The International Seismological Summary.
1943 October, November, December.

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

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

The last quarter 1943 contains 126 epicentres, 81 of which are repetitions from previous determinations.

Cases of abnormal focal depth are noted below :—

Oct.	2d.	17h.	Undetermined shock	Suggested Deep
	11d.	6h.	16·1S. 168·3E.	,, ,,
	16d.	13h.	36·4N. 27·9E.	,, ,,
	18d.	13h.	35·6N. 134·2E.	,, ,,
Nov.	7d.	6h.	Undetermined shock	Suggested Deep
	9d.	11h.	43·7N. 147·6E.	0·010
	11d.	0h.	Undetermined shock	Suggested Deep
	12d.	5h.	29·8N. 139·0E.	0·060
	16d.	11h.	15·6S. 74·6W.	Suggested Deep
	17d.	14h.	33·0N. 137·8E.	0·050
	18d.	21h.	20·5S. 64·0W.	0·030
	26d.	21h.	0·8S. 100·6E.	0·010
	28d.	21h.	29·3S. 178·2W.	0·040
	29d.	19h.	27·8S. 67·4W.	Suggested Deep
Dec.	1d.	6h.	4·1S. 143·8E.	0·010
	1d.	10h.	21·0S. 69·0W.	0·010
	3d.	6h.	42·1N. 143·5E.	0·020
	5d.	3h.	36·3N. 71·0E.	0·025
	7d.	1h.	16·0N. 94·0W.	Suggested Deep
	12d.	15h.	35·9N. 70·0E.	0·020
	22d.	7h.	3·0S. 76·9W.	0·010
	28d.	14h.	36·3N. 71·0E.	0·040

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

KEW OBSERVATORY,
RICHMOND, SURREY.

July, 1953.

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

1943 OCTOBER, NOVEMBER, DECEMBER.

Oct. 1d. 17h. 53m.2s. Epicentre 7°·9N. 38°·4W.

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

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Fort de France		23·3	288	e 5 10	0	e 9 34	+14	—	—	—
San Juan		28·9	295	e 6 45	+42	e 11 6	+13	—	—	e 11·3
Rio de Janeiro	E.	31·0	189	e 11 28	S	(e 11 28)	+ 2	—	—	e 15·3
La Paz	Z.	38·1	230	i 7 24 a	+ 2	i 13 25	+ 9	8 27	PP	19·0
Lisbon		40·4	37	7 41 a	0	13 51	+ 1	—	—	18·3
San Fernando	E.	40·8	41	e 8 15	+30	e 15 15	?	e 9 45	PP	—
Granada		43·0	42	i 8 3 a	0	14 28	− 1	8 33	pP	—
Almeria		43·5	43	i 8 7	0	i 14 38	+ 2	8 35	pP	22·0
Toledo		44·2	39	i 8 12	0	i 14 48	+ 2	—	—	—
Fordham		45·5	322	e 8 23	0	e 15 10?	+ 5	—	—	—
La Plata	N.	46·4	202	—	—	15 46?	+28	—	—	23·6
Tortosa	N.	47·6	40	i 8 39	0	14 39	−56	10 13	PP	—
Pittsburgh	N.W.	49·2	318	—	—	i 16 2	+ 4	—	—	e 19·6
Ottawa		49·3	326	e 8 54	+ 1	e 15 58?	− 1	—	—	20·0
Clermont-Ferrand		51·9	36	i 9 9	− 3	e 16 33	− 2	—	—	e 24·2
Paris		53·3	33	e 9 20	− 3	e 16 58?	+ 4	—	—	25·0
Kew		53·5	28	e 9 27	+ 3	e 16 59	+ 2	e 22 58?	SSS	e 26·0
Neuchatel		54·8	37	e 9 33	− 1	—	—	—	—	—
Uccle		55·4	31	e 9 38	0	e 17 21	− 1	—	—	e 26·0
Basle		55·5	36	e 9 38	− 1	—	—	—	—	—
St. Louis		55·6	312	i 9 40	0	e 17 25	0	—	—	e 23·8
Florissant		55·8	312	e 9 41	0	e 17 27	− 1	—	—	—
Florence		56·0	42	e 10 34	+51	i 17 33	+ 3	e 21 58	SS	—
Zürich		56·0	37	e 9 41 a	− 2	—	—	—	—	—
Chur		56·3	38	e 9 42	− 3	—	—	—	—	—
De Bilt		56·6	31	i 9 47	0	i 17 42	+ 4	—	—	e 26·0
Stuttgart		57·0	36	9 48	− 2	e 17 33	−10	e 21 34?	SS	e 26·5
Triest		58·4	40	e 9 50	−10	e 17 57	− 5	—	—	e 29·0
Jena	N.	59·4	35	e 10 3	− 3	—	—	—	—	—
Copenhagen		62·2	30	—	—	19 5	+14	—	—	—
Scoresby Sund		63·4	6	—	—	19 9	+ 3	—	—	26·0
Sofia		64·0	47	e 10 41	+ 3	—	—	e 14 28	PP	—
Upsala		66·6	27	e 9 58?	?	—	—	—	—	e 33·0
Helwan		68·6	61	11 8	+ 1	e 20 13	+ 4	—	—	—
Tucson		71·0	301	i 11 21	− 1	—	—	e 14 19	PP	e 37·3
Ksara		72·6	58	e 9 2	?	—	—	e 10 42	?	—
Palomar	Z.	76·1	303	i 11 52	+ 1	—	—	—	—	—
Riverside	Z.	76·5	303	i 11 53	− 1	—	—	—	—	—
Haiwee	Z.	77·0	305	i 11 55	− 1	—	—	—	—	—
Mount Wilson	Z.	77·1	303	e 11 57	0	—	—	—	—	—
Pasadena		77·2	303	i 11 57	0	—	—	—	—	e 35·0
Tinemaha	Z.	77·2	306	e 11 56	− 1	—	—	—	—	—
College		91·0	337	—	—	e 25 23	PS	e 30 2	SS	e 37·1
Bombay	E.	107·2	67	e 18 46	PP	e 29 1	PPS	—	—	—
Irkutsk		112·1	23	e 27 5	?	e 32 47	?	—	—	—
Mizusawa		133·2	0	e 25 22	?	e 29 42	?	29 48	?	—

Additional readings :—
Rio de Janeiro ePN = 11m.36s.
La Paz iPPP? = 8m.55s.
San Fernando eSSS?E = 19m.24s.
Granada sP = 9m.1s., S = 14m.4s.
Almeria sP = 8m.48s., P_cP = 9m.38s., PP = 9m.54s., pPP = 10m.13s., S_cP = 13m.16s., sS = 15m.22s., SS = 18m.3s.
Tortosa PPPN = 10m.37s.
Clermont-Ferrand eP = 9m.13s.
Florence ePS?N = 18m.8s.
De Bilt iZ = 17m.48s.
Jena eEZ = 10m.7s.
Helwan eZ = 11m.19s.
Long waves were also recorded at Bermuda, Riverview, Stonyhurst, Potsdam, and Calcutta.

Oct. 1d. Readings also at 2h. (Andijan, Tashkent, and Ksara), 6h. (Basle, Bombay, Calcutta, New Delhi, Andijan, Tashkent, and Stalinabad), 7h. (Andijan, Tashkent, and De Bilt), 11h. (Merida, Oaxaca, Auckland, Christchurch, Wellington, Arapuni, and Riverview), 12h. (Mizusawa, Santa Clara, Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Florissant, and St. Louis), 16h. (Sofia and Bucharest), 17h. (Rio de Janeiro), 18h. (Haiwee, Tucson, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, and St. Louis), 19h. (Stuttgart, Mount Wilson, Tucson, Pasadena, Riverside, Tinemaha, Vladivostok, and near Mizusawa), 20h. (Riverview and St. Louis), 21h. (near Branner), 22h. (near Fort de France).

Oct. 2d. 6h. 56m. 39s. Epicentre 40°·6N. 124°·6W. (as on 1941 Oct. 6d.).

Intensity IV at Ferndale.
Epicentre 40°·5N. 124°·6W. (Berkeley).

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

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ferndale		0·2	98	i 0 13	+ 3	i 0 23	+ 7	i 0 17	?	—
Berkeley		3·3	145	e 0 50	− 3	i 1 33	− 2	e 0 56	P*	—
San Francisco		3·3	147	e 1 20	P_g	—	—	—	—	—
Branner	E.	3·7	148	e 0 57	− 3	e 1 32	−13	—	—	—
	N.	3·7	148	e 1 1	+ 1	e 1 35	−10	e 1 21	P_g	—
Santa Clara	E.	3·8	147	e 1 32	?	e 2 28	?	—	—	—
Lick		4·0	143	e 1 2	− 2	e 1 50	− 2	e 1 47	?	—
Fresno	N.	5·4	134	e 1 26	+ 2	—	—	—	—	—
Tinemaha		6·0	125	i 1 38	+ 6	e 3 19	S_g	i 1 48	P*	—
Haiwee		6·9	128	e 1 45	0	e 3 17	+12	—	—	—
Mount Wilson		8·2	138	i 2 5	+ 2	—	—	—	—	—
Pasadena		8·2	138	i 2 4	+ 1	e 3 42	+ 4	i 2 11	P*	—
Riverside	Z.	8·7	136	e 2 9	− 1	—	—	—	—	—
Tucson		13·9	123	e 3 26	+ 5	—	—	—	—	e 8·9
Florissant	E.	26·3	83	—	—	e 11 55	SSS	—	—	e 14·9
St. Louis		26·5	83	e 5 32	− 9	—	—	e 12 7	SSS	e 14·9

Additional readings :—
Berkeley ePE = 1m.11s., iSNZ = 1m.27s.

Oct. 2d. 11h. Undetermined shock.

Bogota iP = 27m.0s.
St. Louis iPZ = 27m.47s., eZ = 28m.0s., ipPZ = 28m.8s., eZ = 28m.39s. and 30m.20s.
eSE = 31m.54s., esSE = 32m.31s.
Tucson iP = 27m.54s., i = 29m.21s., e = 32m.50s., eL = 35m.50s.
Florissant epP?Z = 28m.6s., esS?E = 32m.40s.
Palomar iPZ = 28m.36s. a.
Riverside ePZ = 28m.42s.
Mount Wilson iPZ = 28m.48s.
Pasadena ePZ = 28m.48s., eLN = 37m.24s.
Haiwee iPNZ = 28m.56s.
Tinemaha iPEZ = 29m.4s. a
San Juan eS = 33m.3s., eL = 34m.15s.
Philadelphia eS = 33m.32s., eL = 36m.33s.
Long waves were also recorded at Pittsburgh.

Oct. 2d. 14h. 37m. 39s. Epicentre 39°·5N. 71°·9E. (as on June 2d.).

Epicentre 39°·9N. 71°·2E. (stations of the U.S.S.R.).

$A = +\cdot2404$, $B = +\cdot7354$, $C = +\cdot6335$; $\delta = -7$; $h = -1$;
$D = +\cdot951$, $E = -\cdot311$; $G = +\cdot197$, $H = +\cdot602$, $K = -\cdot774$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Stalinabad		2·6	249	i 0 46	+ 2	i 1 23	+ 6	i 0 50	P*	—
Tashkent		2·7	313	i 0 43	− 2	e 1 16	− 3	i 1 26	S*	—
Tchimkent		3·3	330	i 0 55	+ 2	e 1 28	− 7	e 1 0	P*	—
New Delhi		11·7	156	e 2 32	−19	—	—	—	—	i 7·5
Bombay		20·6	179	e 4 39	− 4	e 8 28	− 1	—	—	e 10·9
Calcutta	N.	22·0	136	—	—	e 9 5	+ 9	—	—	—

Additional readings :—
Stalinabad iP_gP_g = 0m.55s.
Tchimkent PP = 1m.5s.

Oct. 2d. 17h. Undetermined shock. Argentine. Pasadena suggests deep focus.
La Plata P =22m.2s., SZ =23m.24s., SN =23m.32s., SE =23m.36s.?, LN =24m.6s.
La Paz iPZ =23m.39s.k, iSZ =26m.32s., LZ =28m.18s.
Fort de France e =28m.18s.
St. Louis ePZ =31m.22s., eZ =31m.58s., iZ =32m.9s., ePS?N =41m.39s.
Tucson iP =31m.38s., e =34m.16s.
Palomar iPZ =32m.0s.k, eZ =32m.34s., iZ =32m.50s.
Riverside iP =32m.4s.k, iZ =32m.43s.
Mount Wilson iP =32m.7s.k, eZ =32m.42s., iZ =32m.56s.
Pasadena iP =32m.8s.k, eZ =32m.43s., iZ =32m.57s., eN =37m.53s.
Haiwee iP =32m.14s.k.
Santa Barbara ePZ =32m.14s., eZ =32m.45s.
Tinemaha ePEN =32m.19s.

Oct. 2d. Readings also at 0h. (Tucson and near Mizusawa), 1h. (Tucson, near Granada, and Almeria), 4h. (near Florence), 5h. (Riverview, Scoresby Sund, Florissant, St. Louis, Pasadena, Mount Wilson, Riverside, Tinemaha, Tucson, Stuttgart, and near Mizusawa), 6h. (Fort de France, near Bogota, near Basle, Zürich, Stuttgart, and Ebingen), 7h. (New Delhi), 8h. (Kew, De Bilt, Uccle, Stuttgart, Irkutsk, Tashkent, Calcutta, and Bombay), 9h. (Mount Wilson, Riverside, Palomar, Tucson, St. Louis, and Bogota), 10h. (Pasadena, Mount Wilson, Riverside, Tucson, and Palomar), 20h. (Pasadena, Mount Wilson, Riverside, Palomar, and Tucson).

