fresno eE = 12m.0s.
Tucson i = 12m.41s. and 12m.50s.
Stuttgart eZ = 20m.9s.
Long waves were also recorded at Arapuni, Wellington, La Paz, and Philadelphia.

Feb. 3d. 11h. 41m. 38s. Epicentre 21°·0S. 174°·0W. (as at 0h.).

		△	Az.	P.	O−C.	S.	O−C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Apia	E.	7·4	16	e 1 49	− 3	2 50	−28	— —	—
Wellington		22·3	204	—	—	10 28	SSS	— —	14·4
Brisbane		30·7	251	e 6 32	+13	—	—	— —	e 16·0
Santa Barbara	Z.	75·5	44	i 11 49	+ 1	—	—	— —	—
Berkeley		76·1	40	i 11 52	+ 1	e 21 24	−11	— —	e 31·1
La Jolla	Z.	76·2	47	e 11 57	+ 5	—	—	— —	—
Pasadena		76·3	45	i 11 51	− 1	—	—	— —	—
Mount Wilson	Z.	76·5	45	i 11 53	− 1	—	—	— —	—
Palomar	Z.	76·7	46	i 11 54	− 1	—	—	— —	—
Riverside	Z.	76·8	45	i 11 54	− 1	—	—	— —	—
Antarctica		76·8	158	—	—	i 23 54	?	— —	e 34·2
Fresno	Z.	76·9	42	i 11 56	0	—	—	— —	—
Haiwee	N.	77·7	44	e 12 2	+ 2	—	—	— —	—
Shasta Dam		77·9	38	e 12 1	0	—	—	— —	—
Boulder City		79·6	46	i 12 10	0	—	—	— —	—
Pierce Ferry		80·3	46	i 12 14	0	—	—	— —	—
Tucson		80·3	50	i 12 15	+ 1	e 22 26	+ 6	e 15 28 PP	—
Victoria		82·6	32	—	—	e 22 4	−39	— —	38·4
Hungry Horse		87·3	36	e 12 51	+ 1	—	—	— —	—
Collmberg	Z.	149·3	352	e 19 55	[+ 9]	—	—	— —	—
Ksara		150·7	302	e 19 59	[+11]	—	—	36 57 PPS	—
Stuttgart	Z.	152·2	356	e 19 54	[+ 3]	—	—	— —	—
Paris		152·8	5	e 19 53	[+ 1]	—	—	— —	—
Helwan		155·5	296	e 20 28	PKP_2	—	—	— —	—

Additional readings :—
Santa Barbara iZ = 12m.1s.
Berkeley iE = 19m.52s., iN = 22m.18s., eE = 22m.22s.
Pasadena i = 12m.3s.
Mount Wilson iZ = 11m.56s. and 12m.4s.
Palomar iZ = 11m.57s.
Riverside iZ = 12m.6s.
Tucson i = 12m.27s., e = 17m.3s.
Long waves were also recorded at La Paz and Philadelphia.

Feb. 3d. Readings also at 2h. (near Apia), 3h. (Alicante and Strasbourg), 4h. (Hungry Horse, Istanbul, and near Johannesburg), 6h. (Riverview, Mount Wilson, Pasadena, Palomar, Riverside, Boulder City, Pierce Ferry (2), Shasta Dam, Hungry Horse, Stuttgart, and near Tacubaya), 9h. (Grozny), 11h. (Hungry Horse), 12h. (near Huancayo), 13h. (Tashkent, Tchimkent, near Andijan, Obi-garm, Samarkand, and Stalinabad), 14h. (Antarctica), 16h. (near Ottawa), 18h. (Paris and near Leninakan), 19h. (Paris), 20h. (Hungry Horse), 22h. (Pierce Ferry).

Feb. 4d. 2h. Undetermined shock.

Sitka iS =19m.21s., iL =20m.19s.
Hungry Horse eP =22m.7s., i =22m.12s., ePcP =25m.12s., eL =29m.9s., eScS? = 31m.23s.
Bozeman eP =22m.22s., eS =27m.32s., e =28m.14s., eL =29m.16s.
Butte ePN =22m.32s., eS?N =27m.0s., eLN =29m.20s.
Shasta Dam eP =22m.34s.
Berkeley eNZ =23m.0s., eEN =27m.30s., eZ =30m.12s.
Fresno ePZ =23m.13s., eE =23m.18s.
Tinemaha ePZ =23m.19s.
Boulder City eP =23m.38s.
Pierce Ferry eP =23m.40s.
Pasadena ePZ =23m.41s., eZ =24m.44s., eLZ =32·7m.
Mount Wilson ePZ =23m.42s.
Palomar ePZ =23m.52s.
Tucson eP =24m.22s., ePP =26m.26s., ePPP? =27m.21s., eL =36m.41s.
Saskatoon e =26m.31s., L =30m.
Rapid City eE =28m.20s., eLE =33m.16s.
Ksara e =28m.55s. amd 41m.31s.
Logan e =28m.56s., eL =32m.54s.
Bermuda e =35m.20s., eL =49m.
Chicago eS? =37m.6s., eL =38m.9s.
New Kensington eN =37m.7s., eLN =40m.4s.
Long waves were also recorded at Auckland, Arapuni, Wellington, Alicante, and other American stations.

Feb. 4d. 3h. 0m. 30s. Epicentre 21°·0S. 174°·0W. (as on 3d.).

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

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		7·4	16	e 2 4	P*	3 6	−12	—	—	—
Santa Barbara	z.	75·5	44	i 11 46	− 2	—	—	i 11 55	PcP	—
La Jolla	z.	76·2	47	e 11 51	− 1	—	—	e 12 10	PcP	—
Pasadena	z.	76·3	45	i 11 51	− 1	—	—	e 12 2	PcP	—
Mount Wilson	z.	76·5	45	i 11 53	− 1	—	—	i 12 1	PcP	—
Palomar	z.	76·7	46	i 11 54	− 1	—	—	i 12 5	PcP	—
Fresno	z.	76·9	42	i 11 55	− 1	—	—	i 12 5	PcP	—
Haiwee	z.	77·7	44	i 12 1	+ 1	—	—	i 12 10	PcP	—
Shasta Dam		77·9	38	e 12 0	− 1	—	—	—	—	—
Tinemaha	z.	78·1	43	i 12 3	+ 1	—	—	i 12 13	PcP	—
Boulder City		79·6	46	e 12 9	− 1	e 22 14	+ 2	e 12 20	PcP	—
Pierce Ferry		80·3	46	i 11 38	−36	e 22 25	+ 5	i 12 24	PcP	—
Tucson		80·3	50	i 12 15	+ 1	—	—	i 12 25	PcP	—
Hungry Horse		87·3	36	e 11 56	?	—	—	e 12 59	P	—
Copenhagen		145·0	355	19 41	[+ 2]	—	—	—	—	—
Ksara		150·7	302	e 19 57	[+ 9]	—	—	36 34	PPS	—
Stuttgart	z.	152·2	356	e 19 52	[+ 1]	—	—	—	—	—
Paris		152·8	5	e 19 59	[+ 7]	—	—	—	—	—

Additional readings :
Mount Wilson iZ =12m.12s.,
Palomar iZ =12m.13s.
Fresno iZ =12m.15s.
Hungry Horse e =13m.8s.
Stuttgart eZ =19m.59s. and 20m.9s.
Long waves were also recorded at La Paz,

Feb. 4d. 4h. 45m. 22s. Epicentre 23°·8N. 94°·8E. Depth of focus 0·005.
(as on 1947, Aug. 23d.).

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

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Calcutta	E.	6·1	259	i 1 13	−17	i 2 12	−27	i 1 24	P	—
Dehra Dun	N.	16·3	297	e 5 59	?	—	—	—	—	—
Hyderabad	N.	16·6	251	3 51	+ 1	6 36	−15	—	—	7·7
Bombay	E.	21·1	261	i 4 23	−18	8 32	+ 5	—	—	—
Colombo	E.	22·1	223	4 39	−12	8 17	−28	—	—	11·3
Nanking		22·7	63	e 5 4	+ 7	e 9 20	+24	—	—	e 11·9
Murgab		23·0	314	i 5 0	0	i 9 7	+ 5	—	—	—
Almata		24·4	328	i 5 20	+ 7	i 9 40	+14	e 10 38	sS	—
Andijan		25·3	317	—	—	e 9 59	+18	—	—	—
Frunse		25·3	323	e 5 25?	+ 3	—	—	5 55	pP	—
Obi-garm		26·0	312	i 5 32	+ 3	i 9 57	+ 5	—	—	—
Stalinabad		26·6	311	i 5 33	− 1	9 58	− 4	5 55	pP	—
Tashkent		27·6	315	e 5 43	0	e 10 17	− 1	—	—	—
Samarkand		28·3	311	e 5 47	− 3	e 10 22	− 8	i 6 21	pP	—
Irkutsk		29·4	11	6 10	+11	11 9	+22	—	—	—
Batavia		32·0	156	e 7 38	PP	—	—	—	—	—
Vladivostok		36·1	49	e 7 4	+ 7	i 12 45	+13	—	—	—
Sverdlovsk		41·3	332	i 7 44	+ 3	i 13 56	+ 6	—	—	—
Grozny		44·6	308	e 7 51?	−17	14 24	−14	i 8 47	?	—
Leninakan		45·6	305	e 8 8	− 8	—	—	—	—	—
Sotchi	N.	49·0	308	e 8 38	− 4	—	—	—	—	—
Ksara		52·0	295	i 9 3	− 2	e 21 5	SSS	—	—	—
Theodosia	N.	52·2	310	e 9 3	− 3	—	—	—	—	—
Moscow		52·3	323	e 9 7	0	i 16 28	+ 2	—	—	—
Simferopol	N.	53·1	309	9 28	+15	—	—	—	—	—
Helwan		56·3	291	e 9 34	− 2	e 17 11	− 9	—	—	—
Raciborzu	Z.	63·7	316	e 10 29	+ 2	—	—	—	—	—
Copenhagen		66·4	323	10 46	+ 2	—	—	—	—	—
Potsdam	Z.	66·4	319	e 10 45	+ 1	—	—	—	—	—
Jena	E.	67·7	307	e 10 52	− 1	—	—	—	—	—
Rome		69·0	308	e 13 2	PP	e 28 9	SSS	—	—	—
Stuttgart		69·7	316	e 10 58	− 7	—	—	e 11 31	P_cP	—
Chur		69·9	313	e 11 4a	− 2	—	—	—	—	—
Zürich		70·4	315	e 11 7	− 2	—	—	—	—	—
Basle		71·0	315	e 11 11	− 2	—	—	e 11 42	P_cP	—
Paris		73·9	317	i 11 29k	− 1	—	—	e 11 53	P_cP	—
Clermont-Ferrand		74·5	313	i 11 32	− 1	—	—	e 11 44	P_cP	39·6
Kew		74·8	320	i 11 34	− 1	—	—	—	—	e 37·6
Toledo		81·5	309	i 12 11	− 1	—	—	e 11 31	?	—
Hungry Horse		103·7	19	i 18 19	[+ 8]	—	—	i 18 39	PP	—
Shasta Dam		107·1	29	e 18 23	[+ 5]	—	—	—	—	—
Tinemaha	Z.	111·9	28	e 18 35	[+ 7]	—	—	—	—	—
Mount Wilson	Z.	114·4	29	e 18 32	[0]	—	—	—	—	—
Pasadena	Z.	114·4	29	e 18 31	[− 1]	—	—	—	—	—
Pierce Ferry		114·5	25	e 18 56	[+23]	—	—	—	—	—
Palomar	Z.	115·7	29	e 18 35	[0]	—	—	—	—	—
Tucson		119·1	25	e 18 44	[+ 3]	—	—	—	—	—
Huancayo		165·0	320	e 19 58	[+ 2]	—	—	e 24 49	PP	—

Additional readings :—
Calcutta $iP_gE = 1m.36s.$
Bombay $iSEN = 8m.8s.$, $QE = 8m.15s.$
Stalinabad $pP = 6m.6s.$
Helwan $i = 9m.49s.$ and $14m.23s.$
Jena $eEN = 12m.2s.$
Stuttgart $eZ = 11m.16s.$ and $12m.2s.$
Clermont-Ferrand $e = 12m.16s.$, $13m.37s.$, and $16m.53s.$
Hungry Horse $i = 18m.48s.$
Mount Wilson $eZ = 18m.41s.$
Pasadena $eZ = 18m.41s.$
Huancayo $e = 21m.32s.$
Long waves were also recorded at De Bilt,

Feb. 4d. Readings also at 1h. (La Paz), 4h. (Rome), 5h. (near Bogota and near Apia), 6h. (Pierce Ferry, Almata, Andijan, Stalinabad, Bombay, and near Calcutta), 8h. (near Ashkabad), 10h. (Mount Wilson, Palomar, Tinemaha, and Tucson), 11h. (Antarctica and near Mizusawa), 12h. (Stuttgart, Almata, Grozny, Obi-garm, Piatigorsk, Tashkent, near Stalinabad (2), and Balboa Heights), 14h. (La Paz and Stalinabad), 17h. (near Branner), 19h. (Pierce Ferry and Tacubaya), 21h. (Temiskaming), 23h. (Jena and Hungry Horse).

Feb. 5d. Readings at 0h. (La Paz), 2h. (near Shasta Dam and near Tananarive), 3h. (near Hungry Horse), 4h. (Pierce Ferry), 5h. (Tacubaya), 6h. (Rome), 7h. (Pierce Ferry, Hungry Horse, and Tacubaya), 9h. (near Zürich), 10h. (near Stalinabad), 11h. (Antarctica and Tacubaya), 12h. (Pierce Ferry, Stalinabad, Samarkand, near Andijan, Frunse, Murgab, Tashkent, and Tchimkent), 17h. (Antarctica), 18h. (Rome), 20h. (Hungry Horse and near Pierce Ferry), 21h. (Tinemaha, Shasta Dam, and Tucson), 23h. (Rome).

Feb. 6d. 1h. 33m. 39s. Epicentre 18°·3N. 145°·2E. Depth of focus 0·030.
(as on 1942, March 29d.).

$A = -\cdot7802$, $B = +\cdot5422$, $C = +\cdot3121$; $\delta = +10$; $h = +5$;
$D = +\cdot571$, $E = +\cdot821$; $G = -\cdot256$, $H = +\cdot178$, $K = -\cdot950$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Misima		17·6	344	e 3 53	+ 1	7 4	+ 5	—	—	—
Tokyo		18·0	346	i 3 57	0	7 7	0	—	—	—
Hunatu		18·1	344	3 56	− 2	7 9	0	—	—	—
Nagano		18·3	341	4 2	+ 2	7 25	+13	—	—	—
Sumoto		18·4	335	e 3 37	−24	7 18	+ 4	4 27	pP	—
Osaka		18·4	335	e 4 13	+12	7 18	+ 4	—	—	—
Hikone		18·7	339	e 3 38	−26	6 49	−31	—	—	—
Kumamoto		19·5	322	e 4 30	+18	7 41	+ 6	—	—	—
Sendai		20·2	352	e 4 18	− 1	7 54	+ 8	—	—	—
Mizusawa	E.	21·1	352	4 30	+ 2	8 11	+ 7	—	—	—
Morioka		21·6	353	4 33	0	8 24	+11	—	—	—
Sapporo		24·9	353	5 5	+ 1	—	—	—	—	—
Vladivostok		27·2	338	e 5 27	+ 2	i 9 48	+ 2	6 6	pP	—
Batavia		45·0	242	i 7 51	− 4	—	—	i 15 40	PPS	—
Irkutsk		46·7	327	—	—	14 38	− 2	—	—	—
Riverview		52·1	173	i 8 52k	+ 3	e 15 58	+ 4	e 9 54	P_cP	e 21·9
Hyderabad	N.	63·2	282	e 12 19	PP	18 22	+ 4	—	—	—
Frunse		63·7	310	e 10 13	+ 3	—	—	—	—	—
Murgab		64·4	305	10 16	+ 2	18 37	+ 4	—	—	—
Andijan		65·4	308	e 10 23	+ 3	i 18 52	+ 7	—	—	—
Tashkent		67·7	309	i 10 36	+ 1	i 19 15	+ 2	i 11 22	pP	—
Stalinabad		68·4	306	i 10 41	+ 2	i 19 24	+ 3	—	—	—
Sitka		69·1	35	—	—	i 19 28	− 2	i 20 21	sS	—
Samarkand		69·6	306	e 10 51	+ 4	e 19 41	+ 6	—	—	—
Sverdlovsk		71·9	326	i 11 1	+ 1	i 20 3	+ 1	i 11 49	pP	—
Shasta Dam		80·1	51	i 11 45	− 1	—	—	—	—	—
Mineral	N.	80·8	51	e 11 49	− 1	—	—	—	—	—
Fresno		83·1	55	i 12 1	− 1	i 22 1	0	—	—	—
Hungry Horse		83·4	41	e 12 3	0	e 22 2	− 2	i 12 50	pP	—
Santa Barbara	Z.	83·9	56	i 12 6	0	—	—	i 12 57	pP	—
Tinemaha		84·2	53	i 12 8	+ 1	e 23 9	+57	i 12 59	pP	—
Grozny		84·3	314	11 58	−10	—	—	—	—	—
Moscow		84·6	328	12 7	− 2	22 9	− 7	12 57	pP	—
Haiwee		84·7	54	i 12 9	− 1	—	—	i 13 1	pP	—
Pasadena		85·2	56	i 12 10a	− 2	i 23 12	[+60]	i 13 2	pP	—
Riverside	Z.	85·9	56	i 12 15a	− 1	—	—	i 13 4	pP	—
Piatigorsk		85·9	315	—	—	22 21	− 7	—	—	—
La Jolla	Z.	86·4	57	e 13 5	pP	—	—	—	—	—
Leninakan		86·5	312	e 12 29	+10	—	—	—	—	—
Palomar	Z.	86·5	56	i 12 18a	− 1	—	—	i 13 9	pP	—
Boulder City		87·2	53	i 12 22	0	e 22 42	+ 2	i 13 23	pP	—
Pierce Ferry		87·8	53	i 12 25	0	e 22 48	+ 2	i 13 17	pP	—
Tucson		91·6	55	i 12 44	+ 1	e 23 15	− 5	i 13 36	pP	—
Ksara		95·1	307	e 16 58	PP	e 26 52	PPS	—	—	—
Istanbul		96·4	317	e 15 21	?	—	—	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Helwan		100·3	306	e 18 21	PP	i 23 37	[0]	—	—	—
Stuttgart	z.	102·6	331	e 17 46?	PP	—	—	—	—	—
Strasbourg		103·4	332	—	—	e 25 21	+21	—	—	—
Rome		105·9	324	—	—	e 24 54	−27	e 30 24	?	—
Bogota		135·1	62	e 17 47	?	—	—	e 21 29	PP	—
La Paz		148·2	93	i 19 19	[+ 3]	i 36 21	PPS	i 20 14	pPKP	—

Additional readings :—
Vladivostok isS = 11m.0s.
Riverview iSeS?E = 18m.21s.
Sverdlovsk isS = 21m.24s.
Fresno iPePZ = 12m.50s., ePSE = 21m.47s., iSKSZ = 22m.5s.
Boulder City eSKS = 22m.29s.
Pierce Ferry eSKS = 22m.32s., esS = 23m.51s.
Tucson i = 14m.2s., eSKS = 22m.58s., e = 23m.30s., esS = 24m.36s., ePS = 24m.58s.
Bogota eEZ = 18m.0s.
La Paz iPPZ = 22m.57s., iPPP? = 26m.15s.
Long waves were also recorded at Granada.

Feb. 6d. 6h. 14m. 42s. Epicentre 37°·8N. 141°·4E. Depth of focus 0·010.
(as on 1946 May 21d.).

Intensity VI at Yoshioka, Furukawa (Miyagi Prefecture); V at Mizusawa; IV at Utunomiya, Onahama, Kakioka, Fukushima, Sendai, Mito, Morioka, Miyako, Tsukubasan; II-III at Yamagata. Epicentre 38°·0N. 141°·5E. Macroseismic radius 200-300kms. Shallow.

The Seismological Bulletin of the Central Meteorlogical Observatory, Japan for the year 1948, Tokyo 1950, p. 6, with macroseismic chart.

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.
	°	°	m. s.	s.	m. s.	s.
Sendai	0·6	320	0 16a	− 1	0 26	− 3
Hukusima	0·7	266	0 15a	− 3	0 26	− 5
Onahama	0·9	205	−0 6	−25	0 7	−27
Mizusawa	1·4	351	0 26	+ 1	0 41	− 3
Mito	1·6	208	0 27	− 1	0 47	− 2
Kakioka	1·8	212	0 6	−24	0 29	−24
Utunomiya	1·8	224	−0 14	−44	0 4	−49
Tukubasan	1·9	213	0 29	− 3	—	—
Miyako	1·9	14	0 31k	− 1	0 53	− 2
Morioka	1·9	355	0 31	− 1	0 52	− 3
Kumagaya	2·3	224	0 37k	0	0 57	− 8
Aikawa	2·5	275	0 37	− 3	1 3	− 7
Tokyo	2·5	212	0 53	+13	1 20	+10
Yokohama	2·7	211	0 51	+ 8	1 13	− 1
Hatinohe	2·7	2	0 42	− 1	1 5	− 9
Aomori	3·0	355	0 50	+ 3	1 24	+ 2
Hunatu	3·1	223	0 49a	+ 1	1 22	− 2
Mera	3·1	204	1 23	S	(1 23)	− 1
Misima	3·3	216	0 52	+ 1	1 26	− 3
Osima	3·4	208	0 44	− 8	1 30	− 2
Toyama	3·5	253	0 31	−23	—	—
Wazima	3·6	265	0 54k	− 1	1 33	− 4
Shizuoka	3·7	221	0 56	0	—	—
Omaesaki	4·1	220	0 59	− 3	—	—
Gihu	4·4	239	1 11	+ 5	1 56	0
Kameyama	5·0	235	1 27	+13	2 15	+ 4
Sapporo	5·3	359	2 13	S	(2 13)	− 5
Kyoto	5·3	240	1 12	− 6	—	—
Sumoto	6·3	238	1 31	− 1	—	—
Shasta Dam	70·7	53	e 11 8	+ 1	—	—
Hungry Horse	71·2	43	i 10 43	−27	—	—
Tinemaha	75·4	55	i 11 39	+ 4	—	—
Riverside z.	77·8	57	e 11 50	+ 2	—	—
Pierce Ferry	78·7	53	e 12 56	+63	—	—
Tucson	83·1	55	i 12 21	+ 5	—	—

Feb. 6d. 13h. 14m. 16s. Epicentre 36°·3N. 118°·1W. (as on 1945 September 4d.).

$A = -·3756$, $B = -·7034$, $C = +·6034$; $\delta = -6$; $h = -1$;
$D = -·882$, $E = +·471$; $G = -·284$, $H = -·532$, $K = -·797$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tinemaha		0·2	211	i 0 10$_s$	0	i 0 15	− 1	—	—	—
Haiwee		1·2	175	i 0 23$_k$	− 1	i 0 42	+ 1	—	—	—
Fresno		1·5	247	i 0 32	+ 4	i 0 52	+ 3	i 0 36	P$_g$	—
Lick		2·8	270	e 0 55	P$_g$	i 1 33	S$_g$	—	—	—
Boulder City		3·0	117	i 0 49	− 1	i 1 28	+ 1	—	—	—
Santa Barbara	Z.	3·1	206	i 1 2	P$_g$	i 1 38	S*	—	—	—
Santa Clara	N.	3·1	271	e 1 25	S	(e 1 25)	− 4	e 1 47	S$_g$	—
Mount Wilson		3·1	180	e 0 53	+ 2	—	—	—	—	—
Pasadena		3·2	181	i 0 53	+ 1	i 1 41	S*	i 1 1	P$_g$	—
Branner		3·3	272	e 1 4	P$_g$	i 1 49	S$_g$	—	—	—
Berkeley		3·3	280	i 1 4	P$_g$	i 1 47	S$_g$	i 1 12	P$_g$	—
Riverside		3·4	169	i 0 55	0	e 1 43	+ 6	i 1 5	P$_g$	—
Pierce Ferry		3·5	109	i 0 56	− 1	i 1 2	P*	—	—	—
San Francisco		3·5	280	e 1 10	P$_g$	i 1 56	S$_g$	—	—	—
Palomar	Z.	4·1	166	i 1 5	0	—	—	—	—	—
Mineral	N.	4·1	319	i 1 22	P$_g$	i 2 14	S$_g$	—	—	—
Shasta Dam		4·8	317	e 1 21	P*	—	—	i 1 33	P$_g$	—
Tucson		7·8	128	i 1 58	0	—	—	e 2 18	P*	e 4·0

Additional readings :—
Lick iN = 1m.4s., iE = 1m.36s. and 1m.39s.
Branner iE = 1m.27s.
San Francisco iN = 1m.19s.
Mineral eE = 1m.26s., iSEN = 2m.24s., iN = 2m.30s.
Long waves were also recorded at Hungry Horse.

Feb. 6d. 22h. 18m. 44s. Epicentre 10°·9N. 122°·1E. (as on 1948 January 26d.).

$A = -·5219$, $B = +·8320$, $C = +·1879$; $\delta = -9$; $h = +6$;
$D = +·847$, $E = +·531$; $G = -·100$, $H = +·159$, $K = -·982$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Vladivostok		33·2	13	e 6 35	− 5	i 11 56	− 4	—	—	—
Calcutta	E.	34·2	294	e 6 50	+ 1	e 12 19	+ 3	e 14 8	SS	16·3
Hyderabad	N.	42·7	284	8 31	?	14 22	− 2	17 42	SS	20·3
Irkutsk		43·7	344	e 8 21?	+13	14 32	− 7	—	—	—
Kodaikanal	E.	43·8	274	i 8 6	− 3	i 14 49	+ 9	—	—	17·1
Bombay		48·1	286	e 8 16	−27	e 15 23	−19	19 0	SS	23·9
Brisbane		48·5	142	—	—	i 15 51	+ 3	i 18 46	SS	e 19·4
Murgab		50·9	311	9 0	− 5	16 14	− 7	—	—	—
Frunse		52·0	317	e 9 41?	+28	—	—	—	—	—
Riverview	N.	52·3	149	—	—	i 16 50	+10	—	—	20·6
Andijan		52·8	314	—	—	e 16 56	+ 9	—	—	—
Obi-garm		54·1	310	9 32?	+ 3	—	—	—	—	—
Stalinabad		54·8	310	i 9 29	− 5	i 17 11	− 3	—	—	—
Tashkent		55·2	313	e 9 29	− 8	e 17 12	− 8	—	—	—
Tchimkent		55·3	315	e 9 28	−10	—	—	—	—	—
Samarkand		56·4	310	e 9 46	+ 1	—	—	—	—	—
Sverdlovsk		65·5	329	e 10 50	+ 3	i 19 28	− 4	—	—	—
Baku		69·5	309	e 11 22?	+10	e 20 26	+ 6	—	—	—
Grozny		72·7	312	e 11 23	− 9	—	—	—	—	—
Moscow		78·0	325	e 12 4	+ 2	e 21 50	− 5	—	—	—
Ksara		80·9	303	e 12 18	+ 1	e 22 41	+15	—	—	—
Istanbul		85·2	310	e 12 41	+ 2	e 22 28	[−34]	—	—	—
Helwan		85·3	299	e 12 39	− 1	e 23 10	0	24 4	PS	—
Sitka		87·5	32	—	—	i 23 40	+ 9	—	—	—
Warsaw		88·2	323	e 13 0	+ 6	e 23 27	[+ 5]	—	—	e 50·8

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Prague		92·8	322	—	—	e 35 34	?	e 39 16	Q	e 46·3
Cheb		94·0	322	—	—	e 23 16?	[−40]	—	—	—
Rome		97·0	315	—	—	e 24 16	[+ 4]	e 31 26	SS	e 48·4
Alicante		107·5	316	—	—	e 35 15	SS	—	—	—
Granada		110·2	317	—	—	i 36 4	?	—	—	i 59·9
Huancayo		162·9	96	e 20 8	[+ 4]	e 31 33	{+ 5}	e 35 52	SKSP	—
La Paz		168·6	120	i 20 36	[+28]	i 31 52	{− 4}	i 27 42	SKS	76·9

Additional readings :—
Helwan PP =15m.53s.
La Paz iN =39m.40s. readings reduced by 20m.
Long waves were also recorded at many European, American and Canadian Stations.

Feb. 6d. Readings also at 1h. (Samarkand, near Andijan, Frunse, Murgab, Stalinabad, and Tashkent), 2h. (near Grozny), 3h. (Istanbul), 5h. (near Apia), 6h. (Tinemaha, Hungry Horse, Pierce Ferry, Shasta Dam, and Tucson), 10h. (Stuttgart), 11h. (Kew), 14h. (Andijan, Frunse, Murgab, Tashkent, near Samarkand and Stalinabad), 15h. (Stuttgart), 19h. (Hungry Horse and near Fresno), 20h. (Tashkent, Murgab, Andijan, near Obi-garm, Hungry Horse and Stalinabad, near Ottawa, Shawinigan Falls, and near Pavia (2)), 21h. (Ottawa, Kirkland Lake, Temiskaming, Shawinigan Falls, Tinemaha, Hungry Horse (2), Pierce Ferry, Shasta Dam, Tucson, Sitka, Philadelphia, Salt Lake City, College, and near Pavia), 22h. (Antarctica), 23h. (Huancayo).

Feb. 7d. Readings at 1h. (Hungry Horse, Andijan, Samarkand, Murgab, near Obi-garm, and Stalinabad), 2h. (near Fresno), 4h. (Hungry Horse and Bogota), 5h. (Bogota), 7h. (Hungry Horse), 9h. (near Samarkand), 10h. (Pierce Ferry, near Boulder City, Fresno, and Lick), 12h. (Ksara), 13h. (Bogota), 14h. (Stuttgart), 16h. (Pierce Ferry), 17h. (Pierce Ferry and near Bogota), 19h. (Palomar, Tinemaha, Boulder City, Hungry Horse (2), Pierce Ferry, Shasta Dam, Tucson, Auckland, and Stuttgart), 20h.(Palomar, Hungry Horse, Pierce Ferry, Shasta Dam, Tucson, Bermuda, Huancayo, near Fort-de-France, San Juan, and near Obi-garm), 21h. (Pierce Ferry), 22h. (near Obi-garm), 23h. (Hungry Horse).

Feb. 8d. Readings at 4h. (Huancayo), 5h. (Bogota), 11h. (Andijan, Samarkand, near Murgab, Stalinabad, and Obi-garm), 15h. (Berkeley), 16h. (near Apia), 19h. (near Bogota), 20h. (Tacubaya (2), Pierce Ferry, near Apia, and near Leninakan), 21h. (Bogota, La Paz, Fort-de-France, and near Leninakan), 22h. (Aberdeen, and near Obi-garm.).

Feb. 9d. 12h. 58m. 13s. Epicentre 35°·5N. 27°·2E.

Intensity VIII-IX in the villages of Pyles, Othos, Volada, and Aperion in the Island of Karpathos. Also felt at Rhodes, Hierapetra (Crete), and Santorin. Macroseismic radius 175km. Epicentre as adopted. Report from Dr. Galanopoulos, Athens.

$A = +\cdot7258$, $B = +\cdot3730$, $C = +\cdot5781$; $\delta = +11$; $h = 0$;
$D = +\cdot457$, $E = -\cdot889$; $G = +\cdot514$, $H = +\cdot264$, $K = -\cdot816$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Istanbul		5·8	14	1 30	+ 1	i 3 8	S_g	—	—	—
Helwan		6·6	147	i 1 38k	− 3	—	—	—	—	—
Ksara		7·4	101	1 52?	0	3 32?	+14	—	—	—
Bucharest	E.	8·9	355	i 2 18	+ 6	i 3 57	+ 2	i 2 52	P_g	—
Messina		9·7	289	2 20a	− 2	i 4 1	−14	—	—	—
Catania		10·0	285	e 2 28	+ 1	e 4 7	−15	—	—	—
Yalta		10·4	28	i 2 33	− 1	4 25	− 7	—	—	—
Belgrade		10·6	333	i 2 40a	+ 4	i 4 27	−10	—	—	—
Simferopol	N.	10·8	27	i 2 39?	0	—	—	—	—	—
Theodosia	N.	11·4	31	i 2 45	− 2	—	—	—	—	—
Sotchi	N.	12·6	46	e 3 8?	+ 5	e 5 25?	− 1	—	—	—
Kalossa		12·6	333	3 8	+ 5	5 42	+16	—	—	7·1
Rome		13·1	304	i 3 8a	− 2	i 5 29	− 9	—	—	—
Budapest		13·4	335	i 3 17	+ 3	5 47?	+ 2	3 27	PP	7·3
Leninakan		14·1	63	e 3 23	0	—	—	i 3 49	PPP	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Erevan		14·4	66	3 30	+ 3	—	—	i 3 56	PPP	—
Triest		14·4	319	i 3 25a	− 2	i 6 7	− 2	—	—	i 8·3
Piatigorsk		14·9	50	3 33	− 1	—	—	—	—	—
Raciborzu		16·0	338	i 3 53a	+ 5	e 6 59	+13	e 4 8	PPP	—
Grozny		16·3	56	i 3 34	−18	—	—	—	—	—
Pavia		16·8	311	e 2 56	−62	e 5 51	−74	—	—	—
Prague		17·3	333	i 4 5k	+ 1	i 7 15	− 1	i 4 19	PP	e 7·8
Warsaw		17·3	348	i 4 5k	+ 1	i 7 23	+ 7	i 4 20	PP	e 9·8
Chur		17·4	317	e 4 18	+12	e 7 22	+ 3	—	—	—
Cheb		18·1	329	e 4 16	+ 2	i 7 35	0	i 4 27	PP	e 8·7
Zürich		18·3	317	e 4 14a	− 3	e 7 38	− 1	i 4 19	P	—
Baku		18·5	68	i 4 22	+ 3	—	—	—	—	—
Stuttgart		18·7	322	e 4 21a	− 1	i 7 52	+ 4	i 4 54	PPP	i 8·8
Basle		18·9	317	e 4 14	−10	e 7 54	+ 1	i 4 17	P	—
Neuchatel		19·0	316	e 4 27	+ 1	e 7 53	− 2	—	—	—
Collmberg	z.	19·1	331	e 4 20	− 7	i 7 52	− 5	i 4 42	PP	i 9·7
Jena		19·1	330	i 4 27	0	i 7 59	+ 2	—	—	i 9·5
Strasbourg		19·4	320	e 4 30	0	i 8 2	− 2	i 8 41	SSS	—
Potsdam		19·6	334	i 4 32	0	i 8 13	+ 5	i 4 54	PP	—
Besançon		19·8	313	i 4 37	+ 2	i 8 13	0	—	—	—
Barcelona		20·5	296	i 4 40	− 2	i 8 26	− 1	—	—	e 10·2
Clermont-Ferrand		20·9	307	e 4 45	− 1	i 8 47	+12	i 5 2	PP	10·4
Moscow		21·5	16	i 4 50	− 2	8 43	− 4	—	—	—
Bagnères		22·2	300	e 5 4	+ 4	i 9 4	+ 4	—	—	—
Alicante		22·3	287	i 4 52	− 9	i 9 2	0	5 4	pP	i 10·5
Paris		22·5	314	e 5 2a	0	i 9 8	+ 3	i 5 26	PP	12·3
Uccle		22·5	321	i 5 3k	+ 1	i 9 3	− 2	—	—	e 11·4
Copenhagen		22·6	338	i 5 3k	0	9 2	− 5	9 27	?	—
De Bilt		22·9	325	i 5 7a	+ 1	e 9 14	+ 1	—	—	e 11·8
Almeria		23·9	283	i 5 16	0	i 9 34	+ 4	i 5 52	PP	12·3
Helsinki		24·7	358	i 5 24	0	i 9 47	+ 3	—	—	e 12·3
Granada		24·8	284	i 5 26k	+ 1	i 9 39	− 7	5 45	pP	12·6
Toledo		25·0	290	i 5 28	+ 1	9 51	+ 2	—	—	—
Upsala		25·2	349	i 5 27k	− 2	9 46?	− 6	i 6 17	PPP	e 12·8
Kew		25·3	319	i 5 31k	+ 1	e 10 1	+ 7	i 6 25	PPP	e 13·8
Jersey		25·4	314	i 5 30	− 1	i 10 33	+37	—	—	—
Malaga		25·5	284	i 5 31a	− 1	i 10 5	+ 8	i 5 38	pP	i 13·2
Durham	N.	27·7	324	i 5 52	0	i 10 37	+ 4	i 6 45	PP	—
Lisbon		29·0	289	6 4a	0	i 10 57	+ 3	i 6 11	pP	12·6
Edinburgh		29·1	325	6 4	0	10 54	− 2	6 57	PP	—
Aberdeen		29·3	328	i 6 0	− 6	i 10 54	− 5	i 6 46	PP	15·1
Sverdlovsk		31·0	36	i 6 20	− 1	i 11 12	−14	—	—	—
Samarkand		31·6	70	i 6 30	+ 4	—	—	—	—	—
Stalinabad		33·1	71	i 6 9	−31	—	—	—	—	—
Tashkent		33·2	67	i 6 41?	+ 1	i 11 49?	−11	—	—	—
Tchimkent		33·4	65	i 6 43	+ 1	—	—	—	—	—
Obi-garm		33·8	71	i 6 33?	−13	—	—	—	—	—
Andijan		35·6	68	i 7 2	+ 1	e 12 19	−19	—	—	—
Frunse		37·1	64	i 7 13	− 1	—	—	—	—	—
Murgab		37·2	71	7 13	− 2	—	—	—	—	—
Almata		38·7	62	i 7 28	+ 1	—	—	—	—	—
Reykjavik		41·1	331	e 7 47	0	i 13 59	− 2	e 8 57	PP	20·0
Dehra Dun	N.	42·6	81	e 5 31	?	e 11 59	?	—	—	e 18·8
Bombay		43·4	100	i 8 7	+ 1	i 14 43	+ 8	i 10 0	PP	21·2
Scoresby Sund		43·6	339	i 8 8	0	14 27	−11	9 45	PP	—
Hyderabad	N.	48·7	97	8 47	− 1	15 49	− 1	10 44	PP	—
Ivigtut		52·7	325	i 9 15	− 3	i 16 42	− 4	i 19 1	ScS	26·3
Calcutta	E.	54·2	86	i 9 10a	−19	i 16 42	−24	i 11 10	PP	—
Irkutsk		55·4	47	i 9 37	− 1	e 17 8	−14	i 11 46	PP	—
Colombo	E.	55·9	108	9 39	− 3	17 34	+ 5	—	—	27·3
Tananarive		57·5	158	9 55	+ 2	17 54	+ 4	18 10	PPS	27·5
Johannesburg		61·0	179	i 10 23	+ 5	i 18 47	+12	i 20 17	ScS	e 30·8
Halifax		66·6	309	10 52	− 2	19 40	− 5	24 11	SS	29·8
Shawinigan Falls		71·3	314	11 23	0	20 37	− 4	—	—	30·8
Harvard		72·7	310	e 11 32	0	e 20 58	+ 1	e 21 36	ScS	e 36·3

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bermuda		73·4	298	e 11 41	+ 5	i 21 19	+14	e 26 9	SS	e 30·8
Nanking		73·4	62	11 38	+ 2	i 21 3	− 2	—	—	—
Ottawa		73·6	315	11 34	− 3	i 21 8	+ 1	14 19	PP	33·8
Kirkland Lake		74·5	319	i 11 44k	+ 2	e 21 20	+ 3	—	—	39·8
Temiskaming		74·8	317	i 11 45	+ 1	i 21 21	+ 1	—	—	—
Fordham		75·1	310	i 11 46	0	i 21 24	0	—	—	34·8
Vladivostok		76·0	47	i 11 49	− 2	i 21 16	−18	—	—	—
Philadelphia		76·4	310	i 11 53	0	i 21 36	− 2	i 22 24	PPS	i 32·9
Pennsylvania		77·6	312	e 12 17	+17	i 21 52	+ 1	e 14 52	PP	e 34·4
Georgetown		78·2	310	i 12 4	+ 1	i 21 57	0	30 37	SSS	—
New Kensington E.		78·8	313	i 12 8	+ 2	i 22 6	+ 2	—	—	e 39·1
Cleveland		79·4	314	i 12 10k	+ 1	i 22 9	− 1	e 22 40	PS	—
College		79·9	358	e 12 10	− 2	i 22 12	− 4	e 15 4	PP	e 31·2
Hukuoka		80·6	55	e 12 17	+ 1	22 23	0	—	—	—
Kumamoto		81·3	56	12 21	+ 1	22 34	+ 4	—	—	—
Sapporo		81·4	42	12 21	+ 1	22 33	+ 2	—	—	—
San Juan		82·2	287	i 12 25	+ 1	i 22 39	0	e 15 28	PP	e 32·6
Chicago		82·7	318	i 12 27	0	i 22 39	− 5	i 23 32	PS	e 34·0
Toyama		83·1	50	12 32	+ 3	22 54	+ 6	—	—	—
Hikone		83·4	51	i 12 19	−11	22 40	−11	—	—	—
Osaka		83·4	52	12 36	+ 6	23 0	+ 9	—	—	—
Columbia		83·7	308	e 12 33	+ 1	e 22 51	− 3	e 23 55	PS	e 33·5
Saskatoon		83·9	334	12 38	+ 5	22 55	− 1	28 29	SS	38·8
Mizusawa		83·9	46	12 36	+ 3	22 55	− 1	22 59	S	—
Sendai		84·4	46	12 36	0	22 57	− 4	—	—	—
Hunatu		84·9	50	i 12 39	+ 1	23 3	− 3	—	—	—
Shizuoka		85·0	50	12 40	+ 2	23 2	[+ 1]	—	—	—
Batavia		85·2	101	i 12 33	− 6	i 22 56	[− 6]	—	—	—
Tokyo		85·4	49	i 12 43	+ 3	23 11	0	—	—	e 42·8
Sitka		86·1	351	i 12 47	+ 3	e 23 9	[+ 1]	i 23 21	S	e 34·5
St. Louis		86·3	316	i 12 46	+ 1	i 23 10	[+ 1]	i 12 57	pP	—
Lincoln	E.	88·2	321	e 12 52	− 2	i 23 33	− 5	e 16 27	PP	e 35·5
Rapid City	E.	88·9	327	i 12 57	− 1	i 23 22	[− 4]	e 16 24	PP	e 37·0
Bozeman		90·8	332	e 13 9	+ 3	i 24 2	0	i 23 38	SKS	e 34·3
Butte	N.	91·1	334	e 13 10	+ 2	e 23 38	[− 1]	e 24 2	S	e 37·1
Spokane		91·3	336	e 13 10	+ 1	e 23 33	[− 7]	—	—	—
Victoria		92·4	341	12 28	−46	22 58	[−49]	—	—	41·8
Seattle		92·8	340	—	—	e 24 51	[+62]	e 25 32	PS	e 37·4
Logan		94·4	330	e 13 20	− 3	i 23 55	[− 3]	i 24 27	PS	e 34·6
Salt Lake City		95·3	329	e 13 27	0	e 24 39	− 2	i 23 59	SKS	e 38·9
Bogota	Z.	96·5	280	—	—	e 23 47	[−22]	—	—	—
Shasta Dam		99·2	337	i 13 43	− 2	e 24 21	[− 2]	—	—	—
Pierce Ferry		100·1	328	e 13 47	− 2	e 24 29	[+ 2]	i 17 54	PP	—
Boulder City		100·6	329	e 13 52	+ 1	e 24 31	[+ 1]	e 26 56	PS	—
Ukiah		100·9	337	—	—	e 25 33	+ 5	e 32 25	SS	e 41·3
Tinemaha		101·0	332	i 13 55k	+ 2	e 24 35	[+ 3]	i 18 6	PP	—
Berkeley		101·7	335	i 13 57	+ 1	i 24 36	[+ 1]	i 18 5	PP	e 46·4
Haiwee		101·7	331	i 13 58k	+ 2	—	—	i 30 28	PKKP	—
Fresno		101·8	333	i 13 59	+ 3	e 24 36	[0]	i 18 4	PP	e 56·8
Lick		102·0	335	e 13 6	−51	e 25 38	+ 1	e 13 51	P	e 50·7
Tucson		102·0	324	e 13 55	− 2	i 24 38	[+ 1]	i 18 7	PP	e 42·6
Branner	N.	102·1	335	—	—	e 24 37	[0]	—	—	e 55·2
Santa Clara		102·1	335	e 14 1	+ 3	e 24 43	[+ 6]	e 18 10	PP	e 52·6
Riverside		103·3	330	i 14 3	0	i 27 25	PS	i 29 58	PKKP	—
Pasadena		103·5	330	i 14 5	+ 1	e 24 42	[− 2]	i 18 19	PP	e 49·1
La Paz		103·6	259	i 14 10a	+ 6	i 24 48	[+ 4]	27 35	PS	49·1
Palomar	Z.	103·7	329	i 14 6k	+ 1	i 27 29	PS	i 18 21	PP	—
Santa Barbara	Z.	103·9	331	i 14 8	+ 2	—	—	—	—	—
La Jolla		104·3	329	—	—	e 24 53	[+ 6]	i 27 29	PS	—
Tacubaya		105·4	307	e 15 59	?	e 24 55	[+ 3]	e 18 37	PP	—
La Plata	E.	105·8	238	13 59	P	25 5	[+11]	28 11	PS	52·2
	N.	105·8	238	14 41	P	24 59	[+ 5]	33 15	SS	51·2
	Z.	105·8	238	15 16	?	—	—	17 10	?	59·8
Perth		106·7	117	—	—	i 25 2	[+ 4]	i 28 30	PS	—
Huancayo		107·0	267	e 14 26	P	e 25 0	[+ 1]	e 18 41	PP	i 42·4

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m. s.			m.
Antarctica		124·0	207	e 20 34	PP	e 22 8	SKP	—		—	e 56·8
Brisbane	E.	133·6	96	e 21 57	PP	i 28 41	{− 1}	i 44 40		SSS	—
Riverview		134·4	105	i 19 24k	[+ 4]	i 32 18	PS	i 21 57		PP	e 61·8
Apia		152·5	42	e 20 3	[+12]	—	—	e 20 22		PKP_2	—
Auckland		153·9	102	19 59	[+ 6]	30 26	{−14}	—		—	—
Wellington		154·0	112	19 55	[+ 2]	30 41	{+ 1}	37 5		PPS	—

Additional readings :—
Bucharest iE = 2m.33s., iSE = 3m.37s.
Belgrade i = 3m.20s. and 3m.44s., iS = 4m.51s.
Theodosia eP_cPN = 5m.57s.
Kalossa iN = 3m.45s., SE = 5m.45s., iE = 6m.1s.
Budapest SN = 5m.56s.
Raciborzu eZ = 10m.10s. and 10m.59s., eP_cS?Z = 11m.59s., eS_cS?Z = 14m.53s.
Prague iPP = 4m.26s., iZ = 5m.26s., eZ = 6m.7s.
Warsaw iPE = 4m.8s., iPPPN = 4m.33s., iSN = 7m.28s.
Cheb i = 4m.19s., 4m.23s., and 5m.1s., eSS = 7m.59s., eSSS = 8m.17s.
Stuttgart iP = 4m.25s.a, eS = 7m.40s.
Collmberg iZ = 4m.28s., iPPPZ = 4m.52s., iSSZ = 8m.15s., iSSSZ = 8m.32s.
Jena iSN = 7m.54s.
Strasbourg iP = 4m.33s., i = 5m.22s., iS = 8m.7s., iP_cP? = 9m.6s., e = 9m.17s.
Potsdam iSE = 8m.16s.
Clermont-Ferrand iP = 4m.49s., i = 6m.52s.
Alicante PP = 5m.44s., P_cP = 6m.32s., sS = 9m.34s., SS = 9m.58s., SSS = 10m.14s., P_cS = 10m.58s., S_cS = 14m.44s.
Paris iPP = 5m.20s., i = 6m.32s., 7m.17s., and 7m.59s., iS = 9m.11s., eSS = 9m.47s., Q = 11m.17s.
Almeria PPP = 6m.4s., P_cP = 8m.48s., SS = 10m.40s.
Granada iPP = 5m.59s., pPP = 6m.29s., sPP = 6m.48s., P_cP = 8m.18s., sS = 10m.34s.
Upsala e = 11m.27s.
Kew iP_cPEN = 8m.33s.?, eSSEN = 11m.33s.?
Malaga iPPZ = 6m.25s., iP_cPZ = 8m.55s., sSNW = 10m.17s., iS_cPZ = 12m.20s.
Durham iN = 6m.32s., 7m.12s., and 8m.37s., iSN = 10m.25s.
Lisbon iP = 6m.7s.a, EN = 8m.32s., Z = 11m.14s., iPS?E = 11m.20s., Q = 11m.38s.
Edinburgh PPP = 7m.10s., P_cP = 9m.12s., SS = 12m.22s., P_cS = 12m.54s.
Aberdeen iPPPEN = 7m.3s.
Reykjavik ePPP?N = 9m.18s., iSSN = 16m.3s., eEN = 16m.58s., iS_cS?EN = 17m.55s.
Bombay iSN = 14m.46s., iSSN = 17m.47s., iSSE = 17m.58s.
Scoresby Sund 16m.30s., 16m.48s., and 17m.49s.
Hyderabad SSN = 19m.45s.
Ivigtut 20m.41s.
Calcutta iPPPE = 12m.2s., iSSE = 20m.22s.
Irkutsk PP = 11m.35s., SS = 20m.52s. and 21m.9s.
Tananarive P_cP = 10m.54s., PPP? = 13m.33s., S_cSE = 19m.49s., SSN = 21m.27s., SSSE = 24m.9s.
Johannesburg iSN = 18m.53s.
Halifax SSS = 26m.41s.
Harvard eSSS? = 29m.12s.
Bermuda e = 13m.55s., ePPP? = 16m.59s., eS_cS = 22m.4s., e = 24m.57s. and 28m.47s.
Ottawa i = 11m.38s., PPP = 16m.3s., SSE = 26m.5s., SSS = 29m.11s.
Philadelphia i = 12m.17s. and 18m.3s., iSS = 26m.26s.
Pennsylvania iPPSNE = 22m.40s.
Cleveland iN = 12m.13s., iEN = 12m.18s., iN = 23m.10s. and 23m.47s.
College e = 13m.32s., ePPP = 17m.12s., eS_cS = 22m.33s., eSS? = 28m.30s., eSSS = 30m.52s.
San Juan e = 16m.49s., eS = 22m.35s., iPS = 23m.27s., ePPS? = 23m.41s., i = 24m.27s., iSS = 27m.57s., eSSS = 31m.7s.
Chicago i = 12m.40s., ePPP? = 17m.18s., eS_cS = 23m.6s., eSS = 28m.17s., eSSS = 31m.56s.
Saskatoon SSS = 31m.35s.
Sitka i = 13m.32s., eSS = 29m.53s.
St. Louis iPP = 16m.8s., iPS = 24m.19s.
Lincoln eSKSE = 23m.15s.
Rapid City iS_cSE = 24m.6s., eSSE = 29m.18s.
Bozeman e = 13m.23s., 20m.17s., and 22m.11s., eSKS = 23m.31s., ePS = 24m.47s., eSS = 31m.42s.
Butte eN = 13m.19s., 13m.47s., and 14m.38s., ePPN = 16m.31s., ePPPN = 18m.16s., eN = 23m.4s., esPN = 24m.47s., ePSN = 25m.2s., eSSSN = 33m.35s.
Victoria PP = 15m.47s., SSS = 31m.53s.
Logan i = 13m.36s., ePP = 16m.0s., ePPP = 18m.34s., ePS = 25m.11s., eSSS = 32m.5s.
Salt Lake City ePP = 17m.8s., iS = 25m.16s., ePS = 25m.44s.
Pierce Ferry iP = 13m.51s., e = 16m.44s., ePP = 17m.47s., e = 18m.29s.
Boulder City ePP = 17m.57s.
Tinemaha iPKKPZ = 30m.6s.
Berkeley iPN = 14m.1s., iPPZ = 18m.2s., iZ = 19m.4s., iE = 19m.27s., iZ = 23m.20s., iSKSE = 24m.39s., iSKKSN = 25m.13s., iS_cSE = 25m.38s., iS_cSZ = 25m.41s., iSE = 26m.15s., iPSZ = 27m.27s., iPPSZ = 28m.3s., iSSE = 32m.43s., iE = 36m.15s., eZ = 40m.59s.

Continued on next page.

Fresno eN =24m.0s., iSKSZ =24m.45s.
Lick eE =23m.54s.
Tucson iP =13m.59s., i =14m.7s. and 14m.21s., e =15m.10s., eSKS =24m.30s., eS = 25m.29s., ePS =27m.8s., ePPS =28m.7s., iPKKP =30m.4s., i =30m.25s.
Pasadena eSE =25m.44s., iPSEZ =27m.21s., ePPSZ =28m.17s., iPKKPZ =29m.58s.
La Paz iZ =18m.13s., iPPNZ =18m.31s., PPPZ =20m.52s., iSKKS =25m.39s., PPSE = 28m.37s., iSS =33m.33s., SSS =37m.11s.
Palomar iZ =14m.13s. and 19m.3s., iPKKPZ =29m.58s., iZ =30m.19s., eZ =34m.25s.
Tacubaya eE =17m.56s., eSN =26m.10s., ePSE =27m.49s., eSSE =33m.36s., eSSSE = 37m.11s.
La Plata E. 15m.16s., PKP? =17m.11s., PPP =21m.13s., SS =35m.59s., Q =46m.6s.; N. 15m.50s., PKP? =17m.7s., 20m.46s., and 21m.14s., PPP =21m.59s., 24m.18s., PPS =29m.46s. and 34m.10s., Q =44m.37s.
Perth i =37m.55s.
Huancayo ePKP =17m.50s., e =18m.3s., iPP =19m.0s., iSKS =25m.8s., i =25m.38s., eSKKS =26m.3s., iPS =27m.41s., ePPS =28m.45s., i =32m.16s., eSS =33m.47s., eSSS =37m.40s.
Antarctica e =28m.3s., iPS? =30m.0s., eSS =36m.36s.
Brisbane iN =22m.53s., 23m.5s., and 23m.16s., eN =24m.22s., iN =31m.58s., iE = 32m.7s., eE =34m.47s.
Riverview iZ =22m.52s., iN =22m.55s., iPPP?E =23m.56s., iE =25m.45s. and 26m.42s., iSKKKSE =28m.49s., iZ =34m.4s., iE =39m.53s., PSPSE =40m.23s., iS_cS,S_cS?E = 41m.43s., eE =41m.59s., 45m.23s., and 49m.53s.
Auckland i =20m.32s., PKS =23m.57s., PPP =26m.15s., PPP(Δ >180°) =34m.2s., i =38m.27s.
Wellington i =20m.6s., PKS? =25m.29s., i =30m.56s., PS? =33m.38s.
Long waves were also recorded at Honolulu, Ferndale, and Montezuma.

Feb. 9d. 14h. 54m. 8s. Epicentre 0°·1N. 122°·7E. (as on 1941, Nov. 8d.).

Epicentre : 0°, 122°·25E. (Strasbourg).
0°, 122°·5E ; depth 160km. (Gutenberg).

A = −·5402, B = +·8415, C = +·0017 ; δ = −6 ; h = +7 ;
D = +·842, E = +·540 ; G = −·001, H = +·001, K = −1·000.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Batavia		17·1	248	i 3 59	− 3	i 7 14	+ 2	i 4 4	P	e 10·6
Nanking		32·0	354	6 34	+ 4	e 11 34	− 8	—	—	—
Perth		32·6	190	6 37	+ 2	11 40	−11	7 18	PP	—
Brisbane		40·0	136	i 7 36	− 2	i 13 27	−17	i 8 7	pP	i 16·5
Calcutta	E.	40·2	307	e 7 20	−20	i 13 22	−26	i 9 4	PP	—
Mizusawa		42·4	21	8 1	+ 3	e 14 10	−10	—	—	—
Riverview		43·1	144	i 8 3a	− 1	i 14 15	−15	i 8 36	pP	18·2
Colombo	E.	43·3	280	7 59	− 6	14 26	− 7	—	—	18·4
Vladivostok		43·6	10	i 8 7	− 1	i 14 25	−13	i 8 44	?	—
Hyderabad	N.	46·8	295	8 34	+ 1	15 12	−12	10 29	PP	22·9
Bombay	E.	52·4	294	i 9 16	0	i 16 30	−12	—	—	23·9
Irkutsk		54·2	346	i 9 30	+ 1	16 58	− 8	10 22	pP	—
Murgab		58·7	317	10 2	0	—	—	—	—	—
Almata		59·3	323	i 10 7	+ 1	i 18 5	− 9	—	—	—
Frunse		60·5	321	i 10 15	+ 1	i 18 23	− 6	e 11 6	pP	—
Auckland		60·6	134	9 57	−18	18 14	−16	12 33	PP	—
Andijan		60·9	318	e 10 17	0	i 18 30	− 4	11 11?	pP	—
Stalinabad		62·4	315	i 9 54	−33	i 18 8	−45	—	—	—
Wellington		62·5	138	10 22	− 6	18 34	−20	10 57	P_cP	25·9
Tuai		63·0	135	10 29	− 2	18 43	−18	—	—	—
Tashkent		63·3	317	e 10 30	− 3	—	—	—	—	—
Tchimkent		63·5	319	i 10 36	+ 2	i 19 0	− 7	e 11 15	pP	—
Samarkand		64·2	314	e 10 42	+ 3	—	—	i 11 20	pP	—
Ashkabad		69·9	311	i 11 15	0	i 20 15	− 9	12 7	pP	—
Sverdlovsk		75·0	331	i 11 43	− 2	i 21 5	−18	—	—	—
Baku		76·9	312	e 11 59	+ 3	—	—	—	—	—
Grozny		80·4	314	e 11 57	−18	e 21 51	−30	—	—	—
Erevan		80·9	310	12 19	+ 2	—	—	—	—	—
Leninakan		81·5	311	12 20	− 1	—	—	—	—	—
Sotchi	N.	84·8	314	e 12 42?	+ 5	—	—	—	—	—
Moscow		87·2	326	12 46	− 3	e 23 8	[− 7]	—	—	—
Ksara		87·3	304	—	—	e 23 21	[+ 5]	e 34 24	Q	—
Theodosia	N.	88·0	315	12 50	− 3	—	—	—	—	—
Simferopol	N.	88·9	315	—	—	e 23 33	[+ 7]	—	—	—
College		89·7	25	e 16 15	PP	e 23 37	[+ 6]	e 24 41	PS	e 36·1

Continued on next page.

The scanned images of the bulletins of the International Seismological Summary (ISS) have been obtained thanks to funding provided by the US National Science Foundation through grant EAR-9725140 (Villaseñor et al., 1997) and collected by SGA Storia Geofisica Ambiente (Bologna) on behalf of the Istituto Nazionale di Geofisica e Vulcanologia (Rome), in the frame of the EUROSEISMOS project.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Helwan		91·1	299	e 13 7	− 1	—	—	i 16 49	PP	—
Helsinki		93·8	330	—	—	e 23 34	[−20]	e 30 23	SS	e 42·8
Warsaw		97·1	322	e 17 39	PP	e 24 49	− 7	e 31 39	SS	e 44·9
Upsala		97·5	331	—	—	e 31 33	SS	—	—	47·9
Jena		103·1	321	e 18 17	PP	—	—	—	—	—
Rome		104·9	313	e 17 13	?	—	—	i 18 27	PP	—
Stuttgart		105·2	321	e 17 4	?	—	—	e 18 11	pP	e 56·9
Strasbourg		106·2	321	e 18 8	[−17]	—	—	i 18 44	PP	—
Shasta Dam		108·6	46	e 14 24	P	—	—	e 18 51	PP	—
Paris		109·4	323	e 18 32	[0]	—	—	i 19 1	PP	—
Kew		109·8	326	i 18 36	[+ 3]	e 29 16	PPS	e 30 28	?	e 55·9
Clermont-Ferrand		110·2	319	e 18 29	[− 5]	—	—	i 19 17	PP	—
Hungry Horse		111·4	36	i 18 35	[− 1]	—	—	—	—	—
Fresno		111·7	50	i 18 35	[− 2]	i 19 21	PP	—	—	—
Tinemaha		112·8	49	i 14 45	P	—	—	i 18 38	PKP_2	—
Haiwee	z.	113·3	50	e 14 59	P	—	—	i 18 40	PKP_2	—
Pasadena		113·8	52	i 14 53	P	e 25 4	[−23]	i 19 31	PP	—
Riverside	z.	114·5	52	e 14 57	P	—	—	i 18 41	PKP_2	—
Palomar	z.	115·0	53	e 14 54	P	e 32 30	SKKP	i 15 25	pP	—
Logan		115·7	41	e 18 40	[− 4]	—	—	e 20 25	PP	—
Boulder City		115·8	49	i 18 44	[− 1]	—	—	e 29 16	PKKP	—
Pierce Ferry		116·3	49	e 15 30	P	—	—	i 18 45	PKP	—
Toledo		117·3	316	i 18 46	[− 1]	—	—	20 1	PP	—
Almeria		117·4	312	18 45	[− 3]	36 4	SS	i 20 1	PP	—
Malaga	z.	118·9	313	i 18 48k	[− 3]	31 7	PPS	i 20 5	PP	55·0
Tucson		120·2	51	i 18 51	[− 2]	e 31 35	PPS	i 20 32	PP	—
Kirkland Lake		128·0	19	i 19 6	[− 2]	e 31 58	PS	—	—	—
Temiskaming		129·7	19	i 19 9	[− 3]	e 32 10	PS	—	—	—
Tacubaya	E.	134·6	62	i 19 21	[0]	i 22 54	PKS	i 23 2	pPKS	—
La Plata		145·3	179	i 19 38s	[− 2]	41 31	SS	22 56	PP	69·5
Bermuda		147·0	11	e 19 52	[+ 9]	—	—	e 26 52	PPP	e 59·9
Huancayo		158·5	124	e 20 2	[+ 3]	e 27 36	[+33]	e 24 9	PP	e 74·9
La Paz		160·5	147	i 19 59	[− 2]	i 45 32	SSP	i 24 23	PP	78·9
Bogota	z.	162·6	74	i 20 3	[0]	i 20 53	?	—	—	—

Additional readings :—
Perth PPP = 7m.52s.
Brisbane ePEN = 7m.39s., iN = 7m.46s., 8m.54s., 9m.15s., 10m.35s., and 12m.6s., iSSEN = 14m.23s., eQE = 15m.4s.
Calcutta iPPE = 8m.38s., iSSE = 15m.39s.
Mizusawa ePN = 8m.5s., SE = 14m.6s.
Riverview iN = 8m.6s., iZ = 8m.45s., iPPPZ = 10m.30s., iN = 14m.56s., isSN = 15m.16s., iE = 15m.30s., iSSN = 17m.24s., iEZ = 17m.33s., iN = 17m.36s., iS_cSE = 17m.44s.
Hyderabad SSN = 19m.4s.
Frunse epP = 10m.53s.
Auckland P_cP = 10m.28s., i = 13m.37s., P_cS = 14m.13s., S_cS = 19m.16s., i = 20m.32s. and 21m.19s.
Wellington i = 11m.12s., P_cS = 14m.46s., S_cS = 20m.0s.
Tchimkent epP = 11m.28s.
Ashkabad epP = 11m.54s.
College e = 22m.58s., ePPS = 25m.40s., eSS? = 29m.5s., eSS = 30m.32s.
Helwan i = 14m.25s.
Helsinki e = 24m.2s. and 33m.50s.
Warsaw eE = 24m.45s., 25m.50s. and 27m.37s., eN = 27m.43s., and 28m.42s.
Upsala eE = 38m.52s.?, eN = 39m.52s.?
Rome e = 19m.16s.
Strasbourg ePP = 18m.38s., i = 21m.57s.
Shasta Dam ePP = 18m.17s.
Paris e = 22m.1s.
Clermont-Ferrand ipPP = 20m.11s.
Fresno eE = 18m.39s., eNZ = 19m.4s., readings given as for local shock.
Tinemaha ePKKPZ = 29m.0s., iZ = 29m.35s.
Haiwee iZ = 19m.28s., ePKKPZ = 29m.27s.
Pasadena iZ = 15m.7s., $iPKP_2$ = 18m.39s., iZ = 19m.53s., iPPP?Z = 21m.59s., ePKKP = 29m.28s.
Riverside iZ = 15m.2s., 19m.31s., and 22m.4s., iPKKPZ = 29m.21s.
Palomar $iPKP_2Z$ = 18m.40s., iZ = 18m.57s., 19m.16s., and 19m.33s., iPKKPZ = 29m.23s.
Toledo i = 29m.13s.
Almeria PPP = 22m.31s., PPS = 30m.55s.
Malaga PKKPZ = 29m.5s., QZ = 49m.52s.

Continued on next page.

Tucson i = 19m.50s., iPKKP = 29m.0s., i = 32m.58s.
Tacubaya ipPPE = 21m.59s., iPKSE = 22m.38s., isPKSE = 23m.18s., iE = 24m.6s., eE = 32m.46s.
La Plata eE = 20m.16s., N = 20m.21s., Z = 20m.40s., E = 21m.46s., PPZ = 23m.4s., PPPE = 27m.40s., SKSPN = 35m.58s., SSE = 42m.40s., PSS?N = 46m.16s., SSSE = 53m.40s., N = 58m.28s., E = 59m.58s.
Bermuda ePP = 23m.58s., e = 25m.17s. and 32m.14s., ePPS? = 38m.12s., eSS = 41m.17s.
Huancayo e = 20m.37s. and 21m.6s., ePPS = 37m.42s., eSS = 44m.11s.
La Paz iZ = 20m.41s., iPPZ = 25m.2s., iSKKS = 36m.36s., iN = 38m.28s.
Long waves were also recorded at Potsdam, Belgrade, and Scoresby Sund.

Feb. 9d. Readings also at 0h. (College and Hungry Horse), 1h. (Hungry Horse), 3h. (Hungry Horse, Shasta Dam, Andijan, Samarkand, near Stalinabad, and near Obi-garm (2)), 4h. (Pierce Ferry), 6h. (Kew and near Ashkabad), 9h. (near Andijan), 10h. (near Fresno), 12h. (Stuttgart, near Lick, and near Mizusawa), 13h. (Pierce Ferry, Boulder City, Hungry Horse (2), and Belgrade (2)), 14h. (Hungry Horse (3)), 15h. (Logan and Hungry Horse (2), 16h. (Hungry Horse), 17h. (near Istanbul, Hungry Horse, and near Andijan), 18h. (Hungry Horse, Hyderabad, and Istanbul (2)), 21h. (Hungry Horse (2), and Istanbul), 22h. (Istanbul), 23h. (Hungry Horse, Pierce Ferry, La Paz, and Istanbul (2)).

Feb. 10d. 15h. 58m. 52s. Epicentre 35°·5N. 27°·2E. (as on 9d.).

$A = +\cdot7258$, $B = +\cdot3730$, $C = +\cdot5781$; $\delta = +11$; $h = 0$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Istanbul		5·8	14	1 52?	P_g	i 2 53	S*	—	—	—
Helwan		6·6	147	1 38	− 3	2 53	− 5	1 53	P*	—
Ksara		7·4	101	e 1 46	− 6	e 3 5	−13	—	—	—
Bucharest		8·9	355	e 2 38	P*	e 4 0	+ 5	—	—	—
Yalta		10·4	28	i 2 32	− 2	—	—	—	—	—
Belgrade		10·6	333	e 2 41	+ 5	e 6 2	?	e 5 0	SSS	—
Simferopol	N.	10·8	27	e 2 38	− 1	—	—	—	—	—
Theodosia	N.	11·4	31	e 2 49	+ 2	—	—	—	—	—
Rome		13·1	304	e 3 41	?	e 5 53	SS	—	—	—
Leninakan		14·1	63	8 38	P_cP	—	—	—	—	—
Triest		14·4	319	e 3 36	+ 9	i 6 23	+14	—	—	—
Prague		17·3	333	e 3 50	−14	e 7 14	− 2	—	—	e 9·1
Warsaw		17·3	348	e 4 7	+ 3	7 26	+10	—	—	e 10·1
Zürich		18·3	317	e 4 16	− 1	e 7 40	+ 1	—	—	—
Stuttgart		18·7	322	e 4 23	+ 1	—	—	—	—	e 9·6
Basle		18·9	317	e 4 25	+ 1	e 5 27	?	—	—	—
Collmberg	Z.	19·1	331	i 4 26	− 1	—	—	—	—	—
Jena	N.	19·1	330	e 4 25	− 2	—	—	—	—	—
Strasbourg		19·4	320	e 4 30	0	—	—	e 4 39	PP	e 11·3
Potsdam		19·6	334	—	—	i 8 28	SS	—	—	9·6
Clermont-Ferrand		20·9	307	i 4 47	+ 1	i 8 50	+15	i 5 15	PP	e 10·1
Moscow		21·5	16	4 49	− 3	e 8 54	+ 7	—	—	11·6
Alicante		22·3	287	i 5 19	+18	i 9 12	+10	16 11	S_cS	—
Paris		22·5	314	e 5 0	− 2	e 8 46	−19	e 5 22	PP	11·0
Copenhagen		22·6	338	5 5	+ 2	—	—	—	—	11·6
Almeria		23·9	283	i 5 17	+ 1	9 37	+ 7	5 43	PP	12·1
Granada		24·8	284	i 5 41 a	+16	10 0	+14	6 12	PP	13·9
Ashkabad		25·0	75	e 5 22	− 5	e 9 48	− 1	—	—	14·6
Toledo		25·0	290	e 5 28	+ 1	—	—	—	—	—
Kew		25·3	319	e 4 34	−56	e 7 44	?	—	—	—
Malaga	Z.	25·5	284	e 5 35	+ 3	e 11 3	SS	—	—	—
Sverdlovsk		31·0	36	e 5 22	−59	—	—	—	—	—
Hungry Horse		89·6	335	e 13 0	− 1	—	—	—	—	—

Additional readings :—
Jena eP?N = 4m.28s., eN = 4m.34s.
Strasbourg e = 7m.23s. and 7m.30s.
Clermont-Ferrand i = 5m.45s. and 7m.9s.
Alicante PP = 5m.45s., PPP = 6m.7s., P_cP = 9m.7s., PS = 9m.37s., SS = 9m.47s., P_cS = 12m.35s.
Almeria PPP = 6m.5s., P_cP = 8m.48s., SS = 10m.33s., PS = 12m.29s.
Granada iPP = 6m.27s., P_cS = 12m.31s.
Long waves were also recorded at De Bilt, Uccle, and Upsala.

Feb. 10d. 18h. Undetermined shock.

Wellington P = 22m.54s., pP = 23m.36s., i = 25m.2s., S = 27m.21s., i = 28m.0s., L = 29m.
Riverview ePNZ = 23m.33s., iS?EN = 28m.16s., eQ?E = 29·2m., eRZ = 29·8m.
Ksara ePKP? = 23m.40s., PP? = 27m.18s.
Brisbane ePN = 25m.30s., eSE = 29m.51s., eLE = 32m.40s.
Perth P = 31m.5s., i = 35m.0s.
Antarctica e = 32m.32s. and 38m.26s., eL = 43m.20s.
Kirkland Lake e = 37m.36s.
Long waves were also recorded at La Paz, Auckland, and European stations.

Feb. 10d. Readings also at 0h. (Istanbul, Tinemaha, Hungry Horse (2), Pierce Ferry, Shasta Dam, and Tucson), 1h. (near Andijan, Tashkent, Murgab, Obi-garm, Stalinabad, Frunse, and Samarkand), 2h. (Istanbul (2), and La Paz), 3h. (Istanbul (3), Ksara, Hungry Horse (2), Pierce Ferry, Shasta Dam, Tucson (2), Pasadena (2), Mount Wilson, Palomar (2), Tinemaha (2), near Haiwee, Riverside, and Santa Barbara), 4h. (Hungry Horse), 5h. and 6h. (Istanbul), 7h. (Hungry Horse and Istanbul), 10h. (Apia), 13h. (Brisbane and Riverview), 14h. (Apia, Hungry Horse, Pierce Ferry, Ksara, Helwan, Prague, Budapest, Warsaw, Stuttgart, Toledo, and Clermont-Ferrand), 15h. (Antarctica), 16h. (Warsaw, Kew, Rome, Istanbul, Ashkabad, and Hungry Horse), 17h. (Belgrade), 22h. (near Fresno and Pierce Ferry).

Feb. 11d. 3h. 29m. 27s. Epicentre 36°·1N. 118°·8W.

Intensity VI at Clovis, Dinuba, Ducor, Fresno, Kingsburg, Lindsay, Miramonte, Springville, Three Rivers, Tipton, and Woody; V at Cottonwood Gates, National Park, etc. Epicentre as taken. Macroseismic area 18,000 sq. miles.

L. M. Murphy and F. P. Ulrich.
United States Earthquakes, 1948, Serial No. 746, Washington, 1951, p. 12, macroseismic chart p. 13.

A = −·3902, B = −·7097, C = +·5866; δ = +3; h = 0;
D = −·876, E = +·482; G = −·283, H = −·514, K = −·810.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Fresno		1·0	308	i 0 20	− 1	i 0 33	− 3	i 0 24	P	—
Lick		2·6	300	e 0 43	− 1	i 1 21	+ 4	i 0 55	P_g	—
Branner		3·0	297	i 0 51	+ 1	i 1 27	0	i 1 0	P_g	—
Boulder City		3·2	91	i 0 52	0	i 1 44	S_g	i 1 1	P_g	—
Berkeley		3·3	303	i 0 52	− 1	i 1 34	− 1	i 1 6	P_g	—
Pierce Ferry		3·9	88	i 1 2	0	i 2 8	S_g	—	—	—
Mineral	z.	4·8	334	i 1 16	+ 1	i 2 27	S*	i 1 26	P*	—
Shasta Dam		5·4	330	e 1 5	−19	e 2 40	S*	—	—	—
Hungry Horse		12·7	14	e 3 16	+11	—	—	—	—	e 6·7

Additional readings:—
Lick iE = 0m.49s. and 1m.24s.
Branner iN = 1m.5s., iSN = 1m.32s., iN = 1m.35s.
Berkeley iN = 0m.58s., iE = 1m.39s.
Long waves were recorded at Bogota.

