The International Seismological Summary.

1940 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. for financial support, which has largely covered the cost and preparation of this volume.

The number constitutes the beginning of the fourth 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. As explained in the introduction to the 1937 volume, tables which take into consideration the ellipticity of the earth have been used*, and distances 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 modified *geocentric* latitude whose relationship to the ordinary *geographie* latitude ϕ is :—

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

These formulæ 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 ...

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* " Seismological tables," H. Jeffreys and K. E. Bullen, British Assoc., London, 1950,

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. The time calculated is that at which the P wave leaves the focus, not that when P arrives at the epicentre.

(2) Epicentre constants :—

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

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

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

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

δ is defined as the nearest integer to $10^5(A^2+B^2+C^2-1)$ and may be used to compare distances calculated by the first two formulæ 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

$$h=-3\cdot549+10\cdot738\cos 2\phi.$$

(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.

(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 origin 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 1940 contains 93 determinations of epicentre, 41 being repetitions from origins determined since the introduction of the use of geocentric co-ordinates.

Cases of abnormal focal depth are noticed as below :—

Jan.	1d.	12h.	17·8°S.	178·8°W.	0·070
	6d.	14h.	21·8S.	170·8E.	0·005
	21d.	4h.	32·5S.	179·0W.	0·040
	26d.	6h.	14·7S.	167·3E.	0·005
Feb.	8d.	15h.	36·3N.	71·0E.	0·025
	9d.	4h.	37·6N.	141·7E.	0·005
	12d.	8h.	23·2S.	177·4W.	0·020
	12d.	9h.	54·3N.	161·5W.	0·005
	20d.	2h.	13·7S.	167·2E.	0·020
March	9d.	10h.	27·0N.	139·5E.	0·070
	18d.	5h.	31·8S.	178·7W.	0·010
	19d.	4h.	36·3N.	71·0E.	0·010
	22d.	10h.	36·3N.	71·0E.	0·010
	28d.	15h.	14·2N.	120·6E.	0·020
	28d.	17h.	13·1N.	89·5W.	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.

KEW OBSERVATORY,
RICHMOND,
SURREY.

February, 1951.

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1940 JANUARY, FEBRUARY, MARCH.

Jan. 1d. 12h. 15m. 9s. Epicentre 17°·8S. 178°·8W. (as on 1939, November 24d.).

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

Tables for depth of focus 0·070 have been used.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		7·9	60	e 1 59k	+ 3	i 3 28	0	—	—	—
Wellington		24·0	192	6 16	sP	7 41	−39	14 36	SeS	—
Christchurch		26·7	193	e 3 37	?	i 8 55	− 8	i 11 42	SSS	—
Brisbane	N.	27·7	245	i 5 15	+ 5	—	—	e 11 45	SSS	—
Riverview		31·2	233	i 5 44	+ 4	i 10 13	0	e 6 12	pP	i 15·2
Sydney		31·2	233	e 5 39	− 1	e 10 9	− 4	—	—	—
Adelaide	N.	41·5	236	i 7 7	+ 1	i 12 51	+ 4	e 8 0	pP	—
Honolulu		44·0	29	e 7 26	+ 1	e 13 6	−16	—	—	—
Palau		52·4	294	8 33	+ 4	—	—	—	—	—
Mito		66·2	325	9 39	−22	—	—	—	—	—
Kameyama		67·4	322	10 11	+ 3	—	—	—	—	—
Sendai		67·4	327	10 9	+ 1	—	—	—	—	—
Manila		67·5	295	i 10 11k	+ 2	—	—	14 22	PPP	—
Nagano		67·7	324	10 12	+ 2	—	—	—	—	—
Mizusawa		67·9	328	10 9	− 3	—	—	—	—	—
Miyazaki		68·7	316	10 18	+ 2	18 40	− 1	—	—	—
Miyakozima		69·0	307	10 20	+ 2	19 33	sS	—	—	—
Mori		70·4	330	10 42	+16	—	—	—	—	—
Zi-ka-wei	Z.	75·3	310	i 10 55	0	—	—	i 14 1	PP	—
Vladivostok		75·6	325	i 10 57	+ 1	i 20 0	+ 2	—	—	—
Branner		76·5	43	e 10 51?	−10	—	—	—	—	—
Santa Barbara		76·5	47	i 11 0	− 1	—	—	i 14 0	PP	—
Hong Kong		76·7	299	11 5	+ 3	20 11	+ 2	20 28	PS	—
Lick		76·8	43	e 11 2	− 1	—	—	—	—	—
La Jolla		77·4	50	i 11 5	− 1	—	—	e 14 5	PP	—
Pasadena		77·4	48	i 11 5a	− 1	i 20 13	− 4	e 13 3	pP	—
Mount Wilson		77·5	48	i 11 6	− 1	—	—	i 13 4	pP	—
Palomar	Z.	77·9	50	i 11 9a	0	—	—	i 13 8	pP	—
Riverside		77·9	48	i 11 6a	− 3	—	—	e 13 6	pP	—
Haiwee		78·6	46	i 11 12a	0	e 20 25	− 4	e 13 11	pP	—
Tinemaha		78·9	45	i 11 12a	− 2	e 20 26	− 6	—	—	—
Tucson		81·9	52	e 11 29	− 1	20 59	− 4	e 13 29	pP	—
Salt Lake City		85·1	44	e 11 46	+ 1	i 21 21	−13	e 13 46	pP	—
College		85·7	12	e 13 52	pP	e 21 5	−35	e 15 5	PP	—
Bozeman		87·9	40	e 11 58	− 1	i 21 33	−27	e 15 24	PP	—
Irkutsk		96·1	323	—	—	e 22 16	[−10]	—	—	—
Huancayo		98·9	105	e 14 58	pP	i 22 37	[− 3]	e 16 56	PP	—
Calcutta	N.	99·2	291	e 16 46	PP	e 22 46	[+ 5]	—	—	—
Florissant		99·7	52	—	—	e 22 35	[−10]	i 23 13	sSKS	—
Colombo	E.	102·8	273	e 14 51?	pP	—	—	—	—	—
La Paz	Z.	103·7	113	e 16 51	PKP	i 23 1	[− 2]	i 25 59	PS	—
Kodaikanal	E.	106·0	276	i 17 51f	PP	—	—	—	—	—
Agra	E.	109·4	294	i 18 9	PP	i 27 21	PS	—	—	—
Bombay		112·7	283	e 15 28	P	i 23 44	[+ 3]	e 18 23	PP	—
San Juan		116·4	76	e 15 13	P	i 23 52	[− 3]	e 19 6	PP	e 45·8
Sverdlovsk		121·3	326	i 17 59	[+ 1]	—	—	—	—	44·9
Hamburg		143·7	352	i 18 38k	[− 2]	—	—	—	—	—
Ksara		145·1	303	i 18 44k	[+ 2]	—	—	i 20 56	pPKP	—
De Bilt	Z.	145·6	356	i 18 42a	[− 1]	—	—	—	—	—
Jena		145·9	348	e 18 43	[0]	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Bucharest		146·2	327	e 18 46	[+ 2]	—	—	e 19 13 pPP	—
Budapest		147·0	337	i 18 48	[+ 2]	e 24 51?	[−16]	—	—
Uccle		147·0	357	e 18 45	[− 1]	—	—	—	—
Kecskemet	z.	147·2	337	i 18 49	[+ 3]	—	—	—	—
Stuttgart		148·4	352	i 18 47k	[0]	—	—	i 21 5 pPKP	—
Sofia		148·8	327	e 18 54	[+ 6]	—	—	—	—
Strasbourg		148·8	352	e 18 53	[+ 5]	—	—	—	—
Zurich		149·9	351	e 18 49	[0]	—	—	i 18 56 ?	—
Basle		149·9	351	e 18 49	[0]	—	—	i 18 56 ?	—
Helwan	z.	150·0	299	i 18 48a	[− 1]	—	—	i 21 33 pPKP	—
Chur		150·2	349	i 18 49	[0]	—	—	i 18 56 ?	—
Triest		150·3	342	18 55	[+ 6]	—	—	21 17 pPKP	e 17·1
Neuchatel		150·5	352	e 18 50	[0]	—	—	—	—
Clermont-Ferrand		152·1	356	e 18 39	[−13]	—	—	—	—
Rome		154·1	340	i 18 52	[− 3]	—	—	—	—
Toledo		157·6	10	e 19 1	[+ 2]	—	—	—	—
Granada		160·2	11	e 21 0a	pPKP	28 31	SKKS	43 7 SS	—

Additional readings :—
Christchurch i = +14m.49s., iE = +18m.50s.
Brisbane eN = +8m.3s.
Adelaide iN = +10m.17s. and +16m.15s.
Honolulu eP = +7m.30s., iS = +13m.18s.
Mizusawa SN = +10m.26s.
Zi-ka-wei iZ = +12m.55s.
Pasadena iPPZ = +14m.9s.
Mount Wilson iPPZ = +14m.6s.
Palomar iZ = +14m.12s.
Riverside isPZ = +13m.52s., iPP = +14m.12s.
Halwee ePKP, PKPZ = +38m.12s.
Tucson sP = +14m.31s., ePP = +14m.48s., eSP = +21m.46s., eSSS = +29m.57s.
Salt Lake City ePP = +15m.9s., epPP = +16m.54s., ePPP = +17m.28s., esS = +25m.2s.
College ePPP = +17m.15s., iS = +21m.30s., esS = +25m.15s.
Bozeman ePPP = +17m.33s., eSKS = +21m.17s., esS = +25m.12s.
Huancayo epPP = +18m.36s., ePPP = +19m.9s., esPP = +20m.7s., eSP = +25m.16s., ePS = +26m.26s., eSS = +30m.38s.
Florissant iE = +23m.40s.
La Paz iSKKS = +26m.55s.
Bombay eEN = +20m.30s. and +24m.51s.
Bucharest eN = +18m.59s.
San Juan ePKP = +17m.43s., PS = +29m.1s.
Ksara isPKP = +21m.53s., PP = +22m.39s., e = +31m.20s. and +33m.20s.
Uccle i = +18m.48s.
Stuttgart i = +18m.51s. and +18m.56s., iNE = +19m.13s., eNE = +21m.34s.
Helwan iZ = +18m.57s., iEZ = +24m.39s., eE = +28m.33s.
Triest PKP_2 = +19m.2s., PP = +22m.47s.
Clermont-Ferrand i = +18m.47s.
Rome iZ = +18m.57s., eN = +19m.11s., iZ = +19m.21s., iN = +19m.26s.
Toledo iZ = +19m.36s.
Granada SKSPN = +36m.13s.

Jan. 1d. Readings also at 0h. (near Manila), 1h. (La Plata), 2h. (La Plata, Ksara (2), Wellington, and near Mizusawa), 7h. (Wellington), 9h. (Balboa Heights), 11h. (Moscow, Pulkovo, Sverdlovsk, Scoresby Sund, and Tucson), 12h. (Istanbul, Ksara (2), and Irkutsk), 13h. (near Mizusawa), 18h. (Tucson (2)), 20h. (Baku, Sotchi, Ksara, and Huancayo).

Jan. 2d. 0h. 7m. 8s. Epicentre 30°·3N. 22°·0E.

A = +·8019, B = +·3240, C = +·5020; δ = +2; h = +2;
D = +·375, E = −·927; G = +·465, H = +·188, K = −·865.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Helwan		8·1	93	—	—	e 4 1	S•	e 4 40	S_g	i 5·2
Ksara		12·3	69	—	—	e 4 39	−39	—	—	e 8·4
Sofia		12·4	4	e 2 43	−18	i 4 37	−44	—	—	—
Rome		13·9	329	—	—	i 5 49	− 8	i 6 14	SS	i 6·5
Bucharest		14·4	11	e 3 18	− 9	i 5 49	−20	—	—	—
Triest		16·6	340	e 4 0	+ 4	—	—	e 4 11	PP	6·6
Kecskemet	z.	16·7	354	e 4 2	+ 5	(e 6 54?)	− 9	—	—	e 6·9
Budapest		17·3	354	e 4 9	+ 5	(e 7 22)	+ 6	e 4 29	PPP	e 7·4
Chur		19·1	333	e 4 37	+10	—	—	—	—	—
Zurich		19·9	332	e 4 25	−11	e 9 5	+50	—	—	—
Prague		20·5	347	—	—	e 7 22	−65	—	—	—
Neuchatel		20·3	331	e 4 41	+ 1	—	—	—	—	—
Stuttgart		20·9	336	e 4 57	+11	e 7 52	−43	e 5 24	PPP	—
Jena	N.	22·0	343	e 4 52	− 6	—	—	—	—	—
Granada		22·3	294	e 5 2	+ 1	i 9 18	+16	—	—	14·1
Toledo		23·3	301	e 5 39	PP	—	—	—	—	—
Uccle		24·4	331	e 5 37	+16	—	—	—	—	e 10·9
De Bilt	N.	25·1	335	—	—	e 9 0	−51	—	—	—

Additional readings :—
Sofia iSEN = +4m.40s.
Rome eE = +4m.57s., iEN = +5m.12s., iE = +5m.21s., iEN = +6m.24s.
Bucharest iE = +5m.55s., iSS?N = +6m.3s.
Triest eP_g = +4m.18s., eP_gP_g = +4m.21s., ePsS = +5m.8s., iS = +5m.11s., i = +5m.25s., eS_g = +5m.34s., iS_gS_g = +5m.38s.
Stuttgart eNE = +7m.21s.
De Bilt eE = +9m.7s.

Jan. 2d. 11h. 7m. 18s. Epicentre 28°·5S. 113°·5W. (as on 1937, July 26d.).

A = −·3510, B = −·8072, C = −·4747; δ = +11; h = +2;
D = −·917, E = +·399; G = +·189, H = +·435, K = −·880.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Huancayo		39·2	73	7 32	+ 1	i 13 29	− 3	i 8 59	PP	i 17·4
La Paz		43·4	84	i 7 58a	− 8	i 14 25	−10	9 44	PP	19·2
La Plata	E.	47·2	112	8 24	−12	15 18	−11	—	—	21·2
	N.	47·2	112	8 30	− 6	15 12	−17	18 12	SS	18·6
Wellington		58·7	237	10 0	− 2	18 19	+13	25 2	L_q	27·2
Arapuni		58·7	241	—	—	18 24	PS	—	—	26·9
Tucson		60·5	2	e 10 11	− 3	18 41	+12	e 14 3	PPP	e 24·8
Palomar	z.	61·6	357	i 10 25a	+ 3	—	—	—	—	—
Riverside		62·3	356	e 10 27	+ 1	—	—	—	—	—
Mount Wilson		62·5	356	e 10 27	− 1	—	—	—	—	—
Pasadena		62·5	356	i 10 28a	0	e 19 5	+11	—	—	e 26·7
Rio de Janeiro		62·8	102	—	—	i 18 50	− 8	e 22 42	SS	e 25·3
Haiwee		64·4	355	e 10 42	+ 2	—	—	—	—	—
San Juan		65·3	50	e 10 56	+10	e 19 19	−10	e 13 8	PP	e 25·1
Honolulu		65·4	315	10 45	− 2	19 47	+17	e 13 25	PP	e 27·5
Tinemaha		65·4	355	e 10 47	0	—	—	—	—	—
Ukiah		67·9	352	e 12 12	+70	e 20 11	+10	e 14 4	PP	e 29·6
Salt Lake City		68·9	2	e 11 8	− 1	e 20 23	+10	e 13 51	PP	e 30·4
St. Louis	N.	70·2	19	i 11 16	− 1	i 20 29	+ 1	—	—	—
Florissant		70·4	19	e 11 30	+12	e 20 30	0	—	—	—
Bozeman		73·9	3	e 11 35	− 4	e 26 11	SS	e 21 47	S_cS	e 30·2
Butte		74·2	2	e 11 50	+10	e 21 31	+17	e 26 1	SS	e 32·7
Bermuda		76·1	41	e 11 59	+ 8	e 21 38	+ 3	i 22 12	S_cS	e 31·9
Fordham		78·2	30	—	—	e 22 1	+ 4	—	—	—
Riverview		78·2	237	e 22 2	S	(e 22 2)	+ 5	e 27 33	SS	e 37·1

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Sydney		78·7	237	—	—	e 22 12	+ 9	e 27 24	SS	e 35·2
Brisbane	N.	80·2	245	—	—	e 22 24	+ 5	e 27 42	SS	e 37·8
Ottawa		81·2	26	i 12 17	− 2	22 24	− 5	—	—	33·7
East Machias		84·2	32	e 12 58	+24	e 22 59	0	e 27 44	SS	e 34·0
Adelaide		87·2	231	—	—	e 23 52	PS	e 29 32	SS	—
Sitka		87·2	348	—	—	e 29 42	SS	—	—	e 41·7
College		96·8	346	—	—	24 12	[+ 1]	e 26 22	PS	e 39·2
Granada		121·7	62	23 25	PPP	29 22	PS	—	—	e 61·7
Manila		127·9	267	e 22 18	PP	—	—	—	—	60·7
Uccle		128·8	46	—	—	e 38 56	SS	—	—	e 60·7
Zi-ka-wei	Z.	132·7	289	e 19 28	[+11]	—	—	—	—	—
Rome		134·6	58	i 23 44	PPP	e 26 55	[+25]	39 23	SS	63·9
Triest		135·4	52	e 16 0	P	e 26 3	[−28]	e 23 58	PPP	e 61·9
Helwan	Z.	149·4	79	19 49	[+ 3]	—	—	—	—	—
Ksara		153·3	71	e 20 1	[+ 9]	43 15	SS	23 29	PP	72·7
Colombo	E.	155·1	213	e 15 12	P	—	—	—	—	—
Calcutta	N.	159·4	259	e 28 53	PPP	—	—	—	—	—
Bombay		168·8	213	e 20 23	[+15]	e 25 29	PP	e 33 34	PS	82·7
Agra	E.	169·7	264	e 26 34	?	i 32 30	{+29}	—	—	—

Additional readings :—
Huancayo iP = +7m.52s.
La Paz iSZ = +14m.28s.
Tucson P = +10m.22s., P_cP = +10m.51s., eSS = +22m.40s., SS = +22m.56s.
San Juan ePPP = +14m.34s., eSS = +23m.30s.
Honolulu PPP = +15m.16s.
Ukiah eS_cS = +21m.24s., eSS = +25m.2s.
Salt Lake City ePPP = +16m.3s., eS_cS = +21m.4s., eSS = +24m.56s.
Bozeman eP = +12m.17s.
Bermuda eP = +12m.31s.
Riverview eN = +22m.17s.
College eSS = +31m.44s., ePSPS = +32m.9s., eSSS = +35m.37s.
Rome eE = +24m.20s., i = +32m.3s., iE = +34m.3s., e = +44m.34s.
Triest ePKP = +19m.9s., ePP = +21m.7s., eSKKS = +27m.58s., iS = +29m.26s., iPS = +31m.36s., iPPS = +33m.7s., eSS = +38m.43s.
Helwan eZ = +20m.12s., +20m.57s., +21m.54s., and +24m.50s.
Ksara PPS = +37m.13s.
Bombay eE = +21m.29s.
Long waves were also recorded at Cape Town, Kew, Philadelphia, Santa Clara, Bidston, Berkeley, Paris, Fresno, De Bilt, Toledo, and Potsdam.

Jan. 2d. Readings also at 2h. (near Harvard), 4h. (Balboa Heights), 5h. (Manila, Vladivostok, Zi-ka-wei, and Calcutta), 8h. (La Paz, Huancayo, and Tucson (5)), 9h. (Tucson (3), Almata, Andijan, and Agra), 10h. (Tucson (3) and Helwan), 11h. (Tucson, Agra, and Christchurch), 12h. (Kodaikanal), 15h. (Tucson, Agra, Calcutta, and Bombay), 16h. (near Tananarive), 20h. (near Mizusawa), 21h. (Tucson, Ksara, Tinemaha, Haiwee, Mount Wilson, and Riverside), 22h. (Tucson (3)), 23h. (Almata, Andijan, Samarkand, Frunse, Tchimkent, and Tashkent).

Jan. 3d. 14h. 9m. 56s. Epicentre 36°·5N. 141°·6E. (as on 1938, May 23d.).

A = −·6315, B = +·5005, C = +·5922 ; δ = −1 ; h = 0 ;
D = +·621, E = +·784 ; G = −·464, H = +·368, K = −·806.

	Δ	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Tukubasan	1·2	257	0 30	+ 6	—	—
Togane	1·4	227	0 30	+ 3	0 49	+ 3
Tokyo, Imp. Univ.	1·7	242	0 30	− 1	0 52	− 2
Kiyosumi	1·8	220	0 30	− 2	0 55	− 1
Kamakura	2·0	235	0 30	− 5	0 55	− 7
Koyama	2·4	242	0 30	−11	1 1	−11
Mizusawa	2·6	352	e 0 44	0	1 11	− 6
Susaki	2·8	229	0 56?	+ 9	1 29?	+ 7
Osaka	5·3	252	1 36	P*	2 50	S_g

Jan. 3d. Readings also at 0h. (East Machias), 1h. (College), 2h. (Christchurch and Wellington), 3h. (Ksara), 5h. (near Tananarive, and near Osaka), 6h. (Tucson), 11h. (Haiwee. Mount Wilson, Pasadena, Riverside, Tinemaha, and Tucson), 19h. (Tucson (2), near Stuttgart and near Triest), 20h. (Calcutta), 21h. (Tucson and near Mizusawa).

Jan. 4d. 1h. Pacific shock, possibly from an epicentre in the region of the Cooke Islands.

Adelaide iN = 8m.24s., i = 11m.37s. and 14m.39s., iN = 14m.50s., e = 17m.56s., iN = 33m.34s.
Christchurch P? = 15m.12s., S = 19m.25s., L_q = 20m.17s., L_r = 21m.50s.
Apia iE = 15m.14s. and 24m.3s.
Riverview ePE = 17m.45s., eE = 18m.5s., eSN = 23m.27s., eLN = 25m.36s.
Arapuni i = 18m.0s.
Wellington e = 18m.25s., S? = 20m.5s., L_q = 21m.45s., L_r = 22m.55s.
Brisbane eN = 20m.36s. and 22m.30s.
Riverside ePZ = 22m.23s.
Mount Wilson iPZ = 22m.26s.
Pasadena iPZ = 22m.29s., eLZ = 47m.
Sydney e = 22m.30s., eL = 26m.
Tinemaha ePZ = 22m.37s.
Tucson eP = 22m.44s., ePP = 26m.13s., ePPP = 28m.9s., eS = 32m.43s. and 32m.54s., ePS = 33m.30s., ePPS = 34m.4s., eL = 43m.17s., ePKP,PKP = 49m.50s.
Huancayo eP = 23m.7s., eSS = 36m.51s., eL = 47m.4s.
San Juan eP = 24m.39s., eSKS = 35m.17s., eSKKS = 35m.45s., eS = 36m.16s., ePS = 37m.5s.
Ukiah ePPP = 27m.16s., eSS = 38m.16s., eSSS = 41m.48s., eL = 44m.19s.
Ksara e = 31m.19s. and 48m.36s.
Mizusawa SE = 46m.34s.
Long waves were also recorded at Florissant and La Paz.

Jan. 4d. 20h. 44m. 57s. Epicentre 40°·8N. 36°·8E. (as on 1939, Dec. 28d.).

A = +·6079, B = +·4548, C = +·6509; δ = +6; h = −2;
D = +·599, E = −·801; G = +·521, H = +·390, K = −759.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Sotchi	3·5	37	0 50	− 7	i 1 35	− 5	—	—	—
Erevan	5·9	92	e 1 12	−19	e 2 26	−14	—	—	3·2
Ksara	7·0	186	e 1 56	+10	—	—	—	—	i 3·5
Grozny	7·1	67	e 1 46	− 2	e 2 47	?	3 27	S_g	—
Moscow	15·0	3	3 35	0	e 6 22	− 1	—	—	—
Pulkovo	19·4.	351	4 35	+ 5	8 13	+ 9	—	—	—
Sverdlovsk	22·3	36	4 50	−11	—	—	—	—	10·0

Additional readings :—
Sotchi eS = +1m.19s.
Erevan eP* = +1m.20s.
Long waves were also recorded at Baku and Rome.

Jan. 4d. Readings also at 0h. (Ksara), 2h. (San Juan), 8h. (near Tucson), 12h. (San Juan), 13h. (near Wellington), 16h. (near Tananarive), 19h. (Ksara, Warsaw, Sofia, Bucharest, Prague, Triest, Rome, Stuttgart, De Bilt, Uccle, Tucson, Riverside, Mount Wilson, Tinemaha, Sitka, and College), 20h. (Ksara), 21h. (Tucson (2)), 22h. (Rome and Tucson).

Jan. 5d. Readings at 0h. (Mount Wilson, Pasadena, Riverside, Tinemaha, and near Ottawa), 1h. (Calcutta and Ksara), 2h. (Bozeman, Rome, Sofia, and near Bucharest), 3h. (Rome), 4h. (near Mizusawa), 6h. (near Fresno and Tucson), 8h. (3) and 10h. (Tucson), 15h. and 17h. (4) (Tucson), 18h. (near Williamstown), 21h. (Baku, Sverdlovsk, Grozny, Helwan, Ksara, and Tucson), 22h. and 23h. (Tucson).

Jan. 6d. 8h. 15m. 29s. Epicentre 44°·7N. 152°·3E.

A = −·6314, B = +·3315, C = +·7010; δ = −4; h = −3;
D = +·465, E = +·885; G = −·621, H = +·326, K = −·713.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Mizusawa		10·0	240	2 29	+ 2	4 12	−10	—	—	—
Vladivostok		14·8	272	e 3 29	− 3	i 6 46	SSS	—	—	7·7
Zi-ka-wei	z.	27·7	253	e 5 55	+ 3	10 47	+14	i 11 17	SS	14·7
College		38·1	37	e 7 28	+ 6	e 13 19	+ 3	—	—	e 16·1
Hong Kong		38·4	248	7 29	+ 4	13 17	− 3	8 57	PP	—
Manila		40·1	232	i 7 47k	+ 8	13 21	−25	—	—	17·9
Honolulu		47·0	103	e 8 31	− 4	e 15 19	− 7	e 18 28	S_cS	—
Almata		52·4	298	8 59	−17	—	—	—	—	—
Frunse		54·1	298	9 29	0	—	—	—	—	—
Sverdlovsk		55·0	319	i 9 35	0	21 7	SS	—	—	26·5
Calcutta	N.	56·2	270	e 9 45	+ 1	i 17 37	+ 4	—	—	—
Andijan		56·6	297	9 47	0	17 54	+16	—	—	28·5
Tashkent		58·2	299	i 9 59	+ 1	e 18 18	+19	—	—	e 22·5
Agra	E.	60·6	281	i 10 14a	− 1	18 28	− 2	22 22	SS	—
Samarkand		60·6	299	10 18	+ 3	—	—	—	—	—
Bozeman		63·8	51	—	—	19 18	+ 7	—	—	e 35·7
Tinemaha	z.	64·8	63	e 10 53	+10	—	—	—	—	—
Pulkovo		65·6	333	e 10 43	− 5	e 19 57	+24	—	—	e 34·0
Scoresby Sund		65·6	358	e 19 37	S	(e 19 37)	+ 4	e 35 27	L	(35·4)
Moscow		65·9	327	10 46	− 4	e 20 0	+23	—	—	—
Pasadena	z.	66·6	65	e 11 12	+18	—	—	—	—	—
Mount Wilson	z.	66·7	65	i 11 16	+21	—	—	—	—	—
Riverside	z.	67·2	65	e 11 4	+ 6	—	—	—	—	—
Bombay		69·6	278	e 11 12	− 1	i 20 34	+13	—	—	36·5
Baku		70·4	309	—	—	e 20 31	+ 1	—	—	35·0
Grozny		70·7	313	e 11 17	− 3	—	—	—	—	—
Tucson		72·5	63	e 11 38	+ 8	e 20 57	+ 3	—	—	e 30·3
Erevan		73·5	312	e 11 34	− 2	—	—	—	—	—
Warsaw		74·7	332	e 11 33a	−10	e 20 44	−35	—	—	28·5
Bucharest		79·2	325	—	—	e 31 19	SSS	—	—	43·5
De Bilt		79·5	341	i 12 12a	+ 2	—	—	—	—	e 28·0
Ottawa		80·7	33	e 12 21	+ 5	—	—	—	—	44·5
Uccle	z.	80·9	342	i 12 18a	+ 1	—	—	—	—	—
Ksara		82·9	311	i 12 29a	+ 1	e 23 9	+23	—	—	45·2
Basle		83·0	338	e 12 31	+ 3	—	—	—	—	—
Paris		83·2	342	12 32	+ 3	—	—	—	—	e 49·5
Rome		86·6	332	—	—	e 22 52	[−20]	e 32 38?	SSS	—
Helwan		88·4	312	e 12 55	0	23 19	[− 4]	—	—	—
Toledo		92·6	343	—	—	e 21 26	?	—	—	51·5
Granada		95·6	341	i 20 51	?	—	—	—	—	45·7

Additional readings :—
Agra S_cSE = +20m.18s.
Riverside iZ = +11m.19s.
Tucson eP = +11m.50s.
Bucharest eN = +33m.2s., eE = +33m.6s., iN = +33m.37s. and +34m.48s., iE = +35m.4s.
Helwan iZ = +13m.16s., iE = +23m.37s., SKKSEN = +23m.53s.
Long waves were also recorded at Upsala, Triest, Bidston, Fordham, Florissant, Irkutsk, Kew, and Jersey.

Jan. 6d. 14h. 3m. 27s. Epicentre 21°·8S. 170°·8E.

A = −·9173, B = +·1486, C = −·3693 ; δ = −10 ; h = +4 ;
D = +·160, E = +·987 ; G = +·365, H = −·059, K = −·929.

Tables for depth of focus 0·005 have been used.

		△	Az.	P.	O−C.	S.	O−C.	Supp.			L.
				m. s.	s.	m. s.	s.	m. s.			m.
		°	°								
Arapuni		16·8	166	3 57	+ 5	7 9	+13	i 4 9	pP		—
New Plymouth		17·4	172	4 3	+ 3	7 22	+13	—	—		—
Apia		18·4	68	i 4 11k	− 1	i 7 37	+ 5	i 7 54	SS		—
Wellington		19·7	172	4 26	− 1	8 8	+ 8	i 4 41	pP		9·5
Riverview		21·0	230	i 4 39k	− 1	i 8 30	+ 5	5 3	PP		e 10·2
Sydney		21·0	230	i 4 39	− 1	i 8 36	sS	i 9 12	SS		—
Christchurch		21·7	176	4 46k	− 1	8 44	+ 6	i 5 10	PP		—
Chatham Ils.		24·5	158	5 3	−11	9 21	− 6	—	—		11·5
Adelaide		31·1	238	6 13	− 1	11 11	− 3	7 10	PP		12·8
Palau		45·9	305	8 18	0	14 56	− 1	—	—		—
Perth		49·6	246	8 58	+11	15 46	− 3	10 40	PP		22·4
Honolulu		52·7	38	9 9	− 1	i 16 29	− 2	e 11 19	PP		e 22·0
Manila		60·8	303	10 7	− 1	18 17	− 1	—	—		28·9
Yokohama		64·1	332	10 30	0	19 1	+ 1	—	—		e 30·2
Tokyo, Cen. Met. Ob.		64·3	333	10 40	+ 9	19 0	− 2	19 8	sS		—
Nagoya		65·1	331	10 37	+ 1	19 13	+ 1	—	—		—
Osaka		65·4	328	9 34	−64	19 8	− 8	—	—		—
Kosyun		65·4	308	10 37	− 1	19 15	− 1	—	—		—
Miyazaki		65·4	324	10 39	+ 1	e 19 3	−13	—	—		26·6
Koti		65·5	327	10 37	− 2	19 18	+ 1	—	—		—
Kobe		65·6	329	10 37	− 2	19 15	− 3	—	—		—
Sendai		66·0	335	10 39	− 3	19 23	0	—	—		—
Kumamoto		66·5	324	10 37	− 8	19 21	− 8	—	—		—
Mizusawa		66·7	335	e 10 47	+ 1	19 28	− 3	—	—		—
Hukuoka		67·2	324	10 49	0	19 38	0	—	—		39·2
Hamada		67·3	326	10 51	+ 1	19 37	− 2	—	—		—
Mori		69·5	337	11 8	+ 4	20 7	+ 2	—	—		i 39·2
Sapporo		70·0	338	e 11 11	+ 4	20 7	− 4	—	—		e 32·9
Hong Kong		70·5	305	11 11a	+ 1	20 17	0	13 44	PP		33·8
Zi-ka-wei	z.	70·8	317	i 11 13a	+ 1	20 3	−17	13 55	PP		34·5
Keizyo		72·0	324	11 17	− 2	20 31	− 3	—	—		—
Vladivostok		73·9	332	i 11 29	− 1	i 20 54	− 1	i 11 49	pP		e 34·6
Phu-Lien		75·6	300	e 11 40	0	i 21 14	0	—	—		—
Branner		86·2	47	e 12 38	+ 3	—	—	—	—		—
Berkeley		86·4	47	i 12 37	+ 1	e 22 37	[−17]	i 13 1	pP		e 40·6
Santa Clara		86·4	47	i 12 37	+ 1	e 22 41	[−13]	e 28 6	SS		—
Santa Barbara		86·5	51	i 12 37	0	—	—	—	—		—
Ukiah		86·5	45	e 12 37	0	e 23 10	+ 4	e 15 47	PP		e 35·3
Lick		86·6	47	e 12 39	+ 2	—	—	e 13 6	pP		—
La Jolla		87·5	54	e 12 40	− 2	—	—	—	—		—
Pasadena		87·5	52	e 12 40k	− 2	e 22 46	[−15]	i 13 3	pP		e 35·4
Fresno	N.	87·6	49	e 12 42	0	e 23 20	+ 3	e 13 5	pP		—
Mount Wilson		87·6	52	i 12 41k	− 1	—	—	i 13 5	pP		—
Riverside		88·0	52	i 12 43k	− 1	—	—	i 13 1	pP		—
Haiwee		88·6	50	e 12 47	0	—	—	e 13 12	pP		—
Tinemaha		88·8	50	e 12 48k	0	e 23 33	+ 5	e 38 37	P'P'		—
Sitka		90·6	26	e 12 54	− 2	i 23 39	− 5	e 12 58	PcP		e 36·0
Calcutta	N.	91·2	294	e 13 1	+ 2	i 23 17	[− 7]	e 15 59	PP		i 39·8
Victoria		91·3	38	13 6	+ 6	23 57	+ 7	16 33	PP		41·5
College		92·1	17	e 13 3	0	e 23 11	[−17]	e 16 40	PP		e 36·5
Tucson		92·1	56	i 13 3k	0	e 23 58	0	i 13 25	pP		e 37·6
Colombo	E.	93·4	276	13 9	0	23 36	[0]	e 18 53	PPP		—
Irkutsk		93·6	326	e 13 10	0	23 36	[− 1]	—	—		45·5
Salt Lake City		94·9	48	e 13 17	+ 1	e 24 9	−13	e 17 1	PP		e 38·7
Butte		96·6	44	e 17 20	PP	24 28	− 8	e 26 11	PS		e 36·6

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m. s.			m.
Kodaikanal		96·8	279	i 13 24a	− 1	i 23 55	[0]	—		—	41·4
Bozeman		97·5	44	e 13 49	pP	e 23 41	[−17]	e 17 25	PP		e 39·0
Hyderabad		98·4	285	e 13 31	− 1	24 1	[− 2]	17 53	PP		46·7
Agra	E.	102·0	295	13 58	+10	i 24 12	[− 9]	18 12	PP		50·1
Dehra Dun	N.	102·9	298	e 13 4?	−48	e 24 11	[−13]	e 27 7	PS		e 35·6
Bombay		103·9	285	e 13 58	+ 1	i 24 25	[− 4]	i 18 14	PP		50·4
Lincoln		105·8	52	e 14 3	P	e 25 7	[+29]	i 18 25	PP		e 42·5
Huancayo		106·9	111	e 14 12	P	24 36	[− 6]	i 18 39	PP		i 42·4
La Plata	E.	107·1	140	18 31	PP	24 33	[−10]	27 45	PS		49·7
	N.	107·1	140	18 33	PP	26 22	+19	17 21	PKP		49·2
Almata		107·3	311	e 14 24	P	—	—	—	—	—	—
Florissant		110·0	55	e 19 20	pPKP	e 27 44	PS	e 28 50	PPS		—
Andijan		110·1	307	e 15 2	SP	i 29 3	sPS	18 53	pPKP		49·5
St. Louis		110·1	55	e 18 57	PP	e 26 34	S	i 27 25	sS		—
La Paz	Z.	110·9	119	e 14 17	P	24 59	[0]	i 19 1	PP		52·0
Tananarive	E.	111·3	238	e 19 5	PP	28 8	PS	34 28	SS		e 52·4
Tchimkent		112·4	309	—	—	e 26 14	S	—	—		—
Tashkent		112·5	308	e 14 54	P	i 25 55	SKKS	19 33	PP		—
Chicago, U.S.C.G.S.		112·6	52	e 19 13	PP	e 26 54	S	e 21 41	PPP		e 45·8
Samarkand		113·7	305	e 18 33	PKP	e 25 13	[+ 3]	—	—		—
Columbia		116·5	62	e 19 44	PP	e 25 53	SKKS	e 29 30	PS		e 49·7
Cape Town		118·6	208	e 19 58	PP	e 29 31	PS	e 22 54	PPP		47·7
Toronto		118·9	51	—	—	i 29 49	PS	e 35 33	SS		49·5
Sverdlovsk		119·0	324	e 15 5	P	27 48	S	15 26	pP		56·6
Pennsylvania		119·8	54	e 21 18	?	e 28 54	PS	—	—		e 58·3
Ottawa		121·5	49	i 18 40	PKP	27 33?	S	19 18	PP		56·5
Philadelphia		121·8	56	—	—	e 27 37	S	e 36 32	SS		i 51·3
Fordham		122·8	54	i 18 50a	PKP	i 30 16	PS	i 20 28	PP		e 54·5
Harvard		124·6	53	i 18 50	PKP	i 32 16	PPS	i 20 38	PP		e 61·6
Rio de Janeiro		124·6	142	i 20 41	PP	—	—	i 21 41	pPKP		i 57·0
Seven Falls		124·9	47	20 41	PP	30 36	PS	22 5	SKP		59·6
San Juan		126·7	83	e 15 43	P	i 25 57	[+ 2]	e 18 53	PKP		—
Baku		127·1	306	i 18 59	PKP	28 40	S	21 18	PP		63·1
East Machias		127·5	50	e 20 56	PP	e 25 51	[− 6]	i 21 19	PP		e 51·9
Bermuda		129·8	65	e 19 1	PKP	e 31 24	PS	e 21 12	PP		e 52·9
Grozny		129·9	309	19 6	PKP	—	—	e 22 21	PKS		—
Halifax		130·2	49	e 21 51	PP	e 31 51	PS	i 23 2	PPP		62·6
Scoresby Sund		130·7	6	i 19 4	PKP	26 4	[− 1]	e 19 26	pPKP		57·8
Erevan		131·2	306	16 20	pP	—	—	—	—		—
Moscow		131·7	327	i 19 3	PKP	e 28 0	SKKS	e 19 25	pPKP		67·0
Ivigtut		132·3	24	e 16 18	P	e 39 3	SS	22 31	PKS		e 54·8
Pulkovo		132·9	335	e 16 4	P	29 43	sS	16 27	pP		57·7
Upsala		137·5	342	e 19 17	PKP	i 28 43	SKKS	e 40 0	SS		e 54·5
Ksara		138·7	297	i 19 18k	PKP	40 11	SS	i 19 43	pPKP		—
Bergen		140·1	349	19 22	PKP	e 30 59	?	e 22 30	PKS		e 68·1
Copenhagen		142·5	341	e 19 18k	[− 8]	29 14	SKKS	22 51	PKS		—
Istanbul		142·5	310	17 7	P	—	—	20 35	pPKP		e 24·5
Helwan		142·8	292	i 19 21a	[− 5]	26 21	[− 6]	22 36	PP		—
Bucharest		143·2	317	i 19 22	[− 5]	i 29 21	SKKS	i 22 38	PP		42·6
Potsdam		145·0	338	i 19 29	[− 1]	i 29 31	SKKS	i 19 53	pPKP		i 51·8
Hamburg		145·1	341	i 19 30k	[0]	e 29 33	SKKS	i 19 54	pPKP		e 62·3
Heligoland		145·2	344	e 19 30	[0]	i 29 33	SKKS	e 41 29	SS		e 61·5
Edinburgh		145·6	354	19 33	[+ 2]	26 29	[− 2]	23 16	PP		—
Budapest		145·7	326	i 18 8	?	i 28 38	S	e 22 14	PP		e 67·0
Kecskemet	Z.	145·8	324	i 19 30	[− 1]	—	—	i 19 55	pPKP		—
Sofia		145·8	316	e 19 33	[+ 2]	i 29 39	SKKS	—	—		56·5
Szeged		145·9	324	i 19 35	[+ 4]	—	—	—	—		—
Prague		146·2	333	i 19 33	[+ 1]	e 26 33	[+ 1]	e 29 35	SKKS		e 63·5
Jena		146·7	335	e 19 30	[− 3]	e 29 40	SKKS	i 19 54	pPKP		e 51·5
Stonyhurst		147·6	353	19 37	[+ 3]	e 28 28	?	i 20 57	pPKP		69·6
De Bilt		147·8	344	i 19 34k	[0]	e 29 45	SKKS	i 20 2	pPKP		e 42·2
Bidston		148·1	354	i 19 37	[+ 2]	i 29 49	SKKS	i 20 1	pPKP		e 70·0
Uccle		149·2	345	i 19 36k	[− 1]	29 56	SKKS	i 20 1	pPKP		e 73·5
Stuttgart		149·4	337	e 19 37	[0]	i 29 57	SKKS	i 20 3	pPKP		e 67·2
Oxford	E.	149·5	351	i 19 42	[+ 5]	—	—	—	—		—

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
Kew	149·6	350	i 19 35	[− 2]	i 27 3	[+26]	i 29 35 SKKS	e 70·0
Triest	149·7	328	i 19 39k	[+ 2]	26 30	[− 7]	e 20 21 pPKP	e 68·6
Strasbourg	150·0	338	19 43	[+ 5]	30 0	SKKS	20 5 pPKP	e 52·5
Zurich	150·7	336	e 20 32?	PKP_2	—	—	—	—
Chur	150·8	335	e 19 38	[− 1]	e 30 0	SKKS	—	—
Basle	151·0	337	e 19 39	[− 1]	e 30 5	SKKS	—	—
Paris	151·5	345	i 19 40	[0]	26 33?	[− 6]	23 28 PP	e 68·5
Neuchatel	151·7	337	e 19 39	[− 1]	e 30 9	SKKS	—	—
Besançon	151·8	337	e 19 47	[+ 7]	e 30 13	SKKS	—	66·6
Jersey	152·1	351	e 19 51	[+10]	e 43 0	SS	e 35 33? PPS	73·0
Rome	152·9	322	i 19 40k	[− 2]	i 30 12	SKKS	i 20 1 pPKP	—
Toledo	161·5	348	i 19 52	[− 1]	i 29 53	SKKS	e 20 38 pPKP	—
Algiers	161·7	327	i 19 53	[0]	e 30 0	SKKS	e 23 6 PP	—
Lisbon	163·1	358	19 52	[− 3]	34 29	SKSP	20 17 pPKP	68·6
Granada	163·9	344	19 56	[0]	26 54	[+ 3]	25 4 PP	77·3
San Fernando	165·2	350	20 4	[+ 7]	31 18	?	e 37 20 PPS	72·5

Additional readings :—
Arapuni i = +7m.3s.
Apia eSSZ = +7m.58s.
Wellington PP? = +4m.51s., iZ = +5m.3s., P_cP? = +8m.16s., P_cS = +12m.18s., S_cS = +15m.50s.
Riverview iPPPZ = +5m.11s., iSE = +8m.33s., P_cP?EN = +8m.40s., SSN = +8m.52s., iE = +9m.8s.
Christchurch iZ = +9m.8s.
Adelaide P_cP = +8m.3s., SS = +12m.23s.
Perth i = +9m.45s., PPP = +11m.18s., PPPP = +11m.56s., i = +13m.26s., P_cS = +14m.15s., i = +16m.28s., SS = +19m.38s., SSS = +20m.28s., SSSS = +21m.15s.
Honolulu ePPP = +12m.21s., i = +16m.11s., iS = +16m.34s., isS = +17m.11s., i = +17m.17s., SS = +19m.52s., esSS = +21m.6s.
Tokyo SZ = +20m.21s.
Miyazaki iSEN = +19m.19s.
Hong Kong P_cP = +11m.27s., S_cS = +20m.59s., SS = +24m.44s.
Zi-ka-wei iZ = +11m.31s., +12m.7s., and +14m.15s., PPPZ = +15m.7s., iZ = +19m.5s., iN = +20m.19s., iZ = +20m.33s., iN = +21m.13s., SSZ = +24m.41s., iZ = +25m.13s., SSSZ = +27m.33s., SSSSZ = +28m.53s., iZ = +30m.59s. and +33m.23s.
Vladivostok isP = +12m.6s., isS = +21m.19s.
Berkeley iPPZ = +16m.0s.
Ukiah ePcP = +12m.41s., ePPP = +18m.0s., epS = +23m.32s., eSS = +28m.33s., eSSS = +32m.45s.
Pasadena iPPZ = +16m.4s., isPPZ = +16m.32s., iSN = +23m.19s., isSN = +23m.55s., ePKP,PKPZ = +38m.38s.
Fresno eSSN = +24m.2s.
Mount Wilson iPPNZ = +16m.7s., ePKP,PKPZ = +38m.33s.
Riverside iZ = +13m.17s., ePKP,PKPZ = +38m.34s.
Haiwee ePKP,PKPZ = +38m.37s.
Sitka esP = +13m.28s., PP = +16m.31s., isS = +24m.23s., eSS = +29m.39s.
Calcutta iSN = +23m.9s., eS_cSN = +23m.30s., iPSN = +23m.52s., eSSN = +28m.36s., eSSSN = +31m.56s.
Victoria PS = +24m.33s., PPS = +25m.16s., SS = +30m.45s.
College ePPP = +19m.9s., eS = +23m.53s., SPS = +25m.49s., eSS = +29m.58s., esSS = +30m.42s., eSSS = +33m.44s.
Tucson sP = +13m.49s., ePP = +16m.44s., ePPP = +18m.36s., iS = +24m.6s., esS = +24m.37s., esP = +25m.4s., esSP = +25m.43s., eSS = +29m.49s., eSSS = +33m.51s., ePKP,PKP = +39m.16s.
Irkutsk iS = +24m.11s.
Salt Lake City epPP = +17m.22s., S = +24m.18s., iS = +24m.27s., sS = +25m.3s., pPS = +25m.58s., SS = +30m.13s., sSS = +31m.4s., SSS = +34m.56s.
Butte S = +24m.36s., esS = +25m.17s., esSS = +31m.52s., eSSS = +34m.43s.
Kodaikanal iPSE = +24m.52s.
Bozeman epPP = +17m.55s., ePPP = +19m.30s., S = +24m.32s., eSP = +26m.8s., isSP = +26m.45s., esS = +31m.10s., SSS = +35m.55s.
Hyderabad SKKSN = +24m.23s., SEN = +24m.51s., PSE = +26m.26s., SSN = +31m.43s.
Agra iE = +14m.6s., +24m.52s., and +25m.19s., iPSE = +26m.54s., SSE = +32m.2s.
Bombay iEN = +14m.18s., iE = +17m.1s., iSKKS = +25m.7s., iS? = +25m.43s., iPS = +27m.19s., i = +32m.16s., iSSE = +32m.46s., L_q = +43m.25s.
Lincoln esPP = +18m.51s., eS = +26m.1s., eSP = +27m.35s., PS = +27m.47s., eSPS = +28m.15s., sSS = +34m.2s.
Huancayo ePKP = +17m.55s., PPP = +20m.35s., i = +25m.30s., iS = +26m.13s., ipPS = +28m.3s., iSS = +32m.48s., isSS = +33m.50s., iSSS = +37m.19s., iPKP, PKP = +38m.13s.
La Plata E +23m.27s., +26m.9s., +33m.57s., and +37m.39s.
La Plata N +25m.15s., +27m.39s., +33m.39s., and +37m.33s.

Continued on next page.

St. Louis eN = +19m.9s., ePPE = +19m.25s., iN = +26m.44s., iE = +28m.32s., iN = +34m.23s., +34m.46s., and +35m.3s.
La Paz iPZ = +14m.30s.k, iPPPZ = +21m.23s., SKKS = +26m.12s., iPSZ = +28m.27s., PPSZ = +29m.25s., iZ = +30m.11s., iSSZ = +35m.17s., iSSS = +39m.35s.
Tananarive eE = +23m.3s.
Tashkent pPP = +20m.4s., pS = +27m.31s.
Chicago, U.S.C.G.S., eSP = +28m.30s., epPS = +28m.53s., eSS = +34m.55s., esSS = +35m.49s., eSSS = +38m.50s.
Columbia epPP = +20m.5s., eS = +28m.13s., esSS = +36m.21s., eSSS = +40m.25s.
Cape Town ePN = +20m.2s., ePPPN = +25m.30s., eSE = +29m.35s., ePSN = +30m.59s. ePSE = +31m.6s., eSSN = +36m.3s., eSSE = +36m.9s., eSSSN = +39m.20s., eSSSE = +39m.25s.
Toronto i = +30m.53s., e = +36m.51s., +39m.21s., and +46m.21s.
Sverdlovsk iPKP = +18m.45s., ipPKP = +19m.8s., iPP = +20m.10s., iSKS = +25m.30s., iSP = +29m.38s., iSS = +36m.15s., isSS = +36m.57s.
Ottawa PPS = +30m.33s.?, SS = +35m.33s.?, SSS = +39m.33s.?
Philadelphia eSKSP = +30m.14s., ePSP = +31m.35s., eSSS = +40m.29s.
Fordham iSKPE = +22m.26s., iZ = +22m.35s., iPPSZ = +32m.0s., iSSE = +36m.40s., iN = +37m.46s.
Harvard iE = +32m.38s., eSSN = +37m.28s., iPSPSN = +38m.10s.
Seven Falls e = +33m.48s., SS = +38m.21s.
San Juan ipPP = +20m.52s., isPP = +21m.31s., PPP = +23m.13s., eS = +29m.2s., ePS = +30m.49s., ePPS = +32m.29s., eSS = +37m.54s.
Baku SP = +30m.56s., SS = +37m.45s.
East Machias iPKS = +22m.14s., eSKSP = +30m.50s., eSS = +37m.9s., esSS = +38m.34s., eSSS = +42m.23s.
Bermuda iPKS = +22m.27s., isPKS = +23m.12s., eSS = +38m.49s.
Scoresby Sund iPP = +21m.19s., SKP = +22m.18s., iPKS = +22m.31s., ipPKS = +22m.54s., PPP = +24m.37s., eSKSP = +31m.6s., ePS = +32m.3s., PPS = +33m.47s., SS = +39m.9s., eSSS = +43m.22s.
Moscow pPP = +22m.22s., sPP = +23m.4s., SP = +31m.47s., sPS = +33m.13s., SS = +38m.51s.
Pulkovo PKP = +19m.5s., pPKP = +19m.29s., PP = +21m.29s., pPP = +31m.53s.
Upsala e = +22m.40s., iN = +22m.49s., eE = +23m.10s. and +29m.9s., ePPSN = +34m.6s., eSSN = +40m.17s., eSSSE = +45m.4s.
Ksara sPKP = +19m.53s., PP = +22m.21s., PPS = +34m.41s.
Copenhagen iPPZ = +22m.56s. and +23m.24s., i = +32m.38s., +34m.57s., +35m.15s. and +38m.9s., SS = +41m.3s.
Helwan iZ = +19m.41s. and +20m.33s., SKPEZ = +22m.58s., iE = +26m.43s., SKKSE = +29m.21s., PSKSE = +32m.50s., SSE = +41m.21s.
Bucharest PPE = +21m.53s., PPN = +21m.56s., iN = +28m.48s., iE = +28m.55s., iSE = +29m.24s., iPSN = +29m.48s., iPSE = +29m.55s.
Potsdam iNW = +20m.4s., iE = +20m.52s. and +21m.28s., iNW = +22m.43s.
Hamburg eEN = +41m.33s. ?
Edinburgh i = +41m.37s., SS = +42m.23s.
Prague eSS = +36m.45s., eSSS = +42m.57s.
Jena iPKP = +19m.34s., eN = +30m.14s.
Stonyhurst e = +42m.3s., L_q = +62m.3s.
De Bilt iZ = +21m.2s.
Bidston i = +19m.44s., +20m.57s., and +23m.7s., e = +24m.3s., i = +25m.19s., +30m.39s., +33m.53s., +34m.13s., and +39m.13s., e = +42m.25s. and +47m.39s., eL_q = +62·6m.
Uccle PPZ = +23m.38s.
Stuttgart iPKP = +19m.51s., eE = +22m.3s., ePPN = +23m.29s., eE = +30m.35s., eSSN = +42m.25s., iSSE = +43m.17s.
Kew iZ = +19m.43s. and +20m.4s., iN = +23m.13s., eZ = +23m.34s., iNZ = +23m.59s., iN = +25m.24s., iZ = +28m.7s., iN = +28m.56s., iZ = +30m.43s., iNZ = +33m.31s., iN = +33m.45s., iNZ = +34m.7s., iZ = +35m.59s., iN = +39m.15s., eEN = +42m.23s., eE = +48m.23s., eL_q = +62·0m.
Triest iPP = +23m.12s., iSKKS = +29m.56s., ePSKS = +33m.22s., iPPS = +36m.59s., SS = +42m.0s., eSSS = +47m.54s.
Strasbourg e = +20m.42s. and +24m.30s.
Basle e = +19m.46s.
Paris e = +33m.26s., PS = +37m.32s., SS = +43m.33s.?
Jersey e = +28m.8s. and +63m.3s.
Rome iZ = +19m.48s., iN = +20m.7s.; isPKP = +20m.32s., i = +23m.35s., iZ = +23m.53s., PPP = +25m.9s., i = +30m.41s., iPPSZ? = +33m.29s., e? = +36m.45s., iSS = +39m.56s., iZ = +43m.50s., iSSS = +44m.58s.
Toledo iPP = +24m.21s., i = +31m.3s., iSS = +44m.34s.
Algiers eSKKS = +30m.33s., e = +31m.2s., +31m.15s., +36m.1s., and +45m.33s.?
Lisbon PKPE = +19m.58s., PKP_2Z = +20m.46s., $pPKP_2Z$ = +21m.7s., ?N = +23m.6s., PPZ = +24m.36s., pPPN = +24m.56s., pPPZ = +25m.7s., ?N = +27m.43s., pPPPZ = +28m.34s., ?Z = +32m.18s., ?N = +33m.34s., +35m.23s., and +38m.50s., SSN = +44m.12s., SSSN = +51m.1s.
Granada PKP_2E = +20m.38s., PPPE = +28m.40s., SKKSN = +31m.15s., SKSPE = +34m.55s., PPSN = +38m.36s., SS = +45m.2s., SSSN = +51m.25s.
Long waves were also recorded at Warsaw,

Jan. 6d. 19h. 4m. 33s. Epicentre 35°·7N. 25°·9E. (as quoted by De Bilt).

Intensity V-VI in Crete and at Santorin. Epicentre 35°·7N. 26°·4E. (Strasbourg).

See Annales de l'Institut de Physique du Globe de Strasbourg, 1940-1941, Strasbourg 1948.

A = +·7322, B = +·3555, C = +·5810 ; δ = +6 ; h = 0 ;
D = +·437, E = −·900 ; G = +·523, H = +·254, K = −·814.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Istanbul		5·9	24	(1 28)	− 3	1 28	P	2 55	S*	—
Sofia		7·3	345	e 1 53	+ 3	i 3 39	S*	i 3 59	S_g	—
Helwan		7·4	140	i 1 51k	− 1	i 3 9	− 9	i 3 51	S*	—
Ksara		8·4	99	e 2 5	− 1	i 3 35	− 8	—	—	—
Bucharest		8·7	2	2 14k	+ 4	4 5	+15	4 43	S_g	—
Szeged		11·4	340	2 50	+ 3	—	—	—	—	8·0
Kecskemet	Z.	12·1	340	2 59	+ 2	—	—	—	—	e 8·5
Rome		12·1	305	i 2 56	− 1	i 5 5	− 9	i 3 9	PP	i 6·1
Budapest	N.	12·8	339	3 7	+ 1	e 5 32	+ 2	e 3 16	PP	e 7·3
Triest		13·5	321	i 3 45k	PPP	i 6 23	SSS	—	—	—
Chur		16·5	318	e 3 57	+ 3	e 7 10	+12	—	—	—
Prague		16·6	334	i 3 54a	− 2	e 7 22	SS	—	—	e 8·5
Warsaw	Z.	16·9	351	3 57a	− 2	7 18	+11	—	—	8·4
	N.	16·9	351	4 22	+23	7 35	+28	—	—	—
Zurich		17·4	318	e 4 12	+ 6	e 7 28	+ 9	—	—	—
Stuttgart		17·9	323	i 4 11	− 1	e 7 32	+ 2	i 4 21	PP	e 9·8
Basle		18·0	319	e 4 13	0	e 7 44	+12	—	—	—
Neuchatel		18·1	316	e 4 13	− 1	—	—	—	—	—
Jena		18·4	332	i 4 17	− 1	e 7 57	SS	—	—	e 10·0
Strasbourg		18·6	321	e 4 24	+ 3	—	—	e 4 51	PP	e 9·1
Besançon		18·8	314	e 4 27?	+ 4	e 8 2	+12	—	—	e 11·8
Potsdam		19·0	336	e 4 33	+ 7	e 8 4	+ 9	—	—	e 10·8
Baku		19·4	68	4 33	+ 3	i 8 10	+ 6	—	—	10·5
Hamburg		21·1	334	e 4 44a	− 4	e 8 51	+12	—	—	e 12·3
Moscow		21·6	18	4 50	− 4	8 40	− 9	—	—	e 11·5
Paris		21·6	315	4 51	− 3	9 5	+16	—	—	e 11·5
Uccle		21·6	321	4 54	0	e 8 53	+ 4	—	—	e 12·5
Copenhagen		22·0	341	e 4 56	− 2	9 5	+ 9	—	—	11·5
De Bilt		22·0	326	i 4 58a	0	i 9 3	+ 7	—	—	e 12·5
Heligoland	E.	22·3	333	e 4 59	− 2	—	—	—	—	e 12·8
Granada		23·7	283	i 5 17k	+ 3	9 44	+17	5 54	PP	16·1
Toledo		24·0	290	e 5 17	0	e 9 35	+ 3	—	—	—
Pulkovo		24·3	6	e 5 19	− 1	i 9 29	− 8	—	—	e 12·0
Jersey		24·5	314	e 5 19	− 3	e 9 42	+ 2	—	—	e 15·5
Kew		24·5	314	i 5 31	+ 9	i 9 47	+ 7	—	—	e 12·5
Upsala		24·8	350	e 5 20	− 5	9 53	+ 7	—	—	e 13·2
Oxford	E.	25·1	319	e 5 27	− 1	i 10 2	+11	—	—	—
San Fernando		25·9	281	e 6 40	PP	e 10 42	SS	—	—	19·5
Stonyhurst		26·8	322	—	—	e 10 37	+18	—	—	15·5
Bidston		26·9	320	—	—	e 10 37	+17	—	—	e 13·5
Lisbon	N.	28·0	288	—	—	e 11 28	SS	—	—	—
Bergen		28·0	340	—	—	e 12 43	SSS	—	—	e 17·8
Sverdlovsk		31·5	37	6 27	+ 1	11 31	− 3	—	—	15·5
Samarkand		32·6	70	6 39	+ 4	—	—	—	—	—
Tashkent		34·1	66	e 6 51	+ 3	e 12 14	0	—	—	—
Andijan		36·5	68	7 11	+ 2	12 51	0	—	—	—
Frunse		37·9	64	7 23	+ 3	13 13	0	—	—	—
Almata		39·6	62	e 7 49	+14	—	—	—	—	—
Agra	E.	44·8	85	e 8 14	− 3	14 50	− 5	17 48	SS	—
Calcutta	N.	55·3	86	e 12 12	PPP	e 17 19	− 2	—	—	—

Additional readings :—
Istanbul P = +23s.
Helwan iZ = +2m.30s.
Bucharest ?N = +3m.6s., S_gE = +4m.56s.
Rome iN = +3m.18s., iZ = +4m.0s., iEN = +4m.18s., iN = +4m.42s.
Triest iPP = +3m.52s., iPPP = +3m.55s., isS = +6m.43s., iSS = +6m.52s., i = +7m.8s. and +8m.4s.
Jena e = +8m.48s.

Continued on next page.

Hamburg eN = +7m.52s., eSN = +8m.5s.
Granada P_cP = +9m.6s.
Jersey e = +9m.36s.
Kew i = +9m.52s., iP_cSN = +13m.13s.
Upsala SE = +9m.58s.
Agra iE = +8m.18s.
Long waves were also recorded at La Plata, Vladivostok, Irkutsk, Cape Town, Grozny, and Semipalatinsk.

Jan. 6d. Readings also at 0h. (Manila and Ksara), 1h. (Ksara), 2h. (near Chur, Basle, Neuchatel, Zurich, Ksara (2), near Mizusawa, near Triest, and Colombo), 3h. (near Mizusawa, Calcutta, Agra, Bombay, Tucson, and Granada), 4h. (Tucson), 6h. (Tucson, Granada, Bozeman, Tinemaha, Mount Wilson, Riverside, College, Seattle, Lincoln, Sitka, and Salt Lake City), 7h. (Calcutta, San Juan, Bermuda, Fordham, Scoresby Sund, East Machias, and Columbia), 8h. (near Istanbul and Ksara), 9h. (near Tananarive, Bermuda, San Juan, and Huancayo), 10h. (Moscow, Sverdlovsk, Manila, Hong Kong, Ksara, Calcutta, Bombay, and Agra), 11h. (Irkutsk and Pulkovo), 15h. (Bozeman and Mizusawa), 17h. (Ksara and La Paz), 18h. (Pasadena, La Plata, La Paz, New Plymouth, Wellington (2), Tucson (2), San Juan, Huancayo, Riverside, Mount Wilson, Tinemaha, and Christchurch), 19h. (Tashkent, Tchimkent, Andijan, Almata, Frunse, and Samarkand), 20h. (Mizusawa), 21h. (Tucson), 22h. (Sverdlovsk, Agra, Samarkand, Frunse, Almata, and Andijan).

Jan. 7d. 3h. 22m. 31s. Epicentre 33°·6N. 141°·5E. (as on 1937 July 31d.).

A = −·6532, B = +·5196, C = +·5508 ; δ = +4 ; h = +1 ;
D = +·623, E = +·783 ; G = −·431, H = +·343, K = −·835.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Mizusawa		5·5	358	e 1 25	0	2 18	−12	—	—	—
Vladivostok		12·1	325	i 2 54	− 3	i 5 18	+ 4	—	—	i 6·9
Zi-ka-wei	Z.	17·1	267	4 7	+ 5	7 31	SS	—	—	11·3
Manila		26·5	229	e 5 53	+12	10 57	SS	—	—	14·6
Hong Kong		26·6	252	5 42	0	10 49	+33	6 33	PP	—
Phu-Lien		33·4	257	e 8 4	PPP	—	—	—	—	—
Calcutta	N.	47·7	272	e 7 14	?	e 14 10	?	—	—	—
College		52·0	31	—	—	e 16 35	− 1	—	—	e 28·5
Frunse		52·1	301	e 9 24	+10	—	—	—	—	—
Andijan		54·3	299	9 35	+ 5	17 20	+13	—	—	—
Agra	E.	54·4	281	9 28	− 3	17 3	− 6	e 20 41	SS	—
Honolulu		54·5	87	10 31	P_cP	—	—	—	—	—
Tashkent		56·3	301	—	—	i 17 39	+ 5	—	—	—
Sverdlovsk		57·8	321	i 9 58	+ 3	17 56	+ 2	—	—	29·5
Samarkand		58·5	300	e 9 59	− 1	—	—	—	—	—
Bombay		62·3	276	e 6 24	?	i 18 53	+ 1	—	—	—
Colombo	E.	62·6	260	—	—	e 18 59	+ 3	—	—	—
Moscow		70·1	325	11 14	− 2	20 23	− 4	—	—	—
Pulkovo		71·2	330	11 21	− 2	e 20 34	− 6	—	—	e 23·4
Ukiah		73·4	54	—	—	e 28 54	SSS	—	—	e 30·9
Upsala		76·1	335	—	—	e 21 29?	− 6	—	—	e 41·5
Bozeman		77·5	44	e 12 21	+22	e 21 57	+ 7	e 26 52	SS	e 35·3
Tinemaha	Z.	77·8	54	e 12 7	+ 6	—	—	—	—	—
Haiwee	Z.	78·5	54	e 12 9	+ 5	—	—	—	—	—
Pasadena	Z.	79·4	56	e 12 17	+ 8	—	—	—	—	—
Mount Wilson	Z.	79·5	56	e 12 14	+ 4	—	—	—	—	—
Warsaw	N.	80·0	328	—	—	e 21 58	−19	—	—	43·4
Riverside	Z.	80·1	56	e 12 18	+ 5	—	—	—	—	—
Ksara		83·2	306	i 12 33k	+ 4	e 23 9	PS	e 15 52	PP	—
Tucson		85·5	54	e 12 47	+ 6	—	—	—	—	e 35·1
Triest		88·0	327	e 11 55	−58	e 23 32	− 4	e 15 52	PP	e 42·6
Helwan	E.	88·7	305	—	—	e 23 41	− 2	—	—	—
Rome		91·5	325	e 16 19	PP	—	—	—	—	—
La Paz	Z.	148·4	64	19 59	[+14]	—	—	—	—	80·5

Additional readings :—
Zi-ka-wei iZ = +5m.19s.
Tucson eP = +12m.56s.
Triest ePPP = +18m.46s., eSKS = +22m.36s., ePS = +24m.27s., ePPS = +25m.25s., eSS = +29m.30s., eSSS = +33m.29s.
Long waves were also recorded at Irkutsk, Hukuoka, Stuttgart, Scoresby Sund, Toledo, Bergen, Huancayo, San Juan, Fordham, Hamburg, De Bilt, Stonyhurst, Prague, Kew, Bidston, Uccle, and Wellington,

Jan. 7d. 5h. 50m. 21s. Epicentre 36°·9N. 141°·3E. (as on 1939 Nov. 29d.).

Intensity II at Onahama, Tukubasan, Kakioka, and Hukusima ; I at Mito, Sendai, Utunomiya, Mizusawa, and Morioka.

Epicentre 36°·8N. 141°·4E. Shallow. Macroseismic radius 200-300kms.

See Seismological Bulletin of the Central Met. Obs., Japan, for the year 1940, Tokyo, 1950, p. 5-6. Macroseismic Chart, p. 5.

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

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Onahama	0·3	276	0 9k	− 2	0 17	− 1	—	—	—
Mito	0·8	232	0 14k	− 4	0 27	− 4	—	—	—
Hukusima	1·1	322	0 21a	− 1	0 37	− 2	—	—	—
Kakioka	1·1	233	0 19k	− 3	0 33	− 6	—	—	—
Tyosi	1·2	197	0 19	− 5	0 32	− 9	—	—	—
Tukubasan	1·2	235	0 19	− 5	0 34	− 7	—	—	—
Utunomiya	1·2	253	0 36	+12	0 51	+10	—	—	—
Sendai	1·4	347	0 27a	0	0 45	− 1	—	—	—
Kumagaya	1·7	244	0 29k	− 2	0 50	− 4	—	—	—
Tokyo Cen. Met. Ob.	1·7	225	0 31	0	0 53	− 1	—	—	—
Maebasi	1·8	254	0 33	+ 1	0 57	+ 1	—	—	—
Yokohama	2·0	222	0 36	+ 1	0 55	− 7	—	—	—
Mizusawa	2·2	357	e 0 39	+ 1	i 1 5	− 1	—	—	—
Hunatu	2·5	236	0 41	− 2	1 12	− 2	—	—	—
Nagano	2·5	265	0 43a	0	1 17	+ 3	—	—	—
Kohu	2·6	240	0 40	− 4	1 20	+ 3	—	—	—
Misima	2·6	227	0 44	0	1 19	+ 2	—	—	—
Miyako	2·8	11	0 47	0	1 20	− 2	—	—	—
Akita	3·0	342	0 56	P*	1 27	0	—	—	—
Osima	3·2	216	0 42	−10	1 14	−18	—	—	—
Toyama	3·3	268	0 55	+ 2	1 31	− 4	—	—	—
Omaesaki	3·4	228	1 3	P*	—	—	—	—	—
Wazima	3·5	281	0 58	+ 1	1 48	S*	—	—	—
Hamamatu	3·6	234	1 0a	+ 2	1 59	Se	—	—	—
Hatinohe	3·7	3	0 58	− 2	1 40	− 5	—	—	—
Aomori	3·9	354	1 7	P*	—	—	—	—	—
Nagoya	3·9	244	1 6	+ 4	1 53	+ 3	—	—	—
Gihu	4·0	250	1 7	+ 3	1 55	+ 3	—	—	—
Hatidyozima	4·0	199	1 0	− 4	1 48	− 4	—	—	—
Hikone	4·4	250	1 15	P*	2 18	S*	—	—	—
Kameyama	4·4	246	1 15	P*	2 22	Se	—	—	—
Owase	5·0	238	1 23	+ 5	2 36	S*	—	—	—
Osaka	5·2	247	2 36	S*	—	—	3 43	?	—
Mori	5·2	354	1 28	+ 7	2 31	+ 9	—	—	—
Toyooka	5·4	258	1 35	P*	2 57	Se	—	—	—
Siomisaki	5·7	235	2 37	S	(2 37)	+ 2	—	—	—
Sumoto	5·8	246	2 19	+50	—	—	—	—	—
Sapporo	6·2	0	1 49	P*	2 57	+ 9	—	—	—
Koti	7·2	245	3 26	S	(3 26)	+13	—	—	—
Nemuro	7·2	26	2 59	S	(2 59)	−14	—	—	—
Hirosima	7·7	253	3 32	S	(3 32)	+ 7	—	—	—
Vladivostok	9·5	314	e 2 22	+ 2	e 4 14	+ 4	—	—	4·9
Sverdlovsk	55·2	319	9 44	+ 7	—	—	—	—	28·2

Jan. 7d. 9h. 1m. 51s. Epicentre 25°·0N. 64°·0E.