Oct. 3d. 0h. 52m. 49s. Epicentre 38°·3N. 26°·5W.

Strong at Angra do Heroismo and Ponta Delgada.
Registo de macrossismos. Anais do Observatorio central meteorologico do Infante D. Luiz. Vol. LXXXI, 1943, IIIe partie: observacoes sismologicas, Lisbon 1943, p. 26.
Epicentre as adopted.

$A = +\cdot7041$, $B = -\cdot3511$, $C = +\cdot6172$; $\delta = -4$; $h = -1$;
$D = +\cdot446$, $E = -\cdot895$; $G = -\cdot552$, $H = -\cdot275$, $K = -\cdot787$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Angra do Heroismo		0·7	301	i 0 15	− 2	i 0 25	− 3	—	—	—
Ponta Delgada		0·9	126	i 0 18	− 2	0 29	− 5	—	—	—
Lisbon		13·6	83	3 21k	+ 4	6 5	+15	3 33	PP	6·7
San Fernando	E.	16·3	90	e 3 54	+ 2	e 6 54	+ 1	e 4 15	PP	—
Toledo		17·5	78	i 4 5	− 2	e 7 53	SS	e 4 31	PP	—
Granada		18·5	85	i 4 17	− 2	i 7 45	+ 1	4 35	PP	9·8
Almeria		19·1	86	4 27	0	i 8 8	+11	4 38	pP	10·2
Tortosa	E.	20·9	74	e 4 51	+ 5	8 26	− 9	—	—	e 9·6
Kew		22·6	46	e 5 2	− 1	e 9 16	+ 9	—	—	e 10·7
Stonyhurst		22·6	39	—	—	i 9 15	+ 8	—	—	i 11·6
Clermont-Ferrand		23·1	62	e 5 9	+ 1	i 9 22	+ 6	—	—	e 11·3
Paris		23·4	54	e 5 12	+ 1	e 9 32	+11	—	—	11·2
Uccle		25·1	49	e 5 29?	+ 1	e 9 38	−13	—	—	e 11·7
Neuchatel		25·9	59	e 5 35	0	—	—	—	—	—
De Bilt		26·0	47	i 5 39	+ 3	i 10 9	+ 3	—	—	e 12·2
Basle		26·4	58	e 5 41	+ 1	e 11 43	SSS	—	—	—
Zürich		27·1	59	e 5 49	+ 3	—	—	—	—	—
Chur		27·7	60	e 5 51	− 1	—	—	—	—	—
Stuttgart		27·7	56	e 5 49	− 3	e 10 23	−10	—	—	e 12·2
Florence	E.	28·8	66	e 9 45	?	e 12 52	SSS	—	—	—
Jena	E.	29·6	53	e 6 15	+ 6	—	—	—	—	—
Triest		30·6	62	e 9 11	?	—	—	—	—	—
Prague		31·2	54	—	—	e 11 34	+ 5	—	—	—
Pittsburgh	N.W.	40·9	292	—	—	e 14 3	+ 5	—	—	e 26·0
Florissant		49·0	293	e 8 51	+ 1	e 15 52	− 3	e 18 51	SS	—
St. Louis		49·0	293	e 8 50	0	e 15 51	− 4	e 16 25	PS	—
Tucson		66·8	294	i 10 57	+ 1	—	—	—	—	—
Palomar	Z.	70·5	298	e 11 17	− 1	—	—	—	—	—
Riverside	Z.	70·5	299	i 10 53	−25	—	—	—	—	—
Mount Wilson	Z.	70·9	299	e 10 57	−24	—	—	—	—	—
Pasadena		71·0	299	e 10 57	−25	—	—	—	—	e 35·2

For Notes see next page.

NOTES TO OCTOBER 3d. 0h. 52m. 49s.

Additional readings :—
Lisbon N =5m.31s.
San Fernando eSS?E =8m.22s.
Granada SS =8m.26s.
Almeria PP =4m.47s., PPP =5m.2s., P_cP =8m.27s.
Stonyhurst e =10m.41s.
Uccle eN =10m.1s.
Florence eSSE =13m.20s., phases wrongly identified.
Pittsburgh eNW =18m.3s.
Florissant eE =19m.58s.
St. Louis eSSE =18m.45s.
Tucson i =11m.15s.
Riverside iZ =11m.13s.
Mount Wilson iZ =11m.21s.
Pasadena iZ =11m.22s.
Long waves were also recorded at Barcelona, Potsdam, Upsala, Bermuda, and San Juan.

Oct. 3d. 8h. 28m. 29s. Epicentre 43°·1N. 13°·2E. (as on 1937 Jan. 17d.).
A = +·7131, B = +·1673, C = +·6808 ; δ = −1 ; h = −3 ;
D = +·228, E = −·974 ; G = +·663, H = +·155, K = −·732.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Florence		1·6	296	i 0 34k	+ 4	i 0 56	+ 5	—	—	—
Triest		2·6	9	e 0 43	− 1	0 50	P*	i 0 53	P_g	—
Milan	E.	3·7	311	e 1 10	P_g	1 56	S*	—	—	—
Chur		4·6	327	e 1 14	+ 2	—	—	—	—	—
Kalossa		5·3	48	e 1 31?	P*	2 21	− 4	i 1 44	P_g	3·0
Ravensburg		5·3	333	e 1 33?	P*	e 2 32?	+ 7	e 1 45?	P_g	e 3·2
Zürich		5·4	323	e 1 23k	− 1	e 3 4	S_g	—	—	—
Belgrade		5·5	70	e 1 19	− 6	i 2 53	S_g	i 1 56	P_g	—
Neuchatel		5·9	313	e 1 30	− 1	e 2 38	− 2	e 1 35	P	—
Ogyalla		5·9	35	2 7	P_g	e 2 59	S*	—	—	e 3·1
Basle		6·0	321	e 1 32	0	e 2 37	− 6	e 1 45	P*	—
Stuttgart		6·3	336	e 1 34	− 2	e 2 48	− 2	i 2 5	P_g	i 3·8
Strasbourg		6·7	327	e 1 40	− 2	i 2 49	−11	e 1 59	P*	4·1
Prague		7·0	7	e 1 55?	+ 9	e 3 4	− 4	—	—	e 3·5
Sofia		7·4	90	e 1 47	− 5	i 3 7	−11	e 2 23	P_g	—
Clermont-Ferrand		7·7	294	i 1 57	+ 1	e 3 49	S*	i 2 29	P_g	i 5·2
Jena		7·9	353	i 1 57	− 2	i 3 24	− 6	—	—	i 4·0
Barcelona		8·4	262	e 1 54	−12	—	—	—	—	e 4·4
Campulung		8·8	72	e 2 11	0	—	—	—	—	6·0
Potsdam		9·3	0	e 3 19?	?	i 4 29	S*	e 4 55	S_g	i 5·3
Bucharest		9·4	78	e 2 12	− 6	e 4 1	− 6	i 5 12	S_g	—
Paris		9·4	311	e 2 24?	+ 6	e 5 0	S_g	—	—	—
Tortosa	E.	9·7	260	e 2 32	+10	4 52	S*	—	—	6·1
Uccle		9·8	325	e 2 30	+ 6	e 4 57	S*	i 5 24	S_g	e 6·0
Kew		12·4	317	—	—	e 5 21?	0	—	—	e 7·7
Toledo		13·3	261	i 3 13	0	e 6 3	+21	e 3 24	PP	7·5
Almeria		13·5	248	i 3 17	+ 2	7 2	?	i 3 31	pP	i 8·5
Granada		14·1	251	3 26	+ 3	6 32	+30	—	—	i 7·1
San Fernando	E.	16·3	252	e 3 32	−20	e 7 25	+32	—	—	e 10·0
Upsala		17·0	7	—	—	e 6 39	−31	—	—	e 10·5
Lisbon		17·4	263	4 6k	0	7 42	+23	4 14	PP	10·3
Helwan		19·6	127	4 25	− 7	—	—	—	—	—
Ksara		20·0	112	e 4 31	− 6	e 8 15	− 2	—	—	—
Moscow		20·1	43	4 39	+ 1	8 27	+ 8	—	—	—
Sverdlovsk		32·7	49	i 6 30	− 6	—	—	13 34	SS	—
Tashkent		40·9	73	e 7 41	− 5	e 14 6	+ 8	—	—	—
St. Louis		73·1	307	e 11 31	− 3	—	—	—	—	—
Tucson		89·2	315	e 12 58	− 1	—	—	—	—	e 51·8
Mount Wilson	z.	91·1	322	e 13 13	+ 5	—	—	—	—	—
Palomar	z.	91·3	320	e 13 6	− 3	—	—	—	—	—

Additional readings :—
Kalossa PN =1m.39s., SE =2m.8s.
Ravensburg eS_g =3m.1s.?.

Continued on next page.

Belgrade iP_g =1m.40s., i =2m.59s. and 3m.18s.
Ogyalla PE =2m.11s.
Stuttgart iPZ =1m.38s., iP_g =1m.50s., iZ =2m.18s., iS_g =3m.11s., 3m.14s., and 3m.28s.
Strasbourg eP_g =2m.10s., i =3m.9s., iS =3m.14s., iS_g =3m.32s.
Sofia S*EN =3m.44s., iS_gEN =3m.57s.
Clermont-Ferrand iS_g? =4m.12s.
Jena iPE =2m.10s., iN =3m.6s., 3m.19s., and 3m.44s., iEZ =3m.49s.
Potsdam eS_gE =5m.1s.?, iN =5m.10s.
Bucharest eN =2m.55s., iS*N =4m.43s.
Kew eE =6m.32s., eZ =6m.54s., eN =7m.20s.
Almeria PP =3m.49s.
Lisbon PN =4m.10s., SE =7m.51s.
Helwan iZ =5m.19s., eNZ =8m.25s., eZ =8m.46s.
St. Louis eZ =11m.37s., eE =17m.26s.
Long waves were also recorded at De Bilt, Bergen, Copenhagen, and Pasadena.

Oct. 3d. 18h. Pacific. Epicentre roughly 51°S. 165°E. (Pasadena).

Christchurch P =58m.38s., S =60m.26s.
Wellington P =59m.17s., i =60m.17s., S =61m.49s., L =62m.29s.?.
Sydney e =59m.30s.? and 64m.12s.
New Plymouth P =59m.42s., i =59m.57s., S? =63m.15s.
Tuai P =60m.5s., S =63m.16s.
Kaimata S =60m.19s., i =61m.18s., L =63m.28s.
Riverview iP =60m.50s.a, ipP =60m.59s., iSN =64m.16s., iSE =64m.21s., iSS =64m.36s., eLZ =65m.18s.
Arapuni S =63m.30s.
Auckland S? =64m.0s., i =64m.16s. and 64m.45s., L =65m.55s.
Mount Wilson eZ =75m.38s.
St. Louis ePPZ =75m.43s., eE =88m.19s., eSSE =91m.12s.
Tucson e =75m.49s., eL =108m.48s.
Tinemaha eZ =75m.50s.
Stuttgart eZ =77m.30s. and 80m.0s., eQ =86·5m., eR =90·3m.
Granada ePKP =77m.39s., PP =81m.55s., PPP =86m.2s., iSS =102m.56s., Q =130m.
Almeria ePKP? =77m.48s., e =78m.10s. and 82m.40s., L =139m.14s.
Calcutta eN =79m.6s.
Bombay SSE =90m.1s.
Long waves were also recorded at La Plata, Pasadena, Fort de France, and other European stations.

Oct. 3d. Readings also at 0h. (Stuttgart, Mount Wilson, Tucson, Pasadena, Palomar, and Riverside), 8h. (Stonyhurst and Triest), 13h. (Riverview), 20h. (Palomar, Tinemaha, Tucson, St. Louis, La Paz, and near Fort de France), 21h. (Basle, Zürich, Stuttgart, and near Florence), 22h. (Jena and Triest).

Oct. 4d. 10h. 39m. 42s. Epicentre 16°·1S. 168°·3 E. (as on June 24d.).

Epicentre 15°·5S. 168°·0E. (Pasadena).