Feb. 11d. 15h. 31m. 9s. Epicentre 35°·6N. 45°·8E. (as on 1946, August 17d.).

A = +·5682, B = +·5843, C = +·5795; δ = +8; h = 0;
D = +·717, E = −·697; G = +·404, H = +·415, K = −·815.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Erevan	4·7	348	e 1 24?	P*	—	—	—	—	—
Leninakan	5·4	345	e 1 42?	P_g	—	—	—	—	—
Baku	5·8	33	e 1 33	+ 4	—	—	—	—	—
Grozny	7·7	0	i 1 57	+ 1	—	—	—	—	—
Ksara	8·3	261	e 2 11?	+ 7	e 4 13?	S*	—	—	—
Piatigorsk	8·7	347	e 2 11	+ 1	—	—	—	—	—
Ashkabad	10·3	73	e 2 33	+ 1	—	—	—	—	—
Helwan	13·4	249	e 3 19	+ 5	—	—	e 4 24	?	i 7·7
Samarkand	17·3	70	e 4 8	+ 4	—	—	—	—	—
Stalinabad	18·6	73	i 4 18	− 3	i 7 58	SS	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tashkent		19·2	65	e 4 26?	− 2	e 8 5?	+ 6	—	—	—
Tchimkent		19·6	62	i 4 29	− 3	—	—	—	—	—
Andijan		21·5	68	e 4 56	+ 4	—	—	—	—	—
Frunse		23·4	63	e 5 22	+11	—	—	—	—	—
Sverdlovsk		23·5	21	5 11	− 1	9 23	0	—	—	—
Stuttgart	Z.	29·8	308	e 6 9	− 2	—	—	—	—	—

Long waves were also recorded at Istanbul.

Feb. 11d. 15h. 41m. 56s. Epicentre 63°·8N. 145°·4W.

Felt at Northway and Fairbanks.
Epicentre 63°·5N. 146°·0W.

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

A = −·3654, B = −·2521, C = +·8960; δ = −11; h = −10;
D = −·568, E = +·823; G = −·737, H = −·509, K = −·444.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
College		1·5	315	i 0 28	0	i 0 46	− 3	—	—	e 1·2
Sitka		8·0	137	i 2 4	+ 4	e 3 32	− 1	—	—	i 3·8
Victoria		19·5	131	4 30	− 1	8 15	+ 9	—	—	9·6
Hungry Horse		23·0	117	e 5 5	− 2	e 9 25	+11	—	—	i 12·1
Saskatoon		23·2	102	5 15	+ 6	9 37	+19	—	—	12·1
Butte	N.	25·5	117	—	—	e 10 16	+19	—	—	e 12·5
Ferndale		26·4	142	—	—	—	—	e 11 4	Q	e 13·1
Bozeman		26·4	116	e 5 44	+ 4	e 10 11	− 1	—	—	e 12·3
Shasta Dam		26·8	138	e 5 42	− 2	—	—	—	—	—
Mineral	Z.	27·4	137	i 5 48	− 1	—	—	i 5 58	P	e 16·5
Logan		29·4	122	e 6 7	0	e 10 55	− 6	e 7 26	PPP	e 13·2
Berkeley	E.	29·5	140	e 6 13	+ 5	i 11 4	+ 2	—	—	e 13·5
Santa Clara	E.	30·0	140	—	—	e 13 30	SSS	—	—	—
Salt Lake City		30·3	123	e 10 19	?	—	—	—	—	e 15·1
Rapid City	E.	30·9	109	e 6 22	+ 2	e 11 54	+30	e 7 4	PP	e 14·7
Tinemaha	Z.	31·4	135	e 6 25	0	—	—	—	—	—
Boulder City		33·5	131	e 6 35	− 8	—	—	i 8 34	PPP	e 18·7
Pierce Ferry		33·6	129	e 6 43	− 1	—	—	i 6 48	P	e 19·7
Mount Wilson	N.	34·1	136	e 6 48	0	—	—	—	—	—
Pasadena		34·1	136	i 6 48	0	—	—	—	—	e 15·9
Palomar	Z.	35·2	135	i 6 58	0	—	—	—	—	—
Kirkland Lake		37·9	82	e 7 18	− 2	—	—	e 8 46	PP	—
Tucson		38·2	128	i 7 24	+ 1	e 13 25	+ 8	e 16 26	SSS	e 19·5
Chicago		39·4	96	e 7 32	− 1	e 13 34	− 1	e 9 7	PP	e 16·3
Temiskaming		39·4	83	e 7 32	− 1	—	—	i 7 36	P	—
St. Louis		40·9	100	i 7 46	0	i 14 1	+ 3	i 9 22	PP	—
Ottawa		41·9	82	7 51	− 3	14 18	+ 5	16 49	SS	21·3
Shawinigan Falls		42·3	78	e 7 54	− 3	—	—	—	—	21·1
Cleveland		42·4	90	e 7 58k	0	e 14 23	+ 3	e 9 39	PP	—
Seven Falls		42·7	76	7 58	− 2	14 18	− 6	17 23	SS	20·1
Harvard		46·0	80	i 8 26	− 1	e 18 42	SS	e 10 17	PP	i 23·7
Fordham		46·3	84	i 8 31	+ 2	e 15 24	+ 8	e 18 46	SS	—
Philadelphia		46·5	85	i 8 33	+ 2	i 15 32	+13	e 18 35	SS	e 22·9
Halifax		47·7	73	—	—	e 19 10	SS	—	—	25·1
Vladivostok		49·3	287	e 8 52	− 1	e 15 52	− 7	—	—	—
Irkutsk		52·2	314	e 9 14	− 1	16 37	− 2	—	—	—
Aberdeen		56·1	24	—	—	e 20 4	?	—	—	—
Sverdlovsk		58·1	344	9 54	− 4	17 59	+ 1	—	—	—
Copenhagen		59·6	15	10 12	+ 4	—	—	—	—	—
Moscow		60·8	359	e 10 13	− 3	e 18 34	+ 1	—	—	—
Kew		61·9	24	i 10 28a	+ 4	e 19 6	+19	e 27 4	Q	e 30·1
Uccle		63·3	22	e 10 35	+ 2	e 19 11?	+ 7	—	—	e 30·8
Warsaw		63·8	10	e 14 12	PPP	—	—	—	—	e 37·1
Paris		64·9	24	e 10 42	− 1	—	—	e 13 4	PP	34·1
Cheb		65·1	16	e 16 41	?	—	—	e 25 4?	Q	—

Continued on next page,

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Stuttgart	z.	66·0	18	e 10 50	0	—	—	e 13 20	PP	e 36·1
Strasbourg		66·0	20	—	—	e 19 4	−34	—	—	e 27·1
Zürich		67·3	20	e 10 58	− 1	—	—	—	—	—
Clermont-Ferrznd		68·0	24	e 11 4	+ 1	—	—	—	—	35·1
Almata		68·1	329	e 11 5	+ 1	—	—	—	—	—
San Juan		68·9	91	e 11 35	+26	e 20 16	+ 3	—	—	e 28·4
Frunse		69·1	330	e 11 20	+10	—	—	—	—	—
Tchimkent		70·7	334	i 11 22	+ 2	—	—	—	—	—
Andijan		71·6	331	e 11 24	− 1	—	—	—	—	—
Simferopol	N.	71·6	2	e 11 36?	+11	—	—	—	—	—
Tashkent		71·7	334	e 11 25	− 1	—	—	—	—	—
Toledo		72·2	31	i 11 29	0	—	—	—	—	—
Grozny		72·9	352	e 11 33	0	—	—	—	—	—
Stalinabad		74·4	333	i 11 39	− 3	i 21 15	− 1	—	—	—
Alicante		74·4	29	11 36	− 6	e 21 18	+ 2	14 30	PP	e 35·3
Granada		74·9	31	e 11 47k	+ 3	e 21 15	− 7	12 19	PcP	37·1
Malaga	z.	75·1	32	i 11 47a	+ 1	i 22 3	PS	22 45	sS	42·8
Istanbul		75·4	5	—	—	e 30 4	SSS	—	—	e 46·1
Almeria		75·5	30	e 11 33	−15	21 19	− 9	14 30	PP	44·1
Ashkabad		76·9	341	e 11 56	0	—	—	—	—	—
Bogota	z.	77·7	105	i 12 0	0	—	—	—	—	—
Ksara		82·7	0	e 12 54	+27	e 23 41	PS	—	—	—
Calcutta	E.	84·3	312	—	—	e 22 54	− 6	—	—	—
Bombay		92·4	324	—	—	e 27 45	?	—	—	—
La Paz		99·2	108	e 13 32	−13	—	—	17 50	PP	47·8

Additional readings :—
Bozeman i = 10m.33s.
Logan e = 6m.25s.
Berkeley iZ = 6m.43s. and 8m.36s., eE = 9m.0s., iSE = 9m.58s., eN = 11m.9s., iZ = 11m.49s.
Pierce Ferry eS_eS = 15m.18s.
Tucson e = 17m.53s.
St. Louis iSSN = 16m.59s.
Ottawa SSS = 18m.16s.
Cleveland iPZ = 8m.1s., eSSE = 17m.22s., eEN = 17m.30s., eN = 17m.42s.
Seven Falls SSS = 17m.51s.
Uccle eSSN = 23m.58s., eSSSE = 26m.22s.
Paris e = 10m.49s., eP_cP = 11m.15s., Q = 32m.4s.
Alicante PPP = 16m.12s., SS = 26m.14s., SSS = 29m.3s.
Malaga iPPZ = 14m.23s., PPP?Z = 17m.31s., SS?Z = 28m.27s.,
Almeria PPP = 16m.15s., SS = 26m.9s.
Long waves were also recorded at Riverview, Huancayo, Honolulu, Bermuda, Kodaikanal, and other American and European stations.

Feb. 11d. 18h. 3m. 36s. Epicentre 35°·5N. 27°·2E. (as on 10d.).

A = +·7258, B = +·3730, C = +·5781 ; δ = +11 ; h = 0.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Istanbul	5·8	14	e 1 38	+ 9	e 3 7	S_g	—	—	—
Helwan	6·6	147	1 42	+ 1	3 2	+ 4	—	—	—
Ksara	7·4	101	e 1 52	0	—	—	—	—	—
Yalta	10·4	28	e 4 25	S	(e 4 25)	− 7	—	—	—
Belgrade	10·6	333	e 3 3	+27	e 5 47	L	—	—	(e 5·8)
Rome	13·1	304	e 3 10	0	e 5 16	−21	—	—	e 7·0
Prague	17·3	333	e 3 57	− 7	—	—	—	—	e 9·9
Warsaw	17·3	348	4 31	+27	e 7 20	+ 4	e 7 28	SS	e 10·4
Zürich	18·3	317	e 3 30	−47	e 7 57	SS	i 4 8	P	—
Stuttgart	18·7	322	e 3 36	−46	e 8 2	SS	e 4 17	P	—
Basle	18·9	317	e 3 45	−39	e 8 0	+ 7	—	—	—
Jena	19·1	330	e 4 19	− 8	—	—	e 4 57	PPP	—
Clermont-Ferrand	20·9	307	e 4 39	− 7	e 8 26	− 9	—	—	—
Alicante	22·3	287	5 8	+ 7	9 2	0	5 34	PP	e 11·0
Paris	22·5	314	e 4 56	− 6	e 8 42	−23	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Almeria		23·9	283	e 5 14	− 2	9 34	+ 4	5 50	PP	14·4
Granada		24·8	284	i 5 15a	−10	e 9 21	−25	—	—	—
Toledo		25·0	290	e 4 45	−42	i 9 9	−40	—	—	—
Ashkabad		25·0	75	e 4 54	−33	e 9 56	+ 7	—	—	—
Kirkland Lake		74·5	319	e 11 36	− 6	—	—	—	—	—
Temiskaming		74·8	317	e 15 24	?	—	—	—	—	—
Hungry Horse		89·6	335	e 12 13	−48	—	—	e 12 53	P	—

Additional readings :—
Warsaw eE =5m.31s. and 6m.5s.
Long waves were also recorded at Strasbourg, Cheb, Kew, and Helsinki.

Feb. 11d. 22h. 31m. 24s. Epicentre 35°·5N. 27°·2E. (as at 18h.).

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Istanbul		5·8	14	1 30	+ 1	—	—	—	—	—
Helwan		6·6	147	e 1 42	+ 1	i 2 48	−10	i 3 48	S_g	—
Ksara		7·4	101	e 1 38	−14	e 2 58	−20	—	—	—
Bucharest	E.	8·9	355	—	—	e 3 56	+ 1	—	—	—
Belgrade		10·6	333	—	—	e 5 17	SSS	—	—	e 5·8
Rome		13·1	304	—	—	e 5 10	−28	—	—	e 6·9
Triest		14·4	319	—	—	e 6 11	+ 2	i 6 36	SSS	—
Warsaw		17·3	348	e 3 46	−18	—	—	—	—	e 9·6
Cheb		18·1	329	—	—	e 7 16	−19	—	—	e 9·6
Zürich		18·3	317	e 3 56	−21	—	—	—	—	—
Stuttgart		18·7	322	e 4 4	−18	—	—	e 4 14	P	e 10·5
Basle		18·9	317	e 2 5	?	e 4 53	PP	e 4 16	P	—
Collmberg	Z.	19·1	331	e 4 27	0	—	—	—	—	—
Jena		19·1	330	e 4 8	−19	—	—	e 4 38	P	—
Paris		22·5	314	e 4 50	−12	—	—	e 5 1	P	—
Copenhagen		22·6	338	4 50	−13	—	—	—	—	—
Hungry Horse		89·6	335	e 12 41	−20	—	—	—	—	—
La Paz		103·6	259	22 4	?	—	—	—	—	—

Long waves were also recorded at Kew.

Feb. 11d. Readings also at 0h. (near Shasta Dam), 2h. (Istanbul and Hungry Horse (2)), 4h. (Clermont-Ferrand, Paris, Toledo, Stuttgart, Rome, Ksara, Huancayo, La Paz, Pierce Ferry, and Hungry Horse (2)), 8h. (Hungry Horse (2)), 9h. (Helwan, Ksara, Istanbul, Rome, Zürich, Warsaw, Stuttgart, and Hungry Horse), 10h. (Istanbul, Hungry Horse (2), Shasta Dam, Tucson, Tinemaha, La Paz, and Huancayo), 11h. (Hungry Horse, Istanbul, near Obi-garm, near Murgab, and near Tananarive), 12h. (Alicante, Granada ,and Hungry Horse), 13h. (near Andijan (2), Samarkand, Murgab (2), Obi-garm (2), and Stalinabad (2)), 14h. (Tacubaya), 15h. (Kirkland Lake, Temiskaming, Hungry Horse, Basle, Zürich, Clermont-Ferrand, Paris, Toledo, Stuttgart, Istanbul, and Ksara), 16h. (Lick), 17h. (Rapid City, Kirkland Lake, Victoria, Hungry Horse, Butte, Lincoln, Logan, Ksara, Istanbul (2), and Stuttgart), 18h. (Hungry Horse, Istanbul, Obi-garm, near Almata, Andijan, and Frunse), 19h, (Hungry Horse), 23h. (Hungry Horse (2), and near Fresno).

Feb. 12d. 22h. 27m. 10s. Epicentre 35°·5N. 27°·2E. (as on 11d.).

A = +·7258, B = +·3730, C = +·5781 ; δ = +11 ; h = 0.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Istanbul		5·8	14	e 1 39?	+10	i 3 3	S*	—	—	—
Helwan		6·6	147	1 44	+ 3	3 2	+ 4	2 17	P_g	—
Ksara		7·4	101	e 1 50	− 2	3 12	− 6	—	—	—
Bucharest	E.	8·9	355	—	—	e 3 45	−10	e 4 11	S*	—
Yalta		10·4	28	e 2 29	− 5	—	—	—	—	—
Belgrade		10·6	333	2 37	+ 1	e 5 57	L	i 3 22	?	(e 5·9)
Simferopol	N.	10·8	27	e 2 37	− 2	—	—	—	—	—
Kalossa		12·6	333	e 3 2	− 1	—	—	—	—	e 7·3
Rome		13·1	304	e 3 19	+ 9	e 5 43	+ 5	—	—	e 6·6
Budapest		13·4	353	e 3 34	PPP	i 5 32	−13	—	—	7·3

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Leninakan	14·1	63	e 3 32?	+ 9	—	—	—	—	—
Triest	14·4	319	e 3 40	PP	e 6 22	SS	—	—	i 8·4
Erevan	14·4	66	e 3 31	+ 4	—	—	—	—	—
Piatigorsk	14·9	50	e 3 31	− 3	—	—	—	—	—
Grozny	16·3	56	e 3 50	− 2	—	—	—	—	—
Pavia	16·8	311	e 4 30	PPP	—	—	—	—	—
Warsaw	17·3	348	e 3 49	−15	e 7 14	− 2	e 4 16	PP	e 9·8
Prague	17·3	333	e 3 58	− 6	e 7 17	+ 1	—	—	e 8·8
Chur	17·4	317	e 4 7	+ 1	—	—	—	—	—
Cheb	18·1	329	e 4 12	− 2	e 7 33	− 2	—	—	e 9·8
Zürich	18·3	317	e 4 13	− 4	—	—	—	—	e 9·2
Baku	18·5	68	e 4 26	+ 7	—	—	—	—	—
Stuttgart	18·7	322	e 4 19	− 3	—	—	e 4 31	P	e 10·1
Basle	18·9	317	e 4 28	+ 4	e 7 47	− 6	—	—	—
Jena	19·1	330	e 4 22	− 5	e 8 2	+ 5	e 4 38	PP	e 10·4
Strasbourg	19·4	320	e 4 25	− 5	e 7 46	−18	—	—	9·3
Potsdam	19·6	334	i 4 49	PP	i 7 56	−12	—	—	e 10·8
Clermont-Ferrand	20·9	307	e 4 44	− 2	—	—	—	—	—
Moscow	21·5	16	4 43	− 9	e 8 35?	−12	—	—	—
Alicante	22·3	287	i 5 9	+ 8	9 9	+ 7	5 31	PP	11·3
Uccle	22·5	321	e 5 9?	+ 7	e 9 5	0	—	—	e 11·5
Paris	22·5	314	e 5 0	− 2	—	—	—	—	e 13·8
Almeria	23·9	283	5 20	+ 4	i 9 42	+12	5 55	PP	12·8
Granada	24·8	284	i 5 28a	+ 3	i 9 52	+ 6	5 35	pP	12·9
Ashkabad	25·0	75	e 5 25	− 2	i 9 51	+ 2	—	—	—
Toledo	25·0	290	i 5 25	− 2	—	—	—	—	—
Upsala	25·2	349	—	—	e 9 50	− 2	—	—	e 13·8
Kew	25·3	319	e 5 27	− 3	e 10 11	+17	—	—	e 13·3
Malaga	25·5	284	i 5 31a	− 1	i 10 16	+19	—	—	—
Sverdlovsk	31·0	36	e 6 6	−15	—	—	—	—	—
Samarkand	31·6	70	e 6 35	+ 9	—	—	—	—	—
Stalinabad	33·1	71	i 6 38	− 2	e 12 1	+ 2	—	—	—
Tashkent	33·2	67	e 7 2	+22	—	—	—	—	—
Obi-garm	33·8	71	e 6 45	− 1	—	—	—	—	—
Andijan	35·6	68	e 6 56	− 5	—	—	—	—	—
Frunse	37·1	64	e 7 9	− 5	—	—	—	—	—
Kirkland Lake	74·5	319	e 11 38	− 4	—	—	—	—	—
Ville Marie	74·7	319	e 11 41	− 2	—	—	—	—	—
Temiskaming	74·8	317	e 11 42	− 2	—	—	—	—	—
Hungry Horse	89·6	335	e 12 57	− 4	—	—	—	—	—

Additional readings :—
Helwan S* = 3m.26s.
Kalossa eN = 3m.5s. and 4m.32s.
Warsaw ePN = 3m.53s., ePZ = 3m.58s., ePPPZ = 4m.39s., eSN = 7m.7s.?, eSSSE = 7m.52s.
Cheb e = 6m.8s.
Jena eS?N = 8m.10s. and 8m. 15s.
Potsdam iPN = 4m.52s., iN = 5m.33s., iE = 6m.58s.
Alicante PPP = 5m.45s., PS = 9m.53s., PPS = 10m.5s.
Almeria P_cP = 8m.50s., SS = 10m.44s., P_cS = 12m.32s.
Granada sP = 5m.45s., iPP = 6m.8s., pPP = 6m.26s., sPP = 6m.45s.
Malaga iPPZ = 7m.26s., P_cPZ = 8m.32s.
Long waves were also recorded at De Bilt, Copenhagen, and Helsinki

Feb. 12d. Readings also at 0h. (Ksara, Hungry Horse, Bermuda, Bogota, near San Juan and Port au Prince), 1h. (La Paz (3) and Bogota), 2h. (Hungry Horse (2)), 7h. (Pierce Ferry), 8h. (near Bogota), 9h. (Andijan, near Stalinabad, Obi-garm, and Murgab), 11h. (near Tacubaya), 12h. (Istanbul Stuttgart, Bombay, Calcutta, Hungry Horse, La Paz, and near Tacubaya), 15h. (Hungry Horse), 16h. and 17h. (Mizusawa), 18h. (La Plata), 19h. (La Paz and near Berkeley), 20h. (Hungry Horse), 23h. (Hungry Horse and Batavia).

Feb. 13d. 4h. 57m. 9s. Epicentre 36°·0N. 80°·5E.

$A = +\cdot1338$, $B = +\cdot7998$, $C = +\cdot5852$; $\delta = +4$; $h = 0$;
$D = +\cdot986$, $E = -\cdot165$; $G = +\cdot097$, $H = +\cdot577$, $K = -\cdot811$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Murgab		5·8	296	1 33	+ 4	2 47	+ 9	—	—	—
Dehra Dun	N.	6·0	200	i 0 46	−46	i 1 41	−62	—	—	i 2·4
Almata		7·8	340	i 1 57	− 1	3 13	−15	—	—	—
Andijan		7·9	309	e 1 59	0	i 3 23	− 7	—	—	—
Frunse		8·3	328	i 2 6	+ 2	3 36	− 4	—	—	—
Obi-garm		9·0	290	i 2 16?	+ 3	i 4 16?	+18	—	—	—
Stalinabad		9·7	289	i 2 26	+ 4	i 4 11	− 4	—	—	—
Tashkent		10·3	305	i 2 27	− 5	—	—	—	—	—
Tchimkent		10·5	310	e 2 31	− 4	—	—	—	—	—
Samarkand		11·3	293	e 2 51	+ 5	i 4 54	0	—	—	—
Calcutta	E.	15·0	151	i 3 39a	+ 4	i 6 30	+ 7	i 3 51	PP	—
Ashkabad		17·8	284	i 4 15	+ 4	—	—	—	—	—
Bombay		18·3	205	e 4 18	+ 1	i 7 52	+13	—	—	9·5
Hyderabad	N.	18·6	187	4 12	− 9	e 7 47	+ 1	4 26	PP	9·9
Irkutsk		23·4	38	i 5 10	− 1	i 9 24	+ 3	—	—	—
Sverdlovsk		24·8	334	i 5 24?	− 1	—	—	—	—	—
Kodaikanal		25·8	188	e 5 44	+10	e 10 16	+14	—	—	12·9
Grozny		27·6	297	e 5 58	+ 7	e 10 32	0	i 6 52	PPP	—
Erevan		28·5	291	e 6 20?	+21	e 12 33	SSS	—	—	—
Leninakan		29·0	293	e 6 8	+ 4	—	—	i 7 18	PPP	—
Colombo	E.	29·0	183	5 58	− 6	11 3	+ 9	—	—	14·9
Nanking		31·8	87	e 6 24	− 4	—	—	—	—	e 17·7
Moscow		35·0	319	6 54	− 2	e 12 20	− 8	—	—	—
Theodosia	N.	35·1	300	—	—	e 15 39	SSS	—	—	—
Simferopol	N.	36·0	300	e 7 6	+ 1	—	—	—	—	—
Yalta		36·0	299	e 7 0	− 5	—	—	—	—	—
Vladivostok		39·7	64	e 7 33	− 3	i 13 36	− 4	—	—	—
Istanbul		40·1	295	e 7 42	+ 3	—	—	—	—	—
Helwan		41·4	277	7 51	+ 1	14 15	+10	i 9 29	PP	—
Bucharest		41·7	300	e 7 57	+ 5	—	—	—	—	28·8
Miyazaki		42·1	81	7 58	+ 3	—	—	—	—	—
Helsinki		42·6	324	e 7 57	− 2	e 14 27	+ 4	e 9 41	PP	e 21·3
Kôti		43·2	78	8 4	0	17 33	SS	—	—	—
Warsaw		44·4	312	e 8 12a	− 2	e 14 33	−16	9 51	PP	e 22·8
Kameyama		45·1	74	8 15	− 5	—	—	—	—	—
Toyama		45·1	72	8 22	+ 2	—	—	—	—	—
Nagoya		45·4	74	8 26	+ 4	—	—	—	—	—
Belgrade		45·6	301	i 8 26	+ 2	—	—	e 10 16	PP	—
Nagano		45·9	72	e 9 25	+59	—	—	—	—	—
Budapest		46·1	306	8 27	− 1	—	—	i 10 21	PP	e 26·4
Upsala		46·2	323	8 27a	− 1	15 18	+ 3	18 25	SS	e 21·9
Kalossa		46·3	305	e 8 4	−25	—	—	e 10 22	PP	e 27·3
Raciborzu	z.	46·3	310	e 8 33	+ 4	—	—	—	—	—
Shizuoka		46·6	74	e 8 34	+ 2	18 6	SS	—	—	—
Mizusawa		47·4	67	8 45	+ 7	—	—	—	—	—
Tokyo		47·4	73	e 9 8	+30	19 18	SS	—	—	—
Sendai		47·5	69	8 47	+ 9	—	—	—	—	—
Prague		48·7	310	e 10 23	PcP	e 19 16	SS	e 10 42	PP	e 23·9
Batavia		48·7	144	i 10 53	PP	—	—	—	—	e 29·5
Copenhagen		49·2	317	e 8 51	− 1	16 21	+23	e 8 57	P	—
Potsdam		49·2	313	i 8 58	+ 6	i 16 4	+ 6	i 10 49	PP	e 22·9
Cheb		50·0	310	e 8 53	− 5	e 16 16	+ 7	e 10 54	PP	e 30·8
Triest		50·1	304	e 9 3	+ 4	e 16 29	PPS	e 10 51	PP	—
Jena		50·4	311	e 9 0	− 1	—	—	e 10 56	PP	—
Rome		52·0	299	i 9 10a	− 3	e 16 42	+ 6	e 11 11	PP	e 24·6

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Stuttgart		52·4	309	e 9 15	− 1	e 16 57	+15	e 11 25	PP	25·9
Chur		52·6	306	e 9 15	− 3	—	—	—	—	—
Strasbourg		53·3	308	e 9 23	0	e 17 3	+ 9	e 11 35	PP	e 25·4
Basle		53·7	307	e 9 24	− 2	—	—	e 14 50	?	—
Zürich		53·7	307	e 9 19	− 7	e 17 23	+24	—	—	—
De Bilt		54·0	314	—	—	e 17 9	+ 6	e 20 51?	SS	e 25·9
Neuchatel		54·3	307	e 9 23	− 7	—	—	—	—	—
Uccle		54·9	313	e 9 40?	+ 5	e 17 21	+ 5	e 21 25	SS	e 25·8
Paris		56·6	310	e 9 44	− 3	e 23 11	SSS	e 11 57	PP	30·8
Clermont-Ferrand		57·2	306	e 9 50	− 1	—	—	i 10 1	?	29·8
Kew		57·5	314	e 9 51?	− 2	e 17 58?	+ 8	e 12 1	PP	e 27·9
Alicante		62·5	300	10 40	+12	e 19 40	+46	11 1	P_cP	e 32·1
Toledo		64·3	303	i 10 39	0	—	—	—	—	—
Almeria		64·6	299	i 10 41	0	e 19 27	+ 6	13 4	PP	37·6
Granada		65·2	300	i 10 43k	− 2	e 20 13	PPS	—	—	33·8
Malaga	z.	66·0	300	i 10 48k	− 2	e 19 49	+11	20 50	sS	37·8
College		72·6	21	—	—	e 20 57	+ 1	—	—	e 29·0
Victoria		93·2	17	—	—	e 23 51?	[0]	—	—	44·9
Hungry Horse		95·0	9	e 13 27	+ 1	—	—	—	—	—
Riverview		95·8	128	—	—	e 24 6	[+ 1]	e 26 3	PS	e 47·7
Ottawa		96·2	343	e 13 35	+ 4	—	—	—	—	43·9
Shasta Dam		100·8	18	e 13 53	+ 1	—	—	—	—	—
Berkeley		103·5	18	—	—	e 25 54	+ 4	e 24 53	SKS	e 46·9
Bermuda		104·6	330	—	—	e 25 6	[+17]	e 28 1	PS	e 43·4
Tinemaha	z.	105·2	15	e 18 23	PP	—	—	—	—	—
Fresno	z.	105·2	17	e 17 6	P	—	—	e 18 25	PP	—
Haiwee	z.	106·2	15	e 18 43	PP	—	—	—	—	—
Pierce Ferry		107·0	12	e 17 18	PKP	—	—	—	—	—
Boulder City		107·0	13	e 18 51	PP	—	—	—	—	—
Pasadena		108·1	16	e 18 24	PP	—	—	e 19 3	PP	e 41·9
Riverside	z.	108·4	16	e 18 30	PP	—	—	—	—	—
Tucson		111·3	10	e 19 3	PP	—	—	e 29 49	PKKP	—
Bogota		133·1	324	e 19 18	[0]	e 23 15	SKP	—	—	55·9
La Paz		146·0	296	i 19 41	[0]	—	—	i 23 10	PP	70·9
Huancayo		147·7	312	e 19 47	[+ 3]	—	—	e 23 11	PP	e 77·9

Additional readings :—
Calcutta iSSE =6m.57s.
Hyderabad SSN =8m.1s.
Grozny iSSS =12m.3s.
Helwan P_cP =9m.48s.
Bucharest eE =12m.27s.
Helsinki e =8m.12s., 8m.25s., and 8m.56s., ePPP=10m.15s., e =10m.29s. and 15m.33s., eS_cS =18m.12s.
Warsaw eE =8m.15s., ePPE =10m.9s., PPZ =10m.12s., PPPZ =10m.52s., ePPPE = 10m.57s., eP_cSE =13m.32s., P_cSZ =13m.37s., eZ =14m.24s., eSN =15m.14s., SE =15m.20s., S_cSZ =18m.4s', eS_cSN =18m.19s., SSE =18m.39s., SSNZ =18m.49s., eN =19m.52s., SSSE =20m.11s., SSSZ =20m.39s.
Belgrade ePPP? =12m.40s.
Budapest PN =8m.33s., eN =17m.56s., eE =20m.51s.?, and 25m.57s.
Upsala eSE =15m.21s., eSSE =18m.20s.
Kalossa eE =8m.9s., eN =11m.59s.
Mizusawa ePN =8m.49s., eSE =11m.57s., S?N =12m.4s.
Prague ePPP =11m.19s., e =12m.57s., eSSS =20m.9s.
Potsdam iPPPN =11m.57s., iE =14m.51s., iSSE =19m.50s., iSSN =19m.58s.
Cheb eSS =19m.53s.
Jena eZ =9m.6s., eE =9m.11s., ePP?Z =10m.59s., eN =17m.23s.
Rome eS =16m.47s., eSS =20m.13s.
Stuttgart eZ =9m.21s., 9m.25s., and 9m.44s., eP_cP?Z =10m.1s., eSS =20m.33s.
Strasbourg eS_cS =19m.9s., e =21m.30s.
Paris iP =9m.51s.?, i =9m.57s., iP_cP? =10m.55s., e =11m.30s., eQ =26m.51s.
Kew eS_cS?N =19m.43s.,? eSS?EN =22m.12s.?, eSSS?EN =23m.51s., eQEN =24m.51s.
Alicante PP =13m.21s., PS =20m.1s., PPS =20m.17s., SS =24m.3s., Q =28m.45s.
Almeria PPP =14m.46s., P_cS =15m.7s., S_cS =20m.51s., SS =23m.55s., SSS =26m.51s.
Malaga PPZ =13m.37s.
Riverview eSKSN =24m.10s., eSSN =31m.9s., eE =31m.26s., eQ?E =38m.39s.
Berkeley eSN =27m.44s., eN =32m.33s., eE =32m.50s., eN =37m.3s.
Bermuda eS =26m.21s.
Tinemaha eZ =18m.34s. and 30m.4s.
Long waves were also recorded at Ivigtut, Arapuni, Wellington, and other American and European Stations.

Feb. 13d. Readings also at 0h. (Stuttgart, Lick, Fresno, Boulder City, Hungry Horse, Pierce Ferry (2), Shasta Dam, Tucson, Palomar, Pasadena, Riverside, and Tinemaha), 1h. (near Obi-garm and Stalinabad), 3h. (Hungry Horse), 5h. (Hungry Horse), 6h. (Shasta Dam (2), Pierce Ferry, Hungry Horse (4), Tinemaha, and near Obi-garm), 8h. (Hungry Horse, Ashkabad, Bucharest, Belgrade, Stuttgart, Kew, Ksara, Helwan, and Istanbul), 9h. (Basle and near Zürich), 10h. (Hungry Horse), 11h. (Andijan, Tchimkent, near Obi-garm, Murgab, and Stalinabad), 12h. (Hungry Horse), 13h. (Ksara), 15h. (Hungry Horse (2), Pierce Ferry, Tucson, Tinemaha, Stuttgart and near Stalinabad), 17h. (Toledo, Bogota, Huancayo, La Paz, Pierce Ferry, Shasta Dam, near Mineral, and near Obi-garm), 20h. (near Branner), 21h. (Hungry Horse and near Ottawa), 22h. (Stuttgart, Hungry Horse (3), Mineral, Shasta Dam, and near Manzanillo), 23h. (Erevan, near Grozny, Leninakan, and Piatigorsk).

Feb. 14d. 0h. 42m. 3s. Epicentre 22°·9S. 171°·7E. (as on 1938, July 12d.).

$A = -\cdot9125$, $B = +\cdot1331$, $C = -\cdot3869$; $\delta = +6$; $h = +4$;
$D = +\cdot144$, $E = +\cdot990$; $G = +\cdot383$, $H = -\cdot056$, $K = -\cdot922$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Auckland		14·2	170	4 21	+57	7 32	L	—	—	(7·5)
Arapuni		15·5	168	—	—	7 57	L	8 51	PcP	(8·0)
Tuai		16·5	165	3 58	+ 4	7 9	+11	—	—	—
Brisbane		17·5	250	i 4 6	− 1	i 7 17	− 4	i 4 25	PP	—
Wellington	z.	18·5	173	4 19	0	7 56	+12	4 42	PP	9·5
Riverview		21·1	234	i 4 53a	+ 5	i 8 47	+ 8	i 5 19	PP	e 10·2
Antarctica		79·6	160	e 13 27	+77	23 13	PPS	—	—	e 29·0
Branner	z.	86·4	47	i 13 43	+58	—	—	—	—	—
Berkeley		86·6	47	e 13 27	+41	i 20 15	?	e 41 45	Q	e 42·5
Pasadena	z.	87·5	52	i 12 47	− 4	—	—	—	—	e 41·0
Fresno	z.	87·7	47	i 12 50	− 2	—	—	—	—	—
Palomar	z.	88·0	53	i 12 51	− 2	—	—	—	—	—
Riverside	z.	88·0	52	i 12 50	− 3	—	—	—	—	—
Shasta Dam		88·0	44	e 12 49	− 4	—	—	—	—	—
Mineral	z.	88·3	45	i 12 52	− 3	—	—	—	—	—
Haiwee	z.	88·6	49	i 12 55	− 1	—	—	—	—	—
Tinemaha	z.	88·9	49	i 12 54	− 4	—	—	—	—	—
Boulder City		90·8	51	e 13 3	− 3	—	—	—	—	—
Pierce Ferry		91·4	52	i 13 6	− 3	—	—	—	—	—
Tucson		92·1	56	i 13 11	− 1	—	—	—	—	—
Ksara		139·9	295	e 22 32	PP	e 26 10	[−29]	—	—	—
Helwan		144·0	289	e 18 7	?	—	—	e 19 25	PKP	—
Stuttgart	z.	150·7	335	e 19 47	[− 1]	—	—	—	—	—
Zürich		152·1	335	e 19 49	[− 2]	—	—	—	—	—
Basle		152·3	336	e 20 16	[+25]	—	—	—	—	—

Additional readings :—
Auckland S_cS? = 10m.42s.
Brisbane iN = 4m.43s., eN = 5m.1s., iSSEN = 7m.32s.
Wellington P_cP = 8m.46s.
Riverview iZ = 5m.50s., iE = 5m.54s., iZ = 9m.0s.
Pasadena eZ = 13m.1s.
Tucson e = 13m.21s.
Stuttgart eZ = 19m.52s.
Long waves were also recorded at College and other European stations.

Feb. 14d. 10h. 52m. 39s. Epicentre 28°·0S. 63°·5W. Depth of focus 0·070. (as on 1942, Nov. 30d.).

$A = +\cdot3946$, $B = -\cdot7914$, $C = -\cdot4670$; $\delta = +11$; $h = +2$;
$D = -\cdot895$, $E = -\cdot446$; $G = -\cdot208$, $H = +\cdot418$, $K = -884$.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Montezuma	7·2	317	e 1 55	+ 6	e 3 15	0	—	—	e 3·4
La Plata	8·4	147	i 2 35	+34	i 4 24	+46	—	—	4·8
La Paz	12·2	338	i 2 41	− 1	i 4 36	−16	—	—	—
Huancayo	19·4	324	e 3 56	+ 1	e 7 5	+ 1	e 5 10	pP	—
Bogota	34·0	342	i 5 57	− 7	i 12 32	sS	i 6 18	PP	—

Continued on next page,

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Antarctica		40·3	183	e 4 12	?	i 14 0	?	e 17 18	?	—
Tacubaya	E.	58·4	321	9 11	0	e 16 20	−16	i 10 27	pP	—
Bermuda		60·1	359	—	—	e 16 39	−18	e 20 8	sS	e 24·4
Fordham		69·1	353	i 10 14	− 5	—	—	—	—	—
St. Louis		70·8	339	i 10 24	− 5	i 18 40	−25	—	—	—
Tucson		74·9	320	i 10 41a	−11	e 19 36	−14	e 12 57	pP	—
Temiskaming		75·6	350	i 10 53	− 3	—	—	—	—	—
Kirkland Lake		77·2	349	e 11 2	− 3	—	—	—	—	—
La Jolla	Z.	79·2	316	i 11 15	− 1	—	—	—	—	—
Palomar	Z.	79·2	318	i 11 16a	0	—	—	i 13 22	pP	—
Pierce Ferry		79·6	321	i 10 49	−29	e 20 27	−13	i 13 32	pP	—
Boulder City		79·9	320	e 11 49	+30	—	—	—	—	—
Riverside		80·0	317	i 11 20a	0	—	—	i 13 27	pP	—
Mount Wilson		80·6	317	i 11 22	− 1	—	—	—	—	—
Pasadena		80·6	317	i 11 23a	0	i 20 36	−14	i 13 30	pP	—
Haiwee		81·8	319	i 11 30	+ 1	e 20 49	−13	—	—	—
Santa Barbara		81·8	316	i 11 29a	0	—	—	—	—	—
Tinemaha		82·7	319	i 11 34a	0	—	—	i 13 42	pP	—
Fresno	Z.	83·3	318	i 11 36	− 1	—	—	—	—	—
Lick	Z.	84·8	317	i 11 45	+ 1	—	—	—	—	—
Branner	Z.	85·2	317	i 11 46	0	—	—	—	—	—
Berkeley	Z.	85·6	317	i 11 48	0	—	—	—	—	—
Mineral	Z.	86·8	320	i 11 53	− 1	—	—	—	—	—
Toledo		87·3	42	e 11 56	0	—	—	e 13 57	pP	—
Shasta Dam		87·5	320	i 11 55	− 2	e 21 41	−15	e 14 7	pP	—
Hungry Horse		88·4	329	i 12 0	− 1	—	—	e 40 21	SKP,P′	—
Rome		98·7	47	—	—	i 22 30	[−10]	—	—	—
Stuttgart	Z.	100·1	41	e 15 3	pP	—	—	—	—	—
Triest		101·3	45	e 17 34	PP	i 22 41	?	—	—	—
Ksara		112·3	63	e 18 36	PP	28 24	PS	—	—	—

Additional readings :—
La Plata SEZ = 4m.27s., SZ = 4m.31s.
La Paz ipP = 2m.47s., iN = 3m.1s., iS_s = 5m.41s.
Huancayo e = 4m.19s. and 5m.54s., csP? = 6m.38s., e = 7m.39s., iS_cP = 10m.39s., iS_cS = 14m.21s.
Bogota ipPEZ = 6m.13s., iS_cPEZ = 10m.26s., iEZ = 10m.36s., eS_cSEZ = 16m.14s.
Tacubaya iE = 9m.28s., $eP_cS?E$ = 13m.54s., ePPSE = 14m.17s.
Bermuda iS = 16m.42s.
St. Louis eS = 18m.34s., eSP = 19m.24s., e = 20m.22s., e = 22m.14s., esPS = 23m.24s.
Tucson i = 10m.51s., e = 11m.16s., ipP = 13m.6s., esP = 13m.50s.
Palomar eZ = 53m,31s.
Riverside iZ = 14m.48s.
Pasadena ePKP,PKPZ = 40m.50s., eZ = 53m.31s.
Tinemaha isPZ = 15m.6s., ePKP,PKPZ = 40m.38s., eZ = 53m.34s.
Lick iZ = 12m.4s.
Mineral iZ = 12m.3s.

Feb. 14d. 11h. 54m. 22s. Epicentre 18°·3N. 145°·2E. (as on Feb. 6d.).

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Irkutsk		46·7	327	e 8 25	− 7	e 15 1	−21	—	—
Frunse		63·7	310	e 10 35	− 1	—	—	—	—
Murgab		64·4	305	i 10 42	+ 2	—	—	—	—
Andijan		65·4	308	e 10 45	− 2	e 19 22	− 8	—	—
Tchimkent		67·4	310	10 57	− 2	i 19 41	−14	—	—
Obi-garm		67·6	306	e 11 4	+ 3	—	—	—	—
Kulyab		67·7	305	i 11 0?	− 1	i 19 52?	− 6	—	—
Tashkent		67·7	309	i 11 0	− 1	—	—	—	—
Stalinabad		68·4	306	i 11 5	− 1	e 19 56	−11	—	—
Sverdlovsk		71·9	326	i 11 22	− 5	e 20 29	−19	—	—
Ashkabad		76·6	306	e 11 58	+ 4	—	—	—	—
Shasta Dam		80·1	51	e 12 12	− 1	—	—	—	—
Mineral	Z.	80·8	51	e 12 13	− 4	—	—	—	—
Berkeley		80·9	54	—	—	—	—	e 35 26	Q
Branner		81·1	54	i 12 20	+ 2	—	—	—	—

Continued on next page

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Lick	z.	81·6	54	i 12 23	+ 2	—	—	—	—	
Fresno	z.	83·1	55	i 12 31	+ 2	—	—	—	—	
Hungry Horse		83·4	41	e 12 28	− 2	—	—	—	—	
Santa Barbara	z.	83·9	56	e 12 35	+ 2	—	—	—	—	
Tinemaha	z.	84·2	53	e 12 35	+ 1	—	—	—	—	
Grozny		84·3	314	e 12 39?	+ 4	—	—	—	—	
Halwee	z.	84·7	54	e 12 38	+ 1	—	—	—	—	
Pasadena	z.	85·2	56	e 12 42	+ 3	—	—	—	—	
Riverside	z.	85·9	56	e 12 44	+ 1	—	—	—	—	
Palomar	z.	86·5	56	e 12 44	− 2	—	—	—	—	
Boulder City		87·2	53	e 12 52	+ 3	—	—	—	—	
Pierce Ferry		87·8	53	e 17 55	PPP	—	—	—	—	
Tucson		91·6	55	i 13 13	+ 3	—	—	—	—	
Ksara		95·1	307	e 20 29	?	e 31 1	SS	—	—	
Stuttgart	z.	102·6	331	e 13 58	− 2	—	—	—	—	

Additional readings :—
Mineral iPZ = 12m.17s.
Branner eE = 12m.32s.
Fresno eE = 12m.35s.
Tinemaha iZ = 12m.41s. and 13m.0s.
Pasadena iZ = 13m.7s.
Riverside eZ = 12m.50s.
Tucson i = 13m.32s., and 13m.50s.
Long waves were recorded at other European stations.

Feb. 14d. 13h. Region of Solomon Islands ?

Brisbane iPN = 27m.2s., iSEN = 31m.17s., iSSE = 31m.45s.
Wellington e = 28m. and 31m.30s., L? = 35m.
Auckland e = 28m.25s., S? = 32m.?
Riverview eSE? = 32m.41s., eLE = 35·8m.
Arapuni e = 33m.
Branner ePZ = 33m.41s.
Lick iPZ = 33m.44s.
Santa Barbara ePZ = 33m.44s.
Fresno eP = 33m.49s.
Shasta Dam eP = 33m.49s.
Mineral ePZ = 33m.50s.
Pasadena ePZ = 33m.50s.k, eLZ = 57m.
Halwee ePZ = 33m.52s.
Palomar iPZ = 33m.53s.k.
Riverside ePZ = 33m.53s.k.
Tinemaha ePZ = 33m.56s.k.
Pierce Ferry e = 34m.11s.
Tucson eP = 34m.17s., e = 34m.32s.
Hungry Horse eP = 34m.31s.
Toledo e = 41m.53s.
Long waves were recorded at Berkeley, Strasbourg, and Kew.

Feb. 14d. 22h. 0m. 34s. Epicentre 8°·3S. 77°·8W. (as on 1946, Nov. 20d.).

Intensity VI-VII at Quiches ; VI at Sihuas and Parcoy ; V at Mollepata, Conchucos and Pomabamba. Felt less strongly at Cabana, Piscobamba, and Huari.
Epicentre 8°·5S. 77°·2W. (Strasbourg). Macroseismic area 130,000 sq.km.

E. Silgado.
" Datos sismologicos del Peru, 1948." Instituto Geologico del Peru, Bol. 13, Lima, 1949, p.p. 10-23, with map of epicentral region, p. 8.

A = +·2091, B = −·9673, C = −·1434 ; δ = −4 ; h = +7 ;
D = −·977, E = −·211 ; G = −·030, H = +·140, K = −·990.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Huancayo	4·4	147	i 1 11	+ 1	i 2 10	+ 8	—	—	i 2·5
La Paz	12·5	132	i 2 56k	− 6	i 5 50	+27	i 6 30	SSS	7·5
Bogota	13·4	17	i 3 14	0	i 5 55	+10	e 14 30	S_cP	—
Balboa Heights	17·3	354	e 4 4	0	—	—	—	—	—
Fort de France	28·2	37	e 5 52	− 4	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
San Juan		28·9	23	e 6 2	− 1	e 10 49	− 4	e 6 37	PP	e 11·5
La Plata	E.	32·1	147	6 29k	− 2	11 32	−11	9 16	PcP	16·9
	N.	32·1	147	e 6 27a	− 4	13 41	SS	7 26	PP	17·0
Tacubaya	E.	34·7	323	i 7 7	+13	e 17 23	ScS	—	—	e 14·8
Bermuda		42·3	17	e 8 9	+12	e 14 14	− 5	e 9 51	PP	e 17·4
Columbia		42·8	356	—	—	e 14 19	− 7	—	—	e 18·9
Philadelphia		48·1	3	—	—	e 15 40	− 2	—	—	e 25·0
St. Louis		48·1	347	i 8 39	− 4	i 15 34	− 8	—	—	—
Fordham		49·0	5	e 8 51	+ 1	e 16 4	+ 9	—	—	—
Cleveland		49·7	356	e 8 52	− 4	e 16 10	+ 6	—	—	e 23·9
Tucson		51·2	323	e 9 6	− 1	e 16 31	+ 6	e 11 42	PP	e 21·9
Lincoln	E.	51·9	342	—	—	e 16 36	+ 1	e 20 49	SS	e 22·4
Ottawa		53·5	2	e 9 21	− 3	—	—	—	—	22·9
Temiskaming		54·7	359	e 9 31	− 2	—	—	e 22 27	SSS	—
La Jolla		55·6	320	i 9 44	+ 4	—	—	—	—	—
Palomar	Z.	55·6	320	i 9 41	+ 1	—	—	—	—	—
Pierce Ferry		55·8	324	i 9 42	+ 1	—	—	—	—	—
Boulder City		56·1	324	e 9 46	+ 3	—	—	—	—	—
Kirkland Lake		56·2	358	e 9 4	−40	e 21 25	SS	—	—	—
Riverside	Z.	56·4	320	i 9 46	+ 1	—	—	—	—	—
Mount Wilson	N.	56·9	320	e 9 56	+ 7	—	—	—	—	—
Pasadena		57·0	320	i 9 51	+ 1	i 17 50	+ 7	—	—	—
Haiwee	Z.	58·1	322	i 9 59	+ 1	—	—	—	—	—
Santa Barbara	Z.	58·1	319	e 9 58	0	—	—	—	—	—
Logan		58·8	331	e 9 57	− 5	—	—	—	—	—
Tinemaha		58·9	323	i 10 6	+ 3	—	—	—	—	—
Fresno	Z.	59·6	322	e 10 7	− 1	—	—	—	—	—
Antartica		60·3	175	e 11 14	+61	i 19 28	+62	—	—	e 25·8
Branner	Z.	61·5	321	i 9 53	−28	—	—	—	—	—
Berkeley		61·9	321	i 10 24	0	—	—	i 13 24	PP	—
Shasta Dam		63·7	324	i 10 14	−22	—	—	—	—	—
Hungry Horse		64·8	334	i 11 15	+32	—	—	—	—	—
Lisbon		78·9	48	12 6a	− 1	—	—	—	—	—
Malaga	Z.	81·8	51	i 12 16a	− 6	22 52	+17	38 30	P'P'	48·4
Granada		82·6	51	i 12 26a	0	i 22 46	+ 3	i 15 46	PP	i 39·2
Toledo		83·0	49	i 12 27	− 1	—	—	—	—	—
Almeria		83·4	51	i 12 28	− 2	22 49	− 2	15 44	PP	47·4
Alicante		85·3	50	12 39	− 1	23 7	− 3	16 7	PP	e 40·1
Kew		88·8	38	e 12 46	−11	e 23 41	− 3	e 29 24	SS	e 39·4
Clermont-Ferrand		89·6	44	i 13 2	+ 1	—	—	—	—	—
Paris		89·8	41	e 13 0	− 2	e 23 47	− 6	e 16 34	PP	e 46·4
Uccle		91·4	39	—	—	e 24 9	+ 2	e 29 5	SS	e 46·4
De Bilt		92·1	37	—	—	e 30 26?	SS	—	—	e 39·4
Basle		93·0	42	e 13 14	− 3	—	—	—	—	—
Strasbourg		93·2	41	e 13 16	− 1	—	—	e 30 26	SS	—
Stuttgart		94·2	41	e 13 20	− 2	—	—	—	—	—
Rome		95·7	48	e 13 24k	− 5	e 23 39	?	e 17 16	PP	e 42·8
Cheb		96·4	40	—	—	e 23 45	[−24]	e 24 25	SKKS	e 49·4
Prague		98·4	40	—	—	e 32 2	SS	—	—	e 49·4
Helwan		110·7	62	e 21 32	PPP	e 28 28	PS	e 30 3	PPS	—
Ksara		114·2	57	e 14 21	P	e 24 51	[−38]	—	—	—
Riverview		117·5	225	—	—	e 36 21	SS	—	—	e 56·9
Bombay		149·6	67	e 19 47	[0]	e 31 26	?	—	—	—

Additional readings :—
La Paz iEZ =6m.50s.
Bogota e =13m.27s.
La Plata N =10m.55s. and 12m.16s., SSE =13m.38s., SSSN =14m.8s., QE =15m.14s.
QN =16m.2s.
Bermuda eS? =14m.1s.
Cleveland iZ =9m.4s., eN =18m.29s., eE =18m.44s.
Lincoln eScS =18m.54s.
Fresno eSE =10m.14s., iZ =10m.17s.
Branner eE =9m.57s., eN =10m.22s.
Berkeley eN =14m.32s. and 16m.32s., eLE =16m.44s.
Malaga iPPZ =13m.32s., iPPPZ =15m.24s., PPSZ =24m.6s., QZ =41m.26s.
Granada PcP =12m.30s.k, PPP =17m.37s., iSS =28m.17s.
Almeria PPP =17m.40s., ScS =23m.4s., PPS =24m.16s., SS =28m.26s., SSS =31m.56s.

Continued on next page.

Alicante PS =24m.7s., PPS =24m.31s., Q =35·4m.
Kew eSSS?N =33m.43s., eQ?EN =36m.56s.
Paris eSS =30m.26s., ePKP,PKS =41m.31s.
Rome ePS =25m.5s., eSS =30m.36s.
Cheb eSS =31m.44s., eSSS =35m.28s., e =38m.32s.
Prague e =37m.50s., 45m.44s., and 47m.56s.
Long waves were also recorded at Sitka, Seven Falls, Bozeman, Chicago, Montezuma Kodaikanal, and other European Stations.

Feb. 14d. 22h. 2m. 11s. Epicentre 63°·4N. 147°·9W. (as on 1947 July 28d.).

$A = -·3813$, $B = -·2392$, $C = +·8929$; $\delta = -12$; $h = -10$;
$D = -·531$, $E = +·847$; $G = -·756$, $H = -·474$, $K = -·450$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
College		1·5	1	i 0 34	P_g	e 0 51	S_g	—	—	e 1·3
Sitka		8·5	128	i 2 18	+11	e 3 54	+ 9	—	—	i 4·1
Victoria		20·1	126	5 43	+65	8 29	+10	—	—	9·3
Hungry Horse		23·9	112	i 5 13	− 3	—	—	—	—	—
Saskatoon		24·4	98	—	—	e 10 7	+28	—	—	12·3
Butte	N.	26·3	113	—	—	e 10 17	+ 6	—	—	e 13·2
Bozeman		27·2	112	—	—	e 10 33	+ 8	—	—	e 14·0
Shasta Dam		27·3	133	e 5 25	−23	—	—	—	—	—
Mineral	Z.	27·9	133	i 5 54	0	—	—	i 9 21	P_cP	—
Branner	Z.	30·3	136	i 5 45	−30	—	—	—	—	—
Fresno	Z.	31·7	134	i 6 27	0	—	—	—	—	—
Tinemaha	Z.	31·9	131	e 6 30	+ 1	—	—	—	—	—
Haiwee	Z.	32·9	131	e 6 39	+ 1	—	—	—	—	—
Santa Barbara	Z.	33·8	135	e 6 47	+ 1	—	—	—	—	—
Boulder City		34·1	127	e 6 47	− 1	—	—	e 9 4	P_cP	—
Pierce Ferry		34·3	126	e 6 49	− 1	—	—	—	—	—
Mount Wilson		34·6	133	e 6 51	− 2	—	—	—	—	—
Pasadena	Z.	34·6	133	i 6 51	− 2	—	—	—	—	—
Riverside	Z.	35·0	133	i 6 55	− 1	—	—	—	—	—
Tucson		38·9	125	e 7 27	− 2	—	—	—	—	—
Chicago		40·6	93	e 8 28	+45	e 14 33	+39	—	—	—
St. Louis		41·9	98	i 7 49	− 5	e 14 12	− 1	—	—	—
Cleveland	N.	43·5	88	—	—	e 14 44	+ 8	—	—	—
Shawinigan Falls		43·5	75	e 8 1	− 6	—	—	—	—	21·8
Seven Falls		43·9	73	—	—	e 16 13	?	—	—	i 22·7
Philadelphia		47·6	83	—	—	i 15 9	−26	—	—	e 19·0
Columbia		49·9	93	—	—	e 15 58	− 9	—	—	e 21·8
Paris		65·7	22	e 10 51	+ 3	—	—	—	—	—
Strasbourg		66·7	17	e 10 54	− 1	—	—	—	—	e 38·8
Stuttgart	Z.	66·7	16	e 10 55	0	—	—	—	—	—
Lisbon	Z.	73·1	33	11 2	−32	—	—	—	—	—
Ksara		83·1	358	e 18 0	PPP	27 48	SS	—	—	—
Huancayo		93·0	111	e 15 38	?	—	—	—	—	—

Additional readings :—
Mineral eZ =18m.4s.
Branner eE =5m.50s., eN =6m.23s.
Fresno eE =6m.31s.
Paris eP =10m.54s.
Long waves were also recorded at Seattle, Logan, and Salt Lake City.

Feb. 14d. Readings also at 1h. (Palomar, Tucson, Boulder City, Pierce Ferry, Shasta Dam, Piatigorsk, near Erevan, Grozny, Leninakan, and near Andijan), 2h.(Pierce Ferry), 3h. (near Murgab) 5h. (Hungry Horse and Pierce Ferry), 6h. (Arapuni, Auckland, Wellington, Riverview, Tinemaha, Pasadena, Palomar, Riverside, Tucson, Boulder City, Pierce Ferry, Fresno, Mineral (2), Shasta Dam, and Hungry Horse), 7h. (Pavia, Lick, and Mineral), 8h. (Ashkabad, Baku, Erevan, near Grozny, and Leninakan), 9h. (Haiwee, Pasadena, Palomar, Riverside, Tinemaha Tucson, Pierce Ferry, and near Grozny), 10h. (Palomar, Tinemaha, Tucson, Pierce Ferry, and near Mineral), 11h. (Pierce Ferry, near Andijan, and near Mizusawa), 12h. (Belgrade, Stuttgart, and near Triest), 13h. (Pasadena, Palomar, Riverside, Tinemaha, Tucson, Pierce Ferry, Shasta Dam, Clermont-Ferrand, Strasbourg, and near Stuttgart), 14h. (Arapuni, Wellington, Brisbane, Riverview, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Shasta Dam (2), Hungry Horse, Ksara, and near Irkutsk), 15h. (Bozeman, Almata, Frunse, near Andijan, Kulyab, Murgab, Obi-garm, Stalinabad, and Tchimkent), 16h. (Brisbane and Tinemaha), 17h. (near Mizusawa), 22h. (Huancayo), 23h. (Hungry Horse).

Feb. 15d. 0h. 29m. 53s. Epicentre 8°·3S. 77°·8W. (as on 14d.).

$A = +·2091$, $B = -·9673$, $C = -·1434$; $\delta = -4$; $h = +7$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Huancayo		4·4	147	i 1 10	0	i 2 2	0	—	—	i 2·3
La Paz		12·5	132	i 2 56	− 6	i 5 47	SSS	i 6 31	Q	7·4
Bogota		13·4	17	i 3 12	− 2	i 5 56	+11	i 6 27	SSS	—
Balboa Heights		17·3	354	e 4 2	− 2	—	—	—	—	—
San Juan		28·9	23	—	—	e 11 16	+23	—	—	—
Tacubaya	E.	34·7	323	i 7 2	+ 8	—	—	i 8 10	PP	e 17·6
Tucson		51·2	323	i 9 7	0	—	—	i 9 11a	P	—
Palomar	Z.	55·6	320	i 9 44	+ 4	—	—	—	—	—
Pierce Ferry		55·8	324	i 9 40	− 1	—	—	—	—	—
Boulder City		56·1	324	e 9 39	− 4	—	—	—	—	—
Kirkland Lake		56·2	356	e 9 43	− 1	—	—	—	—	—
Riverside	Z.	56·4	320	e 9 44	− 1	—	—	i 9 49	PP	—
Mount Wilson	N.	56·9	320	e 9 50	+ 1	—	—	—	—	—
Pasadena	Z.	57·0	320	e 9 51	+ 1	—	—	i 9 57	P	—
Haiwee	Z.	58·1	322	e 10 1	+ 3	—	—	—	—	—
Santa Barbara	Z.	58·1	319	e 10 5	+ 7	—	—	—	—	—
Tinemaha	Z.	58·9	323	i 10 6a	+ 3	—	—	i 10 13	P	—
Fresno	Z.	59·6	322	e 10 10	+ 2	—	—	i 10 56	PcP	—
Branner		61·5	321	e 10 21	0	—	—	e 10 29	P	—
Mineral	Z.	62·6	323	e 10 33	+ 5	—	—	—	—	—
Shasta Dam		63·7	324	e 10 36	0	—	—	—	—	—
Hungry Horse		64·8	334	e 10 41	− 2	—	—	—	—	—
Malaga	Z.	81·8	51	12 28a	+ 6	—	—	—	—	59·1
Granada		82·6	51	i 12 30a	+ 4	—	—	12 43	PcP	45·9
Toledo		83·0	49	e 12 26	− 2	—	—	i 12 30?	PcP	—
Paris		89·8	41	e 13 0	− 2	—	—	—	—	—

Additional readings :—
San Juan i = 11m.50s., e = 16m.35s.
Pasadena eZ = 11m.39s.
Malaga Z = 13m.14s., iPPZ = 16m.30s., PPPZ = 20m.48s.
Long waves were also recorded at Bermuda and La Plata.

Feb. 15d. 4h. Alaska

College eP? = 2m.0s., eS = 3m.0s., eL = 3m.22s.
Hungry Horse iP = 5m.17s., i = 6m.6s.
Shasta Dam iP = 5m.32s.
Mineral iPZ = 5m.37s., ipPZ = 5m.40s.
Fresno iPZ = 6m.11s.
Tinemaha iPZ = 6m.16s.k, eZ = 9m.11s. and 12m.52s.
Haiwee iPZ = 6m.23s., iZ = 6m.32s.
Santa Barbara ePZ = 6m.29s.
Boulder City eP = 6m.36s., e = 9m.20s.
Pasadena iPZ = 6m.36s., iZ = 6m.44s.
Mount Wilson ePN = 6m.37s.
Pierce Ferry iP = 6m.39s.
Palomar iPZ = 6m.47s.k, iZ = 6m.57s., eZ = 13m.0s.
La Jolla iPZ = 6m.49s.
Riverside iPZ = 6m.49s.k, iZ = 6m.58s.
Tucson iP = 7m.19s.k, e = 8m.4s. and 9m.5s., i = 13m.19s.
St. Louis eP = 7m.59s., eS = 14m.7s.
Sverdlovsk P = 10m.21s., S = 18m.35s.
Paris eP = 11m.17s.
Stuttgart eZ = 11m.24s.
Berkeley eN = 12m.24s., eEZ = 13m.18s.
Long waves were also recorded at Sitka.

Feb. 15d. 15h. 1m. 56s. Epicentre 18°·7N. 145°·4E. Depth of focus 0·030.
(as on 1943, April 9d.).

$A = -·7802$, $B = +·5382$, $C = +·3187$; $\delta = -6$; $h = +5$;
$D = +·568$, $E = +·823$; $G = -·262$, $H = +·181$, $K = -·948$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Misima		17·3	343	i 3 48	− 1	6 56	+ 3	—	—
Hunatu		17·7	344	i 3 53	0	7 5	+ 4	—	—
Nagoya		18·0	341	3 57	0	—	—	—	—
Kakioka		18·1	349	3 57	− 1	7 12	+ 3	—	—
Sumoto		18·2	335	3 59	0	7 13	+ 2	—	—
Hikone		18·4	339	i 4 1	0	7 20	+ 6	—	—
Nagano		19·0	342	i 3 33	−34	6 58	−28	—	—
Toyama		19·3	342	4 8	− 2	7 37	+ 6	—	—
Sendai		19·9	351	4 16	0	7 49	+ 7	—	—
Hamada		20·0	326	4 16	− 1	7 49	+ 5	—	—
Mizusawa		20·7	351	4 25	+ 1	8 11	+14	—	—
Vladivostok		26·9	338	i 5 20	− 2	e 9 41	0	i 5 59	pP
Irkutsk		46·3	327	8 4	− 1	14 35	+ 1	15 51	sS
Calcutta	E.	53·3	285	e 8 58	0	i 16 15	+ 5	—	—
Almata		61·8	311	e 9 58	+ 1	i 18 5	+ 4	—	—
Frunse		63·6	309	e 10 10	+ 1	—	—	—	—
Murgab		64·3	305	10 15	+ 1	—	—	—	—
Andijan		65·3	308	10 19	− 1	e 18 48?	+ 4	—	—
Tchimkent		67·3	310	e 10 36?	+ 4	e 19 18?	+10	—	—
Kulyab		67·6	305	e 10 32	− 2	—	—	e 11 16	pP
Obi-garm		67·6	306	e 10 33	− 1	—	—	—	—
Tashkent		67·6	308	—	—	e 19 14	+ 2	e 20 43	sS
Stalinabad		68·3	305	i 10 37	− 2	i 19 19	− 1	i 11 24	pP
Samarkand		69·5	305	e 10 49?	+ 3	e 19 32?	− 2	—	—
Sverdlovsk		71·7	325	i 10 58	− 1	19 56	− 4	i 11 45	pP
Ashkabad		76·5	306	e 11 28	+ 1	—	—	—	—
Shasta Dam		79·7	51	i 11 44	0	—	—	e 12 39	pP
Mineral	Z.	80·4	51	i 11 47	− 1	—	—	—	—
Berkeley	N.	80·5	53	e 11 48	0	—	—	—	—
Branner	Z.	80·7	53	i 11 50	+ 1	—	—	—	—
Hungry Horse		83·0	41	i 12 1	0	—	—	—	—
Santa Barbara		83·5	56	i 12 5a	+ 1	—	—	i 12 56	pP
Tinemaha		83·8	53	i 12 6a	+ 1	—	—	i 12 58	pP
Grozny		84·2	314	e 12 10?	+ 3	e 22 6?	− 6	—	—
Haiwee		84·3	54	i 12 7	− 1	—	—	i 13 0	pP
Moscow		84·4	327	i 12 6	− 2	i 22 6	− 8	i 12 56	pP
Pasadena		84·8	56	i 12 10a	0	—	—	i 13 2	pP
Mount Wilson		84·9	56	e 12 11	0	—	—	—	—
Riverside		85·5	56	i 12 13a	− 1	—	—	i 13 4	pP
La Jolla		86·0	57	i 12 15	− 1	—	—	e 13 7	pP
Palomar		86·1	56	i 12 16a	− 1	—	—	i 13 8	pP
Boulder City		86·8	53	i 12 20	0	—	—	—	—
Logan	E.	86·9	47	i 12 16	− 5	e 27 56	SS	e 12 36	?
Pierce Ferry		87·4	53	e 12 23	0	—	—	i 13 5	pP
Tucson		91·3	55	i 12 42a	+ 1	—	—	i 13 31	pP
Stuttgart	Z.	102·3	332	e 14 19?	pP	—	—	—	—
Huancayo		140·2	96	e 18 58	[− 4]	—	—	e 22 5	PP
La Paz	Z.	148·0	90	i 19 20	[+ 4]	—	—	—	—

Additional readings :—
Mizusawa ePN = 4m.29s., SE = 8m.14s.
Vladivostok isS = 10m.51s.
Irkutsk sSS = 19m.29s.
Tinemaha iZ = 13m.23s.
Riverside e = 13m.22s.
Long waves were recorded at Toledo, Almeria, Istanbul, and De Bilt.

Feb. 15d. 17h. 54m. 55s. Epicentre 35°·5N. 27°·2E. (as on 12d.).

A = +·7258, B = +·3730, C = +·5781 ; δ = +11 ; h = 0.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Helwan		6·6	147	e 1 35	− 6	e 2 47	−11	—	—	—
Ksara		7·4	101	i 1 44	− 8	3 4?	−14	—	—	—
Bucharest		8·9	355	e 2 16	+ 4	e 4 14	S*	e 2 41	P*	—
Messima		9·7	289	e 2 26	+ 4	e 4 1	−14	—	—	—
Catania		10·0	285	e 2 9	−18	—	—	e 2 57	P*	—
Yalta		10·4	28	i 2 30	− 4	—	—	—	—	—
Belgrade		10·6	333	e 2 38	+ 2	e 6 4	L	e 3 17	?	(e 6·1)
Simferopol	N.	10·8	27	e 2 39	0	—	—	—	—	—
Rome		13·1	304	e 3 13	+ 3	e 5 39	+ 1	—	—	6·4
Budapest		13·4	335	i 3 16	+ 2	—	—	—	—	e 8·1
Erevan		14·4	66	e 3 33	+ 6	—	—	—	—	—
Triest		14·4	319	e 3 20	− 7	e 6 2	− 7	i 6 21	SS	—
Piatigorsk		14·9	50	e 3 40	+ 6	e 6 34	+14	—	—	—
Raciborzu		16·0	338	e 3 50	+ 2	—	—	e 4 19	PPP	e 11·1
Grozny		16·3	56	e 4 1	+ 9	7 5	+12	—	—	—
Prague		17·3	333	e 4 5	+ 1	e 7 20	+ 4	i 4 41	PP	e 10·1
Warsaw		17·3	348	e 4 6a	+ 2	e 7 14	− 2	4 20	PP	e 10·1
Zürich		18·3	317	e 4 14k	− 3	e 7 38	− 1	—	—	—
Baku		18·5	68	e 4 20	+ 1	e 7 52	+ 8	—	—	—
Stuttgart		18·7	322	e 4 21k	− 1	e 7 47	− 1	—	—	e 9·6
Basle		18·9	317	e 4 23	− 1	e 8 24	SS	—	—	—
Neuchatel		19·0	316	e 4 23	− 3	—	—	—	—	—
Collmberg	Z.	19·1	331	e 4 26	− 1	—	—	—	—	—
Jena		19·1	330	e 4 23	− 4	e 8 7	+10	8 13	SS	—
Strasbourg		19·4	320	e 4 29	− 1	e 8 5	+ 1	—	—	e 9·6
Potsdam		19·6	334	i 4 33a	+ 1	e 8 11	+ 3	i 4 50	PP	e 10·1
Clermont-Ferrand		20·9	307	i 4 44	− 2	i 8 43	+ 8	—	—	12·1
Moscow		21·5	16	4 48	− 4	8 40	− 7	—	—	—
Alicante		22·3	287	5 7	+ 6	i 9 9	+ 7	5 35	PP	11·0
Paris		22·5	314	i 5 0	− 2	e 9 3	− 2	i 5 23	PP	e 13·6
Uccle		22·5	321	e 5 5	+ 3	e 9 10	+ 5	—	—	e 11·4
Copenhagen		22·6	338	5 1	− 2	9 7	0	9 31	SS	—
Almeria		23·9	283	i 5 15	− 1	9 37	+ 7	5 53	PP	15·1
Helsinki		24·7	358	i 5 23	− 1	e 9 43	− 1	i 5 32	pP	e 12·1
Granada		24·8	284	i 5 28a	+ 3	i 9 55	+ 9	i 5 37	pP	12·8
Ashkabad		25·0	75	e 5 25	− 2	i 9 47	− 2	—	—	—
Toledo		25·0	290	i 5 26	− 1	—	—	—	—	—
Upsala		25·2	349	e 5 20	− 9	9 54	+ 2	e 10 18	SS	e 14·1
Kew		25·3	319	e 5 26	− 4	e 10 6?	+12	e 6 10	PP	e 13·1
Malaga	Z.	25·5	284	i 5 33a	+ 1	13 5?	S_cP	6 19	PP	—
Sverdlovsk		31·0	36	e 6 16	− 5	e 11 18	− 8	—	—	—
Stalinabad		33·1	71	e 6 37	− 3	e 11 54	− 5	—	—	—
Tashkent		33·2	67	e 6 41	+ 1	e 12 2	+ 2	—	—	—
Tchimkent		33·4	65	i 6 48?	+ 6	—	—	—	—	—
Obi-garm		33·8	71	e 6 45	− 1	e 12 6	− 4	—	—	—
Andijan		35·6	68	e 7 5	+ 4	e 12 39	+ 1	—	—	—
Almata		38·7	62	e 7 38	+11	—	—	—	—	—
Hungry Horse		89·6	335	i 12 58	− 3	—	—	—	—	—
Pierce Ferry		100·1	328	e 13 46	− 3	—	—	—	—	—

Additional readings :—
Raciborzu eE = 3m.58s.
Prague e = 5m.23s.
Warsaw eSEN = 7m.30s., SSN = 7m.42s.
Strasbourg e = 5m.16s. and 5m.25s.
Potsdam iPPZ = 4m.46s., iSSZ = 8m.31s.
Alicante PPP = 5m.41s., P_cP = 9m.3s., PS = 9m.51s.
Paris i = 6m.9s., e = 9m.26s., eSS = 9m.45s., Q = 11m.35s.
Almeria PPP = 6m.6s., P_cP = 8m.46s., SS = 10m.35s.
Helsinki i = 5m.42s.
Granada iPP = 6m.21s., pPP = 7m.2s., SS = 11m.52s.
Upsala eN = 11m.49s.
Kew ePPP?EZ = 6m.30s.?, eSS?E = 11m.38s.?, eS_cS?Z = 16m.1s.
Long waves were also recorded at Auckland and Wellington.

Feb. 15d. 21h. Undetermined shock. South Atlantic.

La Paz eP =14m.35s., iE =23m.18s., iN =24m.56s.
Alicante P =16m.24s., eS =22m.53s., eL =29m.54s.
Granada iP =16m.44s.a, pP =16m.55s., PP =18m.1s., S =23m.5s., L =25·5m.
Almeria eP? =16m.44s., i =19m.24s., L =26·5m.
Rome eP?Z =16m.49s., eS? =24m.26s.
Tucson eP =18m.24s., e =22m.57s.
Pierce Ferry eP =18m.41s., e =23m.14s.
Hungry Horse eP =18m.45s., e =23m.37s.
Palomar ePZ =18m.55s., eZ =23m.28s. and 24m.2s.
Riverside ePZ =18m.56s., eZ =23m.28s. and 24m.3s.
Tinemaha eZ =19m.13s., eZ =24m.1s.
Huancayo eS? =21m.18s.
Stuttgart eZ =21m.30s.