A = +·3978, B = +·8156, C = +·4203 ; δ = +10 ; h = +3 ;
D = +·899, E = −·438 ; G = +·184, H = +·378, K = −·907.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bombay		10·2	125	e 2 30	− 1	e 4 27	0	e 2 47	PP	7·2
Agra	E.	12·8	77	e 3 7	+ 1	5 47	SS	—	—	—
Dehra Dun	N.	13·5	64	—	—	e 5 56	+ 9	—	—	e 9·5
Samarkand		14·8	9	e 3 31	− 1	—	—	—	—	—
Hyderabad		15·4	117	—	—	6 52	SS	—	—	10·5
Tashkent		16·9	14	3 51	− 8	i 7 18	+11	—	—	e 10·0
Andijan		17·2	22	e 4 5	+ 2	—	—	—	—	11·1
Kodaikanal	E.	19·5	137	i 4 38k	+ 7	i 8 24	+18	—	—	10·6
Frunse		19·9	22	e 4 36	0	—	—	—	—	—
Almata		21·1	26	e 4 51	+ 3	—	—	—	—	—
Calcutta	N.	22·4	91	e 5 11	+ 9	i 9 17	+13	e 5 36	PP	e 11·3
Colombo	E.	23·5	138	e 5 39	PP	—	—	—	—	—
Ksara		26·0	294	i 5 39k	+ 3	e 10 31	+25	e 8 53	PcP	—
Helwan		29·3	286	e 6 4	− 2	12 0	+61	7 12	PP	—
Sverdlovsk		31·9	356	i 6 28	− 1	—	—	—	—	16·1
Moscow		36·3	335	7 4	− 3	e 12 48	0	—	—	—
Pulkovo		41·9	335	—	—	e 14 9	− 4	—	—	17·0
Chur		48·1	312	e 8 41	− 2	—	—	—	—	—

Additional readings :—
Bombay e = +2m.55s., +3m.11s., +4m.51s., and +5m.12s.
Dehra Dun eN = +8m.8s.
Calcutta eP_cPN = +9m.5s.
Helwan eE = +11m.24s., iE = +12m.36s.
Long waves were also recorded at Granada, Rome, Warsaw, De Bilt, and Scoresby Sund.

Jan. 7d. 20h. 12m. 13s. Epicentre 46°·7N. 9°·6E.

Intensity V at Lenzerheide ; IV in Engadine and the Rhine Valley.

Epicentre 46°·7N. 9°·6E. Macroseismic area 100km.

E. Wanner.

Jahresbericht des Erdbebendienistes der Schweiz in Jahre, 1940, Annalen der Schweizer, Met. Zentral anstalt (1940), No. 5, p. 2, Zurich, 1941, Macroseismic Chart, fig. 2.

A = +·6787, B = +·1148, C = +·7255 ; δ = +16 ; h = −4 ;
D = +·167, E = −·986 ; G = +·715, H = +·121, K = −·688.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Chur		0·1	—	0 6	− 2	i 0 9	− 4	—	—	—
Zurich		1·0	314	0 21k	0	e 0 39	+ 3	—	—	—
Ravensburg		1·1	1	e 0 25	+ 3	i 0 40	+ 1	i 0 33	S_g	—
Ebingen		1·5	344	i 0 31	+ 3	i 0 54	+ 5	i 0 35	P_g	—
Sion		1·6	254	e 0 31	+ 1	e 0 52	+ 1	—	—	—
Basle		1·6	301	e 0 32	+ 2	i 0 55	+ 4	—	—	—
Neuchatel		1·8	279	e 0 35	+ 3	e 1 0	+ 4	—	—	—
Stuttgart		2·1	352	i 0 37a	0	i 1 4	0	e 0 46	P_g	—
Strasbourg		2·3	327	i 0 38	− 2	1 5	− 4	1 20	S_g	—
Besançon		2·5	283	—	—	i 1 25	S_g	—	—	—
Triest		3·1	110	e 0 58	P*	e 1 32	+ 3	e 1 2	P_g	—
Jena		4·4	16	e 1 28	P_g	e 2 16	S*	—	—	e 2·4
Warsaw	N.	9·1	49	—	—	e 4 24	S*	—	—	—

Additional readings :—
Ravensburg eE = +29s., iS_gE = +43s.
Stuttgart iNE = +51s., iS* = +1m.10s., iS_g = +1m.16s,
Besançon e = +1m.32s.
Triest e = +1m.6s., eP_gP_g = +1m,10s,
Jena e = +1m,32s,

Jan. 7d. Readings also at 0h. (Warsaw, Bucharest, and Triest), 1h. (Balboa Heights, Columbia, Bermuda, Fordham, San Juan, Tucson, La Paz, and Huancayo), 2h. (Ksara), 3h. (Almata, Frunse, Andijan, and Samarkand), 4h. (Tucson (2), and near Hukuoka (2)), 5h. (Tchimkent, Tashkent, near Tucson (3), Andijan, and Samarkand), 7h. (Tucson), 9h. (New Plymouth and near Wellington), 13h. (Rome), 16h. (Basle, Ksara, La Paz, and near Uccle), 17h. (Salt Lake City and Rome), 18h. (Tucson (2)), 20h. (near Triest (2), Uccle, and near Chur, Basle, and Zurich), 21h. (La Paz, La Plata, Tucson, Harvard, Williamstown, Riverside, Mount Wilson, Pasadena, Haiwee, Tinemaha, and Huancayo).

Jan. 8d. Readings at 1h. (College, Honolulu, and Ksara (2)), 2h. (La Paz), 5h. (Tucson), 7h. (Ksara), 9h. (near Wellington and New Plymouth), 13h. (Tucson (2)), 16h. (Ksara), 17h. (Jena), 21h. (Tucson), 23h. (Ksara).

Jan. 9d. 20h. Local Japanese shock.
Tokyo Imperial University gives Epcentre 36°·92N. 141°·66E.

Kamakura P = 2m.20s., S = 2m.54s.
Kiyosumi P = 2m.20s., S = 2m.49s.
Komaba P = 2m.20s., S = 2m.52s.
Koyama P = 2m.20s., S = 2m.58s.
Titibu P = 2m.20s., S = 2m.54s.
Tukubasan P = 2m.20s., S = 2m.40s.
Tokyo, Imp. Univ. P = 2m.21s., S = 2m.52s.
Mizusawa P = 2m.29s., iS = 3m.0s.
Susaki P = 2m.36s., S = 3m.18s.

Jan. 9d. Readings also at 3h. (Uccle), 6h. (Manila, near Rome and Apia), 8h. (Tucson), 13h. (Arapuni, Wellington, Tucson, and Apia), 14h. (near Chur, Huancayo, Riverview, and Sydney), 16h. (near Chur, Christchurch, and near Wellington), 19h. (near Harvard), 22h. (Tucson and near La Paz), 23h. (Istanbul).

Jan. 10d. 11h. 17m. 29s. Epicentre 35°·0N. 98°·8E.

$A = -\cdot1256$, $B = +\cdot8113$, $C = +\cdot5710$; $\delta = +2$; $h = 0$;
$D = +\cdot988$, $E = +\cdot153$; $G = -\cdot087$, $H = +\cdot564$, $K = -\cdot821$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Calcutta	N.	15·4	219	i 3 43k	+ 3	i 6 59	SS	e 3 52	PP	i 8·8
Phu-Lien		15·7	152	e 3 44	0	—	—	—	—	—
Irkutsk		17·7	11	4 5	− 5	7 16	−10	—	—	8·9
Dehra Dun	N.	18·1	261	—	—	e 7 44	+ 9	—	—	e 10·3
Hong Kong		18·5	128	4 16k	− 3	7 51	+ 7	4 23	PP	10·0
Almata		18·8	304	4 25	+ 2	7 54	+ 4	—	—	—
Zi-ka-wei	Z.	19·3	94	e 4 25	− 4	8 1	− 1	i 9 41	?	11·1
Agra	E.	19·4	251	i 4 30k	0	8 17	+13	i 4 42	PP	—
Frunse		20·4	300	e 4 49	+ 8	e 8 50	SS	—	—	—
Semipalatinsk		20·5	326	4 38	− 4	8 29	+ 2	—	—	—
Andijan		21·6	293	5 3	+ 9	9 14	SS	—	—	—
Keizyo		22·8	75	5 11	+ 6	11 57	L	—	—	(11·9)
Tchimkent		23·9	297	5 18	+ 2	9 46	+16	—	—	—
Hyderabad	N.	25·2	230	e 5 32	+ 3	10 8	+16	—	—	13·6
Kumamoto		26·5	85	5 44	+ 3	13 54	L	—	—	(13·9)
Bombay		28·0	241	e 5 56	+ 1	i 10 49	+11	e 6 55	PPP	e 14·3
Manila		28·5	129	e 6 4	+ 5	11 18	+32	—	—	15·0
Colombo	E.	33·0	216	—	—	e 12 1	+ 4	—	—	—
Sverdlovsk		33·7	323	i 6 44	− 1	i 12 14	+ 6	—	—	i 18·1
Moscow		46·1	317	8 26	− 2	15 13	− 1	—	—	22·0
Pulkovo		49·8	322	i 8 55	− 1	e 16 4	− 2	—	—	e 23·4
Ksara		51·1	288	—	—	e 17 32	+68	e 20 20	SSS	—
Warsaw	z.	56·1	314	—	—	e 21 21	SS	—	—	27·5
Helwan		56·2	285	e 9 49	+ 5	e 17 34	+ 1	—	—	—
Upsala		56·2	323	—	—	e 24 31	SSS	—	—	e 30·5

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Prague		60·8	313	—	—	e 26 31	?	— —	e 30·9
Hamburg		62·1	318	—	—	e 25 31	SSS	— —	I 32·5
College		67·8	25	—	—	e 19 57	− 3	e 27 46 SSS	e 31·0
Toledo		77·0	310	i 11 57a	+ 1	—	—	— —	—
Tucson		107·5	27	e 18 35	PP	e 24 55	[− 6]	e 21 1 PPP	e 43·3
La Paz	z.	158·2	322	27 27	PPP	—	—	— —	85·5

Additional readings :—
Calcutta eSSN = +7m.16s., eP_cPN = +8m.23s.
Hong Kong SS = +8m.1s.
Zi-ka-wei iN = +8m.5s., iE = +10m.19s., iN = +10m.47s.
Agra SSE = +9m.2s.
Bombay eEN = +11m.56s. and +13m.28s.
Manila ePN = +6m.8s.
Helwan eZ = +10m.19s.
Toledo i = +12m.9s.
Tucson eS = +26m.17s., ePS = +27m.47s., ePPS = +29m.2s., eSS = +33m.33s., eSSS = +37m.55s.
Long waves were also recorded at Zinsen, Huancayo, Scoresby Sund, and other Japanese, American, and European stations.

Jan. 10d. Readings also at 0h. (Helwan and Columbia), 2h. (Columbia), 3h. (Mount Wilson, Tucson, La Paz, Riverview, and Huancayo), 4h. (Wellington and Christchurch), 6h. (Riverview), 10h. (near Mizusawa), 11h. (Bombay, Agra, Calcutta, and Kodaikanal), 14h. (near Hukuoka and Tucson), 17h. (Ksara), 18h. (Tucson), 19h. (Tucson), 20h. (Tucson), 23h. (Ksara (2), and Bucharest).

Jan. 11d. 9h. Local Japanese shock.

Tokyo Imperial University gives epicentre 35°·9N. 140°·1E.

Kamakura P = 5m.15s., S = 5m.25s.
Koyama P = 5m.15s., S = 5m.30s.
Susaki P = 5m.15s.
Titibu P = 5m.15s., S = 5m.28s.
Togane P = 5m.15s., S = 5m.25s.
Tokyo, Imp. Univ. P = 5m.15s., S = 5m.24s.
Tukubasan P = 5m.15s., S = 5m.24s.

Jan. 11d. Readings also at 0h. (Ksara), 2h. (Sverdlovsk, Frunse, Samarkand, Andijan, Triest, Columbia, and College), 3h. (near Hukuoka and Bozeman), 8h. (near Balboa Heights and Huancayo), 9h. (near Chur and Zurich, Huancayo, and La Paz), 10h. (Manila, Ksara, Christchurch, and Wellington), 12h. (Ksara, near Christchurch Wellington, Hastings, and New Plymouth), 13h. (Jena), 14h. (Tinemaha, Haiwee, Pasadena, Mount Wilson, Riverside, and Tucson), 16h. (Tucson), 18h. (Apia), 19h. (Chur and Wellington), 20h. (Sofia), 21h. (Tucson), 22h. (Tucson), 23h. (La Paz).

Jan. 12d. Readings at 0h. (Ksara), 1h. (Ksara), 2h. (Ksara and Tucson), 5h. (Tucson), 6h. (Colombo), 7h. (La Paz), 12h. (Balboa Heights and Wellington), 15h. (Tucson), 16h. (Wellington), 17h. (Manila), 18h. (Tucson (2)), 20h. (Hukuoka), 22h. (Istanbul).

Jan. 13d. Readings at 0h. (Ksara), 2h. (Columbia), 5h. (Fordham, Ukiah, and Tucson), 7h. (Tucson), 8h. (Tucson), 10h. (Tucson), 17h. (Bozeman), 18h. (Tucson), 20h. (Fresno, near Branner, San Francisco, Lick, and Berkeley), 22h. (Bucharest, Sofia, Ksara, and Tucson).

Jan. 14d. 18h. Undetermined shock.

Istanbul P = 56m.14s., S_g = 57m.0s.
Bucharest eEN = 59m.24s., S?N = 60m.17s., S?E = 60m.33s., S_g?N = 60m.49s., L = 62·9m.
Sofia eEN = 59m.24s.
Ksara e = 61m.8s., e = 63m.4s.
Triest eP = 61m.22s., e = 65m.40s. and 66m.26s.
Stuttgart eNW = 62m.4s., e = 62m.13s.
Strasbourg ePP = 62m.30s.
Uccle eP = 62m.45s., eL = 70·0m.
Sverdlovsk P = 63m.12s., S = 67m.37s., L = 74·0m.
Toledo eZ? = 63m.40s.
Rome e = 65m.29s., 66m.1s., and 66m.46s.
De Bilt e = 71m.0s.
Long waves were also recorded at Baku.

Jan. 14d. Readings also at 0h. (Tucson), 2h. (Zi-ka-wei), 3h. (Tucson and Zi-ka-wei (3)), 4h. (Zi-ka-wei), 5h. (Zi-ka-wei), 6h. (Zi-ka-wei), 7h. (Zi-ka-wei), 8h. (Manila, Zi-ka-wei, Calcutta, and Agra), 9h. (Manila and Zi-ka-wei), 10h. (Zi-ka-wei, Calcutta, Agra, Tinemaha, Pasadena, De Bilt, Uccle, and Paris), 12h. (Zi-ka-wei), 13h. (Manila, Zi-ka-wei, Agra, Tucson, Apia, Kodaikanal, Bozeman, and Bombay), 16h. (Tucson), 17h. (Tucson), 18h. (College).

Jan. 15d. 6h. Local Japanese shock.

Tokyo Imperial University gives epicentre 35°·66N. 146°·06E.

Kamakura P = 1m.12s., S = 1m.21s.
Kiyosumi P = 1m.12s., S = 1m.21s.
Koyama P = 1m.12s., S = 1m.26s.
Titibu P = 1m.12s., S = 1m.26s.
Togane P = 1m.12s., S = 1m.22s.
Tokyo, Imp. Univ. P = 1m.12s., S = 1m.21s.
Tukubasan P = 1m.12s., S = 1m.22s.
Susaki P = 1m.22s., S = 1m.37s.

Jan. 15d. 13h. 19m. 24s. Epicentre 38°·1N. 13°·5E.

Intensity VIII at Villabate and Misilmeri ; VII at Palermo, Ficorazzi, and Bolognetta.

Macroseismic radius 70kms. approximately. Epicentre 38°04′N. 13°28′E.

F. Dalmasso.

Sur terremoto Palermitano del 15 Gennaio, 1940. Geofisica Pura e Applicata, Vol. 2, No. 1, p. 42-55. Messina, 1940. Macroseismic Chart.

$A = +\cdot7671$, $B = +\cdot1841$, $C = +\cdot6145$; $\delta = -5$; $h = -1$;
$D = +\cdot233$, $E = -\cdot972$; $G = +\cdot598$, $H = +\cdot143$, $K = -\cdot789$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Rome		3·9	348	i 1 3k	+ 1	i 1 43	− 7	i 1 56	L_q	—
Triest		7·5	1	2 12	+19	e 3 47	S*	e 2 34	P_g	3·9
Sofia		8·8	55	e 2 12	+ 1	—	—	—	—	5·6
Chur		9·2	342	e 2 18	+ 2	—	—	—	—	—
Zurich		10·0	340	e 2 27	0	—	—	—	—	—
Neuchatel		10·1	334	e 2 30	+ 2	—	—	—	—	—
Basle		10·4	336	e 2 34	0	e.4 29	− 3	—	—	—
Stuttgart		11·1	346	e 2 44	+ 1	—	—	e 2 58	PP	—
Strasbourg		11·3	340	e 2 42	− 4	—	—	—	—	—
Prague		12·0	2	e 1 54	−61	e 6 53	L	—	—	(e 6·9)
Toledo		13·7	283	e 3 6	−12	—	—	—	—	6·1
Warsaw	z.	15·1	18	e 3 40	+ 4	—	—	—	—	—
Hamburg		15·7	352	e 3 51	+ 7	—	—	—	—	e 9·6
Helwan	z.	16·9	114	e 4 0	+ 1	e 7 31	SS	—	—	—
Ksara		18·8	98	e 4 23	0	e 7 58	+ 8	—	—	—

Additional readings :—
Rome iE = +1m.50s., iZ = +1m.53s., iZ = +2m.9s.
Triest eP_gP_g = +2m.49s., eS_gS_g = +4m.42s.
Toledo e = +3m.18s.
Helwan iZ = +4m.7s.
Long waves were also recorded at Bidston, Kew, Uccle, De Bilt, Granada, Paris, Jersey, Budapest, and Potsdam.

Jan. 15d. Readings also at 0h. (Bucharest), 1h. (near Mizusawa), 2h. (Andijan, Frunse, Almata, Tchimkent, Sverdlovsk, Irkutsk, and Agra), 6h. (Lick), 9h. (Ksara), 10h. (Branner), 11h. (Manila and near Triest), 12h. (near Berkeley), 14h. (Agra), 16h. (near Chur, Zurich, and Basle), 17h. (near Branner, Ksara, and Tucson), 19h. (Ksara), 21h. (Huancayo), 22h. (Tucson), 23h. (San Juan).

Jan. 16d. Readings at 0h. (Triest, near Zurich, Strasbourg, Rome, Sofia, and near Balboa Heights), 5h. (near Manila), 6h. (near Berkeley, Branner, Bozeman, San Juan, and San Francisco), 8h. (Colombo), 9h. (Chur), 10h. (Huancayo, near Berkeley, and near Balboa Heights), 13h. (Branner, Lick, Zi-ka-wei, and Fresno), 16h. (Seattle), 18h. (Tucson), 22h. (Riverside, Tinemaha, San Juan, Pasadena, Mount Wilson, and Tucson (3)).

Jan. 17d. 1h. 14m. 53s. Epicentre 17°·5N. 148°·3E.

$A = -·8119$, $B = +·5015$, $C = +·2989$; $\delta = +3$; $h = +5$;
$D = +·525$, $E = +·851$; $G = -·254$, $H = +·157$, $K = -·954$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Palau		16·8	235	3 58	0	7 6	+ 1	—	—	—
Yokohama		19·5	337	4 29k	− 2	8 16	+10	—	—	—
Tokyo Cen. Met. Ob.		19·7	338	4 35	+ 1	8 27	SS	—	—	—
Nagoya		20·3	333	4 41	+ 1	8 39	SS	—	—	—
Nake		20·4	307	4 40	− 1	8 36	+11	—	—	—
Osaka		20·5	321	4 43	+ 1	8 32	+ 5	—	—	—
Miyazaki		21·0	316	4 44	− 3	8 39	+ 2	—	—	—
Nagano		21·1	336	4 47	− 1	8 45	+ 6	—	—	—
Mizusawa		22·4	345	5 1	− 1	9 10	+ 6	—	—	—
Hamada		22·6	322	5 3	0	9 7	0	—	—	—
Hukuoka		22·7	318	5 5	+ 1	9 11	+ 2	—	—	—
Akita		23·2	344	5 15	+ 6	9 46	SS	—	—	—
Mori		25·4	346	5 34	+ 3	10 29	SS	—	—	—
Taihoku		26·0	292	5 39	+ 3	9 58	− 8	—	—	—
Sapporo		26·2	348	5 45k	+ 7	11 36	SSS	—	—	e 19·1
Manila		26·4	268	i 5 38k	− 2	10 23	+11	—	—	25·0
Zinsen	Z.	27·5	320	5 57	+ 7	10 29	− 1	—	—	—
Zi-ka-wei		27·9	305	i 5 54a	0	10 12	−25	6 28	PP	22·2
Vladivostok		29·1	335	i 6 3	− 1	i 11 1	+ 5	—	—	14·6
Hong Kong		32·4	285	6 32a	− 2	11 49	+ 1	7 30	PP	15·2
Phu-Lien		39·4	282	e 7 32	− 1	13 34	− 1	—	—	—
Brisbane		44·9	175	i 6 13	?	i 12 49	?	—	—	—
Irkutsk		48·9	326	8 44	− 6	i 15 47	− 6	—	—	22·1
Apia		50·2	126	i 9 1	+ 1	i 16 18	+ 7	i 19 39	SS	24·1
Honolulu		50·8	76	i 9 7	+ 3	i 16 33	+13	i 10 36	P_cP	21·0
Riverview		51·1	178	e 9 3	− 3	e 16 2	−22	10 56	PP	e 22·2
Sydney		51·2	178	—	—	e 16 10	−15	e 19 5	SS	e 22·4
Adelaide		53·0	191	e 9 17	− 4	i 16 51	+ 1	11 12	PP	e 30·1
Calcutta	N.	56·3	286	e 9 52	+ 7	i 17 33	− 1	i 19 35	S_cS	e 26·1
Perth		58·2	213	9 55	− 3	17 57	− 2	10 37	P_cP	26·3
Arapuni		61·0	156	—	—	19 7	PPS	26 37	L_g	30·1
Semipalatinsk		62·7	319	10 25	− 4	18 53	− 4	—	—	31·6
College		63·3	25	i 10 34	+ 1	i 19 8	+ 4	e 11 17	P_cP	e 26·3
Wellington		63·4	159	10 31	− 3	18 58	− 8	11 7	P_cP	31·1
Dehra Dun	N.	64·6	296	e 10 37?	− 4	i 19 7?	−14	e 27 17?	SSS	e 29·4
Almata		64·7	311	10 42	0	19 23	+ 1	—	—	—
Christchurch		64·7	161	10 41k	− 1	19 14	− 8	26 27	L_g	30·3
Agra	E.	65·0	292	e 10 38k	− 6	19 22	− 4	11 2	pP	—
Hyderabad		66·2	282	10 50	− 2	19 39	− 1	13 13	PP	32·8
Frunse		66·5	309	10 57	+ 3	19 50	+ 6	13 35	PP	34·1
Colombo	E.	67·4	270	10 56	− 3	19 50	− 5	—	—	34·9
Sitka		68·1	35	11 4	0	i 20 9	+ 6	e 15 32	PPP	28·4
Andijan		68·2	307	11 8	+ 4	i 20 10	+ 6	11 28	P_cP	32·1
Tchimkent		70·2	310	e 11 15	− 2	20 27	− 1	11 33	P_cP	35·1
Bombay		71·2	285	i 11 19	− 4	i 20 33	− 7	i 14 0	PP	37·7
Samarkand		72·5	307	11 29	− 1	20 50	− 4	21 47	S_cS	37·1
Sverdlovsk		74·3	326	i 11 40	− 1	i 21 10	− 5	—	—	31·4
Victoria		76·0	43	10 52	−59	19 31	?	25 37	SS	30·1
Ferndale		76·9	51	e 12 3	+ 7	e 21 52	+ 9	—	—	e 35·0
Ukiah		78·0	52	i 12 6	+ 4	i 22 0	+ 5	e 15 2	PP	e 32·8
San Francisco		78·9	54	e 12 10	+ 3	e 22 8	+ 3	—	—	—
Berkeley		79·0	54	e 12 7k	0	e 22 10	+ 4	e 15 12	PP	e 37·2
Branner		79·2	54	e 12 10	+ 2	e 22 11	+ 3	e 15 36	PP	e 38·0
Santa Clara		79·4	54	i 12 7	− 2	i 22 7	− 3	—	—	e 32·2
Lick		79·6	54	e 12 12	+ 2	e 22 19	+ 6	—	—	—
Spokane		80·1	43	e 12 15	+ 2	i 22 21	+ 3	i 12 28	pP	e 38·1
Fresno	N.	81·2	55	e 12 21	+ 2	e 22 35	+ 6	—	—	—
Santa Barbara		81·9	57	e 12 23	0	—	—	—	—	—
Tinemaha		82·3	54	i 12 25	0	e 22 46	+ 6	e 59 14	P'P'P'	—
Haiwee		82·8	54	i 12 28	+ 1	e 22 40	− 5	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m. s.			m.
Pasadena		83·2	57	i 12 29k	0	i 22 51	+ 2	e 39 2	P′P′		e 34·8
Mount Wilson		83·3	57	i 12 29k	− 1	e 23 0	+10	e 59 23	P′P′P′		—
Butte		83·8	43	e 12 29	− 3	e 22 55	0	e 12 34	P_cP		34·6
Riverside		83·9	57	i 12 33k	0	e 22 58	+ 2	—	—		—
La Jolla		84·3	58	i 12 35	0	e 23 2	+ 2	—	—		—
Bozeman		84·9	44	i 12 41	+ 3	e 23 0	− 6	12 44	P_cP		e 34·6
Baku		85·0	311	12 42	+ 4	23 12	+ 5	e 29 43	SS		40·3
Saskatoon		85·3	37	12 45	+ 5	22 49	[−14]	29 7?	SS		34·1
Salt Lake City		86·0	49	e 12 44	+ 1	23 13	− 4	e 16 4	PP		e 35·5
Moscow		86·9	328	12 45	− 3	23 13	[− 1]	16 13	PP		43·3
Grozny		87·0	315	e 12 48	0	—	—	i 24 30	PPS		38·1
Pulkovo		88·2	334	i 12 55	+ 1	23 18	[− 3]	e 16 17	PP		e 42·1
Erevan		89·0	312	12 57	− 1	—	—	—	—		—
Tucson		89·6	56	i 13 1k	0	23 37	[+ 7]	i 13 19	pP		e 35·9
Scoresby Sund		91·7	357	e 13 14	+ 4	e 23 43	[0]	i 17 5	PP		38·0
Upsala		93·2	337	e 13 16	− 1	i 23 42	[− 9]	16 55	PP		e 42·1
Lincoln		96·4	43	e 13 31	− 1	e 24 7	[− 2]	17 36	PP		e 39·2
Bergen		96·8	342	13 29	− 5	—	—	17 29	PP		e 52·5
Warsaw		96·9	331	i 13 34k	0	24 6	[− 5]	17 31	PP		49·1
Ksara		97·9	308	i 13 40k	+ 1	26 36	PS	17 40	PP		48·8
Copenhagen		98·1	336	i 13 41k	+ 1	24 15	[− 2]	i 17 41	PP		—
Istanbul		99·0	317	11 13	?	22 39	?	15 13	?		—
Bucharest		99·0	322	e 13 44	0	24 26	[+ 4]	17 25	PP		47·5
Potsdam		100·3	334	i 13 50	0	i 24 15	[−13]	i 17 56	PP		—
Ivigtut		100·5	8	e 18 3	PP	e 24 25	[− 4]	e 26 47	PS		e 42·3
Hamburg		100·7	336	i 13 52k	0	e 24 26	[− 4]	i 18 0	PP		e 49·1
Budapest	E.	100·9	327	e 13 55	+ 3	24 31	[0]	17 52	PP		50·1
	N.	100·9	327	e 14 1	+ 9	24 31	[0]	17 39	PP		49·1
Kecskemet	Z.	101·0	326	13 50	− 3	—	—	e 17 59	PP		e 60·1
Prague		101·4	332	e 17 7	PKP	e 24 34	[0]	e 18 5	PP		e 45·
Chicago U.S.C.G.S.		101·5	39	e 14 58	+63	e 24 34	[0]	e 18 14	PP		i 42·4
Sofia		101·6	321	e 13 56	0	e 24 38	[+ 3]	e 18 10	PP		43·1
Florissant		101·6	42	e 13 56	0	i 24 36	[+ 1]	i 18 8	PP		—
St. Louis		101·8	42	e 13 58	+ 2	—	—	e 18 8	PP		—
Jena		102·0	333	e 13 57	0	e 24 37	[0]	e 18 43	PP		e 44·1
Edinburgh		103·0	343	18 8	PP	24 29	[−12]	25 30	S		—
Cape Girardeau		103·0	44	e 13 53	− 9	i 24 28	[−13]	i 18 23	PP		—
Helwan		103·2	307	i 14 1a	− 2	24 37	[− 5]	18 15	PP		—
De Bilt		103·6	337	i 18 23k	PP	i 25 5	[+21]	e 33 12	SS		e 51·1
Stonyhurst		104·6	342	i 18 37	PP	i 26 4	+ 5	i 33 32	SS		51·1
Stuttgart		104·7	333	e 14 9	0	e 24 49	[0]	e 18 26	PP		e 48·1
Triest		104·9	329	e 18 29k	PP	i 24 49	[− 1]	e 20 59	PPP		e 50·0
Uccle		105·0	337	e 18 26	PP	26 9	+ 7	i 33 30	SS		e 50·1
Toronto		105·1	33	19 1	PP	25 4	[+13]	33 19	SS		41·1
Bidston		105·2	343	i 18 33	PP	i 26 6	+ 2	i 27 54	PS		e 47·1
Strasbourg		105·4	334	18 29	PP	e 26 7	+ 2	e 20 45	PPP		51·1
Tananarive		105·4	254	e 15 8	P	25 2	[+10]	33 29	SS		50·3
Ottawa		105·8	30	18 39	PP	25 1	[+ 7]	28 49	PPS		43·1
Chur		106·0	332	e 17 34	PKP	—	—	—	—		e 49·6
Zurich		106·0	333	e 14 14	P	e 33 40	SS	e 18 35	PP		—
Kew		106·0	340	e 14 42	P	i 26 14	+ 4	i 18 39	PP		e 53·1
Oxford		106·1	340	18 39	P	i 26 18	+ 7	—	—		44·2
Shawinigan Falls		106·3	27	e 18 49	PP	—	—	—	—		49·1
Basle		106·3	333	e 14 16	P	e 33 48	SS	e 18 42	PP		—
Seven Falls		106·7	26	18 51	PP	25 1	[+ 3]	21 1	PPP		44·1
Neuchatel		107·0	333	e 17 53	PKP	—	—	e 18 47	PP		—
Besançon		107·2	334	e 18 49	PP	e 28 7	PS	—	—		—
Paris		107·3	337	14 21k	P	e 26 7	S	i 18 50	PP		e 52·1
Vermont		107·6	29	—	—	e 37 57	SSS	—	—		e 42·9
Pennsylvania		107·9	34	—	—	e 24 1	[−62]	—	—		e 48·1
Rome		108·2	326	e 14 26k	P	i 25 22	[+17]	i 18 56	PP		e 49·0
Jersey		108·6	340	e 19 7	PP	e 26 40	S	—	—		51·1
Williamstown		109·0	30	e 18 51	PP	i 29 39	PPS	—	—		—
Georgetown		109·4	35	i 20 8	?	i 26 7	{+ 6}	i 29 32	PPS		—
Clermont-Ferrand		109·6	335	e 19 4	PP	—	—	—	—		e 56·9

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Harvard		109·8	29	—	—	e 28 32	PS	e 29 34	S_cSP	e 50·1
Philadelphia		109·8	33	—	—	e 28 23	PS	e 34 50	SS	e 48·5
East Machias		110·0	26	e 18 56	[+23]	24 49	[−23]	i 28 42	PS	i 44·7
Fordham		110·0	32	i 19 12k	PP	i 28 43	PS	e 38 45	SSS	e 48·4
Weston		110·1	29	e 19 15	PP	i 29 46	PPS	i 34 10	SS	—
Columbia		110·5	41	e 19 13	PP	e 25 11	[− 3]	28 40	PS	e 45·4
Halifax		111·7	23	19 19	PP	26 19	{ + 2}	34 37	SS	45·1
Algiers		116·8	329	i 19 49	PP	e 25 48	[+10]	21 25	SKP	59·1
Toledo		117·4	335	e 18 49	[+ 2]	i 25 47	[+ 7]	i 20 1	PP	—
Granada	z.	119·5	334	i 18 56k	[+ 4]	26 4	[+16]	i 20 18	PP	59·7
Lisbon		120·2	339	18 54	[+ 1]	30 22	PS	20 21	PP	—
San Fernando		121·2	336	e 20 28	PP	e 32 40	PPS	e 37 4	SS	49·6
Bermuda		121·2	32	e 20 29	PP	e 26 4	[+11]	e 30 34	PS	e 48·5
Balboa Heights		125·9	64	e 19 7?	[+ 3]	—	—	—	—	—
San Juan		130·8	45	e 16 45	sP	38 35	SS	e 21 28	pP	e 53·0
Cape Town		132·4	240	i 21 38	PP	e 26 35	[+10]	e 31 30	PS	64·2
Huancayo		137·5	88	e 16 24	P	i 31 42	SKSP	e 19 25	PKP	52·4
La Paz		145·2	93	i 19 33k	[− 7]	i 26 33	[−14]	i 20 43	pPKP	67·8
La Plata	E.	150·9	131	19 55	[+ 6]	25 13	?	33 31	SKSP	74·6
	N.	150·9	131	19 49	[0]	—	—	—	—	62·6
	Z.	150·9	131	19 52	[+ 3]	—	—	—	—	—
Rio de Janeiro		168·0	118	e 20 22	[+14]	e 31 56	{ + 3}	—	—	i 52·2

Additional readings :—
Yokohama PN = +4m.33s.
Mizusawa SE = +9m.14s.
Sapporo SS = +13m.32s.
Manila PEN = +5m.41s.
Zi-ka-wei iZ = +7m.2s., iE = +7m.52s., iZ = +8m.0s., +8m.12s., +9m.4s., and +11m.2s., SS = +11m.26s.
Hong Kong SS = +13m.37s., ? = +14m.2s.
Brisbane iSN = +12m.55s., iSSN = +16m.13s., iSSE = +16m.19s.
Apia iSE = +16m.21s., eE = +22m.47s.
Honolulu iP = +9m.12s., i = +11m.46s., iPPP = +11m.59s., i = +15m.46s., esS = +17m.3s., isS = +17m.19s., eS_cS = +18m.32s., iSS = +19m.14s.
Riverview iPNZ = +9m.6s., PPN = +11m.0s., iN = +13m.12s., eSE = +16m.11s., SSN = +19m.11s., SSSN = +20m.31s.
Adelaide P_cP = +10m.17s., iN = +17m.7s. and +17m.12s.
Calcutta eSSN = +21m.9s., eSSSN = +23m.9s.
Perth PP = +12m.7s., PPP = +13m.19s., PPPP = +14m.4s., i = +14m.34s., +18m.24s., +18m.35s., and +19m.57s., SS = +22m.5s., i = +22m.24s., SSS = +24m.15s., i = +25m.57s.
College epPP = +13m.35s., PPP = +14m.46s., S_cS = +20m.9s., eSS = +23m.16s.
Wellington P_cS = +15m.17s., S_cS = +19m.47s., SS? = +22m.52s., L_q = +26m.52s.
Agra iPE = +10m.42s., PPE = +13m.7s., S_cSE = +20m.36s., SSE = +23m.44s.
Hyderabad P_cPE = +11m.12s., PSE = +20m.7s., S_cSE = +20m.46s., SSE = +24m.1s.
Frunse S_cS = +21m.8s.
Sitka sS = +21m.4s., SSS = +27m.39s.
Andijan SS = +20m.49s.
Tchimkent PP = +14m.12s., PPP = +15m.37s.
Bombay eN = +12m\23s., iE = +12m.30s., iN = +20m.45s., iE = +20m.58s., iN = +21m.7s., iEN = +21m.22s., +22m.35s., and +25m.17s., iL_qN = +30m.51s.
Victoria PPP = +13m.19s., SS = +23m.49s.
Ferndale ePN = +12m.7s.
Ukiah ipS = +22m.20s., sSS = +27m.28s.
Berkeley iPZ = +12m.11s., ePSN = +32m.20s.
Branner iPEN = +12m.13s.
Spokane eE = +13m.20s. and +14m.17s., iPPE = +15m.23s., ePSE = +23m.6s., eE = +25m.15s.
Pasadena iZ = +12m.49s., eZ = +13m.4s., eSKP,PKPZ = +42m.32s., ePKP,PKP, PKPZ = +59m.22s.
Mount Wilson iZ = +12m.49s.
Butte iS = +23m.14s., eSS = +28m.32s.
Bozeman esS = +23m.49s., iSS = +28m.50s., eSSS = +32m.10s.
Baku eSSS = +32m.55s.
Saskatoon i = +13m.21s., S = +23m.7s., SKKS = +23m.15s., i = +23m.41s., PPS = +24m.7s.
Salt Lake City ePPP = +17m.48s., iS = +23m.22s., ipS = +23m.28s., eSP = +24m.5s., PS = +24m.12s., eSS = +28m.54s., isSS = +29m.21s., SSS = +33m.6s.
Moscow S = +23m.25s., SS = +29m.13s.
Pulkovo S = +23m.31s.
Tucson iSP = +13m.43s., i = +14m.23s., ePP = +16m.29s., iPP = +16m.39s., eSKS = +23m.12s., ipS = +23m.59s., esS = +24m.22s., sPS = +25m.17s., eSS = +29m.28s., eSSS = +33m.20s.

Continued on next page.

Scoresby Sund eP = +13m.31s., ePPP = +19m.7s., epPPP = +19m.38s., eSKKS = +23m.56s., iS = +24m.16s., pS = +24m.32s., SP = +25m.29s., iPS = +25m.37s., eSS = +30m.44s., iSS = +30m.52s., esSS = +31m.15s., eSSS = +34m.15s.
Upsala eE = +16m.27s., PPPE = +18m.56s., iN = +19m.32s., iSKSE = +23m.46s., eSSN = +30m.7s.?, iN = +31m.59s., eSSSN = +34m.7s.?, eN = +37m.7s.?
Lincoln ePPP = +19m.57s., sS = +26m.14s., SS = +31m.27s.
Warsaw PPPZ = +19m.44s., SN = +24m.54s., SSN = +31m.42s.
Copenhagen eE = +23m.35s., +25m.7s., +25m.37s., and +27m.43s., SS = +31m.43s.
Istanbul PPP = +16m.19s., SKS = +21m.11s., SKKS = +21m.51s., PS = +23m.23s., PPS = +23m.50s., SS = +29m.38s. These readings appear to be 2m.30s. early.
Bucharest PPE = +17m.34s., iE = +18m.48s., PPPEN = +20m.11s., SKKSEN = +24m.46s., iSE = +25m.14s., SN = +25m.22s., PSE = +26m.33s., PSN = +26m.38s., PPSN = +27m.22s.
Potsdam ePN = +13m.55s., iN = +15m.38s. and +22m.0s., iZ = +22m.7s., iPSZ = +26m.53s., iSSZ = +32m.20s., iSSN = +22m.23s., iN = +40m.30s., iZ = +40m.39s.
Ivigtut ePPP = +20m.23s., eSKKS = +24m.38s., eS = +25m.43s. and +26m.1s., ePSZ = +27m.10s., esPS = +27m.44s., ePPS = +27m.53s., SS = +32m.28s., esSS = +32m.58s., eSSS = +36m.48s.
Hamburg eZ = +17m.41s., eSKKSE = +25m.7s., iSSE = +32m.27s., iSSN = +32m.32s., eSSSE = +36m.31s., eZ = +40m.7s.
Budapest E. e = +23m.55s., S = +25m.31s., PS = +26m.58s., e = +27m.43s., eSS = +32m.19s.,
N. eS = +25m.37s., PSKS = +26m.49s., e = +28m.47s., SS = +32m.31s.
Prague eSKKS = +25m.35s., ePPS = +27m.59s., eSS = +32m.43s.
Chicago U.S.C.G.S. eS = +25m.26s., ePS = +26m.56s., eSS = +32m.14s.
Sofia eN = +25m.14s., iN = +25m.40s., iE = +25m.44s., iN = +38m.0s.
Florissant eN = +21m.43s., iPSE = +27m.10s.
St. Louis eN = +18m.24s.
Jena ePN = +14m.0s., iPKP = +18m.7s., iN = +32m.45s., eE = +39m.23s.
Edinburgh SKKS = +25m.2s., PS = +27m.12s., PPS = +28m.3s., e = +28m.44s., i = +31m.29s., SS = +32m.41s., SSP = +32m.49s., SSS = +36m.34s.
Cape Girardeau ePN = +14m.9s., ePKPE = +17m.17s., iE = +18m.8s., eE = +22m.20s., eSKKSN = +25m.5s., eSN = +25m.43s., ePSN = +27m.18s., eN = +29m.23s.
Helwan iZ = +17m.12s., iE = +20m.1s. and +25m.12s., SE = +26m.1s., PSE = +27m.19s., PPSE = +28m.25s.
De Bilt iS = +26m.4s.
Stonyhurst i = +18m.47s.
Stuttgart eZ = +17m.26s. and +17m.34s., iPP = +18m.30s., eZ = +18m.44s., ePPPEN = +20m.53s., eSE = +26m.1s., eSN = +26m.6s., ePSE = +27m.37s., ePSN = +27m.49s., iSSE = +33m.17s., iSSN = +33m.21s.
Triest iSKKS = +25m.59s., iS = +26m.9s., ePS = +27m.46s., ePPS = +28m.42s., i = +30m.15s. and +32m.15s., eSS = +33m.9s., e = +35m.13s., iSSS = +37m.26s., e = +41m.51s.
Uccle iN = +27m.4s.
Toronto S = +25m.13s., PPS = +28m.55s., SSS = +38m.7s.?
Bidston i = +18m.46s., +18m.53s., +19m.11s., +25m.3s., +25m.13s., +26m.59s., +33m.28s., +33m.43s., and +34m.1s.
Strasbourg e = +18m.33s., iSS = +33m.37s.
Tananarive SE = +26m.39s., SSN = +43m.44s.
Ottawa SS = +33m.37s., SSS = +38m.7s.?
Kew eZ = +18m.31s., iNZ = +18m.54s. and +19m.8s., eZ = +22m.42s., iZ = +22m.59s., iN = +25m.10s. and +25m.22s., iE = +26m.36s., iNZ = +27m.54s., iZ = +28m.11s. iN = +28m.22s., iZ = +28m.50s. and +29m.2s., eN = +33m.32s., iN = +33m.50s. and +34m.2s., eL_gE = +48·1m.
Zurich e = +19m.30s.
Basle e = +17m.55s.
Seven Falls PS = +28m.4s., SS = +34m.0s., SSS = +38m.1s.
Paris ePPP = +21m.16s., iPS = +28m.12s.
Rome iZ = +19m.7s., ePPPZ = +21m.26s., iN = +21m.29s., iSN = +26m.34s., iPSN = +28m.25s., ePPSN = +29m.27s., iSSN = +34m.16s., eSSS = +38m.8s., eN = +42m.16s., iN = +45m.31s.
Jersey e = +41m.37s.
Georgetown +20m.40s., i = +27m.7s.
Harvard eE = +45m.7s.?, eN = +30m.38s.
Philadelphia ePS = +28m.32s., esSS = +35m.25s., eSSS = +38m.43s.
Fordham iZ = +20m.9s. and +29m.43s.
Weston e = +35m.5s., eSSS = +39m.30s., e = +45m.22s.
Algiers ePPP = +22m.7s., eS = +27m.40s., ePS = +29m.53s., eSS = +36m.25s.
Toledo i = +20m.45s., ePPP = +22m.37s., i = +29m.55s., iSS = +26m.17s., i = +27m.1s.
Granada PPPZ = +22m.44s., PSN = +30m.3s., PPSZ = +31m.19s., iSSZ = +36m.44s.
Lisbon pPPZ = +21m.6s.?, ?Z = +21m.19s., SKPZ = +21m.58s., PPPZ = +23m.2s., pPPPZ = +23m.30s., ?N = +24m.34s.
Bermuda epPP = +20m.57s., eS = +28m.34s., esS = +29m.8s., esPS = +31m.14s., eSS = +37m.5s., esSS = +38m.0s., eSSS = +41m.24s.
San Juan ePKP = +19m.18s., iPKS = +22m.37s., PPP = +24m.30s., esSS = +39m.41s., SSS = +43m.52s.
Cape Town iPPN = +21m.43s., iSKPE = +22m.50s., iSKSPN = +22m.57s., ePSE = +31m.51s., ePPSE = +33m.44s., eSSE = +39m.16s., eSSN = +39m.27s., eSSSE = +43m.53s.

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Huancayo ePKP = +19m.34s., ePP = +22m.20s., i = +24m.33s., isSP = +33m.4s., iPSP = +34m.39s., i = +38m.18s., sSS = +40m.43s., SSS = +44m.47s.
La Paz iZ = +19m.39s. and +20m.1s., isPKPZ = +21m.19s., iPPZ = +22m.49s., iSKP = +23m.17s., iZ = +29m.15s., PSKS = +32m.49s., PPS = +35m.43s., SSZ = +43m.7s.
La Plata E. PPS = +43m.7s.?, +46m.25s., +49m.19s., +55m.1s., +67m.7s.?
La Plata N. +54m.7s.?
Rio de Janeiro ePE = +20m.25s.

Jan. 17d. 15h. Local Japanese shock. Tokyo Imperial University gives Epicentre 34°·55N. 140°·23E.

Kamakura P = 1m.27s., S = 1m.41s.
Kiyosumi P = 1m.27s., S = 1m.40s.
Komaba P = 1m.27s., S = 1m.41s.
Koyama P = 1m.27s., S = 1m.41s.
Titibu P = 1m.27s., S = 1m.43s.
Togane P = 1m.27s., S = 1m.41s.
Tokyo Imp. Univ. P = 1m.27s., S = 1m.41s.
Tukubasan P = 1m.27s., S = 1m.44s.
Mizusawa eP = 2m.8s., PE = 2m.11s., eSN = 2m.54s., SE = 2m.58s.

Jan. 17d. Readings also at 0h. (near Osaka and near Mizusawa), 1h. (Ravensburg, Stuttgart, near Triest, near Basle, Chur, Neuchatel, Zurich, and Wellington), 2h. (Huancayo, La Paz, and Tucson). 3h. (Tananarive), 4h. (Kodaikanal, Tucson, La Paz, La Jolla, Riverside, Mount Wilson, Pasadena, and Tinemaha), 5h. (Tucson, Mount Wilson, Pasadena, and Apia), 7h. (Tinemaha, Pasadena, Mount Wilson, and Tucson), 8h. (Tucson and Lincoln), 9h. (Mount Wilson and Pasadena), 10h. (Tucson, Balboa Heights, Mount Wilson, and Pasadena), 12h. (Riverside, Pasadena, Haiwee, Tinemaha, Mount Wilson, Tucson, and Manila), 13h. (Tucson (2), Mount Wilson, Pasadena, Vladivostok, Sverdlovsk, Wellington, Brisbane, and Riverside), 14h. (Riverside, Mount Wilson (2), Pasadena (2), near Mizusawa, Tinemaha (2), and Tucson), 15h. (Pasadena, Tucson, Tinemaha, Mizusawa, Mount Wilson, and Riverside), 17h. (Tucson), 19h. (Tucson, Riverside, Mount Wilson, Tinemaha, Pasadena, Vladivostok, Sverdlovsk, and La Jolla), 21h. (Tucson), 22h. (Wellington, Sofia, Tucson, Riverside, Pasadena, Tinemaha, Mount Wilson, Haiwee, near Triest, Bucharest, Arapuni, Adelaide, Brisbane, and Riverview), 23h. (Tucson and Ksara).

Jan. 18d. Readings at 1h. (Ksara and near Mizusawa), 2h. (Bozeman), 3h. (Pasadena, Mount Wilson, Riverside, and Tinemaha), 4h. (Triest), 5h. (Budapest), 7h. (Bombay, Kodaikanal, and Ksara), 8h. (Huancayo), 9h. (near Chur), 14h. (near Tananarive), 15h. (Perth), 19h. (Andijan, Tashkent, and Samarkand), 20h., 21h., and 22h. (Tucson).

Jan. 19d. 5h. 23m. 43s. Epicentre 43°·0N. 122°·0E. (approximate position).

A = −·3888, B = +·6221, C = +·6795; δ = −11; h = −2;
D = +·848, E = +·530; G = −·360, H = +·576, K = −·734.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Vladivostok		7·3	84	e 2 13	P*	—	—	—	—	—
Zi-ka-wei		11·8	183	e 2 53	0	5 35	SSS	—	—	i 7·0
Irkutsk		15·1	314	e 3 41	+ 5	6 40	SS	—	—	7·3
Hong Kong		21·7	199	8 50	S	(8 50)	− 1	9 59	SSS	11·4
Phu-Lien		25·6	215	—	—	e 9 28	−31	—	—	13·3
Manila		28·3	181	e 10 55	S	(e 10 55)	+12	—	—	(15·1)
Semipalatinsk		29·3	300	6 3	− 3	—	—	—	—	15·0
Almata		32·6	287	6 34	− 1	—	—	—	—	17·3
Frunse		34·4	286	6 49	− 2	—	—	—	—	18·3
Calcutta	N.	34·6	244	e 11 54	S	(e 11 54)	−28	—	—	i 18·8
Andijan		36·6	284	7 8	− 2	12 52	− 1	—	—	19·4
Tashkent		38·6	286	i 7 26	0	e 13 17	− 6	—	—	20·2
Agra	E.	38·9	260	e 7 24	− 5	—	—	—	—	—
Sverdlovsk		40·5	313	i 7 36	− 6	13 45	− 7	—	—	19·3
Hyderabad	N.	44·8	249	—	—	e 15 4	+ 9	e 18 28	SSS	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Colombo	E.	51·6	238	e 11 47	PPP	—	—	—	—	—
College		52·2	33	—	—	e 15 45	−54	—	—	—
Baku		52·4	294	e 9 13	− 3	16 35	− 7	—	—	26·6
Moscow		53·1	316	e 9 15	− 6	—	—	—	—	28·8
Ksara		65·3	294	—	—	e 17 48	?	e 26 34	SSS	—
Tinemaha	Z.	83·3	45	e 12 30	0	—	—	—	—	—
Mount Wilson	Z.	85·6	46	i 12 42	+ 1	—	—	—	—	—
Pasadena	Z.	85·6	46	e 12 42	+ 1	—	—	—	—	—
Tucson		90·8	43	e 13 13	+ 7	—	—	—	—	—

Additional readings :—
Calcutta $eP_cP = +15m.42s.$, eSN = +16m.6s.
Tinemaha iZ = +12m.36s.
Pasadena iZ = +13m.2s., eZ = +13m.36s.
Long waves were also recorded at Lincoln, Butte, Rome, Jena, Prague, Potsdam, Scoresby Sund, Samarkand, Pulkovo, De Bilt, Triest, Bidston, San Fernando, Paris, Hamburg, Toledo, Warsaw, Stonyhurst, Uccle, Upsala, and Bombay.

Jan. 19d. 14h. Local Japanese shock. Tokyo Imperial University gives Epicentre 35°·59N. 139°·89E.

Kamakura P = 32m.0s., S = 32m.7s.
Kiyosumi P = 32m.0s., S = 32m.10s.
Komaba P = 32m.0s., S = 32m.7s.
Koyama P = 32m.0s., S = 32m.14s.
Titibu P = 32m.0s., S = 32m.12s.
Togane P = 32m.0s., S = 32m.10s.
Tokyo Imp. Univ. P = 32m.0s., S = 32m.7s.
Tukubasan P = 32m.0s., S = 32m.10s.
Susaki P = 32m.13s., S = 32m.27s.
Mizusawa ePE = 32m.57s., SE = 33m.30s.

Jan. 19d. 16h. 3m. 1s. Epicentre 33°·5S. 179°·0W.

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

		△	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Tuai		6·2	209	1 32	− 3	2 46	− 2
New Plymouth		7·9	223	1 32	−27	2 32	?
Wellington		9·2	211	2 17?	+ 1	3 57	− 6
Christchurch		12·0	211	—	—	5 2	− 9
Pasadena	Z.	88·2	46	e 12 57	+ 3	—	—
Mount Wilson	Z.	88·4	46	e 12 58	+ 3	—	—
Riverside	Z.	88·6	46	e 12 51	− 5	—	—
Tinemaha	Z.	90·2	44	e 13 8	+ 4	—	—
Tucson		91·6	51	e 13 6	− 4	—	—
Ksara		151·0	281	(e 19 49)	[0]	—	—

Additional readings :—
Tuai i = +2m.42s.
Riverside eZ = +13m.3s.
Ksara ePKP = +16m.33s. True PKP is given as ePP.
Long waves were recorded at Huancayo.

Jan. 19d. Readings also at 0h. (Manila and Tucson), 3h. (Tucson, Tinemaha, Mount Wilson, and Pasadena), 4h. (near Hukuoka), 5h. (near Mizusawa), 6h. (Mizusawa, Balboa Heights, Mount Wilson, Tinemaha, Pasadena, Tucson, La Paz, and Riverside), 7h. (Huancayo), near Mizusawa, and La Paz), 8h. (Lincoln, near Mizusawa (2), Tucson, Mount Wilson, and Tinemaha), 9h. (Tucson, Mount Wilson, Tinemaha, and Pasadena), 10h. (Tucson), 13h. (near Apia), 14h. (Tucson, Pasadena, Tinemaha, Mount Wilson, Riverside, Ksara, and Haiwee), 15h. (Tucson), 17h. (College, Tinemaha, Mount Wilson, Riverside, Pasadena, and Tucson), 18h. (Tucson), 20h. (Seattle and Bucharest).

Jan. 20d. 10h. Undetermined shock. Epicentre Pacific, far south.

Wellington PZ = 5m.3s., PPZ = 6m.9s., P_cPZ = 7m.39s., S = 10m.32s., L_q = 12m.30s., L_r = 14·0m.
Christchurch P = 5m.22s., SN = 10m.32s., L_q = 11m.50s., L_r = 14m.14s.
La Plata PE = 7m.48s., N = 11m.18s., SN = 15m.42s., S = 15m.48s., L = 21m.18s.
La Paz eP?Z = 8m.33s., iPZ = 8m.44s., iSN = 17m.33s., iSZ = 17m.40s., iPSZ = 17m.52s., LZ = 28·7m.
Huancayo eP = 8m.47s., eP_cP = 9m.12s., iS_cS = 18m.7s., eL = 25·3m.
Perth i = 9m.50s., i = 13m.55s., iS = 19m.20s., i = 24m.35s., 29m.15s., and 31m.10s.
Honolulu P = 10m.27s., S = 19m.31s., S_cS = 20m.15s., eL = 31·5m.
Chatham Ils. S = 10m.30s., L_q = 12m.30s.
Riverview ePPPN = 10m.47s., eSEN = 15m.5s., eSSN = 18m.6s., eE = 20m.9s., eN = +20m.17s., eL_qN = 22m.24s., eLE = 23·3m.
Tucson eP = 10m.51s. and 11m.6s., ePP = 14m.33s., eS = 21m.18s., eS_cS = 21m.40s., PS = 21m.58s., eL = 32·7m.
Arapuni S = 10m.54s., L_q? = 13m.18s., L = 15·0m.
Pasadena ePZ = 11m.5s., iSE = 22m.3s., eLE = 34·6m.
Mount Wilson ePZ = 11m.8s.
Riverside ePZ = 11m.9s.
San Juan eP = 11m.18s., ePPP = 17m.14s., eS = 22m.7s., ePPS = 23m.49s., eL = 33·8m.
Tinemaha e = 11m.23s.
Apia eEN = 14m.8s., e = 18m.14s.
Sydney e = 15m.0s., eL = 22m.24s.
Colombo eE = 17m.0s.
Calcutta eN = 17m.11s., iN = 20m.50s.
Manila eP = 17m.31s., S?EN = 26m.35s.
Toledo eZ = 17m.40s., eP = 17m.48s.
Istanbul P = 17m.57s.
Granada ePKPZ = 18m.14s.k, PPN = 21m.40s., SKSZ = 25m.12s., SKSPN = 31m.10s., SSZ = 40m.39s., SSSN = 45m.34s., L = 70·6m.
Helwan ePKPZ = 18m.17s., ePKKPZ = 18m.42s., eZ = 19m.21s., PPZ = 22m.6s., eZ = 25m.35s., SSE = 41m.48s., SSSE = 47m.40s.
Ksara ePKP = 18m.17s., ePP = 21m.50s., ePPS = 35m22s., eSS = 41m.34s.
Rome ePKP = 18m.31s., e = 22m.41s., eSKS = 24m.58s., eS = 28m.50s., eL = 62·5m.
Potsdam eZ = 18m.35s., iZ = 22m.45s., eLZ = 77·0m.
Bermuda ePPP = 18m.39s., ePPS = 26m.4s., eSS = 31m.23s., eL = 41·0m.
Rio de Janeiro ePN = 19m.28s., eLN = 31·5m.
Bombay eEN = 19m.56s.
College ePPP = 20m.16s., ePS = 28m.4s., eSS = 34m.39s., ePSPS = 34m.57s., eL = 45·2m.
Agra eE = 20m.44s.
Ukiah eSKS = 21m.50s., eS_cS = 22m.28s., eSS = 28m.42s., ePSPS = 29m.10s., eL = 37·4m.
Cape e = 22m.2s., eE = 27m.36s.
Sale Lake City eSKS = 22m.24s., eSS = 29m.14s., ePSPS = 29m.58s., eL = 38·6m.
Lincoln ePS = 24m.21s., eL = 42·5m.
Victoria e = 26m.0s., 33m.0s., 43m.0s., and 48·0m.
Fordham eNZ = 26m.41s., eN = 32m.35s., eL = 48·7m.
Butte ePSPS = 31m.16s., eL = 45·4m.
Ottawa e = 33m.0s., L = 56·0m.
Branner eE = 39m.13s. and 40m.30s., eN = 47m.42s.
Santa Clara eN = 40m.12s.
Tananarive EN = 41m.50s., eL = 52·9m.
Long waves were also recorded at Stuttgart, De Bilt, Hamburg, Sitka, Bidston, Scoresby Sund, Paris, Uccle, Columbia, Philadelphia, Stonyhurst, Bozeman, Warsaw, Kew, Upsala, Prague, and Jersey.

Jan. 20d. Readings also at 0h. (Tucson and La Paz), 4h. (Butte, Victoria, Salt Lake City, Ukiah, Tucson, Tinemaha, and Pasadena), 7h. (Bucharest and Ksara), 10h. (Riverside (2), Mount Wilson (2), Tinemaha (2), Pasadena (2), and Tucson (2)), 14h. (near Mizusawa), 15h. (near Istanbul, Sofia, and Bucharest), 20h. (Tucson), 22h. (Tucson (2)).

Jan. 21d. 4h. 19m. 45s. Epicentre 32°·5S. 179°·0W. (as on 1939 Oct. 30d.).

$A = -·8449$, $B = -·0147$, $C = -·5347$; $\delta = -2$; $h = +1$;
$D = -·017$, $E = +1·000$; $G = +·535$, $H = +·009$, $K = -·845$.

Tables for depth of focus 0·040 have been used.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tuai		7·0	205	1 43	+ 1	3 3	+ 1	—	—	—
New Plymouth		8·6	219	2 4	+ 2	3 49	+12	—	—	—
Wellington		10·1	208	2 15	− 5	4 10	− 1	i 2 27	pP	—
Christchurch		12·9	209	3 3	+ 8	5 11	− 2	—	—	—
Manila		74·0	300	e 19 33	S	(e 19 33)	−40	21 57	PS	—
Santa Barbara		86·8	46	i 12 14	+ 1	—	—	e 13 8	pP	—
Pasadena		87·5	47	i 12 16	0	e 22 21	−10	i 13 11	pP	—
Berkeley	z.	87·7	42	e 12 17	0	—	—	e 13 12	pP	—
Mount Wilson		87·7	47	i 12 17	0	—	—	i 13 12	pP	—
Riverside		87·9	47	i 12 17	− 1	—	—	i 13 13	pP	—
Haiwee		89·0	45	e 12 24	0	—	—	—	—	—
Tinemaha		89·5	44	e 12 26	0	—	—	—	—	—
Tucson		91·0	51	e 12 33	0	e 22 44	[+18]	13 29	pP	e 37·6
Huancayo		94·8	107	e 12 58	+ 8	e 22 23	[−33]	—	—	—
San Juan		118·7	85	e 18 41	PP	e 24 49	[+ 8]	e 29 3	PS	—
Ksara		150·8	281	e 19 17	[+ 5]	—	—	1 20 20	pPKP	—

Additional readings :—
Wellington i = +2m.19s.
Mount Wilson iZ = +12m.36s., eZ = +13m.44s. and +14m.8s., ePPZ = +15m.51s.
Pasadena iZ = +13m.21s. and +13m.33s.
Tucson esP = +13m.52s., ePP = +16m.19s., esPP = +17m.23s., ePPP = +18m.23s., eS = +23m.18s., epS = +24m.1s., esPS = +25m.49s., eSS = +29m.18s., eSSS = +33m.12s.
Huancayo eS = +22m.47s.
Ksara ePP = +23m.1s.

Jan. 21d. Readings also at 2h. (Zi-ka-wei, Ksara, Hukuoka, Hong Kong, Tinemaha, Tucson, Calcutta, Mount Wilson, Agra, Riverside, Haiwee, Pasadena, and Manila), 3h. (Pasadena, Haiwee, Riverside, Mount Wilson, Tucson, and Tinemaha), 4h. (Granada), 5h. (Brisbane and Perth), 6h. (Bombay, Agra, and near Mizusawa (2)), 7h. (near Mizusawa, Tuai, Tinemaha, Tucson, Riverside, Pasadena, and Mount Wilson), 10h. (Tucson), 11h. (near Tananarive and Tucson), 12h. (Calcutta), 13h. (Mount Wilson, Pasadena, Tinemaha, and Tucson), 15h. (near Apia), 17h. (near Mizusawa (2)), 22h. (Tucson), 23h. (Perth, Manila, Basle, Zurich, and Neuchatel).

Jan. 22d. Readings at 0h. (Brisbane, Adelaide, Riverview, and Ksara), 1h. (Tucson (2), Arapuni, Wellington, Christchurch, Tinemaha, Riverside, Huancayo, Mount Wilson, Pasadena, and La Paz), 2h. (Ksara), 3h. (near Chur, Zurich, Basle, and Williamstown), 4h. (Tucson), 6h. (Ksara), 13h. (Tucson), 14h. (Neuchatel, Basle, and Zurich), 16h. (near Branner), 17h. (near Wellington, Tuai, and New Plymouth), 18h. (near Mizusawa).

Jan. 23d. Readings at 2h. (Mount Wilson, Pasadena, Riverside, Tinemaha, Arapuni, and Wellington), 3h. (La Plata), 5h. (near Lick, Branner, Berkeley, and Santa Clara), 11h. (Huancayo and near Manila), 12h. (La Paz), 13h. (Clermont-Ferrand, Bozeman, Columbia, Tashkent, Agra, Frunse, Samarkand, near Andijan, Almata, and Tchimkent), 14h. (La Paz), 15h. (Balboa Heights, Almata, Tchimkent, near Tananarive, near Andijan, Samarkand, and Frunse), 17h. (Tucson), 19h. (near Tananarive), 23h. (Ksara).

Jan. 24d. 23h. 32m. 16s. Epicentre 44°·8N. 10°·3E. (as on 1937 Sept. 17d.).

Intensity V at Verona. Epicentre 44°·8N. 10°·2E. (Strasbourg).

See Annales de l'Institut de Physique du Globe de Strasbourg, Tome V, 2e partie, Seismologie, 1940, Strasbourg, 1948, p. 4.

$A = +\cdot7004$, $B = +\cdot1273$, $C = +\cdot7023$; $\delta = -1$; $h = -4$;
$D = +\cdot179$, $E = -\cdot984$; $G = +\cdot691$, $H = +\cdot126$, $K = -\cdot712$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Prato		1·1	148	i 0 19	− 3	—	—	—	—	—
Chur		2·1	345	e 0 40	+ 3	e 1 13	S_g	e 0 44	P_g	—
Triest		2·6	71	0 45k	+ 1	1 15	− 2	e 0 48	P*	—
Zurich		2·8	335	e 0 51	+ 4	e 1 37	S_g	e 0 57	P_g	—
Ravensburg		3·0	351	e 0 52	+ 2	i 1 20	− 7	e 1 2	P_g	—
Neuchatel		3·2	313	e 0 53	+ 1	e 1 28	− 4	—	—	—
Ebingen		3·5	345	e 1 2	P*	e 2 0	S_g	e 1 10	P_g	—
Stuttgart		4·1	349	e 1 5	0	i 1 52	− 3	i 1 24	P*	—
Strasbourg		4·2	337	e 1 8	+ 1	1 45	−12	2 12	S*	—
Clermont-Ferrand		5·2	284	e 1 19	− 2	—	—	—	—	—
Jena		6·2	9	e 2 3	P_g	—	—	—	—	e 2·7
Potsdam		7·8	13	—	—	i 4 11	S_g	—	—	—
Hamburg	E.	8·8	359	—	—	e 4 39	S*	—	—	—
Warsaw		10·3	40	e 4 32	S	(e 4 32)	+ 2	—	—	(6·4)

Additional readings :—
Triest ePP = +52s., eP_gP_g = +56s., SSS = +1m.21s., l = +1m.30s., iS_gS_g = +1m.37s., e = +1m.44s.
Ravensburg iS*EN = +1m.28s., iS_g = +1m.49s.
Ebingen eP_gNZ = +1m.16s., iS_gN = +2m.9s.
Stuttgart eZ = +1m.8s., iNW = +1m.29s., l = +1m.38s., iS_g = +2m.17s.
Strasbourg sS_g = +2m.22s., S_g = +2m.27s.
Jena eE = +2m.8s., iE = +2m.14s.
Potsdam iN = +4m.15s., eZ = +4m.29s., iE = +4m.47s.
Warsaw records S as P and L as S.
Long waves were also recorded at De Bilt and Uccle.

Jan. 24d. Readings also at 1h. (Riverview, Ksara, Tinemaha, Tucson, Sydney, near Balboa Heights, Arapuni, Wellington, Brisbane, Christchurch, and Apia), 2h. (Huancayo), 3h. (Potsdam and Uccle), 4h. (near Tuai (2), New Plymouth (2), Wellington (2), and Lincoln), 5h. (Bozeman and near Balboa Heights), 6h. (Andijan, Frunse, Almata, Tchimkent, Tashkent, and Lincoln), 8h. (Mizusawa), 10h. (Huancayo (2), La Paz, La Plata, Tucson, Tinemaha, and Sofia), 13h. (Tinemaha, Tucson, Mount Wilson, and Riverside), 17h. (Brisbane and Sydney), 18h. (Pasadena, Perth, Sverdlovsk, Baku, Riverside, Mount Wilson, Tucson, and Riverview), 21h. (Tucson), 23h. (Ksara).

Jan. 25d. Readings at 0h. (Chur (2), Zurich (2), Neuchatel, Stuttgart (2), Prato (2), and Triest (2)), 4h. (Balboa Heights), 10h. (Ksara and Helwan), 13h. (near Helwan and Ksara), 18h. (Mount Wilson, Pasadena, and La Paz), 19h. (Columbia and Mizusawa), 21h. (Tucson), 22h. (Tucson).

Jan. 26d. 6h. 41m. 50s. Epicentre 14°·7S. 167°·3E. (as on 1939 Oct. 17d.).

$A = -\cdot 9440$, $B = +\cdot 2127$, $C = -\cdot 2522$; $\delta = -2$; $h = +6$;
$D = +\cdot 220$, $E = +\cdot 976$; $G = +\cdot 246$, $H = -\cdot 055$, $K = -\cdot 968$.