$A = -·9413$, $B = +·1949$, $C = -·2756$; $\delta = -1$; $h = +6$;
$D = +·203$, $E = +·979$; $G = +·270$, $H = -·056$, $K = -·961$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane		18·1	229	i 4 16	+ 2	i 7 49	+14	i 8 7	SSS	—
Apia		19·4	86	e 4 33	+ 3	8 14	+10	—	—	—
Auckland		21·5	166	4 58	+ 6	9 5	SS	i 9 23	SSS	i 11·1
Arapuni		22·8	165	—	—	9 18?	+ 7	i 10 24?	SSS	—
Riverview		23·5	217	i 5 13a	+ 1	i 9 36	+13	i 9 56	SS	e 11·5
Sydney		23·5	217	e 5 0	−12	—	—	i 9 57	SS	—
Tuai		23·9	163	5 19	+ 3	9 50	+20	—	—	—
Wellington		25·7	170	5 36	+ 3	10 6	+ 5	6 13	PP	13·3
Christchurch		27·6	173	5 57	+ 6	10 31	− 1	13 13	Q	15·3
Honolulu		49·9	43	e 8 56	− 1	e 16 10	+ 3	—	—	e 20·5
Perth		50·0	242	—	—	i 16 28	PPS	i 20 48	SSS	i 25·3
Ukiah		84·2	47	e 12 36	+ 2	e 22 59	0	e 28 26	SS	e 34·7
Berkeley	E.	84·3	49	i 12 37	+ 2	e 23 4	+ 4	—	—	e 38·3
		84·3	49	i 12 30	− 5	e 23 1	+ 1	—	—	e 39·3
Santa Clara		84·3	49	i 12 39	+ 4	e 23 6	+ 6	e 24 19	PPS	e 38·4

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Santa Barbara		84·8	53	e 12 36	− 1	—	—	—	—	—
Pasadena		85·9	53	i 12 40	− 3	e 23 6?	[− 1]	i 16 9	PP	e 35·2
Mount Wilson		86·0	53	i 12 41a	− 2	—	—	—	—	—
La Jolla		86·1	54	i 12 42	− 2	—	—	—	—	—
Riverside		86·4	53	i 12 44	− 1	—	—	—	—	—
Sitka		86·5	27	—	—	e 23 5	[− 6]	—	—	e 35·6
Palomar	Z.	86·6	55	i 12 43	− 3	—	—	i 12 50	PcP	—
Haiwee	N.	86·8	51	e 12 45	− 2	—	—	—	—	—
Tinemaha		86·9	50	i 12 46	− 2	—	—	—	—	—
Calcutta	N.	87·1	295	e 13 42	+53	i 23 32	+ 4	—	—	—
College		87·3	17	e 12 58	+ 8	e 23 22	{ 0}	—	—	e 38·7
Victoria		88·2	39	e 12 54?	0	e 23 36?	− 2	—	—	48·3
Colombo	E.	90·4	277	13 5	+ 1	23 37	[+ 2]	—	—	—
Tucson		91·0	57	i 13 5	− 2	e 23 44	[+ 5]	e 25 11	PS	e 40·8
Bozeman		95·0	44	e 13 26	0	e 24 43	+ 5	e 23 56	SKS	e 40·0
New Delhi	N.	98·5	297	—	—	i 24 15	[− 5]	—	—	—
Saskatoon		99·6	39	—	—	—	—	e 26 48?	PS	56·3
Bombay	E.	100·1	286	e 17 15	?	i 25 24	+ 3	i 27 46	PPS	—
	N.	100·1	286	e 17 11	?	e 25 28	+ 7	27 40	PPS	—
Tashkent		107·1	309	e 17 54	?	e 25 1?	[+ 1]	i 25 54	SKKS	—
Florissant		108·6	54	e 18 55	PP	e 25 6	[0]	e 28 22	PS	—
St. Louis	E.	108·7	54	e 18 57	PP	e 25 10	[+ 3]	e 28 18	PS	—
La Paz	Z.	115·6	118	—	—	—	—	e 30 18	PPS	55·3
Pittsburgh	N.W.	116·7	52	—	—	e 25 4	[−34]	i 29 46	PS	e 46·8
San Juan		128·1	78	e 21 6	PP	e 22 32	PKS	e 36 30	?	e 49·4
Bermuda		129·4	60	e 22 5	?	—	—	e 22 25	PKS	—
Fort de France		132·4	85	e 23 19	PKS	—	—	—	—	—
Ksara		133·8	301	e 19 25	[+ 6]	—	—	e 22 54	PKS	—
Helwan		138·3	297	e 19 28	[+ 1]	—	—	e 22 18	PP	—
De Bilt		141·7	343	e 19 32	[− 2]	—	—	e 22 38	PP	e 67·3
Stuttgart		143·2	337	e 19 28	[− 8]	—	—	e 22 45	PP	e 79·8
Kew		143·6	348	e 19 55	[+18]	—	—	—	—	e 75·3
Chur		144·6	335	e 19 34	[− 4]	—	—	—	—	—
Zürich		144·6	336	e 19 32a	[− 6]	—	—	—	—	—
Basle		144·8	337	e 19 34	[− 5]	—	—	e 20 32	?	—
Paris		145·4	334	i 19 39	[− 1]	—	—	e 22 53	PP	80·3
Neuchatel		145·5	337	e 19 36	[− 4]	—	—	—	—	—
Milan	Z.	145·9	333	e 18 38	[−63]	—	—	—	—	—
Florence		146·2	329	i 19 38	[− 3]	i 29 37	{−20}	e 42 33	SSP	—
Clermont-Ferrand		147·9	341	i 19 47k	[+ 3]	—	—	i 23 1	PP	e 78·3
Tortosa		153·2	339	19 46	[− 6]	—	—	—	—	—
Almeria		157·8	340	19 59	[+ 1]	23 41	PKS	20 29	PKP_2	79·3
Granada		157·8	343	i 20 11	[+13]	27 32	[+29]	20 29	PKP_2	—
San Fernando		159·2	348	e 19 58	[− 2]	e 25 34	?	20 35	PKP_2	—

Additional readings :—
Riverview i = 5m.18s., iE = 9m.45s., iN = 9m.52s. and 10m.32s., iE = 10m.35s.
Wellington i = 6m.48s., Z = 8m.19s., i = 10m.31s., S_cP? = 12m.13s., P_cS? = 12m.48s.
Tucson e = 16m.7s., ePP = 16m.43s., eS = 24m.24s., e = 29m.44s.
Bozeman e = 34m.33s.
Bombay iE = 18m.27s., PPPE = 19m.53s., eSKSE = 24m.23s., iEN = 24m.30s., iSKKSE = 24m.43s.
Tashkent ePP = 18m.44s., eSS = 34m.52s.
Florissant eSKKSE = 26m.1s., eN = 26m.50s., ePPSE = 29m.27s.
St. Louis eSN = 26m.40s., eSSE = 33m.54s., eSSSE = 38m.18s.
Bermuda e = 34m.10s.
Stuttgart ePKP?Z = 19m.32s., eZ = 24m.18s.
Florence ipPZ = 20m.32s., ePPN = 24m.49s., ePPPN = 27m.40s.
Almeria PP = 24m.4s., PPP = 27m.43s., SS = 43m.56s.
Granada pPKP = 20m.56s., iPP = 24m.11s., pPP = 24m.58s., sPP = 25m.29s., PPP = 27m.55s., sSKS = 28m.22s., SKKS = 31m.12s., sSKKS = 32m.36s., SKSP = 34m.54s., SS = 43m.41s.
San Fernando PP?Z = 24m.13s.
Long waves were also recorded at Harvard.

Oct. 4d. 12h. 32m. 0s. Epicentre 19°·1N. 67°·1W. (as on September 10d.).

$A = +·3680$, $B = -·8711$, $C = +·3252$; $\delta = -1$; $h = +5$;
$D = -·921$, $E = -·389$, $G = +·127$, $H = -·300$, $K = -·946$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
San Juan		1·2	128	e 0 28	+ 4	e 0 42	+ 1	i 0 46	S_g	i 1·1
Fort de France		7·2	127	e 2 29	P_g	—	—	—	—	—
Harvard		23·6	353	e 5 31	+18	e 9 27	+ 2	—	—	—
Tucson		41·3	298	e 7 47	− 2	—	—	e 9 35	PP	—
Palomar	z.	46·4	299	i 8 29	− 1	—	—	—	—	—
Riverside	z.	46·9	300	i 8 33	− 1	—	—	—	—	—
Mount Wilson	z.	47·5	300	i 8 38	0	—	—	—	—	—
Pasadena	z.	47·6	300	i 8 38	− 1	—	—	i 9 16	?	—
Tinemaha	z.	48·0	303	i 8 41	− 2	—	—	—	—	—

Oct. 4d. Readings also at 0h. (New Delhi and Tashkent), 1h. (Stuttgart, Basle, Zürich, Chur, Triest, near Florence, and Milan), 2h. (Tacubaya), 4h. (Riverview, Christchurch, Wellington, Arapuni, and Auckland), 5h. (La Paz), 7h. (Pasadena, Mount Wilson, Riverside, Tinemaha, Palomar, and Tucson (2)), 9h. (Ksara and near Berkeley), 10h. (St. Louis, Pasadena, Mount Wilson, Riverside, Tinemaha, Palomar, Haiwee, and Tucson), 12h. (St. Louis), 13h. (Stuttgart, Palomar, Riverside, Mount Wilson, Pasadena, Tucson, Tinemaha, Auckland, Wellington, and Riverview), 14h. (Palomar, Riverside, Tucson, Mount Wilson, Pasadena, Tinemaha, Wellington, Auckland, and Riverview), 16h. (Stuttgart, Tucson, Palomar, Riverside, Mount Wilson, Pasadena, Tinemaha, Riverview, and Brisbane), 22h. (Bogota), 23h. (near Reykjavik (2)).

Oct. 5d. 11h. Tibet?

Andijan iP = 12m.52s., iS_g = 14m.1s.
Tashkent iP = 13m.34s.
New Delhi iN = 14m.16s., i = 14m.30s., eSN = 16m.40s., iL? = 18m.37s.
Calcutta eN = 14m.58s., iN = 18m.43s.
Sverdlovsk iP = 15m.34s., iS = 19m.13s.
Bombay iPN = 16m.26s., eSEN = 20m.27s., iE = 20m.33s., iN = 20m.36s., iEN = 20m.54s., eLN = 22m.54s.
Grozny eP = 16m.37s.
Copenhagen P = 19m.25s.
Stuttgart eZ = 19m.54s.
Toledo iPZ = 21m.24s., i = 24m.47s.
Long waves were also recorded at other European stations.

Oct. 5d. Readings also at 0h. (Stuttgart near Ebingen and Zurich, near Granada, and near Reykjavik (3)), 1h. (Andijan, Tashkent, Sverdlovsk, Calcutta, Helwan, and Ksara), 2h. (Granada), 4h. (near La Paz), 5h. (near Ksara, near Bogota, and near La Paz), 9h. (La Paz and La Plata), 11h. (Christchurch, Wellington, Brisbane, Riverview, Mount Wilson, Pasadena, Riverside, and Tinemaha), 12h. (Florence, Stuttgart, and Scoresby Sund), 16h. (Mount Wilson, Palomar, Riverside, Tucson, Tinemaha, and St. Louis), 17h. (Granada), 18h. (Kew, Toledo), 19h. (Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, and St. Louis), 20h. (Helwan, Ksara, Tashkent, and near Ferndale (2)), 21h. (New Delhi), 22h. (La Paz), 23h. (near Fort de France).

Oct. 6d. Readings at 0h. (Christchurch, Auckland, and Wellington), 1h. (Triest), 5h. (Bogota), 6h. (Auckland), 8h. (Bogota and New Plymouth), 9h. (Auckland, Arapuni, Christchurch, Wellington, and Riverview), 15h. (Auckland, Christchurch, and Wellington), 17h. (near La Paz, La Plata, St. Louis, Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, and Tucson), 20h. (Stuttgart, near Basle, Chur, Neuchatel, and Zürich), 21h. (near Basle, Chur, Neuchatel, Zürich, and Stuttgart), 22h. (Belgrade and Triest), 23h. (Ksara and Sofia).

Oct. 7d. 2h. 6m. 20s. Epicentre 35°·6N. 134°·2E. (as on 1943 Sept. 11d.).

Scale V at Sakai ; IV at Yonago, Matsue, Kobe, Hikone ; II-III at Saigo, Sumoto, Kyoto, Wakayama, Tsugura. Radius of macroseismic area 200-300 km., shallow. Seismological Bulletin of the Central Meteorological Observatory, Japan for year 1943, Tokyo 1950, pp. 44-45, macroseismic chart p. 44. Suggested epicentre, 35°·5N. 133°·9E.

$A = -\cdot5682$, $B = +\cdot5843$, $C = +\cdot5795$; $\delta = +8$; $h = 0$;
$D = +\cdot717$, $E = +\cdot697$; $G = -\cdot404$, $H = +\cdot415$, $K = -\cdot815$.

		△	Az.	P.	O+C.	S.	O−C.
		°	°	m. s.	s.	m. s.	s.
Kobe		1·2	139	0 23k	− 1	0 40	− 1
Kyoto		1·4	115	0 26	− 1	0 46	0
Osaka		1·4	131	0 28	+ 1	0 49	+ 3
Sumoto		1·4	156	0 24	− 3	0 42	− 4
Wakayama		1·6	150	0 27	− 3	0 49	− 2
Hikone		1·7	101	0 31	0	0 58	+ 4
Hirosima		1·9	230	0 28	− 6	0 49	−10
Kameyama		2·0	112	0 28	− 7	1 7	+ 5
Gihu		2·1	95	0 35a	− 2	1 10	+ 6
Nagoya		2·3	101	0 40	0	1 17	S_g
Owase		2·3	133	0 42	+ 2	1 15	S_g
Siomisaki		2·5	149	0 44	+ 1	1 18	S_g
Nagano		3·4	71	0 56	+ 1	1 44	S*
Omaesaki		3·4	107	1 12	P_g	1 56	S_g
Kohu		3·5	88	1 0	+ 3	1 58	S_g
Shizuoka		3·5	101	1 11	P_g	1 55	S_g
Misima		3·9	96	1 2	0	1 59	S*
Kumamoto		4·0	227	0 59	− 5	1 57	S*
Osima		4·3	100	1 15	P*	2 9	S*
Yokohama		4·4	91	1 31k	P_g	—	—
Tokyo Cen. Met. Ob.		4·5	87	1 32	P_g	2 26	S_g
Utunomiya		4·7	77	1 31	P_g	2 41	S_g
Tukubasan		4·8	81	1 21	+ 6	—	—
Kakioka		4·9	81	1 16	− 1	2 0	−15
Mito		5·1	79	1 41	P_g	—	—
Tomie		5·4	238	1 29	+ 5	—	—
Hukusima		5·5	65	1 13	−12	—	—
Sendai		6·0	62	1 35	+ 3	2 47	+ 4

Long waves were also recorded at Copenhagen and Wellington.