Feb. 15d. Readings also at 3h. (Palomar, Tinemaha, Boulder City, Pierce Ferry (2), Tucson, Almata, near Andijan, Frunse, Tchimkent, and Obi-garm), 4h. (La Paz and near Huancayo), 5h. (Mineral), 6h. (near Erevan and Leninakan), 8h. (near Fresno, Branner, and Lick), 9h. (Tchimkent and near Tashkent), 10h. (near Granada), 11h. (Pierce Ferry, Stalinabad, Obi-garm, near Andijan, Frunse, Tchimkent, and Tashkent), 15h. (near Alicante), 18h. (Pierce Ferry (2) and Riverview), 19h. (near Ottawa).

Feb. 16d. 0h. 42m. 12s. Epicentre 58°·0S. 147°·0E. (as on 1945, Sept. 8d.).

A = −·4466, B = +·2900, C = −·8464 ; δ = −6 ; h = −8 ;
D = +·545, E = +·839 ; G = +·710, H = −460, K = −·533.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Riverview		24·3	10	e 5 16	− 4	i 9 24	−13	i 10 31	SS	e 10·7
Wellington		24·3	58	5 26	+ 6	e 9 46	+ 9	i 5 30	PP	11·3
Brisbane		30·8	10	e 6 20	0	e 11 3	−20	e 7 17	PP	e 13·1
Perth		33·6	308	—	—	i 12 4	− 2	i 14 18	SSS	—
Kodaikanal	E.	88·1	293	—	—	e 23 42	+ 5	—	—	—
Hyderabad	N.	93·8	297	—	—	e 24 10	[+16]	—	—	—
Bombay	E.	97·8	293	—	—	e 30 48?	?	—	—	—
Rome	Z.	147·3	260	e 20 8k	[+25]	—	—	—	—	—
Kirkland Lake		150·6	89	e 20 18	[+30]	—	—	—	—	—
Granada		151·6	236	14 38k	?	27 44	?	44 26	SSP	79·0
Zürich		153·1	265	e 20 21	[+29]	—	—	—	—	—
Stuttgart	Z.	153·6	270	e 20 21	[+28]	—	—	—	—	—

Additional readings :—
Riverview eQ =10m.0s., iN =10m.3s.
Wellington PP =6m.32s., P_cP =9m.9s., S =9m.48s., S_cS? =16m.38s.
Brisbane eSSN =12m.18s.
Granada PKP_3 =15m.44s., iPP =20m.42s., SKSP =32m.26s., SSS =49m.52s., readings wrongly identified.
Long waves were also recorded at Auckland, Arapuni, Alicante, Almeria, Ksara, and Kew.

Feb. 16d. 7h. Undetermined shock.

Shasta Dam iP =24m.59s., epP =25m.37s.
Hungry Horse iP =25m.4s.
Lick iPZ =25m.19s.
Pasadena iPZ =25m.52s.a.
Riverside iPZ =25m.55s., eZ =26m.15s.
Boulder City iP =25m.59s.
Palomar iPZ =26m.2s.a, ipPZ =26m.38s., iZ =26m.55s.
Pierce Ferry iP =26m.2s.
La Jolla iPEN =26m.4s.
Tucson iP =26m.37s.a, ipP =27m.12s., i =27m.31s.
Tinemaha iPEZ =26m.38s.a.
Haiwee iPZ =26m.43s.

Feb. 16d. 17h. Undetermined Shock.

Huancayo eP = 39m.38s., e = 41m.10s. and 45m.58s., eL = 48m.4s.
Tucson eP = 42m.35s.
Palomar ePZ = 42m.44s.
Riverside iPZ = 42m.48s.
Pasadena iPZ = 42m.49s.
Boulder City eP = 43m.1s.
Pierce Ferry eP = 43m.1s.
Tinemaha iPZ = 43m.9s.
Lick iPZ = 43m.13s.
Shasta Dam eP = 43m.33s.
Hungry Horse eP = 44m.14s.
Long waves were recorded at De Bilt.

Feb. 16d. Readings also at 0h. (Palomar, Tinemaha (2), Riverside, Hungry Horse, Pierce Ferry (2), Shasta Dam (2), and Tucson (2)), 2h. (Toledo, near Almeria, Malaga, and Granada), 3h. (Stuttgart (2) and near Ashkabad), 5h. (Stuttgart, Palomar, Riverside, Tinemaha, Hungry Horse, Tucson, and near Shasta Dam), 10h. (Bogota), 13h. (near Lick), 16h. (Rome and La Paz), 18h. (near Mineral), 21h. (San Juan, Calcutta, Hyderabad, Stalinabad, Obi-garm, Kulyab, Murgab, Andijan, Ashkabad, and Frunse), 22h. (La Plata, La Paz, Hungry Horse, Boulder City, Pierce Ferry, Shasta Dam, Tucson, Mount Wilson, Pasadena, Riverside, Tinemaha, Granada, near Lick, and near Ottawa. Several shocks), 23h. (Rome).

Feb. 17d. 0h. Undetermined Shock.

Hungry Horse eP = 8m.30s.
Shasta Dam iP = 8m.36s.
Fresno ePZ = 9m.9s.
Tinemaha iPEZ = 9m.14s.a, iZ = 9m.27s.
Pasadena iPZ = 9m.27s., iZ = 9m.40s.
Mount Wilson iPZ = 9m.28s.a,
Riverside iPZ = 9m.31s.a, iZ = 9m.44s.
Boulder City eP = 9m.32s.
Pierce Ferry iP = 9m.35s., ipP = 9m.42s., eS = 15m.31s.
Palomar iPZ = 9m.38s.
Tucson iP = 10m.8s.a, ipP = 10m.20s.

Feb. 17d. 6h. 1m. 40s. Epicentre 40°·4N. 125°·1W. (as on 1947 September 23d.).

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

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ferndale		0·6	75	e 0 11	− 4	i 0 23	− 3	—	—	—
Shasta Dam		2·1	82	i 0 31	− 6	i 0 58	− 6	—	—	—
Mineral		2·7	91	i 0 40	− 5	i 1 14	− 5	—	—	—
Berkeley		3·4	138	e 0 57	+ 2	e 1 39	+ 2	—	—	—
Branner		3·8	141	i 1 1	0	e 1 48	+ 1	—	—	i 1·9
Lick		4·1	137	i 1 5	0	e 1 57	+ 2	i 1 13	P*	—
Fresno		5·5	129	i 1 27	+ 2	e 3 3	S_g	e 3 9	S_g	—
Tinemaha	z.	6·3	120	e 1 37	+ 1	i 3 6	S*	i 1 48	P*	—
Haiwee		7·0	125	i 1 50	+ 4	—	—	—	—	—
Santa Barbara	z.	7·3	143	e 1 59	+ 9	—	—	—	—	—
Mount Wilson	z.	8·4	134	i 2 5	− 1	—	—	i 2 19	P*	—
Pasadena		8·4	136	i 2 5	− 1	i 3 47	+ 4	i 2 11	P*	—
Riverside	z.	8·9	133	i 2 12	0	—	—	i 2 20	?	—
Palomar	z.	9·6	134	i 2 23	+ 2	—	—	—	—	—
Pierce Ferry		9·7	112	e 1 53	−29	—	—	—	—	—
Hungry Horse		11·2	41	e 2 30	−14	—	—	—	—	—
Tucson		14·1	121	e 3 11	−12	—	—	i 3 32	P	—

Additional readings :—
Berkeley iN = 2m.27s., iE = 3m.2s.
Long waves were also recorded at Ukiah and Santa Clara.

Feb. 17d. 9h. 48m. 55s. Epicentre 38°·4S. 176°·5E. Depth of focus 0·040.
(as on 1947 March 27d.).

Wellington suggests depth = 285kms.

A = −·7842, B = +·0480, C = −·6186; δ = −6; h = −1;
D = +·061, E = +·998; G = +·617, H = −·038, K = −·786.

	Δ	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Tuai	0·6	128	0 38	0	1 9	+ 2
Auckland	2·0	318	1 25?	S	(1 25?)	+ 3
Bunnythorpe	2·0	200	—	—	1 25	+ 3
New Plymouth	2·0	251	0 45	− 1	1 22	0
Wellington	3·2	205	0 58	+ 1	1 45	+ 3
Kaimata	5·6	221	1 23	− 2	2 28	− 3
Christchurch	5·9	309	1 29	+ 1	2 41	+ 3

Auckland also give S = 2m.0s.?

Feb. 17d. 22h. 11m. 2s. Epicentre 14°·0N. 40°·2E.

A = +·7414, B = +·6266, C = +·2404; δ = +9; h = +6;
D = +·646, E = −·764; G = +·184, H = +·155, K = −·971.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Helwan		17·8	333	i 4 6a	− 5	i 7 31	+ 3	—	—	e 9·1
Ksara		20·1	349	i 4 38k	0	i 8 27	+ 8	—	—	—
Erevan		26·4	8	5 44?	+ 4	—	—	—	—	—
Leninakan		26·9	6	e 5 41?	− 4	—	—	—	—	—
Baku		27·6	15	e 6 10	+19	e 11 3	+31	—	—	—
Ashkabad		28·8	31	e 6 4	+ 2	—	—	—	—	—
Grozny		29·6	8	e 6 9?	0	—	—	—	—	—
Piatigorsk		30·0	3	e 6 12?	0	—	—	e 7 36	PPP	—
Bombay		31·6	77	e 7 26	+60	e 12 16	+41	—	—	—
Samarkand		34·7	38	e 6 56	+ 2	—	—	—	—	—
Stalianbad		35·2	40	i 7 0	+ 2	i 12 22	− 9	—	—	—
Kulyab		35·4	43	i 7 3	+ 3	i 12 29	− 5	—	—	—
Obi-garm		35·8	41	i 7 7	+ 4	—	—	—	—	—
Kodaikanal	E.	36·6	91	e 7 9	− 1	—	—	—	—	—
Tashkent		37·3	38	i 7 15	− 1	—	—	—	—	—
Tchimkent		37·9	36	i 7 21	+ 1	—	—	—	—	—
Andijan		38·7	41	e 7 26	− 1	—	—	—	—	—
Warsaw		41·1	342	e 7 1	−46	—	—	e 7 47	P	—
Frunse		41·3	39	e 7 52	+ 3	—	—	—	—	—
Almata		42·9	40	e 8 10	+ 8	—	—	—	—	—
Stuttgart		43·1	331	e 8 0	− 4	—	—	e 9 41	PP	—
Potsdam	Z.	44·0	336	e 8 8	− 3	—	—	—	—	—
Clermont-Ferrand		44·5	323	e 8 16	+ 1	—	—	—	—	—
Sverdlovsk		45·5	15	i 8 21	− 2	15 6	+ 1	—	—	—
Malaga	Z.	45·7	309	i 8 25a	+ 1	—	—	i 10 15	PP	e 28·4
Calcutta	E.	46·3	72	e 8 26	− 3	e 19 0	?	—	—	—
Paris		46·5	327	e 8 27	− 4	—	—	—	—	—
Toledo		46·5	312	i 8 26	− 5	—	—	—	—	—
Irkutsk		63·2	38	i 10 34	+ 2	—	—	—	—	—
Vladivostok		81·8	48	e 12 20	− 2	—	—	—	—	—
Pierce Ferry		124·5	335	e 19 6	[+ 5]	—	—	—	—	—

Additional readings:
Warsaw eE = 7m.40s., eN = 7m.50s., eZ = 8m.24s.
Stuttgart eZ = 9m.12s.
Long waves were also recorded at Kew, Rome, Istanbul, and La Paz.

Feb. 17d. Readings also at 0h. (near Bogota and near Huancayo), 2h. (De Bilt), 3h. (near Zürich and Basle), 5h. (near Huancayo and near Obi-garm), 8h. (Stuttgart, near Pavia, Basle, and Zürich), 11h. (Mount Wilson, Pasadena, Tinemaha, Pierce Ferry, Shasta Dam, and Tucson), 13h. (near Obi-garm), 14h. (Mount Wilson, Pasadena, Tinemaha, Riverside, Pierce Ferry, Shasta Dam, and Tucson), 15h. (Boulder City and Pierce Ferry (2)), 16h. (Piatigorsk, near Grozny, Leninakan, Erevan, and near Mizusawa), 17h. (Basle, Andijan, Murgab, Samarkand, Tashkent, near Obi-garm, and Stalinabad), 18h. (Wellington and Upsala), 19h. (near Branner, Lick, and near Stuttgart), 20h. (Ksara, Lick, Hungry Horse, Pierce Ferry, Shasta Dam, Tucson, Mount Wilson, Pasadena, Riverside, Tinemaha, and near Guam), 22h. (Alicante, Almeria, Granada, Andijan, Tchimkent, near Obi-garm, Kulyab, and Stalinabad), 23h. (Hungry Horse).

Feb. 18d. 1h. Undetermined shock. Epicentre probably north of Celebes.
Batavia iEN =32m.0s.
Vladivostok eP =40m.6s., eS =46m.19s.
Riverview eP?Z =41m.1s., ePP?Z =42m.33s., eS?E =47m.22s., eN =47m.41s., eSS?Z = 50m.30s., eN =51m.26s., eLN =56m.1s.
Irkutsk eP =42m.4s., iS =49m.34s.
Stalinabad eP =43m.19s., iS =51m.53s.
Tashkent eP =43m.19s., eS =51m.56s.
Obi-garm eP =43m.28s.
Kulyab eP =43m.34s.
Sverdlovsk P =44m.28s., S =54m.5s.
Ksara eP =45m.48s., eS? =56m.29s.
Baku eS =54m.51s.
Rome e =55m.26s.
Long waves were also recorded at other European and New Zealand stations.

Feb. 18d. 20h. 29m. 47s. Epicentre 82°·5N. 41°·5E.

$A = +\cdot0984$, $B = +\cdot0871$, $C = +\cdot9913$; $\delta = -6$; $h = -14$;
$D = +\cdot663$, $E = -\cdot749$; $G = +\cdot742$, $H = +\cdot657$, $K = -\cdot131$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Scoresby Sund		17·6	267	4 8k	0	i 7 27	+ 4	—	—	—
Helsinki		22·9	204	e 5 4	− 2	i 9 10	− 3	i 5 30	PP	e 10·2
Upsala		23·6	213	i 5 11a	− 2	i 9 22	− 3	5 45	PP	e 11·7
Reykjavik		23·6	261	i 5 16k	+ 3	i 9 38	+13	5 43	PP	12·3
Sverdlovsk		26·3	156	i 5 39	0	i 10 11	0	—	—	—
Moscow		26·9	185	5 43	− 2	10 20	0	—	—	—
Aberdeen		28·0	234	i 5 57	+ 2	i 10 38	0	—	—	13·2
Copenhagen		28·1	217	i 5 54	− 1	10 42	+ 2	—	—	—
Edinburgh		29·3	235	6 14	+ 8	11 11	+12	7 11	PP	—
Durham		30·3	233	i 6 14	− 1	i 12 42	SS	—	—	—
Warsaw		31·0	206	6 20a	− 1	e 11 23	− 3	7 22	PP	e 14·2
Potsdam		31·4	216	i 6 23a	− 2	i 11 37	+ 5	i 7 16	PP	14·2
De Bilt		32·3	224	i 6 33a	0	e 11 48	+ 2	i 7 39	PP	e 15·2
Collmberg	N.	32·4	215	e 6 36	+ 2	i 14 8	SS	—	—	i 17·6
Jena		32·9	216	e 6 37	− 1	e 12 11	+15	—	—	e 15·7
Raciborzu		33·3	209	i 6 39	− 2	e 12 13?	+11	e 8 1	PP	—
Kew		33·4	230	i 6 42a	0	e 12 2	− 1	e 7 43?	PP	e 15·7
Prague		33·5	214	i 6 42	− 1	i 12 3	− 2	e 7 39	PP	e 17·2
Uccle		33·6	226	e 6 43a	− 1	e 11 47	−19	e 7 25	PP	e 16·1
Cheb		33·7	216	i 6 46	+ 1	e 12 6	− 2	e 7 25	PP	e 19·2
Irkutsk		35·0	108	i 6 55	− 1	12 17	−11	—	—	—
Stuttgart		35·2	219	e 6 57a	− 1	e 12 23	− 8	e 8 16	PP	e 20·2
Strasbourg		35·5	220	i 7 0a	0	i 12 32	− 4	e 8 3	PP	e 18·7
Paris		35·8	227	i 7 4k	+ 1	e 12 32	− 9	i 7 29	pP	e 17·7
Budapest		35·8	207	i 7 3	0	12 57	+16	8 17	PP	17·7
Zürich		36·7	220	e 7 7	− 3	e 13 2	+ 8	—	—	—
Kalossa	E.	36·8	207	e 7 14	+ 3	—	—	—	—	e 17·7
Chur		37·1	218	e 7 14a	0	—	—	e 15 12	SS	—
Neuchatel		37·2	221	e 7 13	− 2	—	—	(e 15 42)	SS	e 15·7
Theodosia		37·7	188	e 7 21	+ 2	—	—	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Simferopol	N.	37·8	190	e 7 19	− 1	—	—	—	—	—
Triest		38·0	213	e 7 27	+ 6	i 13 24	+10	e 8 41	PP	—
Yalta		38·2	189	e 7 28	+ 5	13 12	− 5	—	—	—
Salo		38·3	217	7 23a	− 1	e 13 23	+ 4	e 16 0	SS	—
Belgrade		38·4	205	i 7 25k	0	e 15 58	SS	e 9 2	PP	e 20·1
Bucharest		38·5	199	e 7 1	−25	i 16 12	SS	e 8 43	PP	e 18·2
Piatigorsk		38·6	179	i 7 27	+ 1	—	—	e 8 54	PP	—
Clermont-Ferrand		38·7	225	i 7 28	+ 1	i 13 41	+16	i 9 1	PP	19·7
Pavia		38·8	218	e 7 32	+ 4	—	—	—	—	—
Sotchi	N.	39·1	183	e 7 50?	+19	—	—	—	—	—
Grozny		39·3	175	i 7 36	+ 4	i 13 31	− 3	i 10 0	PPP	—
Sitka		40·2	358	i 7 46	+ 6	i 13 55	+ 7	e 9 15	PP	e 17·0
Almata		41·0	140	i 7 57	+11	e 14 8	+ 9	—	—	—
Frunse		41·1	143	i 7 50?	+ 3	e 14 6?	+ 5	—	—	—
Tchimkent		41·4	148	i 7 50	0	—	—	—	—	—
Istanbul		41·8	196	i 7 54	+ 1	13 47?	−24	—	—	—
Rome		41·8	214	i 7 52a	− 1	i 14 9	− 2	i 9 27	PP	e 18·2
Leninakan		41·9	178	i 7 54?	0	—	—	9 49?	PP	—
Baku		42·3	171	i 8 1	+ 4	e 14 23	+ 4	—	—	—
Tashkent		42·3	149	i 7 56	− 1	—	—	—	—	—
Erevan		42·5	177	e 8 3	+ 4	—	—	—	—	—
Barcelona		43·1	226	i 8 4	0	14 45	+15	17 55	SS	e 23·3
Andijan		43·1	146	e 8 6	+ 2	14 31	+ 1	—	—	—
Samarkand		43·8	152	i 8 11	+ 2	14 41	+ 1	—	—	—
Saskatoon		44·6	334	10 1	PP	14 53	+ 1	18 13	SS	21·2
Obi-garm		44·9	149	e 8 20	+ 2	i 14 55	− 1	—	—	—
Ashkabad		45·0	161	e 8 20	+ 1	e 14 58	0	—	—	—
Stalinabad		45·0	150	i 8 20	+ 1	i 14 58	0	—	—	—
Toledo		45·3	232	i 8 20	− 1	15 0	− 2	18 30	SS	—
Murgab		45·6	144	8 25	+ 1	15 8	+ 2	—	—	—
Kulyab		45·7	149	i 8 28	+ 4	i 15 11	+ 3	—	—	—
Alicante		46·4	228	i 8 32	+ 2	e 14 50	−28	10 18	PP	—
Kirkland Lake		46·4	309	i 8 30	0	—	—	—	—	e 27·2
Seven Falls		46·4	301	8 31	+ 1	15 17	− 1	18 31	SS	22·2
Lisbon		47·0	237	i 8 34a	− 1	15 33?	PS	10 15	PP	23·8
Ville Marie		47·1	309	i 8 35	0	—	—	—	—	—
Vladivostok		47·6	83	i 8 38	− 1	i 15 32	− 3	—	—	—
Temiskaming		47·7	308	i 8 40	0	—	—	—	—	—
Granada		47·9	231	i 8 43k	+ 1	i 15 37	− 2	8 48	pP	i 23·8
Halifax		48·0	293	8 45	+ 2	15 41	0	10 37	PP	23·2
Almeria		48·1	230	i 8 41	− 2	15 45	+ 3	i 10 33	PP	28·4
Malaga	Z.	48·4	232	i 8 46a	0	i 15 40	− 6	8 59	pP	26·4
Ottawa		48·6	305	8 46	− 1	15 49	0	10 48	PP	21·2
Hungry Horse		48·8	340	i 8 48	− 1	e 15 54	+ 2	—	—	—
Ksara		48·8	187	i 8 49a	0	i 16 8	+16	—	—	—
Victoria		49·0	348	8 46	− 4	15 50	− 5	19 7	SS	23·2
Harvard		51·0	300	i 9 7	+ 1	i 16 25	+ 3	—	—	e 27·2
Weston		51·1	300	i 9 8	+ 2	i 16 24	0	11 38	PP	e 25·0
Butte	N.	51·1	338	e 9 19	+13	e 16 25	+ 1	e 11 33	PP	e 21·0
Bozeman		51·3	337	e 14 32	?	e 16 19	− 7	e 20 33	SS	e 21·7
Fordham		52·9	302	9 24	+ 4	16 49	+ 1	—	—	—
Helwan		52·9	192	i 9 17k	− 3	i 16 43	− 5	11 17	PP	—
Cleveland		53·1	309	e 9 19a	− 2	i 16 46	− 5	i 9 32	pP	—
Chicago		53·4	316	e 9 25	+ 1	e 16 44	−11	e 11 29	PP	e 21·1
Pennsylvania		53·4	306	e 9 27	+ 3	—	—	—	—	—
Philadelphia		53·9	303	i 9 29	+ 2	i 17 3	+ 1	i 12 15	PPP	e 24·0
Lincoln	E.	55·1	323	—	—	e 17 19	+ 1	e 19 26	?	e 22·0
Georgetown		55·2	304	e 9 36	− 1	i 17 20	0	e 11 43	PP	—
Salt Lake City		56·2	337	e 9 35	− 9	e 17 32	− 1	e 21 8	SS	e 22·6
Shasta Dam		56·8	347	e 9 46	− 2	—	—	e 39 47	P'P'	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
St. Louis		56·8	317	e 9 46	− 2	i 17 38	− 3	12 2	PP	—
Mineral	Z.	57·1	346	i 9 49	− 1	—	—	—	—	e 38·3
Berkeley		59·6	346	e 10 7	− 1	i 18 17	0	e 13 55	PPP	e 30·0
Lick		60·1	346	i 10 11	0	—	—	—	—	e 34·8
Santa Clara		60·1	346	e 10 9	− 2	e 18 31	+ 7	—	—	e 35·4
Bermuda		60·2	292	e 10 25	+13	i 18 41	+16	e 12 34	PP	e 23·7
Tinemaha		60·2	342	i 10 13a	+ 1	e 18 31	+ 6	e 40 13	P′P′	—
Fresno		60·6	344	i 10 15	0	e 18 41	+11	—	—	e 37·0
Pierce Ferry		61·0	338	i 10 17	− 1	e 18 39	+ 4	—	—	—
Haiwee		61·2	342	i 10 18	− 1	e 18 44	+ 6	—	—	—
Boulder City		61·2	339	i 10 18	− 1	e 18 42	+ 4	e 20 30	S_cS	—
Santa Barbara		62·9	343	e 10 30	0	e 19 3	+ 3	—	—	—
Mount Wilson		63·1	342	i 10 30	− 2	e 19 3	+ 1	i 39 39	P′P′	—
Pasadena		63·2	342	i 10 31a	− 1	i 19 3	0	e 13 4	PP	e 27·2
Riverside	Z.	63·3	342	i 10 31	− 2	—	—	i 39 29	P′P′	—
Palomar		63·9	341	i 10 36a	− 1	—	—	e 39 28	P′P′	—
La Jolla	Z.	64·4	341	e 10 40	0	—	—	—	—	—
Tucson		64·7	336	i 10 42	0	e 19 21	− 1	e 24 9	SS	e 29·4
Bombay		64·8	148	e 10 49	+ 6	e 19 27	+ 4	—	—	28·3
Hyderabad	N.	66·7	142	10 46	− 9	19 35	−11	13 8	PP	—
Kodaikanal	E.	73·8	143	i 12 5	+27	i 21 13	+ 4	25 43	SS	34·7
San Juan		74·2	291	i 11 40	0	i 21 12	− 2	e 14 33	PP	e 31·7
Fort de France		77·1	285	e 11 56	− 1	—	—	—	—	—
Colombo	E.	77·3	141	12 1	+ 3	21 53	+ 5	—	—	37·0
Bogota	Z.	88·7	296	i 12 57	0	—	—	—	—	—
Huancayo		105·3	295	18 50	PP	e 24 54	[+ 2]	e 27 37	PS	e 49·3
La Paz		108·8	287	i 19 1	PP	i 34 25	SS	i 28 33	PS	52·2
Riverview		125·9	75	e 21 2	PP	e 31 5	PS	i 54 16	Q	e 61·2
Wellington		136·0	52	—	—	e 23 49	?	—	—	e 71·2

Additional readings :—
Scoresby Sund 5m.10s. and 5m.40s., eS = 7m.17s.
Helsinki iSS = 9m.47s.
Upsala iPPPN = 5m.55s., eE = 10m.55s.
Reykjavik iN = 6m.7s., SSN = 10m.38s.
Aberdeen iE = 11m.18s., iN = 12m.47s.
Copenhagen 10m.29s. and 10m.54s.
Edinburgh PPP = 7m.25s., P_cP = 9m.16s., SS = 12m.47s., P_cS = 12m.58s., SSS = 13m.8s., S_cS = 16m.52s.
Warsaw eNZ = 7m.0s., eZ = 8m.37s., SZ = 11m.15s., SSEZ = 12m.42s., SSN = 12m.46s., SSSN = 13m.10s.
Potsdam iSN = 11m.42s., iSSSE = 13m.32s.
De Bilt iZ = 7m.1s., iP_cP = 9m.33s., iZ = 9m.59s.
Jena eEZ = 6m.45s., eN = 6m.48s., eE = 14m.9s., eZ = 14m.29s., eN = 14m.43s.
Raciborzu ePEN = 6m.42s., eZ = 7m.1s. and 7m.30s. ePPPN = 8m.13s.?, eP_cP?N = 8m.39s., eZ = 13m.29s., eSS?N = 14m.3s., eZ = 14m.32s., eS_cS?N = 17m.13s.
Kew eP_cP?Z = 9m.15s.?, eE = 11m.36s., eP_cS = 13m.12s., eSS = 13m.54s., eQE = 14m.43s.
Prague iPPP = 8m.0s., eSS = 13m.43s.
Uccle ePPPN = 7m.47s., eSSN = 12m.20s.
Cheb iPS = 12m.9s.
Stuttgart e = 8m.23s. and 13m.34s., eSS = 14m.13s., e = 16m.45s., 17m.51s., and 18m.13s
Strasbourg eP_cP = 9m.18s., eSS = 14m.49s., eS_cS = 17m.9s.
Paris ePP = 8m.15s., eP_cP = 9m.12s., e = 12m.56s., eP_cS = 13m.9s., e = 14m.17s., eSS = 14m.50s., eSSS = 15m.10s., e = 16m.15s., eS_cS = 17m.17s., e = 17m.32s.
Budapest PPE = 8m.20s., PPPE = 8m.49s., SSEN = 15m.1s., SSE = 15m.11s., SSSE = 15m.43s., SSSN = 16m.8s.
Zürich i = 7m.10s.a
Kalossa eE = 7m.43s., eN = 8m.11s., eE = 9m.7s., eN = 10m.8s.
Triest iSS = 15m.49s.
Belgrade iP_cP? = 7m.39s.
Bucharest iE = 15m.26s., 16m.2s., and 16m.32s.
Clermont-Ferrand iP = 7m.38s., iSS = 16m.20s.
Grozny iSSS = 16m.19s.
Sitka ePPP? = 10m.43s.
Rome Q = 14m.42s., eSS = 16m.55s.
Alicante P_cS = 14m.33s.
Seven Falls SSS = 19m.25s.
Lisbon sPE = 8m.39s., SSE = 17m.57s., Q = 21m.43s.
Granada P_cP = 9m.56s., iPP = 10m.22s., pPP = 10m.34s., PPP = 11m.12s., P_cS = 13m.35s., PS = 16m.10s., S_cS = 18m.24s., iSS = 19m.36s., SSS = 20m.45s.
Halifax SS = 19m.1s.

Continued on next page.

The scanned images of the bulletins of the International Seismological Summary (ISS) have been obtained thanks to funding provided by the US National Science Foundation through grant EAR-9725140 (Villaseñor et al., 1997) and collected by SGA Storia Geofisica Ambiente (Bologna) on behalf of the Istituto Nazionale di Geofisica e Vulcanologia (Rome), in the frame of the EUROSEISMOS project.

Almeria iP$_c$P =10m.11s., iPPP =11m.9s., P$_c$S =14m.1s., iS =15m.29s., S$_c$S =18m.29s.
Malaga P$_c$PZ =10m.13s., iPPZ =10m.40s., PPPZ =11m.24s., eS$_c$PZ =13m.42s.
Ottawa SS =18m.37s.
Hungry Horse i =8m.55s.
Harvard i =9m.22s.
Weston 16m.44s., SS =20m.48s., SSS =22m.33s.
Butte eS$_c$SN =19m.22s., eSSN =20m.7s.
Helwan P$_c$P =10m.29s., PPS =16m.58s.
Cleveland iPNZ =9m.23s., ipPN =9m.35s., iN =10m.2s., 10m.14s., 10m.41s., and 10m.53s., iE =16m.51s., isSN =17m.12s., isSE =17m.16s., iE =19m.6s.
Chicago eP$_c$P =10m.37s., ePPP =12m.34s., iS =16m.53s., eS$_c$S =19m.12s.
Philadelphia e =18m.18s., eSS =21m.35s.
Georgetown iP =9m.39s., eSSS =23m.5s.
Salt Lake City eS$_c$S =19m.33s.
St. Louis iP =9m.50s., S$_c$S =19m.38s., SS =21m.34s.
Berkeley iPZ =10m.11s., iN =10m.17s., iSZ =18m.20s., iN =18m.27s., iPSE =18m.41s., iZ =18m.48s., iSSE =22m.16s., eE =28m.1s.
Lick eEN =10m.14s.
Bermuda ePPP =14m.0s., e =17m.33s.
Fresno iZ =10m.24s., iN =10m.31s., iE =10m.36s.
Pasadena iZ =12m.31s., eN =13m.53s., eSSEN =23m.4s., eN =24m.4s., iPKP,PKPZ = 39m.23s.
Riverside iZ =39m.38s.
Palomar iZ =10m.46s., 10m.58s., and 39m.40s.
Tucson i =10m.52s. and 12m.33s., iS =19m.26s., e =19m.48s., eSSS =27m.11s., ePKP,PKP =39m.23s.
Hyderabad SSN =23m.56s.
San Juan ePcP? =12m.3s., eSS =26m.0s., eSSS =29m.44s.
Huancayo eS =26m.3s., ePPS =29m.5s., eSS =33m.11s., eSSS =37m.43s.
La Paz iPPZ =19m.31s.
Long waves were also recorderd at Ivigtut, Columbia, Ferndale, and Ukiah.

Feb. 18d. Readings also at 0h. (Rome, Helwan, Hungry Horse, near Fresno (2), near Almata, near Kulyab, Obi-garm, and Stalinabad), 1h. (near Obi-garm), 4h. (Rome), 5h. (Hungry Horse, Andijan, Murgab, Samarkand, near Kulyab, Obi-garm, and Stalinabad), 6h. (Haiwee, La Jolla, Mount Wilson (2), Pasadena, Palomar (2), Riverside, Tinemaha (2), Tucson (2), Pierce Ferry, Shasta Dam, Fresno, La Paz, Helwan, and Ksara), 7h. and 8h. (near Lick), 10h. (near Malaga), 11h. (Istanbul and near Zürich), 12h. (Andijan, Murgab, Samarkand, near Kulyab, Obi-garm, and Stalinabad), 13h. (Rome), 14h. (near Apia), 15h. (Haiwee, La Jolla, Mount Wilson, Pasadena, Palomar, Riverside, Santa Barbara, Tinemaha, Tucson, Shasta Dam, and Hungry Horse), 16h. (Stuttgart, near Kulyab, and near Mineral), 18h. (near Branner and Lick), 19h. (Ivigtut), 20h. (near Murgab), 21h. (Boulder City and Pierce Ferry), 22h. (Hungry Horse and Wellington), 23h. (near Lick).

Feb. 19d. 8h. 25m. 11s. Epicentre 40°·4N. 125°·1W. (as on 17d.).

$A = -\cdot4391$, $B = -\cdot6248$, $C = +\cdot6456$; $\delta = -2$; $h = -2$;

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ferndale		0·6	75	i 0 11	− 4	i 0 20	− 6	i 0 16	P	—
Ukiah		1·9	131	e 1 39	+65	e 1 58	+59	—	—	e 2·1
Shasta Dam		2·1	82	i 0 5	−32	i 0 53	−11	—	—	—
Mineral		2·7	91	i 0 39	− 6	i 1 9	−10	i 0 42	P	—
Berkeley		3·4	138	i 0 56	+ 1	i 1 37	0	i 1 1	P*	—
San Francisco	E.	3·4	140	e 0 56	+ 1	i 1 36	− 1	—	—	—
Branner	Z.	3·8	141	i 1 0	− 1	e 1 47	0	—	—	—
Santa Clara		3·9	139	e 1 33	+31	e 2 6	S_E	—	—	—
Lick		4·1	137	i 1 5	0	i 1 55	0	—	—	—
Fresno		5·5	129	i 1 25	0	i 2 29	− 1	i 2 59	S_E	i 3·2
Tinemaha		6·3	120	e 1 36	0	i 3 4	S*	—	—	—
Haiwee		7·0	125	e 1 48	+ 2	e 3 36	S*	—	—	—
Santa Barbara	Z.	7·3	143	e 1 51	+ 1	e 3 16	+ 1	i 1 55	P	—
Mount Wilson	Z.	8·4	134	i 2 5	− 1	i 3 42	− 1	i 2 14	?	—
Pasadena		8·4	136	i 2 5	− 1	i 3 44	+ 1	—	—	—
Riverside		8·9	133	i 2 11	− 1	—	—	i 2 18	P	—
Boulder City		9·2	115	e 2 15	− 1	—	—	—	—	—
Palomar		9·6	134	e 2 22	+ 1	—	—	—	—	—
Pierce Ferry		9·7	112	i 2 20	− 2	—	—	—	—	—
Hungry Horse		11·2	41	i 2 33	−11	—	—	—	—	—
Tucson		14·1	121	i 3 23	0	—	—	i 3 33	PP	—

Fresno also gives iN =1m.44s., iZ =1m.54s., iE =2m.3s., iN =2m.22s., iZ =2m.33s., iN =2m.38s.

Feb. 19d. 10h. Undetermined shock.

Vera Cruz iE = 4m.50s., iN = 4m.54s.
Tacubaya PE = 5m.22s., LEN = 7m.30s.
St. Louis iP = 8m.19s.
Tucson iP = 8m.31s.a, ipP = 8m.46s., i = 12m.3s., eS_cP = 16m.11s., e = 17m.7s.
Pierce Ferry iP = 9m.12s., ipP = 9m.27s.
Palomar iPEZ = 9m.13s.a, ipPEZ = 9m.28s., iP_cPZ = 12m.12s.
Boulder City iP = 9m.15s., ipP = 9m.26s.
Riverside iPZ = 9m.19s., ipPZ = 9m.35s., iZ = 9m.45s., iP_cPZ = 12m.15s.
Mount Wilson iPZ = 9m.25s., ipPZ = 9m.39s., iZ = 10m.2s., eP_cPZ = 12m.17s.
Pasadena iPZ = 9m.25s., ipPZ = 9m.40s., iP_cPZ = 12m.17s.
Halwee iPZ = 9m.32s., ipPZ = 9m.47s., iP_cPZ = 12m.20s.
Tinemaha iPZ = 9m.39s.a, iP_cPZ = 12m.22s., epP_cPZ = 12m.37s., eS_cPZ = 16m.6s., eZ = 16m.35s.
Fresno ePZ = 9m.47s., eN = 9m.52s., ipPZ = 10m.3s., eE = 10m.7s.
Lick iPZ = 10m.1s., ipPZ = 10m.16s.
Mineral iPZ = 10m.14s., ipPZ = 10m.30s., iZ = 12m.35s.
Hungry Horse eP = 10m.29s., i = 12m.39s.
Shasta Dam e = 10m.32s., eP_cP = 12m.35s.

Feb. 19d. 21h. 57m. 59s. Epicentre 8°·6S. 109°·9E. (as on 1943, July 23d.).

A = −·3366, B = +·9299, C = −·1485; δ = +7; h = +7;
D = +·940, E = +·340; G = +·051, H = −·140, K = −·989.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Kodaikanal	E.	37·3	301	—	—	e 13 54	SS	—	—	—
Calcutta	E.	37·6	327	—	—	e 13 6	− 2	—	—	e 17·4
Hyderabad	N.	40·4	311	—	—	i 13 32	−18	—	—	—
Riverview		45·5	130	—	—	e 15 31	+26	—	—	e 22·6
Bombay	N.	45·6	297	e 10 1?	PP	e 15 1?	− 5	—	—	—
Vladivostok		55·2	20	e 9 35	− 2	—	—	—	—	—
Kulyab		59·5	324	i 10 1	− 6	i 18 1	−15	—	—	—
Andijan		60·1	328	e 10 17?	+ 6	—	—	—	—	—
Obi-garm		60·1	325	e 10 11	0	i 18 15	− 9	—	—	—
Frunse		60·5	332	e 10 15	+ 1	—	—	—	—	—
Stalinabad		60·5	324	i 10 7	− 7	i 18 14	−15	—	—	—
Tashkent		62·1	327	e 10 17	− 8	e 18 33	−16	—	—	—
Samarkand		62·3	324	e 10 21	− 5	e 18 39	−13	—	—	—
Ashkabad		66·7	318	e 10 31	−24	—	—	—	—	—
Sverdlovsk		76·7	335	i 11 51	− 4	21 34	− 7	—	—	—
Grozny		77·7	318	e 12 1	+ 1	e 21 45	− 7	—	—	—
Leninakan		78·0	315	e 12 5	+ 3	—	—	—	—	—
Ksara		81·7	306	e 12 19	− 3	e 23 17	PS	—	—	—
Helwan		84·4	301	—	—	e 22 53	− 8	—	—	—
Moscow		87·3	328	—	—	i 23 23	− 6	—	—	—
Stuttgart	z.	103·5	318	e 18 14	PP	—	—	—	—	—
Shasta Dam		123·8	46	e 18 59	[0]	—	—	—	—	—
Hungry Horse		125·9	34	e 19 4	[0]	—	—	—	—	—
Tinemaha	z.	128·1	49	e 19 10	[+ 1]	—	—	—	—	—
Pasadena	z.	129·1	52	i 19 11	[+ 1]	—	—	i 22 30	PKS	—
Mount Wilson	z.	129·2	52	i 19 12	[+ 2]	—	—	—	—	—
Riverside	z.	129·8	52	e 19 12	[0]	—	—	i 22 32	PKS	—
Boulder City		131·0	49	e 19 16	[+ 2]	—	—	e 22 38	PKS	—
Pierce Ferry		131·6	48	e 19 11	[− 4]	—	—	—	—	—
Tucson		135·5	52	e 19 23	[+ 1]	—	—	i 22 54	PKS	—
St. Louis		145·0	27	i 19 38	[− 1]	—	—	—	—	—

Pasadena also gives eZ = 19m.29s.
Long waves were also recorded at Auckland.

Feb. 19d. Readings also at 0h. (Shasta Dam and near Ksara), 3h. (near Bogota), 5h. (Andijan, near Obi-garm, Kulyab, Samarkand, and Stalinabad), 6h. (Pierce Ferry and Huancayo), 7h. (La Paz), 8h. (Pierce Ferry), 9h. (Mount Wilson, Palomar, Tinemaha, and Shasta Dam), 10h. (Tucson (2), Hungry Horse, Pierce Ferry, Riverside, and Tinemaha), 11h. (Auckland), 15h. (Jena, Stuttgart (2), near Seven Falls, and near Huancayo), 17h. (Pierce Ferry, near Jena and Stuttgart), 18h. (Mount Wilson and Riverside), 19h. (Tchimkent, near Kulyab, Obi-garm, Andijan, Murgab, Stalinabad, and near Apia), 20h. (Hungry Horse (2) and near Batavia), 21h. (Mount Wilson, Tinemaha, Shasta Dam, and Tucson), 22h. (near Obi-garm, Kulyab, and Stalinabad), 23h. (near Lick).

Feb. 20d. 1h. 23m. 11s. I } Epicentre 5°·08, 80°·7W.
1h. 26m. 32s. II } (as on 1943, Jan. 6d.).

A = +·1610, B = −·9831, C = −·0866 ; δ = −9 ; h = +7 ;
D = −·987, E = −·162 ; G = −·014, H = +·085, K = −·996.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
I	Huancayo	8·8	143	e 2 19	+ 8	e 4 4	+11	e 3 4	?	e 4·6
II		8·8	143	e 2 21	+10	e 4 7	+14	—	—	e 4·7
I	La Paz	16·8	134	i 3 57	− 1	i 7 11	+ 6	—	—	8·9
I	Tucson	46·8	325	i 8 33a	0	—	—	—	—	—
II		46·8	325	i 8 32	− 1	—	—	—	—	—
I	Palomar	z. 51·3	321	i 9 8	0	—	—	—	—	—
II		z. 51·3	321	i 9 7	− 1	—	—	—	—	—
I	Pierce Ferry	51·4	326	e 9 7	− 2	—	—	—	—	—
II		51·4	326	e 9 7	− 2	—	—	—	—	—
I	Boulder City	51·8	326	e 9 10	− 2	—	—	—	—	—
I	Riverside	z. 52·0	321	i 9 14	+ 1	—	—	—	—	—
II		z. 52·0	321	i 9 13	0	—	—	—	—	—
I	Mount Wilson	z. 52·6	321	i 9 18	0	—	—	—	—	—
II		z. 52·6	321	i 9 17	− 1	—	—	—	—	—
I	Pasadena	z. 52·6	321	i 9 18	0	—	—	—	—	—
II		z. 52·6	321	i 9 18	0	—	—	—	—	—
I	Tinemaha	z. 54·6	324	i 9 32	0	—	—	—	—	—
II		z. 54·6	324	i 9 31	− 1	—	—	i 10 32	P_cP	—
I	Mineral	z. 58·7	325	e 9 59	− 3	—	—	—	—	—
II		z. 58·7	325	e 9 59	− 3	—	—	—	—	—
I	Shasta Dam	59·4	325	e 10 2	− 4	—	—	—	—	—
II		59·4	325	e 10 2	− 4	—	—	—	—	—
I	Hungry Horse	60·6	336	i 10 8	− 7	—	—	—	—	—
II		60·6	336	i 10 8	− 7	—	—	—	—	—

Feb. 20d. Readings also at 0h. (Andijan, Tchimkent, Taskhent, near Ob-garm, Stalinabad, Murgab, Kulyab, and near Lick), 1h. (Bogota, near Murgab, Andijan, Obi-garm, Kulyab, and Stalinabad), 2h. (Shasta Dam), 3h. (near Shasta Dam and Mineral), 6h. (Mount Wilson, Pasadena, Riverside, Tinemaha, Palomar, Boulder City, Hungry Horse, Pierce Ferry, Shasta Dam, Tucson, and near Apia), 7h. (Frunse, Samarkand, Andijan, Obi-garm, Kulyab, Stalinabad, and near Murgab), 9h. (near Murgab), 10h. (near Obi-garm), 11h. (Apia), 12h. (La Paz), 14h. (Bombay and Calcutta), 19h. (Huancayo, Hungry Horse, near Shasta Dam and near Ottawa), 21h. (Sverdlovsk), 22h. (Hungry Horse, Istanbul. Ksara, Rome, Belgrade, Potsdam, Stuttgart, near Andijan, Obi-garm, and Stalinabad. Several shocks), 23h. (Pierce Ferry).

Feb. 21d. Readings at 1h. (Kodaikanal and Pierce Ferry), 3h. (Bogota), 4h. (near Berkeley and Branner), 7h. (near Apia), 13h. (Kew), 15h. (Pierce Ferry, Kew, Malaga, and near Alicante), 16h. (Huancayo), 21h. (Mizusawa and near Huancayo (2)), 23h. (Stuttgart, Hungry Horse, and La Paz).

Feb. 22d. Readings at 0h. (Bogota), 1h. (Budapest, Belgrade, Zürich, Kalossa, Strasbourg, Stuttgart, Shasta Dam, near Lick (2), Branner, Berkeley, and Fresno), 2h. (Hungry Horse), 3h. (near Lick), 5h. (Huancayo), 10h. (Huancayo), 11h. (Pasadena, Mount Wilson, Palomar, Tinemaha, Hungry Horse, Pierce Ferry, Shasta Dam, Tucson, Stuttgart, and near Apia), 12h. (near Lick), 13h. (near Apia), 14h. (near Lick), 16h. (near Andijan, Samarkand, Stalinabad, and near Triest), 17h. (Stalinabad, near Andijan, Frunse, Murgab, and near San Francisco), 18h. (Hungry Horse and Stuttgart), 22h. (near Mineral).

The scanned images of the bulletins of the International Seismological Summary (ISS) have been obtained thanks to funding provided by the US National Science Foundation through grant EAR-9725140 (Villaseñor et al., 1997) and collected by SGA Storia Geofisica Ambiente (Bologna) on behalf of the Istituto Nazionale di Geofisica e Vulcanologia (Rome), in the frame of the EUROSEISMOS project.

Feb. 23d. 9h. 25m. 29s. Epicentre 5°·8S. 148°·1E.

A = −·8447, B = +·5258, C = −·1004; δ = +6; h = +7;
D = +·528, E = +·849; G = +·085, H = −·053, K = −·995.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	N.	22·1	169	i 4 55	− 4	i 8 50	− 8	i 5 15	PP	e 12·9
Riverview		28·0	175	i 5 56a	+ 1	i 10 30	− 8	i 10 47	sS	e 13·3
Auckland		39·4	145	e 7 21?	−12	16 12	SS	9 16	PP	e 21·8
Perth		39·8	226	—	—	i 13 33	− 9	i 16 3	SS	i 20·6
Arapuni		40·7	147	—	—	13 37	−18	(16 43)	SS	16·7
Batavia		41·0	268	i 8 2	+16	—	—	i 9 45	PPP	—
Wellington		42·6	151	7 52	− 7	—	—	10 1	PPP	25·3
Mizusawa		45·2	353	e 8 22	+ 2	14 50	−11	8 26	P	—
Vladivostok		50·9	345	i 9 6	+ 1	e 16 18	− 3	—	—	—
Calcutta	E.	64·9	299	e 10 49	+ 6	e 20 14	PPS	—	—	—
Irkutsk		68·8	334	11 9	+ 1	i 20 11	0	11 35	PcP	—
Colombo	E.	69·2	280	11 8	− 2	(20 19)	− 7	14 36	PP	20·3
Kodaikanal	E.	72·1	283	e 11 28	0	—	—	—	—	—
Hyderabad	N.	72·5	291	e 12 37	+67	e 20 53	− 1	21 30	PS	34·3
Bombay		78·1	292	e 12 27	+25	—	—	e 22 50	PPS	—
Almata		80·4	317	e 12 23	+ 8	—	—	—	—	—
Frunse		82·0	315	e 12 21	+ 1	—	—	—	—	—
Andijan		83·1	313	e 12 28	− 1	—	—	—	—	—
College		84·5	23	—	—	e 23 27	+25	—	—	—
Stalinabad		85·3	311	i 12 40	0	i 23 8	− 2	—	—	—
Tashkent		85·4	313	i 12 38	− 2	—	—	—	—	—
Berkeley	E.	93·2	53	—	—	e 31 13	SSP	e 42 37	Q	e 45·2
Shasta Dam		93·4	50	i 13 17	− 1	—	—	—	—	—
Sverdlovsk		93·4	326	e 13 16	− 2	e 23 46	[− 6]	e 17 6	PP	—
Lick	Z.	93·7	53	i 13 20	0	—	—	—	—	—
Mineral	Z.	93·9	50	i 13 21	0	—	—	—	—	—
Pasadena		96·3	56	i 13 31	− 1	—	—	—	—	e 43·8
Tinemaha	Z.	96·4	53	i 13 32	0	—	—	—	—	—
Riverside	Z.	97·0	56	i 13 34	− 1	—	—	—	—	—
Hungry Horse		99·5	42	i 13 45	− 1	—	—	i 30 8	PKKP	—
Pierce Ferry		99·8	54	i 13 47	0	—	—	—	—	—
Tucson		102·4	58	i 30 22	PKKP	e 37 45	?	—	—	e 46·9
Grozny		102·9	313	e 18 34	PP	—	—	—	—	—
Saskatoon		103·9	38	—	—	e 25 31?	−23	—	—	42·5
Leninakan		104·6	311	e 19 10	PP	—	—	—	—	—
Ksara		111·6	304	e 19 27?	PP	—	—	—	—	—
Scoresby Sund		115·1	356	19 49	PP	29 36	PS	—	—	—
Istanbul		115·5	313	e 19 42	PP	—	—	—	—	—
Helwan		116·0	300	e 19 51	PP	—	—	e 20 15	?	—
Kirkland Lake		121·3	35	e 20 19	PP	—	—	—	—	—
Cheb		122·4	328	—	—	e 30 31	PS	—	—	—
De Bilt		124·7	333	e 20 51	PP	e 32 31	PPS	e 23 31	PPP	e 56·5
Stuttgart		124·9	328	e 18 59	[− 3]	e 31 1	PS	e 20 52	PP	e 62·5
Ottawa		125·2	36	i 19 2	[− 1]	—	—	—	—	43·5
Strasbourg		125·7	329	e 20 59	PP	e 28 1	{+ 9}	e 31 11	PS	e 49·5
Uccle		125·9	333	e 19 4	[0]	e 28 21	{+28}	e 20 56	PP	e 56·5
Rome		126·7	320	e 20 50	PP	—	—	—	—	e 69·9
Paris		128·2	332	e 19 9	[0]	e 22 58	SKP	e 21 18	PP	e 68·5
Clermont-Ferrand		130·0	329	e 21 44	PP	(39 31)	SSP	e 22 12	?	39·5
Jersey		130·0	336	e 19 16	[+ 4]	—	—	—	—	—
La Plata	N.	132·7	151	22 47	PKS	—	—	68 31	Q	75·4
Huancayo		133·3	112	i 19 23	[+ 5]	e 26 25	[− 3]	e 21 49	PP	e 55·7
La Paz		137·9	122	i 19 27a	[0]	i 23 2	PKS	i 22 13	PP	66·5
Bermuda		139·6	45	e 22 51	PP	—	—	e 40 46	SS	e 57·9
Fort de France		149·9	71	e 19 49	[+ 2]	—	—	—	—	—

Additional readings :—
Brisbane iN = 5m.38s., 5m.57s., and 6m.13s., iSSN = 9m.16s.
Riverview iNZ = 5m.59s., iN = 6m.25s. and 6m.37s., iZ = 6m.40s., iEN = 9m.19s., eE = 10m.10s., iN = 10m.51s., iZ = 10m.59s. and 11m.11s., iN = 11m.19s., and 11m.50s.
Auckland PPP? = 11m.25s., i = 17m.9s.

Continued on next page.

Wellington PcP?Z = 8m.11s., S? = 15m.31s., iZ = 18m.15s., SS = 20m.1s., SSS = 23m.0s., Q = 24m.12s.
Hungry Horse ePKKP = 29m.53s., ePKP,PKP = 38m.22s.
Stuttgart eZ = 19m.15s.
Strasbourg ePPP = 23m.43s., eS = 28m.31s., eSKKSZ (Δ >180°) = 35m.58s.
Uccle ePPP = 23m.53s., eSEN = 31m.21s., ePPSEN = 33m.45s., eSSE = 39m.25s.
Paris e = 22m.34s., eSKKSZ (Δ >180°) = 36m.34s.?
Huancayo e = 19m.52s., iPKS = 22m.53s., eSS = 39m.52s.
La Paz iNZ = 19m.43s.
Long waves were also recorded at Helsinki, Rapid City, Honolulu, and Tananarive.

Feb. 23d. Readings also at 0h. (near Andijan, Almata, Frunse, Murgab, Stalinabad, and Samarkand), 1h. (Ksara), 2h. (near Butte), 3h. (Piatigorsk, near Sotchi, Erevan, Grozny, Leninakan, near Almata, Frunse, Murgab, Andijan, and near Apia), 5h. (near Mizusawa), 9h. (near Lick), 10h. (Hungry Horse, Bogota, and near Basle), 11h. (near Lick), 13h. (near Irkutsk), 14h. (Almata, near Andijan, Frunse, near Lick, and near Mizusawa), 15h. (Basle, Hungry Horse, Shasta Dam, and near Ottawa), 17h. (Shasta Dam, Almata, near Obi-garm, Stalinabad, Murgab, Samarkand, Andijan, and Frunse), 18h. (near Belgrade), 21h. (Grozny, Erevan, and near Leninakan), 22h. (near Mineral).

Feb. 24d. 2h. 39m. 4s. Epicentre 43°·5N. 111°·0W.

Intensity VI at Jackson, Moran, Wilson; V at Elk, Gros Ventre River; IV at Moose. Macroseismic area 1500 sq.m.

L. M. Murphy and F. P. Ulrich.
United States Earthquakes, 1948, Serial No. 746, Washington, 1951, p. 7. Epicentre as adopted.

A = −·2608, B = −·6794, C = +·6859; δ = +6; h = −3;
D = −·934, E = +·358; G = −·246, H = −·640, K = −·728.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bozeman		2·2	0	i 0 35	− 3	i 1 19	S_g	—	—	—
Butte	N.	2·7	336	i 0 45	0	i 1 25	+ 6	—	—	—
Hungry Horse		5·3	338	e 1 20	− 2	i 2 42	S*	i 1 36	P*	—
Rapid City	E.	5·7	81	2 36	+68	3 52	+77	—	—	e 4·2
Pierce Ferry		7·7	199	i 1 52	− 4	i 4 4	S_g	—	—	—
Mineral	Z.	8·5	252	i 2 28	P*	—	—	—	—	—
Tinemaha		8·5	223	e 2 9	+ 2	e 4 20	S*	i 2 27	P*	—
Shasta Dam		8·9	256	e 2 21	+ 9	—	—	—	—	—
Riverside	Z.	10·7	210	e 2 34	− 4	—	—	—	—	e 5·7
Tucson		11·2	179	e 2 49	+ 5	—	—	—	—	—
Kirkland Lake		22·0	67	4 50	− 8	—	—	—	—	—
Ville Marie		22·4	67	e 4 56	− 6	—	—	—	—	e 11·6
Temiskaming		22·7	71	e 5 0	− 4	—	—	—	—	e 11·7

Additional readings:—
Bozeman i = 0m.56s. and 1m.29s.
Hungry Horse i = 3m.5s.
Mineral ipPZ = 2m.36s.
Long waves were also recorded at Fresno.

Feb. 24d. 8h. 15m. 9s. Epicentre 32°·5N. 118°·6W. (given by Pasadena).

A = −·4045, B = −·7419, C = +·5347; δ = −6; h = +1;
D = −·878, E = +·479; G = −·256, H = −·469, K = −·845.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
La Jolla	1·2	72	i 0 23k	− 1	—	—	—	—	—
Palomar	1·7	60	i 0 30k	− 1	—	—	—	—	—
Pasadena	1·7	12	i 0 30k	− 1	i 0 53	− 1	i 0 35	P_g	—
Mount Wilson	1·8	15	i 0 31k	− 1	i 0 54	− 2	—	—	—
Riverside	1·8	35	i 0 32k	0	i 0 54	− 2	—	—	—
Santa Barbara	2·2	334	i 0 37a	− 1	i 1 3	− 3	i 0 42	P_g	—
Haiwee	3·7	8	i 1 0	0	i 1 55	S_g	—	—	—
Fresno	4·3	347	i 1 9	+ 1	i 1 58	− 2	i 1 29	P_g	—
Tinemaha	4·6	4	i 1 12	0	—	—	—	—	—
Boulder City	4·7	41	i 1 14	0	i 2 34	S_g	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Pierce Ferry		5·2	45	i 1 21	0	—	—	—	—	—
Lick		5·4	334	i 1 22	− 2	i 2 22	− 6	—	—	—
Santa Clara	E.	5·6	331	e 1 55	P_g	e 3 11	S_g	—	—	e 3·8
Branner		5·7	330	e 1 26	− 2	i 2 29	− 6	—	—	—
Berkeley		6·1	332	i 1 49	P*	i 2 47	+ 2	i 3 19	S_g	—
San Francisco	E.	6·1	331	—	—	i 2 39	− 6	—	—	—
Tucson		6·6	90	e 1 38	− 4	i 3 2	+ 4	—	—	i 3·2
Mineral		8·2	344	i 2 3	0	e 3 39	+ 1	—	—	—
Shasta Dam		8·7	341	e 2 10	0	e 3 29	−21	—	—	e 6·0
Salt Lake City		9·9	32	e 2 49	+24	e 4 6	−14	—	—	e 4·5
Butte	N.	14·3	17	e 3 43	+17	—	—	—	—	e 7·9
Bozeman		14·4	22	e 3 39	+12	e 6 26	+17	—	—	e 7·4
Hungry Horse		16·2	11	i 3 53	+ 3	—	—	—	—	e 9·0
Rapid City	E.	16·7	42	i 4 3	+ 6	e 7 21	+18	—	—	e 7·8
Lincoln	E.	19·4	58	e 4 43	+13	—	—	—	—	e 10·4
Saskatoon		21·5	20	—	—	e 8 51	+ 4	—	—	11·8
St. Louis		23·8	67	i 5 15	0	i 9 42	+14	—	—	—
Cleveland	Z.	30·8	62	i 6 20k	0	—	—	—	—	—
Kirkland Lake		32·9	50	e 6 38	0	—	—	—	—	—
Ottawa		35·3	55	e 6 58	− 1	—	—	—	—	18·8
Stuttgart		86·7	32	e 12 46	− 1	—	—	—	—	e 51·8

Additional readings :—
La Jolla iEN =27s.
Fresno iE =1m.13s., iN =1m.17s. and 1m.41s., iZ =1m.51s.
Branner iE =1m.45s., iN =2m.2s., eSE =2m.25s.
Berkeley iN =2m.15s., eE =2m.20s., iE =2m.53s.
Tucson i =2m.23s., e =2m.26s.
Mineral eSN =3m.29s., iZ =3m.50s.
Rapid City e =4m.25s.
Long waves were also recorded at Ukiah, Philadelphia, and De Bilt.

Feb. 24d. Readings also at 0h. (near Kulyab), 1h. (near Zürich and Stuttgart), 2h. (La Paz, near Branner, Lick, and near Pavia), 4h. (Hungry Horse and Istanbul), 5h. (Shasta Dam), 8h. (Bogota), 11h. (Frunse, Samarkand, near Andijan, Kulyab, Murgab, Obi-garm, and Stalinabad), 12h. (near Lick), 14h. (near La Paz (2)), 15h. (Boulder City, Huancayo, Istanbul, and Ksara), 16h. (Tucson and near Obi-garm), 17h. (near Kulyab), 19h. (Ferndale), 20h. (Boulder City and near Lick), 21h. (Stuttgart, Calcutta, Bombay, and near Lick), 22h. (De Bilt, Alicante, near Kulyab, Obi-garm, and Stalinabad).

Feb. 25d. 3h. 40m. 17s. Epicentre 48°·4N. 6°·1E.

Intensity IV-V in Eastern France, particularly in the departments of the Vosges la Meurthe and Moselle. Macroseismic area 5600 sq.km.

J. P. Rothé and N. Dechevoy.
La Séismicité de la France de 1940-1950. Annales de l'Institut de Physique du Globe de Strasbourg 3e partie Géophysique, Nouvelle Série, tome VII, p. 49, Macroseismic chart, p. 48. Epicentre as adopted.

A = +·6626, B = +·0708, C = +·7456 ; δ = −3 ; h = −5 ;
D = +·106, E = −·994 ; G = +·741, H = +·079, K = −·666.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		
		°	°	m. s.	s.	m. s.	s.	m. s.		
Strasbourg		1·1	81	e 0 19	− 3	i 0 35	− 4	—	—	
Basle		1·3	131	e 0 25	0	e 0 43	− 1	—	—	
Neuchatel		1·5	158	e 0 29	+ 1	i 0 49	S_g	—	—	
Zürich		2·0	122	e 0 35	0	e 1 2	0	—	—	
Stuttgart		2·1	80	e 0 35	− 2	e 1 4	0	e 0 39	P*	
Paris		2·4	280	0 45?	P_g	i 1 21	S_g	—	—	
Clermont-Ferrand		3·3	218	—	—	i 1 49	S_g	—	—	
Jena	E.	4·4	53	—	—	e 2 11	S*	e 2 20	S_g	

Additional readings :—
Stuttgart e =43s., eS_g =1m.8s.
Paris e =54s. and 1m.1s., i =1m.29s. and 1m.35s., e =1m.49s.
Clermont-Ferrand i =1m.52s. and 2m.2s.

Feb. 25d. 15h. South-West Pacific, probably deep.

Brisbane ePN =8m.15s., iPN =8m.54s., iSN =12m.21s., iN =12m.25s.
Shasta Dam eP =16m.56s., epP =17m.39s.
Mineral ePZ =16m.57s., iZ =17m.40s.
Mount Wilson ePZ =17m.0s., ipPZ =17m.44s.
Palomar iPZ =17m.3s., ipP =17m.47s.
Riverside ePZ =17m.3s., ipPZ =17m.46s.
Tinemaha ePZ =17m.5s., ipPZ =17m.48s.
Pierce Ferry eP =17m.19s., e =18m.31s.
Tucson eP =17m.25s., ipP =18m.4s.
Lick iPZ =17m.36s.
Fresno ePZ =17m.42s.
Pasadena ipPEZ =17m.42s.
Santa Barabra epPZ =17m.43s.
Haiwee ipPZ =17m.47s.
Hungry Horse iP =18m.18s.
Stuttgart eZ =23m.45s., 23m.50s., and 27m.12s.
Paris ePKP =23m.53s., i =23m.58s.
Clermont-Ferrand iPKP =23m.59s.
Toledo e =24m.10s., i =24m.19s.?.

Feb. 25d. Readings also at 0h. (near Kulyab, Murgab, Obi-garm, and Stalinabad), 1h. (Kodaikanal and near La Paz), 3h. (near Kulyab, Obi-garm, and Stalinabad), 6h. (Huancayo), 7h. (Ksara, near Apia and near Tananarive), 10h. (near Lick), 11h. (near Basle and Zurich), 12h. (near Lick and near Mineral), 14h. (Andijan, near Kulyab, Obi-garm, Stalinabad, and near Alicante), 16h. (near Berkeley, Lick, and near Mizusawa), 17h. and 18h. (3) (near Mineral), 19h. (near Berkeley, Branner (2), Lick, Santa Clara, Fresno, Mineral, Shasta Dam, near Andijan, Kulyab, Obi-garm, Samarkand, and Stalinabad), 22h. (La Paz, Pierce Ferry, Hungry Horse, Branner, near Lick, Mineral, and Huancayo (2)).

Feb. 26d. Readings at 0h. (near Obi-garm and Kulyab), 1h. (Bogota), 3h. (near Lick), 4h. (Kew, Lick, near Fresno, and near Murgab), 5h. (near Apia), 7h. (Ksara and near Lick), 8h. (Hungry Horse and Pierce Ferry), 9h. (Hungry Horse and near Andijan), 10h. (near Mizusawa), 11h. (Hungry Horse), 12h. (Mount Wilson, Pasadena, Riverside, Palomar (2), Tinemaha (2), Pierce Ferry, Tucson (2), La Paz, Huancayo, Bogota, Stuttgart, and near Mineral, several shocks), 13h. (Hungry Horse and near Mineral (2)), 15h. (Hungry Horse, Tananarive, and near Andijan), 17h. (Tananarive), 18h. (Hungry Horse), 19h. (Tinemaha and near Grozny), 22h. (La Paz), 23h. (Tinemaha and Tucson).

Feb. 27d. 2h. Probably South Atlantic.

La Paz iPZ =16m.12s., iSE =23m.42s., L =33m.36s.
Riverview iPZ =19m.32s.a, iSKKSN =29m.59s., eSE =30m.6s., ePSN =31m.8s.
Tucson iP =25m.33s.
Palomar ePZ =25m.41s.
Riverside iPZ =25m.41s.
Mount Wilson ePZ =25m.43s.
Ksara e =25m.44s. and 36m.2s.
Tinemaha iPZ =25m.48s.
Shasta Dam eP =25m.56s.
Hungry Horse iP =26m.0s., e =29m.22s.
Scoresby Sund 29m.33s., L =68m.
Bombay eEN =36m.
Tananarive E =39m.10s.
Long waves were also recorded at Wellington, Berkeley, De Bilt, Paris, and Uccle.

Feb. 27d. 6h. 21m. 35s. Epicentre 32°·5N. 118°·6W. (as on 24d.).

Pasadena refines the position to 32°·2N. 118°·9W.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
La Jolla	1·2	72	i 0 22	− 2	i 0 38	− 3	—	—	—
Palomar	1·7	60	i 0 30a	− 1	—	—	—	—	—
Pasadena	1·7	12	i 0 30k	− 1	i 0 58	+ 4	i 0 34	P_g	—
Mount Wilson	1·8	15	i 0 31k	− 1	i 0 53	− 3	—	—	—
Riverside	1·8	35	i 0 33k	+ 1	i 0 56	0	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Santa Barbara		2·2	334	i 0 37k	− 1	i 1 4	− 2	—	—	—
Haiwee		3·7	8	i 1 0	0	—	—	—	—	—
Fresno		4·3	347	i 1 9	+ 1	i 2 2	+ 2	i 2 23	S_g	—
Tinemaha	z.	4·6	4	i 1 13	+ 1	—	—	—	—	—
Boulder City		4·7	41	i 1 14	0	i 2 38	S_g	—	—	—
Pierce Ferry		5·2	45	i 1 21	0	—	—	—	—	i 2·8
Lick		5·4	334	i 1 22	− 2	i 2 24	− 4	i 1 37	P*	—
Santa Clara		5·6	331	—	—	e 2 51	S*	—	—	e 3·5
Berkeley		6·1	332	e 1 37	+ 3	i 2 42	− 3	—	—	—
Tucson		6·6	90	e 1 38	− 3	e 3 3	+ 5	—	—	e 3·5
Mineral	z.	8·2	344	e 3 4	+61	i 3 11	?	—	—	—
Shasta Dam		8·7	341	e 2 11	+ 1	—	—	—	—	—
Hungry Horse		16·2	11	e 3 55	+ 5	—	—	—	—	e 8·4

Additional readings :—
Fresno iZ = 1m.21s., iN = 1m.27s., iSE = 1m.49s., iSN = 1m.59s., iE = 2m.6s., iN = 2m.12s.
Lick eN = 1m.27s.
Berkeley iZ = 52s., eN = 1m.43s., iZ = 2m.22s., eE = 3m.19s., iN = 4m.8s.
Tucson i = 1m.41s., iS = 3m.11s.
Long waves were also recorded at Bozeman, Lincoln, and Chicago.

Feb. 27d. Readings also at 1h. (Grozny), 4h. (near Mineral), 7h. (near Lick (2)), 13h. (near Mineral), 15h. (near Lick), 20h. (Toledo, near Alicante, Hungry Horse, and near Lick), 22h. (Hungry Horse, near Apia, and near Obi-garm).

Feb. 28d. 1h. 58m. 6s. Epicentre 53°·9N. 132°·1W. (as on 1945, Aug. 2d.).

A = −·3968, B = −·4391, C = +·8061 ; δ = +6 ; h = −7 ;
D = −·742, E = +·670 ; G = −·540, H = −·598, K = −·592.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Sitka		4·1	334	i 0 58	− 7	i 1 46	− 9	—	—	i 2·0
Victoria		7·7	131	1 54	− 2	i 3 28	+ 3	—	—	i 4·1
Hungry Horse		12·6	109	e 3 5	+ 2	—	—	—	—	i 6·7
College		13·5	330	e 3 17	+ 2	e 6 3	+16	—	—	e 6·8
Ferndale		14·3	155	e 3 32	+ 6	e 6 20	+14	—	—	—
Shasta Dam		14·7	150	e 3 30	− 1	e 6 40	+24	—	—	e 9·3
Butte	N.	14·8	114	e 3 33	+ 1	i 6 24	+ 6	—	—	e 6·9
Mineral		15·3	148	e 3 34	− 5	—	—	—	—	e 9·4
Saskatoon		15·4	86	3 45	+ 5	6 39	+ 7	—	—	7·4
Bozeman		15·8	113	e 3 49	+ 4	e 6 31	−11	—	—	e 6·8
Ukiah		15·9	154	e 3 49	+ 2	e 6 42	− 2	—	—	e 7·5
Berkeley		17·4	153	i 4 1	− 5	i 7 18	− 1	i 7 30	SS	e 10·0
San Francisco	E.	17·4	153	e 3 57	− 9	e 7 30	+11	—	—	—
Santa Clara		18·0	153	i 4 11	− 2	e 7 38	+ 6	—	—	—
Lick		18·1	153	i 4 8	− 6	e 7 42	+ 7	—	—	—
Logan		18·2	123	e 4 14	− 2	e 7 33	− 4	—	—	e 7·8
Salt Lake City		18·9	125	e 4 22	− 2	e 7 57	+ 4	—	—	e 8·6
Fresno		19·2	148	i 4 26	− 2	e 8 15	+16	—	—	—
Tinemaha		19·3	145	i 4 28	− 1	e 8 16	+14	—	—	—
Haiwee	z.	20·3	145	i 4 38	− 2	—	—	—	—	—
Rapid City	E.	21·2	105	i 4 54	+ 5	i 8 54	+13	—	—	i 11·3
Santa Barbara	z.	21·3	149	i 4 47	− 3	—	—	—	—	—
Boulder City		21·6	138	e 4 53	− 1	—	—	—	—	—
Pierce Ferry		21·8	137	i 5 14	+18	e 9 37	?	—	—	—
Mount Wilson	z.	22·0	147	i 4 54	− 4	—	—	—	—	—
Pasadena		22·1	147	i 4 54	− 5	i 8 59	+ 1	i 9 59	SS	—
Riverside	z.	22·5	147	i 4 58	− 4	—	—	—	—	—
Palomar	z.	23·2	145	i 5 7	− 2	—	—	—	—	—
La Jolla	z.	23·5	146	e 5 9	− 3	—	—	—	—	—
Tucson		26·4	136	i 5 37	− 3	e 10 20	+ 8	e 6 37	PP	i 11·9
Lincoln	E.	27·0	104	—	—	e 10 44	+22	—	—	e 14·1
Chicago		31·7	94	e 6 21	− 6	e 11 36	− 1	e 8 59	PcP	e 13·4
St. Louis		32·2	101	i 6 30	− 2	i 11 49	+ 4	7 28	PP	16·8
Kirkland Lake		32·6	78	i 6 40k	+ 5	—	—	e 14 36	SSS	e 17·0
Temiskaming		33·9	80	i 6 50k	+ 3	—	—	e 15 30	Q	e 17·8

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Cleveland		35·5	89	e 7 2a	+ 2	i 12 42	+ 6	e 8 31	PPP	—
Ottawa		36·6	79	7 12	+ 2	13 5	+ 12	—	—	18·2
New Kensington	E.	37·1	78	e 8 3	?	e 13 6	+ 5	—	—	e 16·3
Shawinigan Falls		37·7	75	7 21	+ 2	13 27	+17	16 36	SSS	19·9
Honolulu		38·0	221	—	—	e 13 14	0	(e 15 44)	SS	e 16·3
Pennsylvania		38·1	87	i 7 42	+20	e 13 24	+ 8	e 9 16	PPP	—
Seven Falls		38·5	74	7 29	+ 3	13 35	+13	8 57	PP	20·1
Georgetown		39·7	88	e 7 37	+ 1	e 13 48	+ 8	8 57	PP	18·9
Philadelphia		40·2	86	e 7 35	− 5	e 13 25	−23	i 9 19	PP	e 16·6
Fordham		40·4	84	e 7 43	+ 2	13 54	+ 4	i 9 22	PP	21·0
Columbia		40·7	98	e 9 23	PP	e 14 0	+ 5	—	—	e 16·7
Harvard		40·7	80	i 7 48	+ 4	e 14 9	+14	e 9 16	PP	e 19·9
Weston		40·9	80	i 7 47	+ 1	e 14 6	+ 8	9 18	PP	19·3
Halifax		44·0	73	—	—	—	—	e 18 12	SS	22·9
Scoresby Sund		46·3	26	8 34a	+ 5	15 40	+24	10 24	PP	23·9
Bermuda		51·5	86	e 9 24	+15	e 16 49	+20	e 11 29	PP	e 24·2
Vladivostok		59·8	303	i 10 6	− 3	i 18 20	0	—	—	—
San Juan		61·2	98	—	—	e 19 43	+65	—	—	e 26·6
Aberdeen		62·0	28	—	—	i 18 36	−12	i 23 48	SS	e 31·9
Upsala	N.	64·0	17	10 38a	0	19 21?	+ 8	e 13 2	PP	e 29·9
Irkutsk		64·2	326	10 38	− 1	19 21	+ 5	—	—	—
Copenhagen		67·0	21	e 10 59a	+ 2	20 4	+14	24 31	SS	—
Kew		67·5	31	i 11 9a	+ 9	e 20 8?	+12	e 13 44?	PP	e 32·4
Bogota	Z.	67·9	114	e 11 0?	− 2	—	—	e 24 19	SS	—
De Bilt		68·5	27	i 11 9a	+ 3	e 20 20	+12	i 11 42	P_cP	e 32·9
Sverdlovsk		69·1	353	i 11 11	+ 1	20 23	+ 8	—	—	—
Uccle		69·5	29	e 11 14k	+ 2	e 20 32	+12	e 24 54	SS	e 32·9
Potsdam		70·2	23	i 11 19k	+ 2	i 21 21	S_cS	i 13 56	PP	e 33·9
Moscow		70·4	6	11 20	+ 2	e 20 38	+ 8	—	—	—
Paris		70·7	30	i 11 23	+ 3	e 21 1	+27	e 13 58	PP	e 33·9
Warsaw		71·9	17	11 30k	+ 3	e 20 57	+ 9	e 21 26	PS	e 39·9
Cheb		72·2	23	i 11 39	+10	e 21 10	+19	e 17 48	?	e 39·9
Strasbourg		72·4	27	i 11 33	+ 3	e 21 10	+17	e 14 19	PP	e 34·4
Prague		72·6	22	e 11 30	− 1	e 21 9	+13	e 21 35	PS	e 37·9
Stuttgart		72·6	26	e 11 33	+ 2	e 21 16	+20	e 14 17	PP	e 37·9
Basle		73·3	27	e 11 38	+ 3	—	—	—	—	—
Zürich		73·7	27	e 11 40	+ 2	e 21 23	+15	e 15 10	PP	—
Toledo		76·5	39	e 11 56	+ 2	—	—	—	—	—
Triest		76·7	24	e 11 55	0	e 21 55	+14	—	—	—
Granada		79·0	40	—	—	—	—	34 4	!	i 43·5
Alicante		79·1	37	13 41	+93	23 1	+54	16 15	PP	40·1
Malaga	Z.	79·1	41	i 12 10k	+ 2	—	—	—	—	47·2
Almeria		79·7	39	12 4	− 7	21 54	−19	12 22	pP	39·9
Rome		79·9	26	—	—	e 27 49	SS	—	—	e 37·9
Frunse		80·9	341	e 12 28	+11	—	—	—	—	—
Huancayo		81·4	124	e 12 21	+ 1	e 22 40	+ 9	—	—	e 47·4
Andijan		83·4	342	e 12 34	+ 4	—	—	—	—	—
Tashkent		83·4	344	e 12 30	0	e 22 59?	+ 8	—	—	—
Istanbul		84·0	15	e 12 35	+ 2	—	—	—	—	—
Murgab		85·4	340	12 43	+ 3	23 16	+ 5	—	—	—
Obi-garm		85·9	343	i 12 43	0	—	—	—	—	—
Baku		86·1	359	—	—	e 23 30	+12	—	—	—
Stalinabad		86·2	344	e 12 44	0	e 23 15?	− 4	—	—	—
Kulyab		86·6	343	i 12 55	+ 9	—	—	—	—	—
La Paz		88·8	121	i 12 56k	− 1	23 38	− 6	i 16 25	PP	51·4
Ksara		92·0	11	e 13 14	+ 2	e 24 28	+16	—	—	—
Helwan		95·4	15	e 13 32	+ 4	24 8	[+ 5]	26 14	PS	—
Hyderabad	N.	104·3	329	18 17	PKP	—	—	—	—	—
Bombay		104·4	335	—	—	e 25 54	− 3	—	—	—
Riverview		109·5	240	e 28 22	PS	e 29 28	PPS	e 34 36	SS	e 50·3

Additional readings :—
Shasta Dam e = 4m.29s.
Butte eN = 4m.59s.
Mineral eN = 3m.38s., eE = 3m.13s., iZ = 4m.11s.
Bozeman i = 4m.17s.