Tables for depth of focus 0·005 have been used.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane		18·4	224	i 4 4	− 8	i 7 28	− 4	i 4 22	PP	—
Apia		20·3	90	e 4 36	+ 3	i 8 30	+18	—	—	e 9·6
Sydney		24·0	215	e 5 7	− 3	e 9 28	+ 9	—	—	e 16·2
Riverview		24·0	215	i 5 8a	− 2	i 9 22	+ 3	5 34	PP	e 11·2
Arapuni		24·4	164	—	—	9 40	+14	—	—	—
Wellington		27·3	168	5 35	− 6	10 19	+ 5	—	—	14·2
Christchurch		29·1	173	6 10	+13	10 46	+ 4	11 20	L_g	13·3
Adelaide		32·8	226	i 7 56	PPP	11 47	+ 6	12 18	SS	15·2
Honolulu		49·5	44	i 9 7	pP	e 15 47	0	i 9 55	P_cP	—
Perth		49·8	240	i 6 50	?	15 50	− 2	i 10 5	PP	25·0
Manila		54·3	300	e 9 21	− 1	16 55	+ 2	—	—	—
Ukiah		84·0	49	e 12 38	+13	e 22 42	0	e 28 24	SS	e 34·5
Calcutta	N.	85·7	294	e 12 23	−10	e 23 11	+12	e 15 41	pP	—
Pasadena		85·8	53	i 12 34	0	e 23 31	PS	i 15 57	PP	e 38·7
Irkutsk		85·9	327	e 12 34	0	22 48	[− 3]	—	—	45·2
Mount Wilson		85·9	53	i 12 34	0	—	—	i 15 57	PP	—
La Jolla		86·1	55	e 12 38	+ 3	—	—	—	—	—
College		86·3	17	e 16 11	PP	e 23 34	PS	e 28 14	SS	e 35·5
Riverside	E.	86·4	53	e 12 36	0	—	—	—	—	—
Haiwee		86·7	51	e 12 40	+ 2	—	—	—	—	—
Tinemaha		86·8	51	i 12 39	+ 1	—	—	—	—	—
Colombo	E.	89·3	277	e 12 55	+ 5	23 15	[+ 2]	—	—	—
Tucson		91·0	57	e 12 59	+ 1	e 23 38	[+15]	e 16 36	PP	e 38·4
Salt Lake City		92·7	47	—	—	e 23 39	[+ 7]	e 25 43	PS	e 38·7
Bozeman		95·7	43	—	—	e 23 51	[+ 3]	e 25 49	PS	e 40·1
Agra	E.	95·9	296	i 17 18	PP	i 23 37	[−12]	—	—	—
Bombay		98·8	287	e 16 55	PP	i 24 3	[− 2]	e 35 41	SSS	—
Andijan		103·1	309	e 17 33	PKP	e 24 32	[+ 7]	25 54	S	e 40·2
Lincoln		103·9	50	—	—	e 24 32	[+ 3]	e 31 39	SS	e 47·0
Tashkent		105·4	309	e 17 55	PKP	i 24 41	[+ 5]	18 31	PP	—
Tchimkent		105·4	310	—	—	i 24 40	[+ 4]	—	—	—
Sverdlovsk		111·3	325	e 18 50	PP	e 25 5	[+ 4]	—	—	48·2
Huancayo		112·5	109	e 18 26	[− 3]	e 26 11	SKKS	e 29 19	sPS	e 48·2
La Paz	Z.	117·1	117	e 19 17	PP	—	—	—	—	55·3
Ottawa		119·2	45	i 18 41	[− 1]	e 25 40	[+ 9]	e 21 34	PPP	54·2
Baku		120·2	308	e 20 35	PP	30 16	PS	e 36 4	SS	54·2
Williamstown		121·3	48	i 18 47	[+ 1]	—	—	—	—	e 57·9
Seven Falls		122·2	42	—	—	e 37 52	SSP	—	—	54·2
Grozny		122·8	312	e 18 46	[− 3]	—	—	—	—	—
Pulkovo		125·1	44	e 19 23	[+30]	—	—	—	—	e 57·7
San Juan		128·8	77	—	—	e 42 39	SSS	—	—	e 52·2
Upsala	N.	129·7	341	e 22 22	?	—	—	—	—	e 71·2
Ksara		132·3	302	e 19 14	[+ 7]	39 40	SS	e 21 38	PP	—
Helwan	E.	136·8	298	e 22 16	PP	e 28 46	SKKS	i 22 44	pPP	—
Uccle		141·4	344	—	—	e 40 54	SS	—	—	e 66·2
Stuttgart		141·6	337	e 19 25	[+ 1]	—	—	e 20 37	pPKP	—
Triest		142·0	330	e 19 57	[+32]	—	—	—	—	—
Chur		143·0	335	e 19 23	[− 4]	—	—	—	—	—
Basle		143·2	337	e 19 25	[− 2]	—	—	e 20 44	pPKP	—
Neuchatel		143·9	337	e 19 26	[− 1]	—	—	—	—	—
Rome		145·3	325	i 19 40	[+10]	e 34 55	PS	e 41 38	SS	e 59·0
Clermont-Ferrand		146·3	340	e 19 38	[+ 6]	—	—	—	—	—
Toledo	Z.	153·8	345	e 19 44	[+ 1]	—	—	e 20 18	pPKP	—
Granada		156·2	342	i 14 53	P	32 50	PPS	39 3	SS	80·8

For Notes see next page,

NOTES TO JANUARY 26d. 6h. 41m. 50s.

Additional readings :—
Brisbane iPPN = +4m.28s.
Riverview iZ = +5m.12s., PPPE = +5m.45s., SSE = +9m.56s., SSN = +9m.59s., SSSE = +10m.3s.
Adelaide iPP = +8m.30s., i = +8m.50s., +9m.15s., and +9m.49s., P_cP = +11m.20s., i = +14m.20s.
Honolulu pPP = +10m.52s., eS_cS = +18m.23s., SS = +19m.6s.
Perth i = +12m.5s. and +13m.23s., PS = +16m.0s., i = +17m.45s., +18m.40s., +20m.22s., and +21m.40s.
Ukiah eS = +22m.47s., esPS = +24m.24s., SS = +28m.34s., eSSS = +32m.21s.
Calcutta esSN = +23m.48s., eS_cSN = +25m.36s.
College epS = +22m.59s., esS = +23m.14s., esSP = +24m.19s., eSSS = +32m.11s.
Tucson eSP = +13m.36s., epPP = +16m.48s., ePPP = +18m.38s., esS = +24m.22s., esPS = +25m.17s., esSS = +30m.22s., eSSS = +34m.22s.
Salt Lake City eSS = +29m.3s.
Bozeman eSSS = +34m.23s.
Lincoln eSSS = +36m.52s.
Tashkent iPS = +27m.27s.
Huancayo ePPS = +29m.28s., esSS = +35m.38s.
Ottawa e = +27m.10s.?, +30m.34s., and +44m.40s.
Baku eSSS = +41m.28s.
Ksara iSKP = +22m.33s., PPS = +33m.52s.
Rome iZ = +20m.57s.
Toledo eZ = +19m.53s. and +20m.7s.
Granada ePPZ = +19m.29s., pPPZ = +20m.18s., pPPPN = +23m.50s., pPPSN = +34m.35s., sSSN = +40m.38s., SSSN = +44m.53s., sSSSN = +46m.41s., iZ = +58m.4s.
Long waves were also recorded at Scoresby Sund, Fordham, Tananarive, Florissant, St. Louis ,Philadelphia, Chicago, Harvard, Cape Town, East Machias, Kew, Bidston, De Bilt, Butte, Potsdam, Warsaw, Moscow, Sitka, and Vladivostok.

Jan. 26d. 15h. 20m. 35s. Epicentre 36°·3N. 71°·0E. (as on 1939 Dec. 19d.).

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

		△	Az.	P.	O−C.	S.	O−C.		Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Andijan		4·6	14	1 15	+ 3	—	—	—	—	—
Samarkand		4·6	319	i 1 18	+ 6	—	—	—	—	—
Tashkent		5·2	347	e 0 47	−34	i 1 26	−56	—	—	—
Tchimkent		6·1	351	i 1 33	− 1	—	—	—	—	—
Frunse		7·1	22	1 49	+ 1	—	—	—	—	—
Almata		8·3	32	2 4	0	—	—	—	—	—
Dehra Dun	N.	8·4	133	e 3 14	P_g	e 4 26	S_g	—	—	—
Agra	E.	10·9	145	2 35	− 5	4 29	−15	—	—	—
Semipalatinsk		15·6	22	3 37	− 6	—	—	—	—	—
Bombay		17·4	174	i 4 8	+ 2	i 7 22	+ 3	i 7 34	SS	—
Calcutta	N.	20·4	127	e 4 44	+ 3	e 8 14	−11	e 8 33	SS	e 9·9
Grozny		20·6	299	4 48	+ 5	8 37	+ 8	—	—	—
Erevan		21·1	288	4 55	+ 7	8 57	SS	—	—	—
Sverdlovsk		21·7	345	4 52	− 3	i 8 43	− 8	i 5 29	pP	11·7
Ksara		28·8	275	e 5 25	−37	i 11 9	+18	—	—	—
Moscow		29·8	321	e 6 8	− 3	e 10 55	−12	e 6 43	pP	—
Colombo	E.	30·4	163	—	—	e 10 55	−21	—	—	—
Pulkovo		35·1	325	e 6 53	− 4	e 12 17	−13	e 7 30	pP	14·0
Copenhagen		43·6	315	i 8 6	− 2	—	—	—	—	—
Jena	N.	44·2	308	i 10 14	PPP	—	—	—	—	—

Additional readings :—
Calcutta eP_cPN = +9m.9s.
Jena iE = +10m.17s.
Long waves were also recorded at Granada.

Jan. 26d. 17h. 4m. 19s. Epicentre 27°·3N. 132°·4E.

Intensity I at Nake and Miyazaki. Epicentre 26°·8N. 131°·2E. Shallow. Radius 200-300kms.
See Seismological Bulletin of the Central Met. Obs., Japan, for the year 1940. Tokyo, 1950, p. 7-8. Macroseismic Chart, p. 7.

$A = -\cdot6001$, $B = +\cdot6572$, $C = +\cdot4562$; $\delta = +15$; $h = +3$;
$D = +\cdot738$, $E = +\cdot674$; $G = -\cdot308$, $H = +\cdot337$, $K = -\cdot890$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Nake		2·7	293	0 43	− 2	1 11	− 8	—	—	—
Yakusima		3·5	336	0 58	+ 1	1 34	− 6	—	—	—
Naha		4·4	258	1 4	− 6	1 51	−11	—	—	—
Miyazaki		4·7	349	1 12k	− 2	2 4	− 6	—	—	—
Simidu		5·5	5	1 23k	− 2	2 22	− 8	—	—	—
Kumamoto		5·7	344	1 26k	− 2	2 26	− 9	—	—	—
Unzendake		5·7	341	1 34	+ 6	2 33	− 2	—	—	—
Nagasaki		5·8	339	1 34	+ 5	2 32	− 6	—	—	—
Muroto		6·1	13	1 34k	0	3 2	S*	—	—	—
Tomie		6·2	329	1 34	− 1	2 5	−43	—	—	—
Koti		6·3	8	1 35k	− 1	2 41	− 9	—	—	—
Hukuoka		6·5	346	1 39	0	2 35	−20	3 42	S_g	5·1
Izuka		6·5	348	1 38	− 1	3 24	S*	—	—	—
Matuyama		6·5	2	1 38k	− 1	—	—	—	—	—
Siomisaki		6·8	23	1 42k	− 2	3 20	S*	—	—	—
Miyakosima		6·9	250	1 39k	− 6	2 53	−12	—	—	—
Hirosima		7·0	359	1 47	+ 1	3 0	− 8	—	—	—
Sumoto		7·3	14	1 52k	+ 2	3 28	+13	—	—	—
Hamada		7·5	358	1 53	0	3 13	− 7	—	—	—
Owase		7·5	24	1 54	+ 1	3 56	S*	—	—	—
Kobe		7·7	16	1 57k	+ 1	3 50	S*	—	—	—
Osaka		7·8	19	1 58	0	3 59	S*	—	—	—
Isigakizima		7·9	252	1 54	− 5	4 0	S*	—	—	—
Kyoto		8·2	19	2 3	0	4 20	S_g	—	—	—
Husan		8·3	340	2 24	P*	3 32	− 8	—	—	—
Kameyama		8·3	24	2 6	+ 2	4 30	S_g	—	—	—
Toyooka		8·4	12	2 8	+ 2	4 49	S_g	—	—	—
Hatidyozima		8·6	47	1 54	−15	3 2	−46	—	—	—
Hikone		8·6	21	2 9	0	4 18	S*	—	—	—
Nagoya		8·7	24	2 13k	+ 3	4 54	S_g	—	—	—
Titizima		8·7	87	2 13	+ 3	3 46	− 4	—	—	—
Gihu		8·9	23	2 14k	+ 2	3 57	+ 2	—	—	—
Osima		9·5	37	2 25	+ 5	4 25	+15	—	—	—
Misima		9·6	34	2 24k	+ 3	4 27	+15	—	—	—
Hunatu		9·8	32	2 28k	+ 4	5 35	S_g	—	—	—
Kohu		9·8	30	2 29k	+ 5	5 19	S_g	—	—	—
Mera		9·9	38	2 31	+ 6	—	—	—	—	—
Taihoku		10·0	261	2 28	+ 1	—	—	—	—	—
Toyama		10·2	22	2 41	PP	6 2	L	—	—	(6·0)
Yokohama		10·2	35	2 35a	+ 4	5 6	SSS	—	—	—
Karenko		10·3	254	2 35	+ 3	5 9	SSS	—	—	—
Zi-ka-wei	N.	10·3	294	1 2 29	− 3	4 58	SS	i 2 59	PPP	—
Nagano		10·5	25	2 36	+ 1	5 52	L	—	—	(5·9)
Sintiku		10·5	260	2 33	− 2	—	—	—	—	—
Maebasi		10·7	30	2 39	+ 1	5 8	SS	—	—	—
Wazima		10·7	19	3 26	+48	5 38	SSS	—	—	—
Tokyo Cen. Met. Ob.		10·8	35	2 36	− 3	—	—	—	—	—
Taityu		11·0	257	2 43	+ 1	5 21	SSS	—	—	—
Tukubasan		11·0	35	2 44k	+ 2	5 1	SS	—	—	—
Arisan		11·1	253	2 32	−11	—	—	—	—	—
Tyosi		11·1	38	2 44	+ 1	—	—	—	—	—
Keizyo		11·2	337	2 45	+ 1	5 7	SS	—	—	—
Taito		11·2	248	2 38	− 6	4 34	−18	—	—	—
Zinsen		11·2	336	2 45	+ 1	5 6	SS	—	—	—
Utunomiya		11·2	33	3 1	PPP	5 23	SSS	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Mito		11·3	35	2 49k	+ 3	5 10	SS	—	—	—
Aikawa		11·8	23	2 53	0	—	—	—	—	—
Kosyun		11·8	246	2 52	− 1	4 53	−13	—	—	—
Tainan		11·8	252	3 46	+53	—	—	—	—	—
Hukusima		12·4	31	3 3	+ 2	5 34	SS	—	—	—
Sendai		13·0	29	3 9k	0	5 44	SS	—	—	—
Mizusawa		13·8	29	3 21	+ 2	7 49	L	—	—	(7·8)
Akita		13·9	25	3 26a	+ 5	6 14	SS	—	—	—
Miyako		14·6	30	3 28k	− 2	—	—	—	—	—
Aomori		15·1	25	3 38	+ 2	—	—	—	—	—
Hatinohe		15·2	27	3 37	− 1	—	—	—	—	—
Vladivostok		15·8	358	i 2 46	−59	i 5 47	−55	—	—	7·1
Mori		16·2	22	3 59	+ 9	7 38	SSS	—	—	—
Manila		16·5	222	i 3 51k	− 3	i 9 42	L	—	—	(i 9·7)
Hong Kong		17·3	257	3 57	− 7	7 12	− 4	4 11	PP	8·5
Sapporo		17·3	22	4 5	+ 1	7 48	SS	—	—	—
Phu-Lien		24·4	260	i 5 20	− 1	9 41	+ 2	—	—	11·7
Irkutsk		32·5	327	6 35	+ 1	—	—	e 7 30	PP	15·7
Calcutta	N.	40·1	273	e 7 44	+ 5	i 13 47	+ 1	e 9 11	PP	e 19·7
Semipalatinsk		45·6	316	8 24	0	—	—	—	—	—
Almata		47·1	306	8 37	+ 2	15 17	−11	i 10 18	PP	—
Dehra Dun	N.	47·3	287	e 8 30	− 7	e 15 9	−22	—	—	e 24·4
Agra	E.	48·0	283	i 8 37a	− 6	i 15 28	−13	i 10 29	PP	—
Frunse		48·9	305	8 46	− 4	15 49	− 4	—	—	31·7
Andijan		50·6	301	9 5	+ 3	—	—	e 10 16	PcP	—
Tchimkent		52·6	304	e 9 16	− 2	—	—	—	—	—
Tashkent		52·9	303	i 9 21	+ 1	i 16 49	+ 1	—	—	27·8
Colombo	E.	53·7	258	9 24	− 2	17 2	+ 3	—	—	26·2
Samarkand		54·8	301	e 9 34	0	—	—	—	—	—
Bombay		55·0	270	i 9 34	− 1	i 17 15	− 2	i 23 29	SSS	—
Sverdlovsk		57·7	322	i 9 54	− 1	i 17 51	− 2	—	—	26·2
Brisbane		58·0	158	i 9 53	− 4	i 17 53	− 4	—	—	24·6
College		61·3	29	—	—	e 18 43	+ 4	e 23 9	SS	e 25·8
Adelaide		62·2	174	i 10 29	+ 3	18 51	0	10 51	PcP	32·1
Honolulu		63·2	79	—	—	23 43	SS	—	—	—
Riverview		63·3	162	e 10 47	+14	e 19 10	+ 6	e 19 18	PS	e 30·3
Sydney		63·4	162	—	—	i 19 8	+ 2	e 26 14	SSS	—
Baku		67·5	305	i 11 2	+ 2	i 20 0	+ 4	—	—	34·7
Sitka		68·7	36	—	—	e 20 17	+ 7	e 23 59	SS	—
Grozny		69·5	309	e 11 11	− 1	e 20 21	+ 1	—	—	—
Moscow		70·5	323	11 17	− 1	20 28	− 4	—	—	35·7
Erevan		71·4	306	e 11 25	+ 1	e 20 48	+ 6	—	—	—
Pulkovo		72·6	329	i 11 30	− 1	e 20 52	− 4	—	—	e 33·1
Sotchi		73·6	311	11 34	− 3	21 3	− 4	—	—	45·7
Arapuni		76·6	146	—	—	21 11	−29	—	—	—
Upsala		78·1	332	12 13	+11	i 21 53	− 3	e 26 55	SS	e 37·7
Wellington		78·7	148	12 3	− 3	21 53	−10	—	—	41·7
Christchurch		79·6	151	12 6a	− 4	22 9	− 3	33 15	L_g	38·2
Ksara		80·3	303	i 12 14a	0	e 22 30	+10	15 24	PP	—
Scoresby Sund		80·8	352	e 12 26	+ 9	22 27	+ 2	i 23 46	PPS	33·8
Warsaw		80·8	325	12 16a	− 1	i 22 21	− 4	15 39	PP	e 36·7
Istanbul		81·8	312	10 20	?	—	—	—	—	—
Bucharest		82·0	316	e 12 40	+17	22 38	+ 1	23 16	PS	43·7
Bergen		82·6	337	12 28	+ 2	e 23 41	PS	e 28 58	SS	e 39·7
Copenhagen		82·9	331	e 12 29	+ 1	22 44	− 2	—	—	—
Ukiah		83·4	49	—	—	e 23 3	+12	—	—	e 34·2
Budapest		84·5	321	12 37	+ 1	23 3	+ 1	23 44	PS	e 43·2
Sofia		84·6	316	e 12 39	+ 3	e 23 5	+ 2	—	—	—
Potsdam		84·7	328	i 12 38k	+ 1	i 23 5	+ 1	i 24 2	PS	e 40·9
Hamburg		85·3	330	i 12 40k	0	e 23 6	− 4	—	—	e 43·7
Prague		85·4	326	11 57	−43	i 22 12	?	e 22 45	PS	e 41·7
Helwan		85·5	301	12 41	0	23 8	[+ 4]	13 21	pP	—
Heligoland	N.	85·8	332	—	—	e 23 11	− 4	—	—	e 42·7
Butte		86·3	38	e 12 55	+10	e 23 13	[+ 3]	e 24 46	PS	e 36·1
Jena		86·3	327	e 12 41	− 4	e 23 16	− 4	—	—	e 42·7

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bozeman		87·3	38	e 13 15	+25	e 23 15	[− 1]	e 17 59	PPP	e 35·0
Tinemaha		87·8	49	i 12 56	+ 4	—	—	e 16 22	PP	—
Santa Barbara		88·2	52	e 12 57	+ 3	—	—	—	—	—
De Bilt		88·5	330	i 12 57k	+ 1	e 23 37	− 4	i 16 21	PP	e 39·7
Haiwee		88·5	49	e 13 3	+ 7	—	—	—	—	—
Triest		88·5	322	i 12 13	−43	22 57	[−26]	i 14 12	pP	e 43·3
Stuttgart		88·9	326	e 13 7	+ 9	e 23 32	[+ 6]	e 16 30	PP	e 44·7
Edinburgh		88·9	336	—	—	23 32	[+ 6]	—	—	—
Mount Wilson		89·5	51	e 13 2	+ 2	—	—	—	—	—
Pasadena		89·5	51	e 13 2	+ 2	e 23 47	− 3	—	—	e 36·7
Uccle		89·7	331	e 13 2	+ 1	i 23 48	− 4	—	—	e 41·7
Salt Lake City		89·8	43	e 13 4	+ 2	—	—	—	—	—
Chur		90·0	326	e 13 1	− 2	—	—	e 16 20	PP	—
Zurich		90·1	326	e 13 4k	+ 1	e 23 22	[−11]	e 16 36	PP	—
Stonyhurst		90·3	335	—	—	i 23 50	− 7	i 25, 3	PS	46·7
Basle		90·5	326	e 13 14	+ 9	—	—	—	—	—
Bidston		90·8	335	—	—	i 24 24	+22	e 29 41?	SS	e 43·2
La Jolla		90·8	52	e 13 7	+ 1	—	—	—	—	—
Kew		91·2	332	e 18 41?	PPP	i 24 3	− 2	e 30 11	SS	e 50·7
Neuchatel		91·2	326	e 16 30	PP	—	—	—	—	—
Rome		91·5	319	i 14 7	+57	i 25 9	PS	i 14 28	pP	e 42·2
Ivigtut		91·8	0	—	—	e 24 10	− 1	e 26 11	PS	e 49·7
Paris		92·0	329	—	—	29 41?	SS	—	—	e 37·7
Jersey		93·7	333	—	—	30 51	SS	—	—	46·4
Tucson		95·6	49	e 13 30	+ 2	i 24 4	[0]	e 26 20	PS	e 38·8
Toledo		101·8	327	e 13 58	+ 2	32 46	SS	i 18 9	PP	—
Florissant	E.	103·0	33	i 18 14	PP	—	—	—	—	—
Seven Falls		103·0	15	—	—	e 27 23	PS	e 32 53	SS	45·7
Ottawa		103·3	20	i 18 18	PP	27 21	PS	—	—	45·7
Granada		103·7	325	e 15 5k	P	25 56	+ 5	19 0	PP	54·1
East Machias		106·0	14	e 14 25	P	25 26	[+31]	e 18 44	PP	e 49·3
Fordham		108·0	20	e 18 43	PP	e 25 3	[− 1]	e 28 12	PS	e 51·5
Bermuda		118·5	16	—	—	e 29 58	PS	—	—	e 55·0
Cape Town		123·6	246	21 2	PPP	26 26	[+25]	30 37	PPS	59·7
San Juan		131·2	23	e 23 28	PKS	—	—	e 25 8	PPP	e 53·0
Huancayo		149·9	65	e 19 57	[+10]	e 30 6	{−11}	23 32	PP	e 61·7
La Paz	Z.	158·2	65	20 7	[+ 8]	—	—	24 17	PP	77·4

Additional readings :—
Osaka S* = +3m.45s.
Zi-ka-wei iN = +4m.1s. and +5m.21s.
Hong Kong PP? = +4m.1s., SS = +7m.25s.
Irkutsk ePPP = +8m.6s.
Calcutta eP_cPN = +9m.56s., eS_cSN = +17m.54s.
Agra SSE = +18m.56s.
Andijan esP_cP = +10m.51s.
Bombay iEN = +9m.59s., iE = +10m.9s., +10m.43s., and +17m.46s.
Adelaide PP = +12m.49s., PS = +19m.21s., i = +19m.41s., S_cS = +20m.28s., SS = +22m.54s., i = +26m.45s.
Riverview iE = +20m.42s., eE = +26m.11s., eN = +26m.17s.
Upsala SSSN = +30m.16s.
Wellington SS = +28m.35s., SSS = +32m.17s.
Ksara PS = +23m.18s., SS = +27m.59s.
Scoresby Sund eSS = +27m.35s.
Warsaw iZ = +13m.56s., PSN = +23m.1s.
Bucharest iN = +14m.57s.
Ukiah eS = +23m.11s.
Budapest PPE = +12m.43s., iN = +12m.55s., eE = +25m.16s.
Potsdam iZ = +14m.17s., eN = +16m.49s., iE = +17m.14s., iSZ = +23m.8s.
Helwan iZ = +13m.7s. and +16m.2s., SE = +23m.51s., sSE = +25m.11s., PSE = +25m.47s., PPSE = +26m.51s., SSE = +30m.26s.
Butte eP = +13m.7s., eS = +23m.30s., eSS = +29m.5s., eSSS = +32m.54s.
Jena eSN = +23m.19s.
De Bilt eSS = +29m.39s., eE = +36m.1s.
Triest iPPP = +17m.33s., e = +19m.41s., eSKKS = +23m.42s., iS = +23m.46s., i = +24m.7s., ePS = +24m.35s., i = +24m.57s., iSS = +29m.59s., eSSS = +33m.50s.
Stuttgart eNE = +16m.0s., eSNE = +24m.4s., eSSE = +29m.41s.
Bidston i = +28m.22s., e = +37m.2s.
Kew iN = +28m.15s., eN = +37m.15s., eL_g = +43·2m.

Continued on next page,

Rome iPN =ePE = +14m.11s., iPPZ = +17m.46s., iPPE = +17m.55s., iE = +18m.27s., i = +18m.49s., ePPPE = +20m.28s., iSN = +25m.13s., iPSE = +25m.38s., iPSN = +25m.48s., iSSE = +31m.6s., iN = +31m.10s.
Ivigtut ePPS = +26m.53s.
Tucson eP = +13m.58s., ePP = +17m.18s., ePPP = +19m.21s., eS = +25m.25s., eSS = +30m.48s., eSSS = +35m.1s.
Toledo e = +20m.12s.
Florissant iZ = +18m.18s.
Ottawa e = +22m.23s.
Granada SKKSN = +26m.54s., iSN = +27m.54s., PSN = +28m.12s., SSN = +33m.19s., SSSZ = +38m.21s.
East Machias eS = +26m.33s.
Fordham eZ = +21m.15s., eN = +38m.43s.
Cape Town SS = +35m.48s., SSS = +41m.16s.
Huancayo ePPP = +26m.52s., ePPS = +36m.10s., eSS = +42m.53s.
La Paz PKP_2 = +20m.42s., iZ = +24m.48s., PSKS = +34m.35s.
Long waves were also recorded at Harvard, Lisbon, and Williamstown.

Jan. 26d. 20h. 56m. 0s. Epicentre 40°·4N. 38°·2E.

A = +·6001, B = +·4723, C = +·6456,; δ = −1; h = −2;
D = +·618, E = −·786; G = +·507, H = +·399, K = −·764.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Sotchi		3·4	19	0 54	− 1	e 1 26	−11	e 1 2	P*	—
Erevan		4·8	90	1 14	− 1	e 2 0	−12	e 2 24	S*	—
Grozny		6·4	60	1 46	P*	e 3 22	S*	2 8	P_g	—
Ksara.		6·8	196	e 1 46	+ 2	e 2 57	− 6	i 3 34	S*	—
Baku		8·9	86	e 2 10	− 2	e 3 48	− 7	—	—	5·3
Rome		19·4	283	—	—	9 28?	SSS	—	—	e 11·5
Sverdlovsk		22·0	34	e 4 59	+ 1	—	—	—	—	12·0

Additional readings :—
Sotchi iS_g = +1m.37s.
Long waves were also recorded at Tashkent.

Jan. 26d. 23h. 11m. 38s. Epicentre 42°·0N. 78°·0E. (as on 1937 Nov. 10d.).

A = +·1550, B = +·7291, C = +·6666; δ = −3; h = −2;
D = +·978, E = −·208; G = +·139, H = +·652, K = −·745.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Almata		1·5	329	i 0 30	+ 2	—	—	—	—	—
Frunse		2·7	289	i 0 44	− 1	i 1 15	− 4	i 0 49	P*	—
Andijan		4·4	255	e 1 7	− 3	1 53	− 9	i 1 22	P*	—
Tchimkent		6·3	276	1 28	− 8	e 2 52	+ 2	—	—	—
Tashkent		6·5	267	i 1 34	− 5	—	—	i 2 6	P_g	—
Semipalatinsk		8·5	10	2 16	+ 9	—	—	—	—	—
Samarkand		8·7	258	e 2 11	+ 1	e 3 52	+ 2	—	—	—
Agra	E.	14·8	180	e 3 51	PP	6 13	− 5	—	—	—
Sverdlovsk		18·6	329	i 4 19	− 2	e 7 42	− 4	—	—	9·6
Irkutsk		20·5	50	e 4 45	+ 3	e 8 32	+ 5	—	—	10·9
Baku		21·2	276	e 4 50	+ 1	—	—	—	—	12·1
Calcutta	N.	21·2	153	e 4 56	+ 7	e 8 53	+12	e 8 59	P_cP	e 11·4
Bombay		23·5	193	—	—	e 9 23	0	—	—	e 12·4
Grozny		23·7	285	5 14	0	e 10 46	SSS	—	—	—
Erevan		25·2	277	e 5 30	+ 1	—	—	e 5 52	PP	—
Moscow		29·5	312	e 6 21	+13	e 11 17	+15	—	—	e 15·4
Ksara		34·0	270	e 6 45	− 3	e 13 4	+51	e 14 20	SS	—
Pulkovo		34·0	318	e 6 45	− 3	—	—	—	—	15·6
Colombo	E.	35·0	178	e 9 22?	?	—	—	—	—	—
Vladivostok		39·1	70	e 7 42	+11	—	—	—	—	—
Helwan	z.	39·2	267	e 7 27	− 4	—	—	—	—	—
Copenhagen		43·6	312	i 8 6	− 2	—	—	—	—	—

Additional readings :—
Andijan P_gP_g = +11m.29s., iS_g = +2m.17s.
Calcutta eSSN = +9m.26s.
Erevan ePPP = +6m.26s.
Long waves were also recorded at Hamburg, Potsdam, Prague, Rome, Upsala, Warsaw, De Bilt, Kew, and Bidston.

Jan. 26d. Readings also at 1h. (Ksara and near Balboa Heights), 4h. (Pasadena, Mount Wilson, Tinemaha, and Tucson (2)), 6h. (near Mizusawa), 7h. (Ksara and Apia), 8h. (Salt Lake City), 9h. (Bozeman), 15h. (Basle), 18h. (Tucson).

Jan. 27d. 14h. 49m. 40s. Epicentre 32°·5N. 139°·0E.

$A = -\cdot6377$, $B = +\cdot5544$, $C = +\cdot5347$; $\delta = -8$; $h = +1$;
$D = +\cdot656$, $E = +\cdot755$; $G = -\cdot404$, $H = +\cdot351$, $K = -\cdot845$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Osaka		3·6	308	0 54	− 4	1 28	−14	—	—	—
Hukuoka		7·3	279	e 1 54	+ 4	4 19	S_g	—	—	—
Hong Kong		24·2	250	9 59	S	(9 59)	+24	—	—	(13·4)
Manila		24·2	226	e 5 16	− 3	11 34	SSS	—	—	—
Agra	E.	52·6	281	e 9 27	+ 9	17 6	+22	20 52	SSS	—
Andijan		53·0	299	e 9 11	−10	—	—	—	—	—
Sverdlovsk		57·3	320	9 48	− 4	e 17 43	− 4	—	—	26·3
Moscow		69·8	323	e 11 12	− 2	—	—	—	—	e 36·3
Pulkovo		71·1	330	e 11 24	+ 2	—	—	—	—	e 39·6
Tinemaha	z.	80·1	53	e 12 14	+ 1	—	—	—	—	—
Mount Wilson	z.	81·8	54	i 12 25	+ 3	—	—	—	—	—
Pasadena	z.	81·8	54	i 12 25	+ 3	—	—	—	—	—
Ksara		82·1	304	e 12 2	−22	e 22 10	−28	—	—	—
Tucson		87·9	53	e 12 53	0	—	—	—	—	—

Hong Kong gives S as P and L as S.
Long waves were also recorded at Irkutsk, Upsala, Prague, Warsaw, Baku, Potsdam, Hamburg, Uccle, Rome, and De Bilt.

Jan. 27d. Readings also at 2h. (near Tananarive, Pasadena, Mount Wilson, Tucson, La Paz, Huancayo, and Wellington), 3h. (Ksara), 4h. (near New Plymouth and Wellington), 5h. (Ksara), 7h. (near Wellington, New Plymouth, and Bozeman), 10h (Fordham, Scoresby Sund, San Juan, Williamstown, Bermuda, Balboa Heights, Ottawa, Harvard, Bozeman, Tucson, La Paz, and Huancayo), 11h. (Potsdam), 12h. (Mizusawa), 17h. (College), 19h. (Tucson), 23h. (Ksara and Manila).

Jan. 28d. 8h. 27m. 54s. Epicentre 62°·0N. 138°·0W.

$A = -\cdot3507$, $B = -\cdot3158$, $C = +\cdot8816$; $\delta = -6$; $h = -10$;
$D = -\cdot669$, $E = +\cdot743$; $G = -\cdot655$, $H = -\cdot590$, $K = -\cdot472$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Sitka		5·1	164	i 1 26	P*	2 26	+ 6	—	—	2·6
College		5·2	307	e 1 23	+ 2	e 2 19	− 3	—	—	2·6
Victoria		15·8	142	e 2 8	?	i 8 36	L	—	—	(i 8·6)
Bozeman		22·6	123	—	—	e 9 31	SS	—	—	e 12·3
Salt Lake City		26·5	132	—	—	e 10 22	+ 8	—	—	e 14·2
Tinemaha		27·8	144	e 5 53	0	—	—	—	—	—
Haiwee		28·8	144	i 6 1	− 1	—	—	—	—	—
Mount Wilson	z.	30·5	145	i 6 16	− 1	—	—	—	—	—
Pasadena		30·6	145	e 6 15	− 3	—	—	—	—	—
Riverside	z.	31·0	145	e 6 19	− 2	—	—	—	—	—
Tucson		34·5	136	i 6 52	0	—	—	e 8 11	PP	—
Ottawa		38·7	85	i 7 31	+ 4	—	—	—	—	i 20·6
Shawinigan Falls		39·2	81	e 7 37	+ 6	—	—	—	—	e 20·7
Columbia		45·2	100	—	—	e 17 50	SS	—	—	e 24·2
Sverdlovsk		60·6	348	10 12	− 3	18 34	+ 4	—	—	28·1

Additional readings :—
Sitka i = +2m.12s.
Salt Lake City eS = +10m.31s.
Tucson eP_cP = +9m.13s.
Long waves were also recorded at Pennsylvania, Fordham, Williamstown, Halifax, Seven Falls, Irkutsk, Scoresby Sund, Lincoln, East Machias, Baku, San Juan, Philadelphia, Harvard, and Chicago.

Jan. 28d. Readings also at 0h. (Seattle, Baku, and Sverdlovsk), 7h. (Tinemaha, Haiwee, Mount Wilson, Pasadena, Ottawa, Columbia, San Juan, Philadelphia, Butte, Balboa Heights, Huancayo (2), La Paz (2), Williamstown, Fordham, and Tucson), 8h. (College), 10h. (near Almata (2), Frunse (2), and Andijan (2)), 11h. (Manlla), 12h. (Toledo, Wellington, Tucson, La Paz, and Huancayo), 13h. (Ksara), 15h. (near Balboa Heights), 17h. (near Hukuoka and Tucson), 18h. (Tucson (2)), 23h. (Fordham and near Williamstown).

Jan. 29d. Readings at 0h. (Agra), 2h. (Tucson and near Mizusawa), 4h. (Tucson), 6h. (Colombo and Tucson), 8h. (Tucson), 11h. (Tucson and Mizusawa), 12h. (Potsdam and Ksara), 14h. (Riverview, Arapuni, Christchurch, Sydney, and Wellington), 18h. (Tucson), 19h. (Tucson and near Balboa Heights), 21h. (Tucson), 22h. (Tucson).

Jan. 30d. Readings at 0h. (Mizusawa), 3h. (Tananarive), 4h. (La Paz and Tucson), 5h. (Tucson), 10h. (La Paz, Tucson, near Harvard, and Huancayo (2)), 11h. (La Paz, Huancayo, and Balboa Heights), 12h. (Huancayo (4), Balboa Heights, near Harvard, Tucson (2), La Paz (3), Pasadena (2), Mount Wilson (2), San Juan, Toledo, Riverside, Haiwee, Tinemaha (2), and Ottawa), 13h. (Mount Wilson, Pasadena, La Paz, Tucson, and Huancayo (2)), 15h. (Balboa Heights), 19h. (near Fordham), 20h. (Tucson), 22h. (Tucson).

Jan. 31d. Readings at 0h. (Balboa Heights, Huancayo. Tucson, San Juan, La Plata, and La Paz), 1h. (Balboa Heights and Tucson), 4h. (near Triest, Stuttgart, Strasbourg, near Rome, Prato, Basle and Chur), 5h. (Mizusawa), 7h. (Algiers), 10h. (Triest), 11h. (near Triest, Prato, Rome, Strasbourg, Stuttgart, Basle and Zurich), 15h. (Tucson), 16h. (Mizusawa), 17h. (near Almata, Andijan, and Frunse), 18h. (Tucson (2)), 19h. (Huancayo), 21h. (Huancayo), 23h. (Tucson).

Feb. 1d. 5h. 12m. 56s. Epicentre 41°·0N. 33°·0E. (approximate).

$A = +\cdot6348$, $B = +\cdot4122$, $C = +\cdot6535$; $\delta = -6$; $h = -2$;
$D = +\cdot545$, $E = -\cdot839$; $G = +\cdot548$, $H = +\cdot356$, $K = -\cdot757$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bucharest	6·1	306	e 1 34	0	2 44	− 1	1 44	P*	—
Sofia	7·4	287	e 2 2	+10	i 3 40	S*	i 4 2	S_g	—
Ksara	7·5	161	e 2 5	P*	e 3 35	S*	4 27	S_g	—
Szeged	10·7	304	e 2 34	− 4	—	—	e 2 49	PP	—
Warsaw	13·9	328	e 3 15	− 6	5 45	−12	—	—	e 6·8
Potsdam	17·7	317	e 4 22	PP	—	—	—	—	e 11·1
Chur	17·9	299	e 4 12	0	—	—	—	—	—
Stuttgart	18·5	304	e 4 18	− 1	—	—	i 4 34	PP	—
Zurich	18·6	299	e 4 20	− 1	—	—	—	—	—
Pulkovo	18·9	357	e 4 47	PPP	8 56	SSS	—	—	e 10·0
Basle	19·3	300	e 4 27	− 2	—	—	e 5 26	PPP	—
Copenhagen	19·9	326	i 4 31	− 5	—	—	—	—	—
Upsala	21·2	338	e 5 4?	PP	e 8 29	−12	—	—	—
Clermont-Ferrand	22·2	293	e 5 14	PP	—	—	—	—	—
Sverdlovsk	23·9	41	5 14	− 2	9 34	+ 4	—	—	13·6

Additional readings :—
Bucharest $P_gE = +1$m.55s., $S^*E = +3$m.3s., $S^*N = +3$m.7s., $S_gE = +3$m.19s.
Long waves were also recorded at Moscow, Granada, Tashkent, Rome, Baku and Bidston.

Feb. 1d. 6h. Undetermined shock.
Sofia ePEN = 20m.18s., eEN = 20m.26s., iSEN = 21m.0s.
Bucharest ePZ = 20m.37s., PN = 20m.46s., P*Z = 21m.13s., P*E = 21m.16s., P_gE = 21m.25s., SEN = 22m.2s., S*NZ = 22m.15s., S*E = 22m.18s.
Triest e = 20m.58s.a, eP = 21m.9s., iS = 23m.17s. and iSS = 23m.38s.
Szeged eN = 21m.23s., eE = 21m.50s. and 22m.46s., eN = 22m.50s., L = 23·2m.
Rome ePZ = 21m.34s., iSEN = 23m.10s., iZ = 23m.21s., eL_q = 23m.43s., eZ = 24m.2s., i = 24m.21s.
Chur eP = 22m.25s., eS? = 24m.50s.
Basle eP = 22m.42s., eS = 26m.52s.
Prague e = 22m.46s.
Jena eN = 22m.49s., eE = 23m.0s., eSE = 27m.0s., eSN = 27m.6s., iL = 27·2m.
Ksara e = 22m.53s., eS = 25m.59s.
Budapest ePE = 22m.56s., ePN = 23m.0s., LE = 23m.55s.
Kecskemet Z e = 23m.0s., eL = 23·7m.
Stuttgart ePZ = 23m.8s., eNE = 26m.33s. and 26m.46s.
Uccle ePZ = 23m.34s., eL = 28·0m.
Strasbourg e = 25m.44s., 25m.59s., and 27m.19s.
Potsdam eEN = 27m.0s., eZ = 28m.6s.
Long waves were also recorded at Warsaw, Paris, Hamburg, De Bilt, and Upsala.

Feb. 1d. Readings also at 1h. (Tucson), 5h. (Ksara, Triest, Sofia, Rome, and Bucharest), 6h. (Paris), 8h. (Tucson), 10h. (Toledo), 11h. (Calcutta), 12h. (Ksara), 16h. (Scoresby Sund and Mizusawa), 18h. (near Wellington, New Plymouth, and near Manila), 19h. (Calcutta, Kodaikanal, Colombo, and Agra), 20h. (near Manila and Tucson), 22h. (Scoresby Sund).

Feb. 2d. 15h. 46m. 21s. Epicentre 39°·6N. 38°·1E. (as on 1939, December 27d.).

A = +·6080, B = +·4767, C = +·6349 ; δ = 0 ; h = −2 ;
D = +·617, E = −·787 ; G = +·500, H = +·392, K = −·773.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Erevan		5·0	80	1 11	− 7	2 6	−12	—	—	—
Yalta		5·7	330	1 31	+ 3	2 44	+ 9	—	—	—
Ksara		6·0	198	e 1 37	+ 5	e 2 51	+ 8	i 3 33	S_g	—
Grozny		6·8	55	1 45	+ 1	3 12	+ 9	—	—	—
Baku		9·1	81	e 2 15	+ 1	e 3 56	− 4	e 4 29	S*	5·4
Bucharest		10·1	303	—	—	e 5 9	S*	—	—	7·2
Helwan		11·2	212	2 48	+ 4	i 6 52	L	—	—	(i 6·9)
Rome		19·5	286	e 8 35	SS	—	—	—	—	e 12·4
Sverdlovsk		22·7	33	4 53	−11	8 56	−13	—	—	11·6
Tashkent		23·7	76	5 9	− 5	9 19	− 8	—	—	13·7

Feb. 2d. 19h. 53m. 42s. Epicentre 37°·0N. 70°·5E. (as on 1938, January 18d.).

A = +·2672, B = +·7547, C = +·5992 ; δ = +1 ; h = −1 ;
D = +·943, E = −·334 ; G = +·200, H = +·565, K = −·801.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Samarkand		3·8	315	1 16	P_g	1 54	S*	2 2	S_g
Andijan		4·0	20	e 1 9	P*	1 47	− 5	—	—
Tashkent		4·4	351	1 22	P*	i 1 55	− 7	1 30	P_g
Tchimkent		5·3	354	e 1 22	0	—	—	—	—
Frunse		6·7	27	e 1 29	−13	2 29	−31	—	—
Almata		8·0	36	e 1 54	− 6	—	—	2 27	P*
Agra	E.	11·7	145	e 2 44	− 7	4 39	−25	—	—
Semipalatinsk		15·1	24	e 3 32	− 4	6 8	−17	—	—
Erevan		20·5	286	6 3	?	—	—	—	—
Sverdlovsk		20·9	345	4 42	− 4	—	—	—	—
Ksara		28·3	273	—	—	e 10 46	+ 3	e 12 9	SSS

Additional readings :—
Tashkent S_g = +2m.4s.
Agra esP? = +3m.25s.
Long waves were also recorded at Baku.

Feb. 2d. Readings also at 0h. (Helwan and Ksara), 2h. (near Mizusawa), 4h. (near Mizusawa), 5h. (Tucson), 6h. (Ksara, Tucson, Agra, Scoresby Sund, Rome, Bozeman, Butte, Upsala, East Machias, Philadelphia, Salt Lake City, Ivigtut, Paris, Potsdam, Reykjavik, De Bilt, Warsaw, Fordham, Uccle, and Granada), 7h. (Tucson (2)), 9h. (La Paz), 10h. (Scoresby Sund), 11h. (Tucson, Rome, Ksara, and Agra), 12h. (Scoresby Sund).

Feb. 3d. 19h. 34m. 57s. Epicentre 39°·6N. 38°·1E. (as on 1940, February 2d.).

$A = +\cdot6080$, $B = +\cdot4767$, $C = +\cdot6349$; $\delta = 0$; $h = -2$;
$D = +\cdot617$, $E = -\cdot787$; $G = +\cdot500$, $H = +\cdot392$, $K = -\cdot773$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Erevan	5·0	80	1 17	− 1	2 47	S_g	—	—	—
Yalta	5·7	330	1 20	− 8	—	—	—	—	—
Ksara	6·0	198	e 1 58	P_g	i 3 42	S_g	—	—	—
Grozny	6·8	55	1 46	+ 2	4 2	S_g	—	—	—
Baku	9·1	81	—	—	e 3 54	− 6	—	—	6·3
Sverdlovsk	22·7	33	5 3	− 1	9 7	− 2	—	—	12·0
Tashkent	23·7	76	e 5 12	− 2	9 23	− 4	—	—	e 13·6

Long waves were also recorded at Moscow, Rome, Helwan, and Istanbul.

Feb. 3d. Readings also at 0h. (Ksara and near Agra), 9h. (La Paz), 11h. (Ksara, Erevan, Sverdlovsk, Baku, and Grozny), 15h. (near Stuttgart and Ebingen), 16h. (Andijan (2), Frunse (2), and Almata (2)), 23h. (Tucson).

Feb. 4d. 18h. Undetermined shock.

Istanbul P = 17m.45s., P_g = 17m.59s., PS = 18m.24s., S_g = 18m.56s., eL = 19·3m.
Yalta P = 18m.4s., S = 18m.50s.
Grozny P = 19m.13s., S = 20m.53s.
Bucharest ePN = 19m.17s., P*N = 19m.31s., P_g?EN = 19m.51s., SEN = 20m.22s., S*?EN = 20m.31s., iS_g?EN = 20m.51s., LE = 21·3m.
Sofia ePEN = 19m.45s., iEN = 21m.33s., iE = 21m.58s.
Ksara e = 20m.17s. and 21m.27s., i = 22m.11s.
Helwan eZ = 20m.37s., iE = 23m.9s.
Warsaw ePE = 21m.2s., eSE = 23m.30s., L = 24·4m.
Moscow eP = 21m.11s.
Triest eP = 21m.24s., e = 26m.14s.
Sverdlovsk P = 22m.56s., S = 27m.16s., L = 30·0m.
Rome e = 25m.32s. and 27m.2s.
Tashkent eS = 27m.25s., L = 33·5m.
Long waves were also recorded at Baku.

Feb. 4d. Readings also at 2h. (near Berkeley), 5h. (Ksara), 7h. (Tucson), 8h. (Tucson), 11h. (Calcutta), 12h. (Tucson), 15h. (Bozeman and Tucson), 17h. (near Cape Girardeau), 18h. (Tucson, Ksara, Rome, Sofia, and Bucharest).

Feb. 5d. 7h. 59m. 26s. Epicentre 45°·5N. 84°·0E.

$A = +\cdot0735$, $B = +\cdot6994$, $C = +\cdot7109$; $\delta = -6$; $h = -4$;
$D = +\cdot995$, $E = -\cdot105$; $G = +\cdot074$, $H = +\cdot707$, $K = -\cdot703$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m. s.			m.
Almata		5·5	247	1 20	− 5	2 17	−13	2 47	S*		—
Semipalatinsk		5·5	335	1 21	− 4	2 25	− 5	3 3	S_g		—
Frunse		7·3	251	1 58	+ 8	3 16	+ 1	—		—	—
Andijan		9·7	245	—	—	e 4 34	S*	—		—	—
Tashkent		11·5	253	e 3 0	PP	e 4 59	0	—		—	5·7
Samarkand		13·8	251	—	—	i 5 6	−48	—		—	—
Irkutsk		15·0	56	e 3 32	− 3	6 27	+ 4	—		—	i 7·8
Sverdlovsk		18·4	317	e 4 12	− 6	7 35	− 6	—		—	9·2
Agra	E.	19·0	195	e 4 26	0	7 55	0	—		—	—
Calcutta	N.	23·2	170	e 3 10	?	i 9 33	+15	—		—	—
Grozny		27·2	279	5 46	− 1	10 27	+ 2	—		—	—
Moscow		30·7	307	7 5	PP	13 52	SSS	—		—	15·7
Ksara		38·3	269	e 8 57	PP	e 15 3	SS	—		—	—
Warsaw		40·8	303	e 17 31	SSS	—	—	—		—	20·8
Upsala		40·9	315	e 17 53	SS	—	—	—		—	e 22·6

Long waves were also recorded at Pulkovo, Vladivostok, Stuttgart, Jena, Rome, Prague, Kodaikanal, Hamburg, Uccle, and Potsdam.

Feb. 5d. Readings also at 2h. (near Branner, San Francisco, and Lick), 6h. (Perth, La Paz, Vladivostok, Irkutsk, Tashkent, Manila, Sverdlovsk, near Mizusawa, Tinemaha, Haiwee, Tucson, Riverside, Mount Wilson, and Pasadena), 7h. (Colombo, Hong Kong, Baku (2), Sverdlovsk, Agra, Manila, and Tucson), 9h. (near Christchurch, Wellington, New Plymouth, and near Tananarive), 10h. (Tucson, Haiwee, Tinemaha, Riverside, Mount Wilson, and Pasadena), 11h. (near Osaka), 12h. (Frunse, Semipalatinsk, Almata, Agra, Sverdlovsk, and Tashkent), 16h. (near Mizusawa), 18h. (Tucson), 20h. (Tucson), 22h. (near Mizusawa and Tucson (2)), 23h. (Tucson, Agra, Pasadena, Mount Wilson, and Tinemaha).

Feb. 6d. Readings at 0h. (Mizusawa and Ksara), 1h. (near Grozny and Erevan), 6h. (Tucson), 13h. (La Paz and near Algiers), 22h. (Tucson).

Feb. 7d. 17h. 15m. 55s. Epicentre 51°·3N. 175·1E. (as on 1939 September 8d.).

$A = -\cdot6255$, $B = +\cdot0536$, $C = +\cdot7783$; $\delta = -13$; $h = -6$;
$D = +\cdot085$, $E = +\cdot996$; $G = -\cdot775$, $H = +\cdot066$, $K = -\cdot628$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Nemuro		21·4	260	4 49	− 2	8 48	+ 3	—	—	—
College		23·4	40	i 5 13	+ 2	i 9 22	+ 1	e 6 21	PP	i 10·5
Sapporo		24·2	265	e 5 19	0	e 9 35	0	—	—	e 15·4
Mori		25·2	264	e 5 5	−24	—	—	—	—	—
Mizusawa		26·6	256	5 40	− 2	10 12	− 4	—	—	—
Sendai		27·3	255	5 44	− 4	9 48	−39	—	—	—
Mito		28·8	254	6 0	− 2	12 37	SSS	—	—	—
Tokyo, Cen. Met. Ob.		29·7	253	5 5?	−65	—	—	—	—	—
Yokohama		29·9	252	e 6 53	PP	—	—	—	—	—
Vladivostok		30·1	272	i 6 11	− 2	i 13 23	SSS	i 7 11	PP	14·3
Osaka		32·9	256	6 30	− 8	11 57	+ 1	—	—	—
Koti		34·9	255	6 49	− 6	12 17	−10	—	—	—
Honolulu		36·6	135	e 7 23	+13	i 12 58	+ 5	e 8 48	PP	e 15·5
Zinsen		36·6	268	7 7	− 3	12 46	− 7	—	—	—
Hukuoka		36·8	258	7 5?	− 6	—	—	—	—	23·1
Miyazaki		37·3	255	7 16	0	13 0	− 4	—	—	17·2
Nagasaki		37·7	259	7 24	+ 5	13 18	+ 8	—	—	—
Victoria		38·8	69	7 28	0	13 22	− 4	8 56	PP	18·1
Seattle		39·7	70	e 8 0	+24	e 13 45	+ 5	e 9 43	P_cP	e 16·1
Irkutsk		42·2	301	i 7 45	−11	e 14 15	− 2	—	—	21·8
Ukiah		43·9	81	e 8 13	+ 3	14 44	+ 2	e 10 22	pPP	—
Berkeley		44·8	82	e 8 21	+ 4	i 15 3	+ 8	e 10 5	PP	e 22·0
San Francisco		45·2	82	e 8 25	+ 5	—	—	—	—	—
Branner	N.	45·6	82	e 8 5?	−19	—	—	—	—	—
Santa Clara	Z.	45·8	82	i 8 24	− 1	i 15 10	+ 1	—	—	—
Lick		46·0	82	e 8 29	+ 2	e 15 14	+ 2	—	—	—
Saskatoon		46·2	57	8 30	+ 2	15 13	− 2	18 20	SS	21·1
Butte		46·3	66	e 8 31	+ 2	e 15 11	− 5	e 10 12	P_cP	—
Bozeman		47·4	66	e 8 37	− 1	i 15 32	0	18 31	S_cS	e 21·2
Tinemaha		48·2	80	i 8 45	+ 1	e 15 48	+ 5	—	—	—
Haiwee		49·0	81	e 8 53	+ 3	—	—	—	—	—
Santa Barbara	Z.	49·0	84	i 8 53	+ 3	—	—	—	—	—
Logan		49·3	70	i 8 55	+ 2	i 15 16	−43	11 53	PP	—
Salt Lake City		49·8	71	e 8 57	+ 1	i 16 6	0	e 9 21	pP	e 22·3
Mount Wilson		50·2	83	i 9 0	0	e 16 10	− 1	i 9 18	pP	—
Pasadena		50·2	83	i 8 59a	− 1	i 16 12	+ 1	i 9 15	pP	e 21·1
Riverside		50·8	83	i 9 3	− 1	—	—	i 9·20	pP	—
La Jolla		51·6	84	e 9 11	+ 1	—	—	—	—	—
Hong Kong		54·8	262	9 32a	− 2	17 23	+ 9	10 23	P_cP	—
Semipalatinsk		55·7	310	9 41	+ 1	e 17 56	+30	—	—	27·1
Tucson		56·0	79	i 9 43a	0	i 17 27	− 3	i 9 58	pP	e 23·5
Manila		56·6	251	i 9 45k	− 2	i 17 54	+16	—	—	27·6
Scoresby Sund		57·9	7	9 56	0	e 17 51	− 4	e 12 33	PP	e 23·5
Lincoln		58·5	62	e 10 25	+25	i 18 0	− 3	e 12 8	PP	e 23·5
Sverdlovsk		59·5	325	i 10 6	− 1	i 18 14	− 2	—	—	27·5

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Phu-Lien		60·6	268	e 10 12	− 3	18 28	− 2	—	—	—
Almata		62·2	306	10 22	− 4	19 1	+10	—	—	33·1
Ivigtut		62·6	22	e 11 0	+32	i 18 52	− 4	e 13 20	PP	e 25·6
Chicago U.S.C.G.S.		62·7	57	e 10 29	0	i 18 54	− 3	i 20 17	S_cS	e 28·5
Chicago J.S.A.		62·7	57	e 10 34	+ 5	i 18 54	− 3	—	—	—
Florissant		63·5	61	i 10 34	0	i 19 4	− 3	i 13 6	PP	29·3
St. Louis		63·6	61	e 10 33	− 2	e 19 5	− 3	e 20 26	S_cS	—
Frunse		63·7	306	10 31	− 5	e 19 14	+ 4	—	—	34·1
Cape Girardeau		65·0	62	e 10 44	0	e 19 25	− 1	19 50	PS	e 31·4
Toronto		65·6	51	10 51	+ 3	19 25	− 8	14 38	PPP	29·1
Pulkovo		65·7	342	i 10 48	0	e 19 30	− 4	—	—	e 33·0
Ottawa		66·0	47	i 10 49	− 1	i 19 33	− 5	i 13 17	PP	30·1
Andijan		66·4	306	10 51	− 2	—	—	—	—	36·1
Shawinigan Falls		66·4	44	10 53	0	19 38	− 5	—	—	33·1
Tchimkent		66·6	309	10 55	+ 1	19 44	− 1	—	—	34·1
Seven Falls		66·8	43	10 59	+ 3	19 43	− 5	23 52	SS	29·1
Tashkent		67·5	308	i 10 59	− 1	i 19 56	0	—	—	e 26·6
Moscow		67·7	336	10 59	− 2	19 54	− 4	—	—	26·8
Pittsburgh		67·7	53	i 11 5	+ 4	i 19 58	0	e 25 6	SS	—
Upsala		67·7	348	i 10 58	− 3	i 19 53	− 5	e 13 30	PP	e 31·1
Vermont		67·8	46	—	—	e 19 56	− 4	e 24 48	SS	e 30·2
Bergen		68·4	355	i 11 32	+26	20 33	+26	—	—	35·0
Pennsylvania		68·5	51	e 11 30	+24	i 20 7	− 1	—	—	—
East Machias		70·1	43	e 11 25k	+ 9	i 20 25	− 2	e 13 50	PP	e 28·5
Harvard		70·1	46	i 8 19	?	i 20 23	− 4	i 21 19	S_cS	e 39·1
Georgetown		70·3	52	e 11 25	+ 8	i 20 28	− 1	—	—	—
Fordham		70·4	49	i 11 24k	+ 6	i 20 26	− 4	e 25 38	SS	e 31·6
Philadelphia		70·4	50	e 11 24	+ 6	i 20 19	−11	i 21 3	PS	e 32·1
Calcutta	N.	70·8	289	i 11 16k	− 4	i 20 27	− 8	e 21 38	P_cP	i 33·1
Dehra Dun	N.	71·1	295	e 10 30	−52	e 19 43	−55	—	—	e 34·0
Halifax		71·8	40	11 34	+ 8	20 47	+ 1	21 26	PS	34·1
Copenhagen		72·4	350	i 11 29k	− 1	i 20 51	− 2	21 28	PS	32·1
Edinburgh		73·1	359	—	—	i 21 5	+ 4	—	—	—
Agra	E.	73·5	293	i 11 34	− 2	20 58	− 8	14 14	PP	—
Heligoland		74·3	353	i 11 41	0	i 21 12	− 3	e 21 55	PS	e 32·1
Warsaw		74·5	344	i 11 41k	− 1	21 13	− 4	14 27	PP	e 35·1
Hamburg		74·8	352	i 11 42k	− 2	i 21 18	− 2	i 12 25	P_cP	e 39·1
Stonyhurst		75·2	358	—	—	i 21 24	− 1	—	—	44·1
Potsdam		75·6	349	i 11 47k	− 1	i 21 25	− 4	i 14 30	PP	e 32·1
Bidston		75·7	359	i 11 45	− 4	i 21 30	0	i 21 59	PS	e 43·1
Grozny		76·0	325	11 53	+ 2	21 35	+ 1	—	—	—
Oxford		76·4	358	—	—	i 21 41	+ 3	—	—	—
De Bilt		76·6	354	i 11 54k	0	i 21 40	0	i 1 23	pP	e 21·6
Baku		76·9	320	i 11 58	+ 2	i 21 46	+ 3	—	—	37·1
Jena		77·2	350	i 11 55	− 2	i 21 41	− 6	—	—	e 39·1
Kew		77·5	357	i 11 58	− 1	i 21 46	− 4	e 26 5?	PP	e 43·1
Prague		77·7	348	11 58k	− 2	21 48	− 4	—	—	e 33·1
Uccle		78·0	355	i 12 0k	− 2	i 21 51	− 4	—	—	e 32·1
Yalta		78·8	332	—	—	21 54	−10	—	—	—
Erevan		79·2	324	12 11	+ 3	22 10	+ 2	—	—	—
Budapest		79·5	344	i 12 9	− 1	e 22 9	− 2	—	—	e 37·1
Stuttgart		79·6	351	i 12 9k	− 1	e 22 10	− 2	i 15 0	PP	e 35·1
Jersey		79·9	359	e 12 11	− 1	e 22 12	− 4	e 27 1	SS	40·2
Kecskemet	Z.	79·9	344	i 12 11	− 1	—	—	e 15 13	PP	—
Strasbourg		79·9	352	12 12	0	e 22 14	− 2	—	—	42·1
Paris		80·1	355	i 12 14	+ 1	i 22 15	− 3	—	—	e 38·1
Szeged		80·5	343	12 16	+ 1	—	—	—	—	—
Brisbane		80·8	200	e 12 23	+ 6	i 22 23	− 2	i 27 41	SS	—
Basle		81·0	352	e 12 17	− 1	e 22 28	+ 1	—	—	—
Bucharest		81·0	338	i 12 18a	0	i 22 25	− 2	15 6	PP	—
Zurich		81·0	352	e 12 17k	− 1	e 22 23	− 4	i 15 24	PP	—
Chur		81·4	351	e 12 19	− 1	e 22 36	+ 5	—	—	—
Bermuda		81·5	48	12 22	+ 1	i 22 24	− 8	12 29	P_cP	e 36·6
Neuchatel		81·6	352	e 12 20	− 1	e 22 22	−11	—	—	—
Triest		82·1	348	12 23k	− 1	22 32	− 6	e 15 30	PP	e 37·6

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bombay		82·9	291	i 12 26	− 2	i 22 41	− 5	i 15 38	PP	e 41·0
Clemont-Ferrand		83·1	355	e 12 29	0	—	—	—	—	42·1
Sofia		83·2	340	e 12 29a	0	e 22 49	0	—	—	e 34·7
Istanbul		83·4	334	12 27	− 3	22 39	−12	—	—	47·0
Rome		86·0	347	i 12 42	− 1	i 23 13	− 4	i 12 51	pP	i 39·7
Kodaikanal	E.	86·8	283	i 12 45k	− 2	i 23 20	− 5	i 24 8	PS	—
Riverview		87·3	199	e 12 35	−15	e 23 19	[+ 3]	e 29 17	SS	e 35·7
Sydney	E.	87·3	199	—	—	e 23 8	[− 8]	—	—	e 35·1
Colombo	E.	87·9	278	12 52	− 1	23 18	[− 2]	—	—	37·1
Ksara		88·0	327	i 12 53k	0	23 40	+ 4	i 16 20	PP	42·9
Toledo		89·2	0	i 12 57	− 2	23 37	−10	i 16 27	PP	—
Lisbon		90·3	4	—	—	24 20?	+23	—	—	38·1
Granada		91·9	0	i 13 10a	− 1	23 40	[− 4]	16 52	PP	51·2
Algiers		92·4	354	i 13 10	− 4	23 43	[− 4]	16 51	PP	—
San Juan		92·5	56	e 13 17	+ 3	i 23 42	[− 5]	i 30 24	SS	e 38·4
San Fernando		92·6	1	—	—	e 40 5	?	—	—	51·1
Helwan		93·1	328	i 13 15a	− 2	23 45	[− 6]	17 0	PP	—
Christchurch		94·5	182	13 26	+ 3	24 3	[+ 5]	38 13	L_g	45·4
Huancayo		111·5	82	e 18 43	[+ 7]	e 25 6	[−12]	e 19 23	PP	e 45·2
La Paz	z.	119·4	78	e 18 31	[−20]	i 30 5	PS	20 23	PP	58·4
La Plata		138·9	87	22 23	PP	29 11	{− 3}	23 0	SKP	71·1

Additional readings :—
College P_cP = +8m.54s., iS = +9m.26s.
Vladivostok iSSS = +13m.41s.
Honolulu eP = +7m.34s., iS = +13m.15s.
Victoria PPP = +9m.24s., PS = +13m.44s., SS = +15m.53s., SSS = +16m.41s.
Ukiah eSS = +17m.42s.
Berkeley ePNZ = +8m.24s., iPPZ = +10m.19s., eSSEZ = +18m.42s.
Butte eP = +8m.47s., ePP = +10m.24s., iS = +15m.16s., iSS = +18m.23s.
Logan SS = +16m.56s.
Salt Lake City eP_cS = +14m.13s., S_cS = +18m.48s., esSS = +20m.14s.
Pasadena iZ = +9m.7s., iE = +10m.33s., ePPZ = +10m.56s.
Hong Kong PP = +12m.30s., PS = +17m.33s., SS = +21m.16s.
Tucson PP = +11m.54s., PPP = +13m.11s., iSS = +21m.27s.
Scoresby Sund iP = +10m.4s., ePPP = +13m.31s., iS = +17m.56s. and +18m.17s., i = +18m.59s., eS_cS = +19m.38s., SS = +21m.46s.
Lincoln eP = +10m.43s.
Ivigtut S_cS = +20m.24s., eSS = +23m.4s.
Chicago U.S.C.G.S. iS = +19m.13s., eS = +23m.33s., eSSS = +25m.52s.
Florissant iZ = +10m.42s., iPSE = +19m.45s., iE = +20m.26s., iSSE = +23m.7s.
St. Louis eN = +10m.41s., iE = +10m.44s., iSZ = +19m.9s.
Cape Girardeau iN = +11m.25s., iPPPN = +14m.52s., iE = +20m.39s.
Toronto PPS? = +20m.27s., SS = +23m.38s.
Ottawa iZ = +11m.42s., PS = +20m.13s., SS = +24m.5s., SSS = +27m.5s.
Seven Falls SSS = +26m.15s.
Pittsburgh iZ = +11m.22s., isS = +20m.56s.
Upsala eE = +14m.16s., eN = +14m.36s., iPSN = +20m.14s., eE = +20m.54s. and +23m.15s., eN = +24m.5s., eE = +26m.17s.
Vermont esS = +20m.45s., eSSS = +27m.44s.
East Machias PS = +21m.15s., eSS = +24m.45s., iSS = +24m.57s., SSS = +28m.5s.
Harvard eL_gEN = +32m.5s.
Georgetown iS = +20m.30s.
Fordham iZ = +11m.43s., iEN = +21m.17s.
Philadelphia isS = +20m.59s., esSS = +25m.27s., eSSS = +28m.5s.
Calcutta ePPN = +13m.44s., ePSN = +20m.44s., eSKSN = +21m.16s., eSSN = +24m.48s.
Halifax SS = +25m.17s., SSS = +28m.47s.
Agra pPE? = +11m.41s., PPPE = +16m.13s., SSE = +25m.26s., sSSE = +26m.37s., iE = +30m.11s.
Heligoland eSN = +21m.15s.
Warsaw PPPZ = +16m.4s., PS = +21m.49s., SSEZ = +25m.53s.
Hamburg ePPE = +14m.15s., ePPZ = +14m.21s., ePSN = +22m.1s., eE = +34m.5s. ?
Potsdam iPPZ = +14m.33s., iN = +14m.43s., iPPSZ = +22m.14s.
Bidston e = +25m.5s.?
Kew iN = +22m.10s., eL_gE = +34·1m.
Budapest iE = +12m.18s., iN = +12m.24s., iE = +12m.46s.
Stuttgart eSSE = +27m.15s.
Brisbane eSN = +22m.29s., eEN = +33m.53s.
Bucharest iN = +22m.36s., PSE = +23m.4s., SSN = +27m.15s.
Bermuda iSKS = +22m.28s., iSS = +27m.41s., eSSS = +32m.8s.
Triest i = +13m.6s., e = +14m.8s., ePPP = +17m.0s., i = +19m.47s., PS = +23m.17s., i = +24m.37s., e = +24m.59s., eSS = +27m.38s., eSSS = +30m.59s., e = +33m.48s.

Continued on next page.

Bombay iE = +12m.41s. and +15m.23s., eN = +22m.44s., L_qE = +31m.57s.
Rome iE = +13m.15s. and +13m.35s., iPPZ = +16m.3s., SE = +23m.15s., iSKKS = +23m.27s., iE = +24m.0s., iSSE = +29m.35s., iE = +29m.49s., +34m.55s., and +35m.49s.
Riverview eN = +12m.47s.
Ksara PS = +24m.36s., SS = +29m.56s.
Toledo e = +18m.15s.
Lisbon +24m.27s.
Granada S = +23m.58s., SS = +24m.58s.
Algiers eS = +24m.9s., PS = +25m.5s., e = +26m.25s., SSS = +33m.5s.
San Juan esP = +13m.54s., iS = +24m.13s., isS = +24m.57s., eSSS = +35m.19s.
Helwan iZ = +16m.29s., +17m.11s., +17m.38s., and +17m.56s., PPPZ = +18m.17s., iEZ = +20m.40s., eSE = +24m.33s., PSEN = +25m.37s.
Christchurch SEZ = +24m.46s.
Huancayo epPP = +19m.58s., SKS = +25m.18s., iPS = +28m.55s., eSS = +35m.4s.
La Paz PPPZ = +23m.7s.
La Plata SKS = +23m.3s., PSS = +41m.5s?, L_qE = +67·1m.
Long waves were also recorded at Wellington and Tananarive.

Feb. 7d. Readings also at 0h. (Tucson), 1h. (Tucson), 2h. (Bozeman), 4h. (near Tananarive, Sofia, and Tucson), 5h. (Tucson (2) and La Paz), 8h. (Tucson), 9h. (Triest and Tucson), 11h. (New Plymouth and Wellington), 12h. (Bozeman), 14h. and 15h. (Tucson), 16h. (St. Louis), 18h. (Branner), 19h. (Rome, Tucson, near Tuai, New Plymouth, and Wellington), 20h. (near New Plymouth and Wellington), 21h. (Tucson), 22h. (Tucson).

Feb. 8d. 8h. 5m. 56s. Epicentre 40°·0N. 121°·0W.

Intensity VI-VII at Chico, VI at Nevada City, Paradise, etc.

Macroseismic area 28,000 sq. miles.

Epicentre 40°·4N. 121°·7W. (U.S.C.G.S.).
39°·7N. 121°·5W. (Pasadena).

F. Neumann.

"United States Earthquakes, 1940," Washington 1943, p.16-19, Chart p. 17.