Oct. 7d. 10h. 43m. 55s. Epicentre 16°·1S. 168°·3E. (as on 4d.).

$A = -\cdot9413$, $B = +\cdot1949$, $C = -\cdot2756$; $\delta = -1$; $h = +6$;

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane		18·1	229	i 4 9a	− 5	i 7 42	+ 7	i 4 25	PP	—
Auckland		21·5	166	—	—	1 35?	?	—	—	13·1
Arapuni		22·8	165	—	—	e 9 5?	− 6	—	—	15·1
Riverview		23·5	217	i 5 17k	+ 5	e 9 44	+21	i 11 10	SSS	e 12·2
Sydney		23·5	217	—	—	e 9 29?	+ 6	—	—	e 13·1
Pasadena		85·9	53	i 12 42	− 1	—	—	—	—	e 40·1
Mount Wilson		86·0	53	i 12 43k	0	—	—	—	—	—
Riverside	z.	86·4	53	12 44k	− 1	—	—	—	—	—
Palomar	z.	86·6	55	i 12 51k	+ 5	—	—	—	—	—
Haiwee		86·8	51	e 12 46	− 1	—	—	—	—	—
Tinemaha		86·9	50	i 12 46	− 2	—	—	—	—	—
Tucson		91·0	57	e 13 8	+ 1	—	—	—	—	—
St. Louis		108·7	54	e 19 5	PP	—	—	e 32 1	?	e 53·1
Granada		157·8	343	(19 53)	[− 5]	—	—	(23 53)	PP	—

Additional readings :—
Brisbane eSN = 7m.47s.
Riverview iE = 9m.47s., iN = 9m.53s.
Christchurch (△ = 27·6), P = 10h.42m.32s., S = 10h.51m.10s., Q = 10h.58m.8s., R = 11h.2m.36s.
Granada readings reduced by 1 minute.
Long waves were also recorded at Wellington and De Bilt.

Oct. 7d. Readings also at 0h. (Zürich), 6h. (New Plymouth), 7h. (Brisbane, Riverview, Auckland, Wellington, Christchurch, near Apia, and near Ferndale), 8h. (Auckland, Christchurch, Wellington, Riverview, and near Mizusawa), 9h. (near Bogota), 15h. (St. Louis, Tinemaha, Palomar, Mount Wilson, Tucson, Helwan, Sofia, Zürich, Chur, and near Ksara), 18h. (Erevan), 20h. (Tacubaya and Ferndale).

Oct. 8d. Readings at 10h. (Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, near Almeria, Granada, and Toledo), 11h. (Ksara), 13h. (La Paz), 18h. (near Balboa Heights, Bogota, and La Paz), 19h. (Tucson), 22h. (St. Louis and near San Juan).

Oct. 9d. Readings at 5h. and 6h. (near Mizusawa), 7h. (Bogota), 9h. (near Fresno), 10h. (Florissant, St. Louis, Florence, Stuttgart, Clermont-Ferrand, Paris, De Bilt, Uccle and near Fort de France).

Oct. 10d. 0h. 43m. 12s. Epicentre 35°·0N. 82°·0E.

$A = +·1143$, $B = +·8130$, $C = +·5710$; $\delta = +7$; $h = 0$;
$D = +·990$, $E = -·139$; $G = +·079$, $H = +·565$, $K = -·821$.

Approximate.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Dehra Dun	N.	5·7	217	e 1 16	−12	e 2 51	+16	e 3 24	S_g	—
Almata		9·1	336	e 2 16	+ 2	4 46	L	—	—	(4·8)
Tashkent		11·8	306	e 2 49	− 4	—	—	—	—	—
Calcutta	N.	13·6	155	e 3 21	+ 4	e 5 21	−29	—	—	i 7·8
Bombay		18·0	210	e 4 21	+ 8	7 55	+23	—	—	e 9·1
Irkutsk		23·5	35	i 5 5	− 7	9 19	− 4	—	—	—
Sverdlovsk		26·2	334	i 5 35	− 3	10 18	+ 9	—	—	—
Helwan	N.	42·7	278	—	—	e 14 36	+12	—	—	—
Stuttgart		53·9	309	e 9 26	− 1	e 17 8	+ 6	e 20 48?	SS	e 28·8
Uccle		56·4	313	—	—	e 17 39	+ 3	e 20 56	SS	e 28·8

Additional readings :—
Bombay iPE = 4m.24s., iN = 8m.11s., iE = 8m.55s.
Long waves were also recorded at Andijan, Florence, and De Bilt.

Oct. 10d. Readings also at 4h. (Pasadena, Mount Wilson, Tinemaha, Tucson, Riverside, Haiwee, and Palomar), 9h. (Pasadena, Tucson, Mount Wilson, Tinemaha, Riverside, and Palomar), 10h. (Florence, Florissant, St. Louis, and Tacubaya), 14h. (Tashkent), 17h. (Sofia), 18h. (near Erevan).

Oct. 11d. 6h. 23m. 35s. Epicentre 16°·1S. 168°·3E. (as on 7d.).

Pasadena suggests deep focus.

$A = -·9413$, $B = +·1949$, $C = -·2756$; $\delta = -1$; $h = +6$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	
		°	°	m. s.	s.	m. s.	s.	m. s.	
Brisbane		18·1	229	i 4 16	+ 2	i 7 33	− 2	e 7 39	SS
Auckland		21·5	166	(4 55)	+ 3	4 55	P	—	—
Riverview	E.	23·5	217	—	—	i 9 8	−15	—	—
Sydney		23·5	217	e 6 43?	?	—	—	—	—
Wellington		25·7	170	(5 33)	0	(10 25?)	+24	—	—
Pasadena	Z.	85·9	53	i 12 41a	− 2	—	—	e 13 27	?
Mount Wilson		86·0	53	i 12 42	− 1	—	—	i 13 27	?
Riverside	Z.	86·4	53	i 12 43a	− 2	—	—	e 13 21	?
Palomar	Z.	86·6	55	i 12 46a	0	—	—	i 13 33	?
Tinemaha		86·9	50	i 12 47a	− 1	—	—	e 13 33	?
Tucson		91·0	57	i 13 6a	− 1	—	—	e 13 48	?
Stuttgart		143·2	337	e 19 25?	[−11]	—	—	—	—
Chur		144·6	335	e 19 35	[− 4]	—	—	—	—
Zürich		144·6	336	i 19 34k	[− 5]	—	—	—	—
Neuchatel		145·5	337	e 19 37	[− 3]	—	—	—	—
Clermont-Ferrand		147·9	341	e 19 45	[+ 1]	—	—	—	—

Wellington P given as S, S given as L.

Oct. 11d. Readings also at 0h. (New Plymouth), 2h. (Tucson and near Bogota), 12h. (Oaxaca and near Mizusawa), 13h. (near Almeria, Granada, Toledo, San Fernando, near Lisbon, near Mizusawa (2), and near Apia), 17h. (Pasadena, Tucson, Mount Wilson, Riverside, Tinemaha, Palomar, and St. Louis).

Oct. 12d. 9h. 1m. 57s. Epicentre 48°·2N. 9°·0E. (as on Sept. 17d.).

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

	△	Az.	P.	O−C.	S.	O−C.	Supp.	
	°	°	m. s.	s.	m. s.	s.	m. s.	
Ebingen	0·0	—	i 0 4?	− 3	—	—	—	—
Ravensburg	0·6	135	e 0 20	+ 5	—	—	—	—
Stuttgart	0·6	13	e 0 11	P_g	i 0 23	− 3	i 0 14	P
Zurich	0·9	198	e 0 19	− 1	e 0 31	− 3	—	—
Basle	1·2	235	e 0 24	0	e 0 40	− 1	—	—
Chur	1·4	165	e 0 29	+ 2	e 0 38	− 8	—	—
Neuchatel	1·8	229	e 0 36	+ 4	e 0 59	+ 3	—	—
Jena	3·2	32	e 1 24	?	e 1 27	− 5	—	—

Stuttgart gives also iS_g = 0m.19s.

Oct. 12d. Readings also at 4h. (near Mizusawa), 5h. (De Bilt, Calcutta, Bombay, Helwan, Sverdlovsk, Andijan, Stalinabad, Tashkent, and Ksara), 6h. (near Harvard), 7h. and 8h. (near Bogota), 9h. (Stuttgart, Bogota, and near Mizusawa), 11h. (St. Louis, Palomar, Tinemaha, Riverside, Tucson, Tacubaya, and La Paz), 12h. (Riverview).

Oct. 13d. 4h. 44m. 40s. Epicentre 25°·3N. 110°·5W. (as on 1940 June 23d.)

$A = -\cdot3170$, $B = -\cdot8479$, $C = +\cdot4250$; $\delta = +5$; $h = +3$;
$D = -\cdot937$, $E = +\cdot350$; $G = -\cdot149$, $H = -\cdot398$, $K = -\cdot905$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m,
Tucson		6·9	358	i 1 37	− 8	i 2 41	−24	—	—	i 3·0
La Jolla		9·6	323	e 2 22	+ 1	—	—	—	—	—
Palomar	Z.	9·7	327	i 2 24 a	+ 2	—	—	—	—	—
Riverside		10·5	327	e 2 35	0	—	—	—	—	—
Mount Wilson		11·0	325	i 2 41 a	− 1	—	—	—	—	—
Pasadena		11·0	325	i 2 42 a	0	—	—	—	—	i 5·0
Tacubaya	N.	12·0	117	e 3 9	+14	i 5 42	SSS	—	—	e 6·4
Santa Barbara		12·1	320	e 2 58	+ 1	—	—	—	—	—
Haiwee		12·5	331	i 3 2k	0	—	—	—	—	—
Tinemaha		13·5	333	i 3 15k	0	—	—	—	—	—
Fresno	N.	13·9	327	e 3 23	+ 2	—	—	—	—	—
Lick		15·3	324	e 3 41	+ 2	e 6 49	+19	—	—	e 8·0
Salt Lake City		15·5	357	e 3 38	− 4	e 6 50	+15	e 4 8	PP	e 8·2
Santa Clara		15·5	324	e 3 48	+ 6	e 6 54	+19	—	—	e 7·6
Branner	N.	15·6	323	i 3 51	+ 8	—	—	—	—	—
Berkeley		16·1	324	i 3 52	+ 3	i 6 54	+ 5	—	—	e 8·3
Logan		16·4	355	i 3 50	− 3	i 7 1	+ 5	—	—	i 8·6
Bozeman		20·3	0	e 4 32	− 8	e 8 27	+ 4	—	—	e 10·0
Cape Girardeau	N.	21·5	51	e 4 45	− 7	—	—	—	—	e 11·1
Florissant		21·7	47	e 4 55	0	e 8 44	− 7	e 10 21	?	e 11·2
St. Louis		21·7	47	e 4 47	− 8	e 8 41	−10	—	—	i 11·2
Seattle		24·2	341	—	—	e 8 52	−43	—	—	e 11·2
Chicago		25·1	43	—	—	e 9 41	−10	—	—	e 12·5
Victoria		25·3	340	—	—	e 10 11	+17	—	—	13·3
Columbia		27·0	64	—	—	e 10 27	+ 5	—	—	e 13·7
Saskatoon		27·0	5	—	—	e 10 38	+16	—	—	15·3
Pittsburgh	N.W.	29·6	52	—	—	i 10 47	−17	—	—	—
Buffalo		31·3	48	(i 6 12)	−12	(13 8)	SS	(7 54)	PPP	—
Ottawa		34·3	45	e 6 47	− 3	e 14 20	SS	—	—	e 17·3
Seven Falls		38·2	45	—	—	e 16 20?	SS	—	—	e 18·3

Continued on next page.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bermuda	40·4	69	e 9 20	PP	e 16 58	SS	—	—	e 20·4
San Juan	41·6	90	e 11 12	?	e 17 25	SS	—	—	e 21·6
Honolulu	43·5	275	—	—	e 16 53	SS	—	—	e 19·0
Uccle	85·0	36	—	—	e 23 6	− 1	—	—	e 35·3
Granada	87·4	50	12 37	−13	i 23 37	+ 7	—	—	40·7
Almeria	88·3	50	—	—	i 23 52	+13	—	—	42·3

Additional readings :—
Tucson i = 2m.5s.
Berkeley iPZ = 3m.55s., iPE = 3m.59s., iSE = 6m.57s., eSE = 7m.4s.
Logan e = 4m.52s. and 7m.46s.
St. Louis iPZ = 4m.54s., iSN = 8m.49s.
Chicago e = 11m.34s.
Pittsburgh iNW = 12m.42s., and 13m.42s.
Buffalo PPP = (8m.40s.), all readings have been reduced by 10m.
Long waves were also recorded at Riverview, Sitka, and other American and European stations.

Oct. 13d. 5h. 43m. 0s. Epicentre 36°·7N. 138°·2E. (as on 1941 July 15d.).

Epicentre in the vicinity of the Lake Nozini, Nagano Prefecture. Felt throughout Tyubu and part of Tohoku district. Intensity VI at Nagano ; V at Matsumoto, Wazima ; IV at Kohu ; II-III at Niigata, Hukusima, and Hamamatu.
Epicentre 36° 48′N. 138° 13′ E. Radius of macroseismic area 200-300 km. Shallow.
See Seismological Bulletin of the Central Meteorological Observatory, Japan, for the year 1943, Tokyo 1950, pp. 45-46, 2 macroseismic charts p. 45.
H. Kawasumi.
Seismology in Japan 1939-1947.
Bulletin of the Seismological Society of America, volume 39, 1949, p. 161.