Continued on next page.

Berkeley ePN =3m.44s., iPE =4m.4s., iN =4m.7s., eE =4m.11s., iN =5m.22s., eE = 7m.33s.
Lick eN =4m.14s., eE =4m.24s., eSN =7m.49s.
Logan iP =4m.21s.
Salt Lake City e =5m.3s., ePcP? =6m.37s.
Fresno iE =4m.30s., iZ =4m.34s., iN =4m.42s., iZ =4m.52s., iN =6m.37s., iZ =6m.53s.
Pierce Ferry i =5m.33s.
Tucson e =7m.17s., ePcP =8m.22s., iS =10m.32s.
Cleveland eZ =7m.8s. and 8m.24s., iSN =12m.46s., eSEN =12m.52s., eN =15m.12s., iE =15m.25s.
Honolulu SS is given as L.
Seven Falls SS =16m.5s.
Georgetown eSS =16m.34s.
Fordham iP =7m.46s.
Harvard eSS =17m.10s.
Weston SS =17m.2s.
Scoresby Sund 18m.57s.
Bermuda ePPP? =12m.36s., eScS =19m.23s., eSS =20m.32s.
Kew ePS?N =20m.18s.?, eSS?EN =24m.38s.?, eSSSS?E =27m.44s.?, eQEN =29m.24s.?
De Bilt ePP =13m.42s., ePPP =15m.24s., eSS =24m.54s., eSSS =28m.12s.
Uccle eE =11m.19s., eSSSN =28m.30s.
Potsdam iPPPZ =15m.42s., iPSN =20m.51s., eSS?N =25m.36s.?, eSSS?NZ =29m.0s.
Paris ePPP =15m.43s., e =21m.29s., eSS =25m.56s.
Warsaw eZ =11m.36s., PPZ =11m.45s., eSE =21m.2s., ePSE =21m.32s., eSSE =25m.36s., eSSSE =28m.42s., eN =31m.0s.
Cheb e =23m.26s., eSS =26m.48s.
Strasbourg eSS =26m.2s., eSSS =29m.24s.
Prague eSS =26m.0s., eSSS =29m.42s.
Stuttgart eP =11m.42s.a, ePPP =16m.6s., eSS? =25m.54s., eSSS =29m.51s.
Alicante PPP =17m.49s., PS =23m.37s., SS =28m.7s., SSS =31m.31s., Q =34m.5s.
Almeria PP =15m.0s., PcS =15m.45s., PPP =16m.51s., ScS =22m.15s., PS =22m.50s., PPS =23m.8s.
Huancayo e =24m.44s.
Istanbul e =8m.2s. (earlier than P).
La Paz SS =29m.46s.
Long waves were also recorded at Auckland, Ivigtut, Edinburgh, Clermont-Ferrand, and Helsinki.

Feb. 28d. Readings also at 0h. (near Obi-garm), 2h. (near Mineral), 6h. (near Mizusawa), 8h. (La Paz, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Shasta Dam, and Hungry Horse), 9h. (Shasta Dam and Pierce Ferry), 10h. (Brisbane and near Harvard (2)), 11h. (Andijan, Kulyab, Stalinabad, Vladivostok, and Sverdlovsk), 12h. (De Bilt, Uccle, near Tacubaya (2), near Kulyab, Obi-garm, and Stalinabad), 13h. (Wellington, near Andijan, Kulyab, Obi-garm, and Stalinabad), 14h. (near Berkeley), 15h. (La Paz), 17h. (Fresno and near Obi-garm), 18h. (Hungry Horse, near Lick and near Grozny), 20h. (Paris and Stuttgart), 21h. (Temiskaming, near Ottawa and Shawinigan Falls), 22h. (Brisbane and Kew).

Feb. 29d. 4h. Undetermined shock.

Shasta Dam eP =43m.58s.
Mineral ePZ =44m.1s., iZ =44m.15s.
Fresno ePNZ =44m.52s., iZ =44m.57s.
Tinemaha iPZ =44m.56s., iZ =45m.10s.
Haiwee ePZ =45m.3s.
Pierce Ferry eP =45m.18s.
Boulder City eP =45m.18s.
Mount Wilson iPZ =45m.19s., iZ =45m.29s.
Pasadena iPZ =45m.21s., iZ =45m.31s.
Santa Barbara ePZ =45m.21s.
Riverside ePZ =45m.26s., iZ =45m.34s.
Palomar iPZ =45m.34s., iZ =45m.42s.
Tucson iP =46m.5s.
Ottawa eZ =47m.39s., L =59m.
Butte eN =48m.24s., eLN =48m.36s.
Berkeley eZ =50m.36s., eN =51m.6s.
Kirkland Lake e =57m.42s. and 57m.48s., eL =60·4m.
Temiskaming iN =58m.18s. and 58m.29s., eZ =58m.34s.
Long waves were also recorded at other American stations.

Feb. 29d. Readings also at 0h. (Hungry Horse), 3h. (Bombay, Kodaikanal, and near Obi-garm), 4h. (near Obi-garm), 5h. (Hungry Horse, Bombay, and Kodaikanal), 8h. (Kulyab, Obi-garm, and near Mineral), 10h. (Tashkent, Almata, Stalinabad, near Andijan, Murgab (2) , Kulyab, Obi-garm ; Hungry Horse and near Mineral), 12h. (near Kulyab), 13h. (Erevan and Baku), 15h. (Toledo).

March 1d. 1h. 12m. 24s. Epicentre 2°·9S. 127°·3E.

$A = -\cdot6052$, $B = +\cdot7945$, $C = -\cdot0503$; $\delta = +3$; $h = +7$;
$D = +\cdot795$, $E = +\cdot606$; $G = +\cdot030$, $H = -\cdot040$, $K = -\cdot999$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Batavia		20·7	261	i 4 45	+ 1	c 8 38	+ 7	—	—	c 12·9
Guam		23·8	46	i 5 11	− 4	—	—	—	—	—
Perth		30·8	199	6 21	+ 1	11 58	+35	7 16	PP	—
Brisbane	N.	34·7	137	e 6 46	− 8	i 11 55	−29	i 7 53	PP	i 18·1
Nanking	N.	35·7	347	i 6 59	− 3	i 12 37	− 2	8 28	PP	—
Riverview		38·0	147	i 7 17a	− 4	i 12 54	−20	i 7 32	pP	—
Mizusawa		43·7	16	8 12	+ 4	14 44	+ 5	—	—	21·8
Calcutta	E.	45·7	306	i 8 24k	0	i 15 9	+ 1	i 9 10	PP	—
Vladivostok		46·0	5	i 8 26	− 1	i 15 13	+ 1	—	—	—
Colombo	E.	48·3	282	7 41	−64	14 39	−66	—	—	23·4
Kodaikanal	E.	51·3	286	i 9 13	+ 5	16 32	+ 6	11 14	PP	25·0
Hyderabad	N.	52·2	295	9 11	− 4	16 33	− 6	10 30	PcP	26·1
Auckland		55·2	134	9 35	− 2	17 18	− 2	9 56	sP	23·8
Kaimata		55·7	142	9 54	+14	17 25	− 1	19 29	ScS	—
New Plymouth		55·7	137	9 44	+ 4	17 26	0	—	—	—
Arapuni		56·3	135	9 48	+ 3	17 42	+ 8	12 0	PP	—
Wellington		57·2	139	9 47	− 4	17 36	−10	9 58	pP	28·2
Debra Dun	N.	57·4	310	(e 9 48?)	− 5	(e 17 36)	−13	—	—	—
Tuai		57·7	137	10 0	+ 5	17 47	− 6	—	—	—
Bombay		57·8	295	i 9 53	− 2	i 17 51	− 3	—	—	26·1
Irkutsk		58·3	344	10 0	+ 1	i 18 2	+ 1	i 12 11	PP	—
Apia		61·1	104	10 20	+ 2	i 18 38	+ 1	e 14 6	PPP	c 24·6
Frunse		65·8	320	i 10 49	0	—	—	—	—	—
Andijan		66·2	317	c 10 50?	− 2	i 19 44?	+ 4	—	—	—
Kulyab		66·8	313	i 10 56	0	i 19 48	0	—	—	—
Obi-garm		67·2	315	i 10 58	0	—	—	—	—	—
Stalinabad		67·8	315	i 11 3	+ 1	i 19 59	− 1	—	—	—
Tashkent		68·6	317	i 11 7	0	e 20 6	− 3	—	—	—
Samarkand		69·5	314	i 11 10	− 2	i 20 18	− 2	—	—	—
Honolulu		77·0	68	c 11 58	+ 2	c 21 40	− 5	e 14 45	PP	c 31·6
Tananarive		79·4	252	c 12 9	0	c 22 4	− 6	12 25	PcP	37·4
Sverdlovsk		79·9	330	i 12 11	− 1	i 22 4	−12	—	—	—
Baku		82·3	311	i 12 32	+ 7	e 22 38	− 2	—	—	—
Grozny		85·8	314	e 12 41	− 1	i 23 3	[− 3]	i 13 26	PcP	—
Erevan		86·4	311	c 12 46	+ 1	c 23 19	− 2	—	—	—
Piatigorsk		87·8	314	12 52	0	c 23 18	[− 1]	—	—	—
College		90·4	25	c 13 5	+ 1	c 24 1	+ 3	c 16 31	PP	i 36·8
Moscow		92·2	325	13 9	− 4	24 23	+ 9	—	—	—
Ksara		92·8	303	i 13 16a	0	c 24 28	+ 9	—	—	—
Theodosia	N.	93·4	315	c 13 16	− 2	c 23 51	[− 1]	—	—	—
Simferopol	N.	94·3	315	—	—	22 48	[−69]	—	—	—
Yalta		94·3	314	c 13 43	+20	23 59	[+ 2]	i 17 24	PP	—
Sitka		96·4	33	i 13 43	+11	i 24 44	− 6	c 17 28	PP	c 37·6
Helwan		96·6	300	i 13 32k	− 1	24 42	−10	17 21	PP	—
Istanbul	Z.	98·1	311	i 13 44	+ 4	25 8	+ 4	—	—	—
Helsinki		98·6	331	c 13 51	+ 9	i 24 13	[− 7]	i 17 53	PP	c 43·6
Bucharest		100·0	315	c 14 2	+14	(i 24 28)	[+ 1]	c 17 49	PP	39·6
Warsaw		102·0	323	13 57?a	0	i 24 38	[+ 1]	c 18 23	PP	c 46·6
Upsala		102·3	331	14 7a	+ 8	24 35	[− 3]	18 9	PP	c 45·6
Belgrade		104·0	316	c 14 5	− 1	i 24 48	[+ 2]	i 18 22	PP	c 64·1
Budapest		104·1	318	14 18	+10	24 46	[− 2]	18 38	PP	43·1
Raciborzu		104·4	321	c 14 12	+ 4	c 25 42	−15	c 18 37	PP	c 58·6
Kalossa		104·7	318	c 14 15	+ 6	c 24 49	[0]	c 26 4	S	c 41·6
Victoria		104·9	41	14 6	− 4	24 31	[−19]	18 12	PP	48·6
Seattle		105·8	42	c 19 44	PP	c 25 43	[+ 7]	c 28 40	PPS	c 49·7

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m. s.			m.
Ferndale	E.	105·9	49	e 18 44	PP	e 25 2	[+ 7]	—		—	e 50·7
Copenhagen		106·2	328	e 14 16	P	24 57	[+ 1]	20 59	PPP		—
Prague		106·8	322	e 14 29	P	e 24 52	[− 7]	e 18 55	PP		e 49·6
Potsdam		106·9	325	i 14 21	P	i 24 50	[− 9]	i 18 43	PP		e 51·6
Ukiah		106·9	50	e 18 55	PP	e 24 58	[− 1]	e 28 0	PS		e 43·9
Shasta Dam		107·2	48	e 14 21	P	e 25 0	[0]	e 18 53	PP		—
Collmberg	z.	107·3	323	e 18 2	PKP	e 25 57	{+11}	i 19 7	PP		—
Berkeley		107·9	52	i 14 25	P	i 25 0	[− 3]	i 18 4	PKP		—
Mineral	z.	107·9	49	e 15 33	?	—	—	e 18 56	PP		—
Cheb		108·0	323	e 14 24	P	i 25 10	[+ 6]	e 18 34	PP		e 61·6
Jena		108·2	323	e 14 30	P	e 25 4	[− 1]	e 18 57	PP		e 56·6
Santa Clara		108·2	52	e 14 30	P	e 25 1	[− 4]	i 19 4	PP		e 50·9
Lick		108·4	52	e 19 2	PP	e 25 9	[+ 4]	e 28 17	PS		—
Triest		108·4	318	e 14 25a	P	i 25 1	[− 4]	i 18 53	PP		—
Messina		108·8	310	—	—	e 26 58	S	—	—	—	—
Scoresby Sund		109·6	350	14 35	P	25 11	[0]	28 17	PS		—
Fresno		110·0	52	i 14 43	P	e 25 17	[+ 5]	i 19 19	PP		e 54·4
Padova		110·0	318	e 14 42	P	e 25 14	[+ 2]	19 10	PP		—
Rome		110·3	314	i 14 34a	P	25 18	[+ 5]	19 10	PP		—
Stuttgart		110·4	322	e 14 35a	P	e 25 10	[− 4]	e 19 14	PP		e 55·6
De Bilt		110·5	326	i 14 39	P	e 25 19	[+ 5]	e 18 28	PKP		e 54·6
Florence		110·6	316	e 14 49	P	i 25 18	[+ 3]	—	—		—
Salo		110·6	318	e 14 52	P	e 26 48	S	e 19 15	PP		—
Chur		110·8	319	e 17 54	?	—	—	e 19 18	PP		—
Hungry Horse		110·9	39	e 14 39	P	e 25 12	[− 4]	i 18 27	PKP		—
Tinemaha	z.	111·1	51	e 14 43	P	—	—	i 19 24	PP		—
Zürich		111·3	321	e 14 27	P	—	—	e 18 8	PKP		—
Strasbourg		111·4	322	i 14 38	P	e 25 18	[0]	e 18 6	PKP		53·6
Haiwee	z.	111·6	52	e 14 56	P	—	—	i 19 26	PP		—
Pasadena		111·8	55	e 14 43	P	i 25 23	[+ 3]	i 19 28	PP		e 45·7
Mount Wilson	z.	111·9	55	e 14 49	P	—	—	i 18 39	PKP		—
Basle		111·9	321	e 18 22	[−15]	—	—	e 19 27	PP		—
Neuchatel		112·5	321	e 18 36	[− 2]	e 28 41	PS	—	—		—
Riverside	z.	112·5	55	e 14 48	P	—	—	i 19 25	PP		—
Uccle		112·6	326	e 14 42a	P	e 25 21	[− 2]	18 34	PKP		e 57·6
Butte	N.	112·7	40	e 19 50	PP	e 25 22	[− 1]	e 28 55	PS		e 42·9
Aberdeen		112·8	333	e 18 28	[−11]	i 25 8	[−16]	i 28 46	PS		51·0
La Jolla		112·9	56	e 19 32	PP	i 25 59	[+35]	—	—		—
Palomar		113·1	55	i 14 57	P	i 25 32	[+ 7]	i 19 29	PP		—
Saskatoon		113·7	33	17 37	?	24 37	?	i 23 28	?		44·6
Bozeman		113·8	40	i 19 43	PP	i 25 28	[+ 1]	e 22 6	PPP		e 45·9
Durham		113·8	330	e 14 57	P	i 25 29	[+ 2]	i 19 46	PP		—
Edinburgh		114·0	332	e 19 3	[+22]	25 43	[+15]	20 1	PP		—
Boulder City		114·1	52	e 18 44	[+ 3]	e 25 35	[+ 6]	i 19 49	PP		—
Paris		114·5	323	i 14 49	P	e 25 28	[− 2]	e 18 22	PKP		e 57·6
Logan		114·6	45	e 14 59	P	i 25 28	[− 2]	e 18 39	PKP		e 46·4
Pierce Ferry		114·7	51	e 14 59	P	e 25 34	[+ 3]	e 18 54	PKP		—
Salt Lake City		114·9	46	e 19 52	pPKP	e 25 31	[− 1]	i 29 22	PS		—
Kew		114·9	327	e 14 53	P	e 25 3	[−29]	e 18 43	PKP		e 54·6
Reykjavik		114·9	346	e 19 16	?	e 25 32	[0]	e 20 3	PP		57·6
Clermont-Ferrand		115·4	320	e 14 58	P	i 25 35	[+ 2]	e 18 54	PKP		57·6
Jersey		117·0	327	e 16 36	?	e 29 56	PS	e 20 4	PP		—
Barcelona		117·8	316	20 3	• PP	25 31	[−11]	—	—		—
Tucson		118·3	55	e 15 16	P	e 27 2	{ 0}	i 18 51	PKP		e 48·1
Algiers		118·8	311	e 20 11	PP	25 45	[− 1]	27 6	SKKS		64·6
Rapid City	E.	119·5	39	e 19 4	[+12]	e 25 53	[+ 5]	e 20 21	PP		e 48·0
Alicante		120·8	314	15 36	P	25 53	[0]	20 31	PP		58·0
Ivigtut		121·7	357	i 19 38	[+42]	i 25 55	[− 1]	i 27 18	SKKS		59·6
Toledo		122·7	317	e 18 59	[+ 1]	36 52	SS	20 32	PP		—
Granada		123·5	314	i 16 19k	P	i 26 5	[+ 4]	16 42	pP		i 68·3

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Lincoln	E.	125·3	40	e 20 57	PP	e 25 58	[− 9]	e 27 43	SKKS	e 51·2
Lisbon		126·7	318	19 7a	[+ 1]	26 22	{+11}	21 6	PP	52·3
Manzanillo		127·1	68	e 18 52	[−14]	e 26 10	[− 2]	e 27 38	SKKS	e 58·4
Kirkland Lake		129·2	23	e 19 10	[0]	—	—	—	—	—
Ville Marie		130·1	23	e 19 12a	[0]	—	—	i 22 36	PKS	—
Chicago		130·2	34	e 21 33	PP	e 26 6	{−14}	e 22 38	PKS	e 51·7
St. Louis		130·7	38	19 30	[+17]	i 28 42	{+18}	i 19 40	pPKP	—
Temiskaming		130·8	23	e 19 14a	[0]	—	—	i 22 39	PKS	—
Tacubaya		131·7	66	e 19 20	[+ 5]	i 27 6	[+42]	i 21 47	PP	54·4
Ottawa		133·1	22	19 17	[− 1]	26 24	[− 3]	21 51	PP	58·6
Shawinigan Falls		133·1	18	19 20	[+ 2]	28 24	{−15}	21 36	PP	—
Seven Falls		133·2	16	19 31	[+13]	28 29	{−10}	21 53	PP	60·6
Cleveland		133·7	30	i 19 17	[− 2]	i 28 39	{− 4}	i 21 52	PP	—
Vermont		134·8	21	i 22 9	PP	i 26 31	[+ 1]	e 22 50	PKS	e 57·4
Pennsylvania		136·0	27	e 22 10	PP	i 26 42	[+ 9]	i 28 58	SKKS	—
Harvard		137·1	19	e 19 18	[− 7]	e 23 1	PKS	i 22 11	PP	e 69·6
Halifax		137·3	11	22 21	PKS	40 18	SS	24 35	PPP	65·6
Fordham		137·7	23	e 19 18	[− 8]	i 29 6	{− 1}	i 22 29	PP	—
Georgetown		137·8	28	19 17	[−10]	34 28	PPS	22 16	PP	—
Philadelphia		137·9	25	e 22 11	PP	e 32 32	SKSP	i 23 2	PKS	e 73·0
Columbia		139·3	36	e 23 3	PKS	e 29 13	{− 4}	e 40 35	SS	e 54·2
La Plata	E.	142·1	174	19 24	[−10]	29 18	{−16}	23 12	PKS	68·6
	N.	142·1	174	19 26	[− 8]	29 12	{−22}	23 10	PKS	70·8
Bermuda		148·6	19	i 20 6	{+21}	e 27 1	[+ 9]	e 23 26	PP	e 58·3
Balboa Heights		152·6	74	e 20 4	[+13]	—	—	—	—	—
Huancayo		153·0	123	i 19 58	[+ 6]	e 30 31	{− 4}	e 24 5	PP	e 56·6
La Paz		155·4	143	i 19 58a	[+ 3]	i 31 2	{+14}	i 20 24	pPKP	73·3
Bogota	Z.	158·6	82	e 20 38	PKP_2	e 28 26	PPP	i 24 51	PP	—
San Juan		159·8	37	e 20 0	[− 1]	e 31 10	{− 1}	e 24 28	PP	e 63·7
Fort de France		165·6	32	e 20 6	[0]	e 31 20	{−21}	e 24 57	PP	—

Additional readings and note :—
Batavia eSE = 8m.41s.
Perth PPP = 7m.40s.
Brisbane ePN = 6m.49s., iN = 6m.52s., 7m.10s., 8m.9s., 8m.12s., 11m.4s., and 11m.29s., iSSN = 13m.20s.
Nanking iN = 7m.19s., SSN = 14m.36s.
Riverview iPPE = 8m.40s., iEN = 8m.57s. and 9m.3s., iE = 9m.32s. and 12m.40s., iN = 12m.57s., iE = 13m.25s., Q = 15m.18s., iN = 15m.36s., iSSE = 15m.47s., iN = 16m.14s.
Calcutta iSSSE = 20m.0s.
Kodaikanal S_cSE = 18m.53s., SSE = 19m.53s.
Hyderabad PPN = 11m.28s., S_cSN = 19m.2s., SSN = 20m.37s.
Auckland P_cP? = 10m.34s., pP_cP = 10m.44s., i = 11m.15s. and 12m.23s., PPP = 12m.47s., i = 13m.46s., SP = 17m.37s., S_cS = 19m.22s., i = 20m.13s., and 21m.37s.
Arapuni e = 15m.6s., SSS = 24m.6s.
Wellington PP = 12m.1s., iZ = 12m.40s., i = 12m.52s., PPP = 13m.25s., P_cS = 13m.47s., i = 19m.6s., S_cS = 19m.30s., SS = 21m.36s., SSS = 24m.23s., Q = 25m.42s.
Dehra Dun readings reduced by 2 minutes.
Irkutsk PP = 11m.56s.
Apia S_cSEN = 20m.16s.
Honolulu e = 12m.53s., ePPP = 16m.22s., ePPS? = 22m.51s., eSS = 26m.52s., eSSS = 29m.49s.
Tananarive eSN = 22m.10s., PSE = 22m.46s., SSE = 27m.44s., Q = 33·6m.
College ePPP = 18m.55s., eSKS = 23m.32s., iPS = 25m.1s., iSS = 29m.57s., eSSS = 32m.19s.
Sitka iPPP = 19m.21s., eSKS? = 23m.48s., iSKS = 24m.8s., ePS = 25m.57s., iPS = 26m.12s., iSS = 31m.17s.
Helsinki e = 17m.12s., ePPP = 20m.6s., iSKS = 25m.17s., ePS = 26m.34s., e = 27m.39s. 29m.42s., eSS = 31m.48s., e = 39m.46s.
Bucharest iE = 18m.0s., eN = 18m.21s., iS?N = 23m.42s., ePS?N = 24m.13s., iSS?E = 28m.42s., eSS?N = 28m.49s., eSSS?N = 32m.10s., iSSS?E = 32m.20s., the reading entered as S is given as PSE.
Warsaw eP = 14m.0s., iPPE = 18m.26s., PPPZ = 20m.12s., PPPE = 20m.17s., iSKPE = 21m.27s., iSKPZ = 21m.33s., SKSZ = 24m.42s., iSKKSE = 25m.6s., SKKSZ = 25m.18s., iSE = 25m.27s., SN = 25m.30s., S?Z = 25m.53s., PPSZ = 28m.4s., PPSE = 28m.7s., PKKPE = 29m.1s., PKKPN = 29m.5s., iPKKS?E = 32m.54s., SSE = 33m.11s., SSN = 33m.19s., SSSE = 37m.6s., iSSSN = 37m.9s., SSSZ = 37m.24s., with many other readings given without phase.
Upsala P?N = 14m.21s., eE = 17m.6s., ePPN = 18m.13s., ePPPE = 20m.16s., PPPN = 20m.28s., PKSE = 22m.17s., ePSE = 27m.11s., eSS?E = 32m.5s., eSSN = 32m.32s., eSSS = 36m.36s., eE = 38m.57s.

Continued on next page.

Belgrade iPPP =20m.26s., ePS =27m.42s.
Budapest PKPE =18m.20s., PPN =18m.43s., iE =23m.1s., SKKSE =25m.40s., SKKSN =26m.4s., ePSN =27m.40s., PPSN =28m.34s., SSN =33m.34s., SSE =33m.49s., SSSN =37m.14s., eSSSE =38m.6s.
Raciborzu ePE =14m.17s., eN =27m.42s.
Kalossa eN =14m.28s.
Victoria PPP =20m.31s., SKKS =25m.35s., PS =27m.25s., SS =33m.8s.
Seattle e =21m.47s., eSS =33m.36s.
Ferndale eN =18m.54s. and 26m.19s.
Copenhagen 17m.55s. and 18m.52s., PS =27m.42s., PPS =28m.57s., SS =33m.45s.
Prague ePPP =21m.11s., eSKKS =25m.39s., e =26m.24s., ePS =27m.57s., ePPS =28m.36s., eSS =34m.12s., eSSS =38m.0s., e =43m.38s.
Potsdam eN =14m.30s., iEZ =18m.6s., iPPEN =18m.58s., iE =20m.57s., iPPPEZ =21m.9s., iSKSE =24m.54s., iSKKSE =25m.49s., iSKKSZ =25m.55s., iSN =26m.20s., iZ =27m.54s., iPSE =28m.2s., iZ =28m.24s., eZ =32m.30s., iN =33m.14s., iSSPE =34m.5s., eZ =37m.42s., iSSSE =37m.55s., iE =41m.4s., 41m.29s., and 42m.13s.
Ukiah eSKKS =25m.57s., eS =26m.24s., eSS =33m.41s.
Shasta Dam ePS =27m.59s.
Collmberg eSZ =27m.24s.
Berkeley ePZ =14m.32s., iE =14m.37s., eEN =18m.32s., iZ =18m.59s., iEZ =19m.2s., iN =19m.7s., iZ =22m.20s., eE =25m.4s., iPSN =26m.32s., eN =28m.10s., iSSN =34m.13s., eE =34m.46s.
Cheb e =19m.11s., ePPP? =21m.55s., iPPS =28m.48s., eSS =34m.36s., eSSS =38m.6s.
Jena ePKP?N =17m.52s., ePP?N =19m.6s. and 20m.10s., ePPP?Z =21m.4s., ePPP?E =21m.22s., eSKS?N =26m.22s., eE =28m.12s.
Santa Clara iPSEZ =28m.22s., eSSE =34m.39s.
Triest epP? =15m.23s., ePPP =21m.17s., iSKKS =25m.57s., ePS =28m.3s., iSS =34m.7s.
Scoresby Sund 17m.40s. and 18m.14s., PP =19m.11s., iSKKS =26m.10s., 28m.32s., PPS =29m.33s., SS =34m.42s., SSS =38m.51s.
Fresno eN =14m.49s., eE =18m.29s., eN =18m.36s., ePSZ =28m.33s.
Rome PPP =21m.44s., SKKS =26m.24s., PS =28m.53s.
Stuttgart ePKP =18m.0s., ePPP =21m.20s., eSKKS =26m.27s., ePS =28m.36s. and 29m.6s., eSS =34m.18s., eSSS =38m.42s.
De Bilt ePP =19m.18s., ePPP =21m.40s., ePS =28m.42s.
Salo PS =29m.8s.
Hungry Horse i =14m.49s., ePP =19m.12s., ePS =28m.39s., ePKKP =29m.35s., ePKP, PKP? =37m.53s.
Tinemaha iZ =15m.8s., eZ =18m.16s.
Zürich ePP =19m.15s., ePPP =21m.40s.
Strasbourg i =14m.54s., e =18m.34s., i =18m.37s., e =18m.42s., iPP =19m.28s. and 19m.31s., i =20m.40s. and 21m.11s., iPPP =21m.49s. and 21m.53s., i =22m.53s., 23m.2s., and 23m.40s., iSKS =25m.21s. and 25m.36s., iSKKS =26m.34s., iS =26m.58s., i =28m.31s., iPS =28m.44s. and 28m.50s., ePPS =29m.46s., iPPS =29m.49s. and 30m.2s., i =31m.28s. and 31m.50s., iSS =35m.6s., i =38m.35s., iSSS =38m.49s., i =43m.4s. and 43m.9s.
Haiwee eZ =18m.39s.
Pasadena iZ =18m.38s., iE =26m.22s., iS?EN =27m.6s., iPS =28m.45s., iSSN =34m.48s.
Basle ePPP =21m.36s.
Riverside eZ =18m.23s.
Uccle ePPEN =19m.32s., ePPP =21m.49s., eSN =27m.2s., ePSEZ =28m.52s., ePPSNZ =30m.6s., eSSEN =35m.13s., eSSSE =39m.17s.
Butte eN =20m.51s., eSKKSN =26m.30s., eSSN =35m.6s., eSSSN =39m.8s.
Aberdeen eN =17m.38s., SEN =19m.26s., iPSE =21m.44s., iN =25m.12s., iEN =29m.59s., iSSSE =33m.46s., readings wrongly identified.
Palomar eZ =18m.37s., ePSE =28m.58s.
Saskatoon PPS =27m.11s., SS =31m.42s., SSS =33m.30s ; phases wrongly identified.
Bozeman i =23m.9s., eSKKS =26m.30s., eS =27m.13s., iPS =29m.9s., iPPS =30m.17s., eSS =35m.3s., eSSS =39m.31s.
Durham eE =18m.34s., ePKPEN =18m.57s., eEN =19m.4s., iPPPEN =22m.9s., iSKKSEN =26m.34s., iEN =29m.3s. and 30m.19s.
Edinburgh PKS =22m.38s., SKKS =27m.5s., PS =29m.49s., PPS =31m.6s., SS =36m.11s., SSS =39m.40s.
Boulder City ePS =29m.15s.
Paris e =18m.44s., iPP =19m.43s. and 19m.52s., iPPP =22m.6s., ePPP =22m.16s., e =25m.9s., eSKS =26m.24s., eSKKS =26m.39s., e =27m.25s., iPS =29m.13s., PKKP? =29m.21s., i =29m.37s.?, iPPS =30m.36s., ePKKS =32m.22s., i =34m.3s., SS =35m.33s., ePKP,PKP =37m.27s., e =39m.9s.?, iSSS =39m.37s., 39m.50s., and 39m.56s., i =43m.31s. and 46m.10s., PPS? =46m.48s., SS? =55m.17s., eSSP? =58m.6s.
Logan ePP =19m.47s., ePS =29m.17s., eSS =35m.1s., eSSS =39m.55s.
Pierce Ferry iPP =19m.49s., ePS? =29m.22s.
Salt Lake City eSKKS =26m.44s., iSS =35m.43s.
Kew ePP =19m.52s., ePPPZ =22m.0s., eSKKSE =26m.42s., ePS?E =29m.13s., iPSZ =29m.20s., iZ =30m.26s., iSPP =30m.42s., iSSN =35m.56s., iE =39m.47s., iSSSN =40m.0s., e =47m.10s.
Reykjavik ePPP?N =22m.6s., eN =26m.45s., ePS?N =29m.6s., eSSN =35m.48s., eN =40m.0s.

Continued on next page.

Clermont-Ferrand ePP =19m.58s., iSKP =21m.47s., iPPP =22m.26s., iPS =29m.22s., iSS =35m.46s., iSSS =39m.50s.
Tucson i =19m.5s., iPP =20m.6s., eS =28m.6s., ePS =30m.2s., eSS =36m.25s., eSSS = 39m.46s.
Algiers PS =29m.50s. and 30m.2s., e =30m.7s., SS =36m.0s. and 36m.36s.?, i =37m.14s. and 39m.47s., SSS =40m.0s., e =49m.52s.
Rapid City ePPPE =22m.36s., eSKKSE =27m.6s., iPSE =30m.6s., ePPSE =31m.36s., iSSE =36m.43s., eSSSE =40m.55s.
Alicante pP =16m.1s., PKS =22m.37s., PP =23m.23s., SKKS =27m.45s., PS =30m.17s., PPS =31m.23s., PKKS =32m.35s., SS =37m.12s., SSP =37m.37s., SSS =42m.17s., Q =50m.55s.
Ivigtut i =30m.18s., SS =36m.48s., SSS =41m.42s.
Granada iPKP =19m.12s., pPKP =19m.27s., sPKP =20m.4s., iPP =20m.45s., pPP = 20m.57s., SKP =21m.52s., sSKP =22m.18s., PPP =23m.23s., pPPP =23m.34s., sSKS =26m.42s., iSKKS =27m.36s., sS =29m.6s., PS =30m.57s., PPS =32m.12s., iSS =37m.6s., SSS =42m.6s.
Lincoln ePKSE =22m.23s., ePSE =30m.45s., ePPSE =32m.19s.
Lisbon iPPZ =21m.17s., iPPEN =21m.20s., PKS? =22m.36s., PPPZ =24m.25s., N = 27m.4s., iPSE =31m.20s., EZ? =33m.38s., SSEN =38m.16s., Z? =49m.24s.?
Manzanillo eE =20m.14s., eZ =21m.46s., eSKPE =22m.4s., ePSE =31m.46s., eE = 34m.48s., eSSE =38m.18s.
Chicago eSKKS =28m.11s., eSKSP =31m.23s., ePPS =33m.12s., eSS =38m.47s.
St. Louis PP =21m.50s., iSKP =22m.57s., e =31m.44s.
Tacubaya ePKPE =19m.32s., iPKSE =22m.43s., iPKSN =22m.52s., iN =23m.13s., iPPPE =23m.58s., iSKKSE =28m.32s., eN =29m.28s., eSKSPZ =31m.50s., eN = 32m.55s., eSSEN =38m.53s.
Ottawa iZ =19m.26s., SKP =22m.47s., e =23m.44s., SKKS =28m.39s., i =32m.2s., PPS =33m.54s., SS =39m.36s., SSS =44m.36s.?
Shawinigan Falls SKP =22m.47s., PS =31m.42s., SSS =43m.36s.
Seven Falls SKP =22m.54s., PPP =24m.56s., S =30m.19s., PPS =33m.42s., SS = 39m.42s., SSS =44m.30s.
Cleveland iZ =19m.27s., eZ =19m.32s., iEZ =22m.0s., iSKPEN =22m.46s., iE = 22m.57s., iZ =23m.3s., iEN =32m.12s., iE =35m.8s.
Vermont iSKKS =28m.48s., iSKSP =32m.5s., ePS =32m.44s., e =37m.44s., iSS = 39m.55s., iPSPS? =41m.24s., iSSS? =43m.42s.
Pennsylvania iNE =22m.32s. and 22m.58s., eNE =34m.10s., 35m.27s., 36m.9s., and 41m.55s.
Harvard iSKSP =32m.28s., ePPS =34m.26s., eSS =40m.11s., eSSS =45m.6s.
Halifax SSS =45m.18s.
Fordham iSKP =22m.59s.
Georgetown 25m.16s., 35m.46s., and 37m.36s.?
Philadelphia iPP =22m.42s.
Columbia eSKS? =27m.51s.
La Plata E SKSP =33m.0s. and 40m.24s., PSS =44m.51s., 46m.24s., 48m.0s., SSS = 51m.0s., 56m.4s., and 58m.48s., Q =62m.17s.
La Plata N PP =22m.24s. and 31m.32s., SKSP =32m.48s., PS =34m.34s., PPS = 36m.20s. and 41m.49s., PSS =41m.55s., SSS =47m.10s. and 50m.54s., Q =63m.55s.
Bermuda ePPPS =38m.8s.
Huancayo ePPP =26m.38s., e =37m.9s., eSS =42m.37s., eSSS? =50m.31s.
La Paz iPKP$_2$E =21m.2s., iPPN =23m.39s., iPPZ =23m.58s., iZ =33m.16s., iN = 33m.48s., iPPS =37m.8s., iSS =45m.6s.
Bogota iPKP$_2$Z =21m.15s., ePPZ =25m.26s.
San Juan iPP =24m.36s., eSKS? =28m.42s., eSKKKS =31m.59s., eSKSP =34m.44s., iPPS =37m.51s., iPPPS =39m.34s., iSS =44m.32s., iSSS =50m.50s.

March 1d. 8h. 12m. 11s. Epicentre 34°·1N. 117°·4W. (as on 1940, April 18d.).

Intensity VI at Arlington, Burbank, Devore, Huntington, Park, Mount Wilson, Pasadena, Riverside, San Bernardino. Suggested epicentre 34°10′N. 117°32′W. Macroseismic area 4000 sq.m.

L. M. Murphy and F. P. Ulrich.
United States Earthquakes, 1948, Serial 746. Washington, 1951, pp. 13, 14, with macroseimic chart.

$A = -·3819$, $B = -·7367$, $C = +·5580$; $\delta = -6$; $h = 0$;
$D = -·888$, $E = +·460$; $G = -·257$, $H = -·495$, $K = -·830$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Riverside	0·1	—	i 0 8k	0	i 0 12	− 1	—	—	—
Mount Wilson	0·6	283	i 0 12k	− 3	i 0 19	− 7	—	—	—
Pasadena	0·6	275	i 0 14k	− 1	i 0 22	− 4	—	—	—
Palomar	0·9	149	i 0 22k	+ 2	—	—	—	—	—
La Jolla	1·2	174	i 0 27k	+ 3	i 0 47	+ 6	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Santa Barbara		2·0	280	i 0 34	− 1	i 0 59	− 3	—	—	—
Haiwee		2·1	347	i 0 34k	− 3	i 1 2	− 2	i 0 38	P*	—
Boulder City		2·8	48	e 0 47	0	i 1 33	S_g	i 0 54	P_g	—
Tinemaha		3·1	347	i 0 48k	− 3	i 1 33	+ 4	i 0 55	P*	—
Pierce Ferry		3·4	53	i 0 56	+ 1	i 1 49	S*	—	—	—
Lick	N.	4·7	314	e 1 18	+ 4	i 2 5	− 5	i 2 22	S*	—
Berkeley		5·4	315	i 1 21	− 3	i 2 20	− 8	e 1 32	P*	—
Tucson		5·8	106	e 1 30	+ 1	—	—	e 2 3	P_g	e 3·0
Mineral		7·1	333	e 1 46	− 2	i 3 35	S*	e 2 9	P*	—
Shasta Dam		7·7	330	e 2 14	P*	—	—	—	—	i 3·9

Additional readings :—
Lick iEN = 2m.30s.
Tucson e = 2m.13s.
Mineral iZ = 2m.14s. and 3m.22s., iSEN = 3m.38s.
Long waves were also recorded at Logan.

March 1d. 16h. 50m. 5s. Epicentre 26°·8N. 94°·0E. (as on 1943, October 23d.).

A = −·0623, B = +·8916, C = +·4485 ; δ = −2 ; h = +3 ;
D = +·998, E = +·070 ; G = −·031, H = +·447, K = −·894.

		△	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Bombay		21·0	253	e 4 46	− 1	e 8 39	+ 2
Almata		21·5	326	e 4 53	+ 1	—	—
Kulyab		23·2	305	e 5 10	+ 1	i 9 16	− 2
Obi-garm		23·6	307	e 5 14	+ 1	e 9 29	+ 4
Stalinabad		24·2	307	i 5 18	− 1	i 9 35	0
Tashkent		24·9	313	e 5 25	− 1	e 9 53	+ 6
Stuttgart	z.	67·1	315	e 10 55	− 2	—	—

No additional readings.

March 1d. Readings also at 0h. (near Istanbul), 1h. (Stuttgart), 4h. and 6h. (near Mineral), 7h. (near Mizusawa), 8h. (Hungry Horse), 10h. (Stuttgart), 12h. (Batavia), 13h. (Toledo), 14h. (Huancayo, near La Paz, Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Boulder City, Pierce Ferry, Shasta Dam, Mineral, Hungry Horse, Kirkland Lake, Ville Marie, and Temiskaming), 15h. (Istanbul), 16h. (Hungry Horse, Mineral, and Mizusawa), 17h. (near Mineral (3)), 18h. (Hungry Horse and near Andijan), 19h. (Stuttgart), 21h. (Kirkland Lake, Temiskaming, and near Ottawa), 23h. (near Kulyab and near Lick).

March 2d. Readings at 1h. (Pierce Ferry, Boulder City, and Hungry Horse), 2h. (Mount Wilson, Palomar, Riverside, Tinemaha, Tucson, Boulder City, Pierce Ferry, Hungry Horse, La Paz, Bogota, and Huancayo), 3h. (near Bogota), 5h. (near Ashkabad), 6h. (Batavia), 8h. (Pasadena, Palomar, Riverside, Tinemaha, Tucson, Boulder City, Pierce Ferry, Kirkland Lake, Ivigtut, Durham, Kew, Paris, Stuttgart, Toledo, and near Mineral), 9h. (De Bilt and Clermont-Ferrand), 10h. (near Mineral), 15h. (Boulder City, Pierce Ferry, and Stuttgart), 18h. (Ksara), 19h. and 21h. (near Ottawa), 23h. (near Apia).

March 3d. 2h. Peru. Strasbourg gives a depth of 150km.
Bogota iPZ = 28m.12s., iPPZ = 28m.15s., iPPPZ = 28m.18s., iP*?Z = 28m.45s., iP$_g$?Z = 29m.17s., iSZ = 30m.16s., iSSZ = 31m.33s.
Huancayo eP = 28m.38s., i = 29m.0s., e = 30m.19s., eS? = 30m.38s., eL = 30m.43s.
La Paz ePN = 30m.13s., iP = 30m.24s., iN = 33m.29s.
St. Louis iP = 34m.2s.
Tucson iP = 34m.41s., ipP = 35m.19s., e = 36m.19s.
Palomar iPZ = 35m.17s., ipPZ = 35m.56s.
Pierce Ferry iP = 35m.17s., epP = 35m.50s.
Riverside iPZ = 35m.21s., ipPZ = 35m.58s.
Mount Wilson iPZ = 35m.29s., ipPZ = 36m.4s.
Boulder City eP? = 35m.57s.
Pasadena ipPZ = 36m.6s.
Hungry Horse iP = 36m.15s.
Shasta Dam eP? = 36m.49s.
Paris iP = 38m.46s.
Clermont-Ferrand iP = 38m.48s.

March 3d. 9h. 9m. 52s. Epicentre 18°·8N., 119°·0E.

$A = -·4593$, $B = +·8285$, $C = +·3203$; $\delta = -4$; $h = +5$;
$D = +·875$, $E = +·485$; $G = -·155$, $H = +·280$, $K = -·947$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Nanking		13·2	359	i 3 14	+ 3	i 5 26	−14	—	—	i 6·1
Guam		25·3	98	i 5 31	+ 1	e 9 49	− 5	—	—	—
Vladivostok		26·6	22	i 5 41	− 1	i 10 16	0	—	—	—
Batavia		27·6	207	i 5 49	− 2	i 10 28	− 4	i 6 37	PP	i 16·1
Mizusawa	E.	27·9	38	5 54	0	10 40	+ 3	—	—	—
	N.	27·9	38	e 5 59	+ 5	10 37	0	—	—	—
Calcutta	E.	28·9	283	i 6 10a	+ 7	i 11 1	+ 8	i 7 3	PP	—
Irkutsk		35·3	344	e 6 58	− 1	12 34	+ 1	—	—	—
Hyderbad		38·5	275	7 28	+ 2	13 19	− 3	8 59	PP	—
Dehra Dun	N.	38·8	296	e 13 8	S	(e 13 8)	−18	e 18 8	SeS	e 21·3
Colombo	E.	39·9	258	7 41	+ 4	16 13	SS	—	—	20·2
Kodaikanal	E.	41·0	265	7 46	0	—	—	9 6	PP	—
Almata		42·9	315	i 8 5	+ 3	—	—	—	—	—
Bombay		43·6	278	e 8 8	0	i 14 31	− 7	i 10 8	PP	21·7
Murgab		43·6	307	8 6	− 2	14 33	− 5	—	—	—
Frunse		44·4	313	i 8 17	+ 3	—	—	—	—	—
Andijan		45·4	309	8 31	+ 9	e 15 16	+12	—	—	—
Kulyab		46·7	305	i 8 41?	+ 9	i 15 27?	+ 5	—	—	—
Obi-garm		46·9	306	i 8 34	0	i 15 22	− 3	—	—	—
Stalinabad		47·6	306	i 8 38	− 1	i 15 32	− 3	—	—	—
Tashkent		47·8	310	e 8 37	− 4	e 15 33	− 5	—	—	—
Perth		50·6	183	—	—	i 16 15	− 2	i 21 48	SSS	—
Brisbane	N.	56·6	144	i 9 40	− 7	i 17 33	− 5	e 11 32	PP	—
Sverdlovsk		57·3	327	i 9 51	− 1	i 17 46	− 1	—	—	—
Riverview		60·7	150	i 10 16a	+ 1	i 18 35	+ 3	i 12 30	PP	27·3
Baku		62·3	307	i 10 32	+ 6	e 19 6	+14	—	—	—
Grozny		65·3	310	e 10 47	+ 1	19 29	0	—	—	—
Erevan		66·4	307	e 10 56	+ 3	19 45	+ 2	—	—	—
Piatigorsk		67·2	311	e 10 57	− 1	—	—	—	—	—
Sotchi	N.	69·6	311	e 11 12	− 1	—	—	—	—	—
Moscow		69·8	324	11 13	− 1	20 20	− 3	—	—	—
Theodosia	N.	72·5	313	e 11 29	− 1	20 54	0	—	—	—
Yalta		73·5	312	e 11 34	− 2	21 2	− 4	—	—	—
Ksara		74·2	300	i 11 40a	0	e 21 18	+ 4	—	—	—
College		74·5	26	e 11 44	+ 2	e 21 22	+ 5	e 14 32	PP	e 31·8
Apia		75·5	110	e 11 48	0	e 21 40	+12	—	—	e 34·1
Helsinki		75·9	330	e 11 48	− 2	i 21 27	− 5	e 26 22	SS	e 31·1
Auckland		76·4	137	11 58	+ 5	21 40	+ 2	16 45	PPP	32·0
New Plymouth	E.	77·2	139	12 12	+15	21 50	+ 3	13 11	?	—
Honolulu		77·3	71	e 11 58	0	e 21 46	− 2	e 14 45	PP	e 31·6
Arapuni		77·6	138	—	—	21 44	− 7	33 8	Q	38·3
Istanbul		77·9	309	i 12 3	+ 2	e 21 54	0	—	—	—
Helwan		78·9	297	e 12 4	− 3	i 21 59	− 6	22 41	PS	—
Wellington		79·0	141	12 8	+ 1	22 1	− 5	15 1	PP	38·9
Bucharest		79·1	313	e 12 10	+ 2	e 22 6	− 1	—	—	38·1
Tananarive		79·5	246	—	—	e 27 28	SS	—	—	e 33·7
Upsala		79·5	330	e 12 14	+ 4	22 4	− 7	14 59	PP	e 38·1
Warsaw		80·1	322	i 12 13a	0	22 15	− 3	15 17	PP	e 35·1
Raciborzu		82·5	320	i 12 28	+ 2	e 22 38	− 4	e 15 35	PP	—
Belgrade		82·8	314	i 12 26a	− 1	e 22 40	− 5	e 15 10	PP	—
Budapest		82·8	317	e 12 25	− 2	22 43	− 2	15 46	PP	39·6
Sitka		82·8	32	e 12 27	0	i 22 40	− 5	e 15 53	PP	e 34·6
Kalossa	E.	83·2	317	12 33	+ 4	e 22 52	+ 3	e 23 34	PS	e 44·6
Copenhagen		83·6	327	e 12 29	− 2	22 50	− 3	—	—	—
Potsdam		84·6	324	i 12 38a	+ 2	i 23 4	+ 1	i 15 57	PP	e 38·1
Prague		84·8	321	e 12 36	− 1	e 22 58	− 7	e 15 56	PP	e 36·1
Collmberg		85·1	323	i 12 40	+ 1	e 22 5	−63	i 13 3	?	e 35·1
Cheb		86·0	322	e 12 41	− 2	i 23 13	− 4	e 16 8	PP	e 40·1
Jena		86·1	322	e 12 43	− 1	e 23 22	+ 4	e 16 4	PP	e 38·1
Scoresby Sund		86·9	348	12 47a	− 1	23 15	[+ 2]	16 14	PP	—
Triest		86·9	318	i 12 47a	− 1	e 23 9	[− 4]	i 16 7	PP	e 31·0

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m. s.			m.
Stuttgart		88·4	322	e 12 52	− 3	e 23 45	+ 5	e 16 28	PP		e 41·1
Messina		88·6	310	e 12 58	+ 2	i 23 29	[+ 5]	—	—		—
Padova		88·6	317	12 55	− 1	23 23	[− 1]	23 41	S		—
Salo		89·0	319	12 58	0	23 44	− 1	13 13	pP		—
Chur		89·1	320	e 12 55	− 3	e 23 24	[− 3]	e 16 26	PP		—
De Bilt		89·1	326	i 12 58a	0	e 23 46	0	i 16 28	PP		e 40·1
Catania		89·3	309	e 12 58	− 1	e 23 44	− 4	13 19	pP		—
Florence		89·3	316	i 13 18	+19	i 23 43	− 5	i 14 25	pP		—
Rome		89·3	314	i 12 56a	− 3	i 23 26	[− 3]	i 13 16	pP		41·0
Strasbourg		89·3	322	i 13 0a	+ 1	i 23 50	+ 2	e 16 30	PP		i 36·2
Zürich		89·4	321	e 12 58a	− 2	e 23 47	− 2	e 16 27	PP		—
Aberdeen		89·9	333	—	—	i 23 30	[− 2]	i 23 50	S		40·5
Basle		89·9	319	e 12 59	− 3	e 23 54	0	e 16 36	PP		—
Neuchatel		90·6	321	e 13 2	− 3	e 23 33	[− 3]	—	—		—
Durham	N.	91·0	330	13 8	+ 1	i 23 41	[+ 2]	i 25 23	PS		—
Edinburgh		91·1	331	25 8	PS	23 30	[− 9]	23 54	S		—
Paris		92·2	323	i 13 14	+ 1	i 23 47	[+ 1]	i 16 56	PP		e 44·1
Kew		92·3	326	e 13 11	− 2	e 23 45?	[− 1]	e 30 27	SS		e 46·1
Clermont-Ferrand		92·5	320	i 13 19	+ 5	i 23 58	{− 2}	i 17 4	PP		43·1
Victoria		93·0	36	13 5	−12	24 20	− 1	—	—		39·1
Seattle		94·1	36	e 14 50	?	e 24 56	+25	e 32 2	?		e 51·4
Jersey		94·5	326	e 14 8?	+45	e 23 49	[− 9]	—	—		40·1
Barcelona		96·4	317	e 17 20	PP	e 24 10	[+ 1]	—	—		e 44·9
Shasta Dam		97·9	42	e 13 39	0	e 24 18	[+ 2]	e 17 3	PP		—
Hungry Horse		98·1	32	e 13 39	− 1	e 24 35	{− 6}	i 30 8	PKKP		—
Ukiah		98·2	43	e 19 26	PPP	e 25 27	+22	e 32 53	?		e 41·5
Algiers		98·4	312	13 40	− 1	i 24 18	[− 1]	i 17 44	PP		43·1
Mineral	Z.	98·6	42	i 13 43	+ 1	—	—	—	—		—
Saskatoon		99·0	26	e 15 51?	?	—	—	—	—		41·1
Berkeley		99·5	44	i 13 48	+ 2	i 24 24	[− 1]	? 13 56	PcP		—
Ivigtut		99·6	353	—	—	i 24 25	[0]	32 20	SS		45·1
Alicante		99·7	316	e 13 57	+10	i 24 26	[0]	14 12	pP		e 47·4
Santa Clara		100·0	44	—	—	e 24 36	[+ 9]	—	—		—
Butte	N.	100·4	33	e 27 20	PS	e 24 26	[− 3]	e 25 28	S		e 40·3
Toledo		101·1	317	e 13 53	0	24 34	[+ 2]	—	—		—
Bozeman		101·4	33	e 18 18	PP	e 24 40	[+ 6]	e 27 18	PS		e 41·5
Fresno	Z.	101·7	44	i 13 58	+ 2	—	—	i 18 6	PP		—
Granada		102·4	316	14 20	+21	i 24 29	[−10]	16 24	pP		i 48·2
Tinemaha	Z.	102·6	43	i 14 3	+ 3	—	—	e 17 19	?		—
Logan		103·6	36	e 14 20	+16	e 24 37	[− 7]	e 18 23	PP		e 44·2
Salt Lake City		104·2	37	e 18 18	PKP	e 24 49	[+ 2]	e 27 48	PS		e 44·0
Mount Wilson	Z.	104·3	45	i 14 11	+ 3	—	—	e 30 19	PKKP		—
Pasadena		104·3	45	i 14 8	0	i 24 51	[+ 4]	e 27 38	PS		e 47·1
Riverside	Z.	104·9	45	e 14 23	+13	—	—	e 30 25	PKKP		—
Lisbon		105·0	320	18 35a	PP	—	—	—	—		50·1
Boulder City		105·4	43	e 18 32	PKP	—	—	—	—		—
Palomar	Z.	105·6	46	i 14 15	P	—	—	i 18 32	PKP		—
Pierce Ferry		105·9	42	e 14 17	P	—	—	i 18 41	PP		—
Rapid City	E.	106·5	30	e 17 42	?	e 24 56	[− 1]	e 18 46	PP		e 44·9
Tucson		110·3	43	e 14 34	P	e 25 29	[+16]	e 28 38	PS		e 45·0
Kirkland Lake		111·2	13	e 18 38	[+ 2]	—	—	e 19 20	PP		—
Lincoln	E.	112·0	28	—	—	e 25 13	[− 7]	e 28 43	PS		e 46·4
Temiskaming		112·8	12	e 18 50	[+11]	—	—	i 19 44	PP		—
Seven Falls		113·8	6	e 27 9	?	e 39 2	SSS	—	—		48·1
Ottawa		114·7	11	18 42	[− 1]	25 36	[+ 5]	19 31	PP		52·1
Chicago		114·9	22	e 19 33	PP	e 25 30	[− 2]	e 29 16	PS		e 46·3
Vermont		116·1	9	e 22 22	PPP	e 25 31	[− 5]	e 29 33	PS		e 51·0
St. Louis		116·6	25	e 18 46	[0]	e 25 40	[+ 2]	i 19 56	PP		—
Halifax		116·8	2	—	—	e 29 50	PS	e 35 50	SS		56·1
Cleveland		117·1	17	e 18 47	[0]	i 29 41	PS	i 20 7	PP		51·0
Fordham		119·5	10	18 53	[+ 1]	30 8	PS	—	—		—
Philadelphia		120·1	12	24 52	?	e 30 20	PS	e 36 53	SS		e 49·0
Georgetown		120·7	13	i 18 57	[+ 3]	27 32	{+14}	i 20 23	PP		68·1
Columbia		124·1	19	e 21 45	PP	e 26 22	[+19]	e 30 51	PS		e 50·7
Bermuda		129·0	3	e 20 34	PP	e 26 33	[+16]	e 22 41	PKS		e 59·5

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
San Juan		142·7	7	e 19 38	[+ 3]	e 29 38	{+ 1}	e 23 12	PP	e 57·3
Fort de France		146·7	359	e 19 44	[+ 2]	—	—	—	—	—
Balboa Heights		146·9	33	e 19 46	[+ 4]	—	—	—	—	—
Bogota	Z.	153·4	29	i 19 55	[+ 3]	i 27 10	[+12]	e 23 45	SKP	—
La Plata	E.	163·7	189	20 14	[+10]	45 5	SS	25 2	PP	84·1
	N.	163·7	189	20 14	[+10]	31 20	{−11}	24 51	PP	80·8
Huancayo		164·6	66	e 20 13	[+ 8]	e 31 30	{− 6}	e 24 52	PP	e 70·0
La Paz		172·8	72	i 20 14	[+ 3]	i 27 2	[−10]	i 20 24	pPKP	81·6

Additional readings :—
Batavia iPE = 5m.54s., iSSEN = 12m.40s.
Calcutta iPPPE = 7m.17s.
Hyderabad SS = 16m.15s., S_cS = 17m.30s.
Kodaikanal PPPE = 9m.56s., PSE = 13m.32s., SS?E = 16m.7s.
Bombay ePPN = 10m.4s., iSSN = 17m.59s., iSSE = 18m.4s.
Perth i = 20m.4s.
Brisbane iPEN = 9m.43s., iN = 9m.46s. and 12m.26s., eSN = 17m.26s.
Riverview i = 10m.30s., iP_cPN = 10m.54s., iPPPZ = 14m.0s., iN = 14m.9s. and 18m.24s., iPPSZ = 19m.1s., iS_cS?E = 20m.11s., iSSE = 22m.21s., iN = 24m.4s., SSSE = 25m.12s., eQ = 25·3m.
College eSS? = 26m.0s., eSSS = 29m.44s.
Helsinki i = 12m.1s., iS = 21m.43s., e = 28m.32s.
Auckland S_cS = 22m.5s.
Honolulu eSS = 27m.2s., eSSS = 30m.8s.
Wellington P_cPZ = 12m.19s., iZ = 15m.37s. and 18m.19s., S_cS = 22m.27s., SS = 27m.18s., SSS = 30m.0s., Q = 33m.2s., SKKS = 37m.29s.
Bucharest iSE = 22m.11s.
Upsala eN = 15m.27s., ePPPN = 16m.41s., PSN = 22m.44s., iN = 23m.24s., eSS = 27m.8s., eSSSN = 30m.41s.
Warsaw PE = 12m.16s., iP_cPZ = 12m.20s., iZ = 13m.52s., eE = 14m.48s., ePPN = 15m.3s., PPPZ = 17m.12s., PPPN = 17m.18s., SEN = 22m.20s., S_cSZ = 22m.32s., S_cSE = 22m.41s., PSN = 22m.49s., iPPSZ = 23m.4s., PPSE = 23m.12s., iZ = 26m.59s., SSZ = 27m.31s., SSN = 27m.41s., SSSN = 31m.4s., SSSE = 31m.10s.
Raciborzu eE = 16m.58s., eS?N = 23m.1s.
Belgrade eP_eP = 12m.47s.
Budapest PN = 12m.28s., PPPN = 17m.42s., PSE = 23m.22s., PSN = 23m.25s., PPSE = 23m.44s., PPSN = 23m.50s., eSSE = 27m.57s., eSSSE = 31m.23s.
Sitka ePPS = 23m.57s., eSS = 28m.32s., eSSS = 31m.46s.
Kalossa iE = 13m.8s., eE = 14m.13s., eN = 14m.34s., eSN = 22m.8s.?
Copenhagen i = 22m.56s.
Potsdam iSN = 22m.59s., iPSE = 23m.49s., iPSZ = 23m.53s.
Prague ePPP = 18m.8s., eSKS = 22m.44s., ePPS = 24m.8s., eSS = 28m.38s., eSSS = 32m.8s.?
Cheb ePPP? = 17m.48s., eSS = 29m.18s., eSSS = 32m.23s.
Jena ePPE = 16m.8s., ePPN = 16m.13s. and 16m.16s., eSKSN = 23m.12s., eSN = 23m.26s.
Scoresby Sund 16m.0s., S = 23m.32s., PS = 24m.43s., SS = 29m.18s., SSS = 35m.59s.
Triest iPPP = 17m.56s., iS = 23m.39s., iPS = 24m.28s., eSS = 29m.13s.
Stuttgart i = 13m.13s.a, eSKS = 23m.18s., ePS = 24m.32s., ePPS = 25m.21s., eSS = 29m.36s.
Salo eE = 23m.47s., eN = 23m.56s.
De Bilt iPPP = 18m.28s., iSKS = 23m.30s., eSS = 29m.44s.
Rome PS = 25m.13s., SS = 30m.7s., i = 33m.12s. and 36m.36s.
Strasbourg i = 13m.18s. and 14m.14s., iPP = 16m.35s., ePPP = 18m.23s., iPPP = 18m.31s., ePPP = 18m.38s., eSKS = 23m.17s., iSKS = 23m.32s., iS = 23m.54s., iSP = 24m.50s. and 24m.55s., iPPS? = 25m.20s., iSS = 29m.51s. and 30m.3s., iSSS = 33m.44s.
Zürich eSKS = 23m.13s.
Aberdeen iEN = 31m.27s.
Basle eSKS = 23m.40s.
Durham iSN = 24m.10s.
Paris iP = 13m.17s., i = 13m.31s., 13m.52s., and 14m.8s., iPP = 16m.50s., i = 17m.41s., ePPP = 18m.45s., eS = 24m.4s., iPS = 25m.25s., SS = 30m.7s., SSS = 34m.19s., $SKKS_c$? = 37m.22s., PKP,PKP = 39m.0s., e = 39m.26s., eQ = 40m.8s. ?
Kew eSEN = 24m.10s., eSSSN = 34m.42s., eQN = 40m.8s.?
Clermont-Ferrand i = 13m.37s. and 17m.28s., iS = 24m.43s., iSS = 31m.1s.
Victoria S = 23m.30s., SS = 29m.56s.
Hungry Horse iP = 13m.42s., e = 16m.32s., ePKP,PKP = 38m.57s.
Algiers i = 14m.6s. and 17m.21s., ePP = 17m.41s., e = 23m.27s., PS = 26m.9s., eSS = 31m.9s.
Saskatoon e = 22m.25s., 23m.20s., and 30m.8s.?
Berkeley iZ = 17m.0s., iE = 18m.14s., iN = 18m.17s., iSKSE = 24m.29s., iE = 24m.34s. and 25m.9s., iN = 25m.27s., iSE = 27m.0s., iZ = 27m.27s., iN = 27m.30s., eN = 32m.14s., eE = 32m.20s.
Alicante PP = 17m.45s., PKP = 18m.3s., PPP = 19m.35s., SKS = 23m.43s., S_cS = 24m.40s., PS = 26m.7s., PPS = 26m.55s., PKKP = 29m.6s., SS = 31m.39s., SSS = 35m.39s., Q = 41m.15s.
Bozeman eS = 25m.40s., eSS = 32m.44s., eSSS = 36m.33s.
Fresno eE = 14m.10s. and 18m.19s., eN = 18m.32s.

Continued on next page.

Granada sP =16m.58s., iPP =18m.19s., pPP =20m.1s., SKKS =24m.45s., pS =27m.27s., sS =28m.22s., iSS =32m.34s.
Logan e =19m.45s., eSS? =32m.9s.
Salt Lake City ePP? =19m.27s., e =20m.31s., eSKKS −25m.37s., eS −26m.4s., eSS = 32m.51s., eSSS =37m.11s.
Mount Wilson iZ =14m.33s., ePPZ =17m.31s.
Pasadena ePPZ =17m.55s., eSN =25m.56s., eZ =28m.27s., iZ =29m.13s., eSSE = 33m.8s., eSSSN =37m.8s., eQN =42·1m.
Palomar iZ =14m.46s., and 17m.42s., iPKKPZ −30m.7s.
Pierce Ferry i =17m.24s.
Rapid City eE =19m.18s., eSE =26m.24s., ePPS?E =29m.30s., eSSE =33m.56s., eSSSE =37m.58s.
Tucson e =14m.50s. and 17m.56s., ePKP? =18m.15s., ePPP =21m.21s., eS =26m.20s., iPKKP =29m.50s., ePPS? =30m.29s., eSS? =33m.35s., eSSS =38m.54s.
Lincoln eSKKSE =26m.31s., eSSE =35m.14s., eSSSE =39m.13s.
Seven Falls e =29m.4s. and 34m.49s.
Ottawa PS =29m.14s., SS =35m.44s., SSS =40m.32s.
Chicago eS =27m.29s., ePPS =30m.39s., eSS =35m.29s., eSSS? =40m.49s.
Vermont eS =27m.48s., ePPS =30m.41s., eSS =35m.53s.
St. Louis iS =27m.46s., iSP =29m.41s., iSS =36m.6s.
Cleveland eZ =19m.52s., iN =19m.57s., iZ =20m.16s., eN =20m.41s., eE =20m.48s. eSKPE =21m.27s., eN =24m.24s., eSE =27m.49s., iPPSN =31m.4s., iSSN = 36m.16s., iSSE =36m.20s.
Columbia eSS =37m.38s., eSSS? =43m.20s.
Bermuda eSKSP =31m.16s., eSS =39m.4s., eSSS =53m.40s.
San Juan ePPP =25m.36s., iSKS? =27m.37s., eSKSP =32m.31s., ePPS =35m.22s., eSS =41m.12s., eSSS =46m.14s.
Bogota iPKP$_2$Z =20m.24s.
La Plata E. SSS =49m.56s., 62m.56s., Q =66m.14s.
La Plata N. 20m.56s., PPP =29m.14s., SKSP =35m.15s., PPS =38m.32s., PSS = 46m.12s., SSS =50m.44s., Q =65m.20s.
Huancayo eSKS =28m.4s., ePPP =28m.27s., eSKKKS =32m.16s., ePPS? =38m.54s., eSS =45m.23s., eSSS =51m.57s.
La Paz iPPZ =25m.32s., iSKKSZ =32m.31s., iPPSE =39m.58s., iSSEN =46m.40s., QN =72m.8s.
Long waves were also recorded at Reykjavik and Harvard.

March 3d. Readings also at 4h. (Mount Wilson, Riverside, Tucson, Hungry Horse, Shasta Dam, near La Paz, and near Tacubaya), 6h. (Batavia), 11h. (Mineral), 12h. (Ashkabad, Stalinabad, Hungry Horse, Shasta Dam, and Brisbane), 13h. (La Paz, Brisbane, and Riverview), 16h. (Fresno and near Pierce Ferry), 19h. (near Irkutsk), 22h. (Paris, Clermont-Ferrand, Riverside, Tucson, Hungry Horse, and Pierce Ferry), 23h. (Stuttgart).

March 4d. 1h. 52m. 59s. Epicentre 10°·5S. 74°·9W. (as on 1947, Nov. 25d.).

Intensity V at Villa Rica (Oxapampa); IV at Oventeni; III-IV at Cerro de Pasco. Epicentre 10°S. 75°W.

E. Silgado.
Datos Sismologicos del Peru, 1948, Instituto Geologica del Peru, Bol. 13, Lima, 1949, p. 12, Map with epicentre, p. 8.

$A = +·2562$, $B = -·9495$, $C = -·1811$; $\delta = -1$; $h = +6$;
$D = -·965$, $E = -·261$; $G = -·047$, $H = +·175$, $K = -·983$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Huancayo		1·6	195	i 0 27	− 3	—	—	—	—	—
La Paz		8·9	133	i 2 13	+ 1	i 4 11	+12	—	—	—
Bogota		15·0	3	i 3 42	+ 7	i 6 25	+ 2	—	—	—
Balboa Heights		19·9	348	i 4 42	+ 6	e 8 35	+20	—	—	—
Fort de France		28·5	30	e 5 56	− 3	—	—	—	—	e 14·1
La Plata	E.	28·8	150	5 52	−10	10 52	+ 1	6 37	PP	14·5
	N.	28·8	150	5 53	− 9	11 14	+23	—	—	14·6
San Juan		30·0	17	e 6 17	+ 5	e 11 21	+11	—	—	e 12·1
Tacubaya	E.	38·2	322	i 7 31	+ 8	e 13 34	+17	—	—	—
Bermuda		43·7	13	e 8 29	+21	e 14 53	+14	e 18 3	S_cS	e 18·3
Columbia		44·6	353	e 8 15	− 1	e 14 52	0	e 15 25	?	e 18·3
Georgetown		49·2	359	i 8 55	+ 3	i 16 9	+11	—	—	23·0
St. Louis		50·9	345	i 9 7	+ 2	i 16 20	− 1	i 16 27	PS	—
Fordham		51·1	2	i 9 8	+ 2	16 35	+11	—	—	26·3
Cleveland		52·1	354	i 9 14	0	e 16 48	+10	e 20 30	SS	24·6
Chicago		53·3	348	—	—	e 17 4	+10	e 19 13	S_cS	e 21·8

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tucson		54·6	322	i 9 35a	+ 3	e 17 6	− 5	i 11 40	PP	e 24·5
Lincoln	E.	54·9	341	e 9 34	− 1	e 17 17	+ 1	e 19 51	S_cS	e 26·3
Ottawa		55·6	359	9 41	+ 1	17 35	+10	—	—	25·0
Temiskaming		57·0	357	i 9 51a	+ 1	—	—	—	—	—
Seven Falls		57·5	4	e 9 59	+ 6	—	—	—	—	25·0
Kirkland Lake		58·6	356	e 10 3	+ 2	—	—	—	—	—
Palomar		59·1	320	i 10 7a	+ 3	—	—	i 10 50	P_cP	—
La Jolla		59·1	319	e 10 8	+ 4	—	—	—	—	—
Pierce Ferry		59·2	324	i 10 8	+ 3	—	—	i 10 52	P_cP	—
Boulder City		59·6	323	i 10 12	+ 4	—	—	e 13 36	PPP	—
Riverside	Z.	59·9	320	i 10 9a	− 1	—	—	i 10 50	P_cP	—
Rapid City	E.	60·1	337	e 10 14	+ 3	e 18 33	+ 9	e 19 16	PPS	e 26·6
Pasadena		60·5	320	i 10 16a	+ 2	i 18 36	+ 7	i 11 1	P_cP	—
Mount Wilson		60·5	320	i 10 17a	+ 3	—	—	i 10 58	P_cP	—
Salt Lake City		61·4	329	—	—	e 18 37	− 3	—	—	e 30·4
Haiwee	Z.	61·6	321	e 10 24	+ 2	—	—	—	—	—
Santa Barbara	Z.	61·7	319	i 10 31	+ 9	—	—	i 11 4	P_cP	—
Tinemaha		62·4	322	i 10 30a	+ 3	—	—	i 11 9	P_cP	—
Fresno	Z.	63·1	321	i 10 34	+ 2	—	—	—	—	—
Bozeman		64·7	333	e 10 51	+ 9	e 19 31	+ 9	e 23 23	SS	e 33·5
Berkeley		65·4	320	i 10 49	+ 2	i 19 42	+12	i 10 57	pP	e 30·1
Shasta Dam		67·2	323	i 10 58	0	—	—	—	—	—
Hungry Horse		68·0	333	i 11 6	+ 3	—	—	e 39 19	P′P′	—
Victoria		72·7	328	—	—	e 20 49	− 8	—	—	35·0
Granada		81·8	50	i 12 26k	+ 4	22 47	+12	23 35	PS	42·1
Toledo		82·4	47	i 12 24	− 1	22 46	+ 5	—	—	—
Sitka		83·7	332	—	—	i 23 1	+ 7	—	—	e 42·2
Alicante		84·5	49	e 12 28	− 8	i 22 50	−12	23 54	PS	e 38·7
Algiers		86·7	53	e 12 49	+ 2	e 23 1	[−11]	—	—	—
Kew		88·7	37	i 12 54	− 3	e 23 28	[+ 3]	—	—	e 37·0
Clermont-Ferrand		89·2	43	e 12 59	0	—	—	e 14 35	?	—
Aberdeen		89·6	31	—	—	i 22 55	[−35]	—	—	—
Paris		89·7	40	i 12 59	− 2	—	—	—	—	e 42·0
Uccle		91·4	38	—	—	e 23 47	[+ 6]	e 33 31	SSS	e 46·0
De Bilt		92·2	37	e 13 13	0	e 23 49	[+ 3]	—	—	e 39·0
Basle		92·6	42	e 13 14	− 1	—	—	—	—	—
Strasbourg		93·0	41	e 13 13	− 4	e 24 1	[+11]	e 18 1	?	40·0
Zürich		93·3	42	e 13 11	− 7	e 23 53	[+ 1]	—	—	—
Stuttgart		93·9	41	e 13 19a	− 2	e 24 1	[+ 6]	—	—	e 42·0
Florence		94·4	46	—	—	i 24 31	− 2	—	—	—
Rome		95·0	48	e 13 21	− 5	i 24 10	[+ 9]	—	—	e 41·8
Cheb		96·2	39	e 15 1	?	e 24 23	[+15]	—	—	e 46·0
Triest		96·5	45	e 17 29	PP	e 24 11	[+ 2]	e 26 14	PS	e 45·0
Prague		97·5	40	e 14 1	+24	e 24 17	[+ 3]	—	—	—
Copenhagen		97·7	34	13 37	− 1	—	—	—	—	—
Ksara		113·0	58	e 19 27	PP	e 29 15	PS	—	—	—
Riverview		117·9	223	—	—	e 25 51	[+ 8]	e 29 55	PS	e 57·1

Additional readings :—
La Paz iNZ = 2m.49s., iS^* = 5m.2s., iS_g = 5m.37s.
La Plata P_cP?N = 8m.27s., SSE = 12m.23s., SSN = 12m.43s.
Bermuda ePP = 10m.13s., i = 15m.49s.
St. Louis i = 9m.44s., iPS? = 17m.21s., iS_cS? = 18m.59s., i = 20m.27s., iSSS? = 21m.48s.
Cleveland iZ = 9m.21s. and 9m.26s., eSN = 16m.52s., eE = 21m.10s.
Tucson i = 9m.44s. and 9m.54s., iP_cP = 10m.34s., e = 17m.51s.
Palomar iZ = 10m.14s. and 10m.32s.
Riverside iZ = 10m.29s.
Pasadena iZ = 10m.39s., eN = 19m.19s., iE = 19m.43s.
Mount Wilson iZ = 10m.38s.
Santa Barbara iZ = 11m.22s.
Tinemaha iZ = 10m.42s.
Berkeley isSZ = 20m.16s., eN = 27m.49s.
Granada SS = 27m.56s.
Alicante PP = 16m.42s.?, S_cS = 22m.38s., PS = 23m.38s., SS = 31m.49s., Q = 34m.58s.
Algiers P = 13m.1s.?, eSSS = 32m.1s.?
Triest eSKKS = 24m.48s., eSS = 31m.34s.
Prague ePPP? = 20m.39s., eSKKS? = 25m.23s., e = 30m.13s., eSS = 32m.19s.
Long waves were also recorded at Arapuni, Wellington, Bombay, and at other American and European stations.