A = −·3957, B = −·6585, C = +·6402; δ = +6; h = −2;
D = −·857, E = +·515; G = −·330, H = −·549, K = −·768.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ukiah		1·9	243	0 30a	− 4	i 0 52	− 7	—	—	—
Berkeley		2·4	205	e 0 40	− 1	i 1 10	− 2	—	—	—
San Francisco		2·5	207	e 0 43	0	i 1 5	− 9	—	—	—
Ferndale		2·6	283	e 0 39	− 5	i 1 5	−12	—	—	—
Branner		2·7	200	i 0 47	+ 2	—	—	—	—	—
Lick		2·7	191	e 0 47k	+ 2	e 1 22	+ 3	—	—	—
Santa Clara	z.	2·7	196	i 0 48	+ 3	i 1 29	S_g	—	—	—
Fresno	N.	3·3	164	e 0 59	P*	—	—	i 1 4	P_g	—
Tinemaha		3·6	143	i 1 3	P*	i 2 7	S_g	—	—	—
Haiwee		4·5	148	i 1 18	P*	i 2 31	S_g	—	—	—
Santa Barbara		5·6	169	i 1 31	+ 4	—	—	—	—	—
Mount Wilson		6·3	157	e 1 37	+ 1	i 3 18	S*	—	—	—
Pasadena		6·3	158	i 1 38	+ 2	e 3 15	S*	—	—	—
Boulder City		6·4	128	e 1 51	P*	e 2 55	+ 2	i 2 6	P_g	i 3·5
Riverside		6·6	153	i 1 44	+ 3	i 3 39	S_g	—	—	—
Salt Lake City		7·0	80	e 1 48	+ 2	e 3 8	0	e 2 17	P_g	e 3·7
Palomar	z.	7·4	152	i 1 55	+ 3	—	—	—	—	—
Seattle		7·7	353	1 53	− 3	e 3 23	− 2	—	—	4·1
Spokane		8·2	18	i 1 58	− 5	i 3 39	+ 1	i 4 19	S_g	—
Butte		8·6	43	e 1 57	−12	e 3 28	−20	4 10	S*	i 4·5
Bozeman		9·3	49	e 2 18	+ 1	4 28	+23	—	—	i 4·9
Tucson		11·3	130	2 50a	+ 4	e 4 55	+ 1	i 3 15	PP	i 6·2
Saskatoon		15·7	35	e 3 52	+ 8	—	—	—	—	8·1
Lincoln		18·5	80	e 4 19	0	e 7 55	+11	—	—	e 10·1
Sitka		19·4	337	—	—	e 7 34	−30	—	—	e 9·8

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Florissant	E.	23·7	84	e 5 13	− 1	e 9 32	+ 5	—	—	—
St. Louis		23·8	84	e 5 15	0	e 9 39	+11	—	—	e 12·7
Cape Girardeau	E.	24·7	87	e 5 23	− 1	e 9 33	−11	—	—	e 13·4
Chicago U.S.C.G.S.		25·2	75	—	—	10 6	+14	—	—	e 12·9
College		29·3	338	—	—	e 10 47	−12	—	—	e 12·3
Pittsburgh		31·2	75	—	—	e 13 8	SS	—	—	e 18·6
Ottawa		33·4	65	i 6 41	− 1	e 12 16	+13	—	—	e 17·1
East Machias		39·3	65	e 7 39	+ 7	e 13 24	−10	e 8 48	PP	e 19·1
San Juan		51·7	98	—	—	e 18 38	S_cS	—	—	e 23·0
La Paz	Z.	74·7	128	12 7	+24	—	—	—	—	—
Baku		99·6	7	e 27 4	PS	—	—	e 35 59	SSS	47·1
Ksara		103·5	20	—	—	e 34 4	SSP	—	—	—

Additional readings :—
San Francisco iEN = +1m.16s.
Boulder City eS = +3m.13s.
Salt Lake City eS = +3m.36s.
Seattle eS = +3m.35s.
Spokane eE = +1m.48s., iPEN = +2m.14s.
Butte eP = +2m.9s.
Tucson iS = +5m.54s.
Florissant iSE = +9m.36s., eE = +9m.43s.
St. Louis iE = +5m.18s., iN = +9m.48s.
Cape Girardeau ePE = +5m.30s.
Ksara e = +42m.30s.
Long waves were also recorded at Paris, De Bilt, Sverdlovsk, Potsdam, Tashkent, Irkutsk, Williamstown, Scoresby Sund, Philadelphia, Bermuda, Fordham, Harvard, and Huancayo.

February 8d. 15h. 15m. 20s. Epicentre 36°·3N. 71°·0E. (as on 1940, January 26d.).

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

Tables for depth of focus 0·025 have been used.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Andijan		4·6	14	1 10	0	2 4	0	—	—	—
Samarkand		4·6	319	1 8	− 2	1 53	−11	—	—	—
Tashkent		5·2	347	i 1 12	− 6	—	—	—	—	—
Tchimkent		6·1	351	1 34	+ 5	2 29	−10	—	—	—
Frunse		7·1	22	1 44	+ 2	2 53	− 9	—	—	—
Almata		8·3	32	—	—	3 28	− 2	—	—	—
Agra	E.	10·9	145	e 2 33	+ 1	4 33	+ 2	i 4 43	SS	—
Semipalatinsk		15·6	22	3 33	+ 2	—	—	—	—	—
Bombay		17·4	174	i 3 56	+ 4	i 7 7	+ 9	i 4 26	pP	i 9·3
Hyderabad		19·9	159	4 23	+ 5	8 2	+15	—	—	9·4
Calcutta	N.	20·4	127	e 4 21	− 2	i 7 59	+ 3	e 5 21	sP	—
Grozny		20·6	299	4 25	0	—	—	—	—	—
Erevan		21·1	288	4 33	+ 3	—	—	—	—	—
Sverdlovsk		21·7	345	i 4 33	− 3	i 8 19	0	—	—	—
Piatigorsk		22·6	300	4 47	+ 2	—	—	—	—	—
Kodaikanal	E.	26·6	166	e 3 51	?	i 9 46	+ 5	—	—	—
Ksara		28·8	275	e 5 43	+ 1	e 14 31	L	e 6 29	pP	(e 14·5)
Helwan		33·7	270	i 7 4	PP	i 11 28	− 5	e 14 10	SSS	—
Pulkovo		35·1	325	7 38	sP	—	—	7 54	PP	—
Upsala		41·2	322	e 8 40?	pP	e 13 19	− 7	e 15 55	SS	e 20·1
Potsdam		43·2	311	i 7 40	− 4	e 13 51	− 4	17 6	SS	—
Hamburg	N.	45·0	313	—	—	e 17 40?	SS	—	—	—
Rome		45·0	296	e 7 57	− 1	i 14 17	− 4	i 8 26	pP	e 20·8
Stuttgart		46·0	306	e 7 57	− 9	—	—	—	—	—
Zurich		46·6	304	e 8 32	+22	—	—	e 10 55	PPP	—
Basle		47·3	304	e 8 12	− 4	—	—	—	—	—
Berkeley	N.	105·2	11	—	—	e 26 17	+55	—	—	—
Lick		105·8	10	—	—	e 26 19	+52	e 26 52	PS	—
Fresno	N.	106·6	8	—	—	e 26 34	?	27 21	PS	—

For Notes see next page.

NOTES TO FEBRUARY 8d. 15h. 15m. 20s.

Additional readings :—
Bombay esPN = +4m.45s., iE = +7m.5s.
Calcutta eP_cPN = +8m.21s., esSN = +9m.1s., eSSN = +10m.7s.
Upsala eE = +16m.51s.
Potsdam iE = +7m.43s. and +17m.24s., eZ = +18m.16s.
Rome ePPZ = +9m.46s., iE = +15m.28s., iSSN = +17m.13s., iEN = +18m.2s.
Berkeley eN = +26m.38s.
Long waves were also recorded at Irkutsk and Baku.

Feb. 8d. Readings also at 1h. (Pasadena, Mount Wilson, Tucson, La Plata, Tinemaha, and Riverside), 2h. (San Juan), 4h. (Tucson (2)), 5h. (Tucson), 6h. (Tucson), 7h. (Tucson), 9h. (Tucson), 10h. (Agra, Tucson, Ksara, and Calcutta), 11h. (Ksara), 12h. (near Branner, Fresno, Lick, Tucson, Tinemaha, and Berkeley), 14h. (Tucson and Calcutta), 15h. (Manila), 18h. (San Fernando), 19h. (Clermont-Ferrand), 21h. (San Juan), 22h. (Tucson), 23h. (San Juan, Tucson, Berkeley, Ksara, Mount Wilson, Pasadena, Butte, Bozeman, Salt Lake City, Fordham, Palomar, Sitka, College, La Paz, Huancayo, Honolulu, Ukiah, and Kodaikanal).

Feb. 9d. 4h. 20m. 6s. Epicentre 37°·6N. 141°·7E. (as on 1939, August 17d.).

Intensity II at Onahama, Sendai, Hukusima, Mito, Mizusawa, Tukubasan, Utunomiya, and Shirakawa, I at Yamagata, Morioka, Tokyo, and Hatinohe.

Epicentre 37°·5N. 141°·5E. Slightly deep. Radius 200-300km. See Seismological Bulletin of the Central Met. Obs., Japan, for the year 1940 ; Tokyo, 1950, p. 8-9. Macroseismic Chart, p. 8.

$A = -·6233$, $B = +·4923$, $C = +·6076$; $\delta = +4$; $h = -1$;
$D = +·620$, $E = +·785$; $G = -·477$, $H = +·377$, $K = -·794$.

Tables for depth of focus 0·005 have been used.

		△	Az.	P.	O−C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Onahama		0·9	224	0 14k	− 4	0 24	− 7
Sendai		0·9	317	0 16k	− 2	0 27	− 4
Hukusima		1·0	279	0 17k	− 2	0 28	− 5
Mito		1·5	219	0 24k	− 2	0 39	− 6
Mizusawa	E.	1·6	344	0 27	0	0 46	− 1
Kakioka		1·8	222	0 27k	− 3	0 46	− 6
Tukubasan		1·9	223	0 28	− 3	0 42	−12
Tyosi		2·0	200	0 33	+ 1	0 52	− 5
Miyako		2·1	6	0 34a	0	0 58	− 1
Morioka		2·1	349	0 35k	+ 1	1 0	+ 1
Kumagaya		2·4	232	0 34k	− 4	1 2	− 5
Maebasi		2·4	240	0 37	− 1	1 4	− 3
Akita		2·5	329	0 41k	+ 2.	1 14	+ 5
Tokyo		2·5	219	0 37	− 2	1 3	− 6
Yokohama		2·7	217	0 42a	0	1 10	− 4
Hatinohe		3·0	357	0 46	− 1	1 21	− 1
Mera		3·0	209	0 48	+ 1	1 41	+19
Nagano		3·0	252	0 45k	− 2	1 31	+ 9
Hunatu		3·1	228	0 47	− 1	1 23	− 1
Kohu		3·1	232	0 48	0	1 30	+ 6
Misima		3·2	222	0 50	+ 1	1 32	+ 5
Osima		3·4	214	0 50	− 2	1 25	− 7
Toyama		3·7	256	0 56	0	1 46	+ 7
Omaesaki		4·1	224	1 22	+20	—	—
Hamamatu		4·3	229	1 5	0	1 54	0
Gihu		4·5	243	1 6	− 1	1 57	− 2
Mori		4·5	349	1 12	+ 5	2 11	+12
Nagoya		4·5	239	1 5	− 2	1 56	− 3
Hatidyozima		4·8	200	1 16	+ 4	—	—
Hikone		4·9	244	1 13	0	2 7	− 2

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Kameyama	5·0	239	1 19	+ 5	2 32	+20
Kyoto	5·4	243	1 21	+ 1	2 11	−11
Sapporo	5·5	357	1 27	+ 6	2 36	+12
Owase	5·7	233	1 27	+ 3	3 13	+44
Osaka	5·8	242	1 27	+ 2	2 35	+ 3
Kobe	6·0	244	1 44a	+16	2 53	+16
Siomisaki	6·4	231	1 51	+17	—	—
Sumoto	6·4	241	1 30	− 4	3 2	+16
Koti	7·8	241	1 53	0	3 39	+18
Tucson	83·1	55	e 12 23	+ 3	—	—

Feb. 9d. 13h. Undetermined shock.

Irkutsk eP = 29m.34s., L = 38·0m.
Almata eP = 30m.32s.
Berkeley eZ = 31m.5s.
Branner eN = 31m.8s.
Lick eEN = 31m.10s.
Tucson eP = 31m.18s., iP = 32m.17s.
Tinemaha iP = 31m.26s.a, iZ = 31m.55s. and 32m.22s.
Haiwee iP = 31m.31s., iZ = 32m.24s.
Santa Barbara iP = 31m.33s.a.
Andijan eP = 31m.39s.
Pasadena iP = 31m.40s.a.
Mount Wilson iPNZ = 31m.41s.a.
Riverside iP = 31m.43s., iZ = 31m.55s. and 32m.39s.
Palomar iPZ = 31m.49s.a, iZ = 32m.1s., 32m.57s. and 34m.0s.
La Jolla iP = 31m.50s.
College e = 32m.6s.
Fordham iP = 32m.20s.a.
Tashkent eP = 32m.27s.
Florissant eE = 32m.50s., iE = 33m.1s.
St. Louis iN = 32m.52s., eN = 41m.49s.
Williamstown iP = 33m.12s.
Baku eP = 33m.34s., eS = 42m.29s., eL = 61·0m.
Helwan eZ = 34m.18s. and 34m.48s., eE = 44m.34s. and 45m.30s.
Ksara e = 34m.21s., 36m.52s., and 44m.30s.
Calcutta eN = 40m.18s.
Rome e = 43m.48s.
Granada S = 45m.0s., L = 47·0m.

Feb. 9d. 13h. 53m. 40s. Epicentre 40°·6N. 142°·3E.

Intensity III at Miyako, Hatinohe, Morioka, Hakodate; II at Mizusawa, Aomori, Urakawa; I at Mori, Kusiro, and Hukusima.

Epicentre 40°·2N. 142°·5E. Shallow. Radius 200-300km. See Seismological Bulletin of the Central Met. Obs., Japan, for the year 1940. Tokyo 1950, p. 9-10. Macroseismic chart, p. 9.

$A = -·6025$, $B = +·4657$, $C = +·6482$; $\delta = +5$; $h = -2$;
$D = +·612$, $E = +·791$; $G = -·513$, $H = +·396$, $K = -·761$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Hatinohe	0·6	263	0 19k	+ 4	0 28	+ 2	—	—	—
Miyako	1·0	194	0 19	− 2	0 28	− 8	—	—	—
Aomori	1·2	281	0 30k	+ 6	0 49	+ 8	—	—	—
Mizusawa	1·7	211	0 29	− 2	0 49	− 5	—	—	—
Akita	1·9	242	0 37k	+ 3	1 2	+ 3	—	—	—
Mori	2·0	327	0 43	P_g	—	—	—	—	—
Sapporo	2·6	344	0 51k	P_g	1 20	+ 3	—	—	—
Sendai	2·6	205	0 42a	− 2	1 8	− 9	—	—	—
Hukusima	3·2	206	0 53k	+ 1	1 30	− 2	—	—	—
Nemuro	3·8	42	1 4	+ 3	1 44	− 3	—	—	—
Onahama	3·8	196	1 3	+ 2	—	—	—	—	—
Aikawa	4·1	231	1 7	+ 2	2 0	S*	—	—	—
Utunomiya	4·5	205	1 33	P*	—	—	—	—	—
Mito	4·5	199	1 9a	− 2	1 47	−18	—	—	—
Tukubasan	4·7	202	1 11	− 3	2 4	− 6	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m.	s.	m.
Maebasi		4·9	211	1 17	0	2 17	+ 2	—	—	—
Kumagaya		5·0	208	1 17k	− 1	2 17	− 1	—	—	—
Tyosi		5·0	193	1 21	+ 3	2 24	+ 6	—	—	—
Nagano		5·1	221	1 21a	+ 1	2 27	+ 7	—	—	—
Tokyo, Cen. Met. Ob.		5·3	203	1 20	− 2	2 25	0	—	—	—
Wazima		5·3	234	1 19	− 3	2 23	− 2	—	—	—
Toyama		5·6	227	1 27	0	2 37	+ 4	—	—	—
Yokohama		5·6	202	1 26k	− 1	2 30	− 3	—	—	—
Kohu		5·7	211	1 28	0	2 40	+ 5	—	—	—
Hunatu		5·8	209	1 29	0	2 30	− 8	—	—	—
Mera		6·0	199	1 29	− 3	2 47	+ 4	—	—	—
Misima		6·1	207	1 32	− 2	2 46	+ 1	—	—	—
Osima		6·3	203	1 31	− 5	2 52	+ 2	—	—	—
Gihu		6·8	222	1 40	− 4	3 3	0	—	—	—
Omaesaki		6·8	209	1 48	+ 4	3 14	+11	—	—	—
Nagoya		6·8	219	1 48	+ 4	3 7	+ 4	—	—	—
Hamamatu		6·9	213	1 46	+ 1	3 7	+ 2	—	—	—
Hikone		7·1	224	1 48k	0	3 13	+ 3	—	—	—
Kameyama		7·3	220	1 54	+ 4	3 20	+ 5	—	—	—
Kyoto		7·6	225	1 56	+ 1	3 27	+ 4	—	—	—
Hatidyozima		7·8	196	2 5	+ 7	3 10	−18	—	—	—
Osaka		7·8	222	2 0	+ 2	3 37	+ 9	—	—	—
Toyooka		7·8	232	1 45	−13	3 33	+ 5	—	—	—
Owase		8·1	218	2 6	+ 4	3 49	+14	—	—	—
Kobe		8·2	226	2 5	+ 2	3 37	− 1	—	—	—
Sumoto		8·6	225	2 10a	+ 1	—	—	—	—	—
Siomisaki		8·8	218	2 15	+ 4	4 14	S*	—	—	—
Muroto		9·8	224	2 26	+ 2	4 32	+15	—	—	—
Hamada		9·9	238	2 29	+ 4	4 22	+ 2	—	—	—
Koti		9·9	227	2 24	− 1	4 8	−12	—	—	—
Hirosima		10·0	234	2 29	+ 2	—	—	—	—	—
Matuyama		10·1	231	2 28	0	5 12	S*	—	—	—
Simidu		10·8	227	2 37	− 2	5 12	SSS	—	—	—
Izuka		11·6	237	2 50	0	5 6	+ 5	—	—	—
Hukuoka		11·8	237	e 2 57	+ 4	5 8	+ 2	—	—	—
Husan		11·8	246	2 56	+ 3	5 32	SS	—	—	—
Taikyu		11·8	250	2 56	+ 3	5 8	+ 2	—	—	—
Miyazaki		12·3	228	3 2	+ 3	5 10	− 8	—	—	—
Kagosima		13·1	230	3 5	− 5	—	—	—	—	—
Irkutsk		28·3	308	e 6 50	PP	—	—	—	—	15·3
Almata		47·6	297	8 44	+ 5	—	—	—	—	—
Andijan		51·7	295	8 56	−15	—	—	—	—	—
Sverdlovsk		53·0	318	i 9 20	− 1	16 46	− 4	—	—	26·3
Agra	E.	53·9	277	e 9 25	− 2	16 53	− 9	e 11 23	PP	—
Tinemaha		73·2	57	e 11 35	0	—	—	e 11 49	P_cP	—
Santa Barbara		73·9	59	e 11 40	+ 1	—	—	e 11 51	P_cP	—
Haiwee		74·0	57	i 11 39	0	—	—	i 11 52	P_cP	—
Warsaw		74·5	328	i 11 42	0	—	—	e 11 55	P_cP	e 42·3
Copenhagen		75·1	335	i 11 46	0	—	—	—	—	—
Mount Wilson		75·1	58	i 11 45	− 1	—	—	i 11 58	P_cP	—
Pasadena		75·1	58	e 11 44	− 2	—	—	i 11 57	P_cP	—
Riverside		76·1	58	i 11 46	− 5	—	—	i 12 1	P_cP	—
Palomar	Z.	76·4	59	e 11 52	− 1	—	—	i 12 5	P_cP	—
La Jolla		76·5	59	e 12 5	+11	—	—	—	—	—
Potsdam		77·5	332	i 11 57	− 2	—	—	e 12 22	P_cP	e 44·3
Hamburg		77·6	335	e 11 59a	− 1	—	—	—	—	e 41·3
Jena		79·2	331	i 13 8	+60	—	—	—	—	—
Ksara		79·6	306	i 12 11a	+ 1	e 22 18	+ 6	—	—	45·8
Sofia		80·4	320	—	—	e 22 32	+11	—	—	—
Tucson		81·0	56	12 17	− 1	—	—	—	—	—
Stuttgart		81·8	332	e 12 22a	0	—	—	—	—	—
Uccle		81·8	336	i 12 22a	0	—	—	—	—	e 42·3
Triest		82·6	327	e 12 25	− 1	e 23 4	+21	e 16 23	PP	e 41·5
Zurich		83·2	331	e 12 29a	0	—	—	e 13 9	P_cP	—
Basle		83·5	332	e 12 31	0	—	—	—	—	—

Continued on next page,

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Neuchatel		84·2	332	e 12 34	0	—	—	—	—	—
Helwan		85·2	306	i 12 38k	− 1	23 0	[− 2]	12 44	PcP	—
Rome		86·1	326	i 12 42	− 2	e 23 41	+23	e 18 34	PPP	e 46·0
Clermont-Ferrand		86·6	333	e 12 48	+ 2	—	—	—	—	—
Florissant	E.	87·5	39	e 12 51	0	—	—	—	—	—
St. Louis	N.	87·7	39	e 12 52	0	—	—	—	—	—
Williamstown		91·0	26	i 13 8	+ 1	—	—	—	—	—
Fordham		92·5	27	i 12 28	−46	—	—	—	—	—
Toledo		94·2	335	e 13 22	0	—	—	e 17 12	PP	—
La Paz	Z.	144·4	56	19 41	[+ 3]	—	—	—	—	—

Additional readings :—
Agra eSSE = +20m.38s.
Jena iZ = +13m.20s., iE = +13m.26s., iN = +13m.30s.
Tucson iP = +12m.30s. and +12m.38s.
Stuttgart eZ = +12m.35s. and +12m.49s.
Triest e = +12m.34s., +12m.47s., and +13m.41s., ePS = +23m.58s., eSS = +29m.8s.
Helwan iZ = +12m.51s., iE = +23m.26s., SE = +23m.35s.
Florissant iE = +13m.5s.
St. Louis eN = +13m.6s.
Williamstown i = +13m.22s.
Long waves were also recorded at Tashkent, Huancayo, College, Bidston, Prague, Kew, De Bilt, Paris, Upsala, and Baku.

Feb. 9d. Readings also at 0h. (Agra and Rome), 1h. (Tucson, Stuttgart, Triest (2), near Basle, and Zurich), 2h. (Bozeman), 4h. (Tucson), 5h. (Rome), 8h. (Manila), 11h. (Tucson (3)), 12h. (near Christchurch and Wellington), 13h. (near Berkeley), 14h. (Neuchatel and Tucson), 17h. (Agra, Phu-Lien, Hong Kong, Bombay, and Calcutta), 21h. (Tucson (2)), 22h. (La Paz and Tucson), 23h. (La Plata and near Mizusawa).

Feb. 10d. Readings at 4h. (Ksara and Tucson), 6h. (La Paz), 7h. (Piatigorsk, Erevan, Grozny, Baku, and Sverdlovsk), 10h. (Toledo, Tucson, and La Paz), 12h. (Tucson and Bozeman), 15h. (Tucson), 17h. (Andijan, Tchimkent, and Frunse), 18h. (Tucson, near Sofia, Zurich, Bucharest, and Cluj), 19h. (Triest (2) and near Tananarive), 20h. (Williamstown, near Ottawa, Shawinigan Falls, Seven Falls, and near Branner), 21h. (Fordham, Harvard, Tucson, and Bozeman), 22h. (Manila).

Feb. 11d. Readings at 0h. (Christchurch, Wellington, and Tucson), 1h. (Huancayo and Ksara), 6h. (Jena, Tucson, Wellington, Christchurch, Haiwee, Mount Wilson, Pasadena, Riverside, Palomar, and Tinemaha), 9h. (Mizusawa), 10h. (Helwan), 12h. (Balboa Heights), 13h. (Tucson), 14h. (Palomar, Tucson, Riverside, Pasadena, Mount Wilson, Tinemaha, and Haiwee), 15h. (near Tucson), 17h. (Sofia), 20h. (Sofia and Helwan), 21h. (Hong Kong and Manila), 22h. (near Sofia and Bucharest), 23h. (Edinburgh).

Feb. 12d. 0h. 1m. 22s. Epicentre 27°·5S. 70°·5W.

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

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
La Paz	11·2	12	2 54	+10	i 5 15	SS	—	—	6·2
La Plata	13·0	128	3 4	− 5	5 20	−15	3 15	PP	6·1
Huancayo	16·1	342	i 4 0a	PP	—	—	i 4 8	PPP	—
Rio de Janeiro	25·1	85	i 5 28	0	i 9 50	− 1	—	—	i 12·4
Balboa Heights	37·3	347	e 7 16	0	—	—	—	—	—
San Juan	45·8	7	e 8 38	+13	e 14 54	−15	e 10 1	PcP	—
Bermuda	59·7	7	e 10 4	− 5	18 25	+ 6	e 12 39	PP	e 24·1
Georgetown	66·3	356	10 53	+ 1	20 5	+23	—	—	—
Cape Girardeau	66·9	344	i 10 55	− 1	e 19 45	− 4	i 11 7	pP	—
Philadelphia	67·3	358	e 10 58	− 1	e 19 57	+ 3	e 24 25	SS	e 34·1
Fordham	68·1	359	i 11 4a	0	i 20 5	+ 2	i 24 42	SS	e 33·9
St. Louis	68·3	344	e 11 2	− 3	i 20 3	− 3	i 11 18	pP	—
Florissant	68·5	344	e 11 2	− 4	i 20 4	− 4	i 24 37	SS	—
Weston	68·9	0	i 11 14	+ 5	e 20 23	+10	i 11 35	pP	—
Harvard	69·7	0	i 11 15	+ 1	—	—	—	—	e 39·6

Continued on next page,

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Williamstown		69·9	359	e 11 13	− 2	—	—	—	—	e 35·1
Tucson		70·7	325	i 11 19	− 1	e 20 24	−10	e 14 0	PP	e 28·3
Chicago, U.S.C.G.S.		70·9	347	e 11 33	+12	e 20 28	− 8	e 16 2	PPP	e 29·5
Toronto		71·3	354	11 16	− 7	20 38	− 3	14 10	PP	34·6
East Machias		72·0	3	e 11 27	− 1	e 20 34	−15	e 11 43	P_cP	—
Lincoln		72·2	342	e 11 30	+ 1	20 49	− 2	e 14 30	pPP	—
Ottawa		72·7	357	i 11 29	− 3	i 20 58	+ 1	21 16	PS	31·6
Seven Falls		74·3	1	11 44	+ 3	21 16	+ 1	21 38	PS	33·6
Cape Town		74·4	120	—	—	e 20 18	−58	—	—	—
La Jolla		74·7	321	e 11 43	0	—	—	—	—	—
Palomar	z.	74·8	322	i 11 42	− 2	—	—	—	—	—
Riverside		75·6	322	e 11 46	− 2	—	—	—	—	—
Mount Wilson	z.	76·1	322	e 11 49	− 2	—	—	—	—	—
Pasadena		76·1	322	i 11 51	0	i 21 37	+ 2	—	—	e 36·6
Santa Barbara	z.	77·2	320	e 11 52	− 5	—	—	—	—	—
Haiwee		77·5	323	i 11 59	0	—	—	—	—	—
Salt Lake City		78·0	328	e 12 1	− 1	e 27 9	SSS	e 15 0	PP	e 31·1
Tinemaha		78·4	323	i 12 3	− 1	—	—	—	—	—
Lick		80·4	321	e 12 17	+ 2	—	—	—	—	—
Berkeley		81·1	321	e 12 19	+ 1	e 22 26	− 2	—	—	e 38·8
Butte		82·5	333	—	—	22 42	0	e 27 55	SS	e 38·1
Ukiah		82·5	322	e 15 32	PP	e 22 32	−10	e 28 32	SS	e 33·4
Christchurch		88·7	221	—	—	i 23 28	[+ 3]	36 58	L_q	41·0
Wellington		88·7	223	13 58	+61	23 18	[− 7]	—	—	35·6
Victoria		89·2	328	e 18 38	PPP	—	—	—	—	41·6
Granada		89·9	47	e 15 58	PP	23 39	[+ 7]	—	—	48·6
Toledo		91·2	45	i 13 8a	0	24 4	− 1	—	—	—
Algiers		94·1	51	e 13 24	+ 2	e 24 48	+17	19 32	PPP	45·6
Honolulu		97·3	291	e 14 29	+53	e 25 4	+ 6	e 17 26	PP	e 39·4
Rome		103·0	51	e 20 37	PPP	i 25 2	[+21]	i 27 47	PS	e 51·0
Stuttgart		103·8	42	—	—	e 28 1	PPS	—	—	—
Potsdam		107·6	39	—	—	e 28 38	PS	e 29 4	PPS	e 52·6
Upsala		112·4	33	—	—	e 28 50	PS	e 29 21	PPS	e 50·6
Helwan	E.	112·7	67	e 18 50	[+12]	25 40	[+17]	19 46	PP	—
Bucharest		113·2	50	e 18 44	[+ 4]	29 18	PS	—	—	—
Ksara		117·6	65	e 20 1	PP	e 29 52	PS	40 53	SSS	57·1
Baku		129·8	58	e 19 51	[+39]	32 6	PS	39 44	SSP	61·6
Sverdlovsk		134·8	35	—	—	i 33 10	PS	—	—	53·6
Tashkent		144·4	56	i 19 37	[− 1]	26 42	[− 4]	i 22 19	PPP	e 61·7
Kodaikanal	E.	145·3	113	e 19 38?	[− 2]	i 29 38?	{−14}	—	—	46·6
Mizusawa		151·3	302	19 50	[+ 1]	—	—	23 26	PP	—
Agra	E.	152·1	83	19 53	[+ 2]	30 38	{+ 8}	23 29	PP	—
Manila		163·3	222	e 20 8	[+ 4]	31 17	{−13}	35 7	PSKS	78·3
Hong Kong		173·3	220	24 42	PP	31 9	{−70}	36 1	?	—

Additional readings :—
La Plata Z = +3m.9s., SE = +5m.28s.
Huancayo i = +4m.12s.
San Juan ePPP = +11m.3s., iS = +15m.6s., eS_cS = +18m.4s., iSS = +18m.35s.
Bermuda eSS = +22m.14s.
Cape Girardeau iN = +11m.12s., iPPN = +14m.23s., ePPPN = +14m.50s.
Philadelphia ipP = +11m.20s., eSSS = +27m.20s.
Fordham iZ = +11m.17s., iN = +21m.8s.
St. Louis iE = +11m.35s., eN = +15m.18s., eE = +15m.28s., eSSSE = +28m.8s.
Florissant isSE = +20m.27s., eE = +23m.17s.
Weston ePS = +20m.47s.
Williamstown iP = +11m.16s., i = +11m.30s.
Tucson eP_cP = +11m.32s., ePPP = +15m.21s., S = +20m.39s., eSS = +24m.42s., eSSS = +27m.53s.
Chicago U.S.C.G.S. ePS = +21m.22s., eSS = +25m.4s.
East Machias ePP = +14m.13s., ePPP = +15m.48s., epPPP = +16m.10s., epS = +21m.1s., ePS = +21m.35s., eSS = +25m.1s., esSS = +25m.45s., eSSS = +27m.50s.
Lincoln eP = +12m.22s., PS = +21m.31s., eSS = +25m.1s.
Seven Falls e = +12m.18s.
Palomar iZ = +12m.1s. and +12m.35s.
Mount Wilson iZ = +12m.5s.
Pasadena iZ = +12m.4s.
Santa Barbara ePN = +12m.6s.

Continued on next page.

Berkeley iN = +19m.22s.
Butte ePKKP = +29m.11s.
Ukiah epS = +22m.56s., eSSS = +31m.4s.
Toledo i = +13m.23s.
Algiers eSSS = +34m.54s.
Honolulu SS = +31m.33s.
Rome eZ = +22m.2s., eSKKSN = +26m.1s., eSE = +26m.35s., eEZ = +28m.57s. and +31m.9s., eEN = +40m.28s., iE? = +44m.19s.
Helwan eZ = +19m.25s., eE = +21m.10s., SKKSE = +26m.48s., SE = +27m.58s., PSE = +29m.18s., PPSE = +30m.30s.
Bucharest SN = +29m.38s.
Tashkent SKKS = +29m.34s., PPS = +34m.48s., SS = +41m.56s.
Mizusawa PN = +19m.53s.
Agra PKP_2E = +20m.3s., PSKSE = +33m.54s., PPSE = +36m.57s., SSE = +43m.25s., SSE = +49m.3s.
Long waves were also recorded at Colombo, Paris, Irkutsk, Montezuma, Scoresby Sund, College, Jena, Bidston, De Bilt, Hamburg, Kew, Warsaw, Arapuni, Stonyhurst, Triest, Lisbon, Uccle, San Fernando, Vladivostok, Moscow, and Budapest.

Feb. 12d. 5h. 25m. 45s. Epicentre 51°·7N. 178°·5W. (as on 1939 Dec. 7d.).

A = −·6221, B = −·0163, C = +·7828; δ = +5; h = −6;
D = −·026, E = +·1000; G = −·782, H = −·020, K = −·622.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
College		20·6	38	e 4 56	+13	e 8 38	+ 9	e 5 4	PP	—
Vladivostok		34·1	276	e 6 51	+ 3	e 12 39	+25	—	—	—
Tinemaha		44·2	84	i 8 13a	+ 1	—	—	i 9 57	PP	—
Haiwee		45·0	85	i 8 17	− 2	—	—	i 9 58	PP	—
Pasadena		46·1	87	i 8 26a	− 2	—	—	—	—	—
Mount Wilson		46·2	87	i 8 27a	− 1	—	—	—	—	—
Riverside		46·7	87	i 8 31	− 1	—	—	—	—	—
Palomar	Z.	47·5	88	i 8 38	0	—	—	—	—	—
La Jolla		47·6	88	e 8 38	− 1	—	—	—	—	—
Tucson		52·0	84	e 9 11	− 2	—	—	e 10 25	P_cP	—
Florissant		59·7	65	i 10 7	− 2	—	—	—	—	—
St. Louis		59·9	65	e 10 9	− 1	—	—	—	—	—
Cape Girardeau	N.	61·2	67	—	—	e 18 25	−13	—	—	—
Sverdlovsk		61·4	328	10 21	+ 1	18 40	0	—	—	31·2
Ottawa		62·7	50	i 10 25	− 4	—	—	—	—	30·2
Fordham	Z.	67·0	53	i 10 55	− 2	—	—	—	—	—

Additional readings :—
College eS = +9m.4s.
Haiwee iZ = +8m.24s.
Mount Wilson iZ = +8m.35s.
Palomar iZ = +8m.50s.
Tucson eP = +9m.23s., ePP = +11m.35s.
St. Louis eN = +10m.21s. and +20m.7s.
Fordham iZ = +10m.59s. and +11m.24s.
Long waves were also recorded at Ksara, Irkutsk, and Baku.

Feb. 12d. 8h. 20m. 56s. Epicentre 23°·2S. 177°·4W.

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

Tables for depth of focus 0·020 have been used.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		10·8	31	i 2 30k	− 1	4 15	−15	—	—	—
Arapuni		15·9	200	e 3 4	−32	6 34	+ 7	—	—	—
Tuai		16·2	195	3 41	+ 1	6 33	− 1	—	—	—
New Plymouth		17·7	203	3 58	0	8 7	SSS	—	—	—
Wellington		19·2	199	4 12	− 2	7 28	−10	11 44	S_cP	—
Chatham Ils.		20·7	179	—	—	11 4?	?	—	—	—
Christchurch		21·9	200	4 38a	− 3	8 23	− 4	—	—	9·3
Brisbane		27·0	256	i 5 28	− 1	i 9 46	− 7	i 6 16	PP	—
Riverview		29·5	242	i 5 52	+ 1	i 10 28	− 5	i 7 0	PP	12·9
Sydney	E.	29·5	242	e 5 49	− 2	e 10 28	− 5	e 7 4	PP	e 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.
Adelaide		39·9	243	i 10 7	PPP	(13 4)	− 8	—	—	16·4
Honolulu		48·2	26	8 26	0	i 15 10	− 2	e 9 14	pP	e 19·4
Perth		59·0	246	i 10 52	pP	17 27	−10	21 17	SS	24·4
Manila		71·0	297	i 11 3k	+ 1	20 4	+ 1	—	—	—
Mizusawa		73·1	328	11 4	−10	14 17	PP	—	—	—
Santa Barbara		79·3	47	i 11 51	+ 2	—	—	—	—	—
Branner		79·6	42	e 11 50	− 1	—	—	e 12 54	pP	—
Santa Clara		79·7	42	i 11 51	0	i 21 42	+ 3	—	—	—
Berkeley		79·8	42	i 11 46	− 6	i 21 33	− 8	i 12 56	pP	—
Lick		79·9	42	e 11 54	+ 2	e 21 44	+ 3	—	—	—
La Jolla		80·0	49	i 11 54	+ 1	—	—	—	—	—
Pasadena		80·1	47	i 11 55k	+ 2	i 21 47	+ 4	i 12 56	pP	—
Ukiah		80·1	41	e 12 0	+ 7	e 26 49	SS	e 12 30	pP	e 33·4
Mount Wilson		80·2	47	i 11 56	+ 2	e 21 47	+ 3	i 12 57	pP	—
Hong Kong		80·5	300	11 55	− 1	21 44	− 3	14 22	PP	—
Palomar	Z.	80·6	48	i 11 57	+ 1	—	—	i 13 0	pP	—
Riverside		80·6	47	e 11 55	− 1	—	—	e 38 37	P′P′	—
Haiwee		81·4	46	i 12 2	+ 2	e 22 2	+ 6	i 12 56	pP	—
Tinemaha		81·8	45	i 12 5	+ 3	e 22 5	+ 5	i 13 1	pP	—
Tucson		84·1	52	i 12 16	+ 2	22 29	+ 6	e 12 57	pP	e 34·5
Phu-Lien		86·0	294	e 12 24	+ 1	e 22 36	[+ 5]	—	—	—
Seattle		86·1	35	e 12 33	+ 9	e 22 38	− 5	e 16 31	pPP	—
Victoria		86·2	34	i 12 28	+ 4	i 22 34	[+ 2]	i 13 34	pP	—
Salt Lake City		88·0	44	e 12 33	0	22 48	[+ 4]	e 13 25	pP	—
Butte		90·5	39	e 12 39	− 6	23 26	+ 2	e 12 43	PcP	—
College		90·7	12	—	—	e 22 52	[− 7]	e 24 30	sS	—
Huancayo		96·1	106	e 14 8	pP	e 24 18	+ 6	17 39	PP	e 39·7
Lincoln		98·2	48	e 13 18	− 2	e 25 12	sS	e 14 36	sP	e 40·2
La Paz		100·4	113	i 14 27	pP	i 23 51	[− 1]	i 18 27	PP	—
Florissant		102·0	53	i 18 0	PP	e 24 34	[+34]	e 18 25	pPP	—
St. Louis		102·0	53	—	—	e 23 55	[− 5]	i 26 46	sS	—
Cape Girardeau	N.	102·1	55	—	—	e 23 52	[− 8]	e 25 21	S	—
Calcutta	N.	102·3	289	e 19 59	PPP	—	—	—	—	—
Colombo	E.	104·4	271	e 16 34	?	—	—	—	—	—
Toronto		111·2	50	—	—	e 26 16	?	e 27 52	PS	—
Georgetown		111·9	55	22 48	PPP	—	—	—	—	—
Agra	E.	112·6	291	e 18 15	[− 2]	i 24 39	[− 6]	—	—	—
Fordham		114·7	55	e 18 24	[+ 3]	e 26 56	SKKS	e 19 23	PP	—
Ottawa		114·8	49	i 18 20	[− 1]	e 26 22	S	e 30 4	PPS	35·1
Bombay		114·9	281	e 18 4	[−17]	—	—	e 21 35	PPP	—
San Juan		116·1	80	e 19 43	PP	i 24 55	[− 4]	30 21	sPS	—
Seven Falls		117·7	47	—	—	e 26 46	SKKS	e 30 40	sPS	38·1
Bermuda		120·5	65	—	—	e 26 52	SKKS	e 29 18	PS	—
Scoresby Sund		130·6	11	22 8	pPP	—	—	i 22 20	PKS	—
Upsala		141·9	348	e 19 4?	[− 8]	—	—	e 21 39	PP	—
Bergen		142·8	359	e 19 9	[− 5]	—	—	e 22 23	PP	—
Copenhagen		146·7	351	i 19 22k	[+ 1]	—	—	22 34	PP	—
Warsaw		147·7	342	e 19 23k	[+ 1]	—	—	i 22 52	PP	—
Ksara		149·0	297	i 19 27k	[+ 2]	35 53	PPS	20 33	pPKP	—
Heligoland	N.	149·1	354	i 19 29	[+ 4]	—	—	—	—	—
Hamburg	Z.	149·2	352	i 19 24k	[− 1]	—	—	—	—	—
Potsdam		149·8	348	i 19 26k	[+ 1]	—	—	i 20 26	pPKP	—
Cluj		151·0	330	i 19 36k	[+ 8]	—	—	—	—	—
De Bilt		151·1	357	i 19 29k	[+ 1]	—	—	i 20 30	pPKP	—
Bucharest		151·4	324	i 19 38	[+10]	—	—	20 50	pPKP	—
Jena		151·4	347	e 19 27	[− 1]	—	—	i 20 27	pPKP	—
Prague		151·6	344	e 19 35	[+ 6]	—	—	—	—	—
Uccle	Z.	151·7	359	e 19 31k	[+ 2]	—	—	—	—	—
Helwan		153·5	291	i 19 31a	[0]	—	—	i 20 25	pPKP	—
Sofia		154·0	324	e 19 43	[+11]	—	—	—	—	—
Stuttgart		154·0	350	e 19 32	[0]	—	—	i 20 12	pPKP	—
Strasbourg		154·3	353	e 19 36	[+ 3]	—	—	e 19 52	pPKP	—
Paris		154·4	1	i 19 34	[+ 1]	—	—	i 19 59	pPKP	—
Basle		155·4	351	e 19 34	[0]	—	—	i 20 1	pPKP	—
Zurich		155·4	351	e 19 34k	[0]	—	—	i 20 0	pPKP	—

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Chur	155·7	349	e 19 35	[+ 1]	—	—	—	—	—
Triest	155·8	341	i 20 3k	[+29]	i 30 9	SKKS	e 23 12	PP	e 76·5
Neuchatel	156·0	352	e 19 35	[0]	—	—	e 20 3	pPKP	—
Clermont-Ferrand	157·5	0	e 19 37	[0]	—	—	i 20 12	pPKP	—
Rome	159·6	338	19 38k	[− 1]	i 25 27	[−60]	20 36	pPKP	—
Toledo	162·4	17	i 19 40k	[− 2]	—	—	i 20 28	pPKP	—
Granada	165·1	19	i 19 47	[+ 2]	26 35	[+ 3]	20 36	pPKP	e 79·6
Algiers	166·4	359	e 19 48	[+ 2]	31 58	SKKS	i 20 50	pPKP	—

Additional readings :—
Wellington i = +4m.16s. and +5m.42s., S_cS = +15m.25s., sS_cS = +17m.7s.
Brisbane ePN = +5m.34s., iE = +6m.4s. and +7m.22s., iN = +7m.34s., iE = +11m.22s.
Riverview iS_cSN = +16m.10s.
Adelaide iN = +10m.12s. and +10m.16s., PP = +10m.31s., i = +14m.28s. and +14m.32s., SN = +14m.44s., S is given as P_cP.
Honolulu P = +8m.29s., ePP = +10m.18s., ePPP = +11m.15s., esPP = +11m.30s., eP_cS = +13m.29s., iS = +15m.29s., esS = +16m.40s., eSS = +18m.34s.
Perth i = +11m.36s., +12m.30s., +12m.56s., and +16m.24s., PS = +17m.37s., i = +18m.22s., SS = +20m.14s.
Mizusawa P = +11m.7s.
Branner eEN = +12m.57s.
Pasadena iE = +23m.11s., ePKP,PKPZ = +38m.46s., eSKP,PKPZ = +41m.54s.
Ukiah eP_cP = +12m.6s., esP = +13m.15s., ePP = +14m.59s., epPP = +15m.44s., esPP = +16m.7s., ePPP = +16m.59s., eS_cS = +21m.44s., epS = +22m.39s., eSSS = +30m.18s.
Mount Wilson ePKP,PKPZ = +38m.45s., eSKP,PKPZ = +41m.54s.
Hong Kong PS = +22m.9s.
Palomar ePKP,PKPZ = +38m.45s., ipPKP,PKPZ = +39m.41s., iSKP,PKPZ = +41m.52s.
Riverside eSKP,PKPZ = +41m.50s.
Tucson sP = +13m.31s., ePP = +15m.37s., epPP = +16m.19s., esPP = +16m.38s., ePPP = +17m.22s., epPPP = +18m.15s., epS = +23m.15s., sS = +23m.41s., esSP = +24m.44s., eSS = +27m.47s., esSS = +29m.13s., eSSS = +31m.47s.
Seattle sS = +24m.13s.
Salt Lake City ePP = +16m.10s., esPP = +17m.30s., iS = +23m.4s., sS = +24m.24s.
College eS = +23m.19s.
Huancayo esP = +14m.27s., epPP = +18m.21s., iSKS = +23m.34s., S = +24m.25s., pS = +25m.26s., esS = +25m.55s., isS = +25m.59s., eSS = +30m.34s., eSSS = +34m.27s.
Lincoln ePP = +17m.29s., esPP = +18m.38s., eSSS = +35m.18s.
Florissant eZ = +18m.59s., isSKSE = +25m.7s., iSE = +25m.29s., isSPE = +28m.0s.
St. Louis eSEN = +25m.11s., eE = +25m.32s. and +27m.57s., eN = +32m.4s., eEN = +40m.24s., eE = +40m.31s.
Toronto e = +35m.34s.
Fordham iN = +35m.36s.
San Juan epS = +27m.45s., epPS = +29m.40s., eSS = +34m.51s.
Bermuda S = +27m.0s., sSP = +31m.0s.
Scoresby Sund esPKS = +23m.33s.
Upsala i = +22m.49s., eN = +28m.43s.
Bergen e = +20m.20s.
Warsaw iE = +19m.26s., iZ = +20m.23s.
Potsdam iPKPZ = +19m.31s.k, iPPZ = +23m.2s., ipPPE = +23m.43s., ipPPN = +23m.46s.
Cluj PE = +19m.53s.
De Bilt iPP = +23m.16s.
Bucharest iN = +20m.5s. and +21m.40s.
Jena ePN = +19m.31s., iE = +20m.24s. and +20m.27s.
Uccle iZ = +19m.49s.
Helwan iZ = +19m.40s., iEZ = +19m.54s., iZ = +23m.25s.
Stuttgart ePKPZ = +19m.39s., i = +19m.47s. and +19m.55s., ePPE = +23m.2s., ePPN = +23m.6s.
Strasbourg e = +19m.58s.
Triest $iPKP_2$ = +20m.36s., iSKS = +26m.50s., iPPP = +28m.12s., i = +31m.14s., +31m.54s., +33m.29s., and +33m.48s., ePSKS = +34m.41s., iPPS = +38m.3s., SS = +44m.48s., eSSS = +50m.44s.
Rome $iPKP_2Z$ = +20m.19s., iE = +20m.51s., iZ = +21m.15s., eZ = +22m.33s., eE = +23m.43s., iPPZ = +23m.57s., iN = + +24m.9s., iZ = +25m.1s., eN = +30m.24s., iZ = +30m.58s., iPSKSN = +33m.22s., eN = +34m.12s.
Toledo i = +24m.22s.
Granada PKP_2 = +21m.10s., $pPKP_2$ = +21m.33s., PP = +24m.35s., pPP = +24m.54s., PPP = +28m.42s., SKSP = +34m.58s., PPS = +39m.4s., esSS = +47m.16s.
Algiers e = +21m.49s., PP = +24m.38s.
Long waves were also recorded at Balboa Heights.

Feb. 12d. 9h. 17m. 50s. Epicentre 54°·3N. 161°·5W. (as on 1938, November 15d.).

$A = -·5559$, $B = -·1860$, $C = +·8102$; $\delta = +4$; $h = -7$;
$D = -·317$, $E = +·948$; $G = -·768$, $H = -·257$, $K = -·586$.

Tables for depth of focus 0·005 have been used.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
College		12·6	28	e 2 50	− 8	e 5 13	− 5	3 5	pP	6·0
Sitka		14·9	69	—	—	e 6 25	+13	6 41	sS	—
Victoria		24·3	88	i 5 10	− 2	i 9 46	sS	—	—	—
Seattle		25·3	89	e 5 33	+11	e 9 42	+ 1	e 6 16	PP	10·5
Ukiah		29·9	104	e 6 20	+16	e 11 31	sS	e 6 37	pP	e 13·9
Berkeley		31·3	105	e 6 25	+ 9	i 11 22	+ 5	—	—	e 14·5
Branner	N.	31·6	106	e 6 19	0	—	—	—	—	—
Santa Clara		31·8	105	i 6 39	pP	e 11 31	+ 6	—	—	e 15·0
Butte		31·9	83	e 6 19	− 2	e 11 24	− 3	e 7 23	PP	e 13·3
Lick		32·0	105	e 6 28	+ 6	—	—	e 6 42	pP	—
Honolulu		33·0	173	e 6 38	+ 7	e 11 42	− 2	e 7 12	sP	e 14·3
Tinemaha		34·1	102	e 6 42	+ 2	e 12 10	+ 9	i 9 18	P_cP	—
Haiwee		35·0	102	i 6 50	+ 2	e 12 20	+ 5	i 9 21	P_cP	—
Santa Barbara		35·2	106	i 7 0	+10	e 12 23	+ 5	—	—	—
Salt Lake City		35·4	90	e 6 59	+ 7	e 12 34	+13	e 7 28	pP	e 15·0
Mount Wilson		36·3	104	i 7 0	+ 1	e 12 38	+ 3	i 8 37	PP	—
Pasadena		36·3	104	i 7 0	+ 1	i 12 38	+ 3	i 8 41	PP	e 15·3
Riverside		36·8	104	i 7 3	0	e 12 46	+ 4	—	—	—
Palomar	z.	37·6	105	i 7 12	+ 2	—	—	—	—	—
La Jolla		37·7	106	e 7 14	+ 3	—	—	—	—	—
Tucson		41·8	100	i 7 46	+ 1	e 14 15	+18	e 9 29	PP	e 16·5
Lincoln		44·2	78	e 8 4	0	i 14 29	− 3	e 8 36	pP	e 17·7
Chicago		48·7	73	e 8 46	+ 6	i 15 32	− 4	—	—	22·0
Florissant		49·2	78	i 8 40	− 4	i 15 39	− 4	i 8 50	pP	22·8
St. Louis		49·4	77	i 8 43	− 2	e 15 42	− 4	i 8 52	pP	—
Cape Girardeau		50·7	80	e 8 49	− 6	i 15 57	− 7	i 8 59	pP	—
Toronto		52·0	66	—	—	e 16 10	−12	—	—	e 24·8
Irkutsk		52·2	310	e 8 56	−10	e 16 15	−10	—	—	26·2
Scoresby Sund		52·2	17	e 9 0	− 6	e 16 24	− 1	e 11 15	PP	e 23·3
Ottawa		52·8	62	i 9 7	− 4	e 16 27	− 6	e 17 46	sS	24·2
Seven Falls		54·1	57	e 9 14	− 6	16 52	+ 2	e 10 46	pP	25·2
Georgetown		56·5	68	9 28	−10	—	—	—	—	—
Philadelphia		56·8	67	—	—	e 17 13	−13	e 21 2	SS	e 25·1
Fordham		56·9	65	i 9 37k	− 4	i 17 28	0	i 9 54	pP	—
Harvard		56·9	62	i 9 43	+ 2	—	—	—	—	e 33·2
East Machias		57·4	58	c 10 23	pP	e 17 26	− 8	e 11 43	PP	e 23·3
Semipalatinsk		63·6	321	10 25	− 1	—	—	—	—	—
Sverdlovsk		64·0	336	i 10 24	− 5	—	—	—	—	31·2
Pulkovo		65·9	354	e 10 36	− 5	19 13	− 9	—	—	30·8
Upsala		66·2	2	i 10 53	+10	e 19 10?	−15	e 20 49	sS	e 33·2
Bermuda		68·1	64	e 11 10	+15	e 19 38	−10	e 27 29	SSS	e 30·6
Hong Kong		68·9	279	11 0	0	20 4	+ 6	13 18	PP	—
Moscow		69·2	348	10 57	− 5	19 53	− 8	—	—	33·2
Copenhagen		70·3	3	e 11 4	− 5	—	—	11 19	pP	—
Almata		70·8	319	11 20	+ 8	20 27	+ 7	—	—	—
Manila		71·0	269	e 11 13	0	20 34	+12	—	—	—
Frunse		72·0	320	e 11 16	− 3	—	—	—	—	—
Hamburg		72·3	5	e 11 16	− 4	e 20 34	− 3	—	—	e 50·2
De Bilt		73·4	8	i 11 24a	− 3	—	—	i 11 40	pP	e 32·2
Potsdam		73·6	4	i 11 25a	− 3	i 20 51	− 1	e 11 51	pP	e 34·6
Warsaw		73·8	358	e 11 18a	−11	—	—	i 11 40	pP	e 36·2
Tchimkent		74·3	323	11 32	0	—	—	—	—	—
Uccle		74·6	11	i 11 31a	− 3	—	—	i 11 47	pP	e 36·2
Andijan		74·7	321	11 30	− 4	—	—	—	—	—
Jena		75·0	5	i 11 31	− 5	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Paris		76·4	12	e 11 41	− 3	—	—	—	—	e 38·2
Stuttgart		77·0	7	e 11 43	− 5	—	—	e 12 0	pP	—
Strasbourg		77·1	8	e 11 44	− 4	—	—	—	—	—
Basle		78·1	9	e 11 50	− 4	—	—	e 12 5	pP	—
San Juan		78·4	75	e 11 57	+ 2	i 21 42	− 2	22 19	sS	e 40·0
Zurich		78·4	8	e 11 51a	− 4	—	—	—	—	—
Chur		78·9	8	e 11 55	− 3	—	—	—	—	—
Clermont-Ferrand		79·5	10	e 12 15?	+14	—	—	—	—	—
Triest		80·4	4	i 12 35	pP	e 22 44	sS	i 15 41	pPP	e 38·5
Bucharest		81·5	355	e 12 11	− 1	22 15	− 2	15 0	PP	45·2
Calcutta	N.	83·0	299	—	—	i 22 42	+10	—	—	—
Sofia		83·3	356	e 12 21	0	e 22 53	sS	—	—	—
Rome		84·0	4	i 12 21	− 4	e 22 39	− 3	i 12 35	pP	—
Agra	E.	84·1	309	12 24	− 1	22 39	− 4	i 22 57	sS	41·3
Toledo		84·2	18	i 12 23	− 3	—	—	e 12 36	pP	41·2
Algiers		88·3	12	e 12 43	− 3	i 23 26	+ 3	e 23 44	PS	—
Ksara		91·0	346	i 12 57a	− 1	e 23 54	+ 6	13 14	pP	45·2
Bombay		93·6	309	—	—	e 23 58	−13	—	—	e 46·2
Helwan		95·5	348	13 16	− 3	e 24 4	[+17]	e 13 33	pP	—
Huancayo		97·4	100	e 13 31	+ 3	e 24 0	[+ 2]	e 17 44	PP	e 39·9
La Paz	Z.	105·2	96	18 10	PP	—	—	—	—	56·7

Additional readings :—
Ukiah esP = +6m.55s., eP$_c$P = +9m.4s.
Branner eN = +6m.25s.
Butte eS$_c$S = +16m.25s.
Lick eN = +6m.32s.
Honolulu ePP = +7m.52s., pPP = +8m.12s., eP$_c$P = +9m.26s., esS = +12m.35s.
Tinemaha iZ = +6m.52s.
Haiwee i = +6m.58s.
Mount Wilson iNZ = +7m.9s., iP$_c$PZ = +9m.22s., iS$_c$PZ = +13m.26s.
Pasadena i = +7m.9s., iP$_c$PZ = +9m.23s., iS$_c$PZ = +13m.26s.
Riverside i = +7m.13s.
Palomar iZ = +7m.23s.
La Jolla i = +7m.22s.
Tucson iP = +7m.55s., epPP = +9m.43s., sPP = +9m.59s., ePPP = +10m.32s.
Lincoln ePP = +9m.54s.
Florissant iEN = +8m.57s. and +9m.7s., isSE = +15m.56s.
St. Louis isSN = +16m.1s.
Cape Girardeau isSN = +16m.15s.
Toronto e = +23m.40s.
Scoresby Sund eP = +9m.38s.
Ottawa SS = +20m.10s.
Philadelphia eS = +17m.26s.
Fordham iE = +17m.46s., isSE = +18m.19s.
East Machias eSS = +21m.53s.
Bermuda eP = +11m.19s.
Hong Kong PS = +20m.23s.
Potsdam iZ = +11m.39s., iN = +11m.43s., epPPE = +14m.42s., iE = +21m.51s.
Warsaw iZ = +11m.24s.
Jena iPE = +11m.34s.
San Juan esSS = +27m.35s., eSSS = +30m.13s.
Triest ePS = +23m.31s., eSSS = +30m.31s.
Bucharest ePE = +12m.14s., SEN = +22m.32s., PSEN = +23m.4s.
Rome eN = +12m.25s., ePPZ = +15m.12s., ePPPN = +17m.35s., eSN? = +22m.39s.
eZ = +22m.44s., eN = +22m.57s.
Agra PS?E = +23m.55s.
Ksara ePP = +16m.31s., PS = +24m.51s., PPS = +25m.21s.
Helwan eE = +24m.40s. and +27m.2s.
Huancayo ePPP = +19m.38s., eS = +24m.49s., esS = +25m.53s., eSS = +31m.36s.
Long waves were also recorded at Wellington.

Feb. 12d. 16h. 33m. 14s. Epicentre 1°·5N. 126°·0E. (as on 1938, January 26d.).

A = −·5876, B = +·8088, C = +·0260 ; δ = +11 ; h = +7 ;
D = +·809, E = +·588 ; G = −015, H = +·021, K = −1·000.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Manila		13·9	339	i 3 30 k	+ 9	7 10	L	—	—	(7·2)
Kosyun		21·0	347	4 50	+ 3	—	—	—	—	—
Hong Kong		23·7	332	5 11	− 3	9 23	− 4	5 35	PP	—
Phu-Lien		26·9	317	e 5 53	+ 8	—	—	—	—	—
Nagoya		35·0	16	7 1	+ 5	—	—	—	—	—
Nagano		36·8	15	7 16	+ 5	13 1	+ 5	—	—	—
Sendai		39·0	19	7 27	− 3	—	—	—	—	—
Vladivostok		41·8	7	e 7 55	+ 2	i 14 15	+ 4	—	—	22·2
Calcutta	N.	42·1	303	e 9 31	PP	i 17 29	SSS	—	—	—
Colombo	E.	46·3	278	e 5 16	?	—	—	—	—	—
Agra	E.	52·6	304	8 57	−21	16 10	−34	e 10 55	PP	—
Bombay		54·9	292	e 9 44	+ 9	e 17 9	− 7	—	—	—
Almata		60·2	321	i 10 0	−12	—	—	—	—	—
Andijan		62·1	316	i 8 50	?	—	—	—	—	—
Sverdlovsk		75·5	330	11 34	−14	—	—	—	—	36·3
Grozny		81·9	313	12 8	−15	—	—	—	—	—
Ksara		89·3	303	e 10 50	?	e 32 50	SSS	—	—	—
Fordham		134·1	21	i 22 40	PP	—	—	—	—	—

Additional readings :—
Hong Kong SS = +10m.16s.
Agra SSE = +19m.46s.
Ksara e = +14m.11s., +20m.17s., and +31m.30s.
Long waves were also recorded at Irkutsk and Tashkent.

Feb. 12d. Readings also at 0h. (La Paz), 5h. (La Paz), 6h. (near Balboa Heights), 7h. (Ivigtut), 8h. (Tchimkent, Frunse, Andijan, and Almata), 9h. (near Mizusawa and near Berkeley), 15h. (Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, and Tucson), 16h. (Ksara), 17h. (Tucson), 18h. (Calcutta), 20h. (near Branner), 21h. (Florissant, St. Louis, and Tucson), 23h. (Jersey).

Feb. 13d. 11h. 46m. 28s. Epicentre 27°·0N. 92°·0E. (as on 1937, March 9d.).

Intensity VII at Gauhati ; VI at Shillong.

Epicentre 25°·5N. 90°·8E. (Bombay), Government of India, Seismological Bulletin, 1940, p. 24.

A = −·0311, B = +·8917, C = +·4516 ; δ = +4 ; h = +3 ;
D = +·999, E = +·035 ; G = −·016, H = +·451, K = −·892.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Calcutta	N.	5·5	217	e 1 19	− 6	i 2 7	−23	i 1 44	P_g	—
Agra	E.	12·5	275	3 7	+ 5	5 14	− 9	i 4 14	?	—
Hyderabad		15·7	236	e 3 49	+ 5	6 22	−17	—	—	7·9
Bombay		19·4	250	i 4 29	− 1	e 8 8	+ 4	i 4 41	PP	e 9·5
Almata		20·3	328	4 46	+ 6	8 36	+13	—	—	—
Andijan		21·2	315	4 54	+ 5	9 12	SS	—	—	—
Frunse		21·2	323	e 4 39	−10	8 44	+ 3	—	—	—
Kodaikanal	E.	21·6	224	i 4 51	− 3	i 8 28	−21	i 9 15	SS	10·9
Colombo	E.	23·1	213	5 8	0	—	—	—	—	—
Tchimkent		23·8	316	5 16	+ 1	—	—	—	—	—
Irkutsk		26·9	17	—	—	e 9 32	−48	—	—	14·7
Sverdlovsk		37·2	333	—	—	e 13 26	+24	—	—	19·5
Grozny		40·6	306	7 48	+ 5	—	—	—	—	—
Moscow		48·2	322	e 8 42	− 2	—	—	—	—	—
Ksara		48·4	292	e 9 10	+24	e 16 18	+32	—	—	—
Helwan		52·9	288	e 8 47	−33	e 17 10	+22	—	—	—

Additional readings :—
Calcutta iP^*N = +1m.31s., iN = +2m.24s., iS_gN = +2m.57s., eP_cPN = +8m.33s.
Bombay eN = +4m.49s., eEN = +7m.48s. and +8m.14s.

Feb. 13d. 13h. 26m. 40s. Epicentre 12°·5N. 56°·0E.

A = +·5461, B = +·8096, C = +·2151 ; δ = −5 ; h = +6 ;
D = +·829, E = −·559 ; G = +·120, H = +·178, K = −·977.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bombay		17·4	66	i 4 0	− 6	i 7 17	− 2	i 7 50	SS	—
Kodaikanal	E.	21·2	93	4 50	+ 1	i 8 49	+ 8	—	—	10·2
Hyderabad	E.	22·2	75	5 2	+ 2	—	—	—	—	—
Colombo	E.	24·2	102	5 26	+ 7	—	—	—	—	—
Agra	E.	25·3	52	5 32	+ 2	9 52	− 2	—	—	—
Ksara		28·0	322	e 6 20	+25	e 11 52	SS	e 6 50	PP	—
Helwan		28·7	311	5 55	− 6	11 26	+36	7 20	PPP	—
Erevan		29·4	343	6 1	− 6	—	—	—	—	—
Andijan		31·6	25	6 40	+14	—	—	—	—	—
Grozny		32·0	346	i 5 48	−42	i 10 14	?	—	—	—
Calcutta	N.	32·3	66	—	—	e 9 32	?	e 12 52	SS	—
Almata		35·6	27	7 10	+ 9	—	—	—	—	—
Sverdlovsk		44·4	4	8 27	+13	14 49	0	—	—	21·3
Moscow		45·5	346	9 39	PP	—	—	—	—	—
Tucson		133·8	347	e 22 7	PP	—	—	—	—	—

Additional readings :—
Agra iE = +5m.35s.
Helwan eE = +6m.26s., SSE = +13m.40s.
Long waves were also recorded at Baku and Irkutsk.

Feb. 13d. 16h. Local European shock :—
Strasbourg eP_g = 55m.36s., S_g = 55m.54s., e = 56m.32s.
Uccle eN = 55m.43s., eE = 56m.22s.
Stuttgart eZ? = 55m.44s., e = 55m.49s., eZ = 55m.58s., eNE = 56m.24s. and 56m.41s.
Neuchatel eP = 55m.47s., eS_g = 56m.24s.
Basle eP = 55m.48s., eS_g = 56m.21s.
Zurich eP = 55m.51s., eS_g = 56m.30s.
Ebingen eZ = 56m.8s., 56m.26s., and 56m.50s.
Besançon eP_g = 56m.19s.
Ravensburg eEN = 56m.50s.
Paris e = 56m.56s.
Chur eP = 57m.
Long waves were also recorded at Jersey.

Feb. 13d. 23h. 52m. 13s. Epicentre 40°·5N. 123°·5W.

A = −·4209, B = −·6359, C = +·6469 ; δ = +1 ; h = −2 ;
D = −·839, E = +·552 ; G = −·357, H = −·543, K = −·763.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ferndale		0·6	277	i 0 26	+11	(i 0 26)	0	—	—	—
Ukiah		1·4	171	i 0 19k	− 8	i 0 28	−18	—	—	—
Berkeley		2·1	160	e 0 40	+ 3	i 1 9	+ 5	—	—	—
San Francisco	E.	2·8	163	e 0 46	− 1	e 1 25	+ 3	e 0 50	P*	—
Branner		3·3	162	i 0 47	− 6	i 1 34	− 1	i 0 57	P*	—
Santa Clara		3·3	159	i 0 54	+ 1	i 1 20	−15	—	—	—
Lick		3·4	156	e 0 51	− 4	i 1 45	S*	i 1 4	P*	—
Fresno	N.	4·7	140	e 1 15	+ 1	e 2 22	S*	—	—	—
Tinemaha		5·3	127	e 1 27	+ 5	i 2 57	S_g	—	—	—
Haiwee		6·2	133	i 1 37	+ 2	i 3 25	S_g	—	—	—
Santa Barbara	Z.	6·7	152	i 1 53	P*	—	—	—	—	—
Seattle		7·2	6	—	—	e 3 47?	S*	—	—	—
Mount Wilson		7·6	143	i 1 51	− 4	—	—	—	—	—
Pasadena		7·6	143	e 1 50	− 5	—	—	—	—	e 3·4
Riverside		8·1	140	e 1 57	− 5	—	—	—	—	—
Salt Lake City		8·8	85	—	—	e 4 49	S_g	—	—	e 5·3
Butte		9·7	53	—	—	e 4 52	S*	—	—	e 5·7
Tucson		13·1	125	e 3 15	+ 5	e 6 0	S*	e 3 32	PP	e 6·9
Lincoln		20·4	81	e 5 6	PP	—	—	—	—	—

Additional readings :—
Ferndale iE = +32s., iSN = +36s., iE = +39s.
Berkeley iP_gZ = +48s., iSN = +1m.22s., iS_gZ = +1m.29s.
Tucson eP = +3m.25s.
Long waves were also recorded at Bozeman, Fordham, and Ottawa.

Feb. 13d. Readings also at 0h. (Zurich), 1h. (Ferndale), 2h. (Bucharest, Triest, Wellington, and Christchurch), 3h. (near Tananarive, near Lick, Branner, Berkeley, and Christchurch), 4h. (Tucson), 5h. (Calcutta, Zurich, Helwan, Ksara, Agra, Kodaikanal, Colombo, and Bombay), 6h. (Tucson), 9h. (near Ferndale), 10h. (near La Paz), 14h. (Granada), 15h. (Ferndale), 16h. (Ferndale), 17h. (Prato, Chur, Zurich, Basle, Neuchatel, Ebingen, Stuttgart, Ravensburg, and Triest), 20h. (Harvard, near Fordham and Tucson), 21h. (Tinemaha, Haiwee, Santa Barbara, Mount Wilson, Pasadena, Riverside, and Tucson (3)), 22h. (near Berkeley), 23h. (East Machias).

Feb. 14d. 2h. 4m. 59s. Epicentre 49°·2N. 6°·0E.

Intensity III at Pont-a-Mousson, Auboué, and Homécourt.

Epicentre Region de Briey 49°·2N. 6°·0E. (Strasbourg). See Annales de l'Institut de Physique du Globe de Strasbourg, Tome V, 2e partie, Seismologie (1940), Strasbourg 1948, p. 5.

A = +·6524, B = +·0686, C = +·7548 ; δ = +5 ; h = −5 ;
D = +·105, E = −·995 ; G = +·751, H = +·079, K = −·656.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Strasbourg		1·3	118	0 24	− 1	0 43	− 1	—	—	—
Besançon		1·9	180	—	—	e 0 51	− 8	—	—	—
Uccle		1·9	327	e 0 34	0	i 0 59	0	—	—	—
Basle		2·0	148	e 0 53	+18	—	—	—	—	—
Stuttgart		2·1	102	e 0 39	+ 2	e 1 6	+ 2	i 1 9	S_g	—
Ebingen	z.	2·3	117	—	—	e 1 21	S_g	—	—	—
Paris		2·3	261	e 0 56	P_g	e 1 25	S_g	—	—	—
Zurich		2·5	137	e 0 39	− 4	1 37	S_g	—	—	—
Ravensburg		2·8	120	—	—	e 1 21	− 1	e 1 32	S_g	—
De Bilt		2·9	350	—	—	e 1 41	S_g	—	—	—
Chur		3·3	135	e 0 32	−21	e 1 17	−18	—	—	—
Clermont-Ferrand		3·9	211	e 2 18	P_g	—	—	—	—	—
Jena		4·0	62	i 1 19	P_g	—	—	—	—	e 1·9
Potsdam		5·5	52	—	—	e 2 55	S_g	—	—	—

Additional readings :—
Strasbourg S_g = +56s. and +1m.24s.
Besançon S_g = +1m.13s., iS_g = +1m.21s.
Uccle iE = +1m.10s., iN = +1m.13s.
Stuttgart iP_g = +49s., i = +1m.13s., iN = +1m.16s., i = +1m.20s., iS_gNE = +1m.32s.
Ebingen eZ = +2m.19s.
Paris e = +1m.36s.
Ravensburg eN = +1m.36s., eEN = +1m.39s., eE = +1m.45s., eN = +1m.57s.
Jena i = +1m.25s.
Potsdam eE = +3m.1s.?, eZ = +3m.7s.

Feb. 14d. 2h. Undetermined shock.