$A = -·591$, $B = +·5357$, $C = +·5950$; $\delta = -8$; $h = 0$;
$D = +·667$, $E = +·745$; $G = -·444$, $H = +·397$, $K = -804$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Nagano		0·0	—	0 3k	− 4	0 5	− 6	—	—	—
Maebasi		0·7	113	0 15k	− 2	0 27	− 1	—	—	—
Kohu		1·1	164	0 23	+ 1	0 39	0	—	—	—
Aikawa		1·3	2	0 23k	− 2	0 39	− 5	—	—	—
Hunatu		1·3	159	0 26k	+ 1	0 47	+ 3	—	—	—
Wazima		1·3	303	0 23a	− 2	0 41	− 3	—	—	—
Utunomiya		1·4	96	(0 27)k	0	(0 47)	+ 1	—	—	—
Tokyo Cen. Met. Ob.		1·6	128	0 27	− 3	1 2	S_g	—	—	—
Tukubasan		1·6	108	(0 29)	− 1	(0 59)	+ 8	—	—	—
Kakioka		1·7	106	1 20k	+49	—	—	—	—	—
Misima		1·7	159	0 33k	+ 2	0 58	+ 4	—	—	—
Shizuoka		1·7	175	0 35	+ 4	1 0	+ 6	—	—	—
Yokohama		1·7	137	0 33k	+ 2	1 1	+ 7	—	—	—
Nagoya		1·8	213	0 33a	+ 1	0 53	− 3	—	—	—
Mito		1·9	100	0 33k	− 1	0 59	0	—	—	—
Hamamatu		2·0	191	0 38k	+ 3	1 6	+ 4	—	—	—
Hikone		2·1	228	0 41a	+ 4	1 15	S_g	—	—	—
Hukusima		2·1	60	0 35	− 2	1 2	− 2	—	—	—
Omaesaki		2·1	180	0 41k	+ 4	1 7	+ 3	—	—	—
Osima		2·2	154	0 38	0	1 8	+ 2	—	—	—
Kameyama		2·3	217	0 42a	+ 2	1 23	S_g	—	—	—
Tyosi		2·4	114	0 51	P_g	1 38	+26	—	—	—
Kyoto		2·6	230	0 46a	+ 2	1 17	0	—	—	—
Sendai		2·7	54	0 43k	− 2	1 17	− 2	—	—	—
Osaka		3·0	228	0 50	0	1 42	S_g	—	—	—
Toyooka		3·0	247	0 50a	0	1 40	S_g	—	—	—
Owase		3·1	212	0 59	+ 8	1 43	S_g	—	—	—
Kobe		3·2	231	0 53a	+ 1	1 45	S_g	—	—	—
Mizusawa	E.	3·3	43	0 54	+ 1	1 41	+ 6	—	—	—
Wakayama		3·5	226	0 57	0	1 57	S_g	—	—	—
Sumoto		3·6	230	0 59k	+ 1	2 3	S_g	—	—	—
Hatidyozima		3·8	158	0 46	−15	1 40	− 7	—	—	—
Siomisaki		3·8	212	1 12	P*	2 1	S*	—	—	—
Miyako		4·2	44	1 8	+ 1	—	—	—	—	—
Aomori		4·6	26	1 10	− 2	2 37	S_g	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Hatinohe		4·6	33	1 11	− 1	2 11	+ 4	—	—	—
Koti		5·0	232	1 25	+ 7	2 42	S_g	—	—	—
Hamada		5·3	252	1 29	+ 7	2 52	S_g	—	—	—
Simidu		5·8	229	1 40	P*	2 55	S*	—	—	—
Sapporo		6·8	20	1 45	+ 1	3 4	+ 1	—	—	—
Kumamoto		7·3	240	1 52k	+ 2	2 54	−21	—	—	—
Kagosima		8·2	233	2 19a	P*	4 29	S_g	—	—	—
Tomie		8·8	245	3 56	S	(3 56)	+ 3	—	—	—
Naha		13·8	223	3 30	PP	—	—	—	—	—
Calcutta	N.	45·1	266	—	—	—	—	e 15 13	PPS	e 25·4
Tinemaha		78·1	52	i 12 0	− 2	—	—	—	—	—
Haiwee		78·8	53	e 12 4	− 2	—	—	—	—	—
Ksara		79·2	303	e 10 29	?	—	—	e 12 21	P_cP	—
Mount Wilson		79·9	54	i 12 9	− 3	—	—	—	—	—
Pasadena		79·9	54	i 12 9	− 3	—	—	—	—	—
Riverside	z.	80·5	54	e 12 11	− 4	—	—	—	—	—
Palomar	z.	81·2	54	i 12 16	− 3	—	—	—	—	—
Stuttgart	z.	83·6	328	e 12 28	− 3	—	—	—	—	—
Christchurch		85·8	155	—	—	27 4	?	27 36	Q	29·2
Tucson		85·9	52	i 12 37	− 6	—	—	—	—	—
St. Louis	z.	92·7	36	e 13 12	− 3	—	—	—	—	—

Additional readings :—
Utunomiya and Tukubasan readings increased by 1 minute.
Ksara e = 14m.11s.
Long waves were also recorded at Wellington, Riverview, and at other European stations.

Oct. 13d. 11h. 22m. 22s. Epicentre 48°·2N. 9°·0E. (as on 12d.).

$A = +·6609$, $B = +·1046$, $C = +·7432$; $\delta = +8$; $h = -5$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ebingen		0·0	—	i 0 4?a	− 3	—	—	—	—	—
Ravensburg		0·6	135	—	—	e 0 22	− 4	—	—	—
Stuttgart		0·6	13	e 0 10	− 5	i 0 17	S_g	—	—	—
Strasbourg		0·9	295	—	—	i 0 33	− 1	—	—	—
Zürich		0·9	198	e 0 20	0	e 0 33	− 1	—	—	—
Basle		1·2	235	e 0 25	+ 1	i 0 42	+ 1	—	—	—
Chur		1·4	165	e 0 30	+ 3	—	—	—	—	—
Neuchatel		1·8	229	e 0 37	+ 5	—	—	—	—	—
Jena	N.	3·2	32	—	—	e 1 37	+ 5	—	—	—

Oct. 13d. 23h. 24m. 8s. Epicentre 48°·2N. 9°·0E. (as at 11h.).

Strongly felt in the Jura Sonabe ; intensity V in the north of Switzerland.
Annales de l'Institut de Physique du Globe de Strasbourg, 2eme partie, Séismologie, tomes VII-VIII, Strasbourg 1950, p. 38.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ebingen		0·0	—	i 0 3?a	− 4	i 0 3?	− 8	—	—	—
Ravensburg		0·6	135	i 0 12k	− 3	i 0 24	− 2	i 0 18	P	—
Stuttgart		0·6	13	i 0 11a	− 4	i 0 16	S_g	—	—	—
Strasbourg		0·9	295	i 0 22	+ 2	i 0 33	− 1	—	—	—
Zürich		0·9	198	i 0 18a	− 2	i 0 31	− 3	—	—	—
Basle		1·2	235	e 0 22a	− 2	i 0 39	− 2	—	—	—
Chur		1·4	165	i 0 27	0	i 0 48	+ 2	—	—	—
Neuchatel		1·8	229	e 0 32	0	i 1 5	+ 9	i 0 36	P_g	—
Milan	z.	2·7	177	e 0 49	+ 4	1 22	+ 3	—	—	—
Cheb		2·9	50	e 0 56?	P_g	e 1 33	S*	—	—	—
Jena		3·2	32	i 0 59	P*	i 1 33	+ 1	i 1 4	P_g	i 1·6
Clermont-Ferrand		4·7	236	i 1 29	P_g	i 2 12	+ 2	i 2 31	S_g	i 2·6
Potsdam		4·9	33	—	—	e 2 37	S_g	—	—	—

Ravensburg also gives $iS_g = 0m.21s.$

Oct. 13d. Readings also at 0h. (Fort de France), 1h. (College, Mount Wilson, Pasadena, Tucson, Palomar, and Riverside), 9h. (Ebingen, Stuttgart, near Basle, and Zurich), 10h. (Tacubaya and Tucson), 13h. (Riverview, near Lick, and near Bogota), 14h. (Riverview, Arapuni, and Wellington), 16h. (Tashkent), 18h. (new Plymouth), 19h. (Tuai), 22h. (Bacau and Bucharest).

Oct. 14d. Readings at 1h. (Fort de France), 3h. (near Mizusawa), 5h. (near Berkeley, Branner, Fresno, Lick, San Francisco, and Santa Clara), 6h. (Arapuni, Auckland, Wellington, Riverview, Haiwee, Mount Wilson, Pasadena, Palomar, Tucson, and Tinemaha), 11h. (Mount Wilson, Tucson, Pasadena, Palomar, Tinemaha, Bucharest, and Sofia), 12h. (Haiwee, La Jolla, Mount Wilson, Pasadena, Palomar, Santa Barbara, Tinemaha, and Tucson), 14h. (near Branner, Lick, Fresno, Haiwee, Jolla, Mount Wilson, Pasadena, Palomar, Riverside, Santa Barbara, Tinemaha, and near Tucson), 15h. (near Fort de France and near Mizusawa), 16h. (Pasadena, Palomar, Tucson, and Tinemaha), 18h. (near Mizusawa), 22h. (Mount Wilson, Pasadena, Tinemaha, Tucson, Fresno, San Francisco, Santa Clara, near Berkeley, Branner, and Lick), 23h. (Ferndale).

Oct. 15d. 18h. 57m. 45s. Epicentre 34°·2N. 140°·5E.

Scale IV at Hatidyozima; II-III at Tomisaki, Tokyo, and Hukusima. Radius of macro seismic area 200-300 km. Shallow. Epicentre as adopted.
Seismological Bulletin of Central Meteorological Observatory, Japan, for year 1943, Tokyo 1950, p. 47, with chart.

$A = -\cdot6396$, $B = +\cdot5272$, $C = +\cdot5595$; $\delta = +7$; $h = 0$;
$D = +\cdot636$, $E = +\cdot772$; $G = -\cdot432$, $H = +\cdot356$, $K = -\cdot829$.

	Δ	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Hatidyozima	1·2	207	0 30	+ 6	0 46	+ 5
Yokohama	1·4	330	0 29k	+ 2	0 46	0
Misima	1·6	306	0 30k	0	0 50	− 1
Tokyo Cent. Met. Ob.	1·6	337	0 27	− 3	0 50	− 1
Tyosi	1·6	11	0 30	0	0 49	− 2
Omaesaki	1·9	282	0 36	+ 2	1 7	+ 8
Kakioka	2·0	353	0 24	−11	0 45	−17
Tukubasan	2·0	351	0 35	0	0 58	− 4
Mito	2·2	359	0 41	+ 3	1 3	− 3
Utunomiya	2·4	248	0 30	−11	0 57	−15
Nagano	3·1	323	0 50	− 1	1 27	− 2
Nagoya	3·1	288	0 52	+ 1	1 27	− 2
Kameyama	3·4	283	0 57	+ 2	—	—
Hukusima	3·5	0	0 55	− 2	1 29	−11
Owase	3·6	269	0 59	+ 1	1 36	− 6
Hikone	3·7	282	0 59	− 1	1 41	− 4
Toyama	3·7	314	1 10	P_g	1 53	S*
Siomisaki	4·0	261	1 3	− 1	—	—
Sendai	4·1	4	1 0	− 5	1 44	−11
Aikawa	4·2	335	1 14	+ 7	2 9	+12
Kobe	4·4	278	1 56	S	(1 56)	− 6
Wakayama	4·4	272	1 15	+ 5	—	—
Sumoto	4·6	273	1 15	+ 3	2 1	− 6
Mizusawa	4·9	6	e 1 22	+ 5	e 2 5	−10
Miyako	5·5	12	2 15	S	(2 15)	−15

Oct. 15d. 22h. 8m. 54s. Epicentre 25°·7S. 68°·8W. (as on 1937 Oct. 12d.).

$A = +\cdot3263$, $B = -\cdot8412$, $C = -\cdot4313$; $\delta = +11$; $h = +3$;
$D = -\cdot932$, $E = -\cdot362$; $G = -\cdot156$, $H = +\cdot402$, $K = -\cdot902$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Montezuma		3·1	359	e 1 8	P_g	—	—	—	—	e 2·1
La Paz	Z.	9·2	5	2 30	+14	i 5 10	S_g	—	—	6·1
La Plata		13·1	137	3 5	− 5	5 30	− 8	—	—	6·5
Rio de Janeiro	E.	23·5	88	e 5 21	+ 9	e 9 51	+28	—	—	—
	N.	23·5	88	e 5 16	+ 4	e 9 54	+31	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bogota		30·6	350	e 6 21	+ 3	—	—	—	—	—
St. Louis	z.	67·1	342	i 10 54	− 3	—	—	—	—	—
Tucson		70·2	323	i 11 12	− 5	—	—	—	—	—
Palomar	z.	74·4	320	i 11 35	− 7	—	—	—	—	—
Mount Wilson	z.	75·7	320	i 11 43	− 6	—	—	—	—	—
Pasadena		75·7	320	i 11 43	− 6	—	—	—	—	e 36·1
Santa Barbara	z.	76·9	319	e 11 50	− 6	—	—	—	—	—
Haiwee		77·0	322	e 11 52	− 4	—	—	—	—	—
Tinemaha	z.	77·9	322	e 11 57	− 4	—	—	—	—	e 41·6

Additional readings :—
La Plata N = 3m.18s.?, E = 4m.6s.?.
St. Louis eZ = 11m.2s.
Palomar iZ = 11m.46s.
Mount Wilson iZ = 11m.52s.
Pasadena iZ = 11m.53s.
Tinemaha iZ = 12m.7s.
Long waves were also recorded at De Bilt.