March 4d. 22h. 55m. 6s. Epicentre 20°·0N. 125°·0E. (as on 1947, Oct. 17d.).

Epicentre as suggested by U.S.S.R.

A = −·5394, B = +·7703, C = +·3400; δ = −9; h = +5;
D = +·819, E = +·574; G = −·195, H = +·279, K = −·940.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Vladivostok		23·8	13	e 5 37	PP	—	—	—	—	—
Calcutta	E.	34·2	281	e 7 56	PP	e 14 6	SS	—	—	—
Irkutsk		36·0	339	e 7 10	+ 5	e 12 52?	+ 8	—	—	—
Almata		46·3	312	e 8 29	0	—	—	—	—	—
Bombay		49·1	278	e 8 40	− 11	e 15 23	−33	—	—	—
Andijan		49·1	307	e 8 49	− 2	—	—	—	—	—
Kulyab		50·8	303	i 8 59	− 5	—	—	—	—	—
Obi-garm		50·9	304	e 9 4	− 1	—	—	—	—	—
Stalinabad		51·6	304	i 9 3	− 7	e 16 15	−16	—	—	—
Sverdlovsk		59·5	325	e 10 12	+ 5	e 18 12	− 4	—	—	—
Leninakan		70·7	308	e 11 17	− 3	—	—	—	—	—
Stuttgart		90·9	323	e 13 9?	+ 2	—	—	e 16 40	PP	e 49·9
Rome		92·4	316	e 16 27	PP	e 24 35	+19	e 22 59	?	e 50·7
Shasta Dam		93·1	45	e 13 34	+17	—	—	—	—	—
Hungry Horse		94·0	35	e 13 38	+17	—	—	—	—	—

Long waves were also recorded at other European stations.

March 4d. Readings also at 0h. (Tacubaya), 4h. (La Plata, La Paz, and near Stuttgart), 5h. (Hungry Horse, Shasta Dam, near Triest and near Mizusawa), 6h. (Mount Wilson, Tinemaha (2), Pierce Ferry, Boulder City, Tucson (2), La Paz, and Stuttgart), 9h. (near Boulder City (2), Pierce Ferry (2), and near Padova), 10h. (La Paz), 11h. (Istanbul (3), Ksara (2), Rome, and Stuttgart (3)), 12h. (near Apia), 14h. (Helwan, Istanbul, Ksara, Rome, Triest, Clermont-Ferrand, Stuttgart, and Alicante), 15h. (Rome, Strasbourg, De Bilt, Kew, and Cheb), 17h. (Uccle, De Bilt, Helwan, Istanbul, Ksara, Stuttgart, Alicante, Strasbourg, Kew, Hungry Horse, near Lick, Fresno, and Berkeley), 18h. (La Paz), 20h. (Istanbul, Rome, La Paz, and near Lick).

March 5d. 20h. 2m. 0s. Epicentre 42°·1N. 45°·9E. (as suggested by U.S.S.R.).

A = +·5179, B = +·5344, C = +·6679; δ = −11; h = −2;
D = +·718, E = −·696; G = +·465, H = +·480, K = −·744.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Grozny		1·2	359	e 0 24	0	i 0 40	− 1	i 0 32	?
Leninakan		2·0	230	e 0 54?	P_g	i 1 23?	S_g	—	—
Erevan		2·2	209	—	—	e 1 23	S_g	—	—
Piatigorsk		2·8	315	—	—	i 1 24?	+ 2	—	—
Baku		3·5	119	1 27?	P_g	—	—	—	—
Ashkabad		10·4	110	e 2 44	+10	e 4 37?	+ 5	—	—
Moscow		14·7	341	e 3 28	− 3	e 5 54	−22	—	—
Tashkent		17·5	85	—	—	e 7 50?	SS	—	—
Sverdlovsk		17·5	28	e 4 4	− 3	e 7 6	−15	—	—
Stalinabad		17·8	92	4 13	+ 2	7 30	+ 2	—	—
Almata		22·8	76	e 5 15?	+10	—	—	—	—
Copenhagen		25·6	315	5 34	+ 2	—	—	—	—
Stuttgart	Z.	26·4	299	e 5 41	+ 1	—	—	—	—
Hungry Horse		88·3	247	i 12 54	− 1	—	—	—	—

March 5d. Readings also at 2h. (Tinemaha, Boulder City, Shasta Dam, Pierce Ferry, Tucson, and near La Paz), 6h. (Hungry Horse and near Lick), 8h. (Rome), 9h. (De Bilt, Ksara, Stuttgart, and Hungry Horse), 10h. (Mount Wilson, Pasadena, Riverside, Tinemaha, Hungry Horse (2), Shasta Dam, and Mizusawa), 11h. (near Alicante), 12h. (Mount Wilson, Pasadena, Tinemaha, Pierce Ferry, Shasta Dam, Tucson, Rome, and near Apia), 13h. (Stalinabad, near Kulyab, Murgab, and Obi-garm), 14h. (Paris, Istanbul, Murgab, near Kulyab, Obi-garm, and Stalinabad), 15h. (La Paz), 16h. (Mount Wilson, Riverside, Tinemaha, Hungry Horse, Pierce Ferry, Shasta Dam, and Tucson), 17h. (Frunse and Almata), 18h. (near Kulyab), 19h. (Murgab, Stalinabad, near Obi-garm, and near Ottawa), 21h. (La Paz), 22h. (Hungry Horse), 23h. (near Andijan, Murgab, and Kulyab).

March 6d. 4h. 43m. 45s. Epicentre 8°·0S. 161°·0E.

Approximate Determination.

A = −·9364, B = +·3225, C = −·1383; δ = −2; h = +7;
D = +·326, E = +·946; G = +·131, H = −·045, K = −·990.

		△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	Supp. m. s.		L. m.
Brisbane		20·8	200	i 4 49	+ 4	i 8 37	+ 4	i 5 7	PP	—
Riverview		27·3	197	e 5 50	+ 2	e 10 22	− 5	i 10 52	?	e 12·6
Lick	z.	84·9	51	i 12 50	PcP	—	—	—	—	—
Shasta Dam		85·1	48	e 12 42	+ 3	—	—	e 16 5	PP	—
Fresno	z.	86·2	52	i 12 56	PcP	—	—	—	—	—
Pasadena	z.	86·9	55	i 12 58	PcP	—	—	—	—	—
Mount Wilson	z.	87·0	55	e 12 47	− 1	—	—	i 12 58	PcP	—
Haiwee	z.	87·5	53	e 13 2	PcP	—	—	—	—	—
Riverside	z.	87·5	55	e 12 50	− 1	—	—	i 13 0	PcP	—
Tinemaha	z.	87·5	52	e 12 48	− 3	—	—	e 12 52	PcP	—
Boulder City		90·0	54	e 13 3	0	—	—	i 13 13	PcP	—
Pierce Ferry		90·6	54	e 13 4	− 1	—	—	i 13 17	PcP	—
Hungry Horse		92·6	41	i 13 31	+16	—	—	—	—	—
Tucson		92·7	58	e 13 12	− 3	—	—	i 13 24	PcP	e 41·8

Additional readings :—
Brisbane iPEN = 4m.52s., iN = 5m.0s. and 5m.27s., iE = 5m.42s., iN = 5m.55s. and 6m.22s., iSE = 8m.40s.
Tinemaha iZ = 13m.2s.
Long waves were also recorded at Wellington and Berkeley.

March 6d. 13h. 46m. 55s. Epicentre 17°·8S. 178°·8W. Depth of focus 0·070.
(as on 1947, Nov. 20d.).

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

		△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	Supp. m. s.		L. m.
Apia		7·9	60	i 1 59	+ 3	i 3 31	+ 3	e 2 18	sP	—
Auckland		19·8	195	—	—	e 6 55	−16	i 7 25	?	e 12·6
Brisbane		27·7	245	i 5 12	+ 2	i 9 17	− 1	i 6 38	PP	i 12·2
Riverview		31·2	233	i 5 44a	+ 4	i 10 13	0	i 7 11	pP	—
Batavia		73·3	269	i 19 29	S	(i 19 29)	− 4	—	—	—
Vladivostok		75·6	325	i 10 54	− 2	i 20 14	+16	—	—	—
Santa Barbara	z.	76·5	47	i 11 14	+13	—	—	—	—	—
Lick	z.	76·8	43	i 11 3	0	—	—	—	—	—
Pasadena		77·4	48	i 11 6	0	—	—	—	—	—
Mount Wilson	z.	77·5	48	i 11 6	− 1	—	—	e 13 59	PP	—
Riverside	z.	77·9	48	i 11 7	− 2	—	—	—	—	—
Shasta Dam		78·3	41	i 11 9	− 2	—	—	e 13 5	pP	—
Haiwee	z.	78·6	46	i 11 12	0	—	—	—	—	—
Mineral	z.	78·6	42	i 11 12	0	—	—	—	—	—
Tinemaha		78·9	45	i 11 14	0	—	—	—	—	—
Boulder City		80·7	48	i 11 24	+ 1	—	—	—	—	—
Pierce Ferry		81·4	48	i 11 27	0	—	—	e 13 25	pP	—
Tucson		81·9	52	i 11 30	0	—	—	e 13 30	pP	—
Hungry Horse		87·4	37	i 11 55	− 1	—	—	—	—	—
Ksara		145·1	303	e 18 42	[− 1]	—	—	e 21 37	?	—
Jena	N.	145·9	348	e 18 46	[+ 2]	—	—	—	—	—
Stuttgart	z.	148·4	352	e 18 47	[− 1]	—	—	e 18 51	PKP_2	—
Paris		149·0	358	i 18 54	[+ 6]	—	—	e 29 40	?	—
Basle		149·9	351	e 19 55	[+65]	—	—	—	—	—
Zürich		149·9	351	e 18 49	[− 1]	—	—	—	—	—
Helwan		150·0	299	e 18 58	[+ 8]	—	—	e 22 34	PP	—
Clermont-Ferrand		152·1	356	e 18 53	[0]	—	—	—	—	—

Additional readings :—
Brisbane iN = 5m.18s., 6m.17s., and 10m.20s., iSSE = 10m.44s.
Riverview eE = 13m.12s., iS_cSN = 15m.17s.
Mount Wilson eZ = 13m.3s.
Tucson e = 14m.44s.
Stuttgart eZ = 18m.56s.

March 6d. 20h. 12m. 48s. Epicentre 34°·8N. 25°·6E. (as on 1942, Sept. 30d.).

A = +·7422, B = +·3556, C = +·5681 ; δ = +5 ; h = 0 ;
D = +·432, E = −·902 ; G = +·512, H = +·245, K = −·823.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Istanbul		6·8	23	2 2	P*	i 3 36	S_g	—	—	—
Helwan		6·9	134	1 48	+ 3	2 55	−10	2 15	P_g	—
Ksara		8·6	94	e 2 6	− 3	3 33	−15	—	—	—
Messina		8·8	296	e 3 4	P_g	4 47	S_g	—	—	—
Catania		8·9	290	e 2 49	P*	—	—	—	—	—
Bucharest	N.	9·6	2	e 2 23	+ 2	e 4 3	− 9	—	—	i 4·8
Belgrade		10·8	340	i 2 37k	− 2	e 4 45	+ 3	—	—	—
Rome		12·5	308	e 3 4	+ 2	5 34	+11	—	—	i 7·2
Kalossa		12·7	340	e 3 13	+ 8	—	—	—	—	e 8·7
Budapest		13·6	341	2 25	?	—	—	e 3 35	P	7·7
Sotchi	N.	14·0	47	e 2 58?	−24	—	—	—	—	e 9·3
Triest		14·1	324	e 3 22	− 1	i 6 2	0	i 4 24	?	i 8·3
Padova		14·3	316	e 4 40	?	e 6 10	+ 4	—	—	—
Florence		14·3	313	e 3 42	PP	e 6 33	SS	—	—	—
Leninakan		15·6	62	e 3 51	+ 8	—	—	—	—	—
Salo		15·8	318	e 3 51	+ 6	e 6 53	+11	—	—	—
Piatigorsk		16·3	50	3 54	+ 2	—	—	—	—	—
Chur		17·1	320	e 4 2	0	e 7 20	+ 8	—	—	—
Prague		17·3	336	e 4 12	+ 8	e 7 30	+14	—	—	e 8·2
Warsaw		17·7	351	e 4 8	− 2	—	—	—	—	e 7·2
Grozny		17·8	55	e 4 11	0	—	—	—	—	—
Zürich		17·9	321	e 4 12k	0	e 7 29	− 1	—	—	—
Algiers		18·4	283	i 4 27	+ 9	e 7 54	+13	i 4 34	PP	—
Basle		18·5	321	e 4 18	− 1	—	—	e 6 46	?	—
Stuttgart		18·5	325	e 4 16	− 3	e 7 46	+ 2	e 4 50	PP	e 10·2
Neuchatel		18·6	319	e 4 20	− 1	e 7 44	− 2	—	—	—
Strasbourg		19·1	323	e 4 32	+ 5	e 7 58	+ 1	—	—	e 9·6
Jena		19·1	335	e 4 23	− 4	—	—	e 4 30	P	—
Potsdam		19·7	338	e 4 32	− 2	i 8 10	0	e 4 35	PP	e 11·2
Baku		20·0	65	e 4 53	+16	—	—	—	—	—
Clermont-Ferrand		20·3	310	i 4 41	+ 1	e 8 24	+ 1	—	—	—
Alicante		21·2	289	i 4 55	+ 6	8 49	+ 8	5 12	pP	e 11·6
Paris		22·1	317	i 4 58	− 1	i 8 59	+ 1	5 19	PP	e 11·0
Uccle		22·2	323	e 4 59	− 1	e 9 0	0	e 5 31	PPP	e 11·7
Moscow		22·5	17	e 4 58	− 4	—	—	—	—	—
De Bilt		22·6	327	i 5 9	+ 6	e 9 8	+ 1	—	—	e 11·2
Copenhagen		22·8	342	5 1	− 4	—	—	—	—	12·2
Granada		23·7	286	i 5 21a	+ 7	i 9 36	+ 9	5 53	PP	14·1
Toledo		24·0	291	i 5 21	+ 4	9 44	+12	—	—	—
Jersey		24·9	315	e 5 27	+ 1	e 9 48	+ 1	e 7 12	?	—
Kew		25·0	320	i 5 28	+ 1	e 9 53	+ 4	—	—	e 12·2
Ashkabad		26·5	73	e 5 40	− 1	—	—	—	—	—
Durham	E.	27·5	325	5 52	+ 2	10 49	+19	—	—	—
Stalinabad		34·6	70	e 6 53	0	—	—	—	—	—
Obi-garm		35·3	69	e 6 58	− 1	—	—	—	—	—
Kulyab		35·5	71	e 6 59	− 1	—	—	—	—	—
Hungry Horse		89·7	334	i 13 2	+ 1	—	—	—	—	—

Additional readings :—
Rome i = 4m.35s. and 6m.28s.
Algiers SS = 8m.12s.
Stuttgart eP = 4m.25s.
Strasbourg e = 5m.22s. and 5m.25s., i = 6m.39s., eS = 7m.54s.
Potsdam iSE = 8m.7s.
Clermont-Ferrand e = 5m.58s., i = 6m.37s.
Alicante PP = 5m.41s., iS = 9m.10s., SS = 9m.55s., SSS = 10m.13s., P_cS = 12m.31s., S_cS = 15m.59s.
Paris iP = 5m.3s., i = 5m.12s., e = 5m.55s., i = 6m.7s., iS = 9m.4s., e = 9m.11s., eSS = 9m.30s., eP_cS = 12m.34s.
Granada PPP = 6m.9s., SS = 11m.12s.
Long waves were also recorded at Helsinki.

March 6d. Readings also at 0h. (Mizusawa and near Branner), 1h. (Almata, Vladivostok and near Irkutsk), 3h. (Andijan, Kulyab, near Murgab and Obi-garm), 4h. (near Ksara, near Stalinabad, Kulyab, and Obi-garm), 5h. (La Paz, Bogota, Huancayo, near Tacubaya, Mount Wilson, Pasadena, Riverside, Tinemaha, Boulder City, Hungry Horse, Pierce Ferry (2), Shasta Dam, Tucson, and Toledo ; several shocks), 6h. (Padova), 9h. (near Murgab, Kulyab, Obi-garm, Stalinabad, near Boulder City, Pierce Ferry, and near Zürich), 10h. (near Chur and Stuttgart), 13h. (La Paz), 14h. (Mount Wilson, Pasadena, Tinemaha, Pierce Ferry, Shasta Dam, Tucson, and Stuttgart), 17h. (near Istanbul), 18h. (Mount Wilson, Pasadena, Boulder City, Pierce Ferry, Shasta Dam, and Tucson), 19h. (Pierce Ferry and near San Juan), 20h. (Stuttgart), 21h. (near Obi-garm, Kulyab, and Stalinabad), 22h. (La Paz, Bogota, Shasta Dam, and near Branner), 23h. (Andijan (2), Obi-garm (2), Kulyab (2), Tashkent, Stalinabad, near Almata, Frunse (2), and Murgab (2)).

March 7d. 5h. 19m. 29s. Epicentre 21°·6N. 145°·7E. (as on 1947, June 20d.).

$A = -\cdot7688$, $B = +\cdot5244$, $C = +\cdot3660$; $\delta = 0$; $h = +4$;
$D = +\cdot564$, $E = +\cdot826$; $G = -\cdot302$, $H = +\cdot206$, $K = -\cdot931$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Vladivostok		24·4	335	i 5 22	+ 1	i 9 47	+ 8	—	—	—
Irkutsk		44·1	325	e 8 12	0	e 14 43	− 2	—	—	—
Batavia		47·1	238	e 8 46	+11	e 15 22	− 6	—	—	—
Brisbane	N.	49·3	171	e 8 50	− 3	—	—	—	—	—
Andijan		63·8	306	e 10 38	+ 2	e 19 10	− 1	—	—	—
Kulyab		66·2	303	i 10 55	+ 3	i 19 39	− 1	—	—	—
Obi-garm		66·2	305	e 10 55	+ 3	—	—	—	—	—
Stalinabad		66·9	304	i 10 57	+ 1	i 19 46	− 3	—	—	—
Sverdlovsk		69·5	325	i 11 13	+ 1	i 20 16	− 4	—	—	—
Shasta Dam		77·6	51	e 11 58	− 2	—	—	—	—	—
Lick	Z.	79·2	54	i 12 8	0	—	—	—	—	—
Hungry Horse		80·7	42	i 12 16	0	—	—	—	—	—
Fresno	Z.	80·8	54	i 12 17	0	—	—	—	—	—
Santa Barbara	Z.	81·7	56	i 12 21	− 1	—	—	—	—	—
Tinemaha	Z.	81·9	54	i 12 23	0	—	—	—	—	—
Grozny		82·4	314	12 27	+ 2	—	—	—	—	—
Mount Wilson	Z.	83·0	56	i 12 29	+ 1	—	—	—	—	—
Pasadena	Z.	83·0	56	i 12 27	− 1	—	—	—	—	—
Riverside	Z.	83·7	56	i 12 31	− 1	—	—	—	—	—
Leninakan		84·7	312	e 12 44	+ 7	—	—	—	—	—
Boulder City		84·8	53	i 12 38	+ 1	—	—	—	—	—
Pierce Ferry		85·4	53	i 12 40	0	—	—	e 16 4	PP	—
Tucson		89·4	55	i 12 59	− 1	—	—	e 16 29	PP	e 41·2
Ksara		93·4	308	—	—	e 22 34	?	e 33 53	SSS	—
Stuttgart		99·9	332	e 13 46	− 2	—	—	—	—	e 55·5
Rome	N.	103·4	326	—	—	e 32 57	SS	—	—	e 51·7
La Paz	N.	147·7	56	20 53	[+69]	—	—	—	—	—

Additional readings :—
Brisbane iN = 9m.10s and 9m.39s.
Santa Barbara iZ = 12m.29s.
Tinemaha iZ = 12m.30s.
Mount Wilson iZ = 12m.40s.
Pasadena iZ = 12m.39s.
Riverside iZ = 12m.39s.
Pierce Ferry i = 13m.25s.
Tucson i = 14m.0s.
Long waves were also recorded at College, Berkeley, De Bilt, Strasbourg, Alicante, and Granada.

March 7d. 18h. 50m. 11s. Epicentre 53°·1N. 160°·9E.

$A = -·5698$, $B = +·1973$, $C = +·7977$; $\delta = -8$; $h = -7$;
$D = +·327$, $E = +·945$; $G = -·754$, $H = +·261$, $K = -·603$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Vladivostok		21·7	254	e 4 56	+ 1	e 8 49	− 2	—	—	—
College		28·1	45	e 5 54	− 1	e 10 34	− 6	—	—	e 12·3
Irkutsk		33·6	292	e 6 43	− 1	e 11 59	− 7	—	—	—
Sitka		35·4	57	e 7 5	+ 5	e 12 41	+ 7	—	—	e 15·4
Hungry Horse		51·0	58	e 9 5	− 1	—	—	—	—	—
Shasta Dam		51·4	71	e 9 7	− 2	—	—	i 9 23	pP	—
Mineral	z.	52·1	71	i 9 14	0	—	—	i 9 29	pP	—
Sverdlovsk		52·6	318	e 9 15	− 3	e 16 36	− 8	—	—	—
Butte	N.	53·3	60	—	—	e 16 53	− 1	—	—	e 21·8
Berkeley	E.	53·4	74	—	—	e 17 1	+ 6	(e 20 31)	SS	e 20·5
Lick	z.	54·1	74	i 9 29	0	—	—	—	—	—
Bozeman		54·3	60	—	—	e 17 11	+ 4	e 20 57	SS	e 24·3
Fresno	z.	55·6	73	i 9 45	+ 5	—	—	i 9 55	pP	—
Tinemaha	z.	56·2	72	i 9 45	+ 1	—	—	i 10 2	pP	—
Haiwee	z.	57·1	73	i 9 50	0	—	—	i 10 5	pP	—
Santa Barbara	z.	57·2	75	i 10 7	pP	—	—	—	—	—
Salt Lake City		57·3	64	e 10 8	+16	e 17 45	− 2	e 13 32	PPP	e 25·3
Andijan		58·0	297	e 9 56	− 1	—	—	—	—	—
Mount Wilson		58·4	74	i 9 59	− 1	—	—	i 10 15	pP	—
Pasadena		58·4	74	i 9 58	− 2	i 17 59	− 3	i 10 14	pP	e 27·4
Riverside	z.	58·9	74	i 10 2	− 1	—	—	i 10 18	pP	—
Boulder City		59·0	71	i 10 4	0	—	—	i 10 20	pP	—
Tashkent		59·2	300	—	—	e 17 49	−23	e 18 57?	PS	—
Pierce Ferry		59·3	70	i 10 7	+ 1	e 18 17	+ 3	i 10 32	pP	—
La Jolla	z.	59·8	75	e 10 12	+ 3	—	—	i 10 25	pP	—
Obi-garm		60·9	297	e 10 19	+ 2	e 18 32	− 2	—	—	—
Kulyab		61·4	296	i 10 21?	+ 1	i 18 37?	− 3	—	—	—
Stalinabad		61·5	298	i 10 18	− 3	i 18 36	− 6	—	—	—
Samarkand		61·6	300	e 10 19?	− 3	—	—	—	—	—
Moscow		61·9	328	e 10 22	− 2	e 18 43	− 4	—	—	—
Upsala		63·6	341	10 36	+ 1	e 19 5	− 3	e 23 49?	SS	e 30·8
Tucson		64·0	71	e 10 36	− 2	e 19 8	− 5	i 10 53	pP	e 29·4
Lincoln	E.	65·1	55	—	—	e 19 14	−13	e 23 7	SS	e 33·0
Ashkabad		67·4	303	e 10 59	0	e 19 52	− 3	—	—	—
Temiskaming		68·2	40	e 11 2	− 2	—	—	—	—	—
Copenhagen		68·5	342	e 11 4	− 2	20 7	− 1	—	—	—
Grozny		69·0	315	e 11 12	+ 3	—	—	—	—	—
Baku		69·5	311	e 11 28	+16	—	—	—	—	—
Warsaw		69·8	336	e 11 14	0	e 20 26	+ 3	—	—	e 36·8
St. Louis		69·9	52	i 11 13	− 2	i 20 19	− 5	e 11 45	pP	—
Ottawa		70·6	39	e 11 16	− 3	e 20 25	− 8	—	—	37·8
Cleveland		71·5	45	i 11 25	+ 1	i 20 38	− 5	e 21 31	PS	—
Potsdam		71·5	341	i 11 25k	+ 1	i 20 44	+ 1	i 21 2	PS	e 34·8
Hyderabad	N.	71·7	275	e 11 23	− 3	e 20 41	− 4	21 29	PS	—
Leninakan		71·9	315	e 11 33	+ 6	—	—	—	—	—
Erevan		72·1	314	e 11 32	+ 4	—	—	—	—	—
Collmberg	z.	72·5	340	i 11 31	+ 1	—	—	e 14 0	PP	—
De Bilt		73·2	345	e 11 36	+ 1	e 21 5	+ 3	—	—	e 35·8
Jena		73·2	340	e 11 35	0	—	—	—	—	—
Prague		73·4	339	e 11 39?	+ 3	e 21 3	− 2	e 14 49?	PP	e 33·8
Cheb		73·8	340	e 16 49?	PPP	—	—	—	—	e 36·8
Bombay		74·0	281	e 11 36	− 3	—	—	—	—	—
Kew		74·6	348	e 11 43	0	—	—	—	—	e 39·8
Uccle		74·6	346	e 11 48	+ 5	e 21 18	0	—	—	e 36·8
Budapest		74·7	334	e 11 33	−10	e 19 19	?	11 47	pP	e 42·3
Weston		74·8	37	i 11 44	0	e 21 11	− 9	26 3	SS	e 34·4
Fordham		75·2	40	i 11 45	− 1	e 21 37	+12	—	—	39·0
Stuttgart		75·7	341	e 11 47a	− 2	e 21 19	−11	e 12 6	PcP	e 40·8
Strasbourg		76·2	342	e 11 50?	− 2	e 21 31	− 5	e 12 7	PcP	e 37·8
Belgrade		76·7	332	e 11 59	+ 4	—	—	—	—	41·8

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Paris		76·8	346	i 11 55	0	e 22 12	+30	e 27 43	SS	e 39·8
Basle		77·2	342	e 11 57	0	—	—	e 12 10	pP	—
Zürich		77·2	342	e 11 57a	0	e 21 44	− 3	—	—	—
Istanbul		77·4	325	i 12 3	+ 5	i 21 53?	+ 4	—	—	—
Chur		77·5	340	e 11 58	− 1	—	—	—	—	—
Triest		77·7	337	e 11 54	− 6	e 21 7	−45	—	—	e 40·3
Clermont-Ferrand		79·7	345	i 12 13	+ 2	—	—	—	—	46·8
Florence		80·0	338	i 12 18	+ 5	i 30 19	?	—	—	—
Brisbane	N.	80·5	187	i 12 16	+ 1	—	—	—	—	—
Ksara		81·1	317	e 12 19	+ 1	22 32?	+ 4	—	—	—
Rome		81·5	337	i 12 22k	+ 1	e 22 24	− 8	15 45	PP	e 40·6
Bermuda		86·1	38	—	—	e 23 25	+ 7	e 29 4	SS	e 35·5
Helwan		86·5	318	e 12 49	+ 3	e 23 15	[+ 4]	—	—	—
Toledo		86·5	349	i 12 47	+ 1	—	—	—	—	—
Alicante		87·5	346	e 13 9	+18	i 23 41	+10	16 21	PP	e 40·5
Granada		89·1	348	13 1a	+ 3	i 23 48	+ 2	—	—	i 43·3
Wellington	Z.	94·8	171	—	—	e 24 1	[+ 1]	—	—	44·8
Huancayo		119·6	69	—	—	e 30 5	PS	e 36 29	SS	e 53·3
La Paz		128·2	65	i 19 8	[0]	i 38 25	SS	21 9	PP	64·1

Additional readings :—
Butte eN =17m.41s.
Berkeley eN =17m.7s.
Lick eEN =9m.32s.
Fresno iZ =11m.1s.
Salt Lake City eS_cS =19m.38s., eSS? =22m.8s.
Boulder City e =15m.5s., ePKP,PKP =39m.58s.
Pierce Ferry ePKP,PKP =39m.54s.
Upsala SSSE =26m.5s.
Tucson ePP =13m.11s., e =19m.39s., ePKP,PKP =39m.35s.
St. Louis isS =21m.15s.
Cleveland eE =28m.43s.
Potsdam iSE =20m.39s., iN =23m.28s., eZ =29m.55s.
Collmberg iP_cP?Z =11m.47s.
Weston e =30m.43s.
Stuttgart ePP? =14m.1s., ePS =21m.55s., e =22m.24s.
Strasbourg ePP =14m.49s., e =17m.55s., eSS =27m.1s.
Paris i =12m.9s., e =12m.39s.
Clermont-Ferrand e =13m.41s.
Brisbane iN =12m.28s. and 12m.45s.
Rome eS =22m.48s., ePS? =23m.37s., eN =37m.23s.
Bermuda eSSS? =33m.34s.
Alicante PS =24m.21s., PPS =24m.56s., SS =28m.56s., Q =35m.6s.
Huancayo eSSS =41m.23s.
Long waves were also recorded at Honolulu, Chicago, Philadelphia, Columbia, San Juan, Helsinki, and Arapuni.

March 7d. Readings also at 2h. (near Batavia), 4h. (Bogota), 5h. (Stalinabad, near Obigarm, and Kulyab), 6h. (near Basle, Neuchatel, and Zürich), 7h. (near Fresno and Lick), 9h. (Pierce Ferry, near Mizusawa, near Apia, and near Port au Prince), 10h. (Hungry Horse, La Paz, and near Apia), 11h. (Paris, Mount Wilson, Pasadena, Riverside, Tinemaha, Tucson, Boulder City, Pierce Ferry, and Shasta Dam), 12h. (near Apia), 14h. (near Lick), 16h. (near Ottawa), 17h. (Tinemaha, Tucson, Boulder City, Pierce Ferry, and Shasta Dam), 18h. (Mount Wilson (2), Pasadena (2), Riverside, Tinemaha (2), Tucson (2), Boulder City (2), Pierce Ferry (2), Shasta Dam (2), Brisbane, Paris (2), and Stuttgart), 19h. (Tinemaha, Tucson, and Shasta Dam), 20h. (Mount Wilson, Tinemaha, Tucson, Boulder City, Pierce Ferry, Shasta Dam, Paris, Stuttgart, and Ksara), 23h. (Bogota and La Paz).

March 8d. 2h. 20m. 17s. Epicentre 22°·5S. 66°·0W. Depth of focus 0·030.
(as on 1946, February 27d.).

A = +·3762, B = −·8448, B = −·3805 ; δ = −1 ; h = +4 ;
D = −·914, E = −·407 ; G = −·155, H = +·348, K = −·925.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
La Paz		6·3	341	i 1 33a	+ 1	i 2 43	− 1	—	—	—
Huancayo		13·7	318	e 3 9	+ 3	e 5 38	+ 4	—	—	e 5·7
La Plata		14·2	152	3 17	+ 5	6 21	+36	—	—	—
Bogota	Z.	28·1	313	e 5 39	+ 6	e 10 14	+14	—	—	—
Fort de France		37·3	8	e 6 49	− 3	e 12 14	− 9	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tucson		69·3	321	e 10 45	0	—	—	e 11 5	pP	—
Pierce Ferry		73·9	321	e 11 12	0	—	—	—	—	—
Boulder City		74·3	321	e 11 15	+ 1	—	—	—	—	—
Riverside	z.	74·5	318	i 11 14	− 2	—	—	—	—	—
Mount Wilson	z.	75·0	318	e 11 17	− 1	—	—	—	—	—
Pasadena	z.	75·1	318	e 11 19	0	—	—	—	—	—
Haiwee	z.	76·2	320	i 11 26	+ 1	—	—	—	—	—
Tinemaha	z.	77·0	320	i 11 30	0	—	—	—	—	—
Shasta Dam		81·8	321	e 11 53	− 2	—	—	—	—	—
Toledo		84·7	44	i 12 10	0	—	—	—	—	—
Paris		93·5	38	12 52	+ 1	—	—	—	—	—

Additional readings :—
La Paz iN =3m.1s., 3m.15s., and 3m.39s.
La Plata P?E =1m.29s., E =4m.15s., N =5m.43s.
Tucson i =10m.52s.

March 8d. 11h. Undetermined shock. South Pacific.

Wellington suggests depth of 200-300kms.

Auckland P =6m.28s., i =7m.22s., S? =9m.45s., e =10m.16s., i =17m.26s.
Wellington P =7m.12s., iZ =7m.24s., S =11m.28s., sP_cPZ =11m.55s., sS =12m.55s., S_cPZ =13m.55s.
Mount Wilson iPZ =14m.27s.
Pasadena iPZ =14m.27s.
Riverside iPZ =14m.29s.
Shasta Dam eP =14m.29s.
Haiwee iPZ =14m.32s.
Tinemaha iPZ =14m.34s.
Boulder City eP =14m.45s.
Pierce Ferry eP =14m.48s.
Tucson iP =14m.51s.
Strasbourg e =16m.12s.
Stuttgart eZ =16m.54s., 21m.27s., 21m.53s., and 28m.36s.
Paris iP? =28m.40s., e =36m.

March 8d. 16h. 7m. 39s. Epicentre 5°·2S. 152°·4E. (as on 1946, June 5d.).

A = −·8826, B = +·4614, C = −·0901 ; δ = −1 ; h = +7 ;
D = +·463, E = +·886 ; G = +·080, H = −·042, K = −·996.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Guam		20·1	337	e 5 27	PPP	i 9 8	SSS	—	—	—
Brisbane		22·2	179	i 5 0	0	i 9 1	+ 1	i 5 19	PP	i 11·4
Riverview		28·5	183	e 6 0	+ 1	i 10 45	− 1	i 6 11	pP	e 13·6
Apia		36·3	106	e 7 21?	+14	—	—	—	—	—
Auckland	N.	37·6	150	8 58	PP	e 13 5	− 3	—	—	i 17·6
Arapuni	E.	39·0	151	—	—	13 27	− 2	—	—	16·4
Wellington	z.	41·1	155	8 1	+14	14 1	0	9 42	PP	19·4
Perth		43·3	228	—	—	i 14 26	− 7	i 17 36	SS	i 20·7
Batavia		45·3	267	e 8 23	+ 2	i 15 22	+20	i 10 12	PP	e 22·4
Vladivostok		51·6	341	i 9 7	− 3	i 16 22	− 9	—	—	—
Honolulu		55·4	60	—	—	e 17 26	+ 4	—	—	e 23·8
Irkutsk		70·3	331	e 11 14	− 3	20 22	− 7	—	—	—
Hyderabad	N.	76·3	289	—	—	e 22 28	PPS	—	—	—
Bombay		81·9	290	e 12 21	− 2	e 22 29	− 7	—	—	—
College		82·4	22	—	—	e 22 32	− 9	e 28 1	SS	e 34·1
Almata		83·0	315	e 12 29	+ 1	—	—	—	—	—
Frunse		84·6	313	e 12 37	+ 1	—	—	—	—	—
Sitka		85·0	32	e 12 40	+ 2	e 23 5	− 2	e 24 21	PPS	e 35·4
Andijan		85·9	311	e 12 42	− 1	—	—	—	—	—
Kulyab		87·4	308	i 12 50	0	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Obi-garm		87·5	309	e 12 52	+ 1	—	—	—	—	—
Stalinabad		88·2	309	i 12 51	− 3	—	—	—	—	—
Tashkent		88·2	311	e 12 51	− 3	23 12	[−10]	—	—	—
Ukiah		88·9	51	—	—	e 24 49	PS	e 26 35	?	e 40·5
Berkeley		89·5	53	i 13 7	+ 7	i 23 53	+ 3	i 29 45	SS	e 42·6
Shasta Dam		89·7	49	e 13 1	0	e 23 55	+ 3	e 16 33	PP	—
Lick	z.	90·1	53	i 13 5	+ 2	—	—	—	—	—
Mineral	z.	90·3	50	i 13 5	+ 1	—	—	—	—	—
Fresno	z.	91·3	53	i 13 13	+ 4	—	—	i 13 39	?	—
Pasadena		92·4	56	i 13 16	+ 2	i 22 19	?	—	—	e 42·1
Mount Wilson	z.	92·5	56	i 13 16	+ 2	—	—	i 13 29	P_cP	—
Tinemaha		92·6	53	i 13 18	+ 3	—	—	i 13 23	P_cP	—
Haiwee		92·7	54	i 13 18	+ 3	—	—	i 13 30	P_cP	—
La Jolla		93·1	57	e 13 21	+ 4	—	—	—	—	—
Riverside		93·1	56	i 13 19	+ 2	—	—	i 13 31	P_cP	—
Boulder City		95·3	54	e 13 29	+ 2	—	—	i 17 28	PP	—
Sverdlovsk		95·3	326	i 13 25	− 2	26 5	PS	17 17	PP	—
Pierce Ferry		95·9	54	i 13 32	+ 2	—	—	e 30 19	PKKP	—
Hungry Horse		96·2	42	i 13 33	+ 2	e 24 6	[− 2]	—	—	—
Salt Lake City		97·7	50	—	—	e 26 39	PS	—	—	e 41·1
Bozeman		98·3	44	—	—	i 24 51	{+ 9}	—	—	e 45·9
Tucson		98·5	58	e 13 46	+ 4	e 25 10	+ 2	e 17 41	PP	e 41·7
Rapid City	E.	103·9	46	—	—	e 27 41	PS	—	—	e 48·9
Grozny		105·7	313	—	—	e 24 47	[− 7]	—	—	—
Leninakan		107·5	311	e 18 51	PP	—	—	—	—	—
St. Louis		114·5	50	i 19 38	PP	e 26 54	{+17}	e 29 18	PS	—
Ksara		114·8	304	i 19 42	PP	—	—	e 29 27	PS	—
Upsala	N.	115·6	336	—	—	—	—	e 43 6	Q	e 59·3
Istanbul		118·2	314	20 3	PP	—	—	—	—	—
Temiskaming		119·5	38	e 18 53	[+ 1]	—	—	—	—	—
Ottawa		122·2	38	e 18 56	[− 1]	—	—	—	—	e 59·4
Collmberg	z.	123·0	331	i 19 2	[+ 3]	—	—	—	—	—
Prague		123·1	329	—	—	e 37 57	SSP	—	—	e 51·4
Cheb		124·1	330	e 32 21?	PPS	—	—	—	—	e 62·3
Vermont		124·2	38	—	—	e 37 56	SSP	—	—	e 57·9
Philadelphia		125·0	44	—	—	e 26 59	[+53]	—	—	e 62·1
De Bilt		126·0	336	—	—	—	—	e 37 21?	SS	e 62·4
Triest		126·1	325	e 24 9	PPP	—	—	—	—	e 62·4
Stuttgart		126·5	330	e 19 5a	[0]	—	—	e 19 46	?	e 67·3
Strasbourg		127·3	331	i 19 3	[− 4]	—	—	e 39 33	?	—
Basle		128·2	330	e 19 9	[0]	—	—	—	—	—
Kew		128·6	339	e 19 9	[0]	—	—	—	—	e 59·4
Rome		129·0	322	e 19 4	[− 6]	e 38 26?	SS	e 43 26	SSS	e 58·4
Huancayo		129·5	110	e 19 18	[+ 7]	e 38 55	SS	e 21 32	PP	e 55·4
Paris		129·6	334	i 19 13	[+ 2]	e 26 25	[+ 6]	e 21 31	PP	70·3
Clermont-Ferrand		131·6	331	e 19 17	[+ 2]	e 22 36	SKP	—	—	75·3
La Paz		134·5	119	19 25	[+ 5]	i 22 57	PKS	—	—	63·8
Bermuda		136·1	47	e 23 11	PKS	—	—	—	—	e 57·4
Alicante		138·8	327	20 11	[+43]	33 49	PS	23 15	PP	e 64·5
Toledo		139·5	331	e 19 30	[0]	—	—	—	—	—
Granada		141·3	328	19 36a	[+ 3]	—	—	e 22 14	PP	73·2
Fort de France		145·7	72	e 19 44	[+ 4]	—	—	—	—	—

Additional readings :—
Guam i =5m.46s., e =7m.0s.
Brisbane iN =5m.42s., 6m.3s. and 7m.22s., iSSEN =9m.24s., iN =10m.3s.
Riverview ePPZ =6m.52s., iPPPZ =7m.1s., isSN =11m.3s., eE =11m.6s., eN =11m.33s., iE =13m.27s.
Auckland iN =11m.22s., S?N =13m.31s.
Wellington P_cPZ =9m.51s., S_cPZ =13m.46s., i =15m.6s., SSZ =17m.21s.
Batavia i =12m.51s., iN =13m.43s., SSEN =18m.6s.
College eS_cS? =23m.28s., ePPS =23m.50s., eSSS? =32m.32s.
Sitka iS_cS =23m.29s., e =27m.27s., eSSS? =32m.41s.
Berkeley iSE =24m.8s., iN =24m.19s., eQE =40m.57s.
Tinemaha iZ =13m.29s.
Boulder City iPP =16m.54s.
Sverdlovsk SS =31m.3s.

Continued on next page.

Bozeman eSS? =32m.27s., eSSS? =36m.15s.
Tucson i =14m.0s. and 15m.6s., ePPP =19m.44s., ePPS =26m.51s., ePKP,PKP =38m.24s.
Upsala eE =56m.8s.
Rome ePP? =22m.30s., eS? =31m.26s., e =48m.18s.?
Huancayo ePKS =22m.39s., ePPP =23m.43s., ePS =32m.0s.
Paris e =19m.33s. and 19m.53s., ePKS =22m.35s., e =23m.18s., ePS? =32m.21s., eSS =39m.21s., Q =64m.21s.
Clermont-Ferrand e =19m.57s.
Alicante PPP =26m.23s., PPS =35m.49s.
Granada PPP =25m.25s.
Long waves were also recorded at San Juan and at other American and European stations.

March 8d. 21h. 32m. 22s. Epicentre 45°·5N. 144°·0E.

Approximate Determination.

A = −·5690, B = +·4134, C = +·7109 ; δ = +4 ; h = +3 ;
D = +·588, E = +·810 ; G = −·575, H = +·418, K = −·703.

		△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.
Mizusawa	E.	6·7	199	e 1 48	+ 6	3 2	+ 2
Hungry Horse		64·6	46	i 10 54	+13	—	—
Shasta Dam		64·7	57	e 10 44	+ 2	—	—
Tinemaha	Z.	69·4	58	i 11 12	0	—	—
Mount Wilson	Z.	71·5	60	i 11 19	− 5	—	—
Pasadena	Z.	71·5	60	i 11 24	0	—	—
Boulder City		72·2	57	e 11 26	− 3	—	—
Pierce Ferry		72·6	56	e 11 27	− 4	—	—
Palomar	Z.	72·8	60	e 11 23	− 9	—	—
Tucson		77·2	57	e 11 57	0	—	—
Stuttgart	Z.	78·2	331	e 12 5	+ 2	e 15 44	PP

March 8d. Readings also at 5h. (Mineral), 6h. (near Kulyab), 10h. (Kulyab, Stalinabad, near Andijan, Obi-garm, and near Lick), 11h. (Fresno, Mount Wilson, Pasadena, Riverside, Haiwee, Tinemaha, Boulder City, Pierce Ferry, Shasta Dam, Tucson, near Budapest and Kalossa), 14h. (Mount Wilson, Pasadena, Tinemaha, Shasta Dam, and Tucson), 15h. (Kulyab and Stalinabad), 16h. (near Kulyab, near Messina and near Alicante), 18h. (Tacubaya), 19h. (Boulder City and Pierce Ferry (2)), 20h. (Mount Wilson, Palomar, Pasadena, Tinemaha, Boulder City, Hungry Horse, Pierce Ferry, Shasta Dam, and Tucson), 22h. (Hungry Horse and Rome).

March 9d. 18h. 12m. 13s. Epicentre 34°·8N. 137°·0E. (as on 1946, July 13d.).

Intensity V at Nagoya, Irako ; IV at Kameyama, Tu, Owase, Hikone, Osaka, Kyoto ; II-III at Gihu, Sumoto, Tokusima, Ibukiyama, Siomisaki.
Epicentre 34°·8N. 136°·7E. Macroseismic radius 200-300 kms. Shallow.

The Seismological Bulletin of the Central Meteorological Observatory, Japan, for the year, 1948, Tokyo, 1950, p. 7, with macroseismic chart.

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

	△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.
Kameyama	0·4	277	0 12a	− 1	0 19	− 2
Nagoya	0·4	356	0 14k	+ 1	0 22	+ 1
Gihu	0·6	342	0 13	− 2	0 23	− 3
Hikone	0·8	307	0 19k	+ 1	0 27	− 4
Omaesaki	1·0	101	0 42	S	(0 42)	+ 6
Owase	1·0	222	0 17	− 4	0 28	− 8
Kyoto	1·1	282	0 22	0	0 33	− 6
Osaka	1·2	263	0 23	− 1	0 38	− 3
Shizuoka	1·2	82	0 25a	+ 1	0 38	− 3
Kobe	1·5	266	0 27k	− 1	0 44	− 5

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Hunatu		1·6	64	0 31	+ 1	0 55	+ 4
Sumoto		1·8	256	0 29a	− 3	0 49	− 7
Toyama		1·9	5	0 41	P*	1 9	S*
Toyooka		2·0	298	0 35	0	0 57	− 5
Nagano		2·1	28	0 38	+ 1	1 20	S_g
Kumagaya		2·3	55	0 41	+ 1	1 25	S_g
Maebasi		2·3	46	0 47	P_g	1 27	S_g
Tokyo		2·4	66	0 48	P_g	1 24	S_g
Wazima		2·6	358	0 58	P_g	1 29	S_g
Muroto		2·8	238	0 50	+ 3	1 25	+ 3
Tukubasan		2·9	61	0 59	P_g	—	—
Utonomiya		2·9	53	1 10	+22	2 2	+38
Kakioka		3·0	61	0 51	+ 1	1 41	S_g
Kôti		3·1	246	0 50	− 1	1 32	+ 3
Mito		3·2	61	1 6	P_g	1 47	S_g
Aikawa		3·4	17	1 18	P_g	2 0	S_g
Hirosima		3·8	265	1 15	P_g	2 1	S_g
Onahama		3·8	55	1 17	P_g	2 1	S_g
Hamada		4·1	273	1 3	− 2	1 47	− 8
Hukusima		4·1	43	1 12	P*	—	—
Sendai		4·7	41	1 30	P_g	2 40	S_g
Misusawa	E.	5·4	36	1 53	P_g	3 5	S_g
Miyazaki		5·5	240	1 45	P_g	—	—
Hukuoka		5·6	260	1 24	− 3	—	—
Kumamoto		5·6	251	1 34	+ 7	—	—
Kagosima		6·3	241	1 27	− 9	—	—

March 9d. 18h. 47m. 45s. Epicentre 3°·6S. 146°·0E. (as on 1946, Dec. 24d.).

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

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Guam		17·0	355	i 4 8	+ 7	i 6 58	−12	—	—	—
Brisbane	N.	24·7	165	i 5 22	− 2	i 9 50	+ 6	i 5 51	PP	—
Riverview		30·5	172	i 6 18a	+ 1	i 11 22	+ 4	i 7 18	PP	14·2
Omaesaki		38·7	351	e 7 31	+ 4	13 27	+ 2	—	—	—
Kôti		38·8	343	7 26	− 2	13 31	+ 5	—	—	—
Shizuoka		39·0	352	e 7 26	− 4	13 27	− 2	—	—	—
Batavia		39·1	265	e 7 41	+10	i 14 34	+63	i 9 17	PP	—
Hunatu		39·5	352	e 7 23	−11	13 19	−18	—	—	—
Utonomiya		40·3	354	7 50	+10	13 46	− 3	—	—	—
Perth		40·4	221	i 9 20	PP	13 50	0	—	—	—
Aikawa		42·0	352	e 7 51	− 3	14 12	− 2	—	—	—
Auckland	N.	42·4	145	8 2	+ 4	14 18	− 2	9 24	PP	17·9
Mizusawa		42·8	355	8 1	0	e 14 27	+ 1	e 14 24	S	—
Apia	E.	42·9	106	e 8 0	− 2	e 14 31	+ 4	—	—	e 18·5
Arapuni	E.	43·7	146	e 8 15	+ 7	14 39	0	i 18 15	SSS	19·3
Nanking		43·9	326	e 8 2	− 8	(e 14 21)	−21	—	—	e 14·3
Wellington		45·5	150	7 24	?	15 4	− 1	8 23	P	21·5
Vladivostok		48·2	346	i 8 41	− 3	i 15 38	− 5	—	—	—
Honolulu		60·3	63	—	—	e 18 23	PS	e 22 40	SS	e 24·8
Irkutsk		65·9	333	e 10 46	− 4	19 30	− 7	—	—	—
Colombo	E.	66·8	279	10 58	+ 2	21 8	PPS	—	—	43·0
Hyderabad	N.	69·8	290	e 11 31	+17	20 27	+ 4	13 48	PP	33·0
Bombay		75·3	290	e 11 55	+ 8	e 21 26	0	26 42	SS	35·7
Almata		77·4	316	e 12 10	+12	—	—	—	—	—
Andijan		80·0	312	e 12 14	+ 1	e 22 27	+10	—	—	—
Kulyab		81·4	309	i 12 27?	+ 7	i 22 39?	+ 8	—	—	—
Obi-garm		81·6	310	e 12 26	+ 5	e 22 44	+11	—	—	—
Stalinabad		82·3	310	i 12 23	− 2	e 22 43	+ 3	—	—	—
Tashkent		82·4	312	e 12 22	− 3	e 22 39	− 2	—	—	—
College		83·3	23	e 15 40	PP	e 22 50	0	e 28 16	SS	e 34·0

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Samarkand		83·8	310	e 13 3	+31	—	—	—	—	—
Sitka		87·0	32	—	—	e 23 24	− 3	e 24 23	PS	e 35·7
Ashkabad		90·3	308	e 13 21	+17	—	—	—	—	—
Sverdlovsk		90·4	327	—	—	23 36	[+ 1]	e 24 0	S	—
Victoria		93·0	42	13 57	+40	24 31	+10	25 31	PS	42·3
Shasta Dam		93·5	49	e 13 17	− 2	—	—	—	—	—
Berkeley		93·6	52	i 17 3	PP	i 24 27	+ 1	i 30 55	SSP	e 42·3
Santa Clara		93·8	52	e 17 14	PP	e 25 47	PS	e 31 23	SSP	e 43·0
Fresno	z.	95·5	53	e 13 27	− 1	—	—	e 17 25	PP	—
Pasadena		96·8	55	e 13 34	0	e 24 47	− 7	i 31 45	SS	i 43·7
Mount Wilson	z.	96·9	55	i 13 40	+ 6	—	—	—	—	—
Riverside	z.	97·5	56	e 13 37	0	—	—	—	—	—
Hungry Horse		99·3	41	e 13 44	− 1	—	—	i 13 53	P_cP	—
Boulder City		100·1	54	e 13 52	+ 3	—	—	—	—	—
Pierce Ferry		100·2	54	e 13 53	+ 4	—	—	i 18 23	PP	—
Butte	N.	100·5	43	—	—	e 25 31	+ 6	e 32 19	SS	e 39·7
Leninakan		101·5	310	e 18 7	PP	—	—	—	—	—
Salt Lake City		101·5	48	e 15 4	?	e 24 54	[+20]	e 32 42	SS	e 42·0
Bozeman		101·6	43	—	—	e 26 19	?	i 27 41	PPS	e 41·3
Tucson		103·0	57	e 16 52	?	e 25 17	{+ 1}	e 18 22	PP	e 43·1
Saskatoon		103·5	36	—	—	e 26 15?	{+55}	e 33 15?	SSP	44·3
Rapid City	E.	107·4	44	e 19 23	PP	e 25 30	[+29]	e 28 23	PS	e 46·9
Helsinki		108·1	333	—	—	e 26 4	?	e 28 24	PS	e 48·3
Ksara		108·7	304	e 19 4	PP	e 28 27?	PS	—	—	—
Upsala		111·5	335	—	—	e 28 37?	PS	e 34 15?	SS	e 45·3
Istanbul		112·5	313	e 19 41	PP	e 29 1	PS	—	—	—
Lincoln	E.	112·9	46	—	—	e 28 48	PS	e 34 52	SS	e 52·4
Helwan		113·1	301	—	—	e 27 27	{+60}	e 31 17	PPS	—
Warsaw		113·6	326	—	—	e 29 7	PS	e 39 37	SSS	e 52·3
Copenhagen		116·2	333	—	—	29 35	PS	35 45	SS	52·3
St. Louis		118·2	47	e 20 1	PP	e 27 15	{+14}	e 40 58	SSS	—
Prague		118·3	327	e 22 15?	PKS	e 25 52	[+ 8]	e 40 33	SSS	e 49·3
Chicago		118·9	43	—	—	e 27 38	{+32}	e 29 46	PS	e 51·3
Cheb		119·4	328	e 19 15?	[+23]	e 26 15	[+27]	—	—	e 49·3
Jena		119·4	328	20 12	PP	—	—	—	—	—
Aberdeen		120·9	341	—	—	i 29 41	?	e 50 11	Q	64·3
Triest		121·0	323	—	—	e 25 43	[−10]	e 30 14	PS	e 53·3
De Bilt		121·7	333	e 20 15?	PP	e 30 15	PS	e 37 15	SS	e 56·2
Stuttgart		121·9	328	e 18 57	[+ 1]	e 37 15	SS	e 20 28	PP	60·3
Strasbourg		122·7	328	e 20 19	PP	e 30 33	PS	e 32 15	PPS	54·3
Uccle		123·0	333	—	—	e 30 44	PS	e 36 45	SS	e 58·3
Zürich		123·0	327	e 19 41	[+42]	—	—	—	—	—
Cleveland		123·2	41	e 20 33	PP	e 37 21	SS	e 31 57	PPS	51·6
Basle		123·5	327	e 19 30	[+30]	e 38 15	SSP	—	—	—
Rome		123·7	320	e 20 26	PP	i 37 45	SS	e 30 41	PS	56·3
Kew		124·6	335	e 28 30	?	e 42 36	SSS	e 32 31	PPS	e 55·3
Paris		125·3	331	e 19 7	[+ 4]	37 15	SS	e 20 41	PP	e 57·3
Seven Falls		126·2	29	—	—	e 38 15?	SS	—	—	55·3
Vermont		126·7	34	—	—	e 31 12	PS	e 38 19	SS	e 51·5
Clermont-Ferrand		127·0	328	e 19 23	[+17]	e 38 48	SSP	e 21 25	PP	57·3
Jersey		127·1	336	e 22 15	PKS	—	—	—	—	57·3
Philadelphia		128·1	39	e 17 31	?	—	—	—	—	e 54·6
Fordham		128·4	37	e 19 20	[+11]	—	—	—	—	55·3
Barcelona		130·3	325	—	—	e 32 17	?	—	—	—
Algiers		132·6	319	—	—	e 23 15	SKP	e 44 15	SSS	e 72·2
Alicante		133·9	323	20 45	[+86]	33 13	PS	23 17	PP	e 63·4
Toledo		134·9	326	e 19 30	[+ 9]	—	—	e 22 26	PP	—
Huancayo		136·1	111	e 19 31	[+ 8]	e 40 24	SS	e 23 9	PKS	e 55·3
Granada		136·5	324	e 16 43a	?	i 40 29	SS	19 45	PKP	i 65·6
Lisbon	N.	138·4	331	—	—	41 13	SS	45 53	SSS	70·2
Bermuda		139·4	41	e 22 48	PP	e 40 39	SS	—	—	e 56·3
La Paz		140·8	122	e 19 29	[− 3]	26 45	[+ 4]	i 22 53	PP	e 66·6
San Juan		145·3	62	e 19 45	[+ 5]	e 41 33	SS	e 47 39	SSS	e 66·0

For Notes see next page.

NOTES TO MARCH 9d. 18h. 47m. 45s.

Additional readings :—
Brisbane iN =6m.14s., 6m.35s., 7m.42s., and 8m.31s.
Riverview iZ =7m.28s., iPPPN =7m.36s., iN =11m.28s., and 11m.56s., iZ =12m.1s., iE =12m.48s., iSSN =13m.8s., iN =13m.23s., iE =13m.27s. and 13m.56s., iZ =13m.59s., iN =14m.5s., iS$_c$SE =16m.46s.
Batavia ePE =7m.45s., i =10m.37s. and 12m.16s.
Auckland PPPN =9m.47s., P$_c$PN =10m.30s., iN =11m.6s., SN =13m.35s., SSN =15m.25s.
Wellington pP$_c$PZ =8m.39s., PP? =10m.42s., P$_c$S =13m.26s., i =16m.47s.
Hyderabad P$_c$PN =11m.54s., SSN =24m.31s., iN =30m.8s.
Bombay eSE =21m.22s.
College eS$_c$S? =23m.34s.
Sitka eSS? =28m.47s.
Sverdlovsk PS =25m.8s., iSS =30m.15s.
Victoria PPS =25m.57s., SS =30m.50s.
Berkeley iPPZ =17m.22s., eE =21m.43s., iSKSN =24m.33s., iSKKSN =25m.21s., iS$_c$SE =25m.53s., iSN =27m.17s., iPPSZ =28m.13s.
Pasadena eE =25m.54s., 29m.21s., 30m.5s., and 38m.17s.
Salt Lake City ePS =26m.47s., eSSS? =36m.7s.
Bozeman iSS? =31m.39s., iSSS =36m.29s.
Tucson ePPP =20m.45s., eS? =26m.42s., ePS =27m.22s., eSS =32m.57s.
Rapid City eSSE =34m.19s., eSSSE =37m.57s.
Helsinki e =29m.58s., eSS =34m.20s., e =37m.0s., 41m.18s., and 44m.35s.
Warsaw eE =30m.27s., eZ =34m.45s., eE =35m.46s., eN =36m.6s., eE =39m.33s.
Copenhagen 30m.46s., SSS =40m.0s.
St. Louis eSS =35m.55s.
Prague ePS? =30m.2s., eSS? =36m.21s.
Chicago eSS =36m.19s.
Cheb ePPS? =32m.15s.?, eSS? =37m.15s.?
Aberdeen iEN =45m.21s., eE =49m.53s.
Triest eSS =36m.45s., eSSS =41m.16s.
De Bilt eSSS =41m.39s., e =49m.45s.
Stuttgart ePSKS? =30m.15s., eSSS =41m.15s., eQ? =55m.15s.
Strasbourg e =21m.57s., eSSS =41m.9s., e =41m.21s.
Cleveland eE =37m.45s. and 49m.39s.
Rome eSKSZ =23m.18s., iSKSE =23m.36s., e =27m.18s., eE =29m.26s., and 30m.3s., ePSN =32m.0s., ePPSN =33m.4s., eN =35m.2s.
Kew eEN =36m.53s.
Paris e =38m.15s., eSSS =42m.45s., e =54m.58s.?, eQ =54m.15s.
Vermont ePPS =32m.36s.
Clermont-Ferrand e =33m.13s., 42m.38s., and 51m.40s.
Philadelphia eS? =29m.54s., eSS? =37m.36s., e =39m.22s.
Algiers S =35m.15s.?, e =52m.15s.?, and 55m.15s.?
Alicante PKS =24m.17s., PPP =26m.11s., SKS =28m.3s., PPS =34m.19s., SS =40m.5s., SSP =40m.57s., SSS =45m.11s., Q =57m.25s.
Huancayo ePPP? =24m.37s., ePPS =34m.49s., eSSS =45m.15s.
Granada PP =22m.56s., PPP =24m.20s., SKS =27m.11s., PPS =34m.38s., SSS =45m.56s.
Lisbon Q? =57m.57s.
Bermuda ePKS =24m.19s., eSKKKS =30m.10s., ePS =33m.33s., ePPPS =36m.13s., ePSPS =41m.43s.
La Paz iPKPN =19m.59s., PPP =25m.47s., SKKS =29m.33s., Q =60m.39s.
San Juan ePKS? =25m.11s., eSKSP =33m.46s.
Long waves were also recorded at La Plata and at other American and European stations.

March 9d. Readings also at 9h. (Tinemaha, Hungry Horse, Shasta Dam, Tucson, and near Port-au-Prince), 10h. (Hungry Horse, Pierce Ferry, and Shasta Dam), 11h. (near Alicante), 16h. (near Obi-garm, Andijan, and Stalinabad), 17h. (near Balboa Heights), 18h. (Hungry Horse and Shasta Dam), 19h. (Mount Wilson, Pasadena, Riverside, Shasta Dam, and Stuttgart), 22h. (Hungry Horse, Pierce Ferry, Shasta Dam, Paris, Stuttgart, Ksara, Bombay, and Mizusawa), 23h. (Rome, Florence, De Bilt, Granada, Alicante, near Murgab, Andijan, Kulyab, and Obi-garm).

March 10d. 11h. 25m. 30s. Epicentre 21°·3S. 173°·6E.

A = −·9267, B = +·1039, C = −·3612; δ = +3; h = +4;
D = +·111, E = +·994; G = +·359, H = −·040, K = −·932.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Auckland	N.	15·5	173	3 39	− 3	6 49	+14	—	—	i 7·8
Apia		15·8	64	i 3 31	−16	5 40	−62	6 30	Q	e 7·5
Arapuni	E.	16·8	172	—	—	7 18	+13	—	—	—
New Plymouth	E.	17·7	177	4 19	+ 9	7 42	+16	—	—	—
Tuai	N.	17·7	171	4 11	+ 1	7 38	+12	—	—	—
Brisbane	N.	19·7	247	e 4 35	+ 1	e 8 26	+16	i 4 56	PP	i 10·4
Wellington		19·9	177	4 30	− 6	8 39	+24	5 11	PP	10·5
Kaimata		21·2	183	4 45	− 4	8 57	+16	—	—	—
Christchurch		22·2	181	5 10	+10	9 8	+ 8	—	—	—
Riverview		23·4	232	i 5 10a	− 1	i 9 33	+12	i 5 19	pP	e 11·1
Honolulu		50·7	36	—	—	e 16 13	− 5	e 20 54	SS	e 22·7
Perth		52·2	245	i 12 23	PPP	i 17 32	PPS	i 21 43	SSS	i 24·6
Batavia		66·1	273	e 11 3	+12	e 19 56	+17	i 13 16	PP	e 34·5
Vladivostok		74·7	330	i 11 39	− 4	i 21 18	− 1	—	—	—
Santa Clara		84·1	46	e 12 38	+ 4	e 24 17	PPS	—	—	e 39·4
Berkeley		84·2	46	i 12 48	+14	i 23 2	+ 3	i 24 0	PS	e 34·5
Pasadena		85·1	50	i 12 39	0	e 23 6	− 2	e 24 8	PS	e 34·9
Mount Wilson	z.	85·2	50	e 12 39	0	—	—	—	—	—
Fresno	z.	85·3	48	i 12 38	− 2	—	—	—	—	—
Riverside	z.	85·6	50	i 12 42	+ 1	—	—	—	—	—
Shasta Dam		85·6	44	e 12 32	− 9	—	—	—	—	—
Palomar	z.	85·7	52	e 12 33	− 9	—	—	—	—	—
Mineral	z.	86·0	44	e 12 44	+ 1	—	—	—	—	—
Tinemaha		86·5	48	e 12 42	− 4	—	—	—	—	—
Boulder City		88·4	50	e 12 53	− 2	—	—	—	—	—
Pierce Ferry		89·1	51	e 12 54	− 4	—	—	e 16 28	PP	—
Sitka		89·3	26	—	—	e 23 46	− 2	e 25 0	PS	e 36·6
Victoria		89·3	37	—	—	e 23 48	0	e 24 48	PS	46·5
Tucson		89·7	55	e 13 0	− 1	e 24 0	+ 8	e 17 10	PP	e 36·9
College		90·9	16	—	—	e 23 53	−10	e 25 5	PS	e 37·0
Salt Lake City		92·6	47	e 18 4	PP	e 24 33	+15	e 23 52	SKS	e 39·4
Butte	N.	94·5	42	—	—	e 24 32	− 2	e 27 20	?	e 39·8
Hungry Horse		94·6	39	e 13 25	+ 1	—	—	—	—	—
Irkutsk		94·7	325	e 13 44	+20	e 24 38	+ 2	e 26 12	PPS	—
Bozeman		95·3	43	—	—	e 24 58	+17	—	—	e 39·3
Colombo	E.	95·9	275	14 20?	?	25 5	+19	—	—	53·8
Rapid City	E.	99·8	46	—	—	e 24 30	[+ 4]	e 32 14	SS	e 46·8
Hyderabad	N.	100·8	284	—	—	25 29	+ 2	—	—	—
Huancayo		104·6	109	—	—	e 26 13	+14	e 27 4	PS	e 43·2
Bomaby		106·4	284	18 14	[−12]	e 26 38	+24	34 23	SS	50·5
St. Louis		107·6	54	—	—	e 25 45	{− 3}	i 26 31	S	—
La Paz		108·8	117	e 14 25	P	i 26 48	S	i 28 30	PS	54·5
Chicago		110·3	51	—	—	e 28 33	PS	e 38 51	SSS	e 53·3
Stalinabad		114·3	304	e 18 51	[+ 9]	—	—	—	—	—
Tashkent		114·3	307	e 19 34	PP	e 29 12	PS	e 35 26	SS	—
Cleveland	E.	114·7	53	e 29 13	PS	—	—	—	—	—
Sverdlovsk		120·1	324	—	—	e 36 36	SS	e 41 6	SSS	—
San Juan		124·0	81	e 21 50	?	e 25 47	[−16]	e 29 50	PS	—
Bermuda		127·4	64	e 23 5	PKS	e 31 35	PS	e 38 32	SS	e 47·7
Grozny		131·7	310	22 40	PKS	—	—	—	—	—
Leninakan		133·5	307	19 38	[+19]	—	—	—	—	—
Ksara		140·8	298	e 19 39	[+ 7]	—	—	23 15	PKS	—
Copenhagen		142·9	343	—	—	27 24	[+40]	42 30	SSP	—
Istanbul		144·2	312	19 36	[− 2]	26 10	[−36]	—	—	—
Helwan		145·0	292	19 35	[− 4]	—	—	42 0	SS	—
Potsdam		145·5	339	e 19 42?	[+ 2]	—	—	—	—	e 74·5
Collmberg	z.	146·4	338	e 19 39	[− 3]	—	—	—	—	—
Prague		146·9	336	—	—	e 46 0	?	e 47 6	SSS	e 70·5
Cheb		147·7	338	—	—	—	—	e 47 30?	SSS	e 72·5
De Bilt		148·0	347	—	—	—	—	e 48 0	SSS	e 71·5

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Kew		149·5	353	—	—	e 42 54	SS	e 66 30?	Q	e 73·5
Stuttgart		149·9	338	e 19 45	[− 2]	—	—	e 24 9	PP	78·5
Strasbourg		150·5	340	e 19 55	[+ 7]	e 42 30	SS	e 24 21	PP	69·5
Triest		150·6	331	e 20 10	PKP_2	—	—	—	—	e 68·5
Zürich		151·3	339	e 19 52	[+ 3]	—	—	e 24 29	PP	—
Basle		151·5	340	e 19 59	[+10]	—	—	—	—	—
Paris		151·6	348	e 19 53	[+ 4]	—	—	e 64 30?	Q	71·5
Rome		154·0	326	e 20 13	PKP_2	—	—	e 43 31	SS	—
Clermont-Ferrand		154·4	344	e 20 14	PKP_2	—	—	—	—	79·5
Toledo		161·4	353	e 20 43	PKP_2	—	—	—	—	—
Alicante		162·3	345	20 3	[0]	27 50	[+43]	23 34	PKS	e 78·0
Algiers		162·5	332	e 22 32	?	e 29 30?	?	e 24 12	PP	—
Granada		164·0	352	i 20 50k	PKP_2	32 21	{+48}	i 25 18	PP	i 81·1

Additional readings :—
Brisbane iN = 5m.26s., eN = 5m.36s., iSSN = 9m.11s.
Wellington P_gPZ = 8m.30s.
Kaimata i = 4m.57s. and 5m.16s.
Riverview i = 5m.13s., iN = 5m.32s., i = 5m.44s., iPPZ = 5m.52s., iE = 5m.57s., iN = 6m.15s., iZ = 6m.25s., iE = 6m.34s., iEZ = 7m.22s., iZ = 7m.54s., iE = 8m.41s., iN = 8m.44s., isSE = 9m.50s., isSN = 9m.54s., iN = 10m.19s., iSEN = 10m.32s.
Batavia eEN = 14m.59s., eSSEN = 24m.11s.
Berkeley iP_gPZ = 13m.28s., iPPSZ = 24m.11s., iPPSE = 24m.14s., iSSE = 29m.2s.
Pasadena eSSE = 28m.54s.
Palomar iZ = 12m.50s.
Tinemaha iZ = 12m.51s. and 13m.3s.
Pierce Ferry i = 13m.28s.
Victoria e = 37m.0s.
Tucson eSKS = 23m.35s., eSS = 29m.42s.
Salt Lake City ePS = 25m.22s., eSS? = 30m.26s.
Huancayo eSS = 32m.28s.
St. Louis iPS = 28m.3s., iSS = 38m.5s.
La Paz ePPN = 16m.31s., iEN = 29m.50s., iE = 31m.26s., iSSN = 34m.24s., Q = 46m.0s.
Chicago ePPS? = 30m.41s.
San Juan eSS? = 37m.47s.
Bermuda ePPS? = 33m.0s.
Potsdam iZ = 19m.48s.
Collmberg iPKPZ? = 19m.56s., $ePKP_2Z$? = 20m.42s.
Prague e = 54m.54s.
Kew eN = 51m.26s. and 56m.26s.
Stuttgart ePKPZ = 19m.54s., eZ = 24m.56s., e = 41m.18s., and 48m.30s., eQ? = 71·5m.
Strasbourg eSSS = 48m.12s.
Paris i = 20m.0s.
Rome iZ = 21m.4s., eE = 24m.39s., iE = 26m.20s., eE = 37m.3s. and 50m.8s., iE = 53m.28s.
Alicante PKP_2 = 21m.3s., PP = 24m.59s., PPP = 28m.58s., SKKS = 32m.0s., SKSP = 35m.40s., PPS = 39m.7s., SS = 46m.0s., SSS = 52m.16s.
Granada PKP_2 = 21m.33s., SKP = 24m.48s., PPS = 38m.9s., iSS = 45m.20s., and SSS = 51m.9s.
Long waves were also recorded at Tananarive, Lincoln, Philadelphia, Helsinki, Upsala, and Warsaw.

March 10d. 20h. 4m. 9s. Epicentre 3°·3S. 126°·5E. (as on 1943, Aug. 10d.).