Almata P = 8m.48s., iS = 16m.42s.
Andijan P = 8m.53s.
Tchimkent P = 9m.7s., S = 17m.24s.
Sverdlovsk P = 10m.13s., eS = 19m.31s., L = 48·0m.
Perth i = 10m.25s., 12m.20s., 16m.13s., 18m.25s., 21m.10s., 21m.50s., 24m.0s., 27m.0s., and 28m.33s.
Moscow P = 11m.9s., eS = 21m.22s., L = 60·5m.
Agra iE = 14m.32s.
Irkutsk S = 15m.0s., eL = 55·0m.
Santa Barbara iPZ = 16m.35s.
Pasadena iP = 16m.36s.k, eLZ = 53·0m.
Tinemaha iP = 16m.37s.
Haiwee iPZ = 16m.38s.
Mount Wilson iPNZ = 16m.38s.k, iZ = 17m.59s.
Riverside iPZ = 16m.39s., eZ = 18m.2s.
Tucson iPKP = 16m.50s., ePP = 18m.17s.
Ottawa iZ = 17m.10s. and 19m.53s., L = 580m.
Fordham i = 17m.22s., 17m.25s., and 17m.28s.
Tashkent S = 17m.22s., eL = 53·0m.
La Paz eP = 17m.43s.
Adelaide eP = 18m.8s., e = 18m.36s., S = 20m.30s., i = 25m.10s., 26m.0s., 28m.54s., 29m.24s., 29m.44s., and 31m.22s.

Continued on next page.

Brisbane eN =18m.30s., eE =18m.36s.
Riverview eN =20m.0s., eLE =26m.18s.
Manila eP =20m.14s. and S?N =24m.3s.
Ksara e =21m.15s. and 29m.58s.
Hong Kong S? =22m.44s.
Huancayo e =30m.10s., i =30m.15s. and 30m.57s.
Wellington e =37m.0s.
Long waves were also recorded at De Bilt, Potsdam, Florissant, Arapuni, Warsaw, Vladivostok, St. Louis, Sydney, and Pulkovo.

Feb. 14d. 10h. Undetermined shock.

Christchurch PZ =33m.3s.?, SEN =38m.57s.?, L_q =42·1m., L_rZ =44·1m.
Huancayo e =34m.2s., i =42m.40s.
La Paz PZ =34m.27s., iPPP =37m.23s., iSZ =42m.41s., PSZ =42m.59s., SSZ =46m.35s., LZ =50·0m.
Tucson e =37m.37s.
Riverside ePZ =37m.44s.
Mount Wilson ePNZ =37m.47s.
Pasadena ePZ =37m.48s., eE =48m.42s., eLE =61·5m.
Haiwee ePZ =37m.57s.
Tinemaha ePZ =37m.57s.
Ukiah e =39m.4s.
San Juan e =39m.33s.
La Plata E P? =40m.18s., 40m.48s., and 43m.18s., S =45m.0s., L =47·3m.
La Plata N P? =40m.24s., S =45m.6s., L =47·4m.
Wellington SS? =42m.0s., L_q =44·0m., L_r =48·0m.
Rome eZ =42m.27s.
Paris ePKP =44m.25s., eL =97·0m.
Helwan iPKPZ =44m.30s.$_a$, PKKPZ =45m.12s.
Chur e =44m.49s.
Granada PKP =44m.51s., PP =50m.52s., SKKS =56m.31s., SS =72m.3s., SSP =73m.26s., eSSS =77m.47s., eL =114·8m.
Ksara eP =44m.56s., ePP =48m.22s., PPS =61m.22s., L =99·0m.
Agra eE =45m.10s.
Apia eN =49m.0s., eE =49m.42s.
Tananarive N =50m.56s., eN =58m.31s., eLN =77·5m.
Riverview eN =52m.24s., eLN =55·7m.
Ottawa eN =53m.0s., L =72·0m.
Adelaide e =54m.50s.
Brisbane eN =55m.18s.
Berkeley eN =55m.55s., eEN =77m.43s.
Bozeman e =57m.31s.
College e =60m.48s.
Salt Lake City e =68m.58s.
Butte e =73m.12s.
Sitka e =77m.12s.
Long waves were also recorded at Upsala, Scoresby Sund, Williamstown, Hamburg, Sydney, Warsaw, Arapuni, Potsdam, Uccle, and De Bilt.

Feb. 14d. Readings also at 0h. (East Machias (2), Chicago, Ottawa, Tucson), 2h. (La Paz), 3h. (Fordham), 6h. (La Paz), 8h. (Tchimkent, Andijan, and Almata), 9h. (near Wellington, near Tananarive, and New Plymouth), 10h. (Honolulu, near Tananarive, and La Paz), 11h. (Hong Kong, Colombo, Zi-ka-wei, near New Plymouth, Wellington, and Manila), 12h. (Potsdam), 13h. (Mizusawa), 15h. (Ksara), 17h. (near Berkeley, Riverside, and Tucson), 19h. (near Bucharest, Sofia, and Cluj), 20h. (San Juan), 21h. (Cape Girardeau), 22h. (Ksara and Tucson (2)), 23h. (near Ferndale).

Feb. 15d. Readings at 1h. (Huancayo, Rio de Janeiro, La Plata, Helwan, Granada, La Paz, Ksara, Wellington, and Tucson), 2h. (Paris, Tucson, Potsdam, and Ottawa), 4h. (Tucson and Zurich), 5h. (Bucharest, Tucson, Potsdam, Ksara, and Helwan), 7h. (Apia and Tucson), 8h. (Bozeman, Helwan, Ksara, near Ottawa, Wellington, and Granada), 10h. (near Ottawa), 11h. (Ksara), 12h. (Ksara and Wellington), 13h. (Granada), 14h. (Columbia), 15h. (Tucson), 16h. (near New Plymouth, Tucson, and near Wellington), 17h. (La Paz), 18h. (Tucson), 21h. (Tucson), 23h. (Ksara).

Feb. 16d. 1h. 1m. 59s. Epicentre 32°·5N. 94°·0E.

$A = -·0589$, $B = +·8429$, $C = +·5347$; $\delta = -15$; $h = +1$;
$D = +·998$, $E = +·070$; $G = -·037$, $H = +·533$, $K = -·845$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Calcutta	N.	11·2	208	e 2 45	+ 1	e 5 3	+11	i 5 56	SSS	—
Dehra Dun	N.	13·8	265	—	—	e 5 48	− 6	—	—	e 7·4
Agra	E.	14·9	253	3 27	− 7	6 34	+14	—	—	—
Phu-Lien		16·2	133	—	—	e 7 18	SS	—	—	e 9·0
Almata		16·9	314	4 3	+ 4	—	—	—	—	—
Andijan		18·9	302	4 27	+ 3	—	—	—	—	11·7
Semipalatinsk		20·2	336	4 39	0	—	—	—	—	—
Hong Kong		20·6	114	8 40	SS	—	—	—	—	(10·1)
Irkutsk		20·7	17	e 4 44	0	e 8 40	+ 9	—	—	11·3
Hyderabad		20·9	227	—	—	e 8 37	+ 2	—	—	e 11·0
Tashkent		21·3	302	e 5 0	+10	i 8 49	+ 6	—	—	i 12·2
Tchimkent		21·4	306	4 45	− 6	—	—	—	—	—
Bombay		23·6	241	e 5 16	+ 3	e 9 20	− 5	—	—	i 13·0
Kodaikanal	E.	27·3	220	—	—	e 9 33	−54	e 12 4	SSS	i 13·5
Colombo		28·7	211	e 9 1?	?	—	—	—	—	—
Sverdlovsk		33·0	328	6 43	+ 4	e 12 7	+10	—	—	17·0
Ksara		48·1	288	e 11 40	PPP	e 19 22	SS	—	—	—
Prague		59·5	314	—	—	e 25 1?	SSS	—	—	—
Granada		76·5	306	e 18 38	?	—	—	—	—	e 52·1

Additional readings :—
Calcutta $iS_gN = +6$m.35s., $eP_cPN = +8$m.31s., $eS_cSN = +15$m.47s.
Bombay $eN = +9$m.25s.
Long waves were also recorded at Hamburg, Upsala, Potsdam, De Bilt, Warsaw, Uccle, Bidston, Kew, Helwan, Moscow, and Baku.

Feb. 16d. Readings also at 1h. (Manila and La Paz), 2h. (Tinemaha, Tucson, and near Balboa Heights), 5h. (Tucson), 8h. (near Balboa Heights and near Tananarive), 11h. (Tucson), 14h. (Tucson, Ukiah, Sitka, Lincoln, College, Butte, Bozeman, Fordham, Ottawa, and East Machias), 15h. (East Machias), 17h. (Tucson), 20h. (Rome), 21h. (Sofia, La Paz, and Bucharest).

Feb. 17d. Readings at 1h. (Manila), 2h. (Ksara, Bucharest, and Sofia), 4h. (Huancayo), 7h. (Bozeman), 9h. (near Mizusawa), 12h. (La Paz), 13h. (Palomar, Riverside, Tinemaha, Pasadena, Mount Wilson, Haiwee, and Tucson), 14h. (Tucson), 16h. (Ottawa, near Hukuoka, and Huancayo), 21h. (Tucson), 23h. (near Mizusawa).

Feb. 18d. Readings at 1h. (Balboa Heights), 2h. (Tucson), 4h. (Tucson), 7h. (Apia (2), Balboa Heights, Tucson (2), Mount Wilson (2), and Tinemaha (2)), 10h. (Manila), 11h. (Tucson), 13h. (Riverview, Perth, Sydney, Brisbane, Tucson, Mount Wilson, and Tinemaha), 14h. (Potsdam), 18h. (San Francisco), 20h. (La Paz), 22h. (near Branner), 23h. (Tucson).

Feb. 19d. 12h. 6m. 53s. Epicentre 34°·0N. 117°·0W. (as given by Pasadena).

$A = -·3772$, $B = -·7402$, $C = +·5566$; $\delta = -2$; $h = 0$;
$D = -·891$, $E = +·454$; $G = -·253$, $H = -·496$, $K = -·831$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Riverside		0·3	270	i 0 11k	0	i 0 15	− 3	—	—	—
Palomar	Z.	0·7	170	i 0 17	0	—	—	—	—	—
Mount Wilson		0·9	284	i 0 19a	− 1	i 0 28	− 6	—	—	—
Pasadena		0·9	279	i 0 20a	0	i 0 32	− 2	—	—	—
La Jolla		1·1	191	i 0 24k	+ 2	i 0 40	+ 1	—	—	—
Tinemaha		3·3	343	i 0 53	0	i 1 43	S*	—	—	—
Fresno	N.	3·6	321	e 1 6	P*	i 1 41	− 1	i 1 53	S*	—
Lick		5·0	313	e 1 17	− 1	e 2 16	− 2	e 2 46	S_g	—
Branner		5·4	310	—	—	e 2 44	S*	—	—	—
Tucson		5·5	106	e 1 24	− 1	2 28	− 2	2 55	S_g	3·2
Berkeley		5·7	314	i 1 27	− 1	e 2 33	− 2	—	—	—

Additional readings :—
Lick $eE = +1$m.20s.
Tucson $eP = +1$m.29s., $iS_g = +3$m.6s.

Feb. 19d. Readings also at 2h. (near Tananarive, near Branner, Berkeley, and Lick), 3h. (Ksara), 7h. (La Paz, Ottawa, Huancayo (2), San Juan, Williamstown, St. Louis, Mount Wilson, Tucson, Columbia, Tinemaha, Pasadena, Riverside, and Palomar), 8h. (Tucson), 10h. (Ksara), 12h. (Columbia), 13h. (Columbia and near Mizusawa), 18h. (near Berkeley, Lick, and Branner), 21h. (Tucson), 23h. (near Berkeley, Lick, Branner, near Christchurch, Wellington, and New Plymouth).

Feb. 20d. 2h. 18m. 20s. Epicentre 13°·7S. 167°·2E.

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

Tables for depth of focus 0·020 have been used.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane		19·0	222	i 4 4	− 8	i 7 34	0	i 7 40	SS	—
Apia		20·4	93	i 4 28a	+ 2	i 8 5	+ 5	—	—	—
Riverview		24·8	213	i 5 9	+ 1	i 9 17	0	i 5 50	pP	—
Sydney	E.	24·8	213	i 5 10	+ 2	i 9 13	− 4	i 10 22	SS	—
Arapuni		25·4	164	5 16	+ 2	9 22	− 5	i 10 10	sS	—
Wellington		28·3	168	5 40	− 1	10 10	− 4	i 6 50	pP	—
Christchurch		30·1	172	5 56	− 1	10 42	0	6 39	pP	—
Honolulu		48·9	45	i 8 32	+ 1	e 15 22	0	e 9 10	pP	e 20·0
Perth		50·2	239	8 48	+ 7	15 40	0	10 7	PP	22·5
Manila		53·7	300	i 9 6a	− 1	i 16 25	− 2	i 10 10	pP	23·2
Yokohama	Z.	55·4	333	i 9 20	0	—	—	—	—	—
Tokyo Cen. Met. Ob.		55·6	334	9 19	− 2	15 31	?	—	—	—
Osaka		56·5	329	i 9 28a	0	17 8	+ 4	—	—	—
Miyazaki		56·8	323	9 30	0	17 2	− 6	—	—	23·7
Nagano		57·1	332	9 30	− 2	—	—	—	—	—
Kosyun		57·7	308	9 36	0	—	—	—	—	—
Kumamoto		57·9	325	9 36	− 1	—	—	—	—	—
Mizusawa		57·9	337	9 37	0	17 18	− 5	—	—	—
Hamada		58·7	327	9 41	− 2	17 31	− 2	—	—	—
Hukuoka		58·7	324	9 42	− 1	16 28	−65	—	—	—
Akita		58·8	337	9 37	− 7	11 53	PP	—	—	—
Mori		60·7	339	7 57	?	16 3	?	—	—	—
Sapporo		61·3	339	e 10 1	0	12 27	PP	—	—	—
Zi-ka-wei	N.	62·6	316	10 8	− 1	i 18 22	− 1	—	—	—
Hong Kong		63·1	304	10 11k	− 2	18 29	0	12 15	PP	29·9
Zinsen		63·6	325	10 16	0	18 32	− 3	—	—	—
Phu-Lien		68·7	299	i 10 48	0	i 19 36	− 1	—	—	—
Ukiah		83·3	47	12 9	− 1	i 22 15	0	e 12 51	pP	e 34·5
Branner		83·4	49	e 12 13	+ 3	e 22 17	+ 1	e 13 10	pP	—
Berkeley		83·5	49	i 12 11	0	e 22 19	+ 2	i 12 57	pP	—
Santa Clara		83·6	49	i 12 8	− 3	i 22 14	− 4	—	—	—
Lick		83·8	49	e 12 13	+ 1	—	—	—	—	—
Santa Barbara		84·2	53	i 12 15	+ 1	—	—	i 13 8	pP	—
Sitka		84·9	28	12 16	− 2	e 22 12	−19	e 13 4	pP	34·9
Fresno	N.	85·0	50	e 14 59	PP	e 23 59	PPS	—	—	—
Irkutsk		85·0	327	15 17	PP	i 22 20	[− 4]	23 24	PS	—
Calcutta	N.	85·2	294	i 12 25a	+ 6	i 22 37	+ 3	e 13 1	pP	e 35·4
Pasadena		85·3	53	i 12 19	− 1	i 22 28	[+ 2]	i 13 8	pP	e 34·7
College		85·4	17	e 12 20a	0	e 22 26	[0]	e 13 9	pP	e 34·9
Mount Wilson		85·4	53	i 12 20a	0	—	—	i 13 9	pP	—
La Jolla		85·6	55	e 12 20	− 1	—	—	i 13 10	pP	—
Riverside		85·9	53	i 12 23	0	—	—	i 13 11	pP	—
Palomar	Z.	86·0	54	i 12 23	0	—	—	i 13 13	pP	—
Haiwee		86·1	51	i 12 24	0	—	—	i 13 13	pP	—
Tinemaha		86·2	50	e 12 24	0	—	—	e 13 11	pP	—
Victoria		87·0	38	12 28	0	22 38	[+ 1]	15 52	PP	41·7
Seattle		87·4	40	e 16 18	PP	22 40	[+ 1]	24 10	sS	—
Tucson		90·6	57	12 44a	− 1	e 22 47	[−12]	i 13 34	pP	e 37·4
Colombo	E.	91·6	277	12 42	− 8	22 50	[−15]	—	—	29·1
Kodaikanal	E.	92·1	281	i 12 40?a	−12	—	—	i 16 40?	PP	45·5

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		92·1	48	e 12 44	− 8	23 38	0	e 13 38	pP	e 37·4
Hyderabad	N.	92·9	288	e 12 59	+ 3	i 23 8	[− 4]	—	—	35·6
Butte		93·1	43	e 12 59	+ 2	e 23 51	+5	e 13 58	sP	e 38·2
Bozeman		94·0	44	e 13 1	0	e 23 14	[− 4]	i 13 50	pP	e 37·5
Agra	E.	95·4	297	13 6	− 1	i 23 21	[− 5]	13 51	pP	—
Dehra Dun	N.	96·1	300	e 13 6?	− 4	e 23 42?	[+12]	—	—	e 33·9
Bombay		98·4	288	i 13 19	− 2	i 23 41	[− 1]	i 14 5	pP	i 46·2
Saskatoon		98·4	38	e 19 4	PPP	e 27 58	?	e 36 16	SSS	42·7
Semipalatinsk		98·5	320	e 13 20	− 1	—	—	—	—	—
Almata		99·4	313	e 13 26	+ 1	e 24 9	SKKS	—	—	—
Frunse		101·1	312	e 13 48	+15	23 6	[−49]	e 17 55	PP	—
Andijan		102·4	309	e 13 48	+ 9	25 48	sS	—	—	—
Lincoln		103·4	50	14 33	pP	e 25 14	+ 1	e 17 58	PP	e 43·0
Tchimkent		104·7	311	e 13 54	+10	—	—	e 18 12	PP	—
Tashkent		104·8	310	e 17 39	PKP	24 5	[− 7]	e 18 10	PP	41·3
Florissant		108·1	54	e 14 6	P	i 27 46	PS	14 53	pP	—
St. Louis		108·2	54	e 14 9	P	i 27 26	sS	i 18 34	PP	—
Cape Girardeau	E.	108·7	56	e 19 26	pPP	e 27 54	sS	e 28 59	PPS	—
Sverdlovsk		110·4	327	i 14 15	P	i 24 36	[0]	i 18 50	PP	44·7
Chicago U.S.C.G.S.		110·7	50	i 18 50	PP	e 26 41	S	e 19 30	pPP	e 45·3
Tananarive		112·3	243	20 10	pPP	28 17	PS	34 50	SS	57·2
Huancayo		112·9	110	e 18 21	[+ 4]	—	—	—	—	—
La Plata	E.	115·4	140	17 52	[−31]	24 46	[−11]	19 10	pPKP	47·7
Columbia		115·5	58	e 19·23	PP	e 24 56	[− 1]	e 20 16	pPP	e 43·7
Toronto		116·2	48	e 19 22	PP	e 28 52	PS	e 35 4	SS	49·7
La Paz		117·6	117	18 28	[+ 1]	i 25 26	[+22]	i 19 44	PP	56·0
Pennsylvania		117·7	51	—	—	i 46 3	?	—	—	—
Georgetown		118·5	53	i 19 46	PP	28 56	PS	29 27	pPS	44·7
Ottawa		118·6	45	i 18 28	[− 1]	i 28 46	PS	e 19 46	PP	i 44·5
Philadelphia		119·8	52	e 20 13	PP	e 29 10	PS	e 23 13	pPPP	e 53·3
Shawinigan Falls		120·4	43	e 18 40?	[+ 8]	e 28 40?	?	—	—	—
Fordham		120·7	50	i 17 48	[−45]	—	—	i 20 58	pPP	e 52·2
Williamstown		120·9	48	i 18 33	[0]	i 28 40	?	i 19 33	pPKP	—
Grozny		122·1	313	e 18 37	[+ 1]	—	—	e 20 24	pPP	—
Harvard		122·1	48	e 19 21	pPKP	e 30 55	PPS	—	—	e 61·7
Moscow		123·0	329	18 38	[0]	25 43	[+21]	20 16	PP	56·0
Erevan		123·6	310	e 18 56	[+17]	—	—	—	—	—
Cape Town	E.	124·0	212	20 20	pPKP	26 57	SKKS	21 23	pPP	—
	N.	124·0	212	20 16	pPKP	24 43	?	21 5	pPP	—
Pulkovo		124·2	336	e 18 41	[+ 1]	25 31	[+ 6]	e 20 27	PP	e 46·8
East Machias		124·5	45	e 16 28	sP	e 26 36	SKKS	e 20 12	PP	e 50·7
Sotchi		126·3	315	e 18 46	[+ 3]	—	—	e 20 44	PP	—
San Juan		128·7	77	e 15 55	P	i 25 12	[−26]	e 20 58	PP	e 53·7
Upsala		128·8	342	18 57	[+ 9]	e 30 40?	PS	20 52	PP	e 52·7
Bermuda		129·1	59	e 17 9	pP	25 42	[+ 3]	20 57	PP	50·6
Bergen		131·5	349	18 56	[+ 2]	e 36 40	?	e 21 20	PP	—
Ksara		131·7	304	i 18 55a	[+ 1]	i 32 41	PPS	i 19 46	pPKP	—
Rio de Janeiro		133·0	140	e 21 20	PP	e 34 31	?	—	—	e 57·0
Warsaw		133·0	333	i 18 57a	[0]	—	—	i 21 25	PP	30·7
Copenhagen		133·8	341	i 18 58a	[0]	—	—	21 28	PP	—
Bucharest		134·9	321	i 21 34	PP	—	—	23 22	PPP	61·7
Potsdam		136·2	338	i 19 0a	[− 2]	i 27 56	SKKS	e 19 40	pPKP	—
Helwan		136·3	299	e 19 4	[+ 2]	39 8	SS	19 52	pPKP	—
Hamburg		136·4	342	e 18 53	[− 9]	—	—	e 19 50	pPKP	e 56·7
Heligoland		136·4	343	e 19 11	[+ 9]	—	—	e 21 52	PP	e 55·7
Budapest	E.	137·1	329	19 6	[+ 2]	e 39 57	SS	21 51	PP	e 65·2
Edinburgh		137·2	352	—	—	—	—	e 21 56	PP	—
Szeged	N.	137·4	327	e 18 59	[− 5]	—	—	—	—	—
Sofia		137·5	320	e 19 6	[+ 1]	i 35 6	?	i 21 53	PP	—
Prague		137·5	335	e 19 10	[+ 5]	e 39 40	SS	e 21 53	PP	e 56·7
Jena		137·9	338	e 18 56	[− 9]	—	—	e 21 55	PP	e 57·7
De Bilt		139·1	344	e 19 0k	[− 8]	e 43 40?	SSS	i 19 58	pPKP	—
Stonyhurst		139·1	351	i 19 10	[+ 2]	—	—	i 22 44	pPP	e 66·7
Bidston		139·7	352	i 19 0	[− 9]	i 27 6	SKKS	e 21 52	PP	e 65·7
Uccle		140·5	345	19 2	[− 8]	—	—	e 19 53	pPKP	e 45·7

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Stuttgart	140·6	338	e 19 5a	[− 5]	i 25 34	[−29]	e 19 54	pPKP	e 63·2
Oxford	140·9	349	—	—	i 22 46	PP	e 20 7	pPKP	—
Kew	141·0	348	i 19 7k	[− 4]	i 27 16	SKKS	i 19 57	pPKP	e 66·7
Triest	141·1	331	e 19 13	[+ 2]	e 25 45	[−19]	i 22 14	PP	e 48·7
Strasbourg	141·3	339	e 19 9	[− 2]	44 40?	SSS	e 20 36	pPKP	—
Zurich	142·0	337	e 19 8k	[− 5]	—	—	22 25	PP	—
Chur	142·0	336	e 19 6	[− 7]	—	—	22 19	PP	—
Basle	142·2	338	e 19 9	[− 4]	—	—	22 23	PP	—
Paris	142·8	344	i 19 9	[− 6]	i 40 50	SS	i 22 22	PP	e 63·7
Neuchatel	142·9	338	e 19 11	[− 4]	—	—	e 22 24	PP	—
Jersey	143·5	350	e 19 18	[+ 3]	e 28 24	SKKS	e 21 55	PP	e 68·4
Rome	144·4	327	i 19 16	[0]	i 25 51	[−17]	i 20 4	pPKP	66·6
Clermont-Ferrand	145·4	341	i 19 20	[+ 2]	e 33 40?	?	e 22 39	PP	—
Toledo	152·8	346	e 19 32	[+ 2]	—	—	i 19 52	PKP_2	46·7
Algiers	153·0	331	i 19 33	[+ 2]	—	—	i 23 29	PP	—
Lisbon	154·9	353	19 32	[− 2]	—	—	19 57	pPKP	73·7
Granada	155·2	343	i 19 37k	[+ 3]	26 25	[+ 2]	20 28	pPKP	71·7
San Fernando	156·6	347	e 19 35	[0]	e 27 51	sSKS	e 34 3	PPS	65·7

Additional readings :—
Apia i = +5m.30s.
Riverview iPN = +5m.12s., isSEN = +10m.35s.
Wellington i = +7m.30s.
Christchurch sP = +6m.58s., P_cP = +8m.48s., sS = +11m.58s., P_cSZ = +12m.10s., S_cS = +16m.0s.
Honolulu PP = +10m.22s., iS = +15m.27s., eSS = +19m.14s.
Perth i = +8m.58s. and +9m.45s., PPP = +11m.4s., i = +11m.23s., i = +11m.45s., +12m.3s., +16m.53s., +17m.13s., and +18m.0s., SS = +18m.55s., i = +19m.28s., SSS = +19m.45s.
Hong Kong P_cP = +10m.54s., S_cS = +19m.46s., SS = +22m.50s.
Ukiah ePP = +15m.26s., esPP = +16m.33s., ePPP = +17m.16s., epPPP = +18m.1s., SP = +23m.0s., epS = +23m.13s., isSP = +24m.38s., eSS = +27m.7s., eSSS = +31m.27s.
Branner eN = +22m.22s.
Sitka iS = +22m.29s., isS = +23m.37s., PS = +23m.48s., sPS = +24m.47s., i = +30m.47s., +31m.0s., and +31m.8s.
Calcutta isSN = +23m.44s., eSSN = +28m.5s.
Pasadena iPPZ = +15m.41s., iPKKPZ = +30m.27s., iZ = +32m.1s., ePKP,PKPZ = +38m.30s.
College P_cP = +12m.26s., ePP = +15m.32s., epPP = +16m.34s., epPPP = +18m.31s., iS = +22m.31s., epS = +23m.27s., sS = +23m.51s., eSS = +28m.4s., eSSS = +31m.49s., eSSS = +31m.58s.
Mount Wilson iPPZ = +15m.42s., iPKKPZ = +30m.25s., iZ = +32m.1s., iPKP,PKPZ = +38m.28s., eSKP,PKPZ = +41m.36s.
La Jolla ePPZ = +15m.43s.
Riverside iPKKPZ = +30m.24s., ePKP,PKPZ = +38m.30s.
Palomar iPPZ = +15m.47s., iPKKPZ = +30m.25s., iPKP,PKPZ = +38m.30s.
Haiwee iPKKPZ = +30m.25s., iPKP,PKPZ = +38m.27s.
Tinemaha iPKKPZ = +30m.24s., ePKP,PKPZ = +38m.29s.
Victoria PPPE = +18m.20s., PSE = +24m.18s., SSN = +28m.50s., eN = +34m.52s.
Seattle esPS = +25m.32s.
Tucson eP_cP = +12m.47s., esP = +13m.58s., ePP = +16m.22s., epPP = +17m.7s., sPP = +17m.37s., ePPP = +18m.27s., epPPP = +19m.14s., eS = +23m.22s., S = +23m.25s., eSP = +24m.25s., SP = +24m.30s., ePS = +24m.55s., esPS = +25m.51s., eSS = +29m.20s., esSS = +30m.45s., eSSS = +33m.14s.
Colombo iE = +23m.14s.
Salt Lake City esP = +13m.50s., ePP = +16m.48s., esPP = +17m.46s., esS = +24m.45s., iPS = +25m.8s., isPS = +26m.14s., eSS = +29m.38s., eSSS = +33m.38s.
Hyderabad iN = +23m.42s.
Butte ePP = +16m.59s., esPP = +17m.40s., iPS = +25m.13s., esPS = +16m.17s., eSS = +19m.59s., SSS = +24m.54s.
Bozeman epPPP = +19m.31s., eS = +23m.48s. and +23m.54s., esS = +25m.12s., isPS = +26m.23s., sSS = +31m.46s., eSSS = +33m.57s.
Agra PPE = +16m.58s., pPP?E = +17m.46s., iE = +24m.44s. and +26m.36s., SSE = +29m.36s., SSSE = +34m.26s.
Bombay isP = +14m.27s., i = +16m.27s., PP = +17m.20s., iSKKS = +24m.34s., i = +25m.4s., +25m.53s., and +26m.13s.
Saskatoon eE = +29m.22s.
Lincoln epPP = +18m.48s., ePPP = +20m.19s., epPPP = +20m.49s., epS = +26m.17s., iPS = +27m.15s., ipPS = +28m.13s., sSS = +34m.1s.
Tashkent PS = +26m.51s., PPS = +27m.48s., SS = +32m.16s.

Continued on next page.

Florissant iE = +14m.9s., eZ = +18m.26s., ePPE = +18m.32s., iZ = +18m.36s. and +19m.54s., iE = +28m.2s., isSPE = +29m.0s., iE = +29m.41s. and +30m.23s.
St. Louis iE = +27m.44s., eSPE = +27m.55s.
Cape Girardeau eE = +20m.4s.
Sverdlovsk iPKP = +18m.15s., iSKKS = +25m.33s., iPS = +28m.1s., iPPS = +29m.3s., iSS = +34m.10s.
Chicago, U.S.C.G.S. ePPP = +21m.2s., iPS = +28m.21s., eSS = +33m.58s.
Tananarive PPSN = +29m.32s., EN = +30m.41s.
La Plata pPPPE = +22m.10s., N = +22m.58s., sSE = +28m.10s., SKSPN = +28m.40s., sPSE = +29m.52s., PPSN = +30m.4s., E = +31m.16s. and +33m.34s., sSSE = +36m.10s., sSSN = +36m.16s., SSS = +40m.16s., E = +42m.4s.
Columbia ePPP = +22m.2s., eS = +26m.49s., ePS = +28m.55s., sPS = +29m.58s., eSS = +35m.0s.
La Paz iSKP = +21m.10s., SZ = +27m.26s., PSZ = +29m.16s., iPPS = +30m.44s., iZ = +31m.44s., SSZ = +36m.28s.
Ottawa eZ = +20m.4s., iZ = +28m.50s., e = +29m.4s. and +30m.10s., eE = +31m.52s., e = +36m.58s.
Philadelphia esSS = +37m.20s.
Shawinigan Falls e = +42m.58s.
Fordham eN = +29m.14s., iN = +29m.57s. and +47m.14s.
Moscow SKKS = +26m.50s., PS = +30m.0s., SKSP = +30m.52s., PPS = +31m.28s., SS = +36m.40s.
Cape Town SKPN = +23m.5s., SKPE = +23m.19s., PPPE = +23m.57s., SKKSE = +27m.59s., SKKSN = +28m.15s., SE = +29m.27s., PSN = +30m.53s., PSE = +31m.5s., PPSE = +31m.59s., SSE = +36m.51s., SSN = +37m.9s., SSSN = +41m.55s.
Pulkovo PS = +30m.17s., ePPS = +30m.57s., SS = +36m.46s.
East Machias epPP = +20m.58s., ePPP = +23m.33s., epPPP = +24m.14s., ePS = +30m.33s., epPS = +31m.16s., eSS = +36m.57s., esSS = +37m.31s.
San Juan ePKP = +18m.48s., isPP = +22m.8s., ipPKS = +22m.56s., eS = +28m.0s., pS = +28m.53s., iPS = +30m.53s., sPS = +31m.47s., SS = +37m.54s., isSS = +39m.17s.
Upsala eN = +19m.15s., iN = +22m.5s., +22m.57s., and +23m.21s., e = +30m.40s., eN = +36m.40s.?, +41m.51s., and +42m.32s., eE = +42m.44s.
Bermuda ePKP = +18m.46s., epPP = +21m.40s., isPP = +22m.12s., ipPKS = +22m.59s., PPP = +24m.18s., SKKS = +26m.52s., ePPS = +32m.18s., iSS = +38m.20s., isSS = +39m.45s.
Bergen e = +22m.8s.
Ksara i = +21m.20s., PP = +21m.43s., i = +22m.5s.
Warsaw iZ = +19m.37s., +22m.7s., and +24m.16s.
Copenhagen i = +18m.45s. and +19m.48s.
Bucharest SKSN = +22m.30s., SKSE = +22m.34s.
Potsdam iPKPE = +19m.4s., ipPKPZ = +19m.51s., iZ = +21m.45s., iPPZ = +22m.29s. iPPE = +22m.34s., isPPN = +23m.23s., isPPZ = +23m.26s., iZ = +34m.50s.
Helwan eE = +19m.34s., sPKPE = +20m.17s., PP = +21m.46s., pPPEN = +22m.34s., pPKSEN = +22m.42s., eN = +24m.13s., iN = +28m.19s. and +29m.43s.
Hamburg iZ = +19m.2s., iZ = +21m.47s., iN = +22m.35s., eZ = +34m.51s.
Heligoland iN = +22m.35s., eE = +35m.22s.
Budapest eE = +22m.3s., iE = +22m.39s., eE = +23m.28s., +24m.28s., +30m.27s., +49m.57s., and +56m.40s.
Sofia iE = +22m.38s. and +24m.30s.
Prague e = +22m.32s.
Jena ePZ = +19m.6s., ePEN = +19m.10s., i = +22m.40s.
De Bilt iPP = +22m.0s., ipPP = +22m.44s., ePPS = +35m.40s.?, eSSS = +46m.40s.?
Bidston iSKP = +22m.4s., iPKS = +22m.44s., ipPKS = +23m.32s., epPPP = +25m.39s., eSS = +39m.39s., eSSS = +44m.25s.
Uccle iZ = +19m.9s., ePP = +22m.4s., i = +22m.12s., ipPPNZ = +22m.48s.
Stuttgart iZ = +19m.12s., iPP = +22m.12s., ipPE = +22m.43s., ipPNE = +22m.48s., ipPNW = +22m.52s., ipPPN = +23m.38s., eSKKSE = +27m.44s., eSSN = +39m.22s.
Kew iZ = +19m.19s., ePPNZ = +22m.3s., iSKPN = +22m.15s., iPKSN = +22m.49s., ipPPZ = +22m.56s., ipPKSN = +23m.37s., epPPPNZ = +25m.47s., eSKKSE = +28m.1s., iPSPZ = +34m.19s., eSS = +40m.10s., eSSSEN = +45m.10s., eL_gE = +56·7m.
Triest i = +19m.27s., e = +20m.13s., +20m.28s., and +22m.41s., iPPP = +23m.33s., e = +28m.28s., SKS = +29m.24s., eSKKS = +30m.8s., eS = +30m.52s., ePS = +31m.48s., ePPS = +32m.13s., SS = +36m.17s., iSSS = +40m.25s., i = +42m.56s.
Strasbourg i = +19m.26s., PP = +22m.20s.
Zurich e = +23m.1s.
Chur e = +22m.48s.
Paris iPKS = +22m.54s., iPPP = +25m.29s.
Jersey ePKS = +22m.53s., e = +24m.40s., ePPP = +25m.20s., eSPP = +34m.42s., e = +36m.55s., +43m.50s., and +47m.2s.
Rome +20m.42s., iEN = +21m.33s., iPP = +22m.34s., iSKPZ = +22m.50s., iN = +23m.13s., iE = +23m.37s., iPPPN = +25m.16s., iEN = +26m.59s., iE = +29m.50s., iN = +30m.26s., iE = +31m.2s., PSKSNZ = +32m.34s., iE = +32m.49s., iEN = +33m.46s., iPPSEN = +34m.58s., iEN = +36m.11s., iE = +39m.19s., iSS?EN = +41m.7s., iN = +41m.44s., iE = +42m.13s, and +59m.8s,

Continued on next page.

Toledo iPP = +23m.25s.
Algiers e = +22m.3s., +28m.51s., and +31m.40s.
Lisbon PKP_2Z = +20m.36s.?, $pPKP_2N$ = +20m.41s., $pPKP_2E$ = +20m.45s., pPPN = +24m.11s., pPPZ = +24m.16s., pPPE = +24m.24s.
Granada $pPKP_2$ = +21m.58s., SKP = +22m.53s., iPP = +23m.37s., pPP = +24m.25s., iPPP = +27m.39s., SKKS = +30m.1s., pSKKS = +31m.13s., SKSP = +33m.43s., i = +35m.49s., PPS = +37m.1s., SS = +43m.42s., sSS = +44m.27s., SSS = +49m.50s.
San Fernando iPKPN = +19m.41s.
Long waves were also recorded at Ivigtut.

Feb. 20d. 12h. 54m. 20s. Epicentre 40°·5S. 78°·5E.

This determination is uncertain owing to a lack of recording of P at southern stations.

A = +·1520, B = +·7473, C = −·6469; δ = +4; h = −2;
D = +·980, E = −·199; G = −·129, H = −·634, K = −·763.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Perth		31·1	86	8 2	PPP	11 45	+17	—	—	13·5
Tananarive		34·2	300	—	—	e 12 16	0	(e 13 51)	SS	e 13·9
Colombo	E.	47·2	2	8 30	− 6	15 5	−24	—	—	19·0
Cape Town		47·5	258	15 51	S	(15 51)	+17	—	—	22·9
Riverview		56·8	108	—	—	e 18 10	+29	e 22 22	SS	e 28·7
Hyderabad		57·6	0	—	—	17 39	−12	—	—	—
Bombay		59·3	354	i 10 6	0	i 18 2	−12	—	—	e 33·0
Brisbane		61·5	102	—	—	e 19 4	+22	—	—	e 30·7
Calcutta	N.	63·4	11	e 10 40	+ 6	i 19 4	− 2	—	—	e 29·5
Christchurch		66·2	127	10 51	− 1	20 6	+26	28 5	L_q	33·0
Agra	E.	67·3	0	e 11 11	+12	i 19 40	−14	e 13 32	PP	29·8
Manila		67·5	45	e 11 56	+56	19 32	−24	—	—	27·7
Dehra Dun	N.	70·5	0	—	—	e 20 57	PS	e 25 29	SS	e 34·5
Hong Kong		70·8	35	11 25	+ 5	20 29	− 6	13 48	PP	—
Andijan		81·1	355	12 22	+ 4	—	—	—	—	—
Tashkent		81·9	353	i 12 26	+ 3	i 22 30	− 6	—	—	e 38·3
Helwan		82·5	320	i 11 28a	−58	22 40	− 2	28 4	SS	—
Frunse		83·1	357	12 16	−13	—	—	—	—	—
Almata		83·4	359	12 15	−15	—	—	—	—	—
Ksara		83·8	325	i 12 38	+ 6	e 23 30	PS	e 15 45	PP	—
Baku		84·6	338	e 12 37	+ 1	23 8	+ 5	—	—	e 41·2
Erevan		86·1	335	12 56	+12	—	—	—	—	—
Grozny		88·5	337	e 13 14	P_cP	—	—	—	—	—
Granada		107·8	304	i 19 16	PP	—	—	—	—	56·1
Pasadena	z.	165·3	110	e 20 23	[+17]	—	—	e 25 13	PP	e 77·8
Mount Wilson	z.	165·5	110	e 20 24	[+18]	—	—	—	—	—
Palomar	z.	165·8	115	e 20 25	[+19]	—	—	—	—	—
Riverside	z.	165·8	111	e 20 20	[+14]	—	—	—	—	—
Haiwee	z.	166·4	103	e 20 24	[+17]	—	—	—	—	—
Tinemaha	z.	166·5	99	e 20 23	[+16]	—	—	—	—	—
Tucson		168·9	135	e 20 26	[+18]	e 27 7	[− 4]	e 25 27	PP	e 64·0

Additional readings :—
Perth PP = +8m.20s., i = +11m.14s.
Cape Town PPE = +16m.15s., SSE = +21m.15s.
Riverview eE = +18m.22s.
Bombay E = +10m.14s., eN = +21m.9s., and +26m.21s.
Brisbane eN = +25m.40s., eE = +29m.28s.
Agra SSE = +23m.45s.
Hong Kong PS? = +20m.43s., SS = +24m.59s.
Tucson ePPS = +39m.27s.
Long waves were also recorded at Arapuni, Sydney, Wellington, San Juan, Johannesburg, La Paz, La Plata, Bermuda, and other American, European, and U.S.S.R. stations.

Feb. 20d. Readings also at 2h. (Lisbon, Tucson (2), and College), 3h. (Cape Girardeau, St. Louis, and Williamstown), 4h. (Harvard and Bozeman), 9h. (Ksara and La Paz), 11h. (Huancayo), 13h. (Sverdlovsk, Cape Town, Tashkent, Baku, Ksara, Helwan, and Tananarive), 14h. (Helwan), 15h. (Tananarive and Agra), 17h. (Tucson), 20h. (Tucson (2), Ksara, Pasadena (2), Helwan, Chatham Ils., Apia, Perth, Wellington, Sydney, Arapuni, Colombo, Riverview, Brisbane, Tinemaha (2), Riverside (2), Palomar (2), and Mount Wilson (2)), 21h. (Ukiah, Chur, Salt Lake City, Bombay, Calcutta, Tucson, Kodaikanal, Agra, Bozeman, and College), 22h, (De Bilt, Rome, Granada, and San Fernando), 23h. (Ksara).

Feb. 21d. 0h. Much damage to the village of Vilâyet de Kayseri. Damage also at Soysalli, Sendenmeke köy, Develi, Kulpak, Kizik, Hacilar. Dormant volcano in activity. Epicentre 38°·7N. 35°·3E. approx.

W. Salomon-Calvi.

Des Erdbeben des Erciyes (Argaeus). M.T.A. Sere 5, Sayi 2-19, Ankara, 1940, pp. 180-182. Resumé in German, p. 182-184.

It is not possible to get these observations to fit the above determination.

Ksara iP =50m.51s., S =51m.54s.
Sotchi iP =51m.10s., S_g =52m.30s.
Yalta iP =51m.22s., eS_g =53m.10s.
Istanbul P =51m.24s., P_g =52m.1s., PS =52m.34s., S_g =53m.32s.
Helwan iPZ =51m.55s.k, SEN =53m.54s., S*E =54m.42s., S_gE =55m.12s., iE = 56m.27s.
Erevan eP =52m.3s.
Grozny eP =52m.19s., eS =53m.52s., L =55·2m.
Baku eP =52m.49s., iS =54m.49s., L =56·4m.
Sofia ePE =53m.0s., ePN =53m.11s., iEN =55m.7s.
Bucharest ePN =53m.14s., P*N =53m.44s., P_gEN =54m.1s., SEN =54m.44s., S*EN = 55m.22s.
Rome iPZ =53m.54s.a, iS =57m.17s., LN =59·2m.
Triest eP =54m.13s., ePP =54m.26s., iS =57m.21s., iSS =58m.0s.
Jena eN =54m.15s., eE =54m.30s.
Chur e =54m.25s., eS? =58m.17s.
Zurich eP =54m.31s.
Stuttgart eP =54m.32s., e =54m.51s. and 55m.12s.
Prague e =60m.
Granada e =64m.10s., L =68·0m.
Colombo eE =73m.30s.
Long waves were also recorded at Sverdlovsk, Tashkent, Potsdam, and De Bilt.

Feb. 21d. Readings also at 1h. (Haiwee, Palomar, Tinemaha, Pasadena, Mount Wilson, Riverside, and Tucson), 2h. (Pasadena, Mount Wilson, Riverside, and Tucson), 7h. (near Branner and Berkeley), 8h. (near Branner and Berkeley), 9h. (near Mizusawa), 10h. (Tucson and Triest), 12h. (near Basle, Strasbourg, Neuchatel, Zurich, Uccle, Stuttgart, and Jena), 13h. (Manila, Brisbane, and Riverview), 14h. (Tucson, Mizusawa, and Tananarive), 17h. (near Mizusawa), 18h. (Triest), 21h. (Tucson and San Juan), 22h. (near Mizusawa and La Paz).

Feb. 22d. 13h. 30m. 46s. Epicentre 20°·4N. 122°·0E. (as on 1939 Sept. 3d.).

$A = -·4971$, $B = +·7955$, $C = +·3465$; $\delta = -1$; $h = +5$;
$D = +·848$, $E = +·530$; $G = -·184$, $H = +·294$, $K = -·938$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Manila		5·8	190	i 1 20a	− 9	i 2 23	−15	—	—	—
Hong Kong		7·5	285	1 58	+ 5	3 5	−15	—	—	3·6
Zi-ka-wei	Z.	10·8	356	e 2 54	PPP	5 8	SSS	—	—	i 6·2
Phu-Lien		14·4	275	i 3 26	− 1	—	—	—	—	—
Osaka		18·8	37	4 18	− 5	7 14	−36	—	—	—
Vladivostok		24·1	18	1 5 29	+11	i 9 50	+16	—	—	13·8
Mizusawa		24·9	37	e 5 31	+ 5	5 55	PP	—	—	—
Calcutta	N.	31·4	280	e 6 25	0	e 11 16	−16	e 9 38	P_gP	—
Agra	E.	40·7	288	7 38	− 6	13 41	−14	9 17	PP	—
Colombo	E.	42·9	258	7 57	− 5	14 16	−11	—	—	—
Almata		43·9	313	e 8 15	+ 5	—	—	—	—	—
Semipalatinsk		44·4	324	8 20	+ 6	e 15 5	+16	—	—	—
Frunse		45·5	311	e 8 47	+24	—	—	—	—	—
Bombay		46·2	277	i 8 25	− 3	i 15 6	− 9	i 10 18	PP	—
Andijan		46·6	307	i 8 37	+ 5	i 15 22	+ 1	—	—	—
Tchimkent		48·9	309	i 8 57	+ 7	i 15 56	+ 3	—	—	—
Tashkent		49·0	308	i 8 50	0	e 15 52	− 3	—	—	—
Sverdlovsk		57·6	326	i 9 56	+ 2	i 17 53	+ 2	—	—	26·7
Baku		63·6	306	e 10 45	+10	—	—	—	—	33·2
Grozny		66·4	310	10 59	+ 6	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Moscow		70·3	324	—	—	e 20 28	− 1	—	—	33·7
Pulkovo		73·4	329	i 16 31	PPP	e 22 7	PS	—	—	—
Ksara		75·8	300	—	—	e 22 40	PPS	—	—	39·2
Helwan		80·7	298	i 14 14	?	i 22 14	−10	—	—	—
Potsdam		85·0	325	i 12 29	− 9	—	—	—	—	e 43·2
Rome		90·2	314	e 13 0	− 4	i 23 26	[− 8]	i 16 39	PP	e 42·2
Tucson		107·2	45	e 14 4	P	25 19	[+19]	e 18 36	PP	e 43·5
Columbia		121·6	22	e 20 47	PP	e 30 39	PS	e 22 56	PPP	e 48·3

Additional readings :—
Calcutta iS_eSN = +17m.13s.
Agra sP?E = +8m.2s., SSSE = +14m.10s.
Bombay eE = +15m.2s., iE = +18m.11s. and +18m.46s.
Helwan eZ = +14m.33s.
Rome iSE = +23m.59s., iN = +24m.28s. and +24m.46s., iPSE? = +25m.12s., iE = +25m.34s. and +25m.54s.
Columbia ePPS = +32m.4s.
Tucson ePPP = +20m.43s., eS = +26m.2s., ePS = +27m.35s., ePPS = +28m.53s., eSS = +33m.21s., eSSS = +37m.45s.
Long waves were also recorded at Kew, Bidston, and De Bilt.

Feb. 22d. Readings also at 0h. (Triest), 4h. (Perth, Triest, Rome, Tucson (2), Haiwee, Tinemaha (2), Palomar, and Salt Lake City), 5h. (Florissant, Butte, Bozeman, near Zurich, Basle, Seattle, Sitka, Ukiah, St. Louis, Tucson, Haiwee, Tinemaha, Palomar, and Salt Lake City), 6h. (San Juan and Fordham), 7h. (Colombo), 8h. (near Berkeley, Lick, and Branner), 10h. (near Tucson), 11h. (Hukuoka), 17h. (Tucson and near Hukuoka), 18h. (near Berkeley, Lick, and Branner), 19h. (Triest and Tucson), 21h. (Harvard), 22h. (Sverdlovsk, Tashkent, Tchimkent, Andijan, and Frunse), 23h. (Tucson).

Feb. 23d. 0h. 39m. 51s. Epicentre 40°·0N. 20°·0E. (as on 1938 Aug. 15d.).

Destruction at Cakrani. Damage at Valona and Berat (Albania) felt in the Pouilles (Italy). Macroseismic epicentre 40°32′N. 19°36′E.

Carlo Morelli.

La Sismicita dell'Albania. Estratto del Bollettino della Societa Sismolog. Italiana, Vol. XXXIX, No. 1-2, 1941, et Public. del'Institut Geophysique de Rome, No. 84.

Prof. Mario Magnani.

Tettonica e Sismicita' nella Regione Albanese. Geofisica pura e applicata, Vol. VIII, Fasc. 1-2, pp. 1-42, resumé in English and German, p. 1. Appendix 1, p. 33, 3 figures.

A = +·7219, B = +·2627, C = +·6402 ; δ = +1 ; h = −2 ;
D = +·342, E = −·940 ; G = +·602, H = +·219, K = −·768.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Sofia		3·7	42	e 1 3	+ 3	i 1 44	− 1	i 1 8	P*	—
Rome		6·0	290	i 1 29a	− 3	i 2 37	− 6	i 1 46	P*	—
Szeged	E.	6·2	1	(1 39)	+ 4	(i 2 47)	− 1	—	—	(3·0)
	N.	6·2	1	(1 43)	P*	(e 2 43)	− 5	—	—	(3·2)
Bucharest		6·3	44	1 45	+ 9	i 2 47	− 3	2 5	P_g	—
Kecskemet	Z.	6·9	358	1 49	+ 4	—	—	e 2 5	P*	3·6
Istanbul		7·0	79	2 29	P_g	3 5	− 3	5 6	S_gS_g	—
Cluj		7·3	21	e 1 49	− 1	i 3 46	S*	i 2 12	P*	—
Triest		7·3	323	i 1 43k	− 7	3 22	+ 7	2 10	P*	—
Budapest	E.	7·5	356	1 51	− 2	i 3 32	+12	2 35	P_g	4·3
	N.	7·5	356	1 59	+ 6	i 3 44	S*	i 2 22	P*	4·3
Chur		10·2	315	e 2 26	− 5	e 4 6	−21	—	—	—
Prague		10·8	341	2 31a	− 8	e 4 59	SS	—	—	e 5·2
Zurich		11·1	315	e 2 36	− 7	e 4 47	− 2	—	—	—
Basle		11·7	314	e 2 44	− 7	e 4 57	− 7	—	—	—
Stuttgart		11·7	322	i 2 43k	− 8	e 4 45	−19	—	—	e 6·2
Neuchatel		11·8	311	e 2 45	− 8	e 4 43	−23	—	—	—
Strasbourg		12·3	319	e 3 4	+ 5	e 5 3	−15	—	—	6·1
Warsaw		12·3	3	e 3 5	+ 6	e 5 43	SS	e 6 3	SSS	e 6·5
Jena		12·4	334	i 2 53	− 8	e 6 9	SSS	—	—	e 6·5
Clermont-Ferrand		13·6	300	e 3 23	PP	—	—	—	—	8·7

Continued on next page,

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Potsdam	13·3	341	4 12	+59	e 5 41	− 1	—	—	i 6·3
Helwan	13·7	134	i 3 24	+ 6	i 5 57	+ 5	i 6 27	SSS	i 7·5
Ksara	14·1	111	i 3 39	PP	6 56	SSS	—	—	8·3
Hamburg	15·2	337	—	—	e 6 9	−19	—	—	e 8·1
Sotchi	15·2	70	e 2 49	−49	—	—	—	—	—
Paris	15·3	311	e 3 43	+ 4	e 5 27	−63	—	—	—
Uccle	15·4	320	e 3 43	+ 3	—	—	—	—	e 7·6
Kew	18·2	317	—	—	e 7 39	+ 2	—	—	i 10·0
Toledo	18·4	277	e 4 20	+ 2	e 7 47	+ 6	—	—	8·8
Granada	18·6	270	i 4 26k	+ 5	i 7 55	+ 9	8 41	SS	10·1
Moscow	19·6	32	4 30	− 2	8 6	− 2	—	—	10·1
Bidston	20·6	318	—	—	e 7 31	−58	—	—	e 10·0
Stonyhurst	20·6	322	i 3 39	−64	—	—	—	—	e 13·1
Pulkovo	20·8	16	e 4 43	− 2	e 8 35	+ 2	—	—	e 10·8
Sverdlovsk	31·2	44	i 6 24	+ 1	11 26	− 3	—	—	14·2
Fordham	67·8	305	i 10 59	− 3	—	—	—	—	—
Tucson	94·9	320	e 13 27	+ 2	e 23 52	[− 8]	e 17 12	PP	e 38·3

Additional readings :—
Sofia iE = +1m.52s., iN = +1m.58s.
Rome iP_g = +2m.0s., iZ = +2m.3s. and +2m.19s., iE = +2m.21s., iSN = +2m.31s., iE = +2m.47s., iS_gN = +3m.4s., iEN = +3m.27s., iZ = +3m.33s., iE = +3m.52s.
Szeged iN = (+2m.18s.); all readings have been diminished by 2m.
Bucharest iE = +2m.36s., iEN = +3m.0s., SN = +3m.17s., S*N = +3m.41s.
Cluj eS*N = +4m.31s., S_gN = +4m.59s.
Triest i = +1m.47s., eP* = +1m.53s., P_g = +2m.7s., S = +2m.56s., iS_gS_g = +3m.26s., i = +3m.29s. and +3m.42s., e = +3m.53s.
Budapest iE = +3m.58s.
Stuttgart eZ = +2m.47s., ePP = +2m.51s.
Strasbourg e = +4m.42s.
Jena iPZ = +2m.57s., eN = +6m.20s.
Potsdam iZ = +4m.35s., eN = +4m.51s., eE = +6m.6s.
Tucson ePP = +19m.13s., eS = +24m.21s., eSS = +30m.46s., eSSS = +34m.51s.
Long waves were also recorded at Tashkent, Irkutsk, Vladivostok, De Bilt, Edinburgh, Bergen, Upsala, and Heligoland.

Feb. 23d. 9h. 27m. 46s. Epicentre 42°·1N. 25°·1E.

Intensity V-VI at Borisovgrad and neigbourhood. Radius of macroseismic area 120km. Epicentre 42°·1 ±0°·2N. 25°·1 ±0°·2E.

Kiro T. Kirof.

Tremblements de terre en Bulgarie. Listes de Tremblements de Terre ressentis pendant les annees, 1931-1940, Sofia 1941, p. 90-92.

A = +·6740, B = +·3157, C = +·6679; δ = +3; h = −2;
D = +·424, E = −·906; G = +·605, H = +·283, K = −·744.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Sofia	1·5	295	i 0 25	− 3	i 0 47	− 2	i 0 41	P_g	—
Bucharest	2·4	17	e 0 46	+ 5	i 1 11	− 1	i 0 52	P_g	—
Cluj	4·8	348	i 1 15k	0	2 13	+ 1	1 27	P*	—
Kecskemet	6·1	323	e 2 58	S*	—	—	—	—	—
Triest	8·9	297	e 3 48	S	(e 3 48)	− 7	i 4 34	S*	—
Rome	9·4	273	—	—	e 4 50	S*	e 5 9	S_g	—
Warsaw	10·5	346	e 4 48	S	(e 4 48)	+13	e 5 10	SSS	e 7·6
Sotchi	10·8	77	e 2 44	+ 5	—	—	—	—	—
Moscow	15·8	27	e 3 38	− 7	7 27	L	—	—	(7·4)

Additional readings :—
Bucharest iEN = +1m.15s., iS_gEN = +1m.21s.
Cluj ePE = +1m.18s., P*E = +1m.33s., P_gE = +1m.47s., SE = +2m.20s.
Kecskemet eZ = +3m.7s.
Triest eP* = +4m.0s., eP_g = +4m.8s., iPP = +4m.11s., i = +4m.14s. and +4m.26s., iPS = +4m.46s., eS = +4m.53s., i = +5m.1s.
Rome eNZ = +5m.5s., iE = +5m.25s.
Warsaw iE = +6m.8s., eZ = +6m.54s., iZ = +7m.6s.
Long waves were also recorded at Budapest, Upsala, Szeged, and Potsdam,

Feb. 23d. 19h. Local Japanese shock. Tokyo Imperial University gives Epicentre 36°·18N. 139°·80E.

Kamakura P = 51m.16s., S = 51m.30s.
Kiyosumi P = 51m.16s., S = 51m.32s.
Komaba P = 51m.16s., S = 51m.25s.
Koyama P = 51m.16s., S = 51m.31s.
Mitaka P = 51m.16s., S = 51m.27s.
Titibu P = 51m.16s., S = 51m.25s.
Togane P = 51m.16s., S = 51m.27s.
Tokyo Imp. Univ. P = 51m.16s., S = 51m.25s.
Tukubasan P = 51m.16s., S = 51m.23s.
Susaki P = 51m.29s., S = 51m.51s.
Mizusawa eP = 51m.51s., eSN = 52m.28s.
Osaka P = 52m.25s., S = 53m.6s.

Feb. 23d. Readings also at 0h. (near Toledo, Granada, and Tucson), 1h. (Riverside, Mount Wilson, Pasadena, Tinemaha, and Palomar), 3h. (New Plymouth and Wellington), 5h. (Christchurch, Wellington, Arapuni, Tucson, Riverside, Mount Wilson, Pasadena, Tinemaha, and Palomar), 8h. (Tucson), 9h. (Tucson, Palomar, Tinemaha, Pasadena, Mount Wilson, and Riverside), 12h. (Jena), 16h. (Riverside, Mount Wilson, Palomar, Pasadena, Tinemaha, and Tucson), 18h. (near Erevan, Grozny, and Piatigorsk), 21h. (Tucson).

Feb. 24d. 9h. 37m. 59s. Epicentre 37°·5N. 118°·5W. (as given by Pasadena).

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

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tinemaha		0·5	155	i 0 13$_a$	− 1	i 0 21	− 2	—	—	—
Fresno	N.	1·3	233	i 0 22	− 3	i 0 37	− 7	—	—	—
Haiwee		1·4	163	i 0 28	+ 1	i 0 48	+ 2	—	—	—
Lick		2·5	266	i 0 41	− 2	—	—	i 0 45	P*	—
Branner		2·9	268	i 0 46	− 2	e 1 19	− 5	—	—	—
Berkeley		3·0	277	e 0 48	− 2	e 1 29	+ 2	—	—	—
Santa Barbara		3·2	198	i 0 53	+ 1	i 1 33	+ 1	—	—	—
Mount Wilson		3·3	174	i 0 54	+ 1	i 1 44	S*	—	—	—
Pasadena		3·4	175	i 0 55	0	i 1 44	S*	—	—	—
Riverside		3·6	165	i 0 58	0	i 1 54	S*	—	—	—
Palomar	Z.	4·4	162	i 1 9	− 1	—	—	—	—	—
Tucson		8·2	128	e 2 8	+ 5	e 4 27	S$_g$	e 2 39	P$_g$	e 4·7
Columbia		30·5	85	e 6 14	− 3	—	—	—	—	—

Tucson also gives eS$_g$ = +4m.42s.

Feb. 24d. 12h. 0m. 5s. Epicentre 2°·6S. 141°·8E.

Felt in New Guinea.

Epicentre 2°·5S. 141°·5E. (U.S.C.G.S.).
3°·0S. 141°·5E. (Pasadena).
3°·0S. 141°·0E. (Batavia).

See Annales de l'Institut de Physique du Globe de Strasbourg, Tome V, 2e partie, Seismologie (1940). Strasbourg, 1948, p. 6.

$A = -·7851$, $B = +·6178$, $C = -·0450$; $\delta = +8$; $h = +7$;
$D = +·618$, $E = +·786$; $G = +·035$, $H = -·028$, $K = -·999$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Palau		12·2	324	3 5	+ 7	5 9	− 7	—	—	—
Manila		26·8	310	e 5 47	+ 3	10 23	+ 4	i 12 8	SSS	13·0
Brisbane	E.	27·0	157	i 5 49a	+ 4	i 10 25	+ 3	—	—	—
Adelaide		32·3	185	e 5 37	−56	11 52	+ 6	7 45	PP	18·6
Riverview	N.	32·3	165	e 6 20	−13	e 11 45	− 1	—	—	e 16·6
Sydney		32·3	165	—	—	e 11 31	−15	—	—	e 16·7
Miyazaki		35·7	345	7 1	− 1	12 41	+ 2	—	—	—
Hong Kong		36·6	314	7 8k	− 2	12 48	− 5	8 26	PP	18·3
Koti		36·8	348	7 9	− 2	12 52	− 4	—	—	—
Kobe		37·6	352	7 17	− 1	13 5	− 3	—	—	—
Gihu		38·1	354	7 20	− 2	13 9	− 7	—	—	—
Perth		38·1	216	7 18	− 4	13 18	+ 2	8 37	PP	19·1
Tokyo Cen. Met. Ob.		38·1	357	7 27	+ 5	13 7	− 9	—	—	—
Hamada		38·4	347	7 31	+ 6	11 51	?	—	—	—
Zi-ka-wei	Z.	38·8	332	e 7 19	− 9	13 13	−13	i 16 33	SS	19·1
Mizusawa		41·5	359	7 48	− 2	13 40	−27	—	—	—
Phu-Lien		41·6	305	e 7 51	0	14 0	− 8	—	—	—
Arapuni		47·0	143	—	—	15 31	+ 5	—	—	20·7
Wellington		48·6	146	8 45	− 2	15 48	− 1	i 11 45	PPP	22·1
Christchurch		49·1	150	8 53a	+ 2	15 59	+ 3	19 15	SS	23·9
Calcutta	N.	57·8	298	e 10 21	+26	i 18 31	+37	i 20 12	S_cS	e 28·7
Colombo	E.	62·5	278	10 28	0	—	—	—	—	—
Irkutsk		63·2	335	e 10 25	− 7	18 53	−10	—	—	26·9
Kodaikanal	E.	65·3	282	i 10 46	0	i 19 29	0	19 37	PS	31·4
Hyderabad		65·5	290	e 10 52	+ 5	19 33	+ 1	20 35	S_cS	32·2
Agra	E.	68·1	300	i 11 1	− 3	i 19 59	− 4	11 27	pP	33·0
Bombay		71·0	291	i 11 21	− 1	i 20 37	0	e 14 3	PP	37·1
Almata		73·8	317	e 11 40	+ 2	e 21 48	PS	—	—	—
Frunse		75·3	315	11 53	+ 6	21 35	+ 9	—	—	—
Andijan		76·3	312	11 51	− 1	21 36	− 1	—	—	—
Tashkent		78·7	313	i 11 57	− 9	i 21 52	−11	—	—	e 33·2
Tchimkent		78·7	314	12 9	+ 3	22 11	+ 8	—	—	—
Sverdlovsk		87·3	327	i 12 51	+ 1	23 13	[− 3]	i 24 33	PS	35·9
Baku		93·1	310	e 13 25	+ 8	23 56	[+ 6]	17 39	PP	45·9
Tananarive		93·2	251	—	—	e 25 42	PS	30 37	SS	48·4
Victoria	E.	95·1	41	e 20 55?	PPP	e 29 55?	?	—	—	44·9
Grozny		96·2	313	13 33	+ 2	—	—	—	—	—
Moscow		99·4	326	e 13 50	+ 4	24 25	[+ 1]	17 59	PP	48·9
Tinemaha		99·5	53	e 13 47	+ 1	—	—	—	—	—
Haiwee		99·8	54	e 13 48	+ 1	—	—	—	—	—
Mount Wilson		99·8	56	i 13 47	0	—	—	e 17 13	PP	—
Pasadena		99·8	56	i 13 48	+ 1	—	—	—	—	e 40·9
Riverside	Z.	100·4	56	i 13 51	+ 1	—	—	—	—	—
Palomar	Z.	100·9	56	i 13 53	+ 1	—	—	e 17 29	PP	—
Pulkovo		102·9	331	—	—	e 25 18	−27	e 27 37	PS	46·6
Bozeman		103·7	43	—	—	e 24 44	[− 1]	e 27 31	PS	e 45·2
Salt Lake City		104·1	48	—	—	e 33 10	SS	e 37 21	SSS	e 51·9
Ksara		104·7	303	e 14 10	+ 1	e 27 5	PS	e 18 9	PP	—
Tucson		106·1	57	e 14 16	P	24 57	[+ 2]	18 43	PP	e 45·4
Istanbul		108·7	313	19 0	PP	—	—	—	—	—

Continued on next page.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Upsala	108·8	334	—	—	e 28 19	PS	e 39 55?	?	e 53·9
Helwan	109·0	301	e 18 34	PKP	e 25 7	[− 1]	e 19 19	PP	—
Bucharest	110·0	317	e 19 15	PP	e 26 52	{+47}	e 21 10	PPP	64·9
Sofia	112·4	315	e 19 21	PP	e 29 1	PS	—	—	—
Bergen	113·5	339	—	—	e 43 55	?	—	—	e 63·9
Potsdam	114·8	329	e 19 19	PP	e 29 12	PS	e 29 23	PPS	e 53·9
Triest	117·7	322	e 25 50	SKS	(e 25 50)	[− 9]	(e 29 16)	PS	e 56·1
De Bilt	118·9	331	—	—	e 29 55	PS	—	—	e 58·9
Uccle	120·1	331	e 18 57	[+ 4]	—	—	—	—	e 57·9
Rome	120·2	317	e 18 54	[+ 1]	i 25 49	[−15]	i 21 4	SKP	54·0
St. Louis E.	120·6	45	—	—	e 37 2	SSP	e 41 23	SSS	e 65·0
Chicago U.S.C.G.S.	121·0	41	—	—	e 36 41	SS	—	—	e 50·4
Stonyhurst	121·1	336	—	—	e 41 55?	SSS	—	—	e 68·9
Bidston	121·7	336	—	—	e 30 32	PS	e 40 39	?	e 59·9
Kew	121·9	333	—	—	e 30 27	PS	e 41 3	SSS	e 65·9
Paris	122·3	329	—	—	e 30 39	PS	—	—	66·9
Ottawa	126·2	32	i 19 5	[0]	—	—	—	—	63·9
Columbia	129·3	46	e 22 16	?	—	—	e 22 37	PKS	e 63·9
Williamstown	129·3	31	i 19 13	[+ 2]	—	—	i 22 33	PKS	—
East Machias	130·8	26	e 21 25	PP	e 26 23	[+ 2]	e 22 55	PKS	e 54·4
Toledo	131·7	324	i 19 17	[+ 2]	—	—	e 21 41	PP	64·9
Granada	133·1	322	i 19 22s	[+ 4]	e 25 17	[−71]	i 22 50	PKS	73·0
Huancayo	140·3	112	e 16 35	P	e 26 27	[−13]	e 22 35	PP	e 56·5
La Paz	144·9	124	i 19 42s	[+ 3]	30 15	{+26}	i 20 57	pPKP	70·9
San Juan	148·5	57	e 19 46	[+ 1]	e 33 24	SKSP	e 24 3	PP	e 78·4
Rio de Janeiro	154·2	169	e 20 17	[+23]	—	—	—	—	—

Additional readings :—
Adelaide P_cP = +8m.49s., SS = +13m.45s., S_cS = +16m.22s.
Riverview eE = +6m.38s., iE = +11m.50s.
Hong Kong P_cP = +9m.37s., SS = +15m.12s., SSS = +16m.39s.
Perth P = +7m.31s., PPP = +9m.13s., i = +9m.48s., PS = +13m.33s., SS = +16m.0s., SSS = +16m.28s., i = +16m.47s. and +17m.40s.
Mizusawa SN = +13m.44s.
Christchurch i = +8m.57s., L_q = +20m.53s.
Calcutta eSSN = +22m.20s.
Kodaikanal SSE = +23m.45s.
Hyderabad SSN = +23m.52s.
Agra PPE = +13m.29s., sS?E = +20m.53s., iE = +23m.46s. and +24m.44s., SSSE = +27m.13s.
Bombay eE = +15m.13s., iE = +21m.18s.
Sverdlovsk SS = +29m.25s.
Baku SS = +30m.55s.
Moscow PPP = +20m.31s., PS = +26m.49s.
Pulkovo SS = +34m.37s.
Bozeman eS = +25m.56s., eSS = +33m.34s., eSSS = +36m.56s.
Ksara PPS = +27m.45s., PKP,PKP = +39m.0s.
Tucson ePPP = +21m.1s., eS = +26m.21s. and +26m.33s., ePPS = +28m.43s., eSS = +34m.10s., ePSPS = +34m.37s.
Helwan eE = +26m.1s.
Bucharest eEN = +28m.25s.
Potsdam eN = +29m.20s.
Triest e = +35m.30s., eSKS = +36m.12s., eSKKS = +36m.44s., eS = +36m.48s. PS = +37m.23s., PPS = +38m.3s., e = +38m.40s., eSS = +43m.7s., eSSS = +46m.45s.
Rome eZ = +18m.25s., 1 = +24m.2s., PS = +30m.4s., iPPS? = +31m.34s., eSS = +36m.25s., iN = +41m.40s.
Kew eL_qEN = +60·9m.
East Machias eSKSP = +31m.35s., eSS = +38m.54s., eSSS = +43m.47s.
Granada SKKS = +29m.3s., iS = +31m.47s., SKSP = +33m.18s., PPS = +36m.4s., SS = +43m.25s.
Huancayo ePKP = +19m.20s., ePKS = +23m.13s., iPKS = +23m.18s., eSKKS = +28m.39s., ePPS = +34m.26s., eSS = +41m.40s., eSSS = +45m.2s.
La Paz sPKP? = +21m.37s., iPPZ = +23m.1s., PSKS = +34m.33s., SSZ = +43m.55s.
San Juan ePPS = +36m.38s., PPPS = +38m.48s., eSSS = +48m.38s.
Long waves were also recorded at Toronto, Jena, Stuttgart, Warsaw, Hamburg, Ukiah, Prague, Honolulu, College, Bermuda, Santa Clara, La Plata, Harvard, and Jersey.

Feb. 24d. 18h. Local Japanese shock. Tokyo Imperial University gives Epicentre 35°·30N. 140°·11E.