Oct. 15d. Readings also at 4h. (Bogota), 5h. (St. Louis), 6h. (Tucson, Mount Wilson, Pasadena, Palomar, Tinemaha, Tacubaya, near Bacau, Budapest, Campulung, and Focsani), 7h. (St. Louis and Tacubaya), 8h. (Mount Wilson, Pasadena, Palomar, Tinemaha, Tucson, St. Louis, and Tacubaya), 12h. (St. Louis), 16h. (Lick, near Fresno, Haiwee, La Jolla, Mount Wilson, Pasadena, Palomar, Riverside, Santa Barbara, Tinemaha, and near Tucson), 17h. (Tucson, Mount Wilson, Pasadena, Palomar, and Tinemaha), 20h. (Arapuni, Auckland, Christchurch, Wellington, Riverview, Sydney, and near Branner), 21h. (La Paz and Pasadena), 22h. (Kew), 23h. (near Ottawa).

Oct. 16d. 0h. Undetermined shock.

Brisbane ePE = 32m.5s., iSE = 36m.25s., iSS?E = 37m.4s., iLE = 41m.49s.
Riverview iN = 34m.40s., iS?EN = 38m.40s., SS?E = 40m.26s., eLN = 42m.54s.
Auckland P? = 35m.15s.?, S? = 40m.0s., i = 41m.15s., and 43m.35s., R? = 47m.?.
Wellington PZ = 35m.46s., S = 42m.30s.?, i = 43m.35s., R = 48m.
Sydney e = 37m.54s.?.
Bombay eP?E = 39m.51s., iE = 50m.9s., 50m.28s. and 51m.28s., eE = 53m.25s.
Tashkent P = 40m.20s., iS = 51m.0s.
Pasadena ePZ = 40m.43s., eZ = 41m.8s., eLZ = 70m.
Tinemaha ePZ = 40m.49s., eZ = 41m.3s.
Christchurch S = 42m.15s., Q = 45m.16s., R = 48m.27s.
Perth i = 45m.20s. and 51m.0s.
St. Louis eZ = 47m.11s., eLE = 83m.
Calcutta iN = 47m.30s., eN = 49m.20s.
Fort de France e = 59m.28s.
Long waves were also recorded at De Bilt, Kew, Florence, and Ksara.

Oct. 16d. 10h. Puerto Rico.

Felt at Ciudad Trujillo (República Dominica).
Boletín sísmico del Instituto geofisico de los Andes Colombianos, Bogota. Octubre 1943.
Port au Prince iP = 2m.14s., iL = 2m.47s.
San Juan iP = 2m.20s., iS = 2m.56s., iL = 3m.8s.
Fort de France e = 3m.38s. and 9m.39s.
Bogota eP = 4m.58s., ipP? = 5m.6s., i = 5m.18s., e = 7m.56s., iS? = 8m.2s.
Harvard eP = 6m.44s., eS = 10m.39s., e = 27m.12s.
Cape Girardeau ePN = 6m.50s.
St. Louis ePZ = 7m.1s., eLE = 13m.48s.
Ottawa eZ = 7m.6s.? and 12m.12s.?, L = 16m.
Tucson eP = 8m.53s.
Palomar ePZ = 9m.36s.
Mount Wilson ePZ = 9m.44s.
Pasadena iPZ = 9m.44s.
Haiwee ePZ = 9m.46s.
Tinemaha eP = 9m.50s.
Long waves were also recorded at Bermuda, Florissant, De Bilt, and Uccle.

Oct. 16d. 12h. 10m. 7s. Epicentre 45°·2N. 8°·1E.

Epicentre as adopted (Strasbourg). 45°·1N. 8°·1E. (Stuttgart).
Annales de l'Institut de Physique du Globe de Strasbourg, 2ème partie, Séismologie, tomes VII-VIII, Strasbourg 1950, p. 38.

$A = +·6999$, $B = +·0996$, $C = +·7072$; $\delta = -9$; $h = -4$;
$D = +·141$, $E = -·990$; $G = +·700$, $H = +·100$, $K = -·707$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Milan	0·8	71	i 0 16	− 2	i 0 34	+ 3	—	—	—
Chur	1·9	31	e 0 34	0	—	—	—	—	—
Neuchatel	2·0	336	e 0 35	0	e 1 5	+ 3	e 1 10	S_g	—
Zurich	2·2	9	e 0 38	0	—	—	—	—	—
Basle	2·4	351	e 0 41	0	e 1 15	+ 3	e 1 28	S_g	—
Florence	2·7	122	i 0 37a	− 8	i 1 12	− 7	i 1 25	S*	—
Ravensburg	2·8	22	e 0 53?	+ 6	e 1 23	+ 1	e 0 59	P_g	—
Clermont-Ferrand	3·6	279	i 0 58	0	i 1 53	S*	i 1 18	P_g	—
Strasbourg	3·6	356	e 1 1	+ 3	i 1 43	+ 1	e 1 14	P_g	2·3
Stuttgart	3·6	11	e 0 56	− 2	i 1 43	+ 1	e 1 8	P*	i 2·4
Triest	4·0	82	—	—	e 1 42	−10	e 2 8	S_g	—
Jena	6·2	21	i 2 1	P_g	i 2 44	− 4	—	—	—
Potsdam	7·9	23	—	—	e 4 23?	S_g	—	—	—

Additional readings :—
Florence $eP_gZ = 0m.44s.$
Ravensburg $i = 1m.17s.$, $iS_g = 1m.46s.$
Stuttgart $eP_g = 1m.13s.$, $iZ = 1m.18s.$ and $1m.50s.$, $eZ = 1m.55s.$, $iS_gZ = 2m.1s.$, $eZ = 2m.10s.$

Oct. 16d. 13h. 8m. 46s. Epicentre 36°·4N. 27°·9E.

Felt at Cairo (Egypt), and at Aydin (Turkey). Epicentre 36°·5N. 27°·5E. Depth 110 kms. (Pasadena). Magnitude 6·5 (Gutenburg).
Epicentre as adopted (U.S.C.G.S.).
Bulletin météorologique séismique et magnétique de l'Observatoire d'Istanbul, Istanbul 1948, p. 44.

$A = +·7130$, $B = +·3775$, $C = +·5908$; $\delta = -8$; $h = 0$;
$D = +·468$, $E = -·884$; $G = +·522$, $H = +·276$, $K = -·807$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Istanbul		4·7	11	(1 37)	P*	(2 49)	SS_g	(1 44)	P_g	—
Ksara		7·0	110	e 1 47	+ 1	i 3 0	− 8	e 2 39	P_g	—
Helwan		7·1	155	i 1 48	0	2 59	−11	—	—	—
Sofia		7·2	332	i 1 56	+ 7	i 3 19	+ 6	i 2 35	P_g	—
Bucharest		8·1	351	e 2 6	+ 4	e 3 41	+ 6	i 4 13	S*	—
Campulung		9·1	347	e 2 22	+ 8	e 4 6	+ 6	—	—	—
Focsani		9·3	357	e 2 30	PPP	—	—	—	—	e 4·7
Belgrade		10·1	328	i 2 41	PP	i 5 16	S*	i 3 1	PPP	i 6·4
Bacau		10·2	356	e 2 40	+ 9	—	—	—	—	4·9
Ogyalla		13·5	331	3 4	?	(5 31)	−16	e 3 11	P	5,5
Triest		14·1	315	i 3 14	− 9	—	—	—	—	i 7·1
Florence	N.	14·7	305	i 3 34a	+ 3	i 6 15	− 1	i 3 40	PP	i 7·1
Grozny		15·3	58	3 42	+ 3	—	—	—	—	—
Milan		16·8	309	i 4 4	+ 6	7 18	+13	—	—	—
Prague		16·8	329	i 4 0	+ 2	e 7 10	+ 5	—	—	e 8·2
Cheb		17·7	327	i 4 13	+ 3	e 7 33	+ 7	—	—	e 8·7
Ravensburg		17·7	315	i 4 11	+ 1	e 7 41	SS	—	—	—
Zurich		18·1	314	i 4 15a	+ 1	e 7 53	SS	—	—	—
Stuttgart		18·4	319	i 4 19a	+ 1	i 7 45	+ 4	i 4 35	PP	—
Basle		18·7	314	i 4 22a	0	—	—	—	—	—
Jena		18·7	327	i 4 21a	− 1	e 7 54	+ 6	e 7 58	SS	e 9·7
Neuchatel		18·8	313	i 4 23	0	—	—	—	—	—
Potsdam		19·1	332	i 4 28	+ 1	i 8 5	+ 8	i 4 43	PP	—
Strasbourg		19·1	317	i 4 28	+ 1	e 8 3	+ 6	i 4 57	PPP	—
Moscow		20·4	16	4 40	− 1	8 18	− 7	i 4 56	PP	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Barcelona		20·6	294	i 4 41	− 2	e 8 23	− 6	i 8 51	SS	e 9·1
Clermont-Ferrand		20·8	305	i 4 44	− 1	i 8 40	+ 7	—	—	e 10·4
Tortosa		21·8	291	i 4 51	− 5	i 8 48	− 4	5 7	PP	10·1
Copenhagen		22·0	337	i 4 56	− 2	i 8 54	− 2	5 13	PP	13·2
Uccle		22·2	320	i 4 59a	− 1	i 8 58	− 2	e 8 51	?	e 11·2
Paris		22·3	313	i 4 59	− 2	e 8 55	− 7	—	—	14·2
De Bilt		22·5	324	i 5 1a	− 1	i 9 4	− 1	—	—	e 11·2
Almeria		24·3	281	i 5 19	− 1	i 9 35	− 2	5 52	PP	11·2
Upsala		24·4	348	5 18	− 3	i 9 33	− 6	e 16 10	S_cS	e 12·9
Kew		25·1	317	e 5 29	+ 1	i 10 2	+11	i 10 27	SS	—
Granada		25·2	282	i 5 28a	− 1	i 10 12	+20	5 49	pP	14·3
Toledo		25·3	288	i 5 29	− 1	e 9 49	− 5	e 6 2	PP	—
San Fernando		27·4	281	e 6 9	+20	e 11 8	+40	e 7 7	PP	16·2
Bergen		28·0	338	5 54	− 1	—	—	e 12 14?	SSS	e 14·7
Edinburgh		28·7	323	—	—	e 11 14	+24	—	—	—
Lisbon		29·3	287	i 6 6k	0	11 2	+ 3	13 0?	SSS	—
Sverdlovsk		29·9	37	i 6 10	− 2	10 59	−10	i 6 29	pP	—
Tashkent		32·4	69	i 6 33	− 1	11 39	− 9	—	—	—
Bombay	E.	43·0	102	e 7 58?	− 5	17 36	SS	10 32	PPP	—
Scoresby Sund		43·0	338	i 8 2	− 1	17 32?	SS	9 44	PP	—
Calcutta	N.	53·6	87	e 8 44	?	—	—	—	—	—
Irkutsk		54·4	48	i 9 29	− 2	i 17 2	− 7	—	—	—
Seven Falls		69·6	315	11 10	− 3	20 8?	−13	—	—	35·2
Shawinigan Falls		71·1	315	11 18	− 4	20 28	−10	—	—	—
Ottawa		73·4	315	11 33	− 3	20 59	− 6	—	—	33·2
Bermuda		73·5	298	—	—	e 21 0	− 6	—	—	—
Fordham		74·9	310	i 11 42	− 2	i 21 16	− 6	i 12 3	P_eP	—
Vladivostok		75·0	48	11 44	− 1	21 50	SP	26 4	SS	—
Kumamoto		80·3	57	12 47	+33	—	—	—	—	—
San Juan		82·4	288	e 12 47	+22	e 22 32	− 9	—	—	—
Nagoya		82·9	51	e 12 37	+ 9	—	—	—	—	—
Sendai		83·3	47	e 12 49	+19	22 41	− 9	—	—	—
Kohu		83·6	51	e 11 48	−43	—	—	—	—	—
Kakioka		84·2	49	e 12 23	−11	—	—	—	—	—
Florissant	Z.	86·0	316	i 12 41	− 2	—	—	e 13 2	pP	—
St. Louis		86·0	316	i 12 41	− 2	e 23 17	0	i 13 1	pP	e 39·0
Cape Girardeau	N.	86·5	315	e 12 47	+ 1	e 23 0	[−11]	e 13 7	pP	—
Tinemaha	Z.	100·4	333	e 13 49	− 1	—	—	e 30 29	PKKP	—
Haiwee	Z.	101·2	333	e 13 51	− 3	—	—	—	—	—
Tucson		101·5	325	e 13 53	− 2	e 24 25	[− 9]	e 18 1	PP	e 50·0
Mount Wilson	Z.	102·9	332	e 13 58	− 3	e 24 33	[− 8]	e 18 14	PP	—
Pasadena		103·0	332	e 13 59	− 3	i 24 33	[− 8]	e 18 15	PP	—
Palomar	Z.	103·2	331	e 18 18	PP	—	—	i 29 55	PKKP	—
La Paz		104·4	260	e 24 22	SKS	(e 24 22)	[−26]	—	—	—

Additional readings :—
Istanbul readings reduced by 2 minutes.
Bucharest eE = 3m.5s., eN = 3m.11s., iS_gE = 4m.37s.
Belgrade i = 3m.42s.
Florence iPPPN = 3m.43s., isPN = 4m.17s., isSN = 6m.25s., iSSE = 6m.38s.
Stuttgart i = 5m.28s., i = 8m.28s. and 8m.32s.
Strasbourg isP = 5m.0s., i = 5m.34s., 5m.50s., and 6m.11s.
Tortosa PPPN = 5m.24s., SSN = 9m.14s.
Copenhagen 9m.21s.
Almeria PPP = 6m.8s., SS = 10m.39s., SSS = 10m.49s.
Upsala eE = 7m.17s., SE = 9m.29s.
Kew iEN = 10m.13s.
Granada PP = 6m.9s., pPP = 6m.18s., PPP = 6m.27s., pPPP = 6m.37s., sPPP = 6m.54s., P_eP = 8m.27s., sS = 10m.55s.
San Fernando eSS?E = 12m.29s.
Lisbon SN = 10m.53s.
Bombay iE = 8m.33s. and 17m.53s., SSSE = 18m.24s.
Calcutta eN = 10m.34s. and 15m.34s.
St. Louis iZ = 13m.19s., ePPPP?E = 18m.28s., eSKSE = 22m.46s., iSKKSE = 23m.9s., esSE = 24m.0s., ePSE = 24m.24s., ePPSE = 25m.37s., eSSE = 28m.54s.
Cape Girardeau eSKKSN = 23m.12s.
Tucson e = 30m.1s.
Mount Wilson iPKKPZ = 29m.56s., iZ = 30m.16s,
Pasadena eZ = 17m.58s., iPKKPZ = 30m.16s,
Palomar eZ = 30m.17s,

Oct. 16d. 19h. 18m. 30s. Epicentre 45°·2N. 8°·1E. (as at 12h.).