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

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Batavia		19·8	263	i 4 39	+ 4	i 9 41	?	—	—	i 11·1
Perth		30·2	198	i 7 19	PP	i 11 14	+ 1	—	—	—
Brisbane	N.	34·9	136	e 7 49k	+54	—	—	i 8 16	PP	—
Riverview		38·1	146	i 7 22	0	i 13 7	− 9	i 8 49	PP	e 18·8
Vladivostok		46·5	6	i 8 27	− 4	i 15 11	− 8	—	—	—
Colombo	E.	47·6	283	8 41	+ 2	15 41	+ 6	—	—	24·7
Hyderabad	N.	51·7	295	9 11	0	16 34	+ 2	—	—	—
Bombay		57·2	295	e 10 12	+21	e 18 5	+19	21 55	SS	27·2
Irkutsk		58·5	344	e 9 58	− 2	e 17 59	− 4	—	—	—
Almata		64·3	323	e 10 41	+ 2	—	—	—	—	—

Continued on next page.

The scanned images of the bulletins of the International Seismological Summary (ISS) have been obtained thanks to funding provided by the US National Science Foundation through grant EAR-9725140 (Villaseñor et al., 1997) and collected by SGA Storia Geofisica Ambiente (Bologna) on behalf of the Istituto Nazionale di Geofisica e Vulcanologia (Rome), in the frame of the EUROSEISMOS project.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Frunse		65·6	321	e 10 54	+ 6	—	—	—	—	—
Andijan		66·0	318	e 10 50	0	19 39	+ 1	—	—	—
Kulyab		66·5	314	i 10 55	+ 1	—	—	i 14 37	PPP	—
Obi-garm		66·9	315	e 10 55	− 1	e 19 52	+ 3	—	—	—
Stalinabad		67·5	315	i 10 57	− 3	i 19 55	− 1	i 14 39	PP	—
Tashkent		68·3	318	e 11 19	PcP	e 20 3	− 3	e 13 27	PP	—
Sverdlovsk		79·8	330	i 12 12	0	i 22 10	− 4	—	—	—
Grozny		85·5	314	12 57	PcP	—	—	—	—	—
Piatigorsk		87·6	314	e 12 51	0	—	—	—	—	—
Ksara		92·3	303	e 13 14	+ 1	25 34	PS	—	—	—
Helwan		96·4	299	e 13 33	+ 1	e 26 15	PS	—	—	—
Istanbul		97·8	312	e 13 51?	+13	—	—	e 18 51?	PP	—
Cheb		107·8	322	—	—	e 25 51?	{+ 1}	—	—	—
Shasta Dam		108·1	48	e 18 47	PP	—	—	—	—	—
Rome		110·0	314	e 19 11	PP	i 25 30	[+18]	e 28 40	PS	—
Stuttgart		110·2	321	e 18 31	[− 2]	(e 28 51?)	PS	e 19 16	PP	e 28·8
Strasbourg		111·2	321	e 19 24	PP	e 29 51?	PPS	e 34 51?	SS	—
Hungry Horse		111·7	38	e 18 33	[− 4]	—	—	e 19 12	PP	—
Tinemaha	z.	112·0	51	e 18 30	[− 7]	—	—	—	—	—
Pasadena	z.	112·7	53	i 18 35	[− 3]	—	—	—	—	—
Mount Wilson	z.	112·8	53	i 18 36	[− 3]	—	—	—	—	—
Riverside		113·4	53	e 18 37	[− 3]	—	—	e 19 27	PP	—
Paris		114·3	323	e 18 42	[0]	e 29 51?	PS	e 19 43	PP	e 64·8
Kew		114·8	327	—	—	e 40 9	SSS	e 43 47	Q	e 52·8
Boulder City		115·0	51	e 18 43	[0]	—	—	—	—	—
Pierce Ferry		115·6	51	e 18 45	[+ 1]	—	—	e 19 44	PP	—
Tucson		119·1	54	e 18 48	[− 3]	e 30 6	PS	e 20 7	PP	e 56·0
Temiskaming		131·4	23	e 19 15	[0]	—	—	e 22 39	PKS	—
Huancayo		153·5	125	e 20 55	PKP_2	—	—	—	—	—
La Paz		155·5	144	20 7	[+12]	i 44 55	SSP	—	—	75·2

Additional readings :—
Batavia ePEN =5m.52s., iEN =7m.23s., L is given as SS.
Perth i =9m.37s.
Brisbane iN =7m.55s., 8m.1s., 8m.10s., and 8m.47s., e =9m.8s.
Riverview iPPPZ =9m.11s., isSN =13m.22s., eN =14m.55s., iEN =15m.49s., iZ = 15m.56s.
Tashkent eSS =24m.27s.
Rome ePPS? =29m.10s., eSS? =34m.24s.
Tucson ePPP =22m.0s.
Long waves were also recorded at Auckland, Christchurch, Wellington, Berkeley, Bermuda, De Bilt, Ucele, and Granada.

March 10d. Readings also at 0h. (near Apia), 1h. (Arapuni and Wellington), 2h. (Andijan, near Kulyab, Murgab, Obi-garm, and Stalinabad), 8h. (near Alicante (3), near Kulyab (2), Murgab, Obi-garm (2), and Stalinabad (2)), 9h. (Rome), 10h. (Balboa Heights, Palomar, Riverside, Tinemaha, Tucson, Boulder City, Pierce Ferry, Shasta Dam, Hungry Horse, and near Mizusawa), 11h. (Stalinabad, near Kulyab, Murgab, Obi-garm, and near Samarkand), 13h. (Strasbourg, near Stuttgart, Chur, Basle, Zürich, Triest (2), and near Ashkabad), 15h. (Hungry Horse, Pierce Ferry, and Tacubaya), 18h. (Temiskaming), 20h. (Hungry Horse), 22h. (Andijan and near Kulyab).

March 11d. 2h. Undetermined Shock.
Batavia ePEN =54m.22s.
Riverview iE? =61m.22s., eN =64m.28s., iZ =65m.22s., iE =65m.29s., iN =66m.9s., iE =67m.7s., iZ =67m.25s., iEN =67m.32s., iZ =67m.40s.
Brisbane ePN =62m.37s., iN =63m.26s., 63m.51s., 64m.12s., 64m.36s., 64m.50s., 65m.0s., 65m.9s., 65m.29s., 66m.28s., 66m.42s., 67m.29s., 68m.27s., and 69m.6s.
Hungry Horse iP? =67m.59s.
Tinemaha iPZ =67m.59s.
Mount Wilson iPZ =67m.59s.
Pasadena iPZ =68m.0s.
Riverside iPZ =68m.0s.
Tucson iP =68m.13s.
Huancayo eP =69m.13s.

March 11d. 13h. 30m. 22s. Epicentre 6°·7S. 153°·0E. Focus at Base of Superficial Layers.
(as on 1946, Feb. 7d.).

$A = -·8850$, $B = +·4509$, $C = -·1159$; $\delta = -3$; $h = +7$;
$D = +·454$, $E = +·891$; $G = +·103$, $H = -·053$, $K = -·993$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	N.	20·7	179	i 4 42	+ 2	i 8 41	SS	i 5 3	PP	—
Riverview		27·1	183	e 5 46	+ 4	e 10 24	+ 8	i 6 19	PP	e 13·3
Perth		42·8	228	—	—	i 14 33	+15	i 17 57	SS	22·9
Vladivostok		53·2	341	e 9 14	− 3	i 16 40	− 4	i 9 19	P	—
Irkutsk		71·9	330	e 11 21	− 1	e 20 39	0	—	—	—
Andijan		87·3	311	e 12 49	+ 4	e 23 25	+ 4	—	—	—
Stalinabad		89·6	308	i 12 57	+ 1	e 23 42	0	—	—	—
Tashkent		89·7	311	e 12 56	0	e 23 41	− 2	—	—	—
Pasadena	Z.	92·7	56	e 13 9	− 1	—	—	—	—	—
Mount Wilson	Z.	92·9	56	e 13 10	− 1	—	—	—	—	—
Tinemaha	Z.	93·0	54	e 13 12	+ 1	—	—	—	—	—
Riverside	Z.	93·4	56	e 13 12	− 1	—	—	—	—	—
Ksara		116·2	304	e 19 49	PP	—	—	e 30 40	PPS	—
Helwan		120·7	300	e 20 19	PP	—	—	—	—	—
La Paz	N.	133·2	118	i 22 46	PKS	—	—	—	—	—

Additional readings :—
Brisbane iN = 4m.47s., 4m.55s., and 5m.18s.
Riverview iZ = 5m.56s., iN = 6m.16s., iE = 10m.27s., iN = 10m.50s., and 11m.11s., iE = 11m.48s., iN = 12m.0s.
Long waves were also recorded at Hungry Horse, Auckland, and Wellington.

March 11d. Readings also at 3h. (Stuttgart, near Zürich, and Basle), 6h. (near Fresno and Lick), 10h. (Stuttgart, La Paz, near Grozny, and near Ashkabad), 11h. (Erevan, Piatigorsk, Leninakan, Rome, and Hungry Horse), 12h. (Mount Wilson, Pasadena, La Paz, and near Stalinabad), 13h. (near Mizusawa), 14h. (Stuttgart and Toledo), 17h. (La Paz), 19h. (near Stalinabad), 20h. (near Ottawa), 21h. (near Lick and Branner), 22h. (Florence, Rome, Istanbul, Ksara, Shasta Dam, near Huancayo, near Obi-garm, Stalinabad, and Murgab), 23h. (La Paz).

March 12d. 4h. Undetermined Shock.

Readings inconsistent with the given epicentre and with each other.

Intensity VI at Bell Ranch, Bueyeros, Gladstone, Ione, Logan, Mount Dora, Senaca (New Mexico), at Amarillo, Channing, Dalhart, Electric City, Panhandle, Perico, Perryton (Texas), at Boise City, Felt, Kenton, Regnier (Oklahoma), at Kim, Trinchera (Colorado), etc.

Epicentre 36°·0N. 102°·5W.
Macroseismic area, 50,000 sq.miles.

L. M. Murphy, F. P. Ulrich.
United States Earthquakes, 1948, Serial No. 746, Washington, 1951, p. 8, with macroseismic chart.
Tucson (7·8) eP? = 31m.3s., i = 31m.11s., iS? = 32m.50s., iL = 33m.6s.
Rapid City (8·1) eP?E = 31m.24s., eS?E = 32m.30s., eLE = 32m.54s.
Pierce Ferry (9·3) eP = 31m.11s., iS = 33m.28s.
Boulder City (10·0) eP? = 32m.7s., i = 32m.37s., eS = 34m.15s.
Palomar (12·1) eZ = 32m.20s., eSZ = 35m.16s.
Riverside (12·4) ePZ = 31m.59s., eS? = 35m.37s.
Tinemaha (12·7) eZ = 32m.54s., eSZ = 35m.42s.
Mount Wilson (12·9) ePZ = 32m.14s., eZ = 33m.1s.
Pasadena (13·0) eZ = 33m.2s., eSZ = 35m.47s.
Hungry Horse (15·0) eP = 33m.1s., eS = 36m.5s., eL = 37m.2s.
Shasta Dam (16·3) eP = 32m.48s.
Temiskaming (20·5) eE = 37m.45s., e = 39m.35s.
Ottawa (22·3) P = 34m.3s., S = 38m.42s., L = 40m.33s.

March 12d. 10h. 49m. 45s. Epicentre 10°·5S. 74°·9W. (as on March 4d.).

$A = +·2562$, $B = -·9495$, $C = -·1811$; $\delta = -1$; $h = +6$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Huancayo		1·6	195	i 0 20	−10	i 0 35	−16	—	—	i 1·0
La Paz		8·9	133	2 27	+15	i 4 25	S*	i 5 41	?	—
Bogota	z.	15·0	3	e 3 34	− 1	e 6 23	0	e 6 53	SS	—
Tucson		54·6	322	i 9 33	+ 1	—	—	e 10 24	PcP	—
Palomar	z.	59·1	320	i 10 7	+ 3	—	—	i 10 54	PcP	—
Pierce Ferry		59·2	324	i 10 5	0	—	—	—	—	—
Riverside	z.	59·9	320	e 10 9	− 1	—	—	—	—	—
Mount Wilson	z.	60·5	320	i 10 14	0	—	—	—	—	—
Pasadena	z.	60·5	320	e 10 14	0	—	—	e 10 56	PcP	—
Tinemaha	z.	62·4	322	e 10 27	0	—	—	—	—	—
Shasta Dam		67·2	323	i 10 55	− 3	—	—	—	—	—
Hungry Horse		68·0	333	e 11 2	− 1	—	—	—	—	—

Bogota also gives eZ = 4m.1s.

March 12d. 20h. 18m. 27s. Epicentre 10°·5S. 74°·9W. (as at 10h.).

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Huancayo		1·6	195	e 0 35	+ 5	i 1 21	+30	—	—	i 1·7
La Plata		28·8	150	5 4	−58	—	—	6 57	PP	11·8
San Juan		30·0	17	—	—	e 11 45	+35	—	—	e 14·1
Bermuda		43·7	13	—	—	e 15 38	+59	e 18 33	SSS	e 19·6
Tucson		54·6	322	e 9 29	− 3	—	—	e 9 35	P	e 31·2
Palomar	z.	59·1	320	e 10 4	0	—	—	—	—	—
Pierce Ferry		59·2	324	e 10 3	− 2	—	—	—	—	—
Boulder City		59·6	323	e 10 10	+ 2	—	—	—	—	—
Riverside	z.	59·9	320	e 10 6	− 4	—	—	—	—	—
Mount Wilson	z.	60·5	320	e 10 14	0	—	—	—	—	—
Pasadena	z.	60·5	320	e 10 12	− 2	—	—	—	—	—
Hungry Horse		68·0	333	e 11 3	0	—	—	—	—	—
Stuttgart	z.	93·9	41	e 13 13	− 8	—	—	—	—	—
Ksara		113·0	58	e 19 30	PP	e 29 20	PS	—	—	—

Additional readings :—
La Plata N = 5m.44s., SE = 9m.25s., SN = 9m.33s.
Tucson i = 9m.55s.
Long waves were also recorded at Bombay, Sitka, and other European stations.

March 12d. Readings also at 2h. (near Triest), 7h. (Palomar, Riverside, Boulder City, Hungry Horse, Pierce Ferry, Shasta Dam, Tucson, and Ksara), 10h. (Hungry Horse, near Obi-garm, Stalinabad, and near Alicante), 11h. (Istanbul, Ksara, Stuttgart, near Andijan, and near Lick), 12h. (Mount Wilson, Pasadena, Palomar, Tinemaha, Boulder City, Pierce Ferry, Tucson, and near Huancayo), 13h. (Bombay), 14h. (Auckland and Wellington), 16h. (Hungry Horse and Pierce Ferry), 17h. (near Kulyab, Stalinabad, and Obi-garm), 18h. (near Branner, Lick, and near Huancayo), 20h. (La Paz), 21h. (Murgab, near Kulyab, Obi-garm, and Stalinabad), 23h. (Basle).

March 13d. 5h. 4m. 21s. Epicentre 15°·2S. 74°·9W. Depth of focus 0·010.
(as on 1947, Feb. 9d.).

$A = +·2515$, $B = -·9321$, $C = -·2606$; $\delta = -2$; $h = +6$;
$D = -·965$, $E = -·261$; $G = -·069$, $H = +·256$, $K = -·965$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Huancayo		3·2	352	i 0 50	0	i 1 29	+ 2	—	—	e 1·7
La Paz		6·6	99	i 1 40a	+ 4	i 3 19	+29	—	—	i 4·4
Bogota	z.	19·7	2	e 4 34	+10	e 9 26	Q	—	—	e 10·7
Tucson		58·4	324	e 9 48	0	—	—	—	—	e 32·1
Palomar	z.	62·7	321	e 10 17	0	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Pierce Ferry		63·0	325	e 10 19	0	—	—	—	—	—
Boulder City		63·4	324	e 10 22	0	—	—	—	—	—
Riverside	z.	63·5	321	e 10 22	0	—	—	—	—	—
Mount Wilson	z.	64·0	321	e 10 26	+ 1	—	—	—	—	—
Pasadena	z.	64·1	321	e 10 26	0	—	—	—	—	—
Tinemaha	z.	66·1	323	i 10 40	+ 1	—	—	—	—	—
Shasta Dam		70·9	324	e 11 7	− 1	—	—	—	—	—
Hungry Horse		72·2	334	i 11 17	+ 1	—	—	i 11 33	pP	—

Additional readings :—
Tucson i = 9m.55s., e = 10m.14s.
Palomar iZ = 10m.20s., eZ = 10m.36s.

March 13d. 8h. 6m. 1s. Epicentre 32°·9N. 0°·1E.

Felt at Monts des Ksours, damage and casualties at Asla, Aïn-Ouarka, and Boussemghoun.

J. P. Rothé.
Les Séismes de Kerrata et la Séismicité de l'Algiérie. Annales de l'Institut de Physique du Globe de Strasbourg 3e partie : Géophysique t VI, 1950, p. 35. Epicentre as adopted. Macroseismic radius 60-70 km.

A. Grandjean.
Séismes d'Algérie de 1940-1950 inclus. Annales de l'Institut de Physique du Globe de Strasbourg 3e partie, Géophysique. Nouvelle Série t. VII, pp. 80, 81.

$A = +\cdot 8413$, $B = +\cdot 0015$, $C = +\cdot 5406$; $\delta = +4$; $h = +1$;
$D = +\cdot 002$, $E = -1\cdot 000$; $G = +\cdot 541$, $H = +\cdot 001$, $K = -\cdot 841$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Algiers		4·6	31	i 1 13	+ 1	i 1 58	− 9	i 1 30	P_g	—
Granada		5·2	325	i 1 22k	+ 1	i 2 36	S*	1 35	P*	—
Alicante		5·5	355	1 23	− 2	2 37	+ 7	1 45	P_g	3·2
Toledo		7·7	335	e 1 54	− 2	e 4 28?	S_g	—	—	—
Barcelona		8·7	10	—	—	e 4 57	S_g	—	—	—
Lisbon		9·5	310	2 12	− 8	4 57	S_g	—	—	5·3
Florence		13·9	36	4 35	?	—	—	—	—	i 8·6
Bologna	N.	14·5	34	e 3 51	+23	—	—	—	—	—
Basle		15·7	19	e 3 49	+ 5	—	—	—	—	e 9·6
Zürich		15·8	22	e 3 47	+ 2	—	—	—	—	—
Paris		16·0	6	i 3 49	+ 1	—	—	—	—	—
Jersey		16·4	355	e 3 49	− 4	—	—	—	—	—
Triest		16·5	36	e 4 1	+ 7	e 7 16	+18	—	—	—
Strasbourg		16·7	18	e 3 54	− 3	—	—	e 3 59	PP	e 9·1
Stuttgart		17·3	21	e 4 3k	− 1	e 7 29	+13	e 5 12	PP	e 10·0
Kew	z.	18·6	359	e 4 9	−12	—	—	—	—	—
De Bilt		19·5	9	e 4 59?	+28	e 8 11	+ 5	—	—	e 10·5
Belgrade		19·8	47	e 4 30	− 5	—	—	—	—	—
Jena		19·9	23	e 4 37	+ 1	—	—	—	—	—
Collmberg	z.	20·7	23	e 4 58	+14	—	—	—	—	—

Additional readings :—
Algiers i = 1m.46s., 2m.19s., iS_g = 2m.32s., i = 2m.36s. and 2m.39s.
Granada PS = 2m.1s., P_gS_g = 2m.22s., S = 2m.39s., 2m.49s., and 2m.56s.
Alicante P_g = 1m.37s., P_gS_g = 2m.14s. and 2m.20s., S_g = 2m.45s., and 2m.51s.
Paris i = 5m.0s.
Belgrade e = 5m.48s.
Jena eN = 5m.47s.
Collmberg eZ = 3m.53s.
Long waves were also recorded at Rome, Uccle, and Helwan.

March 13d. 20h. 2m. 42s. Epicentre 1°·5N. 126°·5E. Depth of focus 0·010.

$A = -\cdot5946$, $B = +\cdot8036$, $C = +\cdot0260$; $\delta = 0$; $h = +7$;
$D = +\cdot804$, $E = +\cdot595$; $G = -\cdot015$, $H = +\cdot021$, $K = -1\cdot000$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Batavia		21·1	248	i 4 36	− 2	i 8 22	0	c 8 40	SS	—
Guam		21·6	55	i 4 46	+ 3	i 8 36	+ 5	i 4 57	PP	—
Nanking		31·2	347	6 12	0	11 12	+ 2	—	—	—
Kumamoto		31·4	7	e 6 13	− 1	11 14	+ 1	—	—	—
Hukuoka		32·1	6	6 16	− 4	11 25	+ 1	—	—	—
Kôti		32·6	11	6 25	+ 1	i 11 35	+ 3	7 29	PP	16·5
Hamada		33·6	9	6 32	− 1	e 11 48	+ 1	8 29	PPP	—
Sumoto		33·6	13	i 6 32	− 1	i 11 48	+ 1	8 7	PPP	—
Perth		34·8	196	6 48	+ 5	12 11	+ 5	8 3	PPP	—
Nagoya		34·9	16	6 44	0	12 9	+ 2	—	—	—
Shizuoka		35·1	18	6 45	− 1	12 11	+ 1	—	—	14·8
Hunatu		35·8	17	6 50	− 2	11 53	−28	—	—	—
Utunomiya		37·0	18	i 7 15	+13	12 53	+13	—	—	—
Hukusima		38·3	19	7 11	− 1	i 13 0	+ 1	—	—	—
Brisbane		38·5	140	i 7 13	− 1	i 13 0	− 2	i 7 30	pP	i 18·4
Mizusawa	E.	39·8	19	7 27	+ 2	13 23	+ 1	—	—	—
Akita		40·0	17	7 30	+ 3	13 28	+ 3	—	—	—
Morioka		40·3	18	c 7 30	+ 1	13 18	−11	—	—	—
Miyako		40·5	19	7 29	− 2	13 33	+ 1	—	—	—
Vladivostok		41·7	5	i 7 41	0	i 13 51	+ 1	—	—	—
Riverview		42·1	148	i 7 45a	+ 1	i 13 59	+ 3	9 47	PP	22·5
Calcutta	E.	42·6	303	i 7 58k	+10	i 14 8	+ 5	i 9 18	PP	20·6
Sapporo		43·5	15	7 56	+ 1	14 17	+ 1	—	—	19·5
Colombo	E.	46·8	278	8 19	− 3	15 5	+ 1	—	—	26·2
Kodaikanal	E.	49·5	283	i 8 47	+ 5	i 15 53	+12	10 37	PP	23·7
Hyderabad	N.	49·8	291	8 43	− 2	15 42	− 4	10 41	PP	—
Irkutsk		53·9	343	i 9 15	− 1	16 41	0	—	—	—
Bombay		55·3	292	i 9 14	−12	i 16 53	− 7	21 19	SS	25·9
Auckland	N.	58·8	135	12 2	PP	17 49	+ 3	19 17	S_eS	25·3
Murgab		60·4	314	10 1	0	18 12	+ 5	—	—	—
Almata		60·6	321	i 10 5	+ 2	i 18 13	+ 3	—	—	—
Wellington		61·0	139	10 2	− 4	18 6	− 9	10 15	pP	25·3
Tuai	N.	61·4	136	10 5	− 3	18 17	− 3	19 49	S_eS	—
Frunse		61·9	318	i 10 12	0	—	—	—	—	—
Andijan		62·5	316	10 14	− 2	18 38	+ 4	—	—	—
Kulyab		63·3	312	10 6?	−15	i 18 33?	−11	—	—	—
Obi-garm		63·6	313	i 10 11	−12	—	—	—	—	—
Stalinabad		64·2	313	i 10 26	− 1	i 18 58	+ 3	—	—	—
Tashkent		64·9	316	i 10 31	0	i 19 7	+ 4	19 48	SS	—
Tchimkent		65·0	317	i 10 31	− 1	i 19 9	+ 5	—	—	—
Samarkand		65·9	313	i 10 34	− 4	—	—	—	—	—
Ashkabad		71·9	309	i 11 17	+ 3	i 20 32	+ 6	—	—	—
Sverdlovsk		75·7	329	i 11 37	+ 1	i 21 6	− 3	i 12 3	pP	—
Honolulu		76·1	68	e 11 34	− 5	i 21 15	+ 2	22 15	PPS	e 31·4
Baku		78·8	311	12 1	+ 7	i 21 52	+10	—	—	—
Tananarive		80·0	250	11 28	−32	e 21 59	+ 4	e 12 31	pP	39·6
Grozny		82·2	313	e 12 16	+ 4	22 24	+ 7	—	—	—
Erevan		82·9	310	e 12 19	+ 4	22 30	+ 6	—	—	—
Leninakan		83·4	311	e 12 24	+ 6	22 39	+10	—	—	—
Piatigorsk		84·2	314	e 12 25	+ 3	22 43	+ 6	—	—	—
Sotchi	N.	86·6	313	e 12 31	− 3	—	—	—	—	—
College		86·8	25	e 13 47	+72	i 22 53	[+ 4]	e 31 51	SSS	e 35·4
Moscow		88·1	325	e 12 40	− 1	—	—	e 13 13?	pP	—
Theodosia	N.	89·7	315	e 12 52	+ 4	e 23 37	+ 7	—	—	—
Ksara		89·7	303	i 12 52	+ 4	i 23 40	+10	—	—	—
Yalta		90·6	314	—	—	23 28	−10	—	—	—
Sitka		93·3	32	e 13 2	− 3	i 24 6	+ 5	i 16 48	PP	e 43·5
Helwan		93·7	300	e 18 18	?	e 24 14	+ 9	e 25 24	SP	—
Helsinki		94·4	331	—	—	e 24 19	+ 8	e 25 51	PS	e 41·3
Istanbul		94·6	313	13 5	− 6	23 39	[+ 3]	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m. s.			m.
Bucharest		96·4	315	e 18 48	?	e 23 54	[+ 8]	e 24 34	S		—
Upsala		98·1	331	e 17 27	PP	e 24 47	+ 5	23 56	SKS		e 44·3
Warsaw		98·2	324	e 13 34	+ 7	e 24 1	[+ 5]	e 19 39	PPP		e 49·3
Belgrade		100·3	316	e 17 35	PP	e 27 32	PS	e 19 29	PPP		—
Raciborzu	z.	100·5	322	e 13 44	+ 6	—	—	—	—		—
Budapest		100·6	319	e 17 52	PP	e 25 6	+ 3	—	—		e 53·8
Kalossa		100·9	318	e 13 43	+ 3	e 24 46	−20	e 17 58	PP		—
Victoria		102·1	40	e 22 42?	?	e 25 3?	−12	e 32 6?	SS		47·3
Copenhagen		102·1	328	—	—	25 30	+15	26 48	SP		—
Prague		102·8	322	e 18 36	PP	e 25 28	+ 7	e 27 1	SP		e 42·3
Potsdam		102·9	325	e 13 45	− 3	i 25 34	+12	e 18 5	PKP		e 47·3
Collmberg	z.	103·3	324	e 13 53	+ 3	e 28 8	PPS	e 18 16	PKP		—
Jena		104·3	323	e 14 0	+ 5	e 27 8	PS	—	—		e 52·3
Triest		104·6	319	e 18 18	PKP	e 24 30	[+ 4]	i 25 43	SKKS		—
Ukiah		104·7	49	—	—	e 33 52	SS	—	—		e 44·2
Shasta Dam		104·9	47	e 13 57	− 1	e 24 31	[+ 4]	i 18 16	PKP		—
Mineral	z.	105·6	47	e 13 49	P	—	—	i 18 21	PKP		—
Berkeley		105·7	50	e 18 9	PKP	i 24 40	[+ 9]	i 20 4	PPP		e 49·9
Santa Clara	z.	106·1	50	—	—	e 28 38	PPS	e 33 50	SS		—
Padova		106·2	318	e 16 8	?	e 24 58	SKKS	—	—		—
Lick	z.	106·3	50	i 14 6	P	—	—	i 18 28	PP		—
Stuttgart		106·5	322	e 14 6	P	e 25 59	+ 7	e 14 26	pP		e 49·3
Bologna		106·6	317	e 18 16	PP	e 24 43	[+ 9]	—	—		—
Rome		106·6	314	e 14 2	P	i 24 35	[+ 1]	i 18 26	PP		—
Salo		106·8	319	e 14 10	P	e 24 54	[+19]	—	—		—
Florence		106·9	317	e 14 9	P	i 24 42	[+ 7]	—	—		—
Chur		107·0	320	e 14 28	P	—	—	e 17 11	?		e 52·3
Zürich		107·4	321	e 14 21	P	e 27 44	SP	e 17 32	?		—
Strasbourg		107·4	322	e 14 56	P	e 25 50	− 9	i 18 39	PP		48·3
De Bilt		107·5	327	e 14 12	P	i 27 46	PS	i 18 44	PP		e 51·3
Pavia		107·8	319	e 18 18?	[+ 3]	—	—	—	—		—
Fresno		107·9	50	e 18 48	PP	e 25 48	[+68]	—	—		—
Basle		108·0	322	e 17 25	?	e 26 30	+26	e 27 48	PS		—
Hungry Horse		108·0	37	e 14 12	P	e 26 12	+ 8	e 18 38	PP		—
Aberdeen		108·5	333	—	—	i 24 28	[−15]	e 33 29	SS		48·3
Neuchatel		108·5	321	e 17 44	?	e 27 58	PS	—	—		—
Uccle		108·5	326	e 18 30	PP	e 24 58	[+15]	e 26 17	S		e 53·3
Santa Barbara		108·6	53	—	—	i 25 46	S	—	—		—
Tinemaha	z.	109·0	50	i 18 48	PP	—	—	—	—		—
Durham		109·6	331	e 18 52	PP	25 3	[+16]	i 26 15	SKKS		—
Butte	N.	109·9	39	—	—	e 24 53	[+ 5]	e 25 48	SKKS		e 55·1
Pasadena		109·9	53	e 14 21	P	i 24 54	[+ 6]	e 18 5	PKP		e 44·5
Mount Wilson	z.	110·0	53	i 18 55	PP	—	—	—	—		—
Saskatoon		110·4	32	18 59	PP	25 50	SKKS	28 24	PS		48·3
Paris		110·5	325	e 14 27?	P	e 25 27	[+36]	i 19 1	PP		e 53·3
Riverside	z.	110·6	53	e 14 25	P	i 29 25	PKKP	i 18 59	PP		—
Kew		110·8	328	e 17 44	[−37]	e 28 10	PS	—	—		e 44·3
Bozeman		111·0	39	e 18 52	PP	e 24 56	[+ 3]	e 25 56	SKKS		e 44·8
La Jolla		111·0	54	e 18 54	PP	e 25 2	[+ 9]	i 25 59	SKKS		—
Palomar		111·2	53	e 14 30	P	i 24 33	[−21]	i 28 49	PS		—
Clermont-Ferrand		111·5	321	e 16 56	?	i 28 28	PS	i 19 8	PP		58·8
Boulder City		112·0	50	e 15 30	P	e 29 22	PKKP	e 18 32	PKP		—
Salt Lake City		112·4	45	e 19 18	PP	e 25 5	[+ 7]	e 26 8	SKKS		e 45·7
Pierce Ferry		112·5	50	e 14 34	P	e 28 40	PS	e 18 30	PKP		—
Jersey		112·9	327	e 19 53	PP	e 26 3	SKKS	e 29 18	PKKP		—
Barcelona		114·0	317	e 19 23	PP	—	—	e 28 52	PS		e 60·0
Algiers		115·3	312	e 19 33	PP	25 19	[+ 9]	26 19	SKKS		64·3
Tucson		116·3	52	i 18 36	[+ 3]	i 26 40	SKKS	e 19 38	PP		e 47·4
Alicante		117·2	316	18 31	[− 3]	25 24	[+ 8]	19 42	PP		e 55·6
Ivigtut		117·3	357	—	—	35 48	SS	—	—		56·3
Toledo		118·9	318	e 18 41	[+ 3]	—	—	19 38	PP		—
Granada		119·9	315	19 25k	[+46]	28 11	SKKS	19 56	pPKP		i 65·5
Lincoln	E.	122·4	38	e 20 53	PP	e 26 52	SKKS	e 30 17	PS		e 54·8
Lisbon		122·9	320	18 57	[+12]	—	—	20 56	PP		61·3
Chicago		127·0	31	e 20 42	PP	e 27 37	SKKS	e 37 46	SS		e 55·5

Continued on next page.

The scanned images of the bulletins of the International Seismological Summary (ISS) have been obtained thanks to funding provided by the US National Science Foundation through grant EAR-9725140 (Villaseñor et al., 1997) and collected by SGA Storia Geofisica Ambiente (Bologna) on behalf of the Istituto Nazionale di Geofisica e Vulcanologia (Rome), in the frame of the EUROSEISMOS project.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m. s.			m.
Temiskaming		127·0	21	e 18 54	[+ 1]	—	—	—	—		—
St. Louis		127·7	36	i 19 1	[+ 7]	i 27 47	SKKS	i 21 27	PP		—
Seven Falls		129·2	15	—	—	e 32 48	PPS	—	—		61·3
Ottawa		129·3	20	18 59	[+ 2]	22 12	SKP	21 8	PP		52·3
Cleveland		130·2	28	e 19 3	[+ 4]	i 28 4	SKKS	e 21 17	PP		—
Tacubaya		130·6	63	e 19 9	[+ 9]	—	—	e 22 20	SKP		—
Harvard		133·3	18	i 19 7	[+ 2]	—	—	i 22 28	SKP		e 67·3
Fordham		133·9	21	e 19 12	[+ 6]	e 28 26	SKKS	i 22 31	SKP		—
Philadelphia		134·2	23	e 22 0	PP	e 26 33	[+27]	e 22 36	SKP		e 56·3
Columbia		136·2	33	e 22 36	SKP	e 28 40	SKKS	e 39 46	SS		e 61·6
Bermuda		144·7	17	e 19 45	[+20]	e 41 18	SS	e 22 46	PP		e 60·3
La Plata	E.	146·5	175	19 28	[− 1]	29 31	SKKS	41 30	SS		59·5
	N	146·5	175	19 34	[+ 5]	29 39	SKKS	33 6	SKSP		55·8
	Z.	146·5	175	19 35	[+ 6]	38 48	?	33 54	SKSP		—
Huancayo		155·9	117	e 19 49	[+ 7]	e 30 42	SKKS	e 23 42	PP		e 74·5
San Juan		156·7	32	e 20 31	PKP_2	e 26 50	[+12]	e 24 9	PP		e 53·6
Bogota	z.	158·6	73	e 19 52	[+ 6]	e 30 49	SKKS	e 20 25	PKP_2		—
La Paz		159·3	138	i 19 59	[+12]	i 30 58	SKKS	i 20 9	pPKP		77·3
Fort de France		162·2	24	e 19 54	[+ 4]	—	—	—	—		—

Additional readings and notes :—
Guam e =6m.12s.
Hamada PPP =9m.27s., PS =14m.46s., SS =17m.49s., true PPP is given as PP.
Sumoto eSS? =14m.21s.
Perth SS =13m.38s.
Brisbane iN =7m.45s., 7m.59s., ipPE =8m.43s., iPcPE =9m.8s., iN =9m.49s., 11m.17s., 13m.48s,. 14m.35s., and 15m.4s., isSE =15m.34s.
Riverview eEN =9m.25s., i =9m.32s., iZ =13m.22s., iE =14m.4s., iN =14m.11s., and 16m.45s., iE =17m.7s., iEN =17m.18s., iZ =17m.39s., iNZ =17m.53s., iN =18m.42s., iE =19m.10s., iN =19m.38s., iE =20m.34s. and 22m.21s.
Calcutta iPPE =9m.48s., iSSE =16m.33s.
Kodaikanal SSE =19m.8s.
Hyderabad PcPN =10m.11s., ScSN =18m.32s., SSN =18m.55s.
Bombay iE =12m.52s.
Auckland iN =20m.18s., SSSN =24m.3s.
Wellington iZ =11m.56s., PcS =14m.35s., ScS =19m.48s., SS =22m.7s., SSS =24m.58s.
Sverdlovsk isS =21m.54s.
Honolulu i =21m.42s., e =29m.16s.
Tananarive ScS =22m.16s.
Sitka iSKS =23m.32s., iPS =24m.54s., i =25m.20s., eSS =30m.16s., i =31m.31s.
Helwan e =24m.48s.
Helsinki eS =25m.26s., e =27m.26s. and 27m.47s., eSS =30m.48s.
Bucharest eN =24m.1s.
Upsala eSS?E =30m.48s., eN =38m.18s.?
Warsaw ePP?Z =17m.50s., eSKS?Z =23m.37s., eS?EN =24m.52s., ePS?N =25m.48s., ePS?E =26m.1s., eE =27m.40s., eN =27m.45s., ePKKP?N =30m.18s., eE =30m.41s., eSS?E =31m.42s., eZ =32m.36s., eN =33m.8s., eSSS?E =34m.54s., eSSS?N =35m.3s.
Belgrade e =18m.22s.
Budapest eN =18m.2s., iE =25m.12s.
Kalossa eN =25m.31s.
Prague ePPS =27m.41s., eSS =32m.30s., eSSS =36m.18s.?
Potsdam eZ =14m.18s., iEZ =18m.33s., iZ =25m.37s., iPSZ =26m.45s., iE =26m.58s., iPPSEZ =27m.38s.
Collmberg eZ =19m.17s., ePPPZ =20m.50s.
Jena eN =17m.21s.
Shasta Dam eSKKS =25m.16s., ePS =27m.18s.
Berkeley iZ =19m.16s., iE =25m.24s., iN =25m.38s. and 27m.55s., iZ =28m.32s., 29m.1s. and 32m.6s., iN =33m.15s., and 37m.59s.
Stuttgart ePKP?Z =17m.28s., iPP =18m.33s.a, i =19m.0s., e =19m.41s., ePPP? =21m.21s., iPS =27m.38s., ePPS =28m.44s., e =31m.48s., eSS =33m.18s., eSSS =37m.18s.
Bologna eN =18m.42s.
Rome iSKKSE =25m.43s., iPSE =27m.54s., PPS =29m.5s., iSSE =34m.2s.
Salo e =17m.45s.
Strasbourg e =17m.24s., i =19m.6s. and 19m.10s., ePPP =21m.28s., eSKP =21m.43s., eSKKS =25m.55s., e =27m.37s., i =27m.40s., ePS =28m.22s., i =28m.46s., e =31m.33s., 31m.39s., and 33m.32s., eSS =33m.43s., e =37m.8s. and 45m.18s.
De Bilt iZ =19m.12s., iPPS =28m.43s.?, eSS =33m.18s.?
Fresno eFN =19m.32s., iZ =19m.40s., 21m.46s., and 24m.26s., eN =26m.36s., eE =26m.39s.
Hungry Horse ePKP =17m.33s., eSKKS =25m.34s., ePS =27m.55s., iPKKP? =29m.1s.
Aberdeen iN =33m.50s.

Continued on next page.

Uccle ePSZ =27m.57s., ePPSN =28m.59s.
Durham iPPEN =19m.21s., iEN =28m.8s., iPSE =28m.46s., PPSEN =29m.15s., iE = 29m.20s., SSN =34m.20s., SSPN =34m.36s.
Butte eS?N =26m.23s., ePSN =28m.7s., eSSN =34m.4s., eSSSN =38m.9s.
Pasadena iPKP$_2$Z =18m.23s., ePPE =18m.53s., iZ =19m.7s., iEN =25m.51s., iPSEZ = 28m.8s., iZ =28m.38s., iPPSZ =29m.35s., iSSN =34m.15s., eSSSEN =37m.54s.
Saskatoon SS =34m.18s.
Paris e =17m.25s. and 17m.46s., PKP =18m.25s., i =19m.31s., e =21m.12s., ePPP = 21m.25s., eS =26m.36s. and 26m.40s., i =28m.18s.. ePS =28m.36s., e =28m.58s., i =29m.24s., PPS =29m.49s., SS =34m.22s., eSKKS$_2$? =36m.22s., eQ =51·3m.
Kew eNZ =28m.49s., eZ =29m.12s.
Bozeman ePP =19m.20s., ePS =28m.22s., ePPS =29m.46s., eSS =34m.28s., eSSS = 38m.32s.
Palomar eZ =18m.28s., iZ =18m.50s. and 19m.0s., iEN =25m.33s., iZ =26m.3s.
Clermont-Ferrand e =17m.56s., i =19m.36s., 21m.22s., and 29m.32s., iPKP,PKP? = 39m.36s., i =42m.40s.
Salt Lake City eS =26m.51s., iPS =28m.39s., ePPS =29m.43s., eSS =34m.33s., eSSS = 39m.7s.
Pierce Ferry ePKKP =29m.19s.
Algiers ePP =19m.37s., e =20m.32s.. eS =27m.15s., PS =29m.19s.
Tucson e =15m.59s., i =19m.57s., iPKKP =29m.10s., iPS =29m.25s., eSS =35m.47s.
Alicante PKP =21m.40s., PPP =22m.14s., SKKS =26m.38s., PS =29m.22s., PPS = 30m.40s.. SS =36m.4s., SSP =37m.22s., SSS =39m.46s., Q =49m.20s.
Granada sPKP =20m.23s., iPP =20m.32s., PPP =23m.16s., S =29m.29s., SS =36m.32s.
Lincoln eSSE =36m.55s., eSSSE =41m.23s.
Lisbon Q?N =50m.30s.
Chicago eSKSP =31m.8s., e =32m.16s.
St. Louis i =22m.39s., iPPS =32m.39s., i =37m.44s.
Ottawa e =30m.37s., PPS =32m.48s., SS =38m.36s.
Cleveland iPKPZ =19m.8s., iZ =21m.54s., iSKP =22m.19s., iN =31m.23s., ePSE = 31m.27s., iN =32m.8s., ePPSE =32m.55s., eEN =33m.11s. and 33m.59s.
Tacubaya eE =19m.25s.
Fordham e =31m.50s.
Philadelphia ePPP? =24m.39s., eSKKS =28m.22s., ePPS? =33m.30s., eSS =39m.14s., eSSS =43m.43s.
Columbia ePPS =34m.0s.
Bermuda ePPP =25m.38s., ePS? =35m.18s., e =36m.43s., ePSPS =42m.18s., eSSS = 46m.23s.
La Plata PS?N =34m.0s.. PPSN =38m.36s., SSSE =47m.0s.
Huancayo ePKS =24m.38s., eSKKKS =31m.24s., e =33m.30s., eSS =43m.42s., eSSS = 50m.6s.
San Juan e =31m.58s., eSKSP =33m.30s., e =39m.3s., eSS =43m.38s.
Bogota ePPZ =24m.31s.
La Paz iPPZ =24m.33s., iZ =33m.22s., iSSN =45m.10s., Q =72m.18s.
Long waves were also recorded at Apia.

March 13d. 21h. 5m. 56s. Epicentre 45°·7N. 26°·8E. Depth of focus 0·025.
(as on 1947, Oct. 17d.).

Intensity III-IV at Bucharest. Suggested Epicentre 45°·9N. 26°·7E., depth 150km.

G. Demetrescu and G. Petrescu.
Bull. Séism. de Bucharest. Vol. 14, 1948, p. 9.

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

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Bucharest		1·4	198	e 0 27	− 5	i 0 47	−11	—	—
Yalta		5·3	101	e 1 20	+ 1	2 20	0	—	—
Kalossa	N.	5·5	281	e 1 29	+ 7	e 2 19	− 6	—	—
Budapest		5·6	291	1 18	− 5	—	—	1 12	P
Theodosia	N.	6·1	94	e 1 31	+ 2	—	—	—	—
Warsaw		7·5	332	e 1 46	− 2	e 2 58	−14	e 3 32	SS
Chur		12·0	282	e 2 50	+ 4	—	—	—	—
Stuttgart	Z.	12·4	291	e 2 48	− 3	—	—	—	—
Zürich		12·7	284	i 2 55a	0	—	—	—	—
Basle		13·4	285	e 2 7	−57	—	—	—	—
Clermont-Ferrand		16·6	279	e 3 41	− 2	—	—	—	—
Paris		16·8	289	e 3 42	− 3	—	—	e 4 29	PP
Toledo		23·3	267	i 4 49	− 3	—	—	—	—
Hungry Horse		80·3	335	i 11 52	+ 1	—	—	—	—

Kalossa gives also eE =2m.16s.

March 13d. Readings also at 0h. (La Paz, Boulder City, Pierce Ferry, Hungry Horse, and near Berkeley), 1h. (La Paz), 4h. (near Andijan), 5h. (Haiwee, La Jolla, Mount Wilson, Pasadena, Palomar (2), Riverside (2), Tinemaha (2), Santa Barbara, Tucson (2), Boulder City (2), Pierce Ferry, Shasta Dam (2), Hungry Horse (2), Fresno, Mineral, Helwan, Ksara, Istanbul, and Stuttgart), 6h. (Boulder City), 10h. (near Kulyab, Obi-garm, and Stalinabad (2)), 11h. (Mount Wilson, Pasadena, Palomar, Riverside, Santa Barbara, Tinemaha, Tucson, Boulder City, Pierce Ferry, Hungry Horse, and Ksara), 13h. (La Paz), 16h. (Arapuni, Auckland, Wellington, Ksara, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Boulder City, Pierce Ferry, Shasta Dam, and near Algiers), 21h. (Stalinabad, near Andijan (2), and Murgab (2)), 22h. (La Paz and near Tacubaya (2)).

March 14d. 21h. 18m. 12s. Epicentre 33°·2N. 59°·0E.

$A = +·4319$, $B = +·7187$, $C = +·5450$; $\delta = +9$; $h = +1$;
$D = +·857$, $E = -·515$; $G = +·281$, $H = +·467$, $K = -·838$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ashkabad		4·8	354	e 1 16	+ 1	i 2 34	S_g	—	—	—
Samarkand		9·1	43	i 2 13	− 1	i 4 12	+12	—	—	—
Stalinabad		9·6	53	i 2 20	− 1	—	—	—	—	—
Kulyab		10·0	59	i 2 32	+ 5	—	—	—	—	—
Baku		10·2	317	e 2 59	+28	—	—	—	—	—
Obi-garm		10·3	55	e 2 32	0	—	—	—	—	—
Tashkent		11·5	42	e 2 47	− 1	—	—	—	—	—
Tchimkent		12·3	40	e 2 58	− 1	—	—	—	—	—
Andijan		13·1	51	e 3 9	− 1	—	—	—	—	—
Murgab		13·2	63	3 15	+ 4	—	—	—	—	—
Erevan		13·5	305	e 3 23	+ 8	—	—	—	—	—
Leninakan		14·3	306	e 3 26	0	—	—	—	—	—
Grozny		14·5	318	e 3 31	+ 3	—	—	—	—	—
Frunse		15·6	47	i 3 44	+ 1	—	—	—	—	—
Almata		17·3	48	e 4 6	+ 2	—	—	—	—	—
Bombay	N.	18·9	136	i 4 25	+ 1	—	—	—	—	—
Ksara		19·3	276	e 4 30	+ 1	e 8 14	+12	—	—	—
Theodosia	N.	21·7	309	e 4 55	0	—	—	—	—	—
Yalta		22·3	307	e 5 0	− 1	—	—	—	—	—
Hyderabad	N.	23·5	127	5 14	+ 2	e 9 36	+13	—	—	—
Sverdlovsk		23·7	2	5 17	+ 3	—	—	—	—	—
Helwan		23·8	268	e 5 14	− 1	e 9 46	+18	e 5 44	PP	—
Istanbul		25·0	297	e 5 30	+ 3	10 14?	+25	—	—	—
Moscow		27·0	333	e 5 48	+ 3	e 10 42	+20	—	—	—
Prague		36·7	311	—	—	e 16 48?	?	—	—	—
Rome		37·5	297	—	—	e 15 36	SS	—	—	e 18·5
Collmberg	z.	37·8	312	i 6 25	−55	—	—	—	—	—
Copenhagen		39·1	320	7 29	− 2	—	—	—	—	23·8
Stuttgart		39·9	308	e 7 35	− 2	—	—	—	—	e 23·3
Strasbourg		40·9	308	e 7 43	− 3	—	—	—	—	—
Clermont-Ferrand		44·1	303	e 8 11	− 1	—	—	—	—	—
Paris		44·4	308	i 8 13	− 1	—	—	—	—	—

Long waves were also recorded at other European stations.

March 14d. 21h. 56m. 40s. Epicentre 17°·0S. 75°·0W.
(not intended as an approximate determination).

J.S.A. suggest a depth of 75km.

$A = +·2477$, $B = -·9243$, $C = -·2906$; $\delta = +13$; $h = +5$;
$D = -·966$, $E = -·259$; $G = -·075$, $H = +·281$, $K = -·957$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Huancayo		4·9	356	e 1 16	− 1	i 2 8	− 7	—	—	i 2·4
La Paz		6·6	89	i 1 46a	+ 5	i 3 32	S_g	i 1 54	P*	—
Bogota	z.	21·5	2	i 4 52	0	e 8 56	+ 9	e 5 16	PP	—
La Plata		23·5	141	i 5 16	+ 4	9 26	+ 3	—	—	11·7
Fort de France		34·4	25	e 6 51	0	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
San Juan		36·2	15	e 7 4	− 2	e 12 38	− 9	e 8 27	PP	e 15·1
Tacubaya	E.	43·3	326	i 8 9	+ 4	e 14 18	−15	e 15 16	sS	—
Bermuda		50·1	12	e 9 28	+29	i 16 20	+10	e 11 15	PP	e 20·5
Columbia		51·0	354	e 9 2	− 4	e 16 16	− 6	—	—	e 23·7
Philadelphia		56·7	0	i 9 47	− 1	e 17 35	− 5	e 11 56	PP	e 27·8
St. Louis		57·2	346	i 9 47	− 4	i 17 38	− 8	i 9 59	pP	—
Fordham		57·6	2	e 9 54	0	i 17 50	− 1	—	—	—
Cleveland		58·5	355	i 9 59a	− 1	e 17 52	−11	e 13 34	PPP	28·1
Harvard		59·3	4	i 10 4	− 2	—	—	—	—	e 32·3
Chicago		59·6	349	—	—	e 18 9	− 8	e 21 55	SS	e 29·3
Tucson		59·8	326	i 10 8k	− 1	e 18 20	0	—	—	e 26·3
Lincoln	E.	61·0	341	—	—	e 18 29	− 6	e 20 0	SeS	e 32·6
Ottawa		62·1	359	10 23	− 2	18 48	− 1	25 56	SSS	29·3
Temiskaming		63·5	357	e 10 32	− 2	—	—	—	—	—
La Jolla	Z.	64·0	321	e 10 38	0	—	—	—	—	—
Palomar		64·1	322	i 10 38	0	—	—	—	—	—
Pierce Ferry		64·4	326	i 10 39	− 1	—	—	i 31 52	?	—
Boulder City		64·8	325	i 10 42	− 1	—	—	—	—	—
Riverside		64·8	322	i 10 43k	0	—	—	i 10 53	?	—
Mount Wilson	Z.	65·4	322	i 10 46	− 1	—	—	—	—	—
Pasadena		65·4	322	i 10 45k	− 2	i 19 30	0	—	—	e 31·3
Santa Barbara	Z.	66·5	321	i 10 55	+ 1	—	—	i 11 13	PcP	—
Salt Lake City		66·9	331	e 10 53	− 3	e 19 49	0	e 13 23	PP	e 35·7
Tinemaha		67·5	323	i 10 59	− 1	—	—	—	—	—
Fresno	Z.	68·1	323	i 11 4	0	—	—	—	—	—
Berkeley		70·4	322	e 10 26	−52	20 33	+ 3	i 11 20	P	e 35·0
Bozeman		70·4	335	e 11 37	PcP	e 20 30	0	—	—	e 33·9
Butte	N.	71·3	334	e 11 25	+ 2	e 20 48	+ 7	—	—	e 39·6
Mineral	Z.	71·6	324	i 11 24	− 1	—	—	—	—	—
Shasta Dam		72·3	324	i 11 22	− 7	—	—	—	—	—
Hungry Horse		73·8	334	i 11 36	− 2	—	—	—	—	—
Victoria		78·2	329	12 46	+43	22 42	+45	—	—	36·3
Granada		86·1	49	i 12 49a	+ 5	i 23 15	− 3	13 42	pP	e 45·8
Toledo		86·9	47	i 12 49	+ 1	23 30	+ 4	—	—	—
Alicante		88·8	49	e 12 55	− 2	e 23 37	− 7	16 26	PP	e 42·5
Kew	E.	93·9	37	—	—	(e 23 20?)	−69	—	—	e 23·3
Clermont-Ferrand		94·0	44	—	—	e 24 0	[+ 4]	e 25 48	PS	49·8
Paris		94·7	40	i 13 25	+ 1	e 24 2	[+ 3]	e 25 56	PS	i 44·3
De Bilt		97·4	38	e 13 8	−29	e 24 20	[+ 6]	e 26 20	PS	e 45·3
Strasbourg		97·9	41	e 13 44	+ 5	e 24 20	[+ 4]	e 30 30	PKKP	44·3
College		98·2	335	—	—	e 33 0	?	—	—	e 49·9
Stuttgart		98·8	41	e 13 43	0	e 26 37	PS	—	—	—
Florence		98·9	47	e 17 3	PP	e 24 29	[+ 7]	—	—	—
Rome		99·3	49	e 13 36	− 9	e 24 23	[− 1]	e 17 51	PP	—
Triest		101·1	46	e 17 17	?	e 24 34	[+ 2]	e 17 43	PP	e 46·3
Potsdam	Z.	102·1	38	—	—	e 27 20	PS	—	—	e 53·3
Copenhagen		102·4	35	—	—	24 50	[+11]	—	—	—
Prague		102·5	41	e 18 10	PP	e 27 20	PS	—	—	—
Helwan		112·2	64	—	—	e 29 8	PS	—	—	—
Ksara		116·4	60	e 20 0	PP	e 30 57	PPS	—	—	—
Bombay		149·3	81	e 20 5	[+19]	—	—	—	—	—

Additional readings :—
La Paz iZ = 2m.5s., iS* = 4m.10s., iS_g = 4m.56s.
Bogota iZ = 4m.58s., ePPPZ = 5m.29s.
La Plata SN = 9m.32s., N = 10m.56s.
Tacubaya iPPE = 9m.34s., eP_cSE = 13m.45s.
Bermuda eSS? = 20m.18s.
Philadelphia e = 10m.34s., 18m.29s., and 18m.52s.
St. Louis ePP = 11m.59s., eSS = 21m.44s.
Cleveland iZ = 10m.14s., eN = 19m.44s., eE = 20m.53s.
Chicago e = 19m.41s.
Tucson e = 10m.11s., i = 10m.28s., 10m.40s., and 10m.47s.
Pasadena iZ = 10m.57s. and 11m.3s.
Salt Lake City eSS = 24m.35s.
Tinemaha iZ = 11m.2s. and 11m.10s.
Berkeley eSN = 20m.21s.
Granada P_cP = 12m.54s., pP_cP = 14m.3s., PP = 16m.21s., pPP = 16m.42s.
Alicante P_cP = 13m.7s., S_cS = 23m.23s., PS = 24m.47s., SS = 29m.23s., PKKP = 30m.19s.

Continued on next page.

Strasbourg e =14m.20s., ePKKS =33m.32s.
Rome eSE =25m.19s., ePSE =26m.42s., eSSE =32m.7s., eSSSE =36m.23s.
Triest eS? =25m.51s., ePS =27m.7s.
Long waves were also recorded at Sitka and Warsaw.

March 14d. Readings also at 0h. (La Paz (2), near Berkeley and Lick), 2h. (Batavia, Ksara, Clermont-Ferrand, Paris, Strasbourg, and Stuttgart), 3h. (Rome and near Mizusawa), 4h. (Auckland and near Tacubaya), 6h. (Auckland, Tinemaha, Tucson, Hungry Horse, and Shasta Dam), 8h. (Ksara and Toledo), 10h. (near Kulyab), 14h. (Istanbul, Samarkand, Andijan, Tchimkent, near Kulyab, Obi-garm, and Stalinabad), 17h. (Toledo), 18h. (Stuttgart), 22h. (near Lick).

March 15d. 1h. Undetermined shock. U.S.S.R. suggests 2°·0S. 138°·0E.
Riverview iE =29m.16s., iEN =38m.4s.
Stalinabad iP =31m.57s., eS =41m.26s.
Tashkent eP =32m.2s., eS =41m.36s.
Samarkand eP =32m.4s.
Obi-garm eP =32m.16s.
Sverdlovsk P =33m.4s., eS =43m.24s.
Stuttgart eZ =39m.8s., eQ? =82m.0s.
Paris ePKP =39m.17s., eQ =81m., eR =84m.
Ksara eP? =44m.59s., eS? =55m.22s.
Collmberg iZ =50m.41s.
Helwan e =54m.33s.
Strasbourg e =64m.50s., L =80m.0s.
Jersey e =70m.
Potsdam eZ =70m.0s., eLN =78m.
Long waves were also recorded at other European stations.

March 15d. 2h. 16m. 12s. Epicentre 32°·0N. 138°·6E. Depth of focus 0·050.

Intensity IV at Utunomiya; II-III at Yokohama, Tokyo, Kakioka, and Hukushima. Epicentre as taken. Depth =300kms. Macroseismic radius 300kms.

The Seismological Bulletin of the Central Meteorological Observatory, Japan, for the year 1948, Tokyo 1950, p. 8, with macroseismic map.

$A = -\cdot6373$, $B = +\cdot5619$, $C = +\cdot5273$; $\delta = -7$; $h = +1$;
$D = +\cdot661$, $E = +\cdot750$; $G = -\cdot396$, $H = +\cdot349$, $K = -\cdot850$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
	°	°	m. s.	s.	m. s.	s.	m. s.	
Omaesaki	2·6	353	1 1	+ 5	1 46	+ 6	—	—
Osima	2·8	13	0 39	−19	—	—	—	—
Owase	2·9	316	0 59a	0	1 42	− 3	—	—
Shizuoka	3·0	357	1 2	+ 2	1 49	+ 3	—	—
Kameyama	3·4	328	1 4	+ 1	1 51	− 2	—	—
Hunatu	3·5	2	1 9	+ 5	1 57	+ 2	—	—
Nagoya	3·5	337	1 5k	+ 1	1 54	− 1	—	—
Yokohama	3·5	14	1 8a	+ 4	2 0	+ 5	—	—
Gihu	3·7	336	1 5	− 1	1 58	0	—	—
Osaka	3·7	317	1 8a	+ 2	1 56	− 2	—	—
Tokyo	3·8	15	1 11	+ 4	2 1	+ 1	—	—
Kobe	4·0	314	1 8a	− 1	1 59	− 5	—	—
Muroto	4·0	290	1 8k	− 1	2 4	0	—	—
Sumoto	4·0	308	1 8	− 1	1 58	− 6	—	—
Kumagaya	4·2	8	1 12k	0	2 7	− 1	—	—
Tukubasan	4·4	16	1 18	+ 4	2 14	+ 3	—	—
Kakioka	4·5	17	1 15	0	2 12	− 1	—	—
Koti	4·6	291	1 15a	− 1	2 11	− 4	—	—
Mito	4·7	19	1 18	+ 1	2 15	− 2	—	—
Nagano	4·7	356	1 19	+ 2	2 20	+ 3	—	—
Utunomiya	4·7	13	1 32	+15	2 30	+13	—	—
Toyama	4·8	346	1 23	+ 5	2 16	− 3	—	—
Toyooka	4·8	319	1 16	− 2	2 13	− 6	—	—
Onahama	5·3	21	2 3	+39	3 4	+35	—	—
Wazima	5·6	346	1 25	− 2	2 28	− 7	—	—
Hukusima	5·9	15	1 31k	+ 1	2 39	− 2	—	—
Aikawa	6·0	358	1 32	+ 1	2 38	− 5	—	—
Hamada	6·2	300	1 31a	− 3	2 41	− 6	—	—
Sendai	6·6	16	1 38	0	2 51	− 5	—	—
Kumamoto	6·8	279	1 18a	−23	—	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Izuka		6·9	286	1 36 a	− 6	2 52	−10	—	—
Kagosima		6·9	268	1 36	− 6	—	—	—	—
Hukuoka		7·1	285	1 41	− 3	3 0	− 6	—	—
Mizusawa		7·4	15	e 1 46	− 2	3 10	− 3	1 49	P
Akita		7·8	9	2 3	+11	3 18	− 3	—	—
Morioka		8·0	15	1 55	0	3 25	0	—	—
Miyako		8·1	19	1 58 k	+ 2	3 32	+ 4	—	—
Aomori		9·0	11	2 8	+ 1	—	—	—	—
Sapporo		11·3	10	2 36	+ 2	—	—	—	—
Vladivostok		12·3	336	i 2 42	− 4	—	—	—	—
Irkutsk		32·1	320	5 53	− 4	10 37	− 7	—	—
Andijan		52·9	300	e 8 39	− 4	—	—	—	—
Tchinkent		54·6	303	e 8 49	− 6	—	—	—	—
Tashkent		55·0	302	e 8 55	− 3	—	—	—	—
Obi-garm		55·4	298	i 8 59	− 2	—	—	—	—
Kulyab		55·6	297	e 8 58	− 4	—	—	—	—
Stalinabad		56·1	298	i 9 1	− 5	i 16 22	− 4	—	—
Samarkand		57·2	300	e 9 8	− 5	—	—	—	—
Sverdlovsk		57·5	322	9 11	− 5	16 35	− 9	—	—
Shasta Dam		76·0	51	e 11 13	+ 2	—	—	i 14 38	PP
Mineral	z.	76·7	51	i 11 17	+ 2	—	—	—	—
Hungry Horse		77·2	41	i 11 18	+ 1	—	—	e 12 38	pP
Lick	z.	78·2	53	i 11 26	+ 3	—	—	—	—
Tinemaha	z.	80·7	52	i 11 39	+ 3	—	—	e 13 3	pP
Copenhagen		81·3	333	11 38	− 1	—	—	—	—
Haiwee	z.	81·4	53	i 11 43	+ 3	—	—	e 13 5	pP
Pasadena	z.	82·3	54	i 11 48	+ 4	—	—	—	—
Mount Wilson	z.	82·4	54	i 11 48	+ 3	—	—	i 13 11	pP
Riverside	z.	83·0	54	i 11 51	+ 3	—	—	e 13 23	pP
Boulder City		83·6	52	i 11 54	+ 3	—	—	—	—
Palomar	z.	83·7	53	i 11 54 a	+ 3	—	—	—	—
Pierce Ferry		84·0	51	i 11 57	+ 4	—	—	e 13 20	pP
Stuttgart		87·8	329	e 12 8	− 3	e 22 19	− 3	e 13 37	pP
Tucson		88·6	53	i 12 18	+ 3	—	—	e 13 43	pP
Basle		89·3	329	—	—	e 22 27	− 8	—	—
Paris		90·5	333	i 12 23	− 1	—	—	e 13 56	pP
Florence		90·6	325	e 12 6	−18	—	—	—	—

Additional readings :—
Shasta Dam e =13m.3s.
Tinemaha iZ =14m.50s.
Pasadena iZ =12m.10s.
Mount Wilson iZ =12m.14s.
Riverside iZ =12m.23s.
Palomar eZ =12m.3s., iZ =12m.18s.
Tucson e =15m.50s.
Paris i =36m.3s.

March 15d. 11h. 23m. 53s. Epicentre 36°·9N. 141°·3E. (as on 1947, May 18d.).

Intensity V at Mito and Tukubasan ; IV at Onahama, Hukusima, and Yokohama ; II-III at Tokyo, Maebasi, Kumagaya, and Utunomiya.
Epicentre 36°·2N. 141°·7E. Shallow. Macroseismic radius 200-300km.

The Seismological Bulletin of the Central Meteorological Observatory, Japan, for the year 1948, Tokyo, 1950, p. 9, with macroseismic map.

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

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Onahama	0·3	276	0 19 a	+ 8	0 33	+15	—	—	—
Mito	0·8	232	0 19	+ 1	0 33	+ 2	—	—	—
Hukusima	1·1	322	0 28 a	+ 6	0 52	+13	—	—	—
Kakioka	1·1	233	0 22	0	0 38	− 1	—	—	—
Tukubasan	1·2	235	0 27 a	+ 3	0 45	+ 4	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Utunomiya		1·2	253	0 43a	+19	1 3	+22	—	—	—
Sendai		1·4	347	0 35a	+ 8	0 51	+ 5	—	—	—
Kumagaya		1·7	244	0 32	+ 1	0 56	+ 2	—	—	—
Tokyo		1·7	225	0 29	− 2	0 51	− 3	—	—	—
Maebasi		1·8	254	0 31k	− 1	0 57	+ 1	—	—	—
Yokohama		2·0	222	0 33a	− 2	1 0	− 2	—	—	—
Mizusawa	E.	2·2	357	e 0 48	Pg	1 19	Sg	—	—	—
	N.	2·2	357	0 44	Pg	e 1 26	Sg	—	—	—
Mera		2·4	216	0 37	− 4	—	—	—	—	—
Hunatu		2·5	236	0 41	− 2	—	—	—	—	—
Nagano		2·5	265	0 49	+ 6	1 21	+ 7	—	—	—
Aikawa		2·7	295	0 50a	+ 5	1 39	Sg	—	—	—
Miyako		2·8	11	0 49	+ 2	1 28	S*	—	—	—
Morioka		2·8	358	1 0	Pg	1 38	Sg	—	—	—
Akita		3·0	342	0 55	P*	1 52	Sg	—	—	—
Shizuoka		3·0	232	0 47	− 3	1 24	− 3	—	—	—
Osima		3·2	216	1 3	Pg	—	—	—	—	—
Toyama		3·3	268	1 0a	P*	1 58	Sg	—	—	—
Wazima		3·5	281	1 2	P*	1 57	Sg	—	—	—
Aomori		3·9	354	1 13	P*	2 15	Sg	—	—	—
Nagoya		3·9	244	1 3	+ 1	1 50	0	—	—	—
Gihu		4·0	250	1 13	P*	2 13	Sg	—	—	—
Hikone		4·4	250	1 21	P*	2 21?	Sg	—	—	—
Kameyama		4·4	246	0 56	−14	—	—	—	—	—
Owase		5·0	238	1 16	− 2	—	—	—	—	—
Mori		5·2	354	1 32	P*	2 51	Sg	—	—	—
Osaka		5·2	247	1 37	P*	2 50	Sg	—	—	—
Kobe		5·4	244	1 23	− 1	2 29	+ 1	—	—	—
Sumoto		5·8	246	1 33	+ 4	—	—	—	—	—
Sapporo		6·2	0	1 42	+ 7	3 16	S*	—	—	—
Muroto		6·9	240	1 29	−16	—	—	—	—	—
Koti		7·2	245	1 47	− 2	—	—	—	—	—
Nemuro		7·2	26	1 49	0	—	—	—	—	—
Hamada		7·8	258	1 58	0	—	—	—	—	—
Hukuoka		9·5	253	2 29	+ 9	—	—	—	—	—
Miyazaki		9·5	241	2 19	− 1	—	—	—	—	—
Vladivostok		9·5	314	i 2 26	+ 6	i 4 32	S*	—	—	—
Kumamoto		9·6	248	2 39	P*	—	—	—	—	—
Irkutsk		30·1	313	6 13	0	e 11 22	+10	—	—	—
Almata		48·6	300	e 8 48	+ 1	—	—	—	—	—
College		49·3	32	—	—	e 15 57	− 2	—	—	e 21·2
Frunse		50·3	299	e 9 2	+ 2	—	—	—	—	—
Murgab		52·3	294	9 15	0	16 54	+14	—	—	—
Andijan		52·6	297	e 9 18	0	—	—	—	—	—
Batavia		53·6	225	e 9 19	− 6	i 16 51	− 7	—	—	—
Tchimkent		54·0	300	i 9 27	− 1	—	—	—	—	—
Tashkent		54·6	299	e 9 31	− 1	—	—	—	—	—
Obi-garm		55·2	296	e 9 37	0	i 17 25	+ 5	—	—	—
Sverdlovsk		55·2	319	i 9 36	− 1	i 17 22	+ 2	—	—	—
Kulyab		55·5	295	i 9 38	− 1	i 17 32	+ 8	—	—	—
Stalinabad		56·0	296	i 9 40	− 3	i 17 31	+ 1	—	—	—
Sitka		56·4	40	—	—	e 17 37	+ 1	—	—	e 27·8
Samarkand		56·8	298	e 9 47	− 1	e 17 45	+ 4	—	—	—
Hyderabad	N.	58·2	269	e 9 55	− 3	17 57	− 2	18 11	PS	—
Bombay		61·9	274	e 10 23	− 1	e 18 55	+ 8	—	—	—
Moscow		67·3	324	10 58	− 1	e 19 52	− 2	—	—	—
Riverview	E.	71·0	172	—	—	e 20 22	−15	i 21 19	PPS	—
Shasta Dam		71·3	52	e 11 19	− 4	—	—	i 11 56	PcP	—
Hungry Horse		72·0	43	e 11 23	− 5	—	—	e 11 34	pP	—
Mineral	Z.	72·0	53	e 11 23	− 5	—	—	i 11 33	pP	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Lick	z.	73·6	56	i 11 40	+ 3	—	—	i 11 44	P	—
Bozeman		75·2	44	—	—	e 21 25	0	—	—	e 33·5
Fresno	z.	75·2	55	i 11 51	+ 5	—	—	—	—	—
Tinemaha	z.	75·9	54	e 11 47	− 3	—	—	i 11 58	PcP	—
Santa Barbara	z.	76·5	58	i 12 1	+ 7	—	—	i 12 13	PcP	—
Warsaw	z.	77·1	327	e 11 55	− 2	—	—	—	—	e 41·1
Salt Lake City		77·7	48	—	—	e 21 42	−10	—	—	e 44·7
Pasadena		77·7	56	i 12 6	+ 6	i 21 46	− 6	—	—	e 35·1
Mount Wilson	z.	77·8	56	e 12 3	+ 2	—	—	i 12 6	PcP	—
Copenhagen		78·0	334	e 11 59	− 3	21 57	+ 2	14 59	PP	—
Riverside	z.	78·4	56	e 12 0	− 4	—	—	i 12 9	PcP	—
Boulder City		78·8	53	e 12 3	− 3	—	—	i 12 13	PcP	—
Palomar	z.	79·1	56	i 12 7	− 1	—	—	i 12 14	PcP	—
Pierce Ferry		79·3	52	i 12 6	− 3	—	—	i 12 15	PcP	—
Potsdam		79·7	331	e 12 13	+ 2	i 22 44?	+31	e 23 18?	PS	e 42·1
Istanbul		80·7	315	e 11 7?	−69	—	—	—	—	—
Collmberg	z.	81·2	330	—	—	i 22 21	− 8	—	—	—
Ksara		81·2	306	e 12 20	+ 1	e 22 35	+ 6	—	—	—
Prague		81·5	329	e 12 15	− 6	e 22 35	+ 3	e 27 49	SS	e 44·1
De Bilt		83·4	335	e 12 37	+ 7	e 23 7	+16	—	—	e 43·1
Tucson		83·7	54	e 12 29	− 3	—	—	i 12 40	PcP	e 40·2
Stuttgart		84·7	330	e 12 36k	− 1	e 23 11	+ 7	—	—	e 45·1
Triest		85·2	327	e 12 36	− 3	e 22 59	[− 3]	—	—	—
Strasbourg		85·4	331	e 12 34	− 6	e 23 7	[+ 4]	e 30 37	?	41·1
Kew		85·8	337	—	—	e 23 7?	[+ 1]	—	—	e 47·1
Zürich		86·1	331	e 12 42a	− 2	—	—	—	—	—
Basle		86·3	331	e 12 41	− 4	—	—	—	—	—
Helwan		86·6	305	12 46	0	e 23 25	+ 2	16 10	PP	e 53·1
Paris		87·1	335	i 12 49	0	—	—	e 44 7	Q	—
Rome		88·7	325	e 16 22	PP	e 23 39	− 4	e 16 35	PP	e 47·1
Temiskaming		89·3	27	e 12 56	− 3	—	—	—		e 41·8
St. Louis		91·1	39	i 13 11	+ 3	e 24 11	+ 7	—	—	—
Alicante		97·2	331	e 17 34	?	e 25 30	+33	—	—	—
Granada		100·4	333	18 5a	PP	—	—	52 19	Q	e 49·5
La Paz		147·0	60	i 19 43	[0]	—	—	i 23 27	PP	58·5
										73·1

Additional readings :—
Copenhagen 12m.2s.
Prague eS? = 22m.13s.
Long waves were also recorded at Huancayo, Philadelphia, and at other European stations.

March 15d. 14h. 31m. 14s. Epicentre 14°·0S. 167°·0E. Depth of focus 0·010.
(as on 1946, July 4d.).

A = −·9458, B = +·2184, C = −·2404 ; δ = +3 ; h = +6 ;
D = +·229, E = +·974 ; G = +·234, H = −·054, K = −·971.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	N.	18·7	222	i 4 17	+ 4	i 7 45	+10	i 4 34	PP	—
Riverview		24·4	214	i 5 4a	− 6	i 9 22	+ 2	i 5 38	PP	10·6
Pasadena	z.	85·6	53	e 13 39	?	—	—	—	—	—
Mount Wilson	z.	85·7	53	i 12 29	0	—	—	e 13 35	?	—
Riverside	z.	86·2	54	e 12 31	− 1	—	—	—	—	—
Palomar	z.	86·4	55	i 12 31	− 2	—	—	—	—	—
Tinemaha	z.	86·6	51	e 12 35	+ 1	—	—	—	—	—
Boulder City		88·8	53	e 12 44	0	—	—	e 13 13	pP	—
Pierce Ferry		89·5	53	i 12 48	+ 1	—	—	i 13 27	pP	—
Tucson		90·9	57	e 13 49	?	—	—	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Stuttgart	z.	140·8	337	e 19 19	[0]	—	—	— —	—
Strasbourg		141·5	338	e 22 25	PP	—	—	— —	—
Bologna	z.	143·2	331	e 19 23a	[0]	—	—	— —	—
Rome	z.	144·5	324	i 19 21a	[− 4]	—	—	— —	—
Clermont-Ferrand		145·6	340	e 19 29	[+ 2]	—	—	i 20 10 pPKP	—
Toledo		153·1	345	e 19 38	[− 1]	—	—	i 19 48 PKP_2	—

Additional readings :—
Brisbane eE = 4m.53s., iPPE = 5m.3s., iN = 5m.11s. and 5m.57s., iSSE = 8m.3s.
Riverview iPPPN = 5m.54s., iE = 5m.59s., iN = 6m.3s., iE = 6m.17s., eSN = 9m.9s., eE = 9m.14s., iZ = 9m.27s., Q = 9m.34s., iN = 9m.40s., iE = 9m.57s., iN = 10m.10s., iE = 10m.16s., iZ = 10m.25s.
Riverside iZ = 13m.10s. and 13m.55s.
Palomar iZ = 12m.40s. and 13m.12s.
Tinemaha eZ = 13m.14s., iZ = 17m.11s.
Stuttgart eZ = 23m.56s.