Komaba P = 50m.45s., S = 50m.50s.
Kiyosumi P = 50m.46s., S = 50m.53s.
Koyama P = 50m.46s., S = 50m.57s.
Mitaka P = 50m.46s., S = 50m.56s.
Titibu P = 50m.46s., S = 50m.59s.
Togane P = 50m.46s., S = 50m.55s.
Tokyo Imp. Univ. P = 50m.46s., S = 50m.56s.
Tukubasan P = 50m.46s., S = 50m.58s.
Yosiwara P = 50m.46s., S = 51m.0s.
Susaki P = 50m.53s., S = 51m.6s.
Mizusawa ePE = 51m.39s., SE = 52m.22s.

Feb. 24d. Readings also at 3h. (near Apia and Christchurch), 7h. (Tucson), 9h. (near Fresno), 11h. (Pasadena, Haiwee, Ottawa, Salt Lake City, Santa Barbara, Tucson, Palomar, Riverside, Mount Wilson, and Tinemaha), 13h. (Palomar, Riverside, Mount Wilson, Tinemaha, and Tucson), 16h. (La Paz and Tucson), 18h. (Helwan), 20h. (Agra), 22h. (Tucson), 23h. (Tucson).

Feb. 25d. Readings at 1h. (near Tchimkent, Andijan and Sofia), 3h. (Palomar, Haiwee, Riverside, Tinemaha, Williamstown, and Tucson (2)), 4h. (near Mizusawa), 5h. (Tucson), 6h. (near Mizusawa), 8h. (Tucson, Williamstown, Tinemaha, Riverside, Huancayo, San Juan, and Mount Wilson), 11h. (La Paz), 12h. (near Almata and Frunse), 14h. (Sofia).

Feb. 26d. Readings at 1h. (near Frunse, Tchimkent, Andijan, and Huancayo), 2h. (East Machias), 5h. (Tinemaha, Toledo, and Tucson), 6h. (Lincoln, Columbia, near Wellington, Christchurch, Tuai, and Hastings), 8h. (Helwan and Ksara (2)), 11h. (near Mizusawa, Osaka, and Tucson), 16h. (near La Paz), 17h. (Williamstown, Ksara, Frunse, Tchimkent, Andijan, Agra, Colombo, Triest, Tashkent, and Samarkand), 19h. (San Juan and near Ottawa), 20h. (Ksara), 22h. (Tucson), 23h. (Perth, Agra, Bombay, Calcutta, Hyderabad, Ksara, and Colombo).

Feb. 27d. 12h. 12m. 40s. Epicentre 8°·3N. 60°·8W.

$A = +\cdot4828$, $B = -\cdot8639$, $C = +\cdot1434$; $\delta = -2$; $h = +7$;
$D = -\cdot873$, $E = -\cdot488$; $G = +\cdot070$, $H = -\cdot125$, $K = -\cdot990$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Fort de France		6·4	357	1 37	− 1	2 46	− 7	1 50	P*	—
San Juan		11·3	333	e 3 23	+37	e 5 9	SS	—	—	e 9·1
Huancayo		24·8	215	e 5 24	− 1	9 50	+ 4	—	—	i 11·3
La Paz		25·7	195	i 5 36k	+ 3	i 10 12	+11	—	—	13·2
Williamstown		36·0	345	i 7 4	− 1	—	—	—	—	—
La Plata		43·1	176	18 56	SSS	—	—	—	—	22·4
Tucson		52·1	305	i 9 13	− 1	—	—	e 10 13	PcP	—
Palomar	z.	57·2	305	i 9 51	0	—	—	—	—	—
Riverside		57·8	305	i 9 55	0	—	—	—	—	—
Mount Wilson		58·4	305	i 10 0	0	—	—	—	—	—
Pasadena		58·5	305	i 9 59	− 1	—	—	—	—	—
Haiwee	z.	58·8	308	i 10 2	0	—	—	—	—	—
Tinemaha		59·2	308	i 10 6	+ 1	—	—	—	—	—
Santa Barbara	z.	59·8	305	i 10 9	0	—	—	—	—	—
Strasbourg		69·7	41	—	—	e 21 54	PPS	—	—	—

Feb. 27d. 19h. Undetermined shock. Epicentre Caroline Islands.
Osaka P = 14m.33s., S = 17m.53s.
Manila eP = 15m.23s., S = 19m.20s., iE = 20m.40s., iN = 20m.54s., LEN = 21·7m.
Koti P = 15m.49s., S = 19m.15s.
Mito P = 16m.11s., S = 20m.18s.
Calcutta eN = 20m.11s. and 27m.39s.
Andijan P = 21m.46s.
Sverdlovsk P = 22m.27s., S = 32m.7s., L = 43·0m.
Mount Wilson ePZ = 23m.50s., iZ = 26m.3s.
Pasadena ePZ = 23m.53s., iZ = 26m.1s.
Tinemaha iZ = 26m.0s.
Riverside iZ = 26m.4s.
Tucson eP = 26m.29s.
Long waves were also recorded at Irkutsk and Baku.

Feb. 27d. Readings also at 0h. (Ksara, Tinemaha, Riverside, and Tucson), 3h. (near Ravensburg and Stuttgart), 4h. (Agra, Bombay, Calcutta, and Bozeman), 5h. (Tucson, Huancayo, and Bozeman), 8h. (near Tananarive), 9h. (Tucson), 11h. (near Mizusawa), 14h. (near Tananarive), 18h. (Tucson), 20h. (near Hukuoka), 22h. (Bozeman).

Feb. 28d. 17h. 28m. 7s. Epicentre 33°·1N. 116°·1W. (as given by Pasadena).

$A = -\cdot3693$, $B = -\cdot7538$, $C = +\cdot5435$; $\delta = -1$; $h = +1$;
$D = -\cdot898$, $E = +\cdot440$; $G = -\cdot239$, $H = -\cdot488$, $K = -\cdot839$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
La Jolla		1·0	256	i 0 20a	− 1	—	—	—	—	—
Riverside		1·4	277	i 0 25a	− 2	i 0 44	− 2	—	—	—
Mount Wilson		2·0	305	e 0 34	− 1	i 1 2	0	i 0 37	P*	—
Pasadena		2·0	301	e 0 36	+ 1	i 1 3	+ 1	—	—	—
Santa Barbara		3·2	294	i 0 59	P*	i 1 45	S_g	—	—	—
Haiwee		3·4	333	i 1 0	P*	i 1 49	S*	—	—	—
Tucson		4·5	100	i 1 8	− 3	e 2 8	+ 3	1 29	P_g	i 2·6

Tucson also gives S = +2m.17s.

Feb. 28d. Readings also at 1h. (near Bucharest and Triest), 2h. (Rome), 5h. (Tchimkent, Sofia, Andijan, near Berkeley (2), and Samarkand), 8h. (Tucson), 9h. (Jena and Huancayo), 10h. (near Balboa Heights and Huancayo), 12h. (Clermont-Ferrand) 13h. (Strasbourg, Uccle, Stuttgart, Tinemaha, Palomar, Haiwee, Santa Barbara, Basle, Pasadena, La Jolla, near Triest, Mount Wilson, Riverside, Tucson (2), and Manila), 17h. (near Andijan, Sverdlovsk, Tashkent, Almata, Frunse, La Paz, Mount Wilson, Riverside, Tucson (2), Tchimkent, and Huancayo), 18h. (Salt Lake City), 19h. (Manila), 20h. (Colombo and Tucson), 22h. (Tucson (2)).

Feb. 29d. 16h. 7m. 44s. Epicentre 35°·7N. 25°·9E. (as on 1940 Jan. 6d.).

$A = +\cdot7322$, $B = +\cdot3555$, $C = +\cdot5810$; $\delta = +6$; $h = 0$;
$D = +\cdot437$, $E = -\cdot900$; $G = +\cdot523$, $H = +\cdot254$, $K = -\cdot814$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Istanbul		5·9	24	1 44	P*	3 4	S*	e 2 0	P_g	—
Sofia		7·3	345	i 1 59	+ 9	i 3 41	S*	—	—	—
Helwan		7·4	140	i 1 39	−13	3 14	− 4	2 6	P*	—
Ksara		8·4	99	2 3	− 1	i 3 35	− 8	3 3	P_g	—
Bucharest		8·7	2	i 2 22a	+12	4 40	S_g	—	—	—
Yalta		10·8	33	3 22	PPP	—	—	—	—	—
Cluj		11·2	352	e 2 53a	PP	5 45	+53	3 5	PPP	7·3
Szeged	E.	11·4	340	4 50	S	(4 50)	− 6	—	—	8·3
Rome		12·1	305	i 2 54a	− 3	i 5 23	+ 9	i 3 0	PP	i 6·7
Budapest	E.	12·8	339	e 3 16	PP	e 5 35	+ 5	—	—	6·6
Sotchi		13·2	49	3 25	PP	6 20	SSS	—	—	—
Triest		13·5	321	e 3 18k	+ 3	6 9	SS	e 3 30	PP	e 7·1
Erevan		15·3	67	3 50	+11	—	—	—	—	—
Piatigorsk		15·6	52	3 46	+ 3	—	—	—	—	—
Chur		16·5	318	e 3 55	+ 1	e 7 14	SS	—	—	—
Prague		16·6	334	3 58	+ 2	e 7 15	SS	—	—	e 8·3
Warsaw		16·9	351	i 4 4a	+ 5	7 7	0	7 34	SS	7·7
Grozny		17·1	58	3 40	−22	6 46	−26	i 3 55	PP	—
Zurich		17·4	318	e 4 7a	+ 1	e 7 28	+ 9	—	—	—
Marseilles		17·5	302	e 4 36	PPP	e 7 32	SS	—	—	—
Stuttgart		17·9	323	e 4 12	0	i 7 48	SS	i 4 26	PP	e 10·3
Basle		18·0	319	e 4 14	+ 1	e 7 46	SS	e 4 30	PP	—
Neuchatel		18·1	316	e 4 14	0	e 7 39	+ 4	—	—	—
Jena		18·4	332	i 4 16	− 2	i 7 52	SS	i 4 28	PP	e 10·5
Algiers		18·5	278	i 4 14	− 5	i 7 35	− 9	i 4 33	PP	9·3

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Strasbourg		18·6	321	i 4 20	− 1	7 51	+ 5	i 4 36	PP	10·3
Besançon		18·8	314	i 4 23	0	e 7 56	+ 6	i 4 37	PP	10·8
Potsdam		19·0	336	i 4 26a	0	i 8 4	+ 9	i 4 42	PP	i 9·6
Baku		19·4	68	i 4 36	+ 6	—	—	i 5 15	PP	12·0
Clermont-Ferrand		19·9	307	e 4 32	− 4	—	—	—	—	—
Hamburg		21·1	334	i 4 49a	+ 1	i 8 47	+ 8	—	—	e 13·1
Moscow		21·6	18	4 58	+ 4	8 58	+ 9	i 5 17	PP	—
Paris		21·6	315	i 4 53	− 1	i 8 57	+ 8	—	—	—
Uccle		21·6	321	i 4 55a	+ 1	i 8 55	+ 6	i 5 12	PP	11·3
Copenhagen		22·0	341	i 4 59a	+ 1	i 9 6	+10	i 5 13	PP	—
De Bilt		22·0	326	i 5 0a	+ 2	i 9 5	+ 9	—	—	e 11·3
Heligoland		22·3	333	i 5 0a	− 1	i 9 6	+ 4	—	—	e 12·6
Almeria		22·9	281	5 2	− 4	9 25	+12	5 30	PP	11·8
Granada		23·7	283	i 5 11k	− 3	i 9 18	− 9	5 45	PP	i 12·1
Toledo		24·0	290	i 5 13a	− 4	i 9 26	− 6	i 5 41	PP	—
Pulkovo		24·3	6	i 5 24	+ 4	i 9 42	+ 5	i 5 42	PP	11·7
Jersey		24·5	314	i 5 19	− 3	i 9 45	+ 5	i 5 40	PP	—
Kew		24·5	314	i 5 21a	− 1	i 9 43	+ 3	i 5 41	PP	e 12·8
Upsala		24·8	350	e 5 20	− 5	e 9 48	+ 2	—	—	i 13·3
San Fernando		25·9	281	—	—	i 9 53	−11	—	—	—
Stonyhurst		26·8	322	i 5 38	− 6	i 10 19	0	—	—	15·5
Bidston		26·9	320	i 5 54	+ 9	i 10 17	− 3	i 6 31	PP	e 13·9
Lisbon		28·0	288	e 5 52	− 3	10 33	− 5	—	—	15·3
Bergen		28·0	340	5 59	+ 4	e 10 34	− 4	i 6 57	PP	14·8
Edinburgh		28·3	324	5 53	− 4	10 27	−16	6 40	PP	—
Sverdlovsk		31·5	37	6 29	+ 3	11 44	+10	i 6 36	PP	i 15·4
Samarkand		32·6	70	6 34	− 1	—	—	—	—	—
Tashkent		34·1	66	i 6 52	+ 4	i 12 19	+ 5	i 7 12	PP	i 16·2
Tchimkent		34·3	64	6 50	0	—	—	—	—	—
Andijan		36·5	68	7 14	+ 5	i 13 14	SS	—	—	e 16·6
Frunse		37·9	64	7 34	+14	—	—	—	—	—
Almata		39·6	62	7 36	+ 1	i 14 1	+23	—	—	17·7
Semipalatinsk		41·4	51	7 56	+ 6	i 14 30	SS	—	—	—
Scoresby Sund		43·1	338	e 8 4	0	14 35	+ 5	e 9 33	P_cP	e 18·0
Bombay		44·5	99	i 8 12	− 3	i 14 49	− 2	e 9 14	PP	i 24·1
Agra	E.	44·8	85	i 8 14a	− 3	i 14 51	− 4	10 32	PPP	—
Hyderabad		49·8	97	8 55	− 1	15 59	− 7	18 39	S_cS	24·9
Kodaikanal	E.	53·1	104	i 9 31a	+10	i 16 47	− 4	11 24	PP	—
Calcutta	N.	55·3	86	e 9 36	− 2	i 17 7	−14	e 11 29	P_cP	e 26·1
Irkutsk		56·0	46	9 42	− 1	e 17 29	− 1	—	—	30·3
Phu-Lien		70·9	77	e 11 19	− 2	e 20 33	− 3	—	—	—
Harvard	Z.	71·7	309	i 11 23	− 3	—	—	—	—	—
Bermuda		72·5	296	—	—	20 46	− 8	21 51	S_cS	e 34·7
Ottawa		72·7	313	i 11 29	− 3	e 20 58	+ 1	—	—	35·3
Williamstown		72·7	309	i 11 30	− 2	—	—	—	—	—
Fordham		74·1	308	i 11 38k	− 2	i 21 10	− 2	—	—	—
Hong Kong		76·0	72	21 33	S	(21 33)	− 1	26 28	SS	—
Pennsylvania		76·4	310	e 11 53	0	—	—	—	—	—
College		79·6	357	e 12 26	+16	e 22 15	+ 3	—	—	e 37·8
San Juan		81·1	286	e 13 3	+45	22 15	−13	—	—	—
Koti		83·5	53	12 31	0	22 48	− 4	—	—	—
Kobe		83·8	51	12 44	+12	22 55	0	—	—	—
Nagano		84·4	48	12 38	+ 2	—	—	—	—	—
Mizusawa		84·5	44	12 36	0	22 54	− 8	—	—	—
Sendai		85·0	45	12 36	− 2	22 39	[−22]	—	—	—
Florissant		85·3	315	e 12 39	− 1	e 22 56	[− 7]	e 23 29	S_eS	41·8
St. Louis		85·4	315	i 12 39	− 1	i 22 58	[− 5]	i 23 27	S_eS	—
Manila		85·7	75	12 41	− 1	i 23 13	− 1	i 23 39	S_eS	—
Cape Girardeau	E.	85·9	312	e 11 51	−52	e 22 11	−65	—	—	—
Bozeman		90·2	331	e 13 20	+16	e 24 26	+30	—	—	e 37·2

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Victoria		91·8	339	—	—	e 23 34	[− 9]	—	—	41·3
Tucson		101·2	324	e 13 52	− 2	e 24 46	[+13]	e 17 49	PP	e 40·0
La Paz	z.	102·6	258	e 16 56	?	—	—	—	—	61·3
Mount Wilson	z.	102·7	329	e 17 58	PKP	—	—	i 18 13	PP	—
Pasadena		102·8	329	e 18 10	PP	—	—	—	—	e 53·3
Huancayo		106·0	266	e 18 27	PP	e 24 46	[− 9]	e 33 38	SS	e 40·7
Adelaide		126·1	110	15 33	P	—	—	—	—	—

Additional readings :—
Istanbul S_g = +4m.7s.
Helwan P*Z = +1m.53s., SEN = +2m.50s., S_gEN = +3m.25s.
Bucharest iPE = +2m.25s., iE = +3m.14s., S*N = +5m.30s., S_gN = +6m.23s.
Rome iN = +5m.39s., +6m.9s., and +6m.44s.
Budapest e = +3m.21s., i = +5m.5s.
Triest i = +3m.22s., PPP = +3m.33s., SS = +6m.36s.
Marseilles i = +4m.48s., +4m.54s., +5m.21s., and +5m.34s.
Stuttgart iP = +4m.15s., iSN = +7m.56s., iSSE = +8m.48s., iN = +9m.51s.
Basle e = +9m.29s.
Jena iPN = +4m.20s., i = +8m.16s.
Algiers PPP = +4m.37s., SS = +8m.16s.
Strasbourg i = +5m.46s.
Besançon iPPP = +4m.55s., i = +8m.7s.
Potsdam i = +5m.15s., iE = +5m.41s., iZ = +5m.48s., iSNW = +8m.15s., iZ = +8m.22s.
Uccle i = +9m.16s.
Almeria i = +5m.23s., PPP = +5m.52s., P_cP = +8m.27s.
Granada PP = +5m.57s., P_cP = +8m.49s., pP_cP = +9m.38s., sS = +10m.25s.
Toledo i = +5m.29s., iPPP = +5m.52s., i = +6m.1s. and +10m.8s.
Jersey i = +5m.34s., +9m.54s., +10m.2s., and +10m.9s.
Kew iNZ = +5m.33s., iE = +9m.51s. and +9m.59s., iZ = +10m.7s. and +10m.25s., iE = +10m.31s., iZ = +10m.35s., iE = +10m.46s., iN = +10m.57s.
Upsala iPN = +5m.26s., iSN = +9m.56s., iE = +10m.6s.
Bidston i = +6m.6s. and +11m.22s.
Lisbon ePN = +5m.58s., iZ = +6m.1s.
Bergen e = +6m.12s., S = +11m.10s.
Edinburgh SS = +11m.43s., P_cS = +12m.53s., S_cS = +16m.40s.
Scoresby Sund iP = +8m.25s., PP = +10m.5s., PPP = +10m.35s., S = +14m.50s.
Bombay i = +15m.12s., +18m.6s., +18m.23s., and +18m.49s., iL_q = +19m.4s.
Agra iE = +15m.9s., SSE = +18m.4s., S_cSE = +18m.20s.
Hyderabad SSN = +19m.53s.
Calcutta iS_cSN = +19m.16s., eSSN = +20m.39s.
Bermuda S = +20m.56s.
Ottawa eN = +12m.16s.?
Williamstown i = +11m.48s.
Fordham iZ = +11m.49s.
Hong Kong ? = +21m.55s. and +26m.53s.
Pennsylvania i = +12m.9s.
Florissant eZ = +12m.52s., eE = +12m.56s., +22m.59s., and +23m.5s., eSN = +23m.9s., eE = +23m.21s.
St. Louis iSN = +23m.7s., iN = +23m.12s.
Bozeman eP = +13m.47s.
Tucson eS = +25m.47s.
Huancayo ePKKP = +29m.56s.
Long waves were also recorded at Cape Town and Wellington.

Feb. 29d. Readings also at 1h. (Bozeman and Agra), 2h. (Tucson), 3h. (Tucson (3)), 5h. (Tucson), 7h. (Tucson (3) and Fordham), 8h. (near Tananarive), 12h. (Tucson, Palomar, Riverside, Tinemaha, Pasadena, Mount Wilson, and near Mizusawa), 13h. (Tucson), 15h. (Tucson), 16h. (Tucson (3), Christchurch), 19h. (Salt Lake City), 20h. (Triest and Salt Lake City), 22h. (Tucson), 23h. (Williamstown and Fordham).

March 1d. 7h. 58m. 43s. Epicentre 35°·4N. 138°·3E. (as on 1938 April 15d.).

$A = -·6100$, $B = +·5435$, $C = +·5767$; $\delta = +·8$; $h = 0$;
$D = +·665$, $E = +·747$; $G = -·431$, $H = +·384$, $K = -·817$.

		△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	Supp. m. s.		L. m.
Yosiwara		0·4	127	0 22	+ 9	0 29	+ 8			
Titibu		0·8	47	0 22	+ 4	0 30	− 1			
Susaki		0·9	143	0 21	+ 1	0 33	− 1			
Kamakura		1·0	95	0 22	+ 1	0 33	− 3			
Komaba		1·2	77	0 22	− 2	0 35	− 6			
Tokyo Imp. Univ.		1·2	75	0 24	0	0 37	− 4			
Kiyosumi		1·6	99	0 22	− 8	0 36	−15			
Tukubasan		1·7	61	0 22	− 9	0 41	−13			
Osaka		2·1	248	0 50	P_g	1 22	S_g			
Mizusawa		4·4	30	e 1 11	+ 1	2 1	− 1			

March 1d. Readings also at 0h. (Tucson), 1h. (Kodaikanal), 7h. (Tucson), 9h. (La Paz, Berkeley, near Branner, and Lick), 10h. (Manila, Mount Wilson, Riverside, Tinemaha, and Tucson), 11h. (Colombo, Perth, near Rome, and Triest (2)), 12h. (Jersey), 15h. (Granada), 17h. (Tucson), 19h. (Tucson, Andijan, Tchimkent, near Hukuoka, and near Tananarive), 21h. (Tucson, Phu-Lien, Zi-ka-wei, and near Hong Kong).

March 2d. Readings at 1h. (Tucson (2)), 4h. (near Fordham and Williamstown), 6h. (Manila and near Calcutta), 7h. (Tucson), 11h. (La Paz and Tucson), 13h. (Tucson, near Fresno (2), near Berkeley (2), Branner (2), Lick (2), Santa Clara (2), and San Francisco (2)), 14h. (near Harvard), 15h. (Ksara, near Erevan, Grozny, and Sotchi), 18h. (Chicago U.S.C.G.S. and Tucson), 23h. (Perth, Tucson, Fresno, near Berkeley, Branner, and Lick).

March 3d. 0h. 5m. 37s. Epicentre 18°·0S. 167°·7E.

$A = -·9299$, $B = +·2027$, $C = -·3071$; $\delta = +11$; $h = +5$;
$D = +·213$, $E = +·977$; $G = +·300$, $H = -·065$, $K = -·952$.

		△ °	Az. °	P. m. s.	O−C. s.	S. m. s.	O−C. s.	Supp. m. s.		L. m.
Brisbane	N.	16·5	232	i 3 53	− 1	i 6 59	+ 1	i 4 35	PPP	—
Arapuni		21·2	164	—	—	8 53	+12	—	—	—
Riverview		21·6	219	e 4 53	− 1	i 8 54	+ 5	5 16	PP	e 10·6
Sydney		21·6	219	e 4 53	− 1	i 8 56	+ 7	—	—	e 10·9
Wellington		24·0	167	5 18	+ 1	9 53	+21	6 23	PPP	12·4
Adelaide		30·9	230	e 6 15	− 5	e 10 13	−71	9 28	P_cP	14·5
Honolulu		51·6	43	e 9 9	− 1	17 15	+44	e 10 1	P_cP	21·2
Manila		55·3	302	e 9 44	+ 6	i 17 36	+15	—	—	—
Tokyo Cen. Met. Ob.		59·6	334	10 4	− 4	18 8	− 9	—	—	—
Nagoya		60·4	332	10 13	0	—	—	—	—	—
Kobe		60·8	330	10 14	− 2	18 28	− 5	—	—	—
Nagano		61·1	334	10 16	− 2	—	—	—	—	—
Mizusawa		62·0	337	e 10 8	−16	10 42	?	—	—	—
Hong Kong		65·9	305	10 43	− 7	19 45	+ 8	11 0	P_cP	—
Ukiah		85·9	47	e 12 48	+ 5	e 23 10	[+ 3]	e 17 53	PPP	e 34·7
Berkeley		86·0	48	e 12 49	+ 6	e 23 13	− 4	—	—	40·7
Santa Barbara	Z.	86·4	53	i 12 50	+ 5	—	—	—	—	—
Calcutta	N.	87·4	294	e 12 56	+ 6	i 23 48	+18	i 24 44	PS	—
Pasadena		87·5	53	e 12 50	− 1	e 23 8	[− 9]	e 16 33	PP	e 40·1
La Jolla	Z.	87·7	54	e 12 55	+ 3	—	—	—	—	—
Riverside		88·0	53	i 12 51	− 2	—	—	—	—	—
Palomar	Z.	88·1	54	i 12 50	− 4	—	—	—	—	—
Haiwee		88·4	51	i 12 57	+ 2	—	—	—	—	—
Tinemaha		88·6	50	e 12 55	− 1	—	—	i 16 29	PP	—
Irkutsk		88·9	326	e 12 59	+ 1	e 23 25	[− 1]	e 16 13	PP	45·4

Continued on next page.

		△	Az.W	P.	O−C.	'S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
College		89·3	17	—	—	e 23 38	[+ 9]	e 33 52	SSS	e 37·6
Victoria		90·1	38	—	—	i 23 35	[+ 2]	e 43 53	L_q	51·4
Colombo	E.	90·1	277	13 3	0	23 45	−10	—	—	—
Tucson		92·5	56	e 13 13	− 1	e 23 49	[+ 2]	e 16 53	PP	e 38·6
Kodaikanal	E.	93·3	279	i 13 19?a	+ 1	i 23 56	[+ 4]	—	—	44·6
Hyderabad		94·6	286	13 25	+ 1	24 4	[+ 5]	29 45	SS	43·2
Salt Lake City		94·6	48	e 13 14	−10	e 24 2	[+ 3]	e 16 38	PP	e 40·4
Butte		95·9	43	—	—	e 24 52	+ 6	—	—	e 39·8
Bozeman		96·8	44	e 13 45	+11	e 24 17	[+ 6]	e 17 33	PP	e 38·0
Agra	E.	97·7	296	13 47	+ 9	24 12	[− 3]	e 17 17	PP	—
Bombay		100·1	286	i 13 51	+ 2	i 24 36	[+ 9]	i 26 55	PS	35·7
Andijan		105·5	308	e 18 17	PKP	24 57	[+ 4]	21 42	PKS	—
Tchimkent		107·8	309	18 27	PKP	25 1	[− 2]	18 49	PP	—
Tashkent		107·9	308	e 18 47	PP	25 3	[0]	e 28 13	PS	44·4
Florissant		110·2	54	—	—	i 26 12	{+ 6}	e 28 38	PS	52·6
St. Louis		110·3	54	—	—	e 26 12	{+ 5}	e 28 39	PS	e 51·4
Huancayo		111·0	110	e 19 18	PP	e 25 24	[+ 8]	i 28 54	PS	e 45·0
Chicago (U.S.C.G.S.)		112·6	51	—	—	e 28 57	PS	e 35 7	SS	e 46·5
Sverdlovsk		114·2	325	e 19 39	PP	25 42	[+13]	i 29 12	PS	46·4
Ottawa		121·2	46	i 18 52	[− 3]	e 25 53	[− 1]	e 30 23?	PS	52·4
Baku		122·5	307	20 22	PP	26 19	[+21]	30 25	PS	57·4
Williamstown		123·3	50	e 18 58	[− 1]	—	—	i 20 41	PP	e 60·4
Scoresby Sund		127·1	5	e 22 30	PKS	e 38 17	SS	e 23 47	PPP	e 50·0
San Juan		129·0	80	e 16 1	P	—	—	i 22 39	PKS	e 61·1
Bermuda		130·8	62	e 22 38	PKS	e 39 22	SSP	e 33 38	PPS	e 62·6
Ksara		134·3	299	i 19 23k	[+ 3]	28 45	{− 2}	i 21 55	PP	69·4
Helwan		138·6	295	i 19 29a	[+ 1]	40 29	SS	22 17	PP	—
Potsdam		140·3	336	e 22 33	PP	—	—	—	—	e 69·9
De Bilt		143·3	342	i 19 35k	[+ 1]	—	—	—	—	e 68·4
Uccle		144·7	343	e 19 36k	[− 2]	e 41 55	SS	e 36 48	?	e 68·4
Triest		145·0	328	i 19 41	[+ 2]	—	—	e 23 17	PP	—
Kew		145·3	347	i 19 41	[+ 1]	—	—	—	—	e 74·4
Stuttgart		145·7	335	e 19 37	[− 3]	—	—	—	—	e 81·4
Zurich		146·0	335	e 19 37a	[− 4]	—	—	—	—	—
Chur		146·1	334	e 19 37	[− 4]	—	—	—	—	—
Strasbourg		146·4	337	19 23?	[−18]	—	—	—	—	—
Neuchatel		147·0	335	e 19 41	[− 2]	—	—	—	—	—
Paris		147·0	342	i 19 48	[+ 5]	—	—	—	—	75·4
Rome		148·2	323	i 19 47k	[+ 2]	e 26 39	[−12]	i 23 19	PP	e 66·5
Clermont-Ferrand		149·5	338	e 19 50	[+ 3]	—	—	—	—	—
Toledo		157·1	343	e 20 29	[+32]	—	—	—	—	84·1
Granada		159·4	340	20 37k	[+37]	27 32	[+28]	24 24	PP	89·9

Additional readings :—
Riverview iP = +5m.45s.a, PPPN = +5m.36s., iP_cPE = +9m.6s., SSN = +9m.21s.
Sydney i = +4m.59s.
Wellington iZ = +5m.27s. and +5m.38s., L_q = +11m.8s.
Adelaide iPN = +6m.23s., SS = +11m.29s., S_cS = +16m.39s.
Honolulu S_cS = +19m.10s., eSS = +19m.57s., SS = +20m.2s.
Hong Kong SS = +23m.53s.
Ukiah eS_cS = +23m.36s., ePPS = +24m.25s., eSS = +28m.43s., eSSS = +32m.33s.
Pasadena i = +12m.55s.
Palomar iZ = +12m.55s.
Irkutsk PPS = +24m.55s., eSS = +29m.5s.
College S = +23m.44s.
Tucson iP = +13m.19s., ePPP = +18m.46s., eS = +24m.5s., eS_cS = +24m.29s., ePS = +25m.10s., ePPS = +26m.1s., eSS = +30m.40s., eSSS = +34m.36s.
Kodaikanal i?E = +24m.11s.
Hyderabad iN = +24m.45s.
Salt Lake City ePPP = +19m.37s., iS = +24m.42s., ePS = +25m.54s., ePPS = +26m.37s., eSS = +30m.59s., eSSS = +35m.4s.
Bozeman S = +24m.58s., ePPS = +27m.0s., eSS = +31m.36s., eSSS = +35m.7s.
Agra i = +24m.27s. and +25m.8s.
Bombay i = +16m.51s. and +16m.58s., e = +23m.51s., iSKKS = +25m.15s., e = +32m.19s.
Tashkent S = +26m.40s., SS = +33m.59s.
Huancayo eS = +27m.3s., eSS = +34m.53s., SS = +35m.3s., PSPS = +35m.40s., eSSS = +38m.58s.

Continued on next page.

Chicago (U.S.C.G.S.) eSSS = +39m.54s.
Sverdlovsk S = +27m.23s.
Ottawa eE = +36m.53s., eN = +40m.11s.
Baku SKSP = +31m.22s.
Williamstown i = +22m.46s.
Scoresby Sund ePPS = +32m.43s.
San Juan ePPP = +24m.20s., ePPS = +32m.53s.
Ksara SKP = +22m.54s., SS = +40m.0s.
Helwan SKPE = +23m.5s., PSKSE = +32m.35s., PPSE = +34m.38s.
Uccle iP = +19m.39s.
Triest i = +19m.48s., +19m.56s., +20m.8s., and +23m.40s.
Kew iZ = +20m.13s. and +20m.36s.
Rome iZ = +19m.59s. and +21m.4s., iPP = +22m.50s., iSKPZ = +23m.15s., iE = +30m.20s., ePSKSN = +33m.43s., ePSKSZ = +33m.47s., ePPSZ? = +35m.17s., eN = +37m.2s., +37m.18s., and +38m.46s., eSSN = +42m.24s., eE = +43m.1s. and +46m.54s., eN = +52m.7s., eE = +53m.8s.
Toledo e = +20m.52s.
Granada SKKS = +31m.14s., PPS = +39m.6s., eSS = +45m.48s.
Long waves were also recorded at Warsaw, Pulkovo, Bidston, Stonyhurst, East Machias, Hamburg, Upsala, Jersey, San Fernando, Tananarive, and Harvard.

March 3d. Readings also at 0h. (Ksara), 1h. (near Tananarive), 2h. (Tucson (2)), 4h. (near Ferndale), 7h. (near Tananarive), 8h. (Chicago U.S.C.G.S., Calcutta, and Phu-Lien), 12h. (Calcutta (2), Phu-Lien (2), Agra (3), La Paz, Rome, Tucson, Almata, Andijan, Irkutsk, Wellington, Huancayo, Bombay, Kodaikanal, Hong Kong, Manila, Adelaide, Sydney, Riverview, and Brisbane), 13h. (Grozny, Piatigorsk, and Erevan), 14h. (Tucson and Ksara), 15h. (Ksara), 18h. (Rome and Tucson), 23h. (near Mizusawa).

March 4d. 19h. 59m. 6s. Epicentre 15°·2N. 45°·2W.

A = +·6803, B = −·6851, C = +·2606 ; δ = +8 ; h = +6 ;
D = −·710, E = −·704 ; G = +·184, H = −·185, K = −·966.

	△	Az.	P.	O−C.	S.	O−C.	Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m. s.	m.
San Juan	20·3	282	4 42	+ 2	i 8 26	+ 3	i 9 26 SSS	i 10·4
Bermuda	24·7	318	e 5 23	− 1	e 9 56	+12	e 8 37 PcP	e 15·5
East Machias	34·9	332	e 7 11	+16	e 12 30	+ 3	e 7 59 PP	e 14·9
Fordham	35·7	322	i 7 2	0	e 12 48	+ 9	e 15 40 SSS	—
Philadelphia	35·9	318	e 8 25	PP	e 13 0	+18	— —	e 16·3
Williamstown	36·5	325	e 7 4	− 5	.—	—	— —	e 16·9
Columbia	37·3	307	e 7 50	+34	e 13 3	− 1	— —	e 15·2
Rio de Janeiro N.	37·9	176	e 8 54	PP	—	—	— —	e 16·6
Seven Falls	38·3	332	e 8 54	PP	e 12 54	−25	— —	15·9
La Paz	38·8	216	i 7 28k	0	i 13 31	+ 5	i 8 57 PP	19·9
Ottawa	39·6	328	7 34	− 1	13 26	−12	— —	16·9
Huancayo	40·3	229	e 7 42	+ 2	e 13 44	− 5	i 9 17 PP	e 16·9
Granada	42·8	50	e 8 3a	+ 2	i 14 38	+12	e 18 15 SS	20·4
Toledo	43·5	47	e 8 4	− 3	14 34	− 2	— —	—
Almeria	43·6	52	e 8 6	− 2	14 35	− 3	8 32 pP	21·7
Chicago, U.S.C.G.S.	45·2	314	e 8 20	0	e 14 49	−12	e 9 35 PcP	e 18·4
St. Louis	45·9	309	e 8 22	− 4	i 15 13	+ 2	— —	e 20·8
Florissant	46·0	309	e 8 26	− 1	e 15 12	0	— —	20·9
Ivigtut	46·0	357	e 9 45	PcP	e 15 12	0	e 11 2 PPP	e 18·4
Clermont-Ferrand	50·5	42	e 9 1	− 1	—	—	— —	23·9
Kew	50·9	34	—	—	e 16 21	0	e 20 5 SS	e 21·9
Lincoln	51·2	311	e 9 23	+16	e 19 37	SS	e 10 8 PcP	e 23·6
La Plata	51·3	193	—	—	16 24	− 2	— —	28·9
Uccle	53·2	36	e 9 20	− 2	e 16 51	− 1	— —	e 23·9
De Bilt	54·2	35	—	—	e 17 14	+ 8	— —	e 24·9
Rome	56·0	50	i 10 39a	+56	i 18 33	+63	i 12 44 PPP	e 25·4
Triest	57·7	44	e 9 56	+ 1	e 17 56	+ 3	— —	—
Tucson	61·6	299	e 10 19	− 3	e 18 38	− 5	11 12 PcP	e 25·1
Bozeman	62·3	314	e 10 44	+18	e 19 12	+20	e 23 15 SS	e 25·2
Salt Lake City	62·6	309	e 10 34	+ 6	e 18 59	+ 3	e 13 11 PP	e 25·7

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Palomar	z.	66·6	300	i 10 53	− 1	—	—	—	—	—
La Jolla	z.	67·0	300	e 10 55	− 2	—	—	—	—	—
Riverside		67·0	301	i 10 54	− 3	—	—	—	—	—
Haiwee	z.	67·4	303	e 10 57	− 2	—	—	—	—	—
Mount Wilson		67·6	301	i 10 58	− 3	—	—	—	—	—
Pasadena		67·7	301	e 10 59	− 2	—	—	—	—	e 30·0
Santa Barbara	z.	68·9	301	e 11 6	− 3	—	—	—	—	—
Helwan		71·1	63	e 11 24	+ 2	20 39	+ 1	14 0	PP	—
Ukiah		71·4	306	e 11 23	− 1	e 20 55	+13	e 21 19	S_cS	e 33·1
Sverdlovsk		85·8	31	12 45	+ 3	23 10	− 5	—	—	36·9
Honolulu		104·6	297	—	—	e 27 16	PS	—	—	—

Additional readings :—
Bermuda iS = +10m.24s.
East Machias ePPP = +8m.39s.
Fordham iZ = +7m.8s.
Columbia eS = +13m.8s.
La Paz iPPP = +9m.20s., SSZ = +16m.1s.
Huancayo eP = +7m.57s., ePPP = +9m.59s., iS = +13m.51s. and +13m.59s.
Almeria sP = +8m.53s., PP = +9m.57s., PPP = +10m.23s., S_cS = +17m.54s.
Chicago, U.S.C.G.S., ePP = +10m.23s., S = +15m.8s.
St. Louis eE = +15m.6s., eN = +15m.10s.
Florissant iZ = +8m.39s., eZ = +14m.45s.
La Plata E = +24m.24s.
Rome iE = +10m.46s., ePZ = +14m.57s., eE = +18m.10s., eN = +18m.14s., iE = eZ = +18m.37s., eZ = +19m.15s., eN = +20m.15s. and +20m.25s., eSSE = +22m.16s.
Tucson eP = +10m.41s., ePP = +12m.35s., ePPP = +14m.4s., eS_cS = +20m.11s., eSS = +22m.42s.
Salt Lake City ePPP = +14m.27s., eS_cS = +20m.30s., eSS = +23m.12s.
Helwan PPPE = +15m.34s.
Honolulu PS = +27m.24s.
Long waves were also recorded at Scoresby Sund, Harvard, San Fernando, Bombay, Stonyhurst, Lisbon, Paris, Jersey, and Potsdam.

March 4d. Readings also at 3h. (Perth), 4h. (Colombo and near Branner), 5h. (Mizusawa and Perth), 6h. (Columbia), 10h. (La Paz), 12h. (La Paz, Tinemaha, Tucson (2), Riverside, Mount Wilson, and Pasadena), 15h. (Palomar, Riverside, Manila, Riverview, Mount Wilson, Tucson, and Tinemaha), 16h. (Tinemaha, Haiwee, Tucson (2), Riverside, Mount Wilson, Pasadena, and La Paz), 17h. (near Branner), 19h. (Tucson), 20h. (near Branner), 22h. (Ksara).

March 5d. 1h. 50m. 23s. Epicentre 36°·8N. 5°·3W.

Strongly felt at Algodonales, Olvera, and El Gastor; intensity III at Seville and Malaga.

Epicentre, province of Cadiz, north of Grazalena 36°·8N. 5°·3W.

Radius of Macroseismic area = 100km. See Bulletin Mensual del Observatorio de Cartuja, March, 1940.

A = +·7992, B = −·0741, C = +·5964 ; δ = −10 ; h = 0 ;
D = −·092, E = −·996 ; G = +·594, H = −·055, K = −·803.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
	°	°	m. s.	s.	m. s.	s.	m. s.	
San Fernando	0·8	245	i 0 14	− 4	i 0 32	+ 1	—	—
Granada	1·4	74	i 0 27	0	0 57	+11	0 30	P_g
Almeria	2·3	89	e 0 44	+ 4	1 18	S_g	i 0 47	P_g
Toledo	3·2	18	e 0 51	− 1	i 1 42	S*	i 1 1	P*
Lisbon	3·7	304	0 55	− 5	1 35	−10	1 4	P*
Clermont-Ferrand	10·6	31	e 2 35	PP	—	—	—	—

Additional readings :—
Granada P_gS_g = +1m.1s., S_g = +1m.10s. and +1m.14s.
Almeria P_g = +0m.55s., +1m.0s., and +1m.5s., PS = +1m.8s., S_g = +1m.23s., +1m.27s., and +1m.40s.
Toledo i = +1m.9s. and +1m.53s.
Lisbon S* = +1m.43s., S_gZ = +1m.46s.
Long waves were also recorded at Rome.

March 5d. 23h. 54m. 32s. Epicentre 63°·6N. 150°·8W.

$A = -·3902$, $B = -·2181$, $C = +·8945$; $\delta = -5$; $h = -10$;
$D = -·488$, $E = +·873$; $G = -·781$, $H = -·436$, $K = -·447$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
College		1·8	46	i 0 28	− 4	—	—	i 0 39	P_g	—
Victoria		21·3	123	—	—	i 8 44	+ 1	—	—	i 11·2
Seattle		22·4	121	—	—	e 8 57	− 7	—	—	e 9·5
Saskatoon		25·6	96	—	—	e 9 58	− 1	—	—	13·5
Bozeman		28·5	109	—	—	e 10 43	− 3	e 11 3	SS	e 14·6
Salt Lake City		32·2	116	e 6 32	0	e 11 41	− 4	—	—	e 13·1
Tinemaha		33·0	128	e 6 39	0	—	—	—	—	—
Haiwee		34·0	128	i 6 51	+ 3	—	—	—	—	—
Mount Wilson		35·7	129	i 7 2	0	—	—	—	—	—
Pasadena	z.	35·7	129	e 7 3	+ 1	—	—	—	—	—
Riverside		36·1	129	i 7 5	0	—	—	—	—	—
Lincoln		38·6	98	e 8 53	PP	e 13 12	−11	—	—	e 17·9
Tucson		40·1	122	e 7 37	− 2	e 13 51	+ 5	e 9 20	PP	e 18·9
Chicago, U.S.C.G.S.		41·8	90	—	—	e 14 2	− 9	—	—	e 18·0
Florissant	E.	43·1	95	—	—	i 14 22	− 8	e 17 20	SS	i 22·7
St. Louis		43·3	95	e 12 1	?	c 19 22	SSS	—	—	e 22·6
Ottawa		44·3	77	1 8	− 5	e 17 16	SS	—	—	23·5
Irkutsk		50·6	310	e 9 2	0	16 22	+ 5	—	—	27·5
Pulkovo		56·9	359	e 9 50	+ 1	17 56	+14	—	—	—
Sverdlovsk		57·5	340	9 57	+ 4	18 2	+12	—	—	27·5
Moscow		60·8	355	10 17	+ 1	e 18 44	+11	—	—	34·0
Clermont-Ferrand		69·0	19	11 5	− 4	—	—	—	—	—
Toledo		73·5	26	i 11 36	0	—	—	—	—	—
Granada		76·2	27	i 11 54	+ 2	21 49	+13	14 59	PP	41·2
Ksara		82·8	355	e 12 29	+ 2	e 22 45	0	e 15 41	PP	47·5

Additional readings :—
Bozeman eS = +10m.57s.
Tucson eP = +7m.42s., P = +8m.29s., ePPP = +9m.48s.
Chicago eS = +14m.9s.
Long waves were also recorded at Harvard, Columbia, Williamstown, Pennsylvania, Seven Falls, Sitka, Cape Girardeau, Tashkent, East Machias, Baku, Rome, and Scoresby Sund.

March 5d. Readings also at 1h. (Rome, near Lick, and Sofia), 2h. (Triest, Granada, and Toledo), 3h. (near Mizusawa), 7h. (Perth), 8h. (Mizusawa), 9h. (Granada (2), Toledo, Mount Wilson, Pasadena, Tinemaha, Riverside, Tucson, and Ksara), 15h. (Andijan), 17h. (near Tucson), 21h. (Balboa Heights, Ukiah, and Ferndale), 22h. (College), 23h. (St. Louis, Butte, Fordham, Ottawa, Tucson, near College, Mount Wilson, Pasadena, Tinemaha, and Riverside).

March 6d. 5h. 51m. 24s. Epicentre 63°·6N. 150°·8W. (as on 1940, March 5d.).

$A = -·3902$, $B = -·2181$, $C = +·8945$; $\delta = -5$; $h = -10$.

		△	Az.	P.	O−C.	S.	O−C.	L.
		°	°	m. s.	s.	m. s.	s.	m.
College		1·8	46	e 0 29	− 3	i 0 48	− 8	—
Bozeman		28·5	109	—	—	e 11 7	+21	e 14·6
Tinemaha		33·0	128	e 6 41	+ 2	—	—	—
Haiwee	z.	34·0	128	e 6 49	+ 1	—	—	—
Mount Wilson	z.	35·7	129	e 7 3	+ 1	—	—	—
Pasadena	z.	35·7	129	e 7 3	+ 1	—	—	—
Riverside	z.	36·1	129	i 7 6	+ 1	—	—	—
Tucson		40·1	122	e 7 40	+ 1	—	—	—
St. Louis		43·3	95	e 8 2	− 3	—	—	e 22·6
Ottawa		44·3	77	i 8 10	− 3	—	—	20·6

Additional readings :—
Bozeman eS = +11m.13s.
Tucson eP = +8m.1s.
Long waves were also recorded at Sitka, East Machias, Pennsylvania, Lincoln, and Salt Lake City.

March 6d. 18h. 22m. 40s. Epicentre 51°·3S. 163°·6E. (as on 1939, September 20d.).

$A = -·6023$, $B = +·1773$, $C = -·7783$; $\delta = -5$; $h = -6$;
$D = +·282$, $E = +·959$; $G = +·747$, $H = -·220$, $K = -·628$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Monowai		6·1	27	—	—	2 20?	−25	—	—	—
Christchurch		9·9	41	2 21	− 4	3 26	?	—	—	—
Wellington		12·6	42	2 49	−14	4 30	?	—	—	—
Chatham Ils.		15·3	69	(3 50)	+11	3 50	P	—	—	7·3
Riverview		19·7	328	i 4 38a	+ 4	i 8 8	− 2	—	—	—
Sydney		19·7	328	i 4 20	−14	i 7 47	−23	—	—	e 8·9
Adelaide		24·3	303	e 5 26	+ 6	i 9 44	+ 7	—	—	—
Brisbane	N.	25·1	338	i 5 26	− 2	i 9 38	−13	—	—	—
Perth		39·8	280	(8 5)	+29	13 57	+15	8 33	PP	21·6
Manila		75·4	318	i 11 50k	+ 3	21 26	− 1	—	—	36·3
Calcutta	N.	98·6	296	—	—	e 24 28	[+ 8]	—	—	—
Agra	E.	108·1	291	—	—	e 24 57	[− 7]	e 38 13	SSS	—
Tucson		111·8	66	e 46 30	?	—	—	—	—	—
Ksara		138·7	266	e 19 42k	[+14]	35 40	PPS	e 22 51	PP	—
Ottawa		141·1	74	i 19 39	[+ 7]	—	—	—	—	70·3
Triest		159·3	267	e 20 5	[+ 5]	—	—	—	—	—
Potsdam	z.	161·8	285	e 20 14	[+12]	e 21 9	PKP_2	e 32 25	?	e 95·3

Additional readings :—
Riverview iSN = +8m.14s.
Adelaide iPN = +5m.30s., e = +6m.8s., +7m.28s., and +7m.56s., i = +9m.57s. and +10m.10s.
Perth PPP = +9m.32s., PPPP = +9m.55s., PS = +14m.30s., SS = +17m.20s.; the reading entered as P is given as P_cP.
Agra ePPPE = +18m.7s., eSE = +33m.7s., eE = +34m.2s.
Triest e = +18m.47s.
Long waves were also recorded at Arapuni, La Paz, La Plata, Pasadena, Harvard, Fordham, Scoresby Sund, and European stations.

March 6d. Readings also at 0h. (La Paz), 1h. (near Berkeley, Branner, San Francisco, and College), 2h. (near Mizusawa), 5h. (Williamstown, Butte, and Istanbul), 6h. (Fordham, College, and Tucson), 10h. (near Berkeley, Branner, San Francisco, and Lick), 11h. (near San Fernando, Almeria, Granada, and Toledo), 13h. (Tucson), 20h. (near Balboa Heights, Tucson, and Huancayo), 21h. (near Mizusawa), 23h. (Huancayo and La Paz).

March 7d. 5h. 4m. 36s. Epicentre 42°·2N. 36°·5E. (as given by stations of U.S.S.R.).

$A = +·5973$, $B = +·4420$, $C = +·6692$; $\delta = -4$; $h = -2$;
$D = +·595$, $E = -·804$; $G = +·538$, $H = +·398$, $K = -·743$.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Sotchi	2·7	60	i 0 32	−13	i 1 21	+ 2	—	—	—
Sebastopol	3·2	318	0 43	− 9	1 37	+ 5	—	—	—
Piatigorsk	5·2	66	e 1 25	+ 4	—	—	—	—	—
Erevan	6·4	106	1 41	+ 3	2 59	+ 6	2 0	P_g	—
Grozny	6·9	78	e 1 42	− 3	3 2	− 3	2 2	P^g	—
Bucharest	7·9	290	e 1 56	− 3	—	—	—	—	5·4
Ksara	8·4	185	e 1 27	−39	i 3 17	−26	—	—	—
Sofia	9·7	277	e 3 48	?	—	—	—	—	—
Baku	10·2	96	e 2 25	− 6	—	—	—	—	7·5
Helwan	13·0	200	e 4 27	?	e 6 6	SSS	—	—	i 7·0
Moscow	13·6	2	3 14	− 3	e 5 47	− 3	—	—	—
Warsaw	14·5	319	e 3 13	−15	e 6 11	0	i 6 29	SS	e 7·5
Triest	16·7	290	e 4 30	PPP	—	—	—	—	—
Pulkovo	18·0	351	e 4 22	+ 9	e 7 42	+10	—	—	—
Chur	19·7	295	e 4 7	−27	—	—	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Stuttgart		20·2	299	e 4 17	−22	—	—	—	—	—
Zurich		20·4	295	e 4 19a	−22	—	—	—	—	—
Basle		21·1	295	e 4 25	−23	—	—	—	—	—
Sverdlovsk		21·3	39	4 36	−14	—	—	—	—	11·4
Neuchatel		21·5	294	e 4 30	−22	—	—	—	—	—
Uccle		23·6	303	—	—	e 9 24	− 1	—	—	—
Tashkent		24·4	80	—	—	9 26	−13	—	—	16·8
Philadelphia		77·5	313	—	—	e 23 56	?	—	—	—

Additional readings :—
Sotchi $iP_gP_g = +0m.49s.$
Ksara e = +2m.36s.
Warsaw ePN = +3m.22s., eSE = +6m.14s.
Long waves were also recorded at Rome, De Bilt, Granada, and Florissant.

March 7d. 7h. 8m. 41s. Epicentre 33°·0S. 110°·0W. (approximate).

A = −·2874, B = −·7896, C = −·5421 ; δ = −6 ; h = +1 ;
D = −·940, E = +·342 ; G = +·185, H = +·509, K = −·840.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Huancayo		38·0	64	e 7 24	+ 3	13 11	− 3	e 8 39	PP	15·6
La Paz		41·1	77	i 7 47k	0	i 14 1	0	9 11	PP	18·3
La Plata		42·8	106	8 7	+ 6	14 22	− 4	17 43	SS	21·6
Wellington		58·8	239	—	—	e 27 19?	?	—	—	e 30·3
Rio de Janeiro	E.	59·0	98	e 9 57	− 7	i 18 2	− 8	—	—	e 26·8
	N.	59·0	98	e 9 54	−10	i 18 11	+ 1	—	—	e 27·1
Christchurch		59·6	235	—	—	e 18 42	+25	—	—	27·8
Tucson		64·9	359	e 10 41	− 2	e 19 29	+ 5	e 20 51	SeS	e 27·4
San Juan		66·1	46	e 10 43	− 8	e 19 35	− 4	e 23 58	SS	e 27·7
Riverside	Z.	67·0	353	e 10 58	+ 1	—	—	—	—	—
Pasadena		67·2	353	e 10 57	− 1	—	—	—	—	—
Mount Wilson	Z.	67·3	353	i 10 59	0	—	—	—	—	—
Haiwee		69·2	354	e 11 12	+ 2	—	—	—	—	—
Tinemaha		70·2	354	i 11 17	0	—	—	—	—	—
St. Louis		73·5	15	—	—	i 21 2	− 4	e 25 47	SS	e 34·3
Florissant	N.	73·7	15	—	—	e 20 57	−11	e 25 28	SS	—
Bermuda		77·7	38	—	—	e 21 58	+ 6	e 26 40	SS	e 36·4
Philadelphia		79·4	27	—	—	e 22 9	− 1	—	—	e 35·8
Fordham		80·4	27	e 12 12	− 3	e 22 11	−10	e 23 6	PS	—
Ottawa		84·0	23	i 12 32	− 1	i 22 59	+ 2	28 19?	SS	40·3
East Machias		86·6	29	—	—	e 23 23	0	e 24 19	PS	e 38·3
Granada		121·1	63	—	—	i 31 29	PPS	i 36 26	SS	—
Helwan		147·0	85	i 19 44k	[+ 1]	—	—	e 23 25	PP	—
Ksara		151·6	79	e 19 55	[+ 6]	—	—	e 33 38	PS	—

Additional readings :—
Huancayo P = +7m.31s., iPP = +8m.44s., iPPP = +9m.26s., iS = +13m.14s.
La Paz PPP = +9m.35s.
La Plata N = +11m.31s., Z = +18m.37s., and +19m.19s., L_gN = +20m.25s.
Mount Wilson eZ = +11m.34s.
Fordham eZ = +12m.23s.
East Machias eSS = +28m.40s., eSSS = +32m.28s.
Helwan PKKPZ = +20m.13s., iE = +20m.37s.
Ksara PPS = +36m.56s.
Long waves were also recorded at Brisbane, Uccle, Warsaw, Harvard, Kew, De Bilt, Rome, Scoresby Sund, Chicago U.S.C.G.S., Bidston, and Lincoln.

March 7d. 10h. 18m. 52s. Epicentre 75°·1N. 10°·3E. (as on 1937 April 21d.).

$A = +\cdot2540$, $B = +\cdot0462$, $C = +\cdot9661$; $\delta = 0$; $h = -13$;
$D = +\cdot179$, $E = -\cdot984$; $G = +\cdot950$, $H = +\cdot173$, $K = -\cdot258$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Pulkovo	17·0	144	4 12	+11	7 38	SS	—	—	9·2
Moscow	22·1	135	5 3	+ 4	9 11	+13	—	—	11·4
Warsaw	23·4	162	e 10 39	SSS	—	—	—	—	(13·7)
Sverdlovsk	26·2	106	5 38	0	10 4	− 5	—	—	12·3
Frunse	42·5	102	e 9 17	PP	—	—	—	—	—
Andijan	43·9	105	e 8 1	− 9	—	—	e 9 25	PP	—
Tucson	66·4	308	e 10 50	− 3	—	—	—	—	—

Long waves were also recorded at Potsdam, Grozny, Piatigorsk, and Irkutsk.

March 7d. Readings also at 4h. (La Paz and Bermuda), 7h. (Tucson), 8h. (Tucson), 10h. (Tucson), 19h. (Tucson, Sverdlovsk, Ksara, Palomar, Riverside, Pasadena, Mount Wilson, Haiwee, Tinemaha, St. Louis, and Irkutsk), 20h. (Baku, Huancayo, Tashkent, and Pulkovo), 22h. (Tucson).

March 8d. Readings at 2h. (Bombay), 3h. (Ksara, Helwan, and near Mizusawa), 4h. (near Mizusawa), 5h. (Tucson (2). Riverside, Mount Wilson, Pasadena, Haiwee, and Tinemaha), 22h. (Salt Lake City).

March 9d. 3h. Local Japanese shock. Tokyo Imperial University gives Epicentre 36°·05N. 139°·75E.

Kamakura P = 33m.55s., S = 34m.6s.
Kiyosumi P = 33m.55s., S = 34m.9s.
Komaba P = 33m.55s., S = 34m.5s.
Koyama P = 33m.55s., S = 34m.9s.
Togane P = 33m.55s., S = 34m.8s.
Tokyo Imp. Univ. P = 33m.55s., S = 34m.5s.
Tukubasan P = 33m.55s., S = 34m.5s.
Yosiwara P = 33m.55s., S = 34m.12s.
Susaki P = 34m.6s., S = 34m.23s.
Mizusawa eP = 34m.34s., S = 35m.13s.

March 9d. 5h. Undetermined shock.

College eP = 5m.15s., iP = 5m.18s. and 5m.30s.
Sitka eS = 9m.32s., 9m.43s., S = 10m.6s.
Butte eP = 10m.35s., eL = 19·4m.
Tinemaha eP = 11m.26s.
Pasadena iPZ = 11m.52s.
Mount Wilson ePZ = 11m.50s.
Riverside iPZ = 11m.55s.
Palomar ePZ = 12m.1s.
Tucson eP = 12m.29s., eL = 25·4m.
Ottawa iZ = 12m.57s., L = 28·0m.
Victoria e = 13m.38s., i = 16m.6s.
Chicago ePPP = 15m.18s., eL = 25·7m.
Bozeman eS = 15m.53s., eL = 18m.35s.
Pennsylvania e = 29m.
Williamstown e = 29m.47s., i = 32m.1s.
Long waves were also recorded at Seattle, Lincoln, East Machias, and Salt Lake City.

March 9d. 10h. 47m. 1s. Epicentre 27°·0N. 139°·5E. (as on 1938 Sept. 21d.).

Moderate at Titizima, slight at Katuura, Tokyo, Kakioka, and Utunomiya. Epicentre 28°·0N. 140°·0E. Depth 520km. Macroseismic radius greater than 300km.

See Seismological Bulletin of the Central Met. Obs., Japan, for the year 1940, Tokyo, 1940, pp. 11-12, Macroseismic Chart, p. 11.

$A = -\cdot6784$, $B = +\cdot5794$, $C = +\cdot4516$; $\delta = -13$; $h = +3$;
$D = +\cdot649$, $E = +\cdot760$; $G = -\cdot343$, $H = +\cdot293$, $K = -\cdot892$.

Tables for depth of focus 0·070 have been used.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Titizima	2·4	88	1 12k	+ 6	2 7	+ 9	—	—	—
Hatidyozima	6·1	3	1 37	0	3 40	+46	—	—	—
Siomisaki	7·2	335	1 51	+ 2	3 13	− 2	—	—	—
Omaesaki	7·7	351	1 55	+ 1	3 15	− 9	—	—	—
Susaki	7·7	354	1 51	− 3	3 12	−12	—	—	—
Hamamatu	7·8	350	1 59a	+ 4	3 22	− 4	—	—	—
Muroto	7·8	325	1 56	+ 1	3 24	− 2	—	—	—
Osima	7·8	358	1 52	− 3	3 14	−12	—	—	—
Mera	7·9	2	1 52	− 4	3 16	−12	—	—	—
Misima	8·1	357	1 55	− 3	3 21	−11	—	—	—
Simidu	8·1	317	2 0	+ 2	3 32	0	—	—	—
Wakayama	8·1	334	1 59a	+ 1	3 29	− 3	—	—	—
Kiyosumi	8·2	6	2 1	+ 2	3 28	− 6	—	—	—
Osaka	8·2	339	2 1	+ 2	3 30	− 4	—	—	—
Yosiwara	8·2	353	2 1	+ 2	3 50	+16	—	—	—
Kamakura	8·3	0	2 1	+ 1	3 27	− 9	—	—	—
Kameyama	8·3	343	1 59	− 1	3 30	− 6	—	—	—
Koti	8·3	323	2 2a	+ 2	3 36	0	—	—	—
Sumoto	8·3	333	2 1a	+ 1	3 33	− 3	—	—	—
Nagoya	8·4	345	2 1	0	3 34	− 4	—	—	—
Yokohama	8·4	2	1 59	− 2	3 25	−13	—	—	—
Hunatu	8·5	355	2 0	− 2	3 25	−15	—	—	—
Kobe	8·6	337	2 3a	− 1	3 5	−37	—	—	—
Kyoto	8·6	339	2 5a	+ 1	3 34	− 8	—	—	—
Miyazaki	8·6	307	2 8k	+ 4	3 46	+ 4	—	—	—
Togane	8·6	6	2 1	− 3	3 34	− 8	—	—	—
Gihu	8·7	345	2 3a	− 2	3 38	− 6	—	—	—
Hikone	8·7	342	2 8	+ 3	3 38	− 6	—	—	—
Komaba	8·7	4	2 1	− 4	3 31	−13	—	—	—
Kohu	8·7	350	2 2	− 3	3 35	− 9	—	—	—
Tokyo Cen. Met. Ob.	8·7	2	2 1	− 4	3 29	−15	—	—	—
Tokyo Imp. Univ.	8·7	2	2 1	− 4	3 31	−13	—	—	—
Yakusima	8·7	296	2 10k	+ 5	3 48	+ 4	—	—	—
Tyosi	8·8	8	2 5	− 1	—	—	—	—	—
Matuyama	9·0	321	2 9k	+ 1	3 46	− 3	—	—	—
Nake	9·0	282	2 15	+ 7	3 59	+10	—	—	—
Kagosima	9·1	303	2 18	+ 9	—	—	—	—	—
Kumagaya	9·1	358	2 5k	− 4	3 38	−13	—	—	—
Kakioka	9·2	3	2 5	− 5	—	—	—	—	—
Tukubasan	9·2	4	2 6	− 4	3 43	−10	—	—	—
Maebasi	9·4	357	2 7	− 5	3 52	− 5	—	—	—
Mito	9·4	4	2 9k	− 3	3 43	−14	—	—	—
Toyooka	9·4	336	2 12k	0	3 51	− 6	—	—	—
Utunomiya	9·5	2	2 10k	− 3	3 46	−13	—	—	—
Hirosima	9·6	322	2 15	+ 1	3 57	− 4	—	—	—
Kumamoto	9·6	309	2 17	+ 3	4 1	0	—	—	—
Nagano	9·7	354	2 11a	− 4	3 52	−10	—	—	—
Toyama	9·9	348	2 12	− 6	3 57	−10	—	—	—
Unzendake	9·9	308	2 24a	+ 6	4 13	+ 6	—	—	—
Onahama	10·0	9	2 14	− 5	3 54	−15	—	—	—
Hamada	10·1	323	2 20	0	4 9	− 2	—	—	—
Izuka	10·1	313	2 8	−12	3 58	−13	—	—	—
Nagasaki	10·1	307	2 24a	+ 4	4 11	0	—	—	—
Hukuoka	10·2	312	e 2 28	+ 7	4 18	+ 5	—	—	—
Wazima	10·6	349	2 21	− 4	4 10	−11	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Hukusima		10·8	3	2 21 a	− 6	4 12	−13	—	—	—
Aikawa		11·1	353	2 25	− 5	4 15	−16	—	—	—
Sendai		11·3	3	2 29 a	− 3	4 19	−16	—	—	—
Husan		12·1	314	2 41	0	4 48	− 2	—	—	—
Mizusawa		12·2	6	e 2 37	− 5	i 4 42	−10	—	—	—
Akita		12·7	3	2 46 k	− 1	—	—	—	—	—
Taikyu		12·8	316	2 48	0	5 3	− 1	—	—	—
Miyakozima		13·0	264	2 58	+ 8	5 20	+12	—	—	—
Hatinohe		13·6	7	2 54 a	− 3	5 9	−10	—	—	—
Aomori		13·8	4	2 56	− 3	5 14	− 9	—	—	—
Isigakizima		14·1	263	4 9	+67	6 40	+71	—	—	—
Keizyo		14·9	318	3 3	− 7	5 39	− 5	—	—	—
Mori		15·1	3	4 10	+58	6 41	+54	—	—	—
Zinsen		15·1	317	3 15	+ 3	5 53	+ 6	—	—	—
Sapporo		16·1	6	3 18	− 4	—	—	—	—	—
Taihoku		16·3	268	3 32	+ 8	6 11	+ 2	—	—	—
Zi-ka-wei	E.	16·3	289	e 3 21	− 3	i 6 5	− 4	—	—	—
Karenko		16·4	265	3 31	+ 6	—	—	—	—	—
Sintiku		16·8	267	3 35	+ 6	6 31	+13	—	—	—
Taityu		17·2	266	3 38	+ 5	—	—	—	—	—
Arisan		17·3	262	3 35	+ 1	—	—	—	—	—
Kosyun		17·8	258	3 51	+12	6 52	+16	—	—	—
Manila		21·2	237	i 4 21 k	+ 9	7 26	− 8	—	—	—
Hong Kong		23·5	264	4 39	+ 6	8 17	+ 5	6 53	PPP	10·6
Phu-Lien		30·6	265	i 5 42	+ 7	e 10 10	+ 7	—	—	—
Irkutsk		36·5	324	e 6 39	+14	i 11 41	+ 8	—	—	15·0
Calcutta	N.	46·4	276	e 7 42	− 2	i 13 48	− 8	i 16 35	?	—
Semipalatinsk		50·3	315	8 10	− 3	14 40	− 9	—	—	—
Almata		52·5	306	8 30	+ 1	i 15 17	− 2	—	—	—
Agra	E.	54·2	285	8 30	−12	15 35	− 6	i 17 30	PS	—
Frunse		54·2	306	8 40	− 2	15 37	− 4	—	—	—
Andijan		56·1	302	8 56	+ 1	16 5	− 1	—	—	—
Tchimkent		58·0	305	9 4	− 4	16 26	− 5	—	—	—
Tashkent		58·4	304	e 9 13	+ 2	e 16 32	− 4	—	—	—
Colombo	E.	59·9	262	9 27	+ 7	17 2	+ 7	—	—	—
Samarkand		60·4	302	9 27	+ 3	16 57	− 4	—	—	—
Bombay		64·6	277	i 9 31	− 1	i 17 15	− 1	11 54	PP	—
Sverdlovsk		61·8	323	i 9 37	+ 4	i 17 12	− 6	—	—	30·0
Moscow		74·4	325	e 10 51	+ 1	i 19 37	− 8	—	—	—
Grozny		74·5	312	e 10 55	+ 5	e 19 50	+ 4	—	—	—
Victoria		74·7	43	—	—	e 19 45	− 3	—	—	30·0
Pulkovo		76·0	330	10 58	0	i 19 52	−10	—	—	—
Sotchi		78·5	314	e 11 19	+ 7	e 21 28	+60	—	—	—
Scoresby Sund		81·9	354	—	—	i 20 58	− 5	—	—	—
Butte		82·4	41	—	—	e 21 2	− 6	—	—	—
Tinemaha		83·1	52	i 11 37 a	+ 1	e 21 11	− 4	i 13 33	pP	—
Santa Barbara	z.	83·3	55	i 11 37	0	—	—	—	—	—
Bozeman		83·5	42	—	—	e 21 9	−10	—	—	—
Haiwee		83·8	52	i 11 39	0	—	—	e 13 31	pP	—
Mount Wilson		84·6	54	i 11 44 a	+ 1	i 21 32	+ 3	i 13 32	pP	—
Pasadena		84·6	54	i 11 42 a	− 1	e 21 18	−11	i 13 31	pP	—
Riverside		85·2	54	i 11 46 a	0	—	—	i 13 43	pP	—
Salt Lake City		85·6	46	e 11 49	+ 1	e 21 24	−15	e 13 37	pP	—
Ksara		85·7	305	e 11 54	+ 6	e 21 41	+ 1	e 13 51	pP	—
La Jolla		85·9	55	e 11 50	+ 1	—	—	—	—	—
Palomar	z.	85·9	54	i 11 49 a	0	—	—	i 13 48	pP	—
Sofia		89·1	318	—	—	e 21 59	−12	—	—	—
Tucson		90·2	53	i 12 14	+ 4	e 22 26	+ 5	i 14 5	pP	—
Helwan		91·0	304	12 17	+ 4	i 22 58	+30	15 41	PP	—
Rome		95·8	323	e 16 38	PP	e 25 28	PS	e 31 54	SS	e 58·1
St. Louis		99·8	37	—	—	e 22 37	[− 8]	e 26 4	PS	—
Huancayo		144·1	72	e 18 45	[+ 4]	e 39 53	SS	e 22 6	PP	e 60·7
La Paz	z.	152·3	74	19 12	[+20]	i 28 55	PPP	—	—	—

For Notes see next page.

NOTES TO MARCH 9d. 10h. 47m. 1s.

Additional readings :—
Zi-ka-wei iN = +6m.17s., iE = +6m.29s.
Hong Kong SS = +8m.36s., P_cP = +9m.7s.
Tinemaha iZ = +11m.43s.
Santa Barbara iZ = +11m.42s.
Mount Wilson iZ = +11m.49s. and +13m.44s., eSKP,PKPZ = +40m.34s.
Pasadena iEN = +21m.32s., eSKP,PKPZ = +40m.32s.
Riverside iZ = +11m.51s., eSKP,PKPZ = +40m.30s.
Salt Lake City ePPP = +17m.31s., esPP = +17m.54s.
Ksara ePP = +15m.23s.
Palomar iZ = +11m.54s. and +14m.46s.
Tucson iPP = +16m.0s., ePPP = +18m.5s., eSKS = +22m.1s.
Helwan PSE = +23m.53s., eE = +25m.26s.
Rome eE = +22m.21s. and +27m.59s., eZ = +40m.9s. and +45m.9s.
St. Louis eN = +23m.41s.
Huancayo ePPP = +25m.30s., esSS = +43m.28s., eSSS = +46m.40s.
La Paz i = +21m.17s.