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Milan	Z.	0·8	71	i 0 16	− 2	0 34	+ 3	—	—	—
Neuchatel		2·0	336	e 0 35	0	e 1 5	+ 3	—	—	—
Zürich		2·2	9	e 0 38a	0	e 1 11	+ 5	—	—	—
Basle		2·4	351	e 0 40a	− 1	e 1 14	+ 2	—	—	—
Florence		2·7	122	i 0 34a	−11	i 1 23	+ 4	i 0 43a	P	—
Ravensburg		2·8	22	e 0 50	+ 3	i 1 25	+ 3	e 0 54	P*	—
Clermont-Ferrand		3·6	279	i 0 51	− 7	i 1 37	− 5	i 1 23	P_g	—
Strasbourg		3·6	356	e 1 5	+ 7	e 1 36	− 6	e 1 13	P_g	2·3
Stuttgart		3·6	11	e 0 56a	− 2	i 1 43	+ 1	i 1 3	P*	—
Triest		4·0	82	e 0 50	?	—	—	e 0 57	P	—
Paris		5·3	315	e 1 23	+ 1	2 19	− 6	—	—	3·1
Cheb		5·7	29	e 1 54	P_g	e 2 37	+ 2	e 2 48	S*	e 3·8
Jena		6·2	21	e 1 35	0	—	—	i 2 6	P_g	—
Uccle		6·2	337	e 1 42?	+ 7	i 3 17	S*	—	—	—
Prague		6·5	39	e 2 27	P_g	e 3 53	+58	—	—	e 4·5
Tortosa	E.	7·1	235	1 55	+ 7	3 15	+ 5	4 2	S_g	4·4
De Bilt		7·2	345	—	—	e 3 30?	S*	—	—	—
Potsdam		7·9	23	—	—	e 3 30?	0	—	—	—
Toledo		10·4	243	e 2 24	−10	6 55	L	—	—	(6·9)
Almeria		11·5	227	2 15	−33	6 42	L	3 6	PPP	(6·7)

Additional readings :—
Florence iSZ = 1m.10s.
Ravensburg iP_g = 1m.0s., e = 1m.18s., iS_g = 1m.46s.
Clermont-Ferrand iS* = 1m.52s., iS_g = 2m.4s.
Strasbourg eS_g = 2m.0s.
Stuttgart i = 1m.6s., iZ = 1m.10s., iP_g = 1m.13s., iZ = 1m.18s., i = 1m.27s., iZ = 1m.50s., and 1m.56s., iS_gZ = 2m.2s., iZ = 2m.9s.
Cheb eN = 2m.42s., eE = 3m.21s.
Jena eE = 1m.40s., i = 2m.0s., iNZ = 2m.20s., iN = 2m.24s., iE = 2m.27s.
Long waves were also recorded at Kew.

Oct. 16d. Readings also at 0h. (near Stalinabad and Tashkent), 5h. (Pasadena, Mount Wilson, Tinemaha, Haiwee, Tucson, Palomar, St. Louis, La Paz, and near Stuttgart), 8h. and 10h. (near Mizusawa), 12h. (Istanbul), 15h. (Pasadena, Mount Wilson, Tinemaha, Haiwee, Tucson, and Palomar), 16h. (Granada), 19h. (La Paz), 20h. (Tinemaha).

Oct. 17d. 2h. 29m. 59s. Epicentre 48°·2N. 9°·0E. (as on 13d.).

	Δ	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Ebingen	0·0	—	i 0 3?	P*	i 0 3?	S*
Ravensburg	0·6	135	—	—	e 0 22	− 4
Stuttgart	0·6	13	e 0 11	− 4	i 0 18	− 8
Strasbourg	0·9	295	—	—	i 0 32	− 2
Zürich	0·9	198	e 0 20	0	e 0 33	− 1
Basle	1·2	235	e 0 24	0	e 0 41	0
Chur	1·4	165	i 0 29	+ 2	i 0 49	+ 3
Neuchatel	1·8	229	i 0 37	+ 5	—	—

Oct. 17d. 22h. 37m. 3s. Epicentre 7°·2S. 155°·3E. (as on 1941 Jan. 11d.).

A = −·9014, B = +·4146, C = −·1245 ; δ = −8 ; h = +7 ;
D = +·418, E = +·909 ; G = +·113, H = −·052, K = −·992.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	N.	20·3	185	i 4 40	0	i 8 28	+ 5	—	—	i 12·5
Riverview		26·8	187	i 5 44k	0	i 10 37	+18	i 6 26	PP	e 14·0
Sydney		26·8	187	e 5 51?	+ 7	e 10 18	− 1	—	—	—
Auckland		34·5	154	—	—	i 12 26	+ 6	—	—	19·0
Arapuni		35·9	151	—	—	12 39?	− 3	e 16 39	SSS	20·0

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Wellington		38·1	155	9 21	PP	16 7	SS	—	—	24·0
Christchurch		39·2	159	—	—	13 33	+ 1	e 16 13	SS	20·2
Perth		44·2	230	14 52	S	(14 52)	+ 6	—	—	23·7
Vladivostok		54·4	339	—	—	i 17 9	0	—	—	—
Calcutta	N.	71·8	297	e 12 8	P_cP	i 20 46	0	—	—	—
Irkutsk		73·4	331	e 11 36	0	21 4	− 1	—	—	—
Sitka		85·0	30	—	—	e 22 50	[−11]	—	—	e 40·9
Bombay	E.	85·2	290	e 12 43	+ 4	i 23 4	[+ 2]	i 24 8	PS	—
Victoria		89·6	41	—	—	e 23 39	[+ 9]	—	—	44·0
Pasadena		91·1	56	i 13 10	+ 2	—	—	—	—	e 41·0
Mount Wilson		91·2	56	e 13 8	0	—	—	—	—	—
Tinemaha	Z.	91·4	53	e 13 7	− 2	—	—	—	—	—
Tashkent		91·7	311	e 13 15	+ 5	i 24 12	+ 2	e 17 17	PP	—
Palomar	Z.	92·1	57	i 13 15	+ 3	—	—	—	—	—
Tucson		97·1	58	e 17 32	PP	—	—	—	—	e 46·0
Bozeman		97·7	45	—	—	e 24 22	[+ 7]	—	—	e 46·0
Sverdlovsk		98·5	326	e 13 40	− 2	—	—	e 17 45	PP	—
Florissant	E.	113·4	50	—	—	e 26 40	{+11}	e 29 11	PS	—
St. Louis	E.	113·5	50	—	—	e 26 40	{+10}	e 29 10	PS	—
Helwan		122·9	300	e 20 42	PP	e 37 21	SS	—	—	—
Seven Falls		124·1	36	—	—	e 31 57?	PS	—	—	66·0
Stuttgart		129·7	332	e 19 11	[0]	e 38 57?	SS	e 22 37	PKS	—
Uccle		130·3	337	—	—	—	—	e 22 39?	PKS	e 61·0
La Paz		131·0	119	e 19 29	[+15]	22 44	PKS	—	—	—
Florence		131·9	325	e 22 30	PKS	e 32 59	PPS	—	—	e 59·4

Additional readings :—
Brisbane iN = 9m.48s.
Riverview iZ = 10m.42s.
Auckland S = 15m.17s., SS? = 17m.22s.
Wellington P_cP = 10m.47s., i = 13m.12s. and 17m.30s., SS = 19m.20s., Q = 21·0m.
Christchurch S_cS = 16m.36s., Q = 16m.41s.
Perth S = 19m.57s., SS = 21m.32s., phases wrongly identified.
Bombay iE = 19m.57s., iN = 23m.9s., eN = 24m.22s.
Florissant ePS?E = 30m.28s.
St. Louis eE = 30m.28s., ePPS?E = 31m.12s.
Helwan eZ = 21m.15s.
Stuttgart e = 33m.17s.
Florence ePPPN = 29m.5s., eSSN = 42m.4s., phases wrongly identified.
Long waves were also recorded at Philadelphia, Bermuda, De Bilt, Kew, and Paris.

Oct. 17d. Readings also at 0h. (Tacubaya), 1h. (Tinemaha, Haiwee, Tucson (2), Pasadena, Mount Wilson, Palomar (2), and near La Paz), 4h. (near Lick), 7h. (near Basle, Zürich, and Chur), 9h. (Pasadena, Mount Wilson, Tinemaha, Tucson, Haiwee, and Palomar), 10h. (Pasadena, Mount Wilson, Tucson, Tinemaha, Palomar, La Paz, and La Plata), 12h. (Auckland, Wellington, and Christchurch), 13h. (Riverview and near Fort de France), 15h. (near Basle, Neuchatel, Zürich, and Chur, and near Bogota), 16h. (Ksara and near Granada), 17h. (St. Louis, Pasadena, Tucson, Mount Wilson, Tinemaha, Haiwee, Palomar, and near Mizusawa), 23h. (La Paz (2)).

Oct. 18d. 13h. 22m. 32s. Epicentre 35°·6N. 134°·2E. (as on 7d.).

Intensity V at Matsue, Yonago, Sakai, Tottori ; IV at Tokusima, Saigo, Kobe, Hamada, Koti, Okayama ; II-III at Hirosima, Kyoto, Tsugura, Hikone, Iida, and Osaka.
Epicentre 35°·4N. 133°·9E. Radius of macroseismic area 200-300 km. Depth 10 km.
Seismological Bulletin of the Central Meteorological Observatory, Japan, for the year 1943, Tokyo 1950, pp. 47-48. Macroseismic chart p. 47.

$A = -·5682$, $B = +·5843$, $C = +·5795$; $\delta = +8$; $h = 0$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Toyooka	0·5	98	0 12	− 2	0 22	− 1	—	—	—
Kobe	1·2	139	0 22k	− 2	0 38	− 3	—	—	—
Kyoto	1·4	115	0 28k	+ 1	0 49	+ 3	—	—	—
Osaka	1·4	131	0 26	− 1	0 49	+ 3	—	—	—
Sumoto	1·4	156	0 23k	− 4	0 41	− 5	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Wakayama		1·6	150	0 36k	+ 6	0 56	+ 5	—	—	—
Hikone		1·7	101	0 34	+ 3	1 1	+ 7	—	—	—
Hamada		1·9	248	0 27a	− 7	0 46	−13	—	—	—
Hirosima		1·9	230	0 15	−19	0 27	P	—	—	—
Kameyama		2·0	112	0 36	+ 1	1 7	+ 5	—	—	—
Koti		2·1	195	0 33a	− 4	0 57	− 7	—	—	—
Nagoya		2·3	101	0 41	+ 1	1 18	+ 9	—	—	—
Siomisaki		2·5	149	0 41k	− 2	1 11	− 3	—	—	—
Hamamatu		3·0	107	0 58	+ 8	2 46	L	—	—	(2·8)
Simidu		3·0	200	0 45	− 5	1 23	− 4	—	—	—
Nagano		3·4	71	1 7	P*	2 5	S_g	—	—	—
Omaesaki		3·4	107	1 7	P*	1 54	S_g	—	—	—
Kohu		3·5	88	1 2	+ 5	2 1	S_g	—	—	—
Shizuoka		3·5	101	0 56	− 1	1 52	S*	—	—	—
Misima		3·9	96	0 58	− 4	2 9	S_g	—	—	—
Kumamoto		4·0	227	0 59a	− 5	1 58	+ 6	—	—	—
Aikawa		4·1	52	1 5	0	2 20	S_g	—	—	—
Osima		4·3	100	1 8	0	2 13	S*	—	—	—
Unzendake		4·3	230	1 4a	− 4	2 6	+ 6	—	—	—
Yokohama		4·4	91	1 24	P*	2 22	S_g	—	—	—
Tokyo Cen. Met. Ob.		4·5	87	1 7	− 4	2 37	S_g	—	—	—
Utunomiya		4·7	77	1 20	+ 6	1 40	−30	—	—	—
Tukubasan		4·8	81	1 17	+ 2	2 39	S_g	—	—	—
Kakioka		4·9	81	1 28	P*	—	—	—	—	—
Kagosima		5·0	218	1 14k	− 4	2 44	S_g	—	—	—
Mito		5·1	79	1 37	P_g	2 49	S_g	—	—	—
Tomie		5·4	238	1 26	+ 2	2 32	+ 4	—	—	—
Tyosi		5·4	87	1 52	P_g	2 45	S*	—	—	—
Hukusima		5·5	65	2 7	?	3 44	L	—	—	(3·7)
Sendai		6·0	62	1 36	+ 4	2 54	+11	—	—	—
Mizusawa	E.	6·5	55	e 1 44	+ 5	3 14	S*	—	—	—
Aomori		7·3	43	1 54	+ 4	—	—	—	—	—
Sapporo		9·3	34	2 25	+ 8	—	—	—	—	—
Calcutta	N.	41·8	268	c 8 26	?	—	—	e 16 31	SS	e 21·3

Long waves were also recorded at Florence and De Bilt.