March 15d. 15h. Undetermined shock.

Brisbane iPN = 8m.45s., iN = 8m.58s., 9m.17s., 9m.42s., and 10m.1s.
Auckland eN = 15m.
Wellington e = 16m.
Lick iPZ = 17m.11s.
Shasta Dam iP = 17m.15s., i = 18m.12s.
Mount Wilson iPZ = 17m.16s.a, eZ = 17m.52s.
Pasadena iPZ = 17m.16s.
Palomar iPZ = 17m.17s.
Riverside iPZ = 17m.18s.
Haiwee iPZ = 17m.21s.
Tinemaha iPZ = 17m.22s., iZ = 18m.1s.
Boulder City iP = 17m.31s., epP? = 18m.14s.
Pierce Ferry iP = 17m.35s., ipP? = 18m.11s.
Tucson iP = 17m.40s., e = 18m.13s., ipP? = 18m.24s.

March 15d. Readings also at 0h. (La Paz, Tinemaha, Shasta Dam, and Tucson), 1h. (Stalinabad, Vladivostok, Irkutsk, Collmberg, and Batavia), 2h. (Copenhagen), 6h. (Rome), 7h. (Stalinabad, Murgab, Tchimkent, Samarkand, near Almata, Frunse, and Andijan), 8h. (near Lick), 9h. (Riverview, Wellington, Rome, and near Mizusawa), 10h. (Batavia, Auckland, and near Stalinabad), 11h. (near Mizusawa), 12h. (Andijan, Boulder City, and near Apia), 16h. (near Grozny), 17h. (near Algiers), 18h. (Rome, Vladivostok, and near Mizusawa), 19h. (Hungry Horse, Pierce Ferry, Shasta Dam, Rome, Stuttgart, Copenhagen, and near Mizusawa (3)), 20h. (near Grozny and near Ashkabad), 21h. (De Bilt, Copenhagen, Bombay, and Hungry Horse), 23h. (Tashkent, Samarkand, Tchimkent, near Murgab, Andijan, Kulyab, and Stalinabad).

March 16d. 2h. 40m. 30s. Epicentre 19°·6N. 120°·6E. (as on 1941, April 4d.).

$A = -·4799$, $B = +·8115$, $C = +·3334$; $\delta = -1$; $h = +5$;
$D = +·861$, $E = +·509$; $G = -·170$, $H = +·287$, $K = -·943$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Nanking	12·5	353	e 5 49	?	9 21	?	— —	—
Hukuoka	16·4	30	e 3 45	− 8	—	—	— —	—
Hamada	18·3	32	e 4 24	+ 7	—	—	— —	—
Owase	20·0	41	e 4 30	− 7	—	—	— —	—
Nagoya	21·2	40	4 47	− 2	8 39	− 2	— —	—
Hunatu	22·5	42	5 0	− 2	9 2	− 3	— —	—
Nagano	23·0	38	5 7	0	9 12	− 2	— —	—
Maebasi	23·3	39	5 20	+10	9 38	+18	— —	—
Tokyo	23·3	43	5 20	+10	9 26	+ 6	— —	—
Sendai	25·6	40	5 30	− 2	9 48	−11	— —	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Mizusawa		26·3	48	5 19	−20	5 38	P	—	—	—
Batavia		29·0	210	e 6 16	+12	e 13 23	L	—	—	(e 13·4)
Calcutta	E.	30·2	283	e 6 6	− 8	i 11 13	0	i 13 5	SSS	15·2
Irkutsk		35·0	243	e 6 53	− 3	12 24	− 4	—	—	—
Hyderabad	N.	39·9	275	e 7 46	+ 9	13 54	+11	9 21	PP	—
Kodaikanal	E.	42·6	265	e 8 2	+ 3	—	—	—	—	—
Almata		43·5	314	e 8 6	− 1	—	—	—	—	—
Murgab		44·4	306	e 8 7	− 7	e 14 53	+ 4	—	—	—
Bombay		45·0	278	e 8 21	+ 2	e 15 3	+ 5	e 15 11	PPS	—
Andijan		46·1	309	e 8 31?	+ 3	15 43?	+29	—	—	—
Kulyab		47·5	305	i 8 40?	+ 2	e 15 39?	+ 5	—	—	—
Stalinabad		48·4	306	i 8 47?	+ 1	i 15 55?	+ 9	—	—	—
Tashkent		48·5	309	i 8 46	0	e 15 52	+ 4	—	—	—
Tchimkent		48·5	310	i 8 45	− 1	—	—	—	—	—
Brisbane		56·4	145	i 9 47	+ 2	—	—	i 10 52	PcP	—
Sverdlovsk		57·5	327	i 9 52	− 1	17 43	− 7	—	—	—
Riverview		60·6	151	i 10 24a	+ 9	e 18 38	+ 8	i 18 47	PS	—
Grozny		65·9	310	e 10 53	+ 3	19 39	+ 2	—	—	—
Leninakan		67·6	308	e 11 6	+ 5	—	—	e 11 37	PcP	—
Piatigorsk		67·8	311	e 10 58	− 4	—	—	—	—	—
Moscow		70·1	324	11 13	− 3	20 21	− 6	—	—	—
College		73·1	27	—	—	e 20 56	− 5	e 23 50	?	e 36·8
Yalta		74·1	312	—	—	e 20 49	−23	—	—	—
Ksara		75·1	301	i 11 48	+ 2	—	—	e 22 24	PPS	—
Helsinki		76·0	330	—	—	e 21 42	+ 8	—	—	e 40·5
Istanbul		78·5	311	(i 12 6)	+ 2	i 12 6	P	—	—	—
Upsala		79·6	331	e 13 30?	+80	e 22 20	+18	e 30 30?	SSS	e 44·5
Helwan		79·9	298	12 12	0	22 17	+ 1	—	—	—
Warsaw		80·4	323	12 14a	− 1	e 22 7	−14	—	—	e 44·5
Sitka		81·0	33	—	—	e 22 24	− 3	—	—	e 52·0
Copenhagen		83·8	328	e 12 35	+ 3	22 56	+ 1	12 42	PcP	43·5
Potsdam		85·0	325	i 12 38a	0	i 23 10	+ 3	—	—	e 44·5
Prague		85·1	323	e 12 54	PcP	e 23 6	− 2	—	—	e 46·5
Jena	N.	86·3	324	e 12 44	− 1	—	—	—	—	—
Triest		87·4	319	e 13 21	+31	e 23 39	+ 9	—	—	—
Stuttgart		88·7	323	e 12 56	− 1	e 23 40	− 3	e 24 53	PS	—
De Bilt		89·3	327	—	—	e 24 0	+12	—	—	e 44·5
Bologna		89·4	318	e 13 2	+ 2	—	—	e 13 11	PcP	—
Strasbourg		89·6	323	e 12 57	− 4	e 23 54	+ 3	e 44 0	Q	e 46·4
Florence		89·8	317	e 12 57	− 5	—	—	—	—	—
Rome		89·8	315	e 12 58	− 4	e 23 48	− 5	e 16 36	PP	e 46·8
Basle		90·3	322	e 13 1	− 3	—	—	—	—	—
Paris		92·5	324	i 13 14	0	e 25 57	PS	16 53	PP	e 50·5
Shasta Dam		96·3	43	e 13 28	− 4	—	—	—	—	—
Hungry Horse		96·6	34	e 13 31	− 2	—	—	—	—	—
Tucson		108·7	45	e 18 50	PP	—	—	e 23 48	?	e 53·1
La Paz	z.	171·2	71	i 20 14	[+ 4]	—	—	i 25 40	PP	—

Additional readings :—
Brisbane iN =10m.10s.
Prague e =25m.47s., 30m.48s., and 35m.0s.
Rome ePSN? =26m.1s., eSS?N =29m.40s.
Paris i =13m.24s.
Long waves were also recorded at other European stations.

March 16d. 11h. 40m. 24s. Epicentre 43°·0N. 0°·2E. (as on 1944, January 4d.).

Intensity V-VI S.W. of Bagnères-de-Bigorre, less strong at Lourdes, Argelés, and in Spain. Intensity II-III at Tarrega, II at Camarasa and Barcelona.
Epicentre 43°·01′N. 0°·07′E. Macroseismic area in France 3200 sq. kms.

J. P. Rothé and N. Dechevoy.
La Séismicité de la France de 1940 à 1950: Annales de l'Institut de Physique du Globe de Strasbourg, 3 ème partie, Géophysique, nouvelle sérié, t. VII, pp. 49, 50. Macroseismic map p. 49.

E. Fontséré.
Los temblores de tierra catalanes de los añas 1948 y 1949, Real acad. de ciencias y artes de Barcelona, bol. No. 38, Barcelona, 1951, p. 255.

$A = +·7336$, $B = +·0026$, $C = +·6795$; $\delta = -10$; $h = -3$;
$D = +·003$, $E = -·1·000$; $G = +·679$, $H = +·002$, $K = -·734$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bagneres	0·1	—	i 0 4	P_g	—	—	—	—	—
Barcelona	2·1	129	e 0 37	0	i 1 4	0	—	—	—
Clermont-Ferrand	3·5	36	e 0 50	− 7	i 1 49	S*	i 1 4	P*	2·3
Toledo	4·4	227	i 1 2	− 8	1 53	− 9	1 12	P	—
Alicante	4·7	187	1 14	0	2 27	S*	1 22	P_g	3·4
Paris	6·1	16	e 1 24	−10	i 2 54	+ 9	i 2 2	P_g	—
Neuchatel	6·3	48	e 1 38	+ 2	e 3 14	S*	—	—	—
Granada	6·5	208	—	—	i 3 38	S_g	—	—	i 4·0
Zürich	7·3	51	e 2 15	P*	e 4 0	S_g	—	—	—
Strasbourg	7·7	41	—	—	e 3 53	S*	—	—	i 4·0
Stuttgart	8·5	44	e 2 44?	P*	e 3 48	+ 3	e 4 42	S_g	—

Additional readings :—
Clermont-Ferrand iP = 1m.0s.
Alicante P_g = 1m.29s., P_gS_g = 1m.51s.
Paris i = 1m.49s. and 1m.54s., iP_g = 1m.58s., i = 3m.13s., iS_g = 3m.17s., i = 3m.20s., 3m.23s. and 4m.5s.
Stuttgart e = 4m.10s. and 4m.35s., eS_g? = 4m.46s., eZ = 4m.59s.
Long waves were also recorded at Jena and Jersey.

March 16d. 13h. Undetermined shock.

Ksara eP = 55m.13s.?, iS? = 56m.36s.
Erevan eP = 56m.4s.
Istanbul P = 56m.4s., S = 57m.52s.
Grozny eP = 56m.21s., S = 58m.47s.
Leninakan eP = 56m.38s.
Stuttgart eP = 59m.18s., eL = 66m.0s.
Zürich eP = 59m.18s.
Sverdlovsk P = 59m.27s., eS = 63m.57s.
Basle eP = 59m.27s.
Andijan eP = 59m.53s., eS = 65m.13s.
Strasbourg iSS? = 59m.58s.

March 16d. 16h. 58m. 0s. Epicentre 21°·3S. 173°·6E. (as on 10d.).

$A = -·9267$, $B = +·1039$, $C = -·3612$; $\delta = +3$; $h = +4$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Auckland	N.	15·5	173	4 40	+58	7 36	+61	—	—	—
Apia		15·8	64	e 3 50?	+ 5	—	—	e 4 2?	PP	—
Tuai	N.	17·7	177	4 10	0	7 34	+ 8	—	—	—
Brisbane	E.	19·7	247	i 4 30	− 4	i 8 15	+ 5	i 5 6	PPP	i 10·3
Wellington		19·9	177	4 35	− 1	8 20	+ 5	—	—	—
Riverview		23·4	232	i 5 12k	+ 1	i 9 23	+ 2	i 5 39	PP	10·9
Perth		52·2	245	—	—	i 16 35	− 4	i 22 45	Q	i 25·3
Batavia		66·1	273	e 10 29	−22	i 19 57	+18	i 13 12	PP	e 35·0
Vladivostok		74·7	330	e 11 43	0	i 21 18	− 1	—	—	—
Berkeley		84·2	46	i 12 40	+ 6	e 23 48	PS	i 24 18	PPS	e 35·0

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Pasadena		85·1	50	e 12 40	+ 1	e 23 11	+ 3	e 35 12	Q	e 38·8
Mount Wilson	z.	85·2	50	e 12 39	0	—	—	e 12 51	P_cP	—
Riverside	z.	85·6	50	e 12 40	− 1	—	—	i 12 53	P_cP	—
Shasta Dam		85·6	44	e 12 39	− 2	—	—	—	—	—
Palomar	z.	85·7	52	e 12 35	− 7	—	—	—	—	—
Mineral	z.	86·0	44	i 13 41	+58	—	—	—	—	—
Tinemaha	z.	86·5	48	e 12 45	− 1	—	—	e 12 57	P_cP	—
Boulder City		88·4	50	e 12 55	0	—	—	—	—	—
Pierce Ferry		89·1	51	e 12 57	− 1	—	—	e 16 29	PP	—
Sitka		89·3	26	—	—	e 23 50	+ 2	e 23 34	SKS	e 37·4
Victoria		89·3	37	—	—	e 23 50	+ 2	—	—	36·0
Tucson		89·7	55	e 13 1	0	e 25 5	PS	e 16 41	PP	e 37·1
College		90·9	16	—	—	e 23 48	[+10]	—	—	e 38·8
Salt Lake City		92·6	47	—	—	e 23 50	[+ 2]	e 30 34	SS	e 38·4
Butte	N.	94·5	42	—	—	e 24 39	+ 5	—	—	e 45·5
Hungry Horse		94·6	39	i 18 38	?	—	—	—	—	—
Irkutsk		94·7	325	—	—	e 23 57	[− 2]	—	—	—
Bozeman		95·3	43	—	—	e 24 35	− 6	e 26 52	PPS	e 38·5
Kodaikanal	E.	99·3	277	—	—	e 24 26	[+ 2]	—	—	—
Rapid City	E.	99·8	46	—	—	e 24 28	[+ 2]	e 29 19	?	e 48·4
Huancayo		104·6	109	—	—	e 25 8	{−19}	e 33 24	SS	e 48·9
Bombay		106·4	284	e 17 35	PKP	e 24 58	[+ 1]	—	—	—
La Paz		108·8	117	e 17 27	PKP	i 28 31	PS	—	—	51·4
Tashkent		114·3	307	e 19 21	PP	e 29 42	PS	e 35 54	SSP	—
Sverdlovsk		120·1	324	—	—	27 18	{+ 3}	e 36 30	SS	—
Bermuda		127·4	64	e 23 15	PKS	e 38 30	SS	e 31 12	PS	e 53·4
Grozny		131·7	310	e 22 41	PKS	—	—	—	—	—
Ksara		140·8	298	e 19 44?	[+12]	—	—	23 18?	PKS	—
Istanbul		144·2	312	e 19 31	[− 7]	—	—	e 30 25	?	—
Potsdam	z.	145·5	339	i 19 46	[+ 6]	—	—	—	—	—
Jena		147·2	338	e 19 56	[+13]	—	—	—	—	—
Stuttgart	z.	149·9	338	e 19 51	[+ 4]	—	—	—	—	—
Strasbourg		150·5	340	e 20 0	[+12]	—	—	—	—	e 65·0
Rome		154·0	326	e 20 20	[+27]	e 43 50	SS	e 49 24	SSS	e 69·3
Granada		164·0	352	e 16 16k	?	—	—	19 56	PKP	e 91·8

Additional readings :—
Auckland SN = 8m.53s., SS?N = 10m.34s., P_cSN = 11m.15s. ; readings wrongly identified.
Brisbane iN = 5m.19s., iE = 5m.48s., iN = 6m.21s., iSSE = 8m.32s., iE = 8m.56s.
Wellington i = 5m.37s., 5m.55s., and 6m.15s., P_cP = 7m.58s., S_cP = 10m.4s., P_cS = 11m.11s., S_cS? = 14m.5s., sS_cS = 17m.49s., $S_cS.S_cS$ = 20m.47s., $sS_cS.S_cS$ = 23m.24s.
Riverview iN = 5m.20s., iEZ = 5m.30s. and 5m.49s., iNZ = 8m.18s., iENZ = 9m.33s., iE = 9m.47s., iSSEN = 10m.13s., iE = 10m.27s.
Batavia ePSEN = 20m.31s., iSSEN = 24m.3s.
Berkeley iZ = 13m.0s.
Pasadena eEZ = 18m.21s., eZ = 25m.32s.
Sitka ePS = 24m.52s., e = 26m.0s.
Salt Lake City ePS = 24m.32s.
Huancayo ePP? = 28m.34s., ePPS = 28m.38s., e = 29m.3s.
Bermuda ePPS = 32m.20s.
Rome ePKP$_2$Z = 21m.0s., ePPZ = 24m.40s.
Granada PP = 20m.26s., SS = 31m.47s., SSS = 46m.29s.
Long waves were also recorded at Honolulu and at other American and European stations.

March 16d. Readings also at 1h. (near Mizusawa), 3h. (La Paz and near Bogota), 5h. (La Plata, La Paz, and Apia), 7h. (Pierce Ferry, Hungry Horse, and Tucson), 8h. (Hungry Horse, La Paz, La Plata, and Rome), 9h. (Ksara), 11h. (near Berkeley, Branner, and Lick), 12h. (Hungry Horse and near Mizusawa), 13h. (Stuttgart, Jena, and near Mizusawa), 14h. (Hungry Horse, Helwan, and near Padova), 15h. (Pierce Ferry), 18h. (Ksara), 19h. (Bermuda, Tashkent, Tchimkent, Samarkand, near Kulyab, Murgab, Obi-garm, and Stalinabad).

March 17d. 1h. Undetermined shock. South America.

La Paz P = 0m.26s., iS_g = 1m.55s.
Huancayo iP = 1m.57s., e = 4m.43s.
La Plata N = 3m.54s., LN = 4m.40s.
Tucson iP = 9m.29s., e = 9m.48s. and 10m.22s.
Palomar iPZ = 9m.55s.
Pierce Ferry iP = 9m.57s.
Riverside iPZ = 9m.59s.k, iZ = 10m.53s.
Pasadena iPZ = 10m.2s.
Mount Wilson iPZ = 10m.3s.k.
Haiwee ePZ = 10m.10s.
Tinemaha iPZ = 10m.15s.k
Shasta Dam iP = 10m.38s.
Hungry Horse iP = 10m.44s.
Long waves were also recorded at Kew.

March 17d. 19h. 41m. 34s. Epicentre 15°·5N. 146°·4E. (as on 1948, January 17d.).

A = −·8030, B = +·5335, C = +·2656; δ = −3; h = +6;
D = +·553, E = +·833; G = −·221, H = +·147, K = −·964.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Guam		2·6	219	i 0 50	+ 6	i 1 27	S_g	—	—	—
Mizusawa		24·0	350	5 24	+ 7	9 45	+13	—	—	—
Vladivostok		30·2	338	i 6 14	0	i 10 54	−19	—	—	—
Brisbane		43·2	172	i 8 2	− 2	i 14 26	− 6	—	—	—
Batavia		44·7	244	i 8 23	+ 7	i 15 27	+33	—	—	—
Riverview		49·3	175	i 8 52k	− 1	i 15 59	0	i 10 47	PP	22·3
Irkutsk		49·5	327	e 8 55	+ 1	e 16 1	− 1	—	—	—
Calcutta	E.	55·1	287	e 9 34	− 2	17 28	PS	—	—	—
Almata		64·6	311	10 43	+ 2	e 19 33	+12	—	—	—
Hyderabad	N.	64·9	283	e 12 17	?	e 19 29	+ 5	—	—	—
College		65·9	25	—	—	e 19 32	− 5	e 23 51	SS	e 29·1
Frunse		66·3	310	e 11 19	P_cP	—	—	—	—	—
Kodaikanal	E.	67·2	275	e 11 3	+ 5	—	—	—	—	—
Andijan		68·0	308	e 11 7	+ 4	20 10	+ 8	—	—	—
Bombay		69·9	285	e 11 29	+14	e 20 39	+14	—	—	—
Tchimkent		70·0	310	i 11 18	+ 3	—	—	—	—	—
Kulyab		70·2	305	i 11 20	+ 3	i 20 36	+ 8	—	—	—
Obi-garm		70·2	306	e 11 20	+ 3	e 20 32	+ 4	—	—	—
Tashkent		70·3	309	i 11 16	− 1	e 20 34	+ 5	—	—	—
Stalinabad		70·9	306	i 11 24	+ 3	i 20 40	+ 4	—	—	—
Samarkand		72·2	307	e 11 34	+ 5	—	—	—	—	—
Sverdlovsk		74·9	326	i 11 45	+ 1	21 21	− 1	—	—	—
Victoria		78·7	43	—	—	e 21 50	−13	e 30 50	SSS	e 37·5
Ashkabad		79·1	306	e 12 8	0	e 22 13	+ 6	—	—	—
Shasta Dam		81·0	50	e 12 14	− 4	—	—	—	—	—
Mineral	Z.	81·6	50	e 13 19	+58	—	—	—	—	—
Berkeley		81·7	43	—	—	i 22 28	− 6	i 23 9	PS	e 33·4
Hungry Horse		84·8	41	i 12 36	− 1	e 22 59	− 6	—	—	—
Baku		84·9	311	—	—	e 23 8	+ 2	—	—	—
Tinemaha	Z.	85·0	54	e 12 37	− 1	—	—	i 12 59	P_cP	—
Haiwee	Z.	85·5	54	e 12 41	0	—	—	—	—	—
Pasadena		85·8	56	i 12 40	− 2	i 22 57	[− 9]	i 13 4	P_cP	e 52·9
Mount Wilson	Z.	85·9	56	i 12 40	− 3	—	—	e 13 5	P_cP	—
Butte	N.	86·5	43	—	—	e 23 7	[− 4]	e 28 57	SS	e 40·2
Riverside	Z.	86·5	56	i 12 43	− 3	—	—	e 12 58	P_cP	—
Grozny		87·0	314	—	—	23 20	[+ 6]	—	—	—
Palomar	Z.	87·1	56	i 12 45	− 4	—	—	—	—	—
Bozeman		87·6	43	—	—	e 23 32	0	—	—	e 37·0
Boulder City		87·9	53	e 12 51	− 2	—	—	e 17 14	?	—
Pierce Ferry		88·5	53	e 12 53	− 3	—	—	e 16 32	PP	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Salt Lake City		88·6	48	—	—	e 23 35	− 7	e 29 13	SS	e 36·5
Tucson		92·3	56	e 13 11	− 2	e 23 47	[+ 1]	e 24 14	S	e 39·6
Rapid City	E.	93·3	42	e 13 18	0	e 24 8	[+16]	e 30 32	SS	e 57·7
Ksara		97·7	308	e 13 42	+ 4	e 26 36	PS	—	—	—
Istanbul		99·3	317	17 49?	PP	29 28?	?	—	—	—
Helwan		102·9	306	—	—	i 24 42	[+ 1]	—	—	—
St. Louis		104·5	42	e 21 4	PPP	e 24 45	[− 3]	e 25 54	S	e 45·0
Stuttgart		105·6	332	e 18 32	PP	—	—	e 28 31	PPS	e 56·4
Triest		105·6	328	e 18 49	PP	—	—	e 28 46	PPS	e 44·0
Strasbourg		106·4	333	—	—	—	—	e 43 14	Q	53·9
Basle		107·2	332	—	—	e 35 45	?	—	—	—
Paris		108·4	336	e 18 56	PP	—	—	e 23 55	?	e 60·4
Rome		108·8	325	—	—	e 28 20	PS	e 29 36	PPS	e 52·2
Fordham		112·6	32	—	—	e 30 22	PPS	—	—	68·4
Granada		120·5	333	19 41k	[+47]	30 23	PS	20 19	PP	62·0
Bermuda		123·9	32	—	—	e 26 6	[+ 3]	e 30 56	PS	e 59·9
La Paz		146·8	97	i 19 45	[+ 3]	26 46	[− 3]	i 20 26	pPKP	e 76·4

Additional readings :—
Brisbane iN = 8m.12s., iSE = 9m.2s., iN = 18m.3s.
Riverview iPPZ = 10m.51s., eSE = 15m.54s., iPPSN = 16m.13s., iS_eSE = 18m.46s., eQ = 19m.56s.
Berkeley iE = 22m.31s., iN = 22m.54s.
Pasadena eS?N = 22m.38s., eSSE = 27m.34s.
Salt Lake City eSSS? = 34m.29s.
Tucson e = 13m.44s., ePS = 25m.21s.
St. Louis e = 22m.10s., ePS = 27m.28s., e = 28m.55s., ePKKP? = 29m.55s., eSS = 33m.9s., esSS = 34m.18s., eSSS = 37m.52s., esSSS? = 39m.22s.
Rome ePSEN = 31m.9s.
Granada SKP = 21m.28s., SS = 38m.7s.
Bermuda eSS = 37m.36s.
La Paz iPPZ = 23m.36s., iSKKSE = 30m.6s.
Long waves were also recorded at Arapuni, Wellington, Chicago, Huancayo, Honolulu, and at other European stations.

March 17d. Readings also at 1h. (near Obi-garm), 5h. (Auckland and Hungry Horse), 8h. (near Stalinabad, Kulyab, and Obi-garm), 9h. (near Andijan), 10h. (Hungry Horse, Pierce Ferry, and Shasta Dam), 11h. (Berkeley), 14h. (Bogota), 17h. (Hungry Horse), 19h. (La Paz), 21h. (Stuttgart, Rome, near Florence, and Bologna).

March 18d. 15h. 51m. 31s. Epicentre 50°·9N. 130°·7W. (as on 1944, August 10d.).

$A = -·4122$, $B = -·4792$, $C = +·7749$; $\delta = +1$; $h = -6$;
$D = -·758$, $E = +·652$; $G = -·505$, $H = -·587$, $K = -·632$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Hungry Horse		11·1	97	e 2 48	+ 5	e 5 1	SS	—	—	—
Shasta Dam		11·8	147	i 2 47	− 6	—	—	—	—	—
Mineral	z.	12·4	146	i 2 55	− 6	—	—	i 3 42	pP	—
Tinemaha	z.	16·5	143	i 3 52	− 2	—	—	i 3 59	PP	—
Haiwee	z.	17·4	143	i 4 10	+ 4	—	—	—	—	—
Boulder City		18·9	137	e 4 25	+ 1	—	—	—	—	—
Mount Wilson	z.	19·1	146	i 4 29	+ 2	—	—	—	—	—
Pasadena	z.	19·1	146	i 4 27	0	—	—	—	—	—
Pierce Ferry		19·1	135	e 4 25	− 2	—	—	—	—	—
Riverside	z.	19·6	146	i 4 32	0	—	—	—	—	—
Rapid City	E.	19·7	99	e 4 46	PP	—	—	—	—	e 11·2
Palomar	z.	20·3	144	i 4 38	− 2	—	—	—	—	—
Tucson		23·8	133	i 5 19k	+ 4	—	—	i 5 36	PP	e 13·7

Additional readings :—
Pierce Ferry i = 5m.29s.
Tucson i = 6m.7s.

March 18d. 21h. 9m. 3s. Epicentre 30°·0N. 114°·0W. (as on 1947, December 16d.).

$A = -·3528$, $B = -·7925$, $C = +·4975$; $\delta = +3$; $h = +2$:
$D = -·914$, $E = +·407$; $G = -·202$, $H = -·454$, $K = -·868$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tucson	3·5	50	e 0 59	+ 2	e 2 2	S_g	i 1 21	P_g	i 2·2
La Jolla	4·0	317	e 1 0	− 4	i 1 48	− 4	—	—	—
Palomar	4·1	326	i 1 4	− 1	i 1 57	+ 2	—	—	—
Riverside	4·9	325	i 1 15	− 2	e 2 20	+ 5	—	—	—
Mount Wilson	5·4	323	e 1 24	0	i 2 36	+ 8	—	—	—
Pasadena	5·4	321	e 1 25	+ 1	i 2 35	+ 7	—	—	—
Boulder City	6·0	354	e 1 37	+ 5	e 2 58	S*	—	—	—
Pierce Ferry	6·1	1	i 1 30	− 4	i 2 34	−11	—	—	—
Tinemaha	7·9	335	e 2 5	+ 6	i 4 8	S*	—	—	—
Hungry Horse	18·3	0	i 4 18	+ 1	—	—	—	—	—

Additional readings :—
Pasadona iZ = 1m.29s. and 2m.18s.
Tinemaha iZ = 3m.8s.

March 18d. 23h. 3m. 43s. Epicentre 20°·5S. 179°·0W. Depth of focus 0·080. (as on 1948 January 4d.).

$A = -·9373$, $B = -·0161$, $C = -·3481$; $\delta = -3$; $h = +5$;
$D = -·017$, $E = +1·000$; $G = +·348$, $H = +·006$, $K = -·937$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		9·6	47	—	—	3 45	−17	—	—	—
Auckland	N.	17·2	197	3 39	+ 8	6 34	+13	5 52	?	—
Tuai	N.	18·6	190	3 47	+ 3	6 44	− 1	14 13	S_cS	—
New Plymouth	E.	19·5	195	3 33	−20	—	—	—	—	—
Wellington		21·4	193	4 13	+ 3	7 34	+ 3	14 23	S_cS	—
Riverview		29·6	237	i 5 12	−11	i 9 53	+12	i 12 58	SSS	e 14·1
Lick	Z.	78·9	43	i 11 8	0	—	—	—	—	—
Pasadena		79·4	47	i 11 11	0	—	—	e 13 14	pP	—
Mount Wilson	Z.	79·5	47	i 11 12k	0	—	—	e 13 10	pP	—
Fresno	Z.	79·7	45	i 11 13	0	—	—	—	—	—
Palomar	Z.	79·8	48	i 11 13k	0	—	—	e 13 13	pP	—
Riverside	Z.	79·8	47	i 11 14k	+ 1	—	—	e 13 16	pP	—
Shasta Dam		80·4	39	i 11 15	− 1	—	—	i 13 43	pP	—
Haiwee	Z.	80·6	46	i 11 19	+ 2	—	—	—	—	—
Tinemaha	Z.	80·9	48	i 11 20k	+ 1	—	—	e 13 18	pP	—
Boulder City		82·7	47	i 11 28	0	—	—	e 13 29	pP	—
Pierce Ferry		83·3	47	i 11 31	0	—	—	i 13 32	pP	—
Tucson		83·6	52	i 11 34k	+ 2	—	—	e 13 36	pP	—
Hungry Horse		89·7	37	i 12 1	0	—	—	i 15 37	PP	—
Copenhagen		143·8	351	e 18 36	[+ 2]	—	—	—	—	—
Collmberg	Z.	147·8	347	e 18 46	[+ 6]	—	—	i 18 52	PKP_2	—
Jena	N.	148·5	347	e 18 49	[+ 8]	—	—	—	—	—
Stuttgart	Z.	151·0	350	e 18 48	[+ 3]	—	—	—	—	—
Paris		151·7	358	e 18 50	[+ 4]	—	—	—	—	—
Basle		152·5	351	e 18 56	[+ 9]	—	—	—	—	—
Zürich		152·5	351	e 18 51	[+ 4]	—	—	—	—	—
Clermont-Ferrand		154·7	357	e 19 21	[+31]	—	—	—	—	—

Additional readings :—
Riverview iE = 13m.8s.
Tinemaha iZ = 11m.46s.
Stuttgart eZ = 18m.55s.k, 19m.3s., and 21m.6s.
Paris i = 18m.57s. and 19m.9s.

March 18d. Readings also at 7h. (Istanbul), 8h. (Auckland and near Mizusawa), 9h. (La Paz), 12h. (near Grozny and Leninakan), 16h. (near Ottawa), 17h. (Toledo), 21h. (La Paz), 22h. (Fresno).

March 19d. Readings at 0h. (Tacubaya), 4h. (near Kulyab, Obi-garm, and Stalinabad), 7h. (Tinemaha, Pierce Ferry, Shasta Dam, Tucson, Fresno, and near Lick), 8h. (near Batavia), 9h. (near Samarkand), 12h. (near Samarkand (3)), 13h. (Hungry Horse), 17h. (near Basle and Zürich), 19h. (near Florence).

March 20d. Readings at 0h. (Samarkand, Murgab, near Obi-garm, Kulyab, and Stalinabad), 2h. (Hungry Horse), 4h. (near Lick (2)), 5h. (near Obi-garm), 7h. (Hungry Horse), 8h. (near Lick and Fresno), 10h. (near Mizusawa), 11h. (Vladivostok, Stuttgart, Hungry Horse, and near Lick (2)), 14h. (La Paz), 17h. (Balboa Heights, Boulder City, Hungry Horse, Pierce Ferry, Shasta Dam, Tucson, Mount Wilson, Palomar, Riverside, Tinemaha, Paris, and Stuttgart), 22h. (near Batavia, near Kulyab, Obi-garm, Stalinabad, Murgab, and Andijan), 23h. (Mount Wilson, Palomar, Riverside, Hungry Horse, Shasta Dam, Tucson, Mineral, and Paris).

March 21d. 21h. 34m. 37s. Epicentre 56°·3S. 24°·2W. (as on 1937, November 27d.).

$A = +\cdot5085$, $B = -\cdot2285$, $C = -\cdot8302$; $\delta = +2$; $h = -8$;
$D = -\cdot410$, $E = -\cdot912$; $G = -\cdot757$, $H = +\cdot340$, $K = -\cdot557$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
La Paz		51·7	303	i 9 8k	− 3	i 16 30	− 2	i 9 29	pP	26·9
Huancayo		59·0	298	e 10 3	− 1	e 18 9	− 1	i 10 57	P_cP	e 24·6
Tananarive		64·4	86	—	—	26 52	SSS	—	—	29·9
Fort de France		77·2	325	e 11 57	0	—	—	—	—	—
Wellington		81·5	195	12 23	+ 2	22 28	− 4	15 31	PP	43·4
San Juan		82·3	321	e 12 21	− 4	e 22 30	−10	e 15 24	PP	e 33·9
Riverview		90·2	176	i 13 7a	+ 3	i 23 34	[0]	i 16 38	PP	37·2
Bermuda		94·8	327	e 13 29	+ 4	e 24 44	+ 8	e 17 48	PP	e 43·8
Granada		94·8	17	i 13 26a	+ 1	i 26 37	PPS	17 37	PP	i 39·6
Lisbon		95·5	12	13 42	+14	—	—	—	—	49·7
Algiers		95·6	22	e 13 24	− 4	e 24 4	[0]	—	—	—
Alicante		96·4	18	18 5	PP	i 26 39	PS	19 11	PPP	e 43·6
Helwan		97·9	47	e 17 35	PP	25 17	+14	24 11	SKS	—
Tacubaya	E.	97·9	294	e 14 0	+21	e 25 7	+ 4	i 17 41	PP	—
Columbia		102·0	315	—	—	e 25 48	+11	e 33 33	SS	e 56·2
Rome		102·6	27	e 13 8	−52	e 25 4	{− 9}	e 18 6	PP	e 42·6
Ksara		103·2	49	e 10 27	?	—	—	28 25	PPS	—
Florence		104·1	26	—	—	e 33 32	SS	—	—	—
Clermont-Ferrand		104·2	19	e 18 25	PP	—	—	—	—	49·9
Kodaikanal	E.	104·9	93	—	—	e 24 21	[−29]	—	—	—
Philadelphia		105·1	322	i 18 28	PP	—	—	—	—	e 57·5
Fordham		105·5	324	i 18 33	PP	e 28 42	PPS	e 33 32	SS	56·4
Basle		106·8	22	e 12 37	?	—	—	—	—	—
Paris		107·1	18	e 17 50	PKP	—	—	e 18 30	PP	e 55·4
Strasbourg		107·9	22	—	—	e 34 32	SS	—	—	e 51·4
Stuttgart	Z.	108·3	23	e 18 33?	[+ 4]	e 29 52	PPS	e 18 59	PP	e 60·4
Cleveland		108·8	318	i 18 56k	PP	i 28 45	PS	i 34 11	SS	—
Kew		109·2	15	—	—	e 29 37	PPS	e 34 53	SS	e 50·4
Uccle		109·3	18	—	—	e 28 48?	PS	e 34 38	SS	e 52·4
Bombay		109·4	85	e 19 15	PP	—	—	—	—	—
St. Louis		109·8	310	e 18 0	[−33]	e 26 41	S	i 19 1	PP	—
Ottawa		110·2	324	e 19 2	PP	e 28 43	PS	—	—	56·4
Prague		110·7	25	19 51	PP	e 29 11	PS	e 34 47	SS	e 50·4
Hyderabad	N.	111·3	91	e 15 45	P	e 26 17	{+ 3}	19 21	PP	—
Chicago		111·5	314	—	—	e 28 52	PS	—	—	e 55·7
Temiskaming	N.	112·4	323	e 19 17	PP	—	—	—	—	—
Ville Marie		113·1	323	e 11 35	?	—	—	—	—	—
Kirkland Lake		114·0	323	e 19 23	PP	—	—	—	—	—
Tucson		114·4	292	e 18 40	[− 2]	e 29 6	PS	e 19 32	PP	e 54·2
Palomar	Z.	118·4	289	e 18 51	[+ 1]	—	—	i 20 3	PP	—
Pierce Ferry		119·1	293	e 18 49	[− 2]	—	—	e 20 8	PP	—
Riverside	Z.	119·2	289	i 18 50	[− 1]	—	—	e 20 7	PP	—
Boulder City		119·4	292	e 18 53	[+ 1]	—	—	e 20 13	PP	—
Mount Wilson	Z.	119·7	289	i 18 52	[0]	—	—	i 20 15	PP	—
Pasadena	Z.	119·7	289	i 18 52	[0]	—	—	i 20 14	PP	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Rapid City	E.	119·9	306	e 20 6?	PP	e 36 36?	SS	—	—	e 66·4
Calcutta	E.	120·9	95	20 32	PP	30 37	PS	—	—	—
Salt Lake City		121·5	298	—	—	e 27 58	{+34}	e 36 57	SS	e 64·0
Tinemaha	Z.	122·0	290	e 18 57	[0]	—	—	i 20 28	PP	—
Fresno	Z.	122·5	290	i 17 59	[−59]	—	—	i 20 35	PP	—
Stalinabad		122·5	68	i 19 1	[+ 3]	—	—	e 20 42	PP	—
Lick	Z.	124·0	288	e 18 59	[− 1]	—	—	i 20 42	PP	—
Branner	Z.	124·3	288	i 20 5	[+64]	—	—	—	—	—
Berkeley		124·7	288	i 20 47	PP	—	—	—	—	e 63·1
Tashkent		124·9	66	19 10	[+ 8]	—	—	e 20 53	PP	—
Murgab		125·1	72	i 19 5	[+ 2]	—	—	—	—	—
Tchimkent		125·7	66	e 19 7	[+ 3]	—	—	—	—	—
Andijan		126·0	69	e 19 5	[+ 1]	—	—	e 23 27	PPP	—
Mineral	Z.	126·2	291	e 19 3	[− 2]	—	—	—	—	—
Shasta Dam		126·8	291	i 19 3	[− 3]	—	—	—	—	—
Hungry Horse		128·1	303	e 19 5	[− 3]	—	—	i 21 9	PP	—
Sverdlovsk		131·8	47	i 19 16	[0]	e 28 15?	{−16}	i 22 43	PKS	—
Irkutsk		150·3	75	e 19 49	[+ 1]	—	—	—	—	—
Vladivostok		159·8	121	i 20 1	[0]	e 31 4	{− 7}	i 20 41	PKP_2	—

Additional readings :—
La Paz P_cP =10m.23s., PPZ =11m.7s., PSZ =16m.45s., SSN =20m.3s., iSSSN =21m.53s.
Huancayo i =18m.35s., iS_cS? =19m.33s., eSS? =22m.43s.
Wellington PPS =23m.31s., S_cSP =24m.32s.
San Juan eSS =27m.56s.
Riverview i =13m.42s., iSKKSN =23m.44s., iSE =24m.1s., iPSN =25m.18s., eSSE = 30m.10s.
Bermuda ePPP =19m.27s., eSKS? =24m.23s., e =28m.27s., eSSS =35m.10s.
Granada PS =27m.9s., iSS =31m.31s.
Alicante PPP =20m.48s., PS =27m.39s., PPS =27m.55s., SS =31m.47s., SSS =35m.26s., Q =38m.9s.
Helwan PS =26m.32s.
Tacubaya iE =18m.19s., eE =22m.33s., eSE =25m.37s., eE =29m.50s.
Rome ePSN =27m.25s., iSSEN =33m.17s.
Strasbourg e =41m.39s.
Kew eN =38m.25s.
Uccle eE =31m.53s., eN =38m.35s., eE =45m.6s.
St. Louis iSS =34m.17s.
Temiskaming eZ =19m.24s.
Tucson iPKP =18m.43s., ePPP =21m.48s., ePKKP =29m.20s., eSS =35m.57s.
Palomar iZ =19m.9s. and 20m.16s., iPKKPZ =29m.14s.
Pierce Ferry ePKKP =29m.10s.
Riverside iZ =19m.7s. and 20m.24s., eZ =28m.8s., ePKKPZ =29m.8s.
Boulder City ePKKP =29m.9s.
Mount Wilson iZ =19m.9s., ePKKPZ =29m.9s.
Pasadena iZ =19m.9s., ePKKPZ =29m.8s.
Rapid City iPPE =20m.11s.?
Tinemaha iZ =19m.13s., iPKKPZ =28m.55s.
Fresno eE =18m.6s., iZ =18m.15s.
Shasta Dam i =19m.21s.
Hungry Horse i =19m.16s. and 19m.24s.
Sverdlovsk eSS =39m.59s., eSSS =44m.11s.
Long waves were also recorded at Auckland, Honolulu, College, Butte, Lincoln, Scoresby Sund, and other European stations.

March 21d. Readings also at 0h. (near Tacubaya, near Branner, and Lick), 2h. (La Paz, Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson (2), Boulder City, Pierce Ferry, Shasta Dam, and Lick), 3h. (Bogota), 4h. (Hungry Horse and Port au Prince), 7h. (near Andijan), 12h. (near Stalinabad), 15h. (Samarkand, near Kulyab, Obi-garm, and Stalinabad), 16h. (near Obi-garm), 17h. (near Mineral and near Obi-garm), 19h. (Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Boulder City, Pierce Ferry, Shasta Dam, Hungry Horse, Lick, Mineral, Stuttgart, and near Apia).

March 22d. 0h. 6m. 7s. Epicentre 15°·6S. 74°·6W. Depth of focus 0·010.
(as on 1944, January 6d.).

A = +·2559, B = −·9290, C = −·2673 ; δ = −2 ; h = +6 ;
D = −·964, E = −·266 ; G = −·071, H = +·258, K = −·964.

		△	Az.	P.	O − C.	S.	O − C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Huancayo		3·6	350	i 0 55	0	i 1 45	+ 8	i 1 13	?	i 2·3
La Paz		6·3	101	i 1 28a	− 4	i 2 40	− 3	—	—	—
Bogota		20·1	1	i 4 30	+ 2	i 7 52	−12	i 4 37	PP	—
La Plata	E.	24·4	144	i 5 13	+ 3	9 32	+12	5 51	PP	12·5
	N.	24·4	144	i 5 15	+ 5	9 26	+ 6	10 8	SS	12·0
	Z.	24·4	144	5 12	+ 2	—	—	—	—	—
Balboa Heights		24·9	349	e 5 18	+ 3	—	—	—	—	—
San Juan		34·8	15	e 6 43	0	e 11 58	− 8	e 7 7	?	e 14·3
Tacubaya	E.	42·6	325	i 7 54	+ 6	e 14 9	+ 6	e 15 8	SS	—
Bermuda		48·6	12	e 10 24	PP	—	—	—	—	e 15·1
Columbia		49·7	353	—	—	e 15 40	− 4	e 19 45	SS	e 20·3
Philadelphia		55·3	0	e 10 3	+37	e 17 0	0	—	—	—
St. Louis		55·9	345	e 9 29	− 1	i 17 5	− 3	i 9 58	pP	—
Cleveland		57·2	354	i 9 37a	− 2	i 17 22	− 3	—	—	23·2
Harvard		57·9	4	i 9 43	− 1	—	—	—	—	—
Chicago		58·4	348	—	—	e 17 33	− 8	e 19 27	S_cS	e 26·3
Tucson		58·9	324	i 9 51a	0	i 10 41	sP	i 10 15	pP	e 24·7
Lincoln	E.	59·8	341	—	—	e 17 58	− 1	e 19 35	S_cS	—
Ottawa		61·1	359	9 59	− 7	18 11	− 5	—	—	27·9
Temiskaming		62·1	357	e 10 12	− 1	—	—	—	—	—
Ville Marie		62·8	357	e 10 18	0	—	—	—	—	—
La Jolla	Z.	63·1	320	e 10 22	+ 2	—	—	—	—	—
Palomar		63·2	321	i 10 21	+ 1	—	—	i 10 45	pP	—
Pierce Ferry		63·5	325	i 10 22	0	—	—	i 10 48	pP	—
Kirkland Lake		63·6	357	e 10 22	− 1	—	—	—	—	—
Boulder City		63·9	325	e 10 25	0	—	—	—	—	—
Riverside	Z.	64·1	321	i 10 25	− 1	—	—	i 10 45	pP	—
Mount Wilson		64·5	321	i 10 29	0	—	—	i 10 56	pP	—
Pasadena		64·6	321	i 10 30	+ 1	i 19 5	+ 5	e 10 54	pP	—
Rapid City	E.	64·9	337	e 10 26?	− 5	e 19 4?	+ 1	e 23 19	SS	e 26·9
Santa Barbara	Z.	65·7	320	e 10 38	+ 2	—	—	—	—	—
Haiwee	Z.	65·8	323	i 10 39	+ 2	—	—	—	—	—
Salt Lake City		65·9	330	—	—	e 19 18	+ 2	e 23 39	SS	e 31·2
Tinemaha	Z.	66·6	323	i 10 44	+ 2	—	—	i 11 23	pP	—
Fresno		67·3	323	i 10 27	−19	—	—	e 10 48	P	—
Lick	Z.	68·8	322	i 10 56	0	—	—	—	—	—
Mineral	Z.	70·7	324	i 11 7	0	—	—	—	—	—
Shasta Dam		71·4	324	e 11 9	− 3	—	—	—	—	—
Hungry Horse		72·7	334	e 11 19	0	—	—	—	—	—
Toledo		85·6	47	e 12 29	0	—	—	—	—	—
Stuttgart	Z.	97·6	41	e 13 23	− 2	—	—	i 13 8	pP	—
Ksara		115·4	60	e 19 57	PP	—	—	—	—	—
Bombay		148·7	78	—	—	e 27 53?	?	31 7	?	—

Additional readings :—
La Paz iZ = 1m.45s., iS* = 3m.2s., iS_g = 3m.17s.
Bogota iSS = 8m.23s.
La Plata PPPN = 5m.52s., Z = 6m.52s., N = 7m.39s.
Columbia eS_cS = 18m.27s.
St. Louis i = 17m.36s., isS = 18m.1s.
Cleveland eN = 13m.35s., i?E = 15m.36s., iE = 19m.16s. and 19m.57s.
Harvard i = 10m.5s., 10m.19s., and 10m.30s.
Tucson e = 11m.34s.
Palomar iZ = 10m.26s.
Riverside iZ = 11m.3s.
Mount Wilson eZ = 10m.43s., iZ = 11m.7s.
Pasadena iZ = 11m.2s. and 11m.47s.
Rapid City ePPE? = 13m.18s.?, eS_cSE = 20m.0s.?
Salt Lake City eS_cS = 20m.24s.
Fresno eN = 10m.53s., iZ = 11m.27s.
Long waves were also recorded at Kew.

March 22d. 21h. 34m. 27s. (I) ; Epicentre 11°·5N. 86°·3W.
23h. 41m. 15s. (II) ; (as on 1946, August 24d.).

A = + ·0633, B = − ·9782, C = + ·1981 ; δ = +13 ; h = +6 ;
D = − ·998, E = − ·065 ; G = + ·013, H = − ·198, K = − ·980.

		Δ	Az.	P.	O − C.	S.	O − C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
I	Balboa Heights	7·0	109	e 1 48	+ 2	—	—	—	—	e 3·9
II		7·0	109	e 1 49	+ 3	—	—	—	—	—
I	Tacubaya	14·7	304	i 3 34	+ 3	e 6 35	SS	e 7 0	SSS	—
II		14·7	304	i 3 33	+ 2	i 7 1	SSS	—	—	i 7·1
I	San Juan	20·6	68	e 4 45	+ 2	e 8 43	+14	—	—	e 10·1
II		20·6	68	e 4 45	+ 2	e 8 38	+ 9	—	—	e 12·7
I	Columbia	22·9	11	e 5 11	+ 5	e 9 47	SS	—	—	e 11·3
II		22·9	11	e 5 8	+ 2	e 9 45	SS	—	—	e 11·3
I	Fort de France	24·7	81	e 5 42	+18	—	—	—	—	—
I	Huancayo	25·8	155	e 5 35	+ 1	e 10 2	0	—	—	e 11·6
II		25·8	155	e 5 35	+ 1	e 10 2	0	—	—	e 11·5
I	St. Louis	27·2	354	i 5 48	+ 1	e 10 38	+13	i 5 58	pP	—
II		27·2	354	i 5 47	0	e 10 48	+23	i 11 49	SS	—
I	Georgetown	28·5	17	i 5 58	− 1	11 16	SS	i 7 2	PPP	14·5
I	Bermuda	28·6	41	e 6 5	+ 5	e 10 54	+ 6	e 7 17	PPP	e 12·1
II		28·6	41	e 6 3	+ 3	e 11 25	SS	—	—	e 12·6
I	Philadelphia	30·0	18	e 6 13	+ 1	e 11 40	+30	—	—	i 12·8
I	Chicago	30·2	358	e 6 10	− 4	e 11 21	+ 8	e 7 17	PP	e 13·3
II		30·2	358	e 6 11	− 3	e 11 26	+13	e 7 14	PP	e 12·5
I	Cleveland	30·2	7	i 6 14k	0	i 11 38	+25	e 7 12	PP	15·4
II		30·2	7	i 6 14	0	i 11 37	+24	—	—	15·5
I	Tucson	30·6	317	e 6 16	− 2	e 10 57	−23	e 7 17	PP	e 12·7
II		30·6	317	e 6 15	− 3	e 12 31	?	—	—	e 13·4
I	Fordham	31·2	20	e 6 24	+ 1	e 11 38	+ 9	—	—	17·0
I	La Paz	33·1	147	6 37	− 3	i 12 5	+ 6	7 59	PP	16·9
II		33·1	147	6 33	− 7	11 57	− 2	—	—	18·4
I	Harvard	33·4	20	i 6 43	+ 1	e 12 33	+30	—	—	e 17·0
II		33·4	20	i 6 42	0	—	—	—	—	e 19·7
I	Vermont	34·7	17	—	—	e 12 47	+23	—	—	e 14·9
II		34·7	17	—	—	e 13 10	+46	—	—	e 18·9
I	Ottawa	35·0	13	6 55	− 1	12 54	+26	14 51	SS	18·5
II		35·0	13	6 54	− 2	12 55	+27	8 18	PP	16·8
I	Pierce Ferry	35·0	319	i 6 56	0	—	—	i 7 8	pP	—
II		35·0	319	i 7 0	+ 4	—	—	i 9 27	PcP	—
I	Palomar	35·4	314	i 7 0a	0	e 13 37	ScP	i 7 11	pP	—
II		35·4	314	i 6 59a	− 1	e 13 35	ScP	i 7 10	pP	—
I	Boulder City	35·5	319	i 7 0	0	—	—	i 7 10	pP	—
II		35·5	319	i 6 59	− 1	—	—	i 9 29	PcP	—
I	La Jolla	z. 35·5	313	e 7 2	+ 2	—	—	e 7 12	pP	—
I	Rapid City	E. 35·6	340	i 6 57	− 4	e 12 41	+ 3	i 8 48	PP	e 16·6
II		E. 35·6	340	e 7 1	0	—	—	e 8 19	PP	e 19·7
I	Temiskaming	35·6	8	i 7 0a	− 1	—	—	i 7 11	?	21·5
II		35·6	8	e 6 59	− 2	—	—	—	—	—
I	Ville Marie	36·1	6	e 7 7	+ 2	—	—	—	—	—
II		36·1	6	e 7 6	+ 1	—	—	—	—	—
I	Riverside	z. 36·1	315	i 7 4a	− 1	i 7 18	sP	i 7 14	pP	—
II		z. 36·1	315	i 7 3	− 2	i 7 18	sP	i 7 14	pP	—
I	Mount Wilson	z. 36·7	315	i 7 13a	+ 3	e 13 43	ScP	e 7 21	pP	—
II		z. 36·7	315	i 7 10	0	—	—	e 9 32	PcP	—
I	Pasadena	36·8	315	i 7 12	+ 1	e 13 41	ScP	i 7 22	pP	e 17·1
II		36·8	315	i 7 10	− 1	i 7 26	sP	i 9 34	PcP	e 17·8
I	Salt Lake City	36·8	328	e 8 3	+52	—	—	e 8 37	PP	e 16·1
II		36·8	328	e 8 40	PP	—	—	—	—	e 20·2
I	Seven Falls	37·8	17	e 8 57	PP	(13 33)	+22	—	—	13·6
I	Tinemaha	z. 38·4	318	i 7 25	0	i 7 39	sP	i 7 35	pP	—
II		z. 38·4	318	i 7 23	− 2	—	—	i 9 36	PcP	—
I	Fresno	z. 39·2	316	i 7 32	+ 1	—	—	—	—	—
II		z. 39·2	316	i 7 31	0	—	—	—	—	—
I	Lick	40·8	316	i 7 44	− 1	—	—	e 7 58	?	—
II		z. 40·8	316	i 7 44	− 1	—	—	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
I Santa Clara	z.	41·0	316	e 7 45	− 1	—	—	—	—	—
I Branner	z.	41·3	316	i 7 49	0	—	—	i 9 47	PcP	—
I Shasta Dam		43·0	319	e 8 0	− 3	e 14 9	−20	i 8 13	pP	—
II		43·0	319	e 7 59	− 4	—	—	i 9 50	PP	—
I Hungry Horse		43·4	333	i 8 5	− 1	—	—	—	—	—
II		43·4	333	i 8 3	− 3	—	—	i 9 51	PP	—
I Scoresby Sund		70·8	19	15 51	PPP	26 9	?	—	—	31·6
I Granada		77·4	55	i 11 19k	−39	21 34	−15	26 40	SS	i 37·7
I Kew		78·6	39	—	—	e 27 47	?	e 34 33?	Q	e 39·5
I Paris		80·7	42	e 12 45	+29	—	—	—	—	e 38·6
I Clermont-Ferrand		81·5	46	e 12 42	+21	e 23 44	PPS	e 35 32	Q	39·6
I Uccle		81·6	40	—	—	e 22 51	+18	e 31 29	SSS	e 38·1
II		81·6	40	—	—	e 23 27	PS	e 28 18	?	e 38·8
I De Bilt		81·9	38	—	—	e 22 33	− 3	e 28 33	?	e 35·6
I Strasbourg		84·1	42	e 12 59	+25	e 24 9	PS	—	—	e 40·6
II		84·1	42	—	—	e 28 45?	SS	—	—	37·8
I Stuttgart		85·0	42	e 12 49?	+11	—	—	e 39 33?	Q	e 42·6
I Prague		88·1	39	—	—	e 23 33?	− 4	—	—	e 39·6
I Rome		88·8	48	e 14 22	?	e 23 36	− 8	e 29 48	SS	—
II	E.	88·8	48	e 19 48	?	—	—	—	—	—
I Istanbul		100·8	44	e 17 58	PP	—	—	e 27 33?	PPS	—
I Ksara		109·0	48	e 5 59	?	—	—	e 18 55	PP	—

Additional readings :—
St. Louis I i=10m.56s., 11m.36s., and 11m.50s., II i=10m.56s. and 11m.32s.
Cleveland I iSSE=13m.15s., eN=14m.4s., iE=15m.4s.
Tucson I e=6m.27s., i=6m.49s.
La Paz I iSSE=14m.3s.
Ottawa I PPPN=8m.21s.
Pierce Ferry I eP_cP=9m.25s., II i=7m.30s.
Palomar I iP_cPZ=9m.31s., ipP_cPZ=9m.44s., II iP_cPZ=9m.28s.
Boulder City I i=9m.0s.
Rapid City I eE=11m.58s.?
Riverside I iP_cPZ=9m.30s., ipP_cPZ=9m.41s., eZ=13m.14s., and 13m.37s., II iP_cPZ=9m.29s., ipP_cPZ=9m.39s.
Mount Wilson I isPZ=7m.27s., iP_cPZ=9m.33s.
Pasadena I isPZ=7m.26s., eP_cPZ=9m.33s., epP_cPZ=9m.43s., II epP_cPZ=9m.45s.
Tinemaha I iP_cPZ=9m.37s.
Fresno I eEN=7m.37s., iZ=7m.42s.
Shasta Dam I iPP=9m.51s.
Granada I P_cP=11m.26s., ePP=13m.42s., SSS=30m.31s
Uccle I eE=28m.22s.
Strasbourg I ePP?=7m.11s., e=29m.1s.
Long waves to the first shock were also recorded at La Plata, College, Sitka, Bombay, Ivigtut, and at other American and European stations.
Long waves to the second shock were also recorded at other European stations.

March 22d. Readings also at 3h. (Hungry Horse), 4h. (Boulder City), 5h. and 6h. (Catania), 8h. (Catania and near Bogota), 9h. (Palomar, Mount Wilson, Pasadena, Riverside, Tinemaha, Boulder City, Hungry Horse, Pierce Ferry, Shasta Dam, Tucson, Ksara, near Berkeley, Branner, Santa Clara, Lick (2), and near Mizusawa (4)), 10h. (Mizusawa, near Lick (2), near Catania, and Messina), 11h. (near Lick (3)), 12h. (Mizusawa), 13h. (near Leninakan), 15h. (Hungry Horse), 16h. (Mount Wilson, Tinemaha, Boulder City, Pierce Ferry, and Tucson), 18h. (near Branner), 19h. (Boulder City, Hungry Horse (2), Pierce Ferry (2), Shasta Dam, Tucson, Palomar, Mount Wilson, Pasadena, Riverside, Tinemaha, and near Mizusawa), 20h. (Strasbourg, near Branner, and Lick), 21h. (Stuttgart, Bucharest, Pierce Ferry, and near Apia), 22h. (Pierce Ferry, near Samarkand, Andijan, Murgab, Obi-garm, Stalinabad, Tashkent, Frunse, and near Balboa Heights), 23h. (Palomar, Pasadena, Tinemaha, Hungry Horse, and Shasta Dam).

March 23d. 18h. 11m. 25s. Epicentre 50°·8N. 154°·2E. Depth of focus 0·015.

A = −·5713, B = +·2762, C = +·7728 ; δ = −11 ; h = −6 ;
D = +·435, E = +·900 ; G = −·696, H = +·336, K = −·635.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Mizusawa		14·9	223	3 24	− 1	6 2	− 5	6 5	S	—
Vladivostok		17·0	252	i 3 46	− 5	i 6 43	−11	4 45	sP	—
Irkutsk		30·6	293	i 6 3	− 1	i 10 51	− 4	e 6 50	pP	—
College		32·6	42	e 6 23	+ 2	i 11 27	+ 1	e 7 43	PP	e 14·0
Almata		50·9	294	i 8 50	0	—	—	—	—	—
Sverdlovsk		51·4	315	i 8 53	− 1	i 15 57	− 5	i 9 39	pP	—
Andijan		55·2	294	e 9 21	− 1	—	—	—	—	—
Hungry Horse		55·8	53	i 9 25	− 1	e 16 56	− 5	e 18 54	S_cS	—
Murgab		55·8	290	9 25	− 1	—	—	—	—	—
Shasta Dam		56·1	65	e 9 27	− 1	—	—	e 10 11	pP	—
Tashkent		56·6	296	i 9 30	− 2	—	—	e 10 18	pP	—
Obi-garm		58·1	294	i 9 40	− 2	i 17 24	− 7	—	—	—
Stalinabad		58·7	294	i 9 43	− 3	i 17 31	− 8	i 10 32	pP	—
Samarkand		59·0	296	i 9 45	− 3	—	—	—	—	—
Scoresby Sund		59·0	358	9 47k	− 1	17 42	− 1	19 9	S_cS	—
Bozeman		59·1	55	10 41	P_cP	e 17 43	− 1	e 19 21	S_cS	—
Fresno	Z.	60·3	67	i 9 59	+ 2	—	—	—	—	—
Tinemaha		60·9	66	i 10 2	+ 1	e 18 8	+ 1	i 10 43	pP	—
Logan		61·3	58	e 10 1	− 3	i 18 10	− 2	i 10 48	pP	e 31·6
Moscow		61·5	325	e 10 4	− 1	e 18 9	− 6	e 10 51	pP	—
Santa Barbara	Z.	61·9	69	e 10 9	+ 1	—	—	e 10 54	pP	—
Salt Lake City		62·0	59	e 10 9	0	i 18 22	+ 1	e 19 36	sS	e 25·2
Helsinki		62·1	334	—	—	19 14	+51	e 19 41	sS	e 34·6
Mount Wilson	Z.	63·0	68	i 10 15	− 1	—	—	i 11 2	pP	—
Pasadena		63·0	68	i 10 15	− 1	i 18 30	− 4	i 11 0	pP	—
Riverside	Z.	63·6	68	i 10 18	− 1	—	—	i 11 5	pP	—
Boulder City		63·7	64	i 10 20	0	—	—	i 11 4	pP	—
Pierce Ferry		64·1	64	i 10 22	− 1	e 18 39	− 8	i 11 7	pP	—
Rapid City	E.	64·2	51	i 10 24	+ 1	i 18 47	− 2	e 11 4	pP	e 26·6
Palomar		64·4	68	i 10 23	− 2	i 18 49	− 2	i 11 8	pP	—
La Jolla	Z.	64·5	69	e 10 25	0	—	—	—	—	—
Ashkabad		65·0	300	9 57?	−31	e 20 17?	S_cS	—	—	—
Grozny		67·6	311	e 10 45	0	—	—	—	—	—
Baku		67·7	307	e 10 47	+ 1	e 20 23	PS	—	—	—
Piatigorsk		68·3	313	e 10 48	− 1	—	—	—	—	—
Tucson		68·7	65	e 10 51	− 1	e 19 41	− 2	i 11 34	pP	—
Copenhagen		69·2	338	e 10 54	− 1	—	—	11 16	PcP	—
Batavia		69·8	231	i 11 6	+ 8	i 20 0	+ 4	i 11 55	pP	—
Lincoln	E.	69·8	50	—	—	i 19 50	− 6	e 23 49	SS	e 30·3
Warsaw		70·0	332	i 11 1k	+ 1	e 21 2	sS	—	—	e 31·6
Bombay		70·2	276	e 11 7	+ 6	e 20 6	+ 6	e 21 27	?	—
Leninakan		70·4	311	e 11 10	+ 8	—	—	—	—	—
Erevan		70·6	310	e 11 4	+ 1	—	—	—	—	—
Kirkland Lake		71·0	35	e 11 5	− 1	—	—	—	—	—
Ville Marie		71·9	35	e 11 9	− 2	—	—	e 11 58	pP	—
Temiskaming		72·6	35	e 11 12	− 3	—	—	e 11 59	pP	—
Kodaikanal	E.	73·8	267	e 11 21	− 1	—	—	—	—	—
Prague		73·8	334	e 11 53	pP	e 22 5	?	—	—	—
Jena	E.	73·9	336	e 11 19	− 4	—	—	—	—	—
De Bilt		74·2	341	i 11 23k	− 1	e 20 43	− 3	e 22 10	sS	e 33·6
St. Louis		74·6	47	i 11 25	− 2	i 20 46	− 4	i 12 12	pP	—
Budapest		74·8	330	e 11 28	0	—	—	—	—	—
Ottawa		74·9	34	11 26	− 2	20 45	− 9	—	—	38·6
Shawinigan Falls		74·9	31	11 27	− 1	20 48	− 6	—	—	—
Seven Falls		75·0	30	11 30	+ 1	20 48	− 7	—	—	—
Uccle		75·6	342	e 11 32k	0	e 22 5	sS	—	—	e 35·6
Kew		75·8	344	—	—	e 22 35?	PPS	—	—	—
Cleveland		76·0	40	e 11 33k	− 2	e 21 0	− 6	i 12 22	pP	—
Stuttgart		76·4	337	i 11 35k	− 2	e 22 10	sS	e 12 40	sP	e 30·6
Istanbul		76·7	320	i 11 37	− 2	22 30	PPS	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Strasbourg		76·9	338	i 11 38k	− 2	e 22 13	sS	e 12 30	pP	—
Paris		77·8	341	i 11 44k	0	—	—	e 12 37	pP	e 43·6
Zürich		77·8	337	e 11 42k	− 2	—	—	e 12 32	pP	—
Basle		77·9	337	e 11 44	− 1	—	—	—	—	—
Triest		78·0	333	e 11 41?	− 5	e 21 11	−16	e 15 7	PP	—
Chur		78·1	335	e 11 45	− 1	—	—	—	—	—
Harvard		78·9	32	i 11 49	− 2	—	—	i 12 36	pP	—
Salo		79·0	335	e 11 55k	+ 4	—	—	12 35	pP	—
Fordham		79·5	34	i 11 54	0	i 21 38	− 5	i 12 48	pP	—
Padova		79·6	333	e 11 45	− 9	e 21 50	+ 6	e 12 25	pP	—
Pavia		79·7	335	e 11 53?	− 2	—	—	—	—	—
Bologna	z.	79·8	334	e 11 55k	0	—	—	—	—	—
Ksara		79·8	312	i 11 55	0	—	—	13 7	?	—
Philadelphia		79·8	36	e 11 50	− 5	i 21 40	− 6	e 23 3	sS	—
Florence		80·4	333	i 12 2	+ 3	i 23 24	PPS	i 12 39	pP	—
Clermont-Ferrand		80·6	340	i 12 0	0	e 23 20	PPS	i 12 42	pP	—
Rome		81·8	332	i 12 4k	− 2	e 22 11	+ 4	i 12 42	pP	—
Helwan		85·2	313	e 12 29	+ 6	22 35	− 6	23 35	sS	—
Tacubaya	N.	85·2	65	i 13 19	pP	e 22 37	− 4	—	—	—
Toledo		87·7	344	e 12 33	− 2	—	—	—	—	—
Alicante		88·5	341	—	—	24 50	PPS	—	—	48·5
Granada		90·2	342	i 12 51k	+ 4	24 47	PS	13 11	pP	51·5
Bermuda		90·3	32	e 12 53	+ 5	e 23 31	+ 3	e 25 7	PS	e 36·0
San Juan		102·5	39	—	—	e 25 9	− 3	e 32 22	SS	—
La Paz		131·9	59	i 18 59	[+ 1]	38 53	SS	i 22 6	PP	—

Additional readings :—
Irkutsk sP = 7m.8s., isS = 12m.2s.
College ePcS = 12m.41s.
Sverdlovsk isP = 10m.1s.
Hungry Horse ePKP,PKP? = 39m.7s.
Tashkent ePP = 11m.39s.
Logan esP? = 11m.26s., ePP? = 12m.12s., eS = 18m.3s., isS? = 19m.6s., eSS? = 23m.10s.
Moscow isS = 19m.31s.
Helsinki e = 25m.46s.
Mount Wilson ePKP,PKPZ = 39m.11s.
Pasadena esSZ = 19m.46s., iPKP,PKPZ = 39m.11s.
Riverside ePKP,PKPZ = 39m.10s.
Pierce Ferry ePKP,PKP = 39m.10s.
Rapid City eE = 12m.9s., isSE = 19m.51s., eSSE = 22m.56s.
Palomar iZ = 11m.48s., ePKP,PKPZ = 39m.13s.
Tucson ePcP = 11m.9s., ePP? = 13m.47s., epPP = 14m.7s., eScS = 20m.19s., esS? = 21m.5s., iPKP,PKP = 38m.58s., ipPKP,PKP = 39m.51s.
Warsaw SE = 21m.20s., eE = 29m.18s.
Prague eSS = 26m.17s., eSSS = 30m.11s.
De Bilt iPP = 14m.14s.k, epPP = 15m.5s., eZ = 17m.13s., ePS = 21m.43s., eSS = 26m.46s.
St. Louis isS = 22m.10s.
Cleveland iZ = 12m.26s., iSKS?E = 21m.29s., iN = 21m.34s.
Stuttgart e = 15m.38s., 17m.37s., and 19m.13s., eSS? = 27m.20s.
Strasbourg e = 12m.43s., ePP? = 14m.39s., esPP? = 15m.42s., e = 18m.50s., esS? = 22m.25s., e = 23m.15s., eSS = 26m.5s., esSS = 27m.28s. and 27m.31s., e = 30m.49s.
Paris ePP? = 14m.42s., esPP? = 15m.50s., epS = 22m.43s., esSS = 28m.3s., e = 32m.55s.
Triest ePcP = 11m.49s., epPP = 15m.40s., eScS = 21m.30s., esS = 22m.41s.?, e = 23m.22s.
Clermont-Ferrand iPP = 15m.7s., esSS = 28m.22s.
Rome ePP = 16m.6s., eS = 23m.26s., iPS = 24m.15s., eSSN = 28m.40s.
Helwan PP = 15m.49s., sS = 23m.59s.
Granada SS = 30m.47s., SSS = 34m.14s.
Bermuda eSS = 29m.35s.
San Juan esSS = 33m.45s.
La Paz iEN = 23m.18s.

March 23d. 21h. Undetermined shock.
Huancayo eP? =10m.52s.
Tacubaya iN =18m.39s.
Fort de France e =20m.56s.
Harvard iP =24m.44s., iS =28m.48s., i =43m.50s.
Tucson eP =27m.12s., e =27m.24s.
Pierce Ferry iP =27m.40s.
Palomar ePZ =27m.56s.
Riverside ePZ =27m.59s.
Hungry Horse eP =28m.1s.
Shasta Dam eP =28m.30s.
Paris P =32m.26s., eL =39m.
Clermont-Ferrand e =32m.54s.
Strasbourg e =32m.56s.
Stuttgart eZ =33m.1s.
La Paz PN =40m.46s., iN =41m.44s. and 46m.21s.
Long waves were also recorded at Bermuda and De Bilt.

March 23d. Readings also at 0h. (Cleveland), 4h. (Pasadena, Mount Wilson, Riverside, Palomar, Tinemaha, Tucson, Pierce Ferry, Shasta Dam, La Paz, and Mizusawa), 5h. (Pasadena, Mount Wilson, Riverside, Tinemaha, Tucson, Hungry Horse, Riverview, and near Obi-garm), 7h. (Almata, Frunse, and Tchimkent), 8h. (Brisbane and Stuttgart), 9h. (near Mizusawa and near Samarkand), 10h. (Murgab and near Obi-garm), 11h. (Hungry Horse), 13h. (La Paz), 14h. (Paris, Stuttgart, Pierce Ferry, Tashkent, near Obi-garm, Stalinabad, Murgab, and Samarkand), 16h. (Paris (2), Stuttgart, Boulder City, Pierce Ferry, near Obi-garm, Stalinabad, and Samarkand), 19h. (Strasbourg), 21h. (Pierce Ferry), 23h. (Paris).

March 24d. 3h. 21m. 26s. Epicentre 10°·5S. 74°·3W.
Felt at Oventeni (Jauja).

E. Silgado.
Datos sismológicos del Perú, 1948. Instituto Geológico del Perú, Bol. 13, Lima 1949, p. 12.

A = +·2661, B = −·9468, C = −·1811 ; δ = +4 ; h = +6 ;
D = −·963, E = −·271 ; G = −·049, H = +·174, K = −·984.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Huancayo		1·8	213	i 0 22	−10	—	—	—	—	—
La Paz		8·4	136	i 2 3	− 3	i 4 5	+22	i 2 34	P*	5·8
Bogota		15·0	1	i 2 53	+18	i 6 38	+15	—	—	—
Balboa Heights		20·0	348	e 4 41	+ 4	—	—	—	—	—
La Plata		28·5	150	5 52	− 7	10 35	−11	6 52	PP	15·2
San Juan		29·8	17	e 6 56	+45	i 11 8	+ 1	—	—	e 17·6
Tacubaya	N.	38·5	322	i 7 55	+29	—	—	e 17 43	Q	e 18·6
Bermuda		43·6	13	—	—	e 14 46	+ 8	e 18 5	SS	e 22·0
St. Louis		51·1	345	i 9 4	− 2	e 16 20	− 4	—	—	—
Tucson		55·0	322	i 9 34	− 1	—	—	e 11 41	PP	—
Temiskaming		57·1	357	e 9 49	− 1	—	—	—	—	—
Ville Marie		57·7	357	e 9 53	− 2	—	—	—	—	—
Kirkland Lake		58·6	356	e 9 58	− 3	—	—	—	—	—
Palomar		59·5	320	i 10 6a	− 1	—	—	—	—	—
Pierce Ferry		59·6	324	i 10 7	− 1	—	—	—	—	—
Boulder City		60·0	323	e 10 11	0	—	—	—	—	—
Rapid City	E.	60·3	337	i 10 12	− 1	—	—	e 12 16	PP	—
Riverside	Z.	60·3	320	i 10 12	− 1	—	—	—	—	—
Mount Wilson	Z.	60·8	320	i 10 17	+ 1	—	—	—	—	—
Pasadena	Z.	60·9	320	i 10 16	− 1	—	—	—	—	—
Tinemaha	Z.	62·8	322	i 10 29	− 1	—	—	—	—	—
Lick	Z.	65·1	320	i 10 45	0	—	—	—	—	—
Shasta Dam		67·6	323	i 10 57	− 4	—	—	—	—	—
Hungry Horse		68·3	333	e 11 4	− 1	—	—	—	—	—
Granada		81·3	50	—	—	i 22 36	+ 6	—	—	43·9
Toledo		82·0	47	i 12 24	+ 1	—	—	17 8	PPP	—
Clermont-Ferrand		88·8	43	e 17 42	PP	—	—	—	—	50·1
Paris		89·3	40	e 12 59	0	39 34?	Q	e 17 43	PP	—
Basle		92·2	42	e 13 13	0	—	—	—	—	—
Stuttgart	Z.	93·6	41	e 13 18	− 1	—	—	e 18 2	PP	—
Rome		94·5	48	e 13 24	+ 1	e 23 59	[+ 1]	e 13 44	pP	—
Triest		96·1	45	e 23 40	?	e 24 0	[− 7]	—	—	—
Ksara		112·5	58	e 15 46	P	—	—	—	—	62·6

For Notes see next page.