March 9d. 15h. 47m. 14s. Epicentre 5°·0N. 82°·5W. (as on 1939 May 28d.).

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

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Balboa Heights		4·9	35	e 1 13	− 4	e 2 1	−14	—	—	—
Huancayo		18·7	157	e 4 29	+ 7	e 8 14	SS	4 35	PP	e 9·6
San Juan		20·8	48	4 46	+ 1	e 8 38	+ 5	8 48	SS	—
La Paz	Z.	25·7	146	5 55	PP	11 32	SSS	—	—	16·0
Tucson		37·9	319	e 7 20	0	—	—	e 8 49	PP	e 15·3
Ottawa		40·7	7	i 7 40	− 4	—	—	—	—	10·8

Additional readings :—
Huancayo iS = +8m.25s.
Tucson eP = +7m.40s.
Long waves were also recorded at Salt Lake City.

March 9d. Readings also at 3h. (Salt Lake City, near Lick, Branner, Fresno, and Tucson), 4h. (near Triest), 5h. (near Triest), 6h. (Rome and near Triest (2)), 10h. (Tucson), 14h. (Palomar, Riverside, Mount Wilson, Tinemaha, and Pasadena), 18h. (Andijan, Agra, and Calcutta), 19h. (Ksara), 20h. (Andijan (2), Ksara, Grozny (2), Erevan (2), Sotchi (2), Sverdlovsk, Baku, Frunse, and Tchimkent), 21h. (Ksara).

March 10d. 18h. 1m. 55s. Epicentre 37°·0N. 115°·0W. (as suggested by Pasadena).

A = −·3383, B = −·7256, C = +·5992; δ = −2; h = −1;
D = −·906, E = +·423; G = −·253, H = −·543, K = −·801.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Haiwee		2·5	241	i 0 42	− 1	i 1 23	S_g	—	—
Tinemaha		2·6	272	e 0 42	− 2	i 1 21	+ 4	i 0 47	P*
Riverside		3·4	213	i 1 0	P*	i 2 1	S_g	—	—
Mount Wilson		3·7	220	e 1 1	+ 1	i 2 7	S_g	—	—
Pasadena		3·8	220	i 1 4	+ 3	i 2 13	S_g	i 1 15	P_g
Fresno	N.	3·8	269	e 1 28	P_g	i 2 18	S_g	—	—
Palomar	Z.	4·0	204	i 1 5	+ 1	—	—	—	—
Salt Lake City		4·5	31	e 1 23	P*	e 2 15	S*	—	—
Santa Barbara		4·6	237	e 1 30	P_g		—	—	—
Lick	N.	5·4	287	e 1 26	+ 2	e 2 47	S*	—	—
Santa Clara		5·6	276	e 2 30	S	(e 2 30)	− 3	e 2 54	P_g
Branner		5·7	277	e 1 50	P_g	—	—	—	—
Berkeley	N.	5·8	279	e 1 53	P_g	—	—	—	—
Tucson		5·8	143	e 1 31	+ 2	e 2 36	− 2	i 1 55	P_g
Ukiah		6·8	291	e 1 39	− 5	e 3 34	S*	—	—

Additional readings :—
Tinemaha i = +51s.
Fresno iN = +2m.36s.
Branner eE = +1m.55s. and +2m.1s.
Tucson S = +2m.41s., i = +3m.4s., eS_g = +3m.23s.
Long waves were also recorded at Chicago, Bozeman, San Francisco, and St. Louis.

March 10d. Readings also at 0h. (Tucson), 6h. (Triest), 10h. (Tucson, Manila, Lincoln, Bozeman, Salt Lake City, Palomar, and Tinemaha), 15h. (La Plata), 16h. (La Paz), 17h. (La Paz), 19h. (La Paz, Tucson, Huancayo, and Fresno).

March 11d. 11h. 25m. 35s. Epicentre 41°·1N. 142°·2E.

Moderate at Hatinohe, Aomori, Urakawa, Hakodate, Morioka, and Miyako; slight at Kusiro, Mori, Mizusawa, and Obihiro.

Epicentre 41°·1N. 142°·2E. Shallow. Radius 200-300km. See Seismological Bulletin of the Central Meteorological Observatory, Japan, for the year 1940, Tokyo 1950, pp. 12-13. Macroseismic chart, p. 12.

Consideration of P readings would lead to the alternative epicentre 40°·6N. 142°·3E., as on 1940, February 9th, with a T_s at 25m.37s.

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

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Hatinohe		0·8	222	0 13k	− 5	0 23	− 8	—	—	—
Aomori		1·1	255	0 19k	− 3	0 37	− 2	—	—	—
Miyako		1·5	186	0 26	− 2	0 43	− 6	—	—	—
Mori		1·6	309	0 24k	− 6	0 45	− 6	—	—	—
Sapporo		1·8	342	0 30	− 2	0 52	− 4	—	—	—
Akita		2·1	229	0 37k	0	1 3	− 1	—	—	—
Mizusawa		2·1	203	0 34	− 3	0 59	− 5	—	—	—
Sendai		3·0	199	0 46k	− 4	1 23	− 4	—	—	—
Nemuro		3·3	48	1 15	P_g	1 50	S_g	—	—	—
Hukusima		3·6	203	0 55	− 3	1 46	+ 4	—	—	—
Onahama		4·3	194	1 16	P*	2 4	+ 4	—	—	—
Aikawa		4·4	226	1 5	− 5	—	—	—	—	—
Mito		4·9	207	1 13	− 4	2 10	− 5	—	—	—
Utunomiya		4·9	203	1 11	− 6	2 13	− 2	—	—	—
Kakioka		5·1	198	1 12	− 8	2 26	+ 6	—	—	—
Tukubasan		5·2	200	1 15	− 6	2 13	− 9	—	—	—
Maebasi		5·3	209	1 17	− 5	2 29	+ 4	—	—	—
Kumagaya		5·4	205	1 23	− 1	2 31	+ 3	—	—	—
Nagano		5·4	217	1 21	− 3	2 40	+12	—	—	—
Tyosi		5·5	191	1 35	P*	2 59	S_g	—	—	—
Wazima		5·6	230	1 26	− 1	—	—	—	—	—
Tokyo, Cen. Met. Ob.		5·7	200	1 27	− 1	2 24	−11	—	—	—
Yokohama		6·0	201	1 32	0	2 50	+ 7	—	—	—
Kohu		6·2	209	1 37	+ 2	3 0	S*	—	—	—
Hunatu		6·2	207	1 31	− 4	2 55	+ 7	—	—	—
Mera		6·4	198	1 35	− 3	3 7	S*	—	—	—
Misima		6·5	205	1 37	− 2	3 0	+ 5	—	—	—
Osima		6·7	200	1 34	− 8	3 12	+12	—	—	—
Gihu		7·1	219	1 46	− 2	3 12	+ 2	—	—	—
Nagoya		7·2	217	1 45	− 4	3 13	0	—	—	—
Omaesaki		7·2	207	2 17	P_g	—	—	—	—	—
Hikone		7·5	221	1 58	+ 5	—	—	—	—	—
Kameyama		7·7	219	1 59	+ 3	—	—	—	—	—
Hatidyozima		8·2	194	2 55	P_g	—	—	—	—	—
Osaka		8·2	219	2 27	P*	4 10	S*	4 31	S_g	—
Owase		8·4	216	2 21	P*	4 20	S*	—	—	—
Koti		10·2	225	2 36	+ 5	—	—	—	—	—
Irkutsk		28·0	307	e 6 6	+11	—	—	—	—	15·4
Hong Kong		30·1	241	10 56	S	(10 56)	−16	—	—	—
Sverdlovsk		52·6	317	9 4	−14	16 32	−12	—	—	23·4
Tashkent		53·3	296	e 9 21	− 2	17 2	+ 8	—	—	27·0
Grozny		67·3	308	e 12 51	P_cP	—	—	—	—	—
Tinemaha	z.	73·0	55	e 11 41	+ 8	—	—	—	—	—
Haiwee	z.	73·7	56	e 11 44	+ 6	—	—	—	—	—
Mount Wilson		74·9	58	e 11 51a	+ 7	—	—	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Pasadena	z.	74·9	58	i 11 50$_s$	+ 6	—	—	—	—	—
Riverside	z.	75·5	58	i 11 53	+ 5	—	—	—	—	—
Ksara		79·3	305	e 11 59	−10	e 22 41	PS	e 27 14	SS	—
Tucson		80·7	55	e 12 24	+ 8	—	—	—	—	—
Helwan	z.	84·8	305	12 25	−12	—	—	—	—	—
Rome		85·7	325	i 12 48	+ 6	e 22 57	[− 8]	e 16 51	PP	e 44·4

Additional readings :—
Helwan iZ = +13m.1s.
Rome iZ = +12m.59s., eZ = +16m.59s., eN = +23m.20s., eZ = +24m.14s. and +34m.21s.
Long waves were also recorded at Potsdam, Baku, Uccle, Paris, Kew, Bidston, and De Bilt.

March 11d. Readings also at 0h. (Salt Lake City, Tucson, near Fresno (2), Lick, and Branner), 3h. (near La Paz), 4h. (La Paz), 5h. (near Fresno, Ferndale, Berkeley, Lick, and Branner), 7h. (Tananarive), 14h. (Chicago), 16h. (near Frunse, Andijan, Tchimkent, and Samarkand), 19h. (St. Louis and Florissant), 20h. (Tucson), 21h. (Ksara and Triest), 23h. (near Branner).

March 12d. 18h. Local Japanese shock.

Tokyo Imperial University gives epicentre 36°·02N. 139°·40E.

Kamakura P = 50m.32s., S = 50m.45s.
Kiyosumi P = 50m.32s., S = 50m.50s.
Koyama P = 50m.32s., S = 50m.44s.
Mitaka P = 50m.32s., S = 50m.43s.
Susaki P = 50m.32s.
Titibu P = 50m.32s., S = 50m.40s.
Tukubasan P = 50m.32s., S = 50m.43s.
Komaba P = 50m.34s., S = 50m.43s.
Tokyo Imp. Univ. P = 50m.34s., S = 50m.44s.

March 12d. 22h. 18m. 31s. Epicentre 19°·2N. 121°·2E. (as on 1937, November 14d.).

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

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Manila		4·6	184	e 1 13	+ 1	2 21	S*	—	—	—
Hong Kong		7·3	296	1 38	−12	3 12	− 3	—	—	3·8
Phu-Lien		13·8	279	e 3 10	− 9	—	—	—	—	—
Calcutta	N.	30·9	283	—	—	e 9 57	?	—	—	—
Irkutsk		35·6	343	e 7 6	+ 5	—	—	—	—	15·5
Agra	E.	40·3	290	e 7 36	− 4	13 26	−23	e 9 9	PP	—
Bombay		45·6	278	—	—	e 14 51	−15	—	—	e 27·9
Tashkent		49·1	309	8 52	+ 1	15 50	− 6	—	—	—
Sverdlovsk		58·1	327	9 57	− 1	17 47	−11	—	—	25·5
Baku		63·7	307	—	—	e 19 11	+ 1	—	—	38·5
Ksara		75·8	300	e 11 49	− 1	—	—	—	—	—
Chicago		113·6	23	e 17 54	PP	—	—	—	—	—

Additional readings :—
Agra SSE = +16m.40s.
Long waves were also recorded at Warsaw, Kew, Granada, Potsdam, Pulkovo, and De Bilt.

March 12d. Readings also at 0h. (near Apia, Tinemaha, Riverside, Palomar, Pasadena, Mount Wilson, and Tucson), 1h. (Ksara, Hukuoka, Osaka (2), and Mizusawa), 4h. (Tucson), 5h. (Tucson), 6h. (Columbia), 7h. (near Berkeley), 8h. (near Berkeley), 9h. (Tucson and near Berkeley), 10h. (Tucson (2), near Lick and Fresno), 13h. (La Paz), 16h. (Triest), 19h. (Ottawa, Tucson, Pasadena, and Mount Wilson), 23h. (near Manila).

March 13d. Readings at 1h. (Sofia, near Fordham, Williamstown, and Harvard), 2h., (Ksara), 3h. (Mizusawa), 8h. (Tucson, Riverside, Mount Wilson, Pasadena, Huancayo, and near La Paz), 9h. (near Berkeley, Lick, and Branner), 13h. (near La Paz), 15h. (Ksara (3), Baku, Sotchi, Erevan, Piatigorsk, Grozny, and Sverdlovsk), 19h. (Brisbane, Wellington, Riverview, and Sydney), 22h. (Haiwee, Tinemaha, Helwan, Arapuni, Ksara, Wellington, Riverview, Sydney, Huancayo, Pasadena, Mount Wilson, Riverside, and Tucson (2)), 23h. (Granada).

March 14d. 18h. 22m. 30s. Epicentre 58°·0S. 147°·0E.

$A = -\cdot4466$, $B = +\cdot2900$, $C = -\cdot8464$; $\delta = -6$; $h = -8$;
$D = +\cdot545$, $E = +\cdot839$; $G = +\cdot710$, $H = -\cdot460$, $K = -\cdot533$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Christchurch		21·5	59	4 52 a	0	8 59	+12	i 5 5	PP	11·0
Adelaide		23·7	343	i 5 0	−14	i 9 4	−23	5 40	PP	10·5
Riverview		24·3	10	e 5 3	−17	i 9 20	−17	5 33	PP	e 10·0
Sydney		24·3	10	e 5 6	−14	i 9 12	−25	—	—	e 10·2
Wellington		24·3	58	5 21	+ 1	9 49	+12	6 10	PP	11·3
Chatham Ils.		26·6	74	—	—	10 12	− 4	—	—	12·0
Arapuni		27·3	56	e 6 30?	+42	—	—	11 12	L_g	13·1
Brisbane		30·8	10	i 6 6	−14	i 10 54	−29	i 6 54	PP	i 11·8
Apia		53·9	54	e 12 6	PPP	e 17 6	+ 4	e 22 54	SSS	27·5
Palau		65·9	347	10 48	− 2	—	—	—	—	—
Manila		75·4	335	e 11 44	− 3	i 21 22	− 5	—	—	36·2
Capetown Univ.		78·8	222	—	—	e 22 39	[+21]	e 27 16	SS	—
Tananarive		79·1	253	e 22 27	PS	28 27	SS	—	—	e 33·2
Kosyun		82·6	337	12 30	+ 4	—	—	—	—	—
Colombo	E.	84·0	294	12 43	+10	23 2	+ 5	—	—	34·5
Hong Kong		84·5	330	12 36	0	23 0	− 2	12 44	P_cP	—
La Plata		85·1	160	13 5	+26	23 41	+33	24 6	PS	37·5
Phu-Lien		85·4	323	e 12 39	− 1	23 5	[+ 2]	—	—	—
Kodaikanal	E.	88·1	293	e 12 56	+ 2	i 23 24	[+ 3]	i 24 1	PS	i 40·5
Miyazaki		90·5	348	13 14	+ 9	—	—	—	—	—
Honolulu		91·3	51	e 17 9	PP	23 43	[+ 3]	25 25	PS	e 39·0
Koti		91·9	350	11 56	?	24 7	− 4	—	—	—
Kobe		92·9	352	13 20	+ 4	—	—	—	—	—
Gihu		93·4	352	13 19	+ 1	23 18	[−34]	—	—	—
Calcutta	N.	93·8	308	e 13 18	− 2	i 23 45	[− 9]	e 13 22	P_cP	e 41·0
Hyderabad	N.	93·8	297	e 13 29	+ 9	24 3	[+ 9]	25 56	PS	42·4
Nagano		94·6	353	13 30	+ 6	—	—	—	—	—
Bombay		97·8	293	e 13 46	+ 8	e 22 48	?	e 17 44	PP	41·9
Rio de Janeiro		99·0	171	e 17 30	PP	—	—	—	—	e 47·0
La Paz	Z.	100·3	147	17 35	PP	i 24 14	[−14]	i 27 32	PPS	e 51·9
Huancayo		102·1	138	—	—	e 25 1	[+24]	i 28 0	PPS	43·0
Agra	E.	102·4	302	e 17 31	PP	i 24 35	[− 3]	30 7	SS	42·2
Dehra Dun	N.	105·1	304	—	—	e 24 54	[+ 3]	—	—	e 51·2
Irkutsk		115·3	332	e 20 5	PP	e 26 4	[+31]	23 0	PPP	49·5
Andijan		116·3	305	—	—	29 34	PS	—	—	—
Tashkent		118·1	303	e 20 8	PP	e 27 21	{+21}	41 12	SS	54·9
Tchimkent		118·8	304	20 14	PP	—	—	—	—	—
Pasadena	Z.	120·7	74	e 19 4	[+10]	—	—	e 20 28	PP	e 54·9
Mount Wilson		120·8	74	e 19 4	[+10]	—	—	—	—	—
Riverside	Z.	121·0	74	e 19 4	[+ 9]	—	—	—	—	—
Santa Clara		121·3	68	e 18 55	[0]	e 37 30	SSP	—	—	e 57·1
Berkeley		121·5	68	—	—	i 32 1	PPS	—	—	e 56·1
Ukiah		122·0	66	e 15 32	P	e 27 50	{+23}	e 23 0	PPP	e 50·1
Tinemaha	Z.	122·9	72	e 19 7	[+ 9]	—	—	e 20 44	PP	—
Tucson		123·0	80	e 19 9	[+10]	e 25 50	[−10]	e 29 54	PS	e 49·2

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Baku		126·6	289	20 53	PP	43 36	SS	24 23	PKS	54·5
Helwan		128·3	266	e 19 21	[+13]	26 30	[+15]	31 0	PS	—
Ksara		128·9	272	e 19 51	[+41]	e 34 37	?	—	—	64·5
Seattle		128·9	60	e 21 17	PP	e 31 30	PS	e 24 25	PPP	e 52·6
Salt Lake City		129·0	72	e 19 34	[+24]	e 38 59	SS	e 22 0	PP	e 53·0
Victoria		129·0	59	e 23 30?	?	e 38 42	SS	—	—	e 53·5
Erevan		129·2	285	21 57	PP	—	—	—	—	—
Sitka		130·3	43	e 22 6	PP	e 39 9	SS	—	—	e 58·7
Grozny		130·9	289	22 26	PKS	—	—	—	—	—
College		132·1	30	e 16 16	P	e 31 1	SKSP	e 17 4	pP	e 49·6
Butte		132·4	68	e 19 55	[+39]	e 32 0	PS	e 22 27	PP	e 54·3
Piatigorsk		132·7	288	21 44	PP	—	—	—	—	—
Bozeman		132·9	69	e 19 44	[+27]	e 39 41	SS	25 44	PPP	e 54·3
San Juan		133·4	134	e 22 44	PKS	e 28 4	{−37}	e 24 58	PPP	e 54·5
Sverdlovsk		133·5	312	e 19 25	[+ 6]	—	—	i 21 52	PP	63·5
Sotchi		134·1	285	21 37	PP	—	—	—	—	—
Istanbul		137·9	274	19 45	[+18]	45 56	SSS	24 1	PP	e 72·5
St. Louis		138·8	92	e 23 18	PP	—	—	—	—	—
Bucharest		141·8	276	e 23 10	PP	—	—	e 25 40	PPP	—
Sofia		142·1	272	e 19 48	[+14]	—	—	e 23 30	PKS	—
Chicago		142·5	90	e 23 47	PKS	e 28 54	{−42}	e 26 5	PPP	e 56·8
Moscow		143·0	298	19 38	[+ 2]	29 31	{− 8}	22 49	PP	68·0
Pittsburgh		145·5	99	i 19 52	[+12]	e 42 26	SSP	e 48 4	SSS	e 71·6
Bermuda		146·4	126	e 20 22	[+41]	e 41 21	SS	e 20 47	pPKP	e 62·0
Kecskemet	z.	146·9	273	e 19 56	[+14]	—	—	—	—	—
Pennsylvania		146·9	101	e 19 55	[+13]	—	—	—	—	—
Rome		147·3	260	i 20 0k	[+17]	i 27 17	[+27]	i 42 45	SS	e 67·6
Budapest		147·6	275	e 20 52	[+68]	—	—	—	—	—
Philadelphia		147·6	107	e 19 55	[+11]	e 42 56	SS	e 48 6	SSS	e 62·1
Toronto		148·1	96	e 18 2	?	e 39 30?	?	—	—	65·5
Algiers		148·3	244	i 20 15	[+30]	e 27 2	[+10]	e 23 8	PP	—
Pulkovo		148·3	301	19 54	[+ 9]	23 22	PKS	22 37	PP	61·5
Fordham	z.	149·0	105	i 20 1	[+15]	e 43 20	SSP	e 25 6	?	—
Triest		149·2	268	20 17k	[+31]	30 29	{+15}	21 6	pP	e 62·8
Warsaw		149·3	283	e 20 1a	[+15]	i 29 24	{−50}	23 34	PP	e 66·5
Williamstown		150·7	103	e 20 0	[+12]	—	—	—	—	—
Almeria		150·9	237	20 22	[+33]	—	—	—	—	83·5
Ottawa		151·2	96	i 20 1	[+12]	e 27 18	[+23]	—	—	e 63·5
Harvard	z.	151·4	106	e 20 7	[+18]	—	—	—	—	—
Granada		151·6	236	e 21 8	[+79]	28 11	[+75]	25 8	PP	82·7
San Fernando		152·1	230	e 20 54	[+64]	—	—	—	—	80·5
Chur		152·3	266	e 19 55	[+ 4]	—	—	—	—	—
Zurich		153·1	265	e 20 15	[+23]	—	—	—	—	—
Potsdam		153·5	278	e 19 30	[−22]	e 20 42	PKP$_2$	i 24 8	PP	e 62·7
Jena		153·6	274	e 20 0	[+ 8]	—	—	—	—	67·5
Stuttgart		153·6	270	e 20 13	[+20]	—	—	e 22 53	PKS	—
Basle		153·7	265	e 20 14	[+21]	—	—	—	—	—
Neuchatel		153·7	264	e 20 6	[+13]	—	—	—	—	—
Toledo		154·1	238	e 20 0	[+ 7]	—	—	—	—	82·3
Upsala		154·3	296	e 18 30?	?	—	—	—	—	e 64·5
Clermont-Ferrand		154·9	257	e 20 16	[+22]	—	—	—	—	e 84·5
Seven Falls		154·9	98	—	—	e 28 30?	?	e 50 30	SSS	78·5
East Machias		155·1	107	e 20 10	[+15]	e 26 38	[−22]	e 24 22	PP	e 60·5
Hamburg		155·8	279	e 20 11	[+16]	e 26 30	[−30]	e 47 42	?	e 67·5
De Bilt		156·9	273	i 21 37	?	e 27 57	[+55]	—	—	73·5
Heligoland		157·1	277	e 20 6	[+ 9]	—	—	—	—	e 70·5
Paris		157·2	262	e 20 23	[+26]	e 29 31	?	—	—	e 61·5
Uccle		157·3	268	e 20 49	[+51]	—	—	—	—	e 74·5
Kew		160·2	266	e 20 19	[+18]	i 27 47	[+42]	e 24 17	PP	e 77·5
Bergen		160·4	293	e 23 58	?	e 32 18	?	—	—	e 74·1

For Notes see next page.

NOTES TO MARCH 14d. 18h. 22m. 30s.

Additional readings :—
Christchurch PZ = +4m.57s.
Adelaide i = +5m.4s., +5m.10s., +5m.22s., +5m.28s., +8m.12s., +9m.9s., +9m.14s., +9m.21s., and +9m.28s., SS = +9m.32s., i = +9m.40s. and +9m.48s.
Riverview ePZ = +5m.6s., iNZ = +5m.9s., i = +5m.15s., iSN = +9m.27s.
Wellington i = +5m.35s., L_q = +10m.14s.
Brisbane ePE = +6m.12s., iSE = +11m.6s.
Apia e = +25m.24s.
Manila ePN = +11m.48s.
Cape Town eE = +22m.42s., e = +27m.56s., eN = +30m.27s.
Hong Kong PP = +15m.35s., S_eS = +23m.40s., SS = +28m.14s., SSS = +33m.58s.
La Plata N = +13m.24s., E = +15m.12s., N = +16m.48s., +19m.54s., +21m.12s., +24m.36s., and +24m.54s., E = +29m.30s.?
Kodaikanal iSSE = +28m.43s.
Honolulu PPP = +19m.4s., S = +23m.58s., SS = +30m.1s., eSSS = +33m.48s.
Calcutta eSKKSN = +24m.0s., eSN = +24m.33s., eSSN = +29m.2s.
Hyderabad SN = +24m.33s., SSN = +30m.41s.
Bombay e = +14m.9s., eE = +18m.8s. and +18m.52s., eN = +19m.45s. and +26m.23s., e = +26m.46s., eSS = +30m.43s., i = +31m.37s., e = +36m.5s.
Rio de Janeiro eE = +17m.56s.
La Paz iZ = +18m.45s.
Huancayo eS = +25m.35s., pS = +26m.30s., eSS = +33m.7s., sSS = +34m.28s.
Irkutsk ePS = +29m.46s.
Tashkent PS = +23m.22s., PPP = +34m.32s.
Ukiah epPKP = +19m.55s., ePPS = +31m.50s., eSS = +36m.49s., esSS = +37m.50s., eSSS = +41m.5s.
Tucson ePP = +20m.44s., epPP = +21m.18s., ePPS = +31m.54s., eSS = +37m.45s., esSS = +38m.48s., eSSS = +41m.35s.
Baku PPS = +38m.54s., SSS = +47m.54s.
Helwan eZ = +19m.36s., +20m.42s., +21m.32s., +23m.10s., and +23m.35s., PPE = +24m.10s., eE = +25m.35s., PSE = +33m.38s., PPSE = +34m.30s.
Ksara ePP = +22m.24s.
Seattle ePPS = +32m.41s., eSS = +38m.19s., eSSS = +42m.55s.
Salt Lake City eSKKS = +27m.9s., eSPP = +32m.30s., eSS = +37m.44s., eSSS = +42m.31s.
College ePPP = +24m.50s., eSS = +38m.1s., esSS = +39m.20s.
Butte eSS = +38m.53s., eSSS = +42m.51s.
Bozeman esPP = +22m.59s., ePPS = +33m.57s., eSSS = +44m.23s.
San Juan sPKS = +23m.54s., ePPS = +34m.38s.
Sverdlovsk iPKS = +22m.58s., iPPP = +24m.42s., eSS = +39m.36s., L_q = +54·5m.
St. Louis eN = +23m.28s.
Sofia eN = +20m.0s. and +22m.0s.
Chicago esSS = +41m.57s., eSSS = +45m.32s.
Moscow PS = +33m.32s.
Pittsbrugh iZ = +20m.15s., e?NW = +40m.38s., e = +44m.4s., iNE = +48m.33s., iNW = +48m.47s., eSSNW = +61m.27s.
Bermuda ePP = +23m.33s., epPPP = +27m.39s., esSS = +43m.43s.
Pennsylvania i = +20m.9s.
Rome iPKP$_2$Z = +20m.6s., iZ = +20m.28s., iE = +20m.35s., iZ = +20m.53s. and +21m.24s., iE = +22m.46s., iZ = +24m.54s., eE = +31m.36s., eEN = +47m.44s., eE = +53m.25s., iL_qN = +61m.41s.
Budapest ePN = +21m.2s., iE = +21m.27s.
Toronto eE = +21m.36s.
Algiers e = +29m.30s.?
Fordham iPPZ = +21m.31s.
Triest P = +23m.10s., PKP = +23m.31s., pPKP = +24m.27s., PP = +25m.20s., S = +33m.36s., sS = +35m.4s., PS = +35m.44s.
Warsaw iZ = +20m.30s., +21m.18s., +21m.45s., and +22m.49s.
Williamstown iP = +20m.6s.
Almeria pPKP = +20m.44s., sPKS = +20m.52s.
Ottawa iZ = +20m.7s.
Granada PPS = +37m.27s., SS = +43m.30s., L_q = +69·5m.
Potsdam eE = +20m.18s., iZ = +21m.15s., iPPZ = +22m.5s., iE = +24m.11s., iPPPZ = +24m.51s., iN = +31m.32s., i = +35m.29s.
Upsala eE = +20m.30s. ?
East Machias epPP = +25m.8s., esPP = +26m.52s., eSS = +42m.45s., eSSS = +49m.41s.
Kew iZ = +28m.27s. and +30m.26s., eZ = +38m.0s. and +40m.14s., eN = +45m.7s., eZ = +48m.9s., eL_q = +67·5m.
Long waves were also recorded at Florissant, Stonyhurst, Prague, and Jersey.

March 14d. 21h. 25m. 4s. Epicentre 26°·1N. 111°·8W.

$A = -·3339$, $B = -·8349$, $C = +·4376$; $\delta = +4$; $h = +3$;
$D = -·928$, $E = +·371$; $G = -·162$, $H = -·406$, $K = -·899$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tucson		6·2	7	e 1 24	−11	e 2 24	−24	—	—	i 2·8
La Jolla	z.	8·3	326	e 2 5	+ 1	—	—	—	—	—
Palomar	z.	8·5	330	i 2 4	− 3	i 4 24	S*	i 2 24	PPP	—
Riverside		9·2	330	e 2 20	+ 4	e 4 29	+26	e 4 43	S*	—
Mount Wilson		9·7	327	e 2 27	+ 5	e 4 58	S*	—	—	—
Pasadena		9·7	327	e 2 25	+ 3	e 5 5	S*	—	—	—
Santa Barbara	z.	10·8	322	e 2 40	+ 1	—	—	—	—	—
Haiwee		11·3	333	i 2 44	− 2	e 5 55	SSS	—	—	e 6·2
Tinemaha		12·3	335	e 2 47	− 2	—	—	—	—	e 6·4
Santa Clara		14·1	325	i 3 12	−11	—	—	—	—	—
Salt Lake City		14·6	0	—	—	e 5 17	−56	—	—	e 7·2
Bozeman		19·6	2	e 4 32	0	—	—	—	—	e 9·7
Butte		19·9	0	e 4 34	− 2	e 8 11	− 4	—	—	e 11·1
Florissant		22·0	50	e 4 58	0	e 8 56	0	—	—	(11·0)
St. Louis		22·0	50	e 4 57	− 1	e 8 58	+ 2	—	—	e 11·1
Ottawa		34·7	47	i 6 54	0	—	—	—	—	17·9

Additional readings :—
Tucson S = +2m.38s.
St. Louis eN = +5m.0s., eEN = +8m.53s.
Long waves were also recorded at Chicago, Philadelphia, East Machias, Harvard, Williamstown, Toronto, Columbia, Berkeley, and Pittsburgh.

March 14d. Readings also at 0h. (Sydney, Tashkent, Brisbane, La Paz, Riverview, and Wellington), 1h. (Sverdlovsk and La Paz), 2h. (Palomar, near Triest, Ksara, Tucson (3), Riverside, Mount Wilson, Pasadena, Haiwee, and Tinemaha), 4h. (Bombay, Sverdlovsk, Wellington, Riverview, and Brisbane), 5h. (near Mizusawa), 8h. (Lincoln), 14h. (Tucson), 15h. (Huancayo), 16h. (near Mizusawa), 17h. (St. Louis, Tucson, Riverview, Tinemaha, Haiwee, Pasadena, Mount Wilson, Riverside, and Salt Lake City), 18h. (Jena and Tucson), 20h. (Pennsylvania), 21h. (New Plymouth, Tucson, and Wellington (2)), 22h. (Harvard, East Machias, Philadelphia, Chicago, Florissant, Butte, Bozeman, Santa Clara, Tucson, Salt Lake City, Riverside, Mount Wilson, Pasadena, and Tinemaha).

March 15d. 5h. 28m. 4s. Epicentre 25°·8N. 143°·4E. (as on 1938 Jan. 1d.).

$A = -·7237$, $B = +·5375$, $C = +·4329$; $\delta = +5$; $h = +3$;
$D = +·596$, $E = +·803$; $G = -·348$, $H = +·258$, $K = -·902$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Manila		23·8	247	e 5 19	+ 4	9 43	+15	—	—	12·4
Hong Kong		26·9	270	5 41	− 4	10 36	+16	—	—	—
Phu-Lien		34·1	270	e 6 46	− 2	—	—	—	—	—
Irkutsk		39·5	323	e 7 51	+17	—	—	e 9 40	PPP	18·0
Calcutta	N.	50·0	279	e 8 33	−25	—	—	—	—	—
Agra	E.	57·9	287	e 9 32	−24	17 43	−12	21 57	SS	—
College		57·9	27	—	—	e 23 59	SSS	—	—	—
Tchimkent		61·6	306	10 20	− 2	18 30	−13	—	—	—
Tashkent		61·9	305	e 10 17	− 7	e 18 32	−15	—	—	e 27·5
Kodaikanal	E.	64·0	270	e 10 36	− 2	—	—	—	—	—
Bombay		65·0	280	e 10 43	− 1	i 19 36	+10	—	—	—
Sverdlovsk		65·3	323	i 10 38	− 8	i 19 11	−18	—	—	21·4
Baku		76·3	309	e 11 56	+ 4	e 21 30	− 7	—	—	38·9
Moscow		77·4	326	11 55	− 3	21 39	−10	—	—	—
Pulkovo		78·8	332	e 12 3	− 3	e 21 52	−12	—	—	—
Santa Barbara	z.	81·1	56	i 12 27	+ 9	—	—	—	—	—
Tinemaha		81·1	53	e 12 23	+ 5	—	—	—	—	—
Haiwee		81·7	54	e 12 24	+ 2	—	—	—	—	—
Mount Wilson	z.	82·4	56	i 12 30	+ 5	—	—	—	—	—
Pasadena		82·4	56	e 12 35	+10	—	—	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Riverside	z.	83·1	56	e 12 36	+ 7	—	—	—	—	—
Palomar	z.	83·7	56	e 12 40	+ 8	—	—	—	—	—
Ksara		89·2	307	e 13 4	+ 5	e 25 34	PS	e 16 32	PP	—
Tucson		89·3	55	i 13 8	+ 9	—	—	—	—	—
Granada		110·1	332	19 27	PP	e 29 26	PPS	21 40	PPP	59·9
La Paz	z.	149·2	78	20 0	[+14]	—	—	—	—	—

Additional readings :—
Bombay e = +18m.59s.
Sverdlovsk i = +10m.46s.
Mount Wilson iZ = +12m.36s.
Palomar eZ = +12m.44s.
Ksara e = +13m.27s.
Granada PPP = +24m.22s., SS = +34m.41s.
Long waves were also recorded at Salt Lake City, Uccle, Kew, Huancayo, Rome, De Bilt, Warsaw, Bidston, Hamburg, and Potsdam.

March 15d. 12h. Local Japanese shock. Tokyo Imperial University gives Epicentre 35°·41N. 140°·00E.

Kamakura P = 34m.8s., S = 34m.19s.
Kiyosumi P = 34m.8s., S = 34m.17s.
Komaba P = 34m.8s., S = 34m.17s.
Koyama P = 34m.8s., S = 34m.23s.
Titibu P = 34m.8s., S = 34m.23s.
Togane P = 34m.8s., S = 34m.18s.
Tokyo Imp. Univ. P = 34m.8s., S = 34m.16s.
Tukubasan P = 34m.8s', S = 34m.21s.
Yosiwara P = 34m.8s., S = 34m.25s.

March 15d. Readings also at 0h. (Jena), 1h. (Christchurch, Ivigtut, and near Balboa Heights), 2h. (Chicago and Toledo), 4h. (Tucson), 13h. (Tucson, Hunacayo, Riverside, Pasadena, Mount Wilson, and Tinemaha), 14h. (Brisbane, Adelaide, Sydney, and Riverview), 15h. (Calcutta, Perth, and Wellington), 20h. (La Plata), 22h. (near La Paz), 23h. (Triest).

March 16d. 20h. 40m. 33s. Epicentre 54°·5N. 158°·0W. (as on 1938 Dec. 19d.).

A = −·5408, B = −·2185, C = +·8123 ; δ = +4 ; h = −7 ;
D = −·375, E = +·927 ; G = −·753, H = −·304, K = −·583.

		Δ	Az.	P.	O−C.	S.	O−C.	L.
		°	°	m. s.	s.	m. s.	s.	m.
College		11·6	22	—	—	e 4 17	−44	e 5·0
Victoria		22·2	92	e 5 27?	PP	e 8 57	− 3	10·5
Santa Clara	E.	29·9	109	i 7 1	PP	i 10 47	−22	—
Bozeman		30·9	87	e 7 43	PPP	e 11 18	− 6	e 13·9
Tinemaha		32·2	106	i 6 34	+ 2	—	—	—
Haiwee		33·0	107	i 6 40	+ 1	—	—	—
Mount Wilson		34·4	110	e 6 51	0	—	—	—
Pasadena		34·4	110	e 6 49	− 2	—	—	e 16·4
Riverside		34·9	110	i 6 55	0	—	—	—
Tucson		39·9	105	i 7 38	+ 1	—	—	e 19·9
Chicago		46·6	76	e 9 37	PcP	—	—	e 17·9
Florissant	E.	47·1	81	—	—	e 15 13	−15	—
Ottawa		50·8	65	i 8 58	− 6	—	—	24·5
Irkutsk		53·6	312	e 9 27	+ 2	—	—	e 28·5
Sverdlovsk		64·7	339	i 10 39	− 3	e 19 21	− 1	31·5
Pulkovo		65·9	354	e 10 46	− 4	e 19 43	+ 6	—
Moscow		69·4	352	e 11 9	− 3	—	—	41·5
Tashkent		76·3	326	e 11 51	− 1	e 21 31	− 6	38·5
Baku		82·5	340	e 12 32	+ 6	e 22 44	+ 2	40·8
Ksara		91·2	349	e 13 2	− 6	e 23 52	−13	—

Additional reading :—
Sverdlovsk i = +10m.47s.
Long waves were also recorded at Kodaikanal, Granada, Agra, Rome, De Bilt, Uccle, Ukiah, and Warsaw.

March 16d. Readings also at 0h. (Triest (2)), 1h. (Triest, Ksara, Huancayo, near Mizusawa, Riverview, Wellington, and Sydney), 2h. (Triest, Huancayo, and Granada), 3h. (Triest and near Mizusawa), 5h. (Tucson), 7h. (Granada, Potsdam, Kew, Bidston, Rome, and De Bilt), 9h. (Balboa Heights), 16h. (Tucson and near Mizusawa), 17h. (near Manila), 18h. (near Fordham and Williamstown), 20h. (Wellington, La Paz, Riverside, Pasadena, Mount Wilson, Tinemaha, Tucson, Huancayo, and Ksara), 22h. (near Ferndale), 23h. (Salt Lake City).

March 17d. 9h. 8m. 51s. Epicentre 38°·0N. 43°·0E.

$A = +\cdot5778$, $B = +\cdot5388$, $C = +\cdot6131$; $\delta = +5$; $h = -1$;
$D = +\cdot682$, $E = -\cdot731$; $G = +\cdot448$, $H = +\cdot418$, $K = -\cdot790$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Erevan		2·5	28	0 44	+ 1	1 17	+ 3	1 34	S_g	
Grozny		5·7	20	—	—	2 7	−28	—	—	—
Baku		5·8	64	1 52	P_g	3 15	S_g	—	—	4·2
Piatigorsk		6·0	0	1 32	0	—	—	—	—	—
Ksara		7·1	237	e 1 49	+ 1	e 3 5	− 5	i 3 50	S_g	—
Helwan		12·6	233	e 3 3	0	5 42	SS	3 15	PP	7·0
Sofia		15·7	293	e 3 45	+ 1	—	—	—	—	e 9·0
Moscow		18·1	351	4 10	− 4	e 7 39	+ 4	—	—	—
Tashkent		20·5	73	4 46	+ 4	8 36	+ 9	—	—	—
Sverdlovsk		22·2	27	4 57	− 3	8 58	− 2	—	—	11·1
Pulkovo		23·2	345	e 5 11	+ 2	9 27	+ 9	—	—	—
Agra	E.	31·3	100	—	—	e 11 53	+22	—	—	—

Additional reading :—
Baku $S_g = +3$m.53s.
Long waves were also recorded at Bombay, Triest, Bucharest, Irkutsk, De Bilt, Granada, and Uccle.

March 17d. 15h. 8m. 27s. Epicentre 42°·5N. 82°·5E. (as on 1939 July 6d.).

$A = +\cdot0965$, $B = +\cdot7332$, $C = +\cdot6731$; $\delta = -4$; $h = -3$;
$D = +\cdot991$, $E = -\cdot131$; $G = +\cdot088$, $H = +\cdot667$, $K = -\cdot740$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Almata		4·2	284	1 13	P*	i 2 29	S_g	—	—	—
Frunse		5·8	266	1 37	P*	3 25	S_g	—	—	—
Andijan		7·8	260	2 0	+ 2	—	—	—	—	4·4
Semipalatinsk		8·1	351	2 3	+ 1	3 45	+10	—	—	—
Tchimkent		9·6	275	1 53	−28	3 15	−57	—	—	—
Samarkand		12·0	263	e 2 52	− 3	—	—	—	—	—
Dehra Dun	N.	12·6	197	e 5 21?	S	(e 5 21?)	− 5	—	—	e 8·9
Agra	E.	15·8	195	e 3 39	− 6	e 6 12	−30	—	—	—
Sverdlovsk		20·0	325	1 4 38	+ 1	—	—	10 57	L_q	12·4
Calcutta	N.	20·5	164	e 4 18	−24	i 8 9	−18	—	—	—
Bombay		24·9	202	—	—	e 9 39	− 8	—	—	e 13·4
Grozny		26·8	285	e 5 49	+ 5	—	—	—	—	—
Sotchi		31·1	287	6 8	−14	—	—	—	—	—
Moscow		31·6	311	6 28	+ 2	11 44	+ 9	—	—	—
Kodaikanal	E.	32·5	190	—	—	e 11 33?	−16	—	—	—
Pulkovo		35·9	318	e 7 4	0	e 12 48	+ 6	—	—	e 19·5
Ksara		37·3	272	e 8 7	+51	e 14 53	SS	—	—	—
Potsdam		46·3	307	—	—	e 20 33	SSS	—	—	25·2

Additional reading :—
Agra SSE? = +6m.33s.
Long waves were also recorded at Prague, Upsala, Warsaw, Irkutsk, Hamburg, and De Bilt.

March 17d. Readings also at 2h. (Granada), 5h. (Zurich, Balboa Heights, Huancayo, and La Paz), 8h. (near Mizusawa and Calcutta), 11h. (near La Paz, New Plymouth, Wellington, Christchurch, and Tuai), 12h. (Pasadena, Mount Wilson, and Tucson), 13h. (Ksara), 16h. (Tucson), 17h. (Tucson, Prague, Hastings, Riverside, Tinemaha, Mount Wilson, Pasadena, New Plymouth, Wellington, Christchurch, and Tuai), 19h. (Sitka).

March 18d. 5h. 39m. 9s. Epicentre 31°·8S. 178°·7W.

$A = -\cdot8513$, $B = -\cdot0193$, $C = -\cdot5244$; $\delta = +8$; $h = +1$;
$D = -\cdot023$, $E = +1\cdot000$; $G = +\cdot524$, $H = +\cdot012$, $K = -\cdot852$.

Tables for depth of focus 0·010 have been used.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Arapuni		7·8	215	2 27	+35	4 15	+55	—	—	i 6·6
Tual		7·8	205	1 51	− 1	3 18	− 2	—	—	—
New Plymouth		9·3	217	2 16	+ 3	4 51	SS	—	—	—
Wellington		10·8	207	2 31	− 2	4 27	− 5	—	—	5·9
Christchurch		13·6	208	e 3 20	+10	e 5 33	− 6	e 5 57	SS	—
Brisbane		24·9	274	e 5 9	− 6	e 9 51	sS	e 5 21	pP	—
Sydney		25·3	257	e 5 21	+ 2	—	—	—	—	e 12·9
Riverview		25·4	257	e 5 19	− 1	e 9 52	sS	e 6 7	PP	e 12·7
Santa Barbara	z.	86·1	45	e 12 23	− 8	—	—	—	—	—
La Jolla	z.	86·6	48	e 12 34	0	—	—	—	—	—
Pasadena		86·9	46	e 12 35	0	—	—	e 16 7	PP	e 38·7
Berkeley		87·0	42	i 12 37	+ 1	e 23 14	+10	—	—	e 40·1
Mount Wilson		87·0	46	i 12 34	− 2	—	—	—	—	—
Palomar	z.	87·2	48	i 12 35	− 1	—	—	—	—	—
Riverside		87·3	46	e 12 36	− 1	—	—	—	—	—
Ukiah		87·4	40	e 13 1	+24	e 23 19	+11	e 24 19	PS	e 36·3
Haiwee		88·3	45	e 12 42	0	—	—	—	—	—
Tinemaha		88·8	44	e 12 44	0	—	—	—	—	—
Tucson		90·4	52	i 12 52	0	e 23 59	S_eS	e 16 18	PP	e 37·4
Victoria		94·0	33	—	—	e 23 33	[+ 3]	—	—	42·9
Huancayo		94·8	107	e 13 42	+30	e 23 50	[+14]	26 25	PPS	e 38·2
Salt Lake City		95·0	44	e 13 25	+12	e 23 43	[+ 5]	e 19 21	PPP	e 39·2
Butte		97·8	40	e 13 23	− 3	e 24 39	0	—	—	e 42·2
La Paz	z.	98·0	115	i 13 12	−14	i 26 17	PS	—	—	45·9
Bozeman		98·5	41	e 17 31	PP	e 24 6	[+ 9]	e 26 20	PS	e 40·5
College		99·3	12	—	—	e 24 58	+ 6	e 26 16	PS	e 40·8
Kodaikanal	E.	107·0	272	e 22 51?	PKS	—	—	—	—	—
Chicago		111·1	52	—	—	e 25 55	[+62]	e 38 38	SSS	e 45·5
Bombay		115·1	278	—	—	e 29 26	PS	—	—	—
San Juan		118·4	85	e 14 54	P	e 30 2	PS	e 22 14	PPP	e 48·9
Ottawa		120·5	52	i 18 41	[0]	e 29 51?	PS	e 36 51?	SS	49·9
Ksara		151·0	283	i 19 38a	[+ 2]	36 47	PPS	e 23 22	PP	—
Helwan	z.	154·2	273	i 19 42a	[+ 2]	—	—	i 20 6	pPKP	—
Stuttgart	z.	162·0	342	e 19 51	[+ 1]	—	—	—	—	—
Triest		163·1	329	e 19 59	[+ 8]	—	—	—	—	81·3
Rome		166·5	322	e 19 43	[−11]	e 47 19	SSP	—	—	—
Toledo		170·9	26	e 19 59	[+ 3]	—	—	e 25 5	PP	—
Granada		173·3	35	e 20 4a	[+ 6]	27 23	[+34]	46 47	SS	18·7
Almeria		174·2	30	19 11	[−47]	—	—	—	—	—

Additional readings :—
Christchurch iEZ = +6m.37s.
Brisbane eE = +9m.57s.
Riverview iE = +5m.56s.
Ukiah eSSS = +32m.19s.
Tucson iP = +12m.59s., ePPP = +18m.39s., PS = +24m.56s., eSS = +30m.1s.
Victoria eN = +24m.21s.
Huancayo eSS = +30m.14s.
Salt Lake City eS = +24m.19s. and +24m.26s., ePPS = +26m.43s., eSS = +30m.31s.
Butte eS = +25m.1s.
Bozeman eS = +25m.6s.
College eSS = +31m.41s.
San Juan ePSPS = +36m.37s.
Ksara PSKS = +33m.46s.
Toledo $ePKP_2$ = +21m.17s.
Granada PKP_2 = +21m.32s., PPP = +31m.24s., SKSP = +36m.52s., eSSS = +56m.15s.
Almeria e = +21m.10s. and +22m.31s.
Long waves were also recorded at Kew, Potsdam, Agra, Stonyhurst, De Bilt, Santa Clara, Bermuda, Warsaw, East Machias, Clermont-Ferrand, Philadelphia, Ivigtut, Columbia, Uccle, and Bidston.

March 18d. Readings also at 0h. (Harvard), 3h. (Haiwee, Stuttgart, Triest, Rome, Potsdam, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Sofia, and Bucharest), 5h. (La Plata), 10h. (Ksara, Bucharest, Sofia, Tucson, Tinemaha, Riverside, Palomar, Pasadena, and Mount Wilson), 13h. (Mizusawa), 14h. (near Fresno and Berkeley), 17h. (Warsaw), 21h. (near Williamstown), 22h. (Chicago).

March 19d. 4h. 35m. 57s. Epicentre 36°·3N. 71°·0E. (as on 1940 Feb. 8d.).

Intensity VII at Drosh, VI at Srinagar, V at Kabul, IV at Peshawar.

Epicentre 36°·5N. 70°·0E. depth = 150km. (Bombay).
35°·7N. 70°·0E. (Strasbourg and Pasadena).

See Government of India Seismological Bulletin, 1940, p. 24.

$A = +\cdot2630$, $B = +\cdot7638$, $C = +\cdot5894$; $\delta = -5$; $h = 0$;
$D = +\cdot946$, $E = -\cdot326$; $G = +\cdot192$, $H = +\cdot557$, $K = -\cdot808$.

Tables for depth of focus 0·010 have been used.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Andijan		4·6	14	1 13	+ 4	—	—	—	—	—
Samarkand		4·6	319	1 2	− 7	—	—	—	—	—
Tashkent		5·2	347	i 1 17	0	—	—	—	—	—
Tchimkent		6·1	351	1 28	− 1	—	—	—	—	—
Frunse		7·1	22	1 48	+ 5	—	—	—	—	—
Almata		8·3	32	2 5	+ 6	—	—	—	—	—
Dehra Dun	N.	8·4	133	e 2 2	+ 2	i 3 27	− 7	—	—	14·5
Agra	E.	10·9	145	i 2 27	− 7	4 21	−14	2 56	PPP	5·5
Semipalatinsk		15·6	22	—	—	6 31	+ 5	—	—	—
Baku		17·0	290	3 51	− 2	i 6 55	− 2	—	—	8·7
Bombay		17·4	174	i 3 50	− 8	i 6 57	− 9	i 4 35	PPP	i 8·8
Hyderabad		19·9	159	4 25	− 1	7 49	−11	8 6	sS	9·6
Calcutta	N.	20·4	127	i 4 37	+ 6	i 8 24	+15	e 5 0	pP	—
Erevan		21·1	288	4 36	− 2	—	—	—	—	—
Sverdlovsk		21·7	345	i 4 43	− 1	i 8 37	+ 4	i 5 16	pP	11·0
Piatigorsk		22·6	300	5 2	+ 9	—	—	—	—	—
Sotchi		25·0	298	5 14	− 2	—	—	—	—	15·2
Kodaikanal	E.	26·6	166	e 5 32	+ 1	i 9 58	+ 1	i 10 43	SS	i 12·2
Irkutsk		28·4	44	6 16	pP	11 6	sS	i 6 50	PP	11·9
Ksara		28·8	275	e 5 50	− 1	e 10 29	− 3	i 6 18	pP	—
Sebastopol		29·5	299	6 3	+ 6	11 1	+18	—	—	—
Moscow		29·8	321	5 57	− 3	10 47	− 1	6 29	pP	13·8
Colombo	E.	30·4	163	e 4 38	?	10 53	− 4	—	—	—
Helwan		33·7	270	e 6 27	− 7	13 9	sS	6 57	pP	—
Phu-Lien		34·7	106	e 6 47	+ 5	12 11	+ 7	—	—	—
Pulkovo		35·1	325	e 6 42	− 4	e 12 7	− 3	i 7 16	pP	e 16·9
Sofia		36·9	295	—	—	e 12 33	− 5	—	—	—
Warsaw		38·3	311	e 7 9	− 3	i 12 13	−46	i 7 40	pP	16·0
Kecskemet		39·2	302	e 7 18	− 2	—	—	—	—	—
Budapest		39·6	303	7 21	− 2	i 13 18	− 1	i 8 53	PP	e 16·0
Hong Kong		39·8	98	7 28	+ 3	13 34	+12	—	—	—
Upsala		41·2	322	e 7 35	− 1	e 13 39	− 4	e 9 14	PP	e 21·0
Prague		42·5	308	e 9 24	PP	e 13 9	−53	—	—	—
Potsdam		43·2	311	i 7 48	− 5	e 14 7	− 5	i 8 22	pP	—
Triest		43·3	301	7 50	− 4	i 14 7	− 6	9 5	PP	e 18·6
Copenhagen		43·6	315	i 7 52	− 4	14 15	− 3	15 6	sS	—
Jena		44·2	308	e 7 57	− 4	e 14 57	+31	e 9 33	PP	e 16·0
Keizyo		44·2	71	8 29	pP	—	—	—	—	—
Hamburg		45·0	313	e 8 46	pP	e 18 5	SS	—	—	—
Rome		45·0	296	e 8 0 s	− 7	i 14 30	− 8	i 8 34	pP	e 21·3
Stuttgart		46·0	306	e 8 14	− 1	e 14 38	−14	e 8 42	pP	—
Vladivostok		46·4	62	e 8 40	pP	i 15 28	sS	—	—	24·6
Strasbourg		47·0	306	e 8 35	+12	—	—	—	—	—
Bergen		47·4	323	—	—	e 18 51	SS	—	—	—
De Bilt		48·1	312	—	—	e 15 19	− 3	—	—	e 23·0

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Uccle		48·8	310	e 9 20	+43	i 15 28	− 4	e 19 26	SS	e 24·0
Manila		49·4	103	i 8 47	+ 5	i 15 53	+13	—	—	24·0
Miyazaki		49·5	77	9 1	+19	15 37	− 4	—	—	—
Paris		50·4	307	—	—	e 18 4	?	—	—	24·2
Koti		50·5	74	8 54	+ 4	16 7	+12	—	—	—
Clermont-Ferrand		50·7	303	e 9 48	pP	—	—	—	—	—
Kew		51·6	312	—	—	e 16 8	− 2	e 20 39	SSS	e 28·6
Osaka		51·6	71	9 3	+ 5	16 41	sS	—	—	—
Stonyhurst		52·3	315	—	—	e 20 3?	SS	—	—	—
Sikka		52·6	51	9 0	− 6	16 26	+ 2	—	—	—
Nagoya		52·6	70	9 9	+ 3	—	—	—	—	—
Bidston		52·8	315	—	—	e 16 12	−15	e 20 40	SSS	e 28·0
Nagano		53·0	68	9 18	+ 9	—	—	—	—	—
Scoresby Sund		57·2	337	—	—	18 25	+60	e 22 19	SSS	—
Toledo		57·5	298	i 9 35	− 6	e 17 29	0	e 10 20	pP	21·0
Almeria		57·6	294	e 7 47	?	i 17 11	−20	e 11 3	PP	—
Victoria		94·7	9	—	—	e 23 39	[+ 4]	—	—	49·1
Brisbane		99·9	117	—	—	i 33 21	?	e 35 3	SSS	—
Riverview	N.	102·2	122	—	—	e 39 27	?	—	—	e 45·6
Tinemaha	Z.	106·5	7	e 18 38	PP	—	—	—	—	—
Mount Wilson	Z.	109·3	7	e 18 9	[−10]	—	—	—	—	—
Pasadena	Z.	109·4	7	e 18 12	[− 7]	—	—	e 19 9	PP	e 57·1
Tucson		111·8	1	e 18 20	[− 3]	—	—	e 20 12	PP	e 57·8

Additional readings :—
Agra P_z = +3m.23s., S* = +4m.51s.
Bombay i = +4m.5s., +5m.36s., +7m.12s., +7m.29s., and +8m.5s.
Calcutta esPN = +5m.20s., isSN = +9m.3s.
Sverdlovsk iPS = +9m.10s.
Ksara i = +11m.19s.
Moscow sP = +6m.40s., pS = +11m.19s., sS = +11m.55s.
Helwan PPZ = +8m.8s., iE = +11m.33s., and +12m.33s., sSE = +14m.3s., SSN = +16m.43s.
Pulkovo pS = +12m.40s.
Sofia eEN = +11m.33s.
Warsaw iSSE = +13m.32s., iZ = +16m.8s. and +16m.29s.
Upsala iE = +11m.35s., eSSN = +16m.3s.?, eSSSE = +16m.46s.
Potsdam ePPN = +9m.21s., iZ = +9m.34s., iPPPE = +9m.46s., iPPSE = +14m.14s., iZ = +16m.24s., iSSE = +17m.25s., iSSSN = +17m.44s.
Triest PPP = +9m.29s., isS = +14m.45s., eSSS = +17m.30s.
Copenhagen +8m.26s., +9m.57s., and +14m.44s.
Rome i = +8m.6s., iPS?N = +15m.6s., eSSN = +17m.40s., iN = +18m.5s.
Stuttgart i = +9m.20s., ePPEN = +9m.47s., eSSE = +17m.53s.
Strasbourg e = +8m.39s.
Kew eN = +20m.49s.
Bidston e = +21m.2s.
Almeria i = +12m.3s., S = +15m.9s., i = +15m.43s.
Brisbane iEN = +37m.21s.
Long waves were also recorded at Wellington.

March 19d. Readings also at 0h. (near San Francisco, Berkeley (2), and Fresno; Harvard, San Juan, and Salt Lake City), 3h. (Tucson), 6h. (Chicago, Salt Lake City, and Tucson), 6h. (La Plata), 8h. (Tucson, Salt Lake City, Mount Wilson, near Mizusawa, and Pasadena), 9h. (near Mizusawa), 10h. (Manila, Mount Wilson, Pasadena, Brisbane, and Riverview), 11h. (Lincoln, Riverview, La Paz, and Wellington), 14h. (Chatham Ils., Bunnythorp, Arapuni, Wellington, Hastings, Tuai (2), New Plymouth (2), and Christchurch), 15h. (Kodaikanal, Bombay, Tuai, New Plymouth, Riverview, Brisbane, Huancayo, and Ksara), 16h. (Port au Prince), 17h. (Tucson, New Plymouth, Tuai, Wellington, Hastings, and Christchurch), 18h. (Ksara, La Paz, and near Mizusawa), 19h. (Fordham), 23h. (La Paz, Tucson, Huancayo, La Jolla, Mount Wilson, Pasadena, Santa Barbara, Haiwee, Palomar, St. Louis, Bozeman, Riverside, Tinemaha, and Calcutta).

March 20d. 0h. 35m. 40s. Epicentre 46°·9N. 134°·8W.

A = −·4832, B = −·4866, C = +·7279; δ = +10; h = −4;
D = −·710, E = +·705; G = −·513, H = −·517, K = −·686.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Seattle		8·5	80	e 2 9	+ 2	—	—	—	—	—
Sitka		10·1	359	—	—	e 4 17	− 8	—	—	—
Ukiah		11·4	126	e 2 50	+ 3	—	—	—	—	—
Branner	N.	13·3	131	e 3 28	+15	—	—	—	—	—
Fresno	N.	15·1	127	e 3 39	+ 3	—	—	e 3 50	PP	—
Butte		15·3	83	—	—	e 6 57	SS	—	—	—
Tinemaha		15·7	122	e 3 44	0	—	—	—	—	—
Haiwee		16·4	124	e 3 57	+ 4	—	—	—	—	—
Bozeman		16·5	85	—	—	e 7 37	SSS	—	—	—
Santa Barbara		16·9	132	e 4 7	+ 8	—	—	—	—	—
Mount Wilson		17·9	129	e 4 13	+ 1	—	—	—	—	—
Pasadena		17·9	129	e 4 16	+ 4	—	—	—	—	—
Riverside	Z.	18·4	129	e 4 16	− 2	—	—	—	—	—
Palomar	Z.	19·2	127	e 4 26	− 2	—	—	—	—	—
College		19·3	344	e 4 30	+ 1	e 8 5	+ 3	—	—	e 10·0
Tucson		23·4	119	e 5 5	− 6	e 9 28	+ 7	e 5 44	PP	e 10·9
St. Louis	N.	33·4	88	e 8 27	PPP	—	—	—	—	e 15·8
Rome		86·9	24	—	—	e 27 20?	?	—	—	—
Bombay		109·9	332	—	—	e 35 3	SSP	—	—	—

Additional readings :—
Sitka eS = +4m.21s.
Ukiah eP = +2m.55s.
Branner eE = +3m.31s.
College eS = +8m.9s.
Tucson P = +5m.8s. and +5m.13s.
Long waves were also recorded at Fordham, Chicago, Philadelphia, East Machias, Columbia, Harvard, and Lincoln.

March 20d. 2h. 45m. 27s. Epicentre 46°·9N. 134°·8W. (as at 0h.).

A = −·4832, B = −·4866, C = +·7279; δ = +10; h = −4.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Seattle		8·5	80	(e 2 6)	− 1	e 2 6	P	—	—	2·2
Sitka		10·1	359	—	—	e 4 3	−22	—	—	—
Ukiah		11·4	126	e 2 51	+ 4	e 4 54	− 2	e 5 8	SS	—
Berkeley		12·9	129	e 3 9	+ 2	e 5 35	+ 2	1 3 25	PP	—
Santa Clara	E.	13·5	131	e 4 17	+62	1 6 12	SS	—	—	—
Fresno	N.	15·1	127	e 3 38	+ 2	—	—	—	—	—
Butte		15·3	83	—	—	e 5 0	?	—	—	e 6·1
Tinemaha	N.	15·7	122	e 3 41	− 3	—	—	—	—	—
Haiwee		16·4	124	e 3 53	0	—	—	—	—	—
Bozeman		16·5	.85	—	—	e 6 0	−58	—	—	e 7·3
Santa Barbara	Z.	16·9	132	e 4 4	+ 5	—	—	—	—	—
Salt Lake City		17·6	102	e 3 40	−28	e 6 49	−34	—	—	e 7·8
Mount Wilson		17·9	129	e 4 14	+ 2	—	—	—	—	—
Pasadena		17·9	129	e 4 14	+ 2	—	—	—	—	e 7·6
Riverside		18·4	129	e 4 18	0	—	—	—	—	—
College		19·3	344	e 4 34	+ 5	e 8 2	0	—	—	e 9·1
Tucson		23·4	119	e 5 3	− 8	e 9 9	−12	e 5 32	PP	e 9·7
Lincoln		27·9	88	—	—	e 10 0	−37	—	—	e 12·7
St. Louis		33·4	88	e 6 27	−15	—	—	—	—	e 11·5

Additional readings :—
Sitka eS = +4m.15s.
Salt Lake City eP = +3m.45s.
College eS = +8m.6s.
Tucson eP = +5m.6s., P = +5m.19s., PPP = +5m.42s.
Lincoln iS = +10m.5s.
Long waves were also recorded at Rome, Fordham, Philadelphia, East Machias, Columbia, Harvard, Scoresby Sund, and Chicago.

March 20d. Readings also at 0h. (Ukiah, Butte, Salt Lake City, College, Toledo, Granada, San Juan, La Paz, Ksara, and Tucson), 7h. (near Tuai), 8h. (near Mizusawa), 10h. (Colombo and Tucson), 11h. (Jena (2)), 13h. (near Dehra Dun, Agra, Kodaikanal, Calcutta, Hyderabad, Bombay, Colombo, Palomar, Pasadena, Riverside, Mount Wilson, and Tinemaha), 15h. (Ksara), 16h. (Tucson), 18h. (Tucson), 19h. (Ksara), 21h. (Tucson), 22h. (Tucson), 23h. (Lincoln).

March 21d. 13h. 52m. 51s. Epicentre 10°·5S. 107°·4E.

Intensity IV at Java and at Christmas Island.

Epicentre 9°·6S. 108°·7E. (Batavia).
10°·1S. 108°·2E. (U.S.C.G.S.).

See Annales de l'Institut de Physique du Globe de Strasbourg, Tome V, 2e partie, Seismologie 1940, Strasbourg 1948, p. 7.

$A = -\cdot2941$, $B = +\cdot9385$, $C = -\cdot1811$; $\delta = +7$; $h = +6$;
$D = +\cdot954$, $E = +\cdot299$; $G = +\cdot054$, $H = -\cdot173$, $K = -\cdot984$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Perth		22·7	161	5 4	0	i 9 16	+ 7	5 29	PP	11·1
Manila		28·3	28	i 5 54a	− 3	i 11 13	+30	—	—	15·2
Phu-Lien		31·1	358	i 6 22	0	e 11 23	− 5	—	—	—
Colombo	E.	32·4	301	i 6 38	+ 4	11 49	+ 1	—	—	20·7
Hong Kong		33·3	11	6 39	− 2	11 57	− 5	7 49	PP	—
Kosyun		34·9	22	6 57	+ 2	—	—	—	—	—
Kodaikanal	E.	36·2	304	i 7 9a	+ 3	i 12 49	+ 2	8 31	PP	18·2
Adelaide		37·4	136	7 30?	+14	12 59	− 6	14 46	SS	18·8
Calcutta	N.	37·7	331	e 7 16	− 3	i 13 6	− 4	e 9 39	PcP	i 18·6
Miyakozima		39·2	26	7 30	− 1	13 23	− 9	—	—	—
Hyderabad		39·9	314	7 36	− 1	13 40	− 3	9 12	PP	19·7
Zi-ka-wei	N.	43·6	17	e 8 5	− 3	i 18 5	SSS	—	—	—
Bombay		44·9	310	i 8 21	+ 3	i 14 51	− 5	i 9 13	PP	21·3
Brisbane	E.	46·0	118	i 8 27	0	i 15 9	− 3	i 10 15	PP	e 18·4
Riverview		46·2	127	i 8 26k	− 2	e 18 20	SS	i 10 15	PP	e 23·8
Sydney		46·3	127	e 8 21	− 8	e 18 39	SS	—	—	e 23·8
Agra	E.	47·0	324	8 37	+ 2	i 15 22	− 4	8 50	pP	22·2
Dehra Dun	N.	49·0	327	e 8 47	− 3	e 15 45	−10	—	—	e 24·9
Koti		50·4	29	9 3	+ 2	16 2	−12	—	—	—
Nagano		55·2	30	9 39	+ 2	17 8	−12	—	—	—
Tokyo Cent. Met. Obs.		55·2	32	10 30	+53	17 37	+17	—	—	—
Tananarive	E.	58·3	254	—	—	e 19 0	+59	—	—	e 29·8
Andijan		60·4	330	i 10 12	− 1	18 22	− 6	—	—	—
Frunse		61·0	333	i 10 17	− 1	—	—	—	—	—
Sapporo		61·7	27	10 27	+ 5	18 34	−10	—	—	—
Samarkand		62·4	325	i 10 24	− 3	—	—	—	—	—
Tashkent		62·4	328	i 10 25	− 2	—	—	—	—	—
Irkutsk		62·6	358	i 10 41	+13	i 19 5	+ 9	—	—	29·1
Semipalatinsk		65·1	343	i 10 43	− 2	19 23	− 4	—	—	—
Baku		73·3	318	—	—	i 21 0	− 4	—	—	36·1
Erevan		76·9	316	12 8	+12	22 6	PS	—	—	—
Sverdlovsk		77·2	336	i 11 56	− 1	i 21 44	− 3	—	—	34·1
Grozny		77·5	319	12 0	+ 1	21 56	+ 6	—	—	—
Piatigorsk		79·5	319	e 12 16	+ 6	e 22 18	+ 7	—	—	—
Ksara		80·8	307	i 12 18k	+ 1	e 22 26	+ 1	e 15 23	PP	39·1
Sotchi		81·6	318	12 21	0	22 35	+ 2	—	—	—
Cape Town		83·3	236	—	—	e 22 57	+ 7	e 28 3	SS	—
Helwan		83·3	302	i 12 30a	0	22 46	− 4	23 12	ScS	—
Sebastopol		86·1	317	e 12 40	− 4	e 23 15	− 3	16 1	PP	—
Moscow		87·6	328	12 50	− 1	23 27	− 5	16 16	PP	47·8
Istanbul		88·2	312	e 12 55	+ 1	—	—	—	—	—
Bucharest		91·1	315	e 13 11	+ 3	23 39	[0]	25 2	PS	—
Pulkovo		92·6	331	i 13 11	− 4	23 45	[− 3]	e 16 59	PP	e 42·4
Sofia		92·7	313	e 13 14	− 1	e 23 44	[− 4]	e 16 57	PP	—
Warsaw		96·0	322	e 13 47k	+17	(23 9)	[−58]	—	—	23·1

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Upsala		98·9	329	—	—	e 24 15	[− 6]	e 31 50	SS	e 48·1
Prague		99·9	319	e 17 55	PP	e 24 22	[− 4]	e 32 4	SS	e 55·1
Triest		100·0	315	18 5	PP	24 23	[− 4]	19 44	PPP	e 50·9
Rome		100·6	310	13 48k	− 3	i 24 28	[− 2]	i 17 58	PP	e 52·9
Potsdam		100·9	322	i 17 57	PP	e 25 25	− 3	e 27 40	PPS	e 47·6
Jena		101·7	320	—	—	i 37 13	SSS	—	—	e 37·3
Hamburg		102·8	323	e 18 15	PP	i 24 41	[+ 1]	—	—	e 53·1
Chur		103·0	316	e 16 53	?	—	—	—	—	—
Stuttgart		103·2	318	e 18 17	PP	e 24 26	[−16]	e 32 9	SS	—
Zurich		103·6	316	e 18 20	PP	—	—	—	—	—
Strasbourg		104·2	318	—	—	36 3	SSS	—	—	60·1
Neuchatel		104·7	316	e 18 18	PP	—	—	—	—	—
College		105·7	25	—	—	e 26 1	− 7	e 27 44	SP	—
De Bilt		105·7	322	e 18 40	PP	e 28 19	PS	e 20 57	PPP	e 56·1
Uccle		106·3	320	e 18 46	PP	e 27 54	PS	—	—	e 56·1
Clermont-Ferrand		107·4	314	—	—	29 49	PPS	—	—	—
Paris		107·6	318	e 18 44	PP	e 38 41	SSS	—	—	56·1
Kew		109·2	321	—	—	e 28 24	PS	—	—	e 60·1
Bidston		110·6	323	—	—	e 29 9	PPS	—	—	e 55·1
Jersey		110·6	319	—	—	e 28 39	PS	—	—	e 60·6
Almeria		112·1	305	e 18 45	[+ 8]	e 27 16	{+56}	—	—	—
Scoresby Sund		112·3	344	e 18 38	[+ 1]	e 28 52	PS	e 19 26	PP	e 48·3
Granada		113·0	306	i 18 45	[+ 6]	24 31	[−53]	29 40	PPS	56·6
Toledo		113·1	309	e 18 39	[0]	—	—	e 19 39	PP	—
Berkeley		127·9	49	i 19 7	[0]	—	—	e 22 31	?	—
Santa Clara		128·3	49	e 21 37	PPP	—	—	e 22 39	PKS	e 66·3
Santa Barbara		130·9	53	i 19 16	[+ 2]	—	—	i 22 36	PKS	—
Tinemaha		131·2	49	e 19 17	[+ 3]	—	—	e 22 37	PKS	—
Haiwee		131·8	50	i 19 16	[+ 1]	—	—	i 22 39	PKS	—
Bozeman		132·0	36	e 19 17	[+ 1]	e 39 16	SS	e 31 53	PS	e 55·3
Pasadena		132·2	53	i 19 16k	[0]	e 39 25	SS	i 22 41	PKS	—
Riverside		132·9	53	i 19 18k	[0]	—	—	i 22 42	PKS	—
Mount Wilson		133·1	53	e 19 6	[−12]	—	—	e 21 47	PP	—
La Jolla		133·4	54	e 19 19	[+ 1]	—	—	e 22 45	PKS	—
Palomar	z.	133·5	53	i 19 19	[0]	—	—	i 22 45	PKS	—
Salt Lake City		134·1	41	e 22 33	PKS	—	—	—	—	—
Tucson		138·7	52	e 19 18	[−10]	—	—	e 19 53	pPKP	—
Seven Falls		144·5	358	—	—	e 41 27	SS	—	—	62·1
Ottawa		145·1	4	i 19 38	[− 1]	—	—	e 22 52	PP	64·1
East Machias		145·6	353	e 19 39	[− 1]	e 41 40	SS	e 23 17	PP	e 58·4
Chicago		146·2	21	e 19 41	[0]	e 26 30	[−18]	23 56	sPP	—
Florissant		147·7	26	i 19 44	[+ 1]	e 42 14	SS	—	—	—
Williamstown		147·8	0	i 19 45	[+ 2]	—	—	23 18	PP	—
St. Louis		147·9	26	e 19 45	[+ 1]	e 42 3	SS	—	—	—
Pennsylvania		149·5	8	e 19 46	[− 1]	—	—	—	—	—
Pittsburgh		149·5	11	i 20 0	[+13]	i 42 30	SS	e 23 37	PP	—
Fordham		149·8	1	i 19 48s	[+ 1]	e 42 26	SS	i 23 32	PP	—
Philadelphia		150·6	3	e 19 52	[+ 4]	e 29 31	{−50}	e 23 31	PP	e 68·4
La Paz		152·8	190	i 19 52k	[+ 1]	43 19	SS	23 44	PP	79·1
Bermuda		157·2	343	e 19 51	[− 6]	e 30 30	{−28}	e 24 8	PP	73·8
Huancayo		157·4	173	e 19 50	[− 7]	e 26 35	[−27]	e 24 10	PP	—
San Juan		170·0	321	e 20 15	[+ 6]	26 56	[−16]	—	—	e 71·6

Additional readings :—
Perth P = +5m.7s., i = +6m.1s., +8m.14s., and +9m.29s., SS = +9m.56s., i = +10m.27s.
Colombo e?E = +6m.10s.
Hong Kong SS = +14m.8s.
Kodaikanal SSE = +15m.15s.
Adelaide PP = +7m.55s.
Calcutta eSSN = +15m.30s., eS_eSN = +17m.32s.
Hyderabad SSN = +16m.36s., S_eS = +17m.46s.
Bombay i = +10m.15s., e = +11m.4s., i = +15m.24s., iE = +18m.13s., L_g = +18m.27s.
Brisbane iPPPE = +11m.15s.
Riverview eE = +18m.49s.
Agra iE = +9m.14s., PPE = +10m.19s., PPPE = +11m.12s., isSE = +15m.47s., SSE = +18m.26s.