NOTES TO MARCH 24d. 3h. 21m. 26s.

Additional readings :—
La Paz iZ = 4m.26s., iS = 4m.45s., iS_g = 5m.26s.
La Plata PPPN = 7m.4s., SSE = 11m.3s., SSSE? = 11m.50s.
Tacubaya iN = 8m.44s.
St. Louis i = 13m.48s.
Palomar iZ = 10m.22s.
Pasadena eZ = 10m.31s., iZ = 11m.27s.
Rome eE = 18m.6s. and 26m.5s.
Triest eSS? = 28m.51s.
Long waves were also recorded at De Bilt.

March 24d. 3h. 26m. 8s. Epicentre 10°·5S. 74°·3W. (as at 3h. 21m.).

		△	Az.	P.	O−C.	S.		L.
		°	°	m. s.	s.	m. s.		m.
Huancayo		1·8	213	i 0 28	− 4	—	—	—
Tucson		55·0	322	i 9 36	+ 1	—	—	—
Ottawa		55·7	359	9 41	+ 1	(20 52)	SS	20·9
Palomar		59·5	320	i 10 8	+ 1	—	—	—
Pierce Ferry		59·6	324	i 10 9	+ 1	—	—	—
Boulder City		60·0	323	e 10 9	− 2	—	—	—
Riverside	z.	60·3	320	i 10 13	0	—	—	—
Mount Wilson	z.	60·8	320	i 10 17	+ 1	—	—	—
Pasadena	z.	60·9	320	i 10 18	+ 1	—	—	—
Tinemaha	z.	62·8	322	i 10 31	+ 1	—	—	—
Lick	z.	65·1	320	i 11 45	+60	—	—	—
Shasta Dam		67·6	323	e 10 58	− 3	—	—	—
Hungry Horse		68·3	333	i 11 6	+ 1	—	—	—

Riverside also gives eZ = 10m.58s.

March 24d. 5h. 19m. 33s. Epicentre 6°·2S. 105°·7E.

Felt at Batavia and Bandoeng.
Bulletin séismique trimestriel de Batavia.

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

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Batavia		1·1	90	i 0 27?	+ 5	—	—	—	—	—
Perth		27·3	160	i 5 27	−21	i 10 37	+10	—	—	—
Colombo	E.	28·9	296	6 4	+ 1	10 55	+ 2	—	—	14·3
Kodaikanal	E.	32·5	300	i 6 35	+ 1	i 11 50	+ 1	7 35	PP	16·9
Calcutta	E.	33·2	330	i 6 44a	+ 4	i 12 7	+ 7	i 13 38	SS	15·3
Hyderabad	N.	35·7	312	7 3	+ 1	12 36	− 3	15 29	SSS	—
Nanking	N.	40·0	16	e 7 38	0	—	—	—	—	—
Bombay		40·9	308	i 7 34	−12	i 13 50	− 8	9 15	PP	18·4
Dehra Dun	N.	45·0	325	e 9 27?	PP	e 15 39	PS	—	—	e 26·4
Brisbane	N.	49·6	120	i 7 57	−58	—	—	—	—	—
Riverview		50·2	129	i 9 0a	0	i 16 10	− 1	i 16 24	PS	e 25·2
Murgab		53·3	328	9 22	− 1	16 49	− 5	—	—	—
Vladivostok		54·5	24	i 9 36	+ 4	i 17 13	+ 3	e 11 34	PP	—
Almata		55·7	335	i 9 43	+ 3	—	—	—	—	—
Mizusawa	E.	55·8	33	(e 9 33)	− 8	e 9 33	P	—	—	—
Obi-garm		55·8	326	i 9 40	− 1	i 17 22	− 6	—	—	—
Andijan		55·9	329	17 25	S	(17 25)	− 4	—	—	—
Stalinabad		56·2	325	i 9 42	− 2	i 17 22	−11	—	—	—
Frunse		56·4	332	i 9 47	+ 2	—	—	—	—	—
Tananarive		57·9	251	e 9 58	+ 2	17 52	− 3	12 16	PP	27·3
Tashkent		57·9	328	i 9 55	− 1	i 17 49	− 6	—	—	—
Samarkand		58·0	324	i 9 55?	− 2	e 17 42?	−15	—	—	—
Irkutsk		58·3	358	i 10 1	+ 2	17 59	− 2	—	—	—
Tchimkent		58·4	329	i 9 57	− 3	i 17 54	− 8	—	—	—
Ashkabad		62·2	319	10 25	− 1	—	—	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Baku		69·0	317	i 11 16	+ 7	i 20 16	+ 2	—	—	—
Auckland	N.	69·6	126	—	—	20 18	− 3	24 21	SS	29·6
Wellington		70·2	131	11 15	− 2	20 19	− 9	28 27	SSS	34·4
Arapuni	E.	70·4	128	—	—	20 27	− 3	—	—	35·4
Erevan		72·7	315	e 11 32	0	20 50	− 7	—	—	—
Sverdlovsk		73·0	336	i 11 32	− 1	i 20 53	− 7	i 12 10	pP	—
Grozny		73·1	318	e 11 34	0	21 0	− 1	—	—	—
Piatigorsk		75·2	318	e 11 46	0	—	—	—	—	—
Ksara		76·9	306	i 11 57	+ 1	—	—	14 51	PP	—
Helwan		79·6	301	e 12 9	− 1	i 22 6	− 6	—	—	—
Theodosia	N.	80·7	317	e 12 15	− 1	e 22 15	− 9	—	—	—
Yalta		81·4	316	e 12 22	+ 2	22 25	− 6	—	—	—
Moscow		83·0	328	i 12 29	+ 1	i 22 43	− 4	e 13 7	pP	—
Istanbul		84·1	312	i 12 34	0	22 47	[− 8]	—	—	—
Helsinki		90·7	331	i 13 8	+ 2	e 23 33	[− 4]	e 16 38	PP	e 41·4
Warsaw		91·6	323	13 8a	− 2	24 11	+ 2	e 16 48	PP	e 49·4
Upsala		94·3	330	e 17 48	PP	e 23 53	[− 4]	e 24 27?	S	e 46·4
Prague		95·5	320	e 13 26	− 2	e 23 57	[− 7]	e 17 19	PP	e 41·4
Triest		95·7	315	e 13 29	0	e 24 52	+ 8	e 17 9	PP	—
Rome		96·5	311	e 13 30	− 2	i 24 5	[− 4]	e 17 24	PP	e 45·4
Copenhagen		96·9	325	e 13 36a	+ 2	24 8	[− 3]	17 31	PP	—
Bologna		97·4	314	e 16 53	PP	e 24 20	[+ 6]	—	—	—
Jena	N.	97·4	320	e 13 38	+ 1	—	—	e 17 29	PP	—
Florence		97·5	313	e 13 31	− 6	e 24 1	[−13]	i 17 34	PP	—
Salo		98·0	315	e 13 46	+ 7	—	—	e 17 43	PP	—
Chur		98·7	316	e 13 40	− 2	e 24 7	[−14]	—	—	—
Stuttgart		98·9	318	e 13 42	− 1	e 25 37	+26	e 17 43	PP	e 52·4
Pavia		99·0	315	e 15 27?	P	—	—	—	—	—
Strasbourg		99·9	318	e 13 50	+ 2	e 24 16	[−11]	e 17 46	PP	e 41·4
Basle		100·0	317	e 17 39	PP	—	—	—	—	—
De Bilt		101·3	322	i 13 55	+ 1	e 24 27	[− 6]	i 20 15	PPP	e 45·4
Uccle		101·9	321	e 18 4	PP	e 24 33	[− 3]	e 25 35	SKKS	e 53·4
College		102·6	25	e 18 17	PP	e 25 11	{− 2}	e 27 30	PS	e 41·7
Clermont-Ferrand		103·2	315	e 14 3	0	i 24 41	[− 1]	e 18 15	PP	49·4
Paris		103·3	319	14 4	+ 1	e 24 32	[−11]	e 18 10	PKP	e 54·4
Aberdeen		104·8	328	—	—	i 24 47	[− 3]	i 26 22	S	e 49·6
Kew		104·8	322	e 18 17	PKP	e 24 45	[− 5]	e 27 47	PS	e 44·4
Durham		105·0	325	14 5	− 6	—	—	—	—	—
Alicante		106·5	309	e 18 54	PP	e 38 7	SSS	—	—	e 53·7
Scoresby Sund		107·8	344	18 54	PP	25 3	[0]	28 21	PS	—
Granada		109·1	308	19 8a	PP	29 26	PPS	33 34	SS	i 57·6
Toledo		109·1	310	e 18 45	PP	28 27	PS	—	—	—
Sitka		110·5	31	e 19 17	PP	e 25 17	[+ 3]	e 28 37	PS	e 48·1
Lisbon		113·2	310	19 33a	PP	28 56	PS	—	—	—
Victoria		120·9	36	—	—	e 31 27?	PPS	e 50 27 i	Q	65·4
Shasta Dam		125·1	44	e 19 2	[− 1]	—	—	e 20 48	—	—
Hungry Horse		126·2	32	i 19 5	[0]	—	—	i 27 54	PKKP	—
Lick	Z.	127·0	47	i 19 7	[+ 1]	—	—	—	—	—
Saskatoon		127·0	25	e 22 27?	PKS	e 31 27?	PS	—	—	64·4
Fresno	Z.	128·6	47	i 19 11	[+ 2]	—	—	—	—	—
Bozeman		129·4	33	e 22 39	PKS	—	—	—	—	e 51·1
Tinemaha	Z.	129·5	46	i 19 16	[+ 5]	—	—	i 22 32	PKS	—
Mount Wilson	Z.	130·9	49	i 19 17	[+ 3]	—	—	i 22 40	PKS	—
Pasadena		130·9	49	e 19 9	[− 5]	i 22 39	PKS	e 21 18	PP	e 62·4
Logan		131·4	37	e 19 13	[− 2]	e 28 34	{+ 6}	e 21 33	PP	e 63·4
Riverside	Z.	131·5	49	e 19 4	[−11]	i 22 41	PKS	i 19 18	PKP,	—
Salt Lake City		132·0	38	e 19 20	[+ 4]	e 26 51	[+26]	e 21 37	PP	e 56·8
La Jolla	Z.	132·1	50	e 19 21	[+ 5]	—	—	i 22 45	PKS	—
Palomar		132·2	49	i 19 20a	[+ 4]	i 22 42	PKS	i 21 11	PP	—
Boulder City		132·5	45	e 19 15	[− 2]	i 22 45	PKS	e 21 44	PP	—

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		133·0	45	i 19 19	[+ 1]	e 22 44	PKS	e 21 30	PP		—
Rapid City	E.	134·6	29	i 19 29?	[+ 8]	26 40?	[+10]	i 22 48?	PKS		e 65·9
Tucson		137·2	47	e 19 15	[−10]	e 22 59	PKS	i 22 12	PP		e 70·0
Kirkland Lake		137·9	6	e 19 26	[− 1]	—	—	—	—		—
Ville Marie		138·8	6	e 19 19	[− 9]	—	—	—	—		—
Temiskaming		139·5	4	e 19 31	[+ 1]	i 23 4	PKS	—	—		—
Lincoln	E.	140·1	26	—	—	e 23 9	PKS	—	—		e 72·5
Ottawa		140·9	2	19 27	[− 5]	—	—	22 34	PP		63·4
Vermont		141·9	358	e 22 42	PP	e 34 41	PS	—	—		e 61·9
Chicago		142·6	17	e 19 29	[− 6]	e 26 33	[−10]	e 22 40	PP		e 60·7
Harvard		143·8	356	i 19 35	[− 2]	—	—	i 22 53	PP		e 75·4
Cleveland		144·3	9	i 19 38s	[0]	e 27 9	[+23]	e 22 53	PP		72·4
St. Louis		144·6	22	i 19 40	[+ 2]	i 36 10	PPS	i 19 56	pPKP		—
Fordham		145·5	359	i 19 42	[+ 2]	e 42 57	SSP	i 23 1	PP		79·0
Philadelphia		146·4	0	i 19 44	[+ 2]	e 43 7	SS	e 22 58	PP		e 75·7
Georgetown		147·3	3	i 19 45	[+ 2]	—	—	—	—		65·4
Columbia		151·6	11	e 19 59	[+ 9]	e 28 17	?	e 23 39	PP		e 62·2
Bermuda		152·4	343	e 20 7	[+16]	e 23 49	PKS	e 23 16	PP		e 62·0
Tacubaya	N.	152·5	59	i 19 59	[+ 8]	e 26 20	[−37]	i 21 4	$sPKP_2$		—
La Paz		156·6	196	i 20 1s	[+ 4]	i 30 47	[− 8]	i 24 17	PP		75·0
Huancayo		161·8	176	e 20 6	[+ 3]	e 31 17	[− 5]	e 24 41	PP		e 65·5
San Juan		165·5	327	i 20 9	[+ 3]	e 31 23	[−17]	i 24 52	PP		e 56·2

Additional readings :—
Bombay eSN = 13m.45s., SSN = 17m.3s.
Brisbane iN = 8m.25s., 9m.15s., and 9m.34s.
Riverview iPPSEN = 16m.33s., iScSN = 18m.46s., iSSE = 19m.41s., iE = 20m.5s.
Tananarive E = 18m.39s., SSN = 21m.56s.
Sverdlovsk isS = 22m.3s.
Warsaw ePE = 13m.13s., SKSE = 23m.40s., eSKSN = 23m.47s., eE = 24m.44s., ePSN = 25m.28s., ePPSE = 26m.3s., eE = 27m.58s. and 29m.23s., eN = 29m.52s., SSE = 30m.16s.
Upsala ePKS?E = 21m.39s.
Prague ePS? = 25m.27s., eSSS? = 35m.27s.?
Triest ePPP = 19m.27s., iSKS = 23m.59s.
Rome ePSE = 26m.12s., eSSN = 31m.33s.
Copenhagen PS = 25m.21s.
Stuttgart ePKP? = 16m.55s., e = 21m.27s., eSS = 31m.57s.
Strasbourg e = 23m.30s., eSS = 31m.47s.
De Bilt ePS = 25m.27s., eSS = 32m.57s.
Uccle ePSZ = 27m.8s., eSSE = 33m.15s., eSSSE = 38m.27s.
College e = 28m.41s., eSS = 33m.9s.
Clermont-Ferrand PPP = 20m.37s., ePS = 27m.35s.
Paris i = 18m.20s., PP? = 18m.37s., ePS = 27m.22s., eSS = 33m.32s., ePKP,PKP = 38m.4s.
Kew eSSEN = 33m.21s., eSSSEN = 36m.57s.
Granada SSS = 38m.58s.
Sitka eSS = 34m.27s.
Pasadena $iPKP_2$ = 19m.17s.
Logan iPKS = 22m.38s., i = 23m.12s., eSKSP = 31m.34s.
Salt Lake City iPKS = 22m.45s., eSKSP = 31m.50s., ePPS = 34m.1s., eSSS = 44m.29s.
Palomar iZ = 21m.37s.
Boulder City iPKP = 19m.21s.
Pierce Ferry i = 20m.24s.
Rapid City eSKKKSE = 29m.19s.?, eSKSPE = 32m.2s.?, eSSSE = 44m.48s.?
Tucson iPKP = 19m.31s., ePPS = 34m.43s., ePPPS? = 35m.23s., e = 39m.42s., eSS? = 41m.53s.
Kirkland Lake ? = 19m.20s.
Ville Marie e = 19m.30s.
Temiskaming ? = 19m.22s.
Ottawa SS = 36m.27s?, SSS = 40m.27s.?
Chicago ePKS = 23m.13s., eSKKS? = 29m.33s., ePPS? = 34m.57s.
Cleveland iEN = 19m.41s., eZ = 22m.57s., iSKPN = 23m.21s., eN = 23m.37s., ePSKSN = 32m.41s., eN = 33m.6s., eE = 34m.4s., ePPSN = 35m.32s., eE = 35m.55s., eN = 37m.12s. and 38m.18s., eE = 38m.52s., eSSN = 42m.6s., eN = 42m.19s., eE = 42m.49s.
St. Louis iPP = 22m.59s., i = 33m.17s. and 38m.19s.
Fordham i = 20m.19s.
Philadelphia i = 20m.14s. and 21m.10s.
Georgetown i = 19m.51s., 22m.13s.
Columbia eSKSP = 33m.19s., ePPS = 36m.49s., eSS = 42m.59s.
Bermuda eSKKKS = 31m.7s., eSKSP = 33m.53s., ePPPS? = 39m.0s., eSS = 43m.0s., eSSS = 48m.43s.

Continued on next page.

Tacubaya ePSKSN =29m.31s., eN =34m.3s., ePPSE =37m.6s.
La Paz iSSEN =43m.47s.
Huancayo eSKKKS =32m.21s., eSKSP =34m.50s., ePPS =38m.19s., eSS =44m.47s., eSSS =51m.26s.
San Juan e =21m.11s., ePKS? =26m.24s., ePPP? =28m.45s., e =32m.5s., eSKSP = 35m.20s., ePPS? =38m.27s., eSS =44m.49s.
Long waves were also recorded at Edinburgh, Potsdam, Ivigtut, and Butte.

March 24d. 8h. Atlantic (Strasbourg).

Paris iP =0m.40s., eL =6·5m.
Clermont-Ferrand e =1m.6s.
Strasbourg e =1m.7s., eL =9m.
Stuttgart eZ =1m.13s.
Hungry Horse eP =4m.22s., iP =5m.54s.
Pierce Ferry iP =5m.33s.
Shasta Dam eP =5m.33s.
Tucson iP =5m.44s.
Riverside ePZ =5m.56s.
Mount Wilson ePZ =5m.57s.
Pasadena ePZ =5m.58s.
Palomar iPZ =5m.59s.
Long waves were also recorded at Kew.

March 24d. Readings also at 0h. (Kew, De Bilt, Paris, Rome, Boulder City, Palomar, and Tucson), 2h. (Apia, Clermont-Ferrand, Paris, Rome, Strasbourg, Stuttgart, Toledo, Palomar, Tucson, and near Lick), 4h. (Apia, Stuttgart, Hungry Horse, and near Lick), 5h. (Hungry Horse), 6h. (Mizusawa), 8h. (La Paz and Tananarive), 9h. (Paris, Palomar, Tucson, Pierce Ferry, and Shasta Dam), 10h. (Clermont-Ferrand, Paris, Stuttgart, Palomar, Tucson, Pierce Ferry, and near Obi-garm), 11h. (Rome), 12h. (La Paz, Hungry Horse, and near Shasta Dam), 14h. (Almata, near Andijan, Frunse, Murgab, Obi-garm, Samarkand, and Stalinabad), 19h. (La Paz (2)), 21h. (Andijan, Frunse, Murgab, Tchimkent, near Obi-garm, Samarkand, Stalinabad, and near Granada), 22h. (De Bilt, Uccle, Paris, Clermont-Ferrand, Kew, Durham, Strasbourg, Copenhagen, and Stuttgart), 23h. (Grozny and near Piatigorsk).

March 25d. 4h. Undetermined shock.

Apia eEN =39m.40s., eLEN =41m.?
La Paz P =46m.23s.
Boulder City iP? =47m.19s.
Mount Wilson iPZ =48m.0s.
Pasadena iPZ =48m.1s.
Riverside iPZ =48m.3s.
Shasta Dam eP =48m.3s.
Haiwee iPZ =48m.11s.
Tinemaha iPZ =48m.12s.
Tucson eP =48m.22s., eL =76m.11s.
Hungry Horse iP =48m.57s.
Riverview iN =50m.32s., eLZ =52m.42s.
Istanbul e =55m.0s.
Ksara ePKP? =55m.52s., PPS? =72m.58s.
Stuttgart eZ =56m.0s.
Strasbourg e =56m.25s.
Long waves were also recorded at Chicago, Huancayo, Arapuni, Wellington, and Auckland.

March 25d. 20h. 32m. 14s. Epicentre 39°·2S. 178°·5E. (as on 1947, April 3d.).
A = −·7768, B = +·0203, C = −·6295; δ = +10; h = −1;
D = +·026, E = +1·000; G = +·629, H = −·016, K = −·777.

		Δ	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Tuai	N.	1·1	291	0 46?	+24	0 59	+20
Arapuni	E.	2·5	297	0 46	+ 3	1 10	− 4
Bunnythorpe		2·5	243	0 46?	+ 3	1 21	S_g
New Plymouth	E.	3·4	271	0 50	− 5	1 28	− 9
Wellington		3·5	232	0 55	− 2	1 37	− 3
Auckland	N.	3·7	307	1 0	0	1 45	0
Kaimata		6·3	236	e 1 45	+ 9	2 52	+ 2

March 25d. Readings also at 1h. (Apia (2), Frunse, near Obi-garm, Murgab, Andijan, Samarkand, and Tchimkent), 2h. (La Paz and Hungry Horse), 3h. (Kulyab), 6h. (Paris, Clermont-Ferrand, Uccle, and Stuttgart), 7h. (Kew, Uccle, Stuttgart, and near Batavia), 8h. (Clermont-Ferrand, Stuttgart, and Hungry Horse), 11h. (Hungry Horse (2), La Paz, and near Huancayo), 13h. (near Apia), 15h. (near Obi-garm), 16h. (Granada), 18h. (Stuttgart, Istanbul, and Ksara), 19h. (Hungry Horse), 23h. (Kulyab, Murgab, near Andijan, Tchimkent, Tashkent, Frunse, Obi-garm, and Stalinabad).

March 26d. 3h. 2m. 12s. Epicentre 41°·3N. 21°·0E.

A = +·7035, B = +·2701, C = +·6575 ; δ = +17 ; h = −2 ;
D = +·358, E = −·934 ; G = +·614, H = +·236, K = −·754.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Taranto		2·9	254	e 0 44	− 4	e 1 22	− 2	—	—	—
Belgrade		3·5	354	i 0 58	+ 1	i 1 47	S*	i 1 10	P_g	—
Bucharest		4·8	49	e 1 13a	− 2	i 2 23	S*	e 1 27	P*	—
Messina		5·2	235	e 1 8	−13	e 2 12	−10	—	—	—
Kalossa	N.	5·4	345	1 29	+ 5	i 2 24	− 4	e 1 50	P_g	3·3
Catania		5·9	232	e 2 3	P_g	e 3 39	S_g	e 2 22	?	—
Istanbul		6·0	91	e 1 19	−13	e 2 44	+ 1	—	—	—
Budapest		6·3	348	1 38	+ 2	i 3 39	S_g	i 2 5	P_g	3·9
Rome		6·4	278	e 1 37	− 1	e 2 53	0	e 2 4	P_g	3·5
Triest		6·8	312	e 1 42	− 2	e 3 0	− 3	i 3 31	S*	—
Padova		7·4	299	e 1 58	+ 6	e 3 28	+10	—	—	4·6
Florence		7·6	292	e 2 16	P*	e 3 20	− 3	—	—	—
Bologna		7·8	298	e 1 58	0	i 3 27	− 1	e 2 43	P_g	—
Salo		8·7	303	e 2 7	− 3	3 48	− 2	—	—	—
Raciborzu		9·0	349	e 2 16	+ 3	—	—	—	—	—
Pavia		9·4	298	e 2 29?	+11	e 4 7	0	—	—	e 5·2
Chur		9·9	308	e 2 26	+ 1	e 4 23	+ 3	—	—	—
Prague		9·9	335	e 2 0	−25	e 5 12	S_g	e 2 27	P	e 6·0
Warsaw		10·9	0	e 2 40	0	e 5 4	SS	e 5 38	SSS	e 6·3
Stuttgart		11·2	316	e 2 41	− 3	e 4 49	− 3	e 5 32	SSS	e 6·8
Basle		11·4	308	e 2 46	− 1	e 5 17	SS	—	—	—
Neuchatel		11·5	304	e 2 47	− 1	—	—	—	—	e 6·7
Jena		11·6	329	e 2 51	+ 1	—	—	—	—	e 7·7
Strasbourg		11·9	312	e 2 48?	− 6	—	—	e 3 3	PP	i 7·2
Potsdam		12·3	337	—	—	e 5 42	SS	—	—	e 6·8
Clermont-Ferrand		13·7	295	e 3 23	+ 5	i 5 52	0	i 3 39	PPP	7·6
Uccle		14·9	315	e 3 35	+ 1	e 8 13	L	—	—	(e 8·2)
Paris		15·1	306	e 3 34	− 2	—	—	i 3 37	P	—
Copenhagen		15·4	342	3 46	+ 6	—	—	—	—	8·8
Alicante		16·7	269	e 3 57	0	7 57	SS	4 5	pP	10·5
Kew		17·8	313	e 4 9	− 2	e 7 49	SS	e 4 48	PPP	e 8·8
Moscow		18·1	32	e 4 13	− 1	e 7 45?	+10	—	—	—
Upsala		18·7	355	e 4 22	0	e 7 57	+ 9	—	—	—
Toledo		19·0	274	e 4 16	−10	—	—	—	—	—
Granada		19·5	267	i 4 21k	−10	—	—	5 5	PPP	i 11·6
Hungry Horse		82·3	332	i 12 16	− 9	—	—	—	—	—
Pierce Ferry		92·6	326	e 13 7	− 8	—	—	—	—	—

Additional readings :—
Belgrade iS = 2m.12s., i = 2m.18s. and 2m.58s.
Bucharest eP_gN = 1m.44s., iN = 2m.38s., iS_gN = 3m.4s.
Kalossa eE = 2m.15s.
Budapest PN = 1m.43s.
Triest iP_gP_g = 2m.10s.
Raciborzu eZ = 2m.48s., eE = 3m.4s., eEN = 5m.30s.
Prague eS? = 3m.35s.
Stuttgart eP = 2m.52s. and 2m.55s., e = 6m.24s.
Jena ePPN = 3m.8s., eS?Z = 6m.32s., eS?N = 6m.40s., eS?E = 6m.44s., eN = 7m.3s.
Strasbourg iPPP? = 3m.11s., i = 3m.28s., e = 3m.48s., i = 5m.51s., e = 5m.56s.
Clermont-Ferrand iSS? = 6m.17s.
Alicante PP = 4m.33s., P_cP = 7m.23s., SS = 8m.52s., SSS = 9m.5s.
Kew iP_cSEZ = 12m.9s.
Long waves were also recorded at Helsinki.

March 26d. 13h. 23m. 16s. Epicentre 0°·5S. 119°·2E. (as on 1941, March 14d.).

A = −·4879, B = +·8729, C = −·0087 ; δ = +8 ; h = +7 ;
D = +·873, E = +·488 ; G = +·004, H = −·008, K = −1·000.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Batavia		13·6	245	i 3 45	PPP	i 6 36	SSS	—	—	—
Calcutta	E.	37·8	309	e 7 11	− 9	i 13 19	+ 8	e 9 39	PcP	—
Colombo	E.	39·9	281	7 35	− 2	13 45	+ 2	—	—	21·2
Brisbane		42·1	132	i 9 30	PP	i 17 14	SS	—	—	e 23·9
Hyderabad	N.	43·9	296	8 16	+ 6	14 41	− 1	18 9	SS	—
Riverview		44·7	141	i 8 16a	0	e 14 51	− 3	i 15 4	PS	e 21·1
Vladivostok		44·9	13	i 8 15	− 3	i 14 46	−10	—	—	—
Bombay		49·4	296	e 9 2	+ 9	i 16 16	+16	e 10 54	PP	25·1
Irkutsk		54·1	349	e 9 28	− 1	17 9	+ 4	—	—	—
Murgab		56·8	318	e 9 45	− 3	17 43	+ 2	—	—	—
Almata		57·7	325	e 9 58	+ 3	—	—	—	—	—
Frunse		58·8	323	10 6	+ 4	—	—	—	—	—
Andijan		59·1	320	e 9 58	− 6	i 18 16	+ 5	—	—	—
Kulyab		59·4	316	10 9	+ 3	18 32	+17	—	—	—
Obi-garm		59·8	317	e 10 7	− 2	e 18 25	+ 5	—	—	—
Stalinabad		60·1	317	e 10 9	− 4	18 32	+ 4	—	—	—
Tashkent		61·4	319	i 10 18	− 2	e 20 12	ScS	—	—	—
Tchimkent		61·6	320	e 10 22	0	—	—	—	—	—
Samarkand		62·1	316	e 10 22	− 3	—	—	—	—	—
Ashkabad		67·7	312	e 11 1	0	20 4	+ 6	—	—	—
Sverdlovsk		73·8	331	e 11 34	− 4	i 21 4	− 5	—	—	—
Baku		74·7	312	e 11 54	+11	—	—	—	—	—
Grozny		78·3	315	e 12 5	+ 2	e 22 5	+ 6	—	—	—
Ksara		84·7	303	e 12 42	+ 5	23 5?	+ 1	—	—	—
Helwan		88·4	299	—	—	e 23 44	+ 4	e 24 50	PS	—
Istanbul		90·4	311	e 13 8	+ 4	e 23 32	[− 3]	—	—	—
Warsaw		95·4	323	—	—	e 24 4	[+ 1]	e 26 9	PS	e 58·7
Copenhagen		99·8	326	17 53	PP	24 28	[+ 2]	26 46	PS	—
Potsdam		100·2	324	e 18 0?	PP	e 26 56	PS	—	—	e 54·7
Rome	Z.	102·7	313	e 18 5	PP	—	—	—	—	—
Stuttgart		103·5	320	e 17 34	?	e 27 32	PS	e 18 24	PP	e 61·7
Strasbourg		104·4	321	e 18 21	PP	e 27 42	PS	—	—	—
De Bilt		105·0	325	e 18 34	PP	e 24 44	[− 7]	e 27 44	PS	e 61·7
Clermont-Ferrand		108·3	318	e 19 10	PP	e 25 8	[+ 3]	—	—	—
Kew		108·4	325	e 18 44?	PP	—	—	—	—	—
Hungry Horse		113·9	36	e 18 36	[− 5]	—	—	—	—	—
Tinemaha		115·8	48	e 18 49	[+ 4]	—	—	—	—	—
Pasadena	Z.	116·9	51	e 18 46	[− 1]	—	—	—	—	—
Tucson		123·3	50	e 19 2	[+ 3]	—	—	—	—	—
Kirkland Lake		129·7	17	e 19 7	[− 4]	—	—	—	—	—
Ville Marie		130·6	17	e 19 16	[+ 3]	—	—	e 22 32	PKS	—
Temiskaming		131·3	17	e 19 17	[+ 2]	—	—	e 22 36	PKS	—
La Paz		161·4	159	e 19 59	[− 3]	33 21	?	24 44	PP	48·7

Additional readings :—
Batavia eNZ = 7m.33s., iS = 8m.29s., iSS = 9m.30s.
Brisbane ePN = 9m.34s., iSN = 17m.3s.
Riverview eSSN = 18m.1s., iZ = 18m.8s., iScSE = 18m.15s.
Bombay ePN = 9m.9s., iSSE = 19m.54s.
Stuttgart e = 22m.12s. and 28m.20s.
La Paz eP? = 17m.23s. Phases wrongly identified.
Long waves were also recorded at Uccle, Granada, and Wellington.

March 26d. Readings also at 0h. (Mount Wilson, Tinemaha, Boulder City, Pierce Ferry (2), Shasta Dam, Tucson (2), Huancayo, and La Paz), 1h. (Mount Wilson, Pasadena, Palomar, Haiwee, Riverside, Tinemaha, Hungry Horse (2), Pierce Ferry, Boulder City, and Shasta Dam), 2h. (Paris, Stuttgart, Frunse, Tchimkent, Samarkand, Kulyab (2), Stalinabad (2), near Murgab, Andijan, and Obi-garm), 3h. (La Plata and near Mizusawa), 4h. (Pierce Ferry and Shasta Dam), 5h. (Bogota, La Paz, and Pierce Ferry), 6h. (Pierce Ferry and near Mizusawa), 9h. (near Mizusawa), 11h. (Nanking), 14h. (Haiwee, Mount Wilson, Palomar, Riverside, Tinemaha, Hungry Horse (2), Pierce Ferry, and Stuttgart), 17h. (Ksara), 18h. (Paris, Clermont-Ferrand, Strasbourg, Stuttgart, Potsdam, De Bilt, Reykjavik, Pierce Ferry, and near Ottawa), 21h. (Lick, Haiwee, Mount Wilson, Palomar, Tinemaha, Boulder City, Hungry Horse, Pierce Ferry, Shasta Dam, Tucson, and Stuttgart), 22h. (Pasadena, Mount Wilson, Haiwee, Tinemaha, Palomar, Lick, Fresno, Boulder City, Hungry Horse, Pierce Ferry, Shasta Dam, Tucson, Strasbourg, Stuttgart, and near Apia), 23h. (Hungry Horse and Apia).

March 27d. 3h. Region of Peru.

Huancayo iP =40m.58s.
La Paz eP =42m.58s., iS =45m.0s., iS_g =46m.20s.
Tucson eP =50m.10s., e =51m.28s.
Pierce Ferry eP =50m.42s.
Boulder City eP =50m.47s.
Mount Wilson ePZ =50m.50s., eZ =51m.55s.
Pasadena ePZ =50m.51s.
Tinemaha ePZ =51m.4s., eZ =52m.10s.
Lick iPZ =51m.19s.
Shasta Dam eP =51m.31s.
Hungry Horse eP =51m.40s.
Strasbourg e =53m.22s.
Stuttgart eZ =53m.48s.

March 27d. 18h. 25m. 12s. Epicentre 39°·2S. 178°·5E. (as on 25d.).

A = −·7768, B = +·0203, C = −·6295 ; δ = +10 ; h = −1.

		Δ	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Havelock North		1·3	249	0 48?	+23	1 2	+18
Arapuni	E.	2·5	297	e 0 48?	P_g	—	—
Bunnythorpe		2·5	243	0 59	P_g	1 33	S_g
New Plymouth	E.	3·4	271	0 57	+ 2	1 36	− 1
Wellington		3·5	232	0 58	+ 1	1 39	− 1
Auckland	N.	3·7	307	0 48	−12	1 34	−11
Kaimata		6·3	236	e 2 6	P_g	2 47	− 3

March 27d. Readings also at 1h. (Mount Wilson, Palomar, Tinemaha, Tucson, Hungry Horse, Pierce Ferry, Huancayo, La Paz, and Granada), 5h. (Hungry Horse), 8h. (Pavia), 9h. (Kew), 10h. (near Piatigorsk), 12h. and 13h. (Hungry Horse), 14h. (Andijan, near Obi-garm, Stalinabad, and Kulyab), 16h. (Neuchatel), 17h. (near Obi-garm, Kulyab, Murgab, and Stalinabad), 19h. (near Obi-garm), 21h. (Pasadena, Mount Wilson, Haiwee, Riverside, Tinemaha, Tucson, Hungry Horse, Fresno, Lick, San Francisco, near Shasta Dam, Berkeley, Branner, and Ferndale), 22h. (Almata, Kulyab, Stalinabad, near Andijan, Tchimkent, Tashkent, Frunse, Murgab, and Obi-garm).

March 28d. 1h. Andes.

La Paz iPNZ =32m.3s.a, iPZ =32m.13s., iP_gZ =32m.23s., iS =32m.47s., iS* =33m.2s., iS_g =33m.15s., L =34m.2s.
Hunacayo eP =33m.56s., eS? =35m.8s., e =36m.34s., eL =37m.2s.
La Plata PN =35m.4s., E =36m.24s., N =36m.42s., SE =38m.24s., SN =38m.28s., E =38m.54s., LE =39·4m.
Tucson eP =41m.57s.
Palomar ePZ =42m.25s., iZ =42m.32s.
Pierce Ferry eP =42m.26s.
Boulder City eP =42m.29s.
Riverside ePZ =42m.31s.
Mount Wilson ePZ =42m.32s.
Pasadena iPZ =42m.35s.
Haiwee ePZ =42m.41s.,
Tinemaha iPZ =42m.48s.
Shasta Dam eP =43m.9s.
Hungry Horse eP =43m.11s.

March 28d. 22h. 38m. 0s. Epicentre 36°·9N. 121°·7W. (as on 1946, Aug. 5d.).

Intensity VI at Monterey, Morgan Hill, and Salinas; V at Hollister, Santa Cruz, etc. Epicentre 36°51′N. 121°34′W. Macroseismic area 4100 sq. miles.

L. M. Murphy and F. P. Ulrich.
United States Earthquakes, 1948, Serial No. 746, Washington, 1951, pp. 14, 15.

$A = -·4213$, $B = -·6821$, $C = +·5978$; $\delta = +12$; $h = -1$;
$D = -·851$, $E = +·525$; $G = -·314$, $H = -·309$, $K = -·802$.

		△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	Supp. m. s.		L. m.
Lick		0·4	6	i 0 13	0	i 0 21	0	—	—	—
Santa Clara		0·5	336	i 0 15	+ 1	i 0 24	+ 1	—	—	—
Branner		0·6	323	i 0 18	+ 3	i 0 29	+ 3	—	—	—
San Francisco		1·0	325	i 0 21	0	i 0 40	+ 4	—	—	—
Berkeley		1·1	335	i 0 23k	+ 1	i 0 42	+ 3	—	—	—
Fresno		1·5	96	i 0 26	− 2	i 0 47	− 2	i 0 29	P_g	—
Tinemaha		2·8	86	i 0 47	0	i 1 24	+ 2	—	—	—
Santa Barbara		2·9	147	i 0 46	− 2	i 1 31	+ 7	—	—	—
Haiwee		3·1	104	i 0 51	0	i 1 33	+ 4	—	—	—
Shasta Dam		3·8	352	e 1 6	+ 5	e 1 58	+11	—	—	—
Pasadena		4·0	131	i 1 0	− 4	i 1 45	− 7	—	—	—
Riverside	z.	4·6	128	i 1 10	− 2	—	—	—	—	—
Palomar	z.	5·3	131	i 1 20	− 2	—	—	—	—	—
Boulder City		5·6	98	e 1 24	− 3	—	—	i 1 49	P_g	—
Pierce Ferry		6·2	94	i 1 34	− 1	—	—	—	—	—
Tucson		10·1	114	e 2 31	+ 3	e 4 48	+23	—	—	e 5·3
Hungry Horse		12·7	24	e 3 9	+ 4	e 6 55	?	i 3 15	PP_1	—

Additional readings :—
Branner iSZ = 0m.31s., iZ = 0m.34s.
San Francisco iN = 0m.29s.
Berkeley iE = 0m.26s.
Long waves were also recorded at Salt Lake City.

March 28d. 23h. 47m. 54s. Epicentre 36°·9N., 121°·7W. (as at 22h.).

		△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	Supp. m. s.	
Lick		0·4	6	i 0 13	0	i 0 21	0	—	—
Santa Clara		0·5	336	i 0 15	+ 1	i 0 25	+ 2	—	—
Branner	N.	0·6	323	i 0 18	+ 3	i 0 31	+ 5	—	—
San Francisco		1·0	325	i 0 22	+ 1	i 0 40	+ 4	—	—
Berkeley		1·1	335	i 0 22	0	i 0 41	+ 2	—	—
Fresno		1·5	96	i 0 26	− 2	i 0 45	− 4	i 0 30	P_g
Tinemaha		2·8	86	i 0 46	− 1	i 1 22	0	—	—
Santa Barbara		2·9	147	i 0 46	− 2	i 1 33	S_g	—	—
Haiwee		3·1	104	i 0 51	0	i 1 40	S_g	—	—
Shasta Dam		3·8	352	e 1 5	+ 4	i 1 32	−15	—	—
Pasadena		4·0	131	e 0 59	− 5	i 1 44	− 8	—	—
Riverside	z.	4·6	128	i 1 9	− 3	—	—	—	—
Boulder City		5·6	98	i 3 11	?	—	—	—	—
Pierce Ferry		6·2	94	e 1 36	+ 1	—	—	—	—
Tucson		10·1	114	e 2 34	+ 6	—	—	—	—

Additional readings :—
Branner iN = 0m.22s.
San Francisco iE = 0m.25s.
Berkeley iNZ = 0m.25s.

March 28d. Readings also at 1h. (near Berkeley and Lick), 2h. (near Leninakan), 5h. (La Paz), 6h. (Nanking, Shasta Dam, Hungry Horse, Lick, and near Berkeley), 8h. (Stalinabad, Kulyab, Samarkand, near Andijan, Tchimkent, Frunse, and near Tacubaya), 14h. (near Neuchatel), 18h. (Paris, Stuttgart, De Bilt, Scoresby Sund, Reykjavik, La Paz, Pasadena, Mount Wilson, Riverside, Santa Barbara, Tucson, Boulder City, Hungry Horse, Pierce Ferry, near Tinemaha, Haiwee, Shasta Dam (2), near Berkeley, Lick (2), Fresno (2), Branner, and San Francisco), 20h. (near Fresno), 21h. (Stuttgart, near Lick and Berkeley), 22h. (Santa Clara, near Berkeley, Lick, Branner, Fresno, and San Francisco), 23h. (near Piatigorsk).

March 29d. 2h. 32m. 53s. Epicentre 35°·5N. 27°·2E. (as on 1948, February 15d.).

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

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Istanbul		5·8	14	1 29	0	i 2 29	− 9	—	—	—
Helwan		6·6	147	1 43	+ 2	2 48	−10	3 19	S*	—
Ksara		7·4	101	e 1 31	−21	e 3 39	S*	—	—	—
Bucharest	N.	8·9	355	e 2 16a	+ 4	e 3 14	−41	—	—	—
Catania		10·0	285	e 3 9	P_g	—	—	—	—	—
Yalta		10·4	28	e 2 33	− 1	—	—	—	—	—
Theodosia	N.	11·4	31	e 2 30	−17	—	—	—	—	—
Rome		13·1	304	e 3 16a	+ 6	i 6 11	SSS	e 4 36	?	—
Budapest		13·4	335	i 3 14	0	—	—	—	—	e 8·1
Leninakan		14·1	63	e 3 38	PP	—	—	—	—	—
Erevan		14·4	66	e 3 33	+ 6	—	—	—	—	—
Triest		14·4	319	e 3 27	0	e 6 16	+ 7	—	—	i 8·4
Florence		14·8	309	i 3 34	+ 2	e 6 30	SS	—	—	—
Padova	E.	14·8	312	e 3 43	+11	—	—	—	—	—
Piatigorsk		14·9	50	e 3 38	+ 4	6 32	+12	—	—	—
Bologna		15·1	311	e 3 27	− 9	e 6 26	+ 1	e 6 35	SS	e 8·3
Raciborzu		16·0	338	e 3 42	− 6	e 6 50	+ 4	e 3 57	PP	e 7·8
Grozny		16·3	56	e 4 12	PP	—	—	—	—	—
Pavia		16·8	311	e 4 14	PP	—	—	—	—	—
Prague		17·3	333	e 4 7	+ 3	e 7 7	− 9	—	—	e 8·1
Warsaw		17·3	348	e 4 3	− 1	e 7 21	+ 5	e 4 19	PP	e 9·1
Chur		17·4	317	e 4 6	0	—	—	—	—	—
Zürich		18·3	317	e 4 15k	− 2	e 7 36	− 3	—	—	—
Baku		18·5	68	e 4 25	+ 6	e 7 52	+ 8	—	—	—
Stuttgart		18·7	322	e 4 19	− 3	e 7 43	− 5	e 4 31k	PP	e 10·1
Basle		18·9	317	e 4 21	− 3	e 7 54	+ 1	—	—	e 10·8
Neuchatel		19·0	316	e 4 23	− 3	—	—	—	—	—
Jena		19·1	330	e 4 23	− 4	e 7 57	0	—	—	e 11·2
Strasbourg		19·4	320	i 4 29	− 1	e 8 22	SS	e 4 46	PP	e 9·6
Algiers		19·6	281	i 4 44	+12	8 11	+ 3	—	—	—
Potsdam		19·6	334	e 4 33	+ 1	i 8 20	+12	i 4 42	PP	e 11·1
Clermont-Ferraud		20·9	307	i 4 44	− 2	i 8 51	SS	i 5 2	PP	11·6
Moscow		21·5	16	4 47	− 5	8 37	−10	—	—	—
Alicante		22·3	287	5 31	+30	9 5	+ 3	5 39	pP	10·9
Paris		22·5	314	e 5 2?	0	e 9 33	SS	e 5 17	PP	e 13·1
Uccle		22·5	321	e 5 9	+ 7	e 9 4	− 1	e 5 43	PPP	e 11·3
Copenhagen		22·6	338	e 4 59	− 4	9 1	− 6	—	—	—
Helsinki		24·7	358	e 5 19	− 5	—	—	e 5 37	P	e 14·1
Granada		24·8	284	i 5 27a	+ 2	10 27	SS	6 6	pP	—
Toledo		25·0	290	i 5 27	0	—	—	—	—	—
Upsala		25·2	349	e 5 7	−22	—	—	—	—	e 13·1
Kew		25·3	319	e 5 27	− 3	e 10 4	+10	e 11 15	SSS	e 17·1
Sverdlovsk		31·0	36	e 6 16	− 5	e 11 13	−13	—	—	—
Stalinabad		33·1	71	e 6 38?	− 2	e 12 10?	+11	—	—	—
Tashkent		33·2	67	e 6 44	+ 4	—	—	—	—	—
Obi-garm		33·8	71	e 6 46	0	i 12 8	− 2	—	—	—
Kulyab		34·0	73	e 6 48?	0	e 12 9?	− 4	—	—	—
Andijan		35·6	68	e 6 58	− 3	e 12 33	− 5	—	—	—
Frunse		37·1	64	e 7 21	+ 7	—	—	—	—	—
Murgab		37·2	71	i 7 16	+ 1	e 12 59	− 3	—	—	—
Bombay		43·4	100	e 9 7	PP	—	—	—	—	—
Ville Marie		74·7	319	e 11 39	− 4	—	—	—	—	—
Temiskaming		74·8	317	e 11 42	− 2	—	—	—	—	—
Hungry Horse		89·6	335	i 12 58	− 3	—	—	i 13 5	P	—

Additional readings :—
Helwan S* = 3m.9s., PcP = 8m.58s.
Raciborzu eP?Z = 3m.49s., eZ = 4m.10s., eNZ = 4m.26s., 4m.50s., and 5m.43s., eN = 7m.7s.
Warsaw eN = 4m.45s. and 5m.31s., eSSE = 7m.35s., eSSN = 7m.41s., eSSSN = 7m.52s.
Stuttgart e = 4m.45s. and 5m.30s., eSS = 8m.7s.

Continued on next page.

Strasbourg e = 4m.50s., 5m.40s., and 5m.45s.
Potsdam iPPN = 4m.39s., iSSZ = 8m.27s.
Clermont-Ferraud iPPP = 5m.19s., i = 6m.43s.
Alicante PP = 5m.53s., PPP = 6m.5s., P_eP = 9m.30s., SS = 9m.39s., SSS = 9m.53s., P_eS = 13m.23s.
Granada PP = 6m.39s., SS = 11m.10s.
Kew eE = 12m.15s.
Long waves were also recorded at Belgrade.

March 29d. 10h. 22m. 40s. Epicentre 35°·1N. 23°·4E. (as on 1947, Oct. 10d.).

A = +·7525, B = +·3257, C = +·5724; δ = −2; h = 0;
D = +·397, E = −·918; G = +·525, H = +·227, K = −·820.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Istanbul		7·4	35	1 52	0	3 46	S*	—	—	—
Helwan		8·5	125	i 2 5k	− 2	i 3 38	− 7	2 20	PP	—
Bucharest		9·5	12	e 2 21	+ 1	i 4 21	+11	i 5 17	S_g	—
Belgrade		10·0	348	e 2 25	− 2	e 4 25	+ 2	e 5 11	S*	—
Ksara		10·4	93	e 2 34	0	4 39	+ 7	—	—	—
Kalossa		11·9	346	e 2 59	+ 5	e 4 54	−15	e 3 18	PPP	e 7·3
Yalta		12·5	38	e 3 4	+ 2	—	—	—	—	—
Florence	N.	12·8	316	e 2 37	−29	e 4 51	−39	—	—	—
Triest		12·8	328	e 2 46	−20	e 5 7	−23	—	—	i 7·0
Theodosia	N.	13·5	39	e 3 22	+ 7	—	—	—	—	—
Salo		14·4	321	e 4 16	+49	e 6 53	SSS	—	—	—
Pavia		14·8	317	e 3 40?	+ 8	e 5 50?	−28	—	—	—
Sotchi	N.	15·2	51	e 3 34	− 4	—	—	—	—	—
Raciborzu		15·4	348	e 3 38	− 2	—	—	e 3 48	PP	—
Chur		15·7	323	e 3 42k	− 2	—	—	—	—	—
Prague		16·3	339	e 3 52	0	e 6 37	−16	e 4 1	PP	e 7·3
Zürich		16·5	322	e 3 51	− 3	e 7 8	+10	—	—	—
Algiers		16·6	283	i 3 59	+ 3	7 5	+ 5	4 10	PP	12·3
Neuchatel		17·1	319	e 3 58	− 4	—	—	—	—	—
Basle		17·2	323	e 3 52	−11	e 7 14	0	—	—	—
Stuttgart		17·2	327	e 3 58	− 5	i 7 18	+ 4	i 4 13a	PP	e 9·4
Warsaw		17·2	355	e 4 4	+ 1	e 7 16	+ 2	e 4 20?	PP	e 8·8
Erevan		17·5	67	e 4 18	PP	—	—	—	—	—
Piatigorsk		17·6	52	e 4 9	+ 1	7 45	SS	—	—	—
Barcelona		17·8	297	4 12	+ 1	—	—	—	—	e 10·3
Strasbourg		17·8	326	i 4 12	+ 1	i 7 28	0	—	—	9·7
Jena		18·0	337	e 3 11	−62	e 6 41	−51	e 3 26	PP	e 7·7
Clermont-Ferrand		18·7	311	i 4 19	− 3	i 7 52	+ 4	i 4 32	PP	9·8
Potsdam		18·8	340	i 4 21a	− 2	i 7 51	+ 1	i 8 25	SS	e 9·3
Grozny		19·1	59	e 4 31	+ 4	8 9	+12	—	—	—
Alicante		19·4	288	e 4 26	− 4	i 8 1	− 3	4 36	pP	—
Paris		20·6	318	i 4 40	− 3	i 8 24	− 5	i 5 2	PP	11·3
Uccle		20·9	325	e 4 43	− 3	i 8 35	0	i 5 2	PP	e 11·1
De Bilt		21·4	330	i 4 51	0	e 8 52	+ 7	—	—	—
Baku		21·6	68	e 4 59?	+ 5	i 8 53?	+ 4	—	—	—
Copenhagen		21·9	344	4 52	− 5	8 50	− 4	—	—	—
Granada		21·9	284	i 4 58a	+ 1	i 8 55	+ 1	5 38	pP	i 13·4
Toledo		22·3	291	i 5 1	0	9 3	+ 1	—	—	—
Moscow		22·9	21	5 2	− 4	9 12	− 1	—	—	—
Jersey		23·4	317	e 4 42	−29	e 9 20	− 1	e 5 20	P	—
Kew		23·6	322	e 5 12	− 1	e 9 25	0	e 5 56	PP	e 11·3
Upsala		25·1	353	e 5 20?	− 8	9 45	− 6	11 7	SSS	e 11·9
Helsinki		25·1	1	e 5 22	− 6	e 9 41	−10	—	—	e 12·3
Durham		26·2	326	5 36	− 2	10 15	+ 6	—	—	—
Aberdeen		28·0	331	—	—	e 10 12	−26	—	—	e 14·8
Sverdlovsk		33·2	37	6 31	− 9	i 11 49	−11	—	—	—
Samarkand		34·7	69	e 7 5	+11	—	—	—	—	—
Stalinabad		36·2	70	i 7 5	− 1	i 12 50	+ 3	—	—	—
Tashkent		36·3	66	i 7 3?	− 4	e 12 47?	− 1	—	—	—
Tchimkent		36·4	64	e 7 17	+ 9	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m.	s.		m.
Obi-garm		36·9	70	e 7 13	+ 1	e 12 59	+ 1	—		—	—
Kulyab		37·1	71	e 7 15?	+ 1	i 13 0?	− 1	—		—	—
Andijan		38·6	66	e 7 27	+ 1	e 13 23	0	—		—	—
Frunse		40·0	63	e 7 48	+10	—	—	—		—	—
Murgab		40·2	70	e 7 40	0	e 13 48	0	—		—	—
Almata		41·7	61	e 8 6	+14	—	—	—		—	—
Scoresby Sund		42·9	340	—	—	14 31	+ 4	—		—	—
Bombay		46·4	97	e 7 59	−31	e 14 48	−30	18	9	8S	—
Hyderabad	N.	51·8	95	e 8 52	−20	16 29	− 4	—		—	—
Kodaikanal	E.	54·9	103	e 9 36	+ 1	e 17 24	+ 8	—		—	27·3
Irkutsk		57·9	46	e 9 57	+ 1	e 17 49	− 6	—		—	—
Bermuda		70·8	297	—	—	e 20 36	+ 1	—		—	e 36·5
Ottawa		71·7	313	11 24	− 2	20 44	− 1	—		—	34·3
Kirkland Lake		72·7	317	e 11 32	0	—	—	—		—	—
Ville Marie		72·8	316	e 11 37	+ 5	—	—	—		—	—
Fordham		72·9	308	e 11 34	+ 1	—	—	—		—	—
Temiskaming		73·0	314	e 11 39	+ 6	—	—	—		—	—
Cleveland		77·3	311	e 11 56k	− 2	e 21 48	0	e 22 14		PS	36·2
Vladivostok		78·5	45	e 12 0	− 4	i 21 52	− 9	—		—	—
St. Louis		84·3	313	e 12 35	0	e 22 57	− 3	—		—	—
Batavia		88·2	98	(e 12 51)	− 3	(e 22 35)	− 3	—		—	—
Hungry Horse		88·6	332	i 12 54	− 2	—	—	—		—	—
Pierce Ferry		98·8	326	e 13 47	+ 4	—	—	—		—	—
La Paz		100·5	257	e 18 23	PP	—	—	—		—	52·7

Additional readings and note :—
Bucharest eE =2m.27s. and 3m.57s., iN =4m.29s.
Belgrade e =3m.20s. and 4m.31s.
Kalossa eE =6m.36s.
Raciborzu eN =4m.56s., 5m.8s., and 5m.56s., eP$_c$P?E =9m.38s., eE =10m.20s.
Algiers iSS =7m.12s.
Stuttgart e =5m.30s., eS =7m.0s.
Warsaw eN =6m.56s., eE =7m.9s., eSE =7m.22s., eSSE =7m.40s., eSSN =7m.44s., SSSEN =8m.5s.
Strasbourg i =5m.20s., iS =7m.31s.
Jena eS?E =6m.38s.
Clermont-Ferrand iSS =8m.3s.
Potsdam iPPP?EN =5m.5s., iSN =7m.48s., iP$_c$PZ =8m.44s., iP$_c$PN =8m.48s.
Alicante PP =4m.48s., P$_c$P =7m.30s., SS =8m.58s., SSS =9m.14s., P$_c$S =11m.27s., S$_c$S =15m.6s.
Paris i =4m.44s., 6m.28s., and 8m.36s., eP$_c$P? =8m.47s., iSS? =8m.52s., eSSS? =9m.8s., e =9m.53s., eQ =10m.50s.
Uccle iE =4m.46s., iSN =8m.28s.
Copenhagen 4m.55s., 4m.59s., S =8m.42s., 9m.0s.
Granada PP =6m.4s., sS =10m.1s., SS =10m.22s.
Kew eSEN =9m.20s., iZ =10m.39s.
Cleveland iZ =12m.4s., iSE =21m.44s., eE =23m.41s., eN =23m.49s.
Batavia readings increased by 13 minutes.
Long waves were also recorded at Ivigtut, Huancayo, and at other American stations.

March 29d. 11h. 50m. 43s. Epicentre 22°·0S. 171°·7E. (as on 1946, August 15d.).

Strasbourg suggests a depth of 100km.

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

		△	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m.	s.		m.
Auckland	N.	15·1	170	4 37	+61	7 27	+62	i 4 59		PP	—
Arapuni	E.	16·4	169	—	—	7 5	+ 9	—		—	—
New Plymouth	E.	17·1	175	4 6	+ 4	—	—	—		—	—
Tuai	N.	17·4	166	4 8	+ 2	7 22	+ 3	—		—	—
Brisbane		17·8	248	i 4 20	+ 9	i 7 35	+ 7	i 7 52		SS	—
Wellington		19·4	174	4 26	− 4	8 11	+ 7	4 48		PP	i 10·0
Kaimata		20·5	181	4 42	0	8 49	SS	i 4 59		PP	i 9·1
Christchurch		21·5	179	4 51	− 1	—	—	i 5 11		PP	—
Riverview		21·6	232	i 4 53k	− 1	i 8 45	− 4	i 5 11		pP	10·2
Perth		50·3	246	—	—	i 15 57	−16	—		—	i 23·4

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Honolulu		52·3	37	—	—	e 17 5	+25	—	—	e 22·2
Batavia		64·4	273	(i 10 36)	− 4	(i 19 7)	−11	(i 11 14)	pP	—
Mizusawa		67·2	335	(e 11 0)	+ 2	e 11 0	P	—	—	—
Vladivostok		74·4	331	i 11 40	− 2	i 21 10	− 6	i 12 10	pP	—
Branner	E.	85·8	47	e 12 44	+ 2	—	—	—	—	—
Berkeley		86·0	47	i 12 45	+ 2	i 23 17	0	i 13 19	pP	e 40·1
Santa Barbara		86·0	50	i 12 44	+ 1	—	—	i 13 12	pP	—
Lick	Z.	86·1	47	i 12 40	− 4	—	—	i 13 1	pP	—
Pasadena		86·9	51	i 12 49a	+ 1	e 23 23	− 3	i 13 18	pP	e 40·4
La Jolla		87·0	53	i 12 50a	+ 2	—	—	—	—	—
Mount Wilson		87·1	51	i 12 49a	0	—	—	i 13 21	pP	—
Fresno	Z.	87·1	48	i 12 50	+ 1	—	—	i 13 17	pP	—
Riverside		87·4	51	i 12 51a	+ 1	—	—	i 13 19	pP	—
Shasta Dam		87·4	44	i 12 51	+ 1	e 23 28	− 2	i 13 21	pP	—
Palomar		87·5	53	i 12 52a	+ 1	e 23 33	+ 2	i 13 18	pP	—
Haiwee		88·0	50	i 12 56a	+ 3	e 23 8	[−13]	i 13 24	pP	—
Tinemaha		88·3	49	i 12 56a	+ 1	e 23 40	+ 1	i 13 28	pP	—
Boulder City		90·2	51	i 13 6	+ 2	—	—	i 13 32	pP	—
Sitka		90·7	26	—	—	e 24 37	+36	—	—	e 41·4
Pierce Ferry		90·9	51	e 13 7	0	—	—	i 13 34	pP	—
Victoria		90·9	37	e 17 15	PP	e 23 56	− 7	e 30 5	SS	36·3
Tucson		91·6	56	i 13 11a	+ 1	e 24 13	+ 4	i 13 41	pP	e 38·5
College		92·0	15	—	—	e 24 7	− 5	e 23 31	SKS	e 39·3
Irkutsk		94·3	325	13 19	− 4	i 23 44	[−13]	e 25 54	PS	—
Salt Lake City		94·4	48	e 16 53	PP	e 24 31	− 2	i 25 21	PS	e 40·0
Butte	N.	96·2	42	—	—	e 24 47	− 1	e 26 47	PPS	e 50·0
Hungry Horse		96·3	40	e 13 30	− 2	—	—	i 38 31	P'P'	—
Bozeman		97·0	43	e 17 49	PP	e 26 29	PS	e 25 39	?	e 41·6
Kodaikanal	E.	97·6	278	i 13 38	0	i 24 7	[− 8]	—	—	41·5
Hyderabad	N.	99·2	285	e 13 43	− 2	e 25 10	− 4	17 45	PP	—
Saskatoon		102·1	38	—	—	e 25 22	−16	e 33 35	?	48·3
Huancayo		106·1	110	e 18 43	PP	e 26 18	+ 7	e 24 47	SKS	e 44·7
Almata		108·1	310	18 44	PP	—	—	—	—	—
Murgab		109·2	304	e 17 57	[−34]	—	—	e 18 55	PP	—
St. Louis		109·5	55	—	—	i 26 48	S	i 27 31	?	—
Frunse		109·7	309	e 18 11	[−22]	—	—	—	—	—
La Paz		110·0	118	19 12	PP	i 34 32	SS	i 29 10	PPS	—
Andijan		110·9	306	e 18 44	[+ 9]	—	—	e 20 3	PP	—
Kulyab		112·3	303	—	—	25 14	[− 8]	—	—	—
Obi-garm		112·5	304	e 18 1	[−37]	—	—	e 19 31	PP	—
Stalinabad		113·2	304	e 18 10?	[−30]	e 25 14	[−11]	—	—	—
Tashkent		113·3	306	e 18 2	[−38]	25 8	[−17]	e 19 20	PP	—
Samarkand		114·7	304	e 18 42	[0]	—	—	—	—	—
Kirkland Lake		118·1	45	e 20 5	PP	—	—	—	—	—
Sverdlovsk		119·6	323	i 18 50	[− 2]	25 35	[−14]	i 20 11	PP	—
Ottawa		121·0	49	18 52	[− 3]	29 5	PKKP	37 41	SSP	51·3
Philadelphia		121·2	55	—	—	e 29 3	PKKP	e 37 32	SS	—
Fordham		122·3	54	e 21 39	?	e 29 19	PKKP	e 37 17?	SS	—
Baku		127·9	305	e 19 8	[0]	—	—	—	—	—
Bermuda		129·3	65	e 22 31	PKS	e 28 47	{+32}	e 39 29	SSP	—
Grozny		130·7	308	e 19 14	[+ 1]	—	—	e 22 37	PKS	—
Scoresby Sund		130·8	6	21 32	PP	22 40	PKS	—	—	—
Ivigtut		132·1	25	—	—	39 59	SSP	—	—	62·3
Moscow		132·2	326	e 19 14	[− 2]	22 41	PKS	e 21 27	PP	—
Upsala		138·0	341	i 22 55	PP	e 40 27	SS	—	—	e 63·3
Yalta		138·6	313	e 19 29	[+ 1]	—	—	e 22 15	PP	—
Ksara		139·5	296	e 19 23?	[− 7]	—	—	22 27	PP	—
Warsaw		142·3	329	e 19 40	[+ 5]	23 5	SKP	e 22 39	PP	e 69·3
Copenhagen		143·0	340	i 19 31	[− 5]	—	—	—	—	62·3
Istanbul		143·3	310	e 9 17?	?	—	—	e 22 17?	PP	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Helwan		143·7	291	i 19 32k	[− 5]	20 10	sPKP	19 59	pPKP	—
Raciborzu	z.	145·1	330	i 19 37k	[− 2]	—	—	—	—	—
Potsdam		145·5	338	i 19 38	[− 2]	—	—	i 20 6	pPKP	e 65·3
Prague		146·8	333	i 19 42	[0]	—	—	e 20 42	?	—
Kalossa		147·0	325	19 47	[+ 4]	—	—	i 20 12	PKP_2	—
Belgrade		147·2	320	e 19 40	[− 3]	—	—	—	—	—
Jena		147·2	335	e 19 41	[− 2]	—	—	e 19 44	PKP	—
Uccle		149·6	345	e 19 50	[+ 3]	e 23 27	SKP	e 20 19	PKP_2	e 73·3
Kew		149·9	350	e 19 45	[− 2]	i 23 13	SKP	—	—	e 59·3
Stuttgart		149·9	336	i 19 45a	[− 2]	—	—	—	—	e 73·3
Triest		150·3	328	e 19 52	[+ 4]	e 43 27	SSP	i 20 12	PKP_2	—
Strasbourg		150·5	337	e 19 37	[−11]	e 42 17	SS	i 23 33	PP	66·3
Chur		151·3	335	e 19 47	[− 2]	—	—	—	—	—
Zürich		151·3	336	e 19 47a	[− 2]	—	—	e 23 30	PP	—
Basle		151·5	337	e 19 48	[− 2]	e 23 0	PKS	—	—	—
Paris		151·9	344	i 19 49	[− 1]	—	—	i 23 41	PP	e 74·3
Salo		151·9	331	e 19 55a	[+ 5]	—	—	—	—	—
Padova		152·1	329	e 19 52	[+ 1]	—	—	e 27 2	PPP	—
Neuchatel		152·2	337	e 19 48	[− 3]	—	—	—	—	—
Bologna		152·3	328	e 19 35a	[−16]	—	—	e 24 11	PP	—
Florence		152·9	328	e 19 49	[− 3]	e 30 17?	{−18}	—	—	—
Rome		153·4	323	e 19 49a	[− 3]	e 43 23	SS	e 23 30	PP	e 68·4
Catania		154·6	312	e 19 27	[−27]	—	—	e 19 55	PKP	—
Clermont-Ferrand		154·6	342	i 19 54	[0]	—	—	i 23 55	PP	69·3
Toledo		161·8	350	e 20 1	[− 2]	20 49	PKP_2	24 32	PP	—
Alicante		162·4	340	20 6	[+ 3]	—	—	24 35	PP	77·8
Granada		164·3	346	i 19 51k	[−14]	20 45	PKP_2	i 24 48	PP	86·3

Additional readings :—
Auckland iN = 10m.32s. and 14m.55s.
Brisbane isP?N = 4m.50s., iN = 5m.3s., iE = 5m.10s.
Wellington SP = 4m.42s., iZ = 5m.58s., 6m.45s., 7m.12s., and 8m.31s., S_cS = 15m.55s.
Kaimata i = 4m.51s. and 5m.45s., S_cS = 15m.4s.
Christchurch i = 5m.45s.
Riverview iE = 5m.18s., iPP = 5m.23s., iPPPEZ = 5m.34s., iSE = 8m.41s., iP_cPEZ = 8m.51s., iN = 9m.5s., iSSE = 9m.23s., eQN = 9·4m.
Batavia ePP = (12m.46s.), readings increased by 4 minutes.
Vladivostok isP = 12m.16s., isS = 21m.58s.
Berkeley iE = 12m.50s., iSN = 22m.50s., iN = 23m.57s., iE = 24m.3s., 25m.1s., and 29m.1s. iN = 29m.25s., eQN = 36m.23s.
Lick eEN = 12m.46s., iPPZ = 16m.8s.
Pasadena ePPZ = 16m.14s., iSEN = 24m.8s., iE = 25m.14s., eSSN = 29m.41s., eQN = 36m.17s.
Shasta Dam ePP = 16m.18s., e = 24m.11s., ePKP,PKP = 38m.44s.
Palomar iZ = 13m.14s., iPPZ = 16m.19s., eSE = 23m.12s., ePKP,PKPZ = 38m.46s.
Haiwee ePKP,PKPZ = 38m.46s.
Tinemaha iP_cP?Z = 13m.7s., ePKP,PKPZ = 38m.47s.
Pierce Ferry ePKP,PKP = 38m.36s.
Victoria i = 24m.44s.
Tucson i = 13m.37s., ePP = 16m.51s., eSKS = 24m.0s., ePS = 25m.4s., ePPS = 25m.57s., ePKKP = 30m.29s., eSS? = 31m.4s., e = 32m.38s., ePKP,PKP = 38m.36s.
College ePS = 25m.31s.
Irkutsk eSS = 31m.5s.
Salt Lake City ePPS = 26m.31s., eSS? = 31m.33s.
Butte eSSN = 31m.52s.
Hungry Horse iPKKP? = 30m.15s.
Hyderabad SKSN = 24m.10s., SSN = 32m.1s.
Huancayo eSKKS = 25m.34s., ePS = 27m.52s., ePPS = 29m.11s., eSS = 33m.37s.
La Paz iZ = 19m.40s.
Tashkent ePS = 28m.52s.
Sverdlovsk PS = 30m.0s., eSS = 36m.29s.
Philadelphia eSSS? = 40m.53s.
Moscow ePPP = 24m.33s.
Upsala eN = 32m.43s., eSSSN = 46m.17s.?
Warsaw eN = 20m.29s., ePPN = 22m.28s., eE = 24m.3s. and 29m.45s.
Helwan PP = 23m.2s., pPP = 23m.23s.
Raciborzu eZ = 20m.4s., eN = 20m.17s., eZ = 20m.37s., 20m.53s., and 21m.17s.
Potsdam iPKPEN = 19m.41s., iPPZ = 22m.59s., iZ = 24m.12s.
Kalossa eN = 19m.58s., eE = 20m.57s.
Belgrade e = 20m.48s. and 21m.28s.
Jena eN = 20m.25s.

Continued on next page.

Uccle ePPN =24m.0s., ePKSPKS?EN =33m.48s.?, ePPSN =36m.39s., eSSEN = 42m.41s., eSSSEN =48m.47s.
Kew iZ =19m.49s., 20m.14s., and 20m.30s., eN =34m.10s.
Stuttgart iZ =19m.51s.a, and 19m.59s.k, e =20m.17s., 23m.18s., 29m.27s., and 33m.25s.
Triest ePP =23m.14s., eSKKKS? =30m.54s., eSKSP =33m.43s.
Strasbourg iPKP =19m.43s., ePP =23m.39s., e =26m.29s. and 33m.41s.
Zürich e =19m.53s.
Paris iPKP =20m.7s., i =24m.13s., ePPP =27m.7s., ePPP_2 =33m.43s., e =39m.17s.
Salo iZ =20m.6s., eEN =20m.20s.
Bologna eZ =19m.43s., eN =29m.51s.
Rome iPKP_2Z =20m.11s., eSKKS? =34m.7s., ePPSE? =37m.53s.
Clermont-Ferrand iPKP_2 =20m.3s., i =20m.18s., 21m.13s., and 21m.48s.
Long waves were also recorded at Helsinki.

March 29d. Readings also at 0h. (near Lick), 1h. (Murgab, Samarkand, Andijan, Tchimkent, Tashkent, Frunse, near Kulyab, Stalinabad, and Obi-garm), 2h. (near Lick(4), Branner, Berkeley, San Francisco, and Fresno), 3h. (Hungry Horse, Stuttgart (2), and Copenhagen), 5h. (near Obi-garm), 7h. (La Paz), 8h. (Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Shasta Dam, and near Obi-garm), 9h. (near Lick (2), Branner, Berkeley, and Fresno), 10h. (near Lick (2)), 13h. (near Lick), 14h. (near Kulyab, Obi-garm, Stalinabad, and near Apia), 20h. (Scoresby Sund, La Plata, near Guadalajara, and near Ottawa), 21h. (La Paz).

March 30d. Readings at 1h. (Upsala), 2h. (Murgab, near Andijan, near Kulyab, Obi-garm and Stalinabad), 4h. (near Branner and Lick), 7h. (Bombay, Calcutta, near Catania and Messina), 8h. (Bombay), 9h. (near Frunse), 10h. (near Murgab, Obi-garm, Kulyab, and Andijan), 12h. (Bogota), 17h. (Obi-garm and near Kulyab), 18h. (near Alicante), 19h. (Hungry Horse), 21h. (Batavia), 22h. (near Alicante), 23h. (near Obi-garm).

March 31d. Readings at 0h. (near Kulyab), 2h. (near Lick), 3h. (Stuttgart, Collmberg, and Hungry Horse), 4h. (Collmberg, Murgab, near Kulyab and Obi-garm (2)), 6h. (near Lick), 10h. (near Alicante), 11h. (La Paz and near Alicante), 13h. (Pasadena, Mount Wilson, Palomar, Riverside, Tinemaha, Hungry Horse, and Pierce Ferry), 14h. (Hungry Horse, near Kulyab, Obi-garm, Stalinabad, and Murgab), 17h. (Pasadena, Mount Wilson, Haiwee, Palomar, Riverside, Tinemaha, Tucson, Boulder City, Pierce Ferry, Shasta Dam, Lick, and Mineral), 18h. (Mount Wilson, Riverside, Tinemaha, Tucson, Boulder City, Hungry Horse, Pierce Ferry, Huancayo, Bogota, and La Paz), 19h. (near Branner), 23h. (near Stalinabad).

The scanned images of the bulletins of the International Seismological Summary (ISS) have been obtained thanks to funding provided by the US National Science Foundation through grant EAR-9725140 (Villaseñor et al., 1997) and collected by SGA Storia Geofisica Ambiente (Bologna) on behalf of the Istituto Nazionale di Geofisica e Vulcanologia (Rome), in the frame of the EUROSEISMOS project.

The scanned images of the bulletins of the International Seismological Summary (ISS) have been obtained as part of a global earthquake relocation project (Villaseñor et al., 1997) initiated with funding from the US National Science Foundation through grant EAR-9725140 and collected by SGA Storia Geofisica Ambiente (Bologna) on behalf of the Istituto Nazionale di Geofisica e Vulcanologia (Rome), in the frame of Euroseismos project.

A digital hypocenter file of the ISS (Villaseñor and Engdahl, 2005) can be obtained from the USGS web site: http://earthquake.usgs.gov/scitech/iss/

Villaseñor, A., and E.R. Engdahl, *A digital hypocenter catalog for the International Seismological Summary,* Seism. Res. Lett., vol. 76, no. 5, pp. 554-559, 2005.

Villaseñor, A., E.A. Bergman, T.M. Boyd, E.R. Engdahl, D.W. Frazier, M.M. Harden, J.L. Orth, R.L. Parkes, and K.M. Shedlock*, Toward a comprehensive catalog of global historical seismicity,* Eos Trans. AGU, vol. 78, no. 50, pp. 581, 583, 588, 1997.