Continued on next page.

Ksara ePS = +23m.10s., eSS = +27m.52s.
Cape Town eN = +23m.2s.
Helwan eEZ = +13m.3s., PSE = +23m.39s.
Moscow PPP = +16m.44s., S_cS = +23m.57s., PPS = +24m.52s.
Bucharest SE = +24m.8s., SN = +24m.12s., PSN = +25m.7s.
Pulkovo ePPP = +19m.2s., S = +24m.14s., eSS = +30m.27s.
Triest cPP = +22m.33s., SKS = +28m.49s., PS = +30m.54s.
Rome iE = +25m.9s. and +25m.15s., S = +26m.0s., i = +28m.2s., iSSE? = +32m.17s., eN = +37m.46s.
Potsdam eN = +24m.33s., iSE = +25m.35s., iZ = +27m.46s.
College eSS = +33m.30s.
Almeria e = +23m.37s.
Scoresby Sund esPS = +29m.31s., ePPS = +30m.13s., eSS = +35m.7s., eSSS = +39m.49s.
Granada PPP = +21m.54s., iS = +26m.19s., SS = +35m.11s.
Santa Barbara iZ = +19m.23s.
Haiwee i = +22m.51s.
Bozeman epPP = +22m.18s., ePKS = +22m.40s., epPS = +32m.17s., eSPP = +31m.16s., ePPS = +34m.25s., eSSS = +43m.18s.
Pasadena iZ = +19m.24s. and +22m.53s.
Mount Wilson iPKP = +19m.17s.k, iZ = +19m.24s., iSKP = +22m.42s., iZ = +22m.55s.
Palomar iZ = +19m.26s.
Tucson PKP = +19m.29s., esPKP = +20m.2s., ePP = +22m.19s., esPP = +23m.0s.
East Machias eSSS = +46m.35s.
Chicago eSKKS = +29m.2s., epPS = +34m.8s., eSS = +41m.26s.
Florissant iPE = +19m.47s.
Williamstown +20m.20s.
St. Louis iPEN = +19m.48s., iEN = +19m.58s.
Pennsylvania i = +19m.56s.
Pittsburgh iZ = +20m.5s. and +20m.11s., eNW = +30m.21s. and +34m.5s.
Fordham iZ = +19m.52s., $iPKP_2Z$ = +19m.59s., eSSN = +42m.30s.
Philadelphia eSS = +42m.42s.
La Paz iZ = +20m.12s., $iPKP_2$ = +20m.25s., iZ = +21m.16s.
Bermuda esPKP = +20m.35s., ePSKS = +34m.25s., sSS = +44m.41s.
Huancayo sPKP = +20m.32s., pPP = +24m.31s., esPP = +24m.46s., eSKSP = +33m.49s., esSS = +44m.34s., eSSS = +48m.50s.
Long waves were also recorded at Stonyhurst, San Fernando, Bergen, Arapuni, and Wellington.

March 21d. Readings also at 0h. (near Agra and Kodaikanal), 3h. (Tucson and Salt Lake City), 10h. (near Mizusawa), 14h. (near Jena, Stuttgart, Ravensburg, Triest, Neuchatel, Zurich, and Chur), 15h. (Salt Lake City), 16h. (near Rome), 19h. (near Tananarive).

March 22d. 10h. 3m. 5s. Epicentre 36°·3N. 71°·0E. (as on 1940, March 19d.).

$A = +\cdot2630$, $B = +\cdot7638$, $C = +\cdot5894$; $\delta = -5$; $h = 0$.

Tables for depth of focus 0·010 have been used.

	Δ	Az.	P.	O−C.	S.	O−C.	L.
	°	°	m. s.	s.	m. s.	s.	m.
Andijan	4·6	14	1 4	− 5	e 1 51	−10	—
Samarkand	4·6	319	1 14	+ 5	2 44	+43	—
Tashkent	5·2	347	i 1 17	0	2 19	+ 3	—
Tchimkent	6·1	351	1 25	− 4	e 2 49	+11	—
Frunse	7·1	22	1 45	+ 2	e 3 1	− 2	—
Baku	17·0	290	—	—	e 8 1	SSS	—
Sverdlovsk	21·7	345	4 45	+ 1	e 8 45	+12	9·9

Additional readings :—
Andijan P_g = +1m.21s., S* = +2m.3s., S_g = +2m.17s.
Tashkent PS = +2m.8s.
Long waves were also recorded at Almata.

March 22d. 20h. Undetermined shock.

Epicentre, South Pacific.

Sydney e = 27m.12s., eL = 35·0m.
Riverview eE = 27m.18s., iE = 27m.37s., eLN = 34·0m.
Columbia e = 31m.27s.
Manila eP = 31m.32s., SN = 41m.40s., L = 52·5m.
La Jolla ePZ = 32m.9s.
Santa Barbara ePZ = 32m.9s.
Berkeley eZ = 32m.10s., eE = 32m.19s., iZ = 32m.40s., eN = 42m.11s., eE = 42m.15s.
Pasadena ePZ = 32m.12s., eLZ = 56·3m.
Mount Wilson iP = 32m.13s.
Palomar iPZ = 32m.15s.
Riverside iP = 32m.15s.
Haiwee eP = 32m.21s.
Tinemaha ePEN = 32m.23s.
Santa Clara iPN = 32m.28s., iSEN = 42m.32s., eLN = 56m.
Tucson iP = 32m.34s., i = 32m.39s., 32m.46s., and 33m.5s.
Huancayo e = 33m.8s., i = 44m.49s.
Honolulu e = 35m.45s.
College e = 36m.2s.
Colombo eE = 36m.30s.
Adelaide eN = 36m.47s., i = 38m.0s., 40m.20s., 41m.0s., and 41m.20s.
Warsaw eZ = 39m.48s., eLE = 102m.
Hamburg eZ = 39m.52s., eLE = 107m.
Potsdam iPKPZ = 39m.52s., iPPZ = 43m.31s., ePPN = 43m.35s., eLZ = 95·9m.
Ksara iPKP = 39m.53s.a, ePP = 43m.35s., PSKS = 53m.57s., PPS = 56m.53s.
De Bilt eZ = 39m.54s. and 43m.36s., L = 113m.
Uccle eZ = 40m.1s., eN = 43m.44s., eE = 63m.5s., eL = 99·0m.
Paris e = 40m.3s. and 44m.3s., eL = 104m.
Rome ePKPZ = 40m.5s.a, ePKP$_2$Z = 40m.44s., ePPNZ = 44m.32s., ePPPEN = 48m.0s., ePSKS = 54m.11s., ePPS = 58m.33s., eSSE = 64m.48s., eN = 66m.14s. and 68m.36s.
Granada iPKP = 40m.10s.k, PP = 44m.53s., SS = 66m.50s., eL = 105·9m.
Helwan ePKPZ = 40m.11s., eEZ = 40m.24s., PKKPEZ = 40m.36s., PPZ = 44m.12s., eE = 51m.0s.
Stuttgart ePKP = 40m.31s., eL = 109·0m.
Triest eP = 40m.36s., pP = 41m.5s., PS = 54m.23s.
Toledo ePKP = 41m.6s., e = 44m.39s.
Ukiah e = 42m.18s.
Salt Lake City e = 43m.22s.
Victoria e = 43m.24s., L = 64·0m.
Bozeman e = 43m.39s.
Kew eZ = 43m.40s., eL = 100m.
Bidston e = 43m.52s., eL = 99·0m.
Calcutta eN = 44m.42s.
San Juan e = 45m.31s.
Chicago e = 46m.2s.
Ottawa eN = 47m.30s., eE = 49m.30s., e = 55m.24s., eL = 71·0m.
Seven Falls e = 49m.48s., L = 79·0m.
Perth i = 50m.17s., 51m.10s., and 56m.40s.
Bombay eE = 53m.53s.
Fordham eN = 55m.57s.
Long waves were also recorded at Wellington, Arapuni, Stonyhurst, Harvard, Lisbon, Prague, San Fernando, Upsala, Scoresby Sund, Kodaikanal, Williamstown, Lincoln, and East Machias.

March 22d. Readings also at 1h. (Tucson), 5h. (near Mizusawa), 8h. (Lincoln, Ukiah, Huancayo, Haiwee, Riverside, Palomar, Mount Wilson, Pasadena, Tucson, and La Paz), 9h. (La Paz), 10h. (Tucson and near Mizusawa), 17h. (La Paz), 18h. (near Triest and Fordham), 19h. (Apia), 20h. (San Juan and Butte), 21h. (Ottawa, near Fordham, Williamstown, and near Mizusawa), 22h. (Tucson), 23h. (Tucson, near Algiers, Rome, and Brisbane).

March 23d. Readings at 0h. (near Phu-Lien), 3h. (Tucson), 5h. (near Wellington), 8h. (Haiwee, Tinemaha, Palomar, Christchurch, Adelaide, Huancayo, Arapuni, Riverview, Sydney, Wellington, Tucson, Pasadena, Riverside, Mount Wilson, and Ksara), 9h. (Granada, Chicago, and Potsdam), 10h. (La Paz, Sofia, and Bucharest), 16h. (Mizusawa), 17h. (Tucson and Ksara), 18h. (Mizusawa), 22h. (Wellington, Tucson, Riverside, Mount Wilson, and Pasadena).

March 24d. 11h. 48m. 47s. Epicentre 13°·0S. 63°·0W.

$A = +·4425$, $B = -·8685$, $C = -·2235$; $\delta = +5$; $h = +6$;
$D = -·891$, $E = -·454$; $G = -·101$, $H = +·199$, $K = -·975$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
La Paz	z.	6·1	234	i 1 35	+ 1	i 2 39	− 6	—	—	3·4
Huancayo		12·1	273	e 3 6	+ 9	e 5 36	SS	i 5 45	SSS	e 7·5
La Plata		22·3	169	5 45	PPP	8 49	−13	—	—	—
San Juan		31·3	353	—	—	e 12 57	SS	i 13 3	SSS	e 16·1
St. Louis		57·3	335	e 15 17	?	e 22 29	SSS	—	—	—
Tucson		64·2	316	i 10 43	+ 4	—	—	—	—	e 38·7
Palomar	z.	69·0	314	e 11 8	− 1	—	—	—	—	—
Riverside	z.	69·7	314	i 11 14	0	—	—	—	—	—
Mount Wilson	z.	70·3	314	i 11 17	0	—	—	—	—	—
Pasadena		70·3	314	i 11 18	+ 1	—	—	—	—	—
Haiwee		71·2	316	e 11 25	+ 2	—	—	—	—	—
Toledo		75·9	43	i 12 8	+18	—	—	—	—	—
Clermont-Ferrand		83·3	40	e 12 43	+13	—	—	—	—	—

Additional readings :—
Huancayo iP = +3m.9s., iS = +6m.27s. and +6m.31s.
La Plata +6m.13s. and +8m.13s.
St. Louis eN = +22m.41s.
Palomar eZ = +12m.20s.
Mount Wilson iZ = +12m.25s. and +12m.49s.
Pasadena eZ = +12m.24s. and +12m.51s.

March 24d. Readings also at 0h. (Granada), 2h. (Tucson), 3h. (Victoria and Seattle), 4h. (Tucson and Triest (2)), 6h. (Zurich), 12h. (La Paz), 15h. (Ksara), 16h. (Toledo), 17h. (Tucson), 18h. (Tucson), 19h. (Tucson), 20h. (Tucson, Bucharest, La Jolla, Santa Barbara, Haiwee, Pasadena, Mount Wilson, and Riverside), 22h. (Potsdam, Rome, Sofia, and Triest (4)).

March 25d. Readings at 1h. (Balboa Heights), 4h. (near Triest and Balboa Heights), 5h. (Sofia), 7h. (near Apia), 9h. (Triest), 11h. (Tucson), 13h. (Triest), 16h. (near Branner), 17h. (Riverside, Pasadena, Mount Wilson, and Tucson), 18h. (Tucson), 21h. (Tucson, near Branner, Fresno, and Salt Lake City), 23h. (Tucson).

March 26d. Readings at 0h. (near Sofia), 9h. (near Fresno), 10h. (Triest), 11h. (Tucson), 12h. (Triest (4)), 13h. (Tucson), 17h. (near Andijan, Tashkent, Samarkand, Tchimkent, Frunse, Almata, and Sverdlovsk), 18h. (Tucson (2)), 23h. (near Triest and Rome).

March 27d. 12h. 31m. 17s. Epicentre 51°·9N. 179°·4E.

$A = -·6195$, $B = +·0065$, $C = +·7849$; $\delta = -11$; $h = -6$;
$D = +·010$, $E = +1·000$; $G = -·785$, $H = +·008$, $K = -·620$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
College		21·2	40	i 4 51	+ 2	8 49	+ 8	e 5 11	PP	9·1
Sitka		26·4	60	e 5 34	− 6	e 10 22	+10	i 6 28	PP	e 12·9
Sapporo		26·9	267	5 35	−10	10 6	−14	—	—	—
Mizusawa		29·3	260	e 6 5	− 1	11 56	+57	—	—	—
Sendai		30·0	258	(6 9)	− 3	6 9	P	—	—	11·4
Tokyo, Cen. Met. Ob.		32·4	257	6 38	+ 4	11 41	− 7	—	—	—
Nagano		32·7	260	6 33	− 3	—	—	—	—	—
Honolulu		35·3	140	e 6 59	0	i 12 24	− 9	7 25	pP	e 14·2
Kobe		35·9	259	7 1	− 3	12 38	− 4	—	—	—
Victoria		35·9	72	7 2	− 2	i 12 39	− 3	8 43?	PPP	17·7
Seattle		37·0	73	e 7 18	+ 5	e 12 37	−22	e 8 51	PP	14·4
Hamada		37·6	262	7 15	− 3	13 6	− 2	—	—	17·9
Koti		37·6	259	7 16	− 2	12 57	−11	—	—	15·5
Zinsen		39·3	270	7 31	− 1	—	—	—	—	—
Miyazaki		40·0	259	7 37	− 1	13 30	−14	—	—	—
Ukiah		41·1	84	e 7 50	+ 3	e 13 58	− 3	e 9 35	PP	17·4
Berkeley		42·5	86	i 7 58	− 1	e 14 20	− 2	—	—	e 20·1
Branner		42·8	86	e 8 3	+ 2	e 14 26	0	—	—	e 22·0
Santa Clara	z.	43·0	86	e 8 11	+ 8	i 14 32	+ 3	—	—	e 20·5
Lick		43·2	86	e 8 8	+ 4	e 14 30	− 2	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Butte		43·6	69	e 8 21	+13	14 38	0	e 8 58	sP	18·0
Saskatoon		43·7	59	e 8 43	+35	i 17 59	SS	—	—	25·7
Irkutsk		44·2	302	i 8 15	+ 3	14 49	+ 3	—	—	21·7
Bozeman		44·7	69	e 8 13	− 3	14 47	− 7	e 10 11	PP	e 18·1
Fresno	N.	44·8	85	e 8 20	+ 3	e 14 51	− 4	—	—	—
Tinemaha		45·5	83	e 8 23	0	e 15 3	− 2	—	—	—
Santa Barbara		46·3	87	e 8 25	− 4	e 15 9	− 7	—	—	—
Logan		46·5	74	i 8 31	0	i 15 13	− 6	18 18	SS	21·0
Salt Lake City		47·1	76	8 35	0	e 15 22	− 6	e 10 11	P_cP	e 19·1
Pasadena		47·4	86	i 8 35a	− 3	i 15 27	− 5	i 13 57	S_cP	e 19·1
Mount Wilson		47·5	86	i 8 35a	− 3	e 15 29	− 5	i 10 54	PP	—
Riverside		48·0	86	e 8 39	− 4	e 15 36	− 5	e 13 59	S_cP	—
La Jolla		48·9	87	e 8 49	− 1	e 15 48	− 5	—	—	—
Tucson		53·2	83	i 9 20	− 2	e 16 40	−12	e 11 13	PP	—
Scoresby Sund		57·0	8	9 54	+ 4	e 17 48	+ 5	e 13 33	PPP	e 22·6
Semipalatinsk		57·3	312	9 53	+ 1	—	—	—	—	—
Hong Kong		57·6	266	9 51	− 3	17 50	− 1	19 43	S_cS	—
Manila		59·3	254	i 10 3	− 3	i 18 17	+ 3	—	—	28·7
Chicago		60·2	60	e 10 9a	− 3	18 21	− 4	13 4	PPP	e 23·8
Sverdlovsk		60·5	327	i 10 14	0	i 18 28	− 1	—	—	30·7
Florissant		60·8	64	i 10 13	− 3	e 18 27	− 6	i 12 33	PP	28·1
Ivigtut		61·0	24	e 13 51	PPP	e 18 31	− 4	e 19 43	S_cS	e 28·3
St. Louis		61·0	64	i 10 15	− 3	e 18 29	− 6	e 12 36	PP	e 27·7
Toronto		63·1	53	10 24	− 8	18 57	− 5	25 9	SSS	29·7
Phu-Lien		63·3	271	e 10 30	− 3	e 18 54	−10	—	—	—
Ottawa		63·6	49	10 33	− 2	19 3	− 5	23 31	SS	29·7
Almata		64·0	308	10 38	0	19 13	0	—	—	—
Shawinigan Falls		64·1	46	10 37	− 1	—	—	—	—	31·7
Seven Falls		64·5	45	10 41	0	19 16	− 3	26 7	SSS	29·7
Pittsburgh		65·2	55	e 10 26	−19	i 20 13	+45	—	—	—
Apia	N.	65·9	170	i 19 28	S	(i 19 28)	− 9	—	—	e 29·7
Pulkovo		65·9	344	i 10 50	0	e 19 36	− 1	—	—	31·3
Pennsylvania		66·0	54	e 10 59	+ 9	e 19 33	− 5	e 27 22	SSS	e 36·2
Williamstown		66·2	50	i 10 54	+ 2	e 20 5	PS	—	—	e 33·7
Upsala		67·6	351	11 0	− 1	19 57	0	e 24 45	SS	e 31·7
Harvard		67·7	49	i 10 59	− 2	—	—	—	—	e 40·7
Georgetown		67·8	55	i 11 0	− 2	19 57	− 3	—	—	—
East Machias		67·9	45	e 11 5	+ 3	e 19 53	− 8	e 20 56	S_cS	e 27·0
Fordham		67·9	52	i 11 1a	− 1	i 19 58	− 3	—	—	—
Philadelphia		67·9	53	e 11 1	− 1	i 19 58	− 3	—	—	e 30·8
Bergen		68·0	357	e 10 50	−13	e 19 44	−18	—	—	e 33·7
Moscow		68·2	338	11 4	0	20 4	0	—	—	31·7
Tchimkent		68·2	312	e 11 5	+ 1	—	—	—	—	—
Tashkent		69·1	311	i 11 15	+ 5	i 20 21	+ 6	—	—	e 34·3
Columbia		69·4	61	e 11 13	+ 1	e 20 17	− 1	e 24 52	SS	e 31·9
Samarkand		71·5	312	11 26	+ 2	e 20 43	0	—	—	—
Calcutta	N.	73·2	285	i 11 36k	+ 1	i 21 9	+ 7	i 11 51	P_cP	e 35·1
Dehra Dun	N.	73·2	298	e 11 35	0	e 20 58	− 4	—	—	e 39·7
Heligoland		74·1	356	e 11 39a	− 1	e 21 13	+ 1	e 25 36	SS	e 36·7
Hamburg		74·5	354	e 11 45a	+ 3	e 21 20	+ 3	e 26 49	SS	e 35·7
Warsaw		74·7	346	i 11 42a	− 1	i 22 0	PPS	i 26 41	SS	—
Bidston		75·0	2	e 11 48	+ 3	e 21 33	+10	—	—	e 44·7
Potsdam		75·4	352	i 11 47	0	i 21 31	+ 4	i 22 14	PS	e 29·2
Agra	E.	75·7	296	i 11 49a	0	21 24	− 6	14 39	PP	—
De Bilt		76·3	356	e 11 51a	− 1	i 21 43	+ 6	e 14 29	PP	e 32·7
Grozny		77·0	327	12 10	+14	21 58	+13	—	—	—
Kew		77·0	0	11 55	− 1	e 21 43	− 2	e 16 58	PPP	33·7
Jena		77·0	352	e 11 57	+ 1	e 21 43	− 2	e 26 43	SS	e 35·7
Prague		77·6	350	e 11 59	− 1	e 22 22	PS	e 27 19	SS	e 34·7
Uccle		77·6	358	e 11 58	− 2	e 21 47	− 4	i 22 53	PS	e 37·7
Baku		78·1	323	12 7	+ 5	27 31	SS	—	—	37·7
Sotchi		78·7	332	12 9	+ 3	22 7	+ 4	—	—	—
Bermuda		79·1	51	e 12 8	0	27 22	SS	e 15 5	PP	e 32·1
Jersey		79·3	2	—	—	e 22 10	+ 1	—	—	31·7
Stuttgart		79·4	354	e 12 5	− 4	e 22 1	− 9	e 23 5	PS	e 37·7

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Sebastopol		79·4	337	12 14	+ 5	e 22 13	+ 3	—	—	43·7
Paris		79·6	358	i 12 12	+ 2	e 22 51	+39	e 15 30	PP	e 36·7
Strasbourg		79·6	354	11 43?	−27	e 21 13	−59	—	—	42·7
Kecskemet	z.	80·0	346	e 16 14	?	—	—	—	—	—
Erevan		80·2	327	12 16	+ 2	22 19	0	—	—	—
Zurich		80·8	354	e 12 18	+ 1	—	—	—	—	—
Chur		81·2	353	e 12 4	−15	—	—	—	—	—
Bucharest		81·3	341	e 12 22	+ 2	e 22 37	+ 7	—	—	28·7
Neuchatel		81·3	355	e 12 15	− 5	—	—	—	—	—
Triest		82·0	350	i 12 23a	0	i 22 46	+ 9	13 22	pP	e 43·1
Brisbane		82·4	203	e 12 25	0	i 22 31	−10	—	—	—
Clermont-Ferrand		82·7	357	e 12 29	+ 2	—	—	—	—	e 39·7
Hyderabad		83·0	289	12 28	0	22 49	+ 2	15 40	PP	39·7
Istanbul		83·9	338	12 34	+ 1	23 8	+12	15 50	PP	e 47·7
Bombay		85·1	294	i 12 38	− 1	i 23 12	+ 4	e 16 0	PP	i 40·9
Rome		85·9	351	i 12 43	0	i 23 20	+ 4	i 16 9	PP	e 41·4
Toledo		88·5	3	e 12 57	+ 1	23 52	+11	e 13 14	pP	36·7
Ksara		88·8	330	i 12 57a	0	e 23 55	+11	i 16 32	PP	45·7
Riverview		88·9	203	—	—	i 23 22	[− 4]	i 29 48	SS	e 40·3
Sydney		88·9	203	—	—	e 23 37	− 7	—	—	—
Kodaikanal	E.	89·3	286	i 12 54,	− 5	i 23 43	− 5	—	—	—
Lisbon		89·4	8	—	—	24 43?	PS	—	—	41·7
Arapuni		89·7	183	—	—	23 43?	− 9	—	—	42·7
San Juan		89·9	60	e 13 1	− 1	23 28	[− 4]	e 18 56	PPP	—
Colombo	E.	90·5	282	13 2	− 3	23 32	[− 4]	—	—	32·5
Algiers		91·6	357	—	—	e 26 43?	?	—	—	—
Almeria		91·6	2	e 13 0	−10	e 25 39	PS	—	—	49·5
Wellington		92·9	183	—	—	23 34	[−15]	42 43?	L_q	45·7
Adelaide		93·6	212	e 23 43	S	(e 23 43)	[−10]	e 25 33	PS	44·2
Helwan		93·9	332	13 19	− 2	23 55	[0]	17 7	PP	—
Christchurch		95·2	184	13 34	+ 7	23 53	[− 9]	30 36	SS	44·0
Huancayo		108·8	85	e 14 36	P	e 25 4	[− 3]	e 19 4	PP	e 44·0
La Paz	z.	116·7	82	e 18 49	[+ 3]	i 29 40	PS	i 19 56	PP	57·2
Rio de Janeiro		136·4	64	e 22 57	PP	—	—	—	—	—
Cape Town		157·4	315	—	—	e 32 2	{+63}	—	—	80·3

Additional readings :—
Sitka eP_cP = +9m.3s., es$S$ = +10m.59s.
Victoria SSS = +15m.52s.
Seattle es$P$ = +7m.58s., S = +13m.12s.
Ukiah es$P$ = +8m.23s., S = +14m.3s. and +14m.9s.
Berkeley ePE = +8m.2s.
Saskatoon e = +20m.18s.
Bozeman eP = +8m.24s., ePPP = +10m.46s.
Salt Lake City epPP = +10m.51s., eS_cS = +18m.20s., eSS = +18m.52s.
Pasadena iZ = +8m.48s., iS_cSN = +18m.25s.
Mount Wilson iS_cPZ = +13m.57s.
Tucson iP = +9m.25s., esPP = +12m.0s., PPP = +12m.20s., S = +16m.52s., iS = +16m.56s., i = +19m.6s., eSS = +20m.26s.
Scoresby Sund epPP = +12m.34s., iS = +17m.52s., sS = +18m.21s., esSS = +22m.5s.
Chicago S_cS = +19m.59s., eSS = +22m.11s.
Sverdlovsk eS = +22m.13s.
Florissant iE = +10m.30s., iP_cPEZ = +10m.57s., eZ = +11m.35s., iZ = +11m.46s., i = +18m.30s., ePSE = +18m.53s., iPSE = +18m.56s., iE = +19m.46s., iS_cSE = +20m.3s.
Ivigtut S = +18m.36s.
St. Louis iSEN = +18m.32s., e$SPEN$ = +18m.54s., e$SSEN$ = +22m.34s.
Ottawa SSS = +25m.43s.
Pittsburgh iZ = +11m.3s., iNW = +11m.41s.
Pennsylvania e = +22m.30s., i = +29m.6s., e = +31m.4s. and +32m.10s.
Upsala e$SSSE$ = +27m.18s., e$SSSN$ = +27m.21s.
East Machias esPP = +14m.19s., eS = +20m.5s., esSS = +25m.1s.
Fordham iSN = +20m.2s., iN = +21m.24s.
Philadelphia iS = +20m.7s.
Calcutta iPSN = +21m.47s.
Heligoland eSN = +21m.18s., eSSN = +26m.40s., e$SSSN$ = +30m.7s.
Hamburg e$SSSE$ = +30m.37s.
Warsaw ePN = +11m.45s., iSEZ = +22m.13s., iN = +26m.50s., iEN = +30m.12s.
Bidston i = +17m.33s., e = +19m.3s., +22m.13s., and +24m.8s.
Potsdam ePE = +11m.51s.
Agra $PPPE$ = +16m.39s., S_cS?E = +21m.40s., iE = +23m.4s., SSE = +26m.14s.
De Bilt ePPP = +16m.40s., eSS = +26m.46s.
Kew eE = +12m.3s., eNZ = +18m.54s. and +22m.13s., eN = +24m.10s., eL_qZ = +27·2m.

Continued on next page.

Uccle SS = +26m.47s.
Bermuda eS_cS = +21m.59s., PS = +22m.10s., isS = +22m.31s., eSSS = +30m.35s.
Stuttgart iPZ = +12m.10s., eSS = +28m.3s.
Triest PP = +16m.8s., i = +23m.0s., eSKKS = +23m.17s., iS = +23m.31s., iPS = +24m.35s., PPS = +25m.2s., eSS = +28m.24s., eSSS = +32m.5s., e = +35m.17s.
Brisbane iN = +22m.37s.
Hyderabad SSN = +27m.54s.
Bombay i = +23m.54s., iL_gN = +32m.45s.
Rome eZ = +15m.49s., iPSEN = +24m.2s., iZ = +24m.32s., iN = +24m.35s., eZ = +27m.20s., iSSN = +29m.12s., eSSSN = +32m.42s., eNZ = +33m.48s.
Toledo ePP = +16m.25s., e = +24m.51s.
Ksara ePPS = +25m.33s.
Riverview iE = +23m.37s.
San Juan ipS = +23m.52s., ePS = +24m.51s.
Wellington SKKS = +24m.13s., S? = +24m.33s.
Adelaide P_cP = +24m.23s., PP = +26m.3s., e = +30m.41s., S = +31m.3s., e = +38m.1s.
Helwan iEN = +24m.9s., SE = +24m.33s., iEN = +25m.58s., SSN = +31m.4s.
Christchurch SE = +24m.32s., iN = +31m.12s., SSSN = +34m.19s., L_gE = +38m.17s.
Huancayo ePPP = +21m.14s., eS = +26m.34s., epS = +26m.57s., eSP = +28m.19s., ePS = +28m.25s., esPS = +29m.3s., eSS = +34m.8s., eSSS = +38m.13s.
La Paz SSZ = +37m.10s.
Cape Town eE = +34m.36s.
Long waves were also recorded at Granada, La Plata, San Fernando, Cluj, and Budapest.

March 27d. 19h. 16m. 42s. Epicentre 5°·0N. 61°·0E.

A = +·4830, B = +·8713, C = +·0866; δ = −5; h = +7;
D = +·875, E = −·485; G = +·042, H = +·076, K = −·996.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Kodaikanal	E.	17·1	72	i 3 57 a	− 5	i 7 49	SS	—	—	—
Bombay		18·0	40	i 4 10	− 3	e 8 17	SSS	—	—	—
Colombo	E.	18·9	84	i 4 34	+10	—	—	—	—	e 9·0
Hyderabad		21·1	54	4 50	+ 2	8 45	+ 6	5 2	PP	10·7
Agra	E.	27·4	36	e 5 47	− 2	10 26	− 2	—	—	13·6
Dehra Dun	N.	29·9	31	—	—	e 11 7?	− 2	—	—	e 16·0
Calcutta	N.	31·7	55	—	—	e 9 50	?	—	—	13·3
Tashkent		36·9	11	i 7 14	+ 2	e 13 0	+ 2	—	—	e 17·8
Ksara		37·0	324	e 7 29	+16	e 13 35	+36	e 8 49	PP	—
Helwan		37·4	316	e 7 21	+ 5	e 13 24	+19	e 8 58	PP	—
Grozny		40·5	344	8 17	+35	14 53	+61	—	—	—
Sverdlovsk		51·7	359	9 9	− 2	16 27	− 5	—	—	23·3
Moscow		54·0	345	9 28	0	e 17 1	− 2	—	—	—
Pulkovo		59·5	344	e 10 5	− 2	e 18 11	− 5	—	—	—

Additional readings :—
Hyderabad SSE = +9m.28s.
Ksara eSS = +15m.53s.
Long waves were also recorded at Irkutsk and Warsaw.

March 27d. 20h. 58m. 14s. Epicentre 51°·9N. 179°·4E. (as at 12h.).

A = −·6195, B = +·0065, C = +·7849; δ = −11; h = −6.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
College		21·2	40	e 5 4	PP	i 9 16	SS	—	—	—
Sitka		26·4	60	—	—	e 10 46?	+34	—	—	—
Victoria		35·9	72	—	—	e 12 46	+ 4	—	—	21·8
Ukiah		41·1	84	e 5 5	?	—	—	—	—	—
Tinemaha	z.	45·5	83	e 8 23	0	—	—	—	—	—
Pasadena	z.	47·4	86	e 8 38	0	—	—	—	—	—
Mount Wilson	z.	47·5	86	i 8 37	− 1	—	—	—	—	—
Riverside	z.	48·0	86	e 8 40	− 3	—	—	—	—	—
Tucson		53·2	83	i 9 20	− 2	—	—	—	—	—
Sverdlovsk		60·5	327	i 10 14	0	e 18 35	+ 6	—	—	28·8
St. Louis		61·0	64	e 10 41	+23	e 18 36	+ 1	—	—	e 28·7
Ottawa		63·6	49	10 34	− 1	—	—	—	—	25·8
Tashkent		69·1	311	11 11	+ 1	20 28	+13	—	—	e 35·5
Agra	E.	75·7	296	—	—	e 30 42	SSS	—	—	—
Ksara		88·8	330	e 12 59	+ 2	e 23 13	[−13]	e 28 43	SS	49·8

Additional readings :—
Tucson i = +9m.44s.
Long waves were also recorded at Rome, Bombay, Bermuda, Harvard, Scoresby Sund, Baku, Potsdam, Warsaw, Moscow, Pulkovo, and Irkutsk.

March 27d. Readings also at 2h. (near New Plymouth and Wellington), 8h. (near Tananarive), 13h. (Riverside, Mount Wilson, Pasadena, Tinemaha, Jena (3), and Tucson), 14h. (Riverview, Tucson, Jena, and Wellington), 15h. (Cluj), 16h. (Tucson), 17h. (Tucson), 18h. (Lincoln, Mizusawa (2), Agra, Ksara, Calcutta, and Tucson), 19h. (Potsdam and Rome), 20h. (La Paz and Huancayo), 21h. (near Florissant and St. Louis).

March 28d. 15h. 48m. 50s. Epicentre 14°·2N. 120°·6E.

Felt in the islands of Luçon, Mindoro, Marinduque, and Catanduares.

Epicentre : 13°·5N. 120°·0E. (U.S.C.G.S.).
14°·0N. 119°·5E. (Manila).

See Annales de l'Institut de Physique du Globe de Strasbourg, Tome V, 2e partie. Seismologie 1940, Strasbourg, 1948, p. 7.

$A = -\cdot4937$, $B = +\cdot8348$, $C = +\cdot2438$; $\delta = +7$; $h = +6$;
$D = +\cdot861$, $E = +\cdot509$; $G = -\cdot124$, $H = +\cdot210$, $K = -\cdot970$.

Tables for depth of focus 0·020 have been used.

		△	Az.	P.	P−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Manila		0·5	44	i 0 32a	+ 9	0 54	+14	—	—	—
Karenko		9·7	4	3 20	+63	5 6	+62	—	—	—
Hong Kong		10·1	323	2 21	− 1	3 10	−63	—	—	—
Phu-Lien		14·8	298	i 3 24	+ 2	i 6 6	+ 4	—	—	—
Palau		15·2	115	3 23	− 4	6 5	≃ 6	—	—	—
Nake		16·3	28	3 40	− 1	6 38	+ 2	—	—	—
Zi-ka-wei		16·9	4	i 3 48k	0	6 48	− 2	i 4 2	PP	13·3
Miyazaki		20·2	28	4 14	−10	7 49	− 7	—	—	—
Hukuoka		21·2	23	e 4 33	− 1	8 14	− 1	—	—	—
Koti		22·6	28	4 45	− 2	8 38	− 1	—	—	—
Hamada		23·1	24	4 51	− 1	8 41	− 7	—	—	—
Zinsen		23·8	10	4 56	− 3	9 5	+ 5	—	—	—
Osaka		24·6	30	5 2	− 5	9 23	+10	—	—	—
Nagoya		25·5	32	5 15	0	9 36	+ 8	—	—	—
Yokohama		27·2	34	e 5 55	+24	e 11 26	SS	—	—	—
Nagano		27·3	30	5 31	− 1	10 15	+17	—	—	—
Tokyo, Cen. Met. Ob.		27·4	34	5 36	+ 4	11 40	SS	—	—	—
Sendai		30·0	33	5 50	− 6	—	—	—	—	—
Vladivostok		30·4	16	i 6 14	+15	i 10 59	+12	i 6 55	pP	12·8
Mizusawa		30·7	32	e 5 59	− 3	10 44	− 7	—	—	—
Calcutta		31·7	290	e 6 7	− 3	i 10 59	− 8	e 7 10	PP	—
Mori		32·7	26	e 6 24	+ 5	—	—	—	—	—
Sapporo		33·8	27	6 28	− 1	11 32	− 8	—	—	—
Irkutsk		40·1	344	i 7 20	− 1	13 7	− 8	—	—	19·2
Hyderabad		40·6	280	e 6 58	−27	13 18	− 5	8 18	PP	19·4
Colombo	E.	40·7	264	7 27	+ 1	13 20	− 4	—	—	27·5
Agra		41·7	295	i 7 32k	− 2	i 13 30	− 9	8 17	PP	—
Dehra Dun	N.	42·2	299	e 7 43	+ 4	e 13 34	−12	—	—	e 16·7
Kodaikanal		42·3	271	i 8 10?k	+31	—	—	—	—	—
Bombay		45·9	283	i 8 8	0	i 14 35	− 4	i 8 59	pP	—
Perth		46·1	185	7 58	−12	14 42	0	i 10 13	PP	21·2
Almata		47·3	317	8 20	+ 1	14 54	− 5	e 19 9	SSS	—
Frunse		48·7	315	8 32	+ 2	15 16	− 3	—	—	23·2
Semipalatinsk		48·7	327	8 33	+ 3	15 13	− 6	e 9 19	pP	—
Andijan		49·5	311	8 37	+ 1	i 15 29	− 1	—	—	26·7
Tashkent		51·9	312	i 8 52	− 2	i 15 53	−10	9 36	pP	—
Brisbane		52·0	142	i 8 58	+ 3	i 16 4	0	i 17 28	sS	21·3
Tchimkent		52·0	313	8 55	0	16 0	− 4	—	—	—
Samarkand		53·2	308	9 4	0	—	—	—	—	—
Riverview		55·9	149	i 9 25	+ 2	i 17 2	+ 6	—	—	e 22·9
Sydney		56·0	149	e 9 22	− 2	e 16 58	0	—	—	e 22·6
Sverdlovsk		61·9	327	i 10 0	− 5	i 18 2	−12	10 41	pP	30·2
Baku		66·3	308	i 10 37	+ 4	i 19 8	0	i 19 55	pS	26·4
Grozny		69·4	311	10 52	0	19 41	− 4	11 41	PP	—
Erevan		70·4	307	11 2	+ 3	19 55	− 1	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Arapuni		73·2	137	—	—	20 52	+24	—	—	—
Sotchi		73·8	312	e 11 13	− 5	20 17	−18	—	—	—
Christchurch		74·5	143	11 22	0	20 42	− 1	12 13	pP	—
Moscow		74·5	324	11 19	− 3	20 33	−10	12 8	pP	—
Wellington		74·5	141	11 20	− 2	20 38	− 5	14 20	PP	34·2
Honolulu		77·3	70	i 11 39	+ 1	21 18	+ 5	e 14 36	PP	e 30·9
Ksara		77·9	301	i 11 41a	− 1	i 21 19	− 1	i 12 30	pP	—
College		78·0	26	e 11 39	− 3	e 30 22	SSS	e 14 46	PP	—
Pulkovo		78·0	329	i 11 40	− 2	e 21 12	− 9	i 12 28	pP	31·8
Tananarive		79·1	247	e 11 50	+ 2	23 51	?	—	—	e 35·0
Istanbul		82·0	310	12 1	− 2	22 2	0	15 42	PP	45·2
Helwan		82·4	298	i 12 4k	− 1	22 4	− 2	12 54	pP	—
Bucharest		83·4	314	e 11 46	−24	22 11	− 5	27 46	SS	36·6
Upsala		84·2	330	12 14	0	i 22 14	−10	27 45	SS	e 34·2
Warsaw		84·7	322	i 12 15a	− 2	i 22 22	− 7	23 3	PS	e 37·2
Sitka		85·7	32	e 12 22	0	22 35	− 4	—	—	e 36·1
Sofia		85·7	312	e 11 23	−59	e 21 28	[−60]	27 24	SS	—
Potsdam		89·2	324	i 12 34	− 5	i 22 46	[− 5]	i 13 24	pP	e 43·7
Prague		89·3	322	e 12 38	− 1	i 22 48	[− 3]	—	—	—
Bergen		89·7	333	—	—	e 23 2	[+ 9]	—	—	e 43·2
Hamburg		90·5	326	e 12 41a	− 4	i 23 24	0	e 13 33	pP	e 41·2
Jena		90·6	323	e 12 40	− 5	e 22 54	[− 5]	e 13 28	pP	e 42·2
Heligoland		91·3	327	—	—	i 23 0	[− 3]	e 24 36	PS	e 46·2
Triest		91·3	318	i 13 20a	pP	i 22 57	[− 6]	i 14 54	pP	e 41·7
Scoresby Sund		91·7	348	i 12 52	+ 2	e 23 18	[+13]	i 16 35	PP	e 36·4
Stuttgart		92·9	322	e 12 53	− 3	i 23 7	[− 5]	e 16 33	PP	e 43·2
Chur		93·6	320	e 12 53	− 6	e 23 7	[− 9]	e 16 44	PP	—
Rome		93·6	314	i 12 55a	− 4	i 23 14	[− 2]	i 16 52	PP	e 42·8
De Bilt		93·7	326	i 12 56a	− 3	e 23 16	[0]	e 13 46	pP	e 47·2
Strasbourg		93·9	322	e 12 33	−27	—	—	e 14 3	pP	—
Zurich		93·9	321	e 13 1	+ 1	e 23 13	[− 4]	e 24 45	PS	—
Uccle		94·8	325	e 12 44	−20	i 23 18	[− 5]	e 13 46	pP	e 47·2
Neuchatel		95·1	321	e 13 4	− 2	e 23 18	[− 6]	—	—	—
Victoria		95·8	37	e 12 35	−34	e 22 46	[−43]	e 16 10?	PP	—
Edinburgh		95·9	332	—	—	e 23 32	[+ 3]	—	—	—
Paris		96·8	323	e 13 17	+ 3	i 23 30	[− 4]	—	—	e 37·2
Kew		97·0	327	i 13 14	− .1	i 23 29	[− 6]	e 14 4	pP	e 41·2
Bidston		97·3	330	—	—	i 23 33	[− 3]	i 30 57	SS	e 41·2
Oxford		97·3	328	—	—	i 23 31	[− 5]	i 25 40	sS	—
Clermont-Ferrand		98·0	321	e 17 10	PP	—	—	—	—	—
Jersey		99·2	326	—	—	e 31 10?	SS	—	—	—
Ukiah		100·3	45	e 18 0	PP	e 24 37	−10	e 26 12	PS	e 40·5
Berkeley		101·6	46	13 31	− 4	—	—	e 17 43	PP	—
Algiers		102·4	313	e 12 10?	?	i 23 58	[− 4]	e 27 17	PS	44·2
Bozeman		104·4	34	e 13 56	P	e 24 26	[+16]	e 18 31	PP	e 42·6
Tinemaha	E.	104·8	44	e 13 52	P	—	—	—	—	—
Toledo		105·6	318	e 18 11	PKP	e 24 15	[− 1]	e 32 39	SS	—
Almeria		106·2	315	i 24 14	SKS	(i 24 14)	[− 5]	e 28 20	PPS	—
Pasadena		106·3	47	i 13 57	P	e 28 13	PPS	i 18 7	PKP	—
Mount Wilson		106·4	47	e 13 56	P	e 30 36	?	i 29 44	PKKP	—
Granada		106·8	318	24 24	SKS	(24 24)	[+ 3]	32 59	SS	52·4
Riverside	Z.	107·0	47	i 14 0	P	—	—	e 18 10	PKP	—
Cape Town		107·8	239	—	—	i 24 29	[+ 3]	e 27 37	PS	e 55·5
San Fernando		108·9	317	—	—	e 23 35	[−55]	—	—	51·2
Lisbon		109·5	320	—	—	e 27 14	PS	i 33 39	SS	55·2
Tucson		112·5	45	e 14 25	P	e 26 35	S	19 5	PP	e 46·8
Seven Falls		118·1	8	e 19 34	PP	e 27 10?	SKKS	e 35 34	SS	52·2
Ottawa		118·9	12	18 30	[+ 1]	29 40	PS	19 45	PP	60·2
Florissant		119·8	27	i 18 33	[+ 2]	i 29 48	PS	—	—	—
St. Louis		120·0	27	e 18 28	[− 4]	e 26 11	S	i 29 56	PS	—
Last Machias		120·9	6	e 15 14	pP	30 8	PS	20 3	PP	e 49·1
Williamstown		122·0	10	i 18 35	[− 1]	—	—	i 20 9	PP	—
Pittsburgh		122·4	17	e 18 29	[− 7]	e 30 0	PS	i 20 4	PP	—
Harvard	Z.	122·5	9	i 18 32	[− 5]	e 25 42	[+21]	e 20 5	PP	—
Pennsylvania		122·7	16	e 18 36	[− 1]	—	—	—	—	—

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Fordham	123·6	12	i 18 39k	[0]	i 30 19	PS	i 20 21	PP	—
Philadelphia	124·2	13	e 20 21	PP	e 30 21	PS	e 36 31	SS	e 48·2
Bermuda	133·5	6	e 18 59	[+ 1]	—	—	e 21 28	PP	e 54·4
San Juan	146·9	11	19 23	[+ 2]	e 42 46	SS	i 35 40	PPS	e 61·2
Balboa Heights	149·5	41	e 19 10?	[−15]	—	—	—	—	—
Rio de Janeiro	162·4	238	e 19 49	[+ 7]	e 30 40	SKKS	—	—	—
Huancayo	164·3	83	e 19 47	[+ 3]	e 34 59	SKSP	e 28 42	PPP	e 64·3
La Paz	171·3	107	i 19 51s	[+ 2]	i 26 23	[+48]	i 20 43	pPKP	80·7

Additional readings :—
Zi-ka-wei iZ = +4m.32s., iE = +6m.52s. and +7m.6s., iN = +7m.10s., iZ = +9m.0s. and +10m.44s.
Vladivostok isP = +7m.19s., sS = +12m.16s.
Mizusawa SE = +10m.48s.
Calcutta iP_cPN = +9m.14s., esSN = +12m.48s., iS_cSN = +16m.59s.
Hyderabad P_cPE = +9m.7s., S_cSE = +16m.38s.
Agra PPP = +9m.6s., P_cPE = +9m.51s., sSE = +14m.52s., sSSE = +16m.35s., SSSEN = +16m.49s.
Bombay isPE = +9m.26s., eE = +9m.42s., iE = +10m.1s. and +14m.21s., isS = +16m.2s., i = +16m.15s., L_qE = +16m.31s.
Perth i = +9m.0s., +9m.15s., and +9m.58s., PS = +14m.55s., i = +15m.50s. and +16m.25s.
Semipalatinsk iS_cS = +17m.53s.
Brisbane iN = +18m.28s.
Riverview i = +9m.28s.
Sverdlovsk iPP = +12m.23s., sS = +19m.29s., SS = +21m.58s.
Grozny SP = +12m.22s., PPS = +15m.16s.
Christchurch eZ = +14m.17s., iZ = +16m.3s., sSEN = +22m.15s.
Moscow PP = +14m.11s., pPP = +14m.53s., SS = +25m.28s.
Wellington iZ = +17m.22s., S_cS = +21m.13s., SS = +25m.50s., L_q = +31·2m.
Honolulu ePPP = +16m.37s., ePPS = +22m.27s., SS = +26m.31s., eSSS = +29m.27s.
Ksara sP = +12m.51s., sS = +22m.41s., SS = +26m.47s.
College ePPP = +16m.29s., ePPS = +22m.36s.
Pulkovo ePP = +14m.44s., sS = +22m.41s., SS = +26m.22s.
Tananarive E = +19m.2s.
Helwan iZ = +13m.49s., pPPZ = +16m.16s., PPPE = +17m.34s., SN = +22m.16s., PSE = +23m.7s., iN = +23m.25s., sSE = +23m.56s.
Bucharest SEN = +22m.28s.
Upsala iSN = +22m.17s., iE = +23m.11s., eE = +28m.10s.
Warsaw PEN = +12m.18s., SZ = +22m.26s., PSZ = +23m.13s., SSE = +27m.43s., eZ = +28m.12s.
Potsdam iE = +12m.42s. and +13m.27s., iZ = +16m.15s., iSKSNW = +23m.5s., iPPS = +24m.4s., iNW = +24m.42s., eNW = +26m.3s., iNW = +29m.3s., iE = +29m.16s. and +36m.4s.
Hamburg iEN = +22m.51s., iZ = +24m.21s., eN = +25m.4s.
Jena ePN = +12m.45s., eE = +18m.22s., +22m.58s., and +29m.10s.
Triest PP = +16m.27s., PPP = +17m.52s., iS = +23m.23s., ePS = +23m.59s., isS = +24m.30s., e = +25m.2s., SSS = +31m.37s.
Scoresby Sund ePPP = +18m.26s., eS = +24m.9s., iPS = +24m.43s., iSS = +29m.42s., ePSPS = +31m.2s.
Stuttgart eZ = +13m.49s., eZ = +16m.44s., eSE = +23m.38s., eSN = +23m.41s., ePSE = +24m.45s., eSSN = +29m.56s.
Rome iZ = +13m.47s., iSKKSN = +23m.46s., iPSEZ = +24m.45s., iPPSE = +25m.1s., eEZ = +26m.5s., iSSEN = +29m.53s., iE = +30m.13s., iZ = +30m.47s., iSSSE = +33m.39s.
De Bilt iPP = +16m.49s., iPS = +25m.1s., iPPS = +25m.27s., isS = +23m.55s., eSS = +30m.15s.
Uccle iZ = +25m.7s., iEN = +25m.11s., SSN = +30m.24s., SSE = +30m.30s.
Kew iPPZ = +17m.14s., epPPZ = +17m.57s., iSPZ = +25m.33s., ePSZ = +26m.1s., Z = +27m.33s., PKKPZ = +30m.25s., SSN = +31m.6s., eSSSN = +35m.40s.
Bidston i = +25m.41s., e = +27m.35s., +30m.39s., and +35m.10s.?
Ukiah ePPS = +27m.21s., eSS = +31m.57s.
Bozeman eS = +25m.46s., ePS = +27m.23s., ePPS = +28m.16s., eSS = +32m.47s.
Toledo e = +29m.48s.
Almeria e = +25m.0s.
Pasadena iEN = +18m.25s., ePKKPZ = +29m.45s., iZ = +30m.40s.
Mount Wilson i = +18m.10s.
Riverside iPKKPZ = +29m.43s.
Cape Town PPSE = +28m.45s., iSSN = +33m.33s., iSSE = +33m.45s., SSSE = +38m.39s.
Tucson ePKP = +18m.21s., ePPP = +21m.32s., ePS = +28m.22s., ePPS = +29m.49s., eSS = +34m.29s., eSSS = +38m.51s.
Ottawa SS = +35m.40s., SSS = +41m.34s.
Florissant iZ = +19m.54s., iN = +30m.33s.
St. Louis eEN = +19m.58s.
East Machias ePKP = +18m.28s., ePPP = +22m.20s., eSS = +36m.18s., eSSS = +41m.9s.
Williamstown i = +21m.11s.

Continued on next page.

Pittsburgh iSNW = +30m.8s., isSNW = +30m.48s.
Harvard eZ = +21m.0s.
Fordham iSSEN = +36m.48s.
Bermuda ePKP = +19m.3s., PKS = +23m.17s.
San Juan iPKP = +19m.34s., SSS = +47m.1s.
Huancayo PKP = +19m.50s., ePPS = +38m.23s., SSS = +50m.59s.
La Paz iPKP$_2$ = −21m.15s., ipPKP$_2$ = +22m.8s., iPPZ = +25m.5s., SKSN = +26m.43s., iPPPZ = +28m.51s., iZ = +29m.13s., SSZ = +43m.45s., SSSZ = +49m.5s.
Long waves were also recorded at Chicago.

March 28d. 17h. 48m. 32s. Epicentre 13°·1N. 89°·5W. (as on 1939 Aug. 16d.).

U.S.C.G.S. suggest depth 75km.

A = +·0085, B = −·9743, C = +·2252; δ = +5; h = +6;
D = −1·000, E = −·009; G = +·002, H = −·225, K = −·974.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Balboa Heights		10·6	112	2 28?	− 8	—	—	—	—	—
Columbia		22·3	19	e 5 8	+ 7	e 9 34	SS	—	—	—
San Juan		23·1	73	e 5 8	0	e 9 14	− 2	5 54	PP	e 12·6
Cape Girardeau		24·1	0	i 5 24	+ 6	i 9 47	+13	i 5 37	pP	e 11·7
St. Louis		25·4	359	i 5 30	− 1	e 9 52	− 4	i 5 46	pP	—
Florissant		25·6	359	i 9 46	S	(i 9 46)	−13	—	—	—
Tucson		27·3	319	i 5 49	+ 1	e 11 2	SS	i 6 4	pP	e 12·9
Pittsburgh	N.W.	28·5	15	—	—	e 12 38	SSS	—	—	e 14·7
Huancayo		28·7	149	e 5 53	− 8	e 10 53	+ 3	e 6 16	pP	e 12·3
Pennsylvania		29·4	17	e 7 4	PP	—	—	—	—	—
Fordham		30·8	25	i 6 21a	+ 1	e 11 52	+29	—	—	—
La Jolla		32·1	313	e 6 31	0	—	—	—	—	—
Williamstown		32·7	23	i 6 36	0	—	—	—	—	—
Riverside		32·8	314	i 6 38	+ 1	e 13 4	S_cP	i 9 22	P_cP	—
Mount Wilson		33·4	314	i 6 43	+ 1	—	—	—	—	—
Pasadena		33·4	314	i 6 43a	+ 1	—	—	i 9 29	P_cP	e 18·7
Ottawa		34·3	17	6 49	− 1	e 12 40	+23	—	—	18·5
Haiwee		34·4	317	i 6 47	− 4	—	—	—	—	—
Santa Barbara	Z.	34·6	313	e 6 53	0	—	—	—	—	—
Tinemaha		35·1	318	i 6 59	+ 2	—	—	—	—	—
La Paz	Z.	36·2	142	e 7 8	+ 2	—	—	—	—	—
Seven Falls		37·4	21	—	—	e 13 52	+47	—	—	20·5

Additional readings :—
San Juan esS = +9m.47s.
Cape Girardeau iE = +5m.32s., esSE = +10m.7s.
St. Louis isSN = +10m.23s.
Florissant eN = +10m.7s., iN = +10m.27s. and +10m.35s., iSZ = +10m.44s., eZ = +11m.13s.
Tucson i = +6m.1s., esP = +6m.27s., ePP = +6m.43s.
Huancayo ePP = +17m.2s.
Fordham iZ = +6m.37s.
Long waves were also recorded at Rome and Chicago.

March 28d. Readings also at 0h. (near Mizusawa), 7h. (Tucson), 8h. (Tucson, Riverside, Mount Wilson, and Pasadena), 10h. (near Triest), 11h. (near Harvard, near San Salvador, Ottawa, and Williamstown), 12h. (near Sotchi, Erevan, and Grozny), 14h. (near Manila), 16h. (near Tuai (3)), 17h. (Tucson), 19h. (Salt Lake City, Fresno, Bozeman, Tinemaha, Haiwee, Riverside, Mount Wilson, Pasadena, and Tucson), 20h. (La Paz, St. Louis, and near Tuai (2)), 21h. (Rome, Triest, and near Mizusawa), 22h. (near Tashkent, Tchimkent, Andijan, and near Tuai (2)), 23h. (Tucson).

March 29d. 21h. 37m. 27s. Epicentre 3°·0N. 97°·0E. (as on 1939 May 13d.).

A = −·1217, B = +·9912, C = +·0520; δ = −1; h = +7;
D = +·993, E = +·122; G = −·006, H = +·052, K = −·999.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Colombo	E.	17·5	283	3 59	− 8	7 15	− 6	—	—	9·1
Phu-Lien		20·1	28	e 4 37	− 1	—	—	—	—	—
Kodaikanal	E.	20·7	293	i 4 46a	+ 2	i 8 25	− 6	—	—	10·3
Calcutta	N.	21·2	338	e 3 56	−53	e 7 43	−58	e 11 21	SS	e 14·1
Hyderabad		23·2	10	5 12	+ 3	9 21	+ 3	—	—	11·2

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Hong Kong		25·4	40	5 33	+ 2	10 23	+27	—	—	—
Manila		26·3	62	e 5 45	+ 6	11 16	SS	—	—	16·4
Bombay		28·4	305	e 6 0	+ 2	i 10 40	− 5	i 12 48	SSS	—
Agra	E.	30·1	326	e 6 10	− 3	e 11 12	0	—	—	—
Andijan		43·7	332	8 8	0	—	—	—	—	—
Tashkent		45·6	331	i 8 22	− 2	15 3	− 3	—	—	21·2
Irkutsk		49·5	7	8 57	+ 3	e 16 9	+ 7	—	—	25·5
Vladivostok		50·6	34	—	—	e 16 36	+19	—	—	28·6
Baku		56·4	319	—	—	e 17 36	PS	—	—	31·5
Sverdlovsk		61·0	339	i 10 13	− 5	18 28	− 7	—	—	29·5
Ksara		64·5	306	e 10 38	− 3	(e 19 21)	+ 2	(e 23 49)	SS	—
Helwan		67·5	302	10 54	− 6	19 48	− 8	—	—	—
Moscow		70·0	330	e 11 17	− 3	e 20 27	− 7	—	—	—
Pulkovo		75·8	331	e 11 50	0	e 21 27	− 4	—	—	39·5
Mount Wilson	Z.	130·4	39	e 19 14	[+ 1]	i 22 35	SKP	e 21 50	PP	—
Pasadena	Z.	130·4	39	e 19 14	[+ 1]	—	—	i 22 35	SKP	—
Tucson		136·1	35	e 19 13	[−10]	—	—	—	—	—

Ksara S and SS have been diminished by 10m.
Long waves were also recorded at College, San Salvador, and Potsdam.

March 29d. Readings also at 1h. (Bozeman), 2h. (Adelaide, Riverview, Arapuni, Christchurch, and Wellington), 3h. (East Machias, La Paz, Fordham, Christchurch, Riverview, Ksara, Tucson, Sydney, and Huancayo), 4h. (Williamstown, Potsdam, and Ottawa), 6h. (Riverside, Haiwee, Mount Wilson, Pasadena, and Tucson), 11h. (Chicago and near Mizusawa), 12h. (Tucson), 13h. (Sydney), 14h. (Agra, Huancayo, Calcutta, and Balboa Heights), 15h. (Balboa Heights and Tucson), 17h. (Tucson), 18h. (near Tuai), 19h. (Tucson and Mizusawa), 22h. (Tucson), 23h. (Perth, Warsaw, Brisbane, Calcutta, Ottawa, Ksara, Christchurch, Riverview, Arapuni, Wellington, and Adelaide).

March 30d. 6h. 21m. 44s. Epicentre 6°·0S. 129°·2E.

$A = -·6286$, $B = +·7708$, $C = -·1038$; $\delta = +5$; $h = +7$;
$D = +·775$, $E = +·632$,; $G = +·066$, $H = -·080$, $K = -·995$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Manila		22·0	338	i 5 6	+ 8	9 22	SS	—	—	11·6
Perth		28·7	203	i 3 44	?	10 39	−11	i 7 26	PPP	16·3
Adelaide		30·1	164	—	—	e 11 6	− 6	i 12 14	SS	i 15·5
Brisbane	E.	31·1	136	—	—	e 10 22	?	i 14 10	SSS	i 15·8
Hong Kong		31·7	333	6 26	− 1	11 46	+ 9	13 36	SSS	—
Riverview		34·4	146	e 10 40	?	i 12 12	− 7	e 14 22	SS	—
Sydney		34·4	146	—	—	e 12 16	− 3	—	—	e 18·3
Phu-Lien		34·6	321	e 6 59	+ 6	—	—	—	—	—
Koti		39·6	6	7 35	0	13 32	− 6	—	—	—
Kobe		40·9	8	7 46	0	13 42	−16	—	—	—
Nagoya		41·6	10	7 52	+ 1	—	—	—	—	—
Nagano		43·3	10	8 4	− 1	14 26	− 7	—	—	—
Calcutta	N.	49·0	307	e 8 38	−12	15 53	− 2	—	—	—
Vladivostok		49·0	2	e 8 29	−21	i 15 29	−26	—	—	21·1
Colombo	E.	50·9	284	9 5	0	16 30	+ 9	—	—	22·6
Christchurch		53·4	141	6 53	?	16 42	−13	26 4	L_g	30·9
Wellington		53·6	138	—	—	16 16?	−42	26 16?	L_g	29·3
Agra	E.	59·4	307	i 10 7a	+ 1	18 15	0	e 12 22	PP	—
Bombay		60·8	295	i 10 15	− 1	i 19 15	PPS	i 12 37	PP	—
Almata		68·1	322	11 11	+ 7	—	—	—	—	—
Andijan		69·8	317	11 17	+ 3	20 28	+ 5	—	—	—
Tashkent		72·1	317	i 11 30	+ 2	i 20 53	+ 3	—	—	36·3
Sverdlovsk		83·5	329	i 12 30	− 1	i 22 43	− 9	15 44	PP	38·3
Moscow		95·9	325	e 17 9	PP	e 24 2	[− 4]	26 12	PS	—
Ksara		96·1	303	e 13 31	0	—	—	e 26 44	PPS	49·3
Helwan	E.	99·8	299	—	—	i 24 20	[− 6]	—	—	—
Tucson		118·4	56	e 18 43	[− 6]	—	—	—	—	—
St. Louis		131·8	41	e 22 29	?	e 33 28	PPS	—	—	—
La Paz	Z.	151·8	143	16 20	P	—	—	19 48	PKP	74·3

For Notes see next page.

NOTES TO MARCH 30d. 6h. 21m. 44s.

Additional readings :—
Perth i = +10m.6s., S = +11m.3s., i = +14m.6s. and +15m.26s.
Adelaide iE = +11m.16s., i = +11m.36s. and +11m.56s., e = +13m.6s.
Agra iE = +18m.50s., S_cS?E = +19m.50s., SSE = +22m.24s.
Bombay i = +19m.59s.
Moscow eS = +24m.43s.
Long waves were also recorded at Pasadena, Huancayo, Pulkovo, De Bilt, and Arapuni.

March 30d. Readings also at 0h. (Potsdam, Kew, San Fernando, De Bilt, Agra, Harvard, Pasadena, College, Huancayo, and La Paz), 1h. (College and Tucson), 4h. (Ottawa, Palomar, St. Louis, San Juan, Columbia, Tucson, Huancayo, near Manila, Mount Wilson, and Pasadena), 5h. (Harvard), 6h. (Helwan and Ksara), 8h. (Haiwee, Phu-Lien, Ksara, Pasadena, Mount Wilson, near Manila, Tucson, Riverside, and Tinemaha), 11h. (College), 12h. (Riverview, Tinemaha, Riverside, Tucson, Mount Wilson, and Pasadena), 13h. (near Manila), 15h. (Tucson, La Paz, Huancayo, and La Plata), 17h. (Tucson), 18h. (Tucson), 21h. (near Mizusawa (2), Tucson, and near Manila).

March 31d. 16h. 52m. 23s. Epicentre 19°·5S. 70°·6W. (as on 1938 April 17d.).

$A = +\cdot3134$, $B = -\cdot8897$, $C = -\cdot3318$; $\delta = -12$; $h = +5$;
$D = -\cdot943$, $E = -\cdot332$; $G = -\cdot110$, $H = +\cdot313$, $K = -\cdot943$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Montezuma		3·5	152	e 1 14	P_g	e 2 1	S_g	—	—	—
La Paz		3·8	39	i 1 9a	P*	i 2 9	S_g	—	—	2·4
Huancayo		8·7	328	e 2 19	+ 9	e 3 45	− 5	—	—	4·5
La Plata		19·0	146	4 23	− 3	7 54	− 1	8 13	SS	9·5
Rio de Janeiro		25·7	102	—	—	e 9 59	− 2	—	—	e 13·6
San Juan		37·9	8	e 7 21	+ 1	i 13 4	− 9	—	—	e 15·5
Fordham		60·1	359	i 10 11	0	e 18 25	− 2	i 11 18	P_cP	—
Pennsylvania		60·4	354	e 10 54	+41	—	—	—	—	—
St. Louis		60·7	344	e 10 12	− 3	e 18 22	−10	i 18 50	PS	—
Florissant		60·9	344	i 10 21	+ 4	i 18 30	− 4	—	—	—
Williamstown		62·0	359	i 10 23	− 1	—	—	—	—	e 35·3
Chicago		63·1	346	e 12 39	PP	e 18 51	−11	e 20 20	S_cS	e 25·2
East Machias		64·0	3	e 10 42	+ 4	e 19 25	+12	e 23 7	SS	e 25·9
Tucson		64·3	323	e 10 39	0	e 19 10	− 7	e 11 8	P_cP	e 32·2
Ottawa		64·8	357	10 42	− 1	19 23	0	—	—	33·6
Riverside		69·4	320	i 11 12	0	—	—	—	—	—
Mount Wilson	z.	70·0	320	i 11 16	+ 1	—	—	—	—	—
Pasadena		70·0	320	i 11 16	+ 1	—	—	—	—	—
Tinemaha		72·0	322	i 11 28	0	—	—	—	—	—
Victoria		82·5	328	12 37?	+11	22 43	+ 1	—	—	45·6
Granada		84·6	48	i 12 27a	− 9	i 24 12	PS	—	—	41·9
Toledo		85·6	45	i 12 43	+ 2	e 23 7	[+ 2]	—	—	—
Rome		97·8	49	—	—	e 27 34	PPS	—	—	—
Ksara		114·0	62	e 15 14	P	e 29 38	PS	e 19 36	PP	60·6

Additional readings :—
Montezuma eS = +12m.12s.
Huancayo S = +3m.50s. and +3m.58s.
La Plata N = +4m.49s. and +5m.43s., SE = +8m.7s.
San Juan iS = +13m.17s.
Fordham iPZ = +10m.29s.
St. Louis iEN = +18m.25s.
Florissant eE = +20m.6s.
Tucson eP = +10m.50s.
Pasadena iZ = +11m.27s.
Toledo eS = +23m.31s.
Ksara SS = +36m.8s.
Long waves were also recorded at Wellington, Arapuni, Colombo, Fresno, Harvard, De Bilt, and Potsdam.

March 31d. Readings also at 3h. (Tucson), 10h. (Balboa Heights), 11h. (near Apia and Tucson), 14h. (Riverview), 15h. (Zurich, near Clermont-Ferrand, Basle, Neuchatel, Strasbourg, Stuttgart, and La Paz), 16h. (Tucson), 17h. (Tucson (2)), 18h. (Agra and Bombay).

The scanned images of the bulletins of the International Seismological Summary (ISS) have been obtained as part of a global earthquake relocation project (Villaseñor et al., 1997) initiated with funding from the US National Science Foundation through grant EAR-9725140 and collected by SGA Storia Geofisica Ambiente (Bologna) on behalf of the Istituto Nazionale di Geofisica e Vulcanologia (Rome), in the frame of Euroseismos project.

A digital hypocenter file of the ISS (Villaseñor and Engdahl, 2005) can be obtained from the USGS web site: http://earthquake.usgs.gov/scitech/iss/

Villaseñor, A., and E.R. Engdahl, *A digital hypocenter catalog for the International Seismological Summary,* Seism. Res. Lett., vol. 76, no. 5, pp. 554-559, 2005.

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