Oct. 18d. Readings also at 1h. (near Apia), 5h. (La Paz, Tinemaha, Tucson, and Palomar), 6h. (Tinemaha, Tucson, Palomar, Mount Wilson, Pasadena, and La Paz), 7h. (Triest, Stuttgart, Belgrade, Bucharest, and near Sofia), 9h. (Tinemaha, Palomar, Mount Wilson, Tucson, Pasadena, La Paz, and Bogota), 15h. (Tacubaya), 16h. (Fort de France, Bogota, and near La Paz), 23h. (Riverview, La Paz, Ksara, and near Berkeley).

Oct. 19d. 1h. 13m. 12s. Epicentre 35°·8N. 140°·8E. (as on 1942 Feb. 18d.).

Scale V at Tyosi; IV at Tokyo, Tukubasan, Mito, Yokohama, and Kakioka; II-III at Hukusima and Iida. Epicentre as adopted. Radius of macroseismic area 200-300 km. Shallow.
Seismological Bulletin of Central Meteorological Observatory, Japan, for 1943, Tokyo 1950, pp. 48-49, with macroseismic chart.

$A = -·6300$, $B = +·5138$, $C = +·5823$; $\delta = -4$; $h = -1$;
$D = +·632$, $E = +·775$; $G = -·451$, $H = +·368$, $K = -·813$.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tyosi	0·1	—	0 9	+ 1	—	—	—	—	—
Kakioka	0·7	311	1 14a	− 3	0 24	− 4	—	—	—
Mito	0·7	335	0 18k	+ 1	0 28	0	—	—	—
Tukubasan	0·7	306	0 16	− 1	0 27	− 1	—	—	—
Tokyo Cen. Met. Ob.	0·8	263	0 16	− 2	0 27	− 4	—	—	—
Yokohama	1·0	249	0 20k	− 1	0 32	− 4	—	—	—
Utunomiya	1·1	315	0 23k	+ 1	0 38	− 1	—	—	—
Osima	1·5	228	0 26	− 2	—	—	—	—	—
Hunatu	1·7	260	0 29k	− 2	0 57	+ 3	—	—	—
Misima	1·7	246	0 28	− 3	0 48	− 6	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Hukusima		2·0	352	0 43a	+ 8	1 12	S_g	—	—	—
Shizuoka		2·1	247	0 35	− 2	1 3	− 1	—	—	—
Nagano		2·3	292	0 41k	+ 1	1 4	− 5	—	—	—
Omaesaki		2·4	240	0 37	− 4	1 9	− 3	—	—	—
Sendai		2·5	2	0 43	0	1 22	+ 8	—	—	—
Hamamatu		2·7	247	0 52	+ 7	1 29	S_e	—	—	—
Hatidyozima		2·7	196	0 46	+ 1	1 13	− 6	—	—	—
Aikawa		3·0	317	0 52k	+ 2	1 23	− 4	—	—	—
Nagoya		3·2	259	0 56	+ 4	1 44	+12	—	—	—
Mizusawa		3·3	5	0 58	+ 5	1 34	− 1	—	—	—
Miyako		3·9	13	1 4	+ 2	1 46	− 4	—	—	—
Owase		4·2	247	1 6	− 1	2 24	S_g	—	—	—
Kyoto		4·2	262	1 8	+ 1	1 43	−14	—	—	—
Kobe		4·7	258	1 8a	− 6	2 18	+ 8	—	—	—
Hatinohe		4·8	8	1 17	+ 2	2 10	− 2	—	—	—
Toyooka		4·9	268	(1 30)	P*	(2 31)	S*	—	—	—
Aomori		5·0	0	1 23	+ 5	2 37	S*	—	—	—
Koti		6·4	252	1 34	− 4	2 59	+ 6	—	—	—
Sapporo		7·3	3	1 49	− 1	3 19	+ 4	—	—	—
Nemuro		8·4	25	2 11	+ 5	3 35	− 8	—	—	—
Vladivostok		10·1	319	i 2 29	+ 1	i 4 53	S*	—	—	—
Calcutta	N.	47·2	269	—	—	e 14 45	−44	—	—	e 28·2
Tashkent		54·7	299	9 29	− 4	e 17 8	− 5	—	—	—
Sverdlovsk		55·8	320	i 9 35	− 6	e 17 31	+ 3	—	—	—
Bombay	E.	61·6	274	i 10 16	− 6	e 18 38	− 5	—	—	—
Moscow		68·0	324	10 57	− 6	—	—	—	—	—
Riverview		69·9	170	—	—	e 19 42?	−42	—	—	e 40·3
Pasadena	Z.	78·7	56	i 12 5	− 1	—	—	—	—	e 35·8
Palomar	Z.	80·0	56	i 12 14	+ 1	—	—	—	—	—
Tucson		84·2	54	i 12 35	− 2	—	—	—	—	—
Stuttgart		85·4	330	e 12 36	− 4	—	—	—	—	e 45·3
Helwan		87·0	305	e 12 43	− 5	e 23 14	[0]	e 16 6	PP	—
La Paz		147·9	61	19 48	[+ 4]	—	—	—	—	—

Additional readings :—
Toyooka readings have been increased by 1 minute.
Stuttgart eZ = 12m.54s.
Long waves were also recorded at Prague, Florence, De Bilt, and Kew.

Oct. 19d. 17h. 38m. 41s. Epicentre 17°·0N. 104°·5W. (as on 1941 June 10d.).

$A = -·2396$, $B = -·9264$, $C = +·2906$; $\delta = +7$; $h = +5$;
$D = -·968$, $E = +·250$; $G = -·073$, $H = -·281$, $K = -·957$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Manzanillo	N.	2·1	4	e 0 31	− 6	—	—	—	—	—
Guadalajara	N.	3·8	14	0 58	− 3	—	—	—	—	—
Tacubaya	N.	5·6	63	1 42	P*	—	—	—	—	—
Tucson		16·2	340	3 48	− 2	e 7 50	+59	—	—	e 8·6
Palomar	Z.	19·7	329	e 4 37	+ 3	—	—	—	—	—
Riverside		20·5	327	i 4 42	0	—	—	—	—	—
Mount Wilson		21·0	326	i 4 47	0	—	—	—	—	—
Pasadena	Z.	21·0	326	i 4 48	+ 1	—	—	—	—	e 11·3
Haiwee		22·5	330	e 5 4	+ 2	—	—	—	—	—
Tinemaha		23·4	331	i 5 12	+ 1	—	—	—	—	—
St. Louis		24·9	26	e 5 25	− 1	e 9 46	− 1	—	—	—
Florissant	E.	25·0	26	—	—	e 9 46	− 3	—	—	e 12·7
Chicago		28·7	27	—	—	e 11 10	+20	—	—	e 14·8

Additional readings :—
Tucson i = 3m.56s.
St. Louis eZ = 5m.35s., eE = 10m.8s.
Long waves were also recorded at Kew.

Oct. 19d. Readings also at 2h. 4h., and 8h. (Riverview), 9h. (Auckland), 13h. (Riverview and near La Paz), 19h. (Mount Wilson, Pasadena, and Riverside), 22h. (near Reykjavik).

Oct. 20d. 4h. Pacific, off coast of Mexico.

Tucson eP =11m.56s., e =13m.12s., eL =14m.21s.
Mount Wilson ePZ =12m.48s.
Riverside ePZ =12m.48s.
Haiwee ePZ =13m.9s.
Tinemaha ePZ =13m.24s.
St. Louis ePZ =13m.51s., epP?Z =14m.1s., eSE =18m.15s., esS?E =18m.36s., eLE = 21m.17s.
Logan eP =14m.9s., e =18m.8s., eL =19m.34s.
Florissant eSE =18m.19s., esS?E =18m.40s., eLE =21m.48s.
Chicago e =20m.26s., eL =23m.37s.
Long waves were also recorded at Tacubaya, Pasadena, Bozeman, and Pittsburgh.

Oct. 20d. Readings also at 0h. (Auckland, Arapuni, Wellington, Riverview, Mount Wilson, Riverside, Tucson, and Tinemaha), 1h. (Tucson, La Paz, near Bogota, Focsani, Bacau, and near Bucharest), 2h. (New Delhi, Bombay, near Sverdlovsk, Almata, and Tashkent), 3h. (near Andijan and Tashkent), 5h. (near Fort de France), 10h. (Tucson), 12h. (Riverview, Tacubaya, Tucson, Mount Wilson, Pasadena, Riverside, Tinemaha, Florissant, St. Louis, and near Almeria), 14h. (near Mizusawa), 15h. (near Milan and near Stuttgart), 16h. (near Mizusawa).

Oct. 21d. 23h. 8m. 10s. Epicentre 15°·1S. 176°·9W.

A = −·9645, B = −·0522, C = −·2589; δ = +1; h = +6;
D = −·054, E = +·999; G = +·259, H = +·014, K = −·966.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Apia		5·2	76	i 1 21	0	i 2 35	S*	—	—	—
Auckland		22·9	199	5 0	− 6	9 25	+12	6 0	PPP	12·8
Arapuni		23·8	195	4 26?	−49	9 56?	+28	—	—	12·8
Tuai		24·2	191	5 20	+ 1	—	—	i 5 27	PP	—
Wellington		27·1	194	5 46	0	10 28	+ 4	6 45	PPP	13·3
Christchurch		29·7	195	6 14	+ 4	11 6	0	7 14	PP	14·6
Brisbane		30·5	241	i 6 16	− 1	i 11 18	0	i 11 21	?	—
Riverview		34·3	231	i 6 50 a	0	i 12 18	+ 1	i 8 14	PP	e 16·1
Sydney		34·3	231	e 7 38	PP	i 12 17	0	—	—	—
Honolulu		40·7	29	e 7 40	− 4	e 13 54	− 1	e 9 50	PPP	i 17·2
Perth		63·0	242	—	—	i 18 50	−11	i 22 50	SS	28·9
Tokyo		65·1	322	e 10 45	0	—	—	—	—	—
Kumagaya		65·6	323	10 3	−45	—	—	—	—	—
Sendai		66·2	326	10 59	+ 7	—	—	—	—	—
Kobe		67·2	319	10 56	− 2	19 49	− 3	—	—	—
Santa Barbara	z.	73·3	47	e 11 37	+ 2	—	—	—	—	—
Santa Clara		73·4	43	i 11 44	+ 8	e 21 20	+15	—	—	e 33·5
Berkeley	z.	73·5	43	i 11 37	+ 1	e 21 26	+20	—	—	—
		73·5	43	i 11 40	+ 4	i 21 15	+ 9	—	—	—
Ukiah		73·6	42	e 11 38	+ 1	e 21 16	+ 9	—	—	e 30·4
Ferndale		73·8	39	—	—	e 21 20?	+11	—	—	e 32·2
La Jolla		74·3	50	e 11 40	− 1	—	—	—	—	—
Pasadena		74·3	48	i 11 40	− 1	e 21 25	+10	i 21 52	PS	e 30·3
Mount Wilson	z.	74·4	48	e 11 39	− 3	—	—	—	—	—
Palomar	z.	74·8	50	e 11 44	0	—	—	—	—	—
Riverside		74·8	48	e 11 43	− 1	—	—	—	—	—
Haiwee		75·4	46	e 11 50	+ 3	—	—	—	—	—
Tinemaha		75·7	46	e 11 49	0	—	—	—	—	—
Tucson		78·8	53	e 12 4	− 2	e 22 8	+ 4	e 23 19	PPS	e 35·2
Victoria		79·1	34	12 12	+ 4	22 17	+10	—	—	35·8
Seattle		79·2	35	e 20 20	?	—	—	—	—	e 35·2
Sitka		80·1	22	e 12 12	− 1	e 22 7	−11	e 14 57	PP	e 35·4
Salt Lake City		81·9	45	e 12 27	+ 4	e 22 43	+ 7	e 15 36	PP	e 36·0
Logan		82·4	43	e 12 18	− 7	e 22 50	+ 9	e 27 52	SS	33·9
College		82·7	12	e 12 31	+ 4	e 22 53	+ 9	e 27 0	SS	e 35·3
Tacubaya	E.	83·8	69	i 13 17	?	—	—	—	—	—
Bozeman		84·7	41	e 12 40	+ 3	e 23 10	+ 6	e 24 16	PPS	e 37·2
Rapid City		89·1	44	e 11 30?	?	e 22 8?	?	e 22 42?	?	e 39·9
Saskatoon		90·2	36	—	—	e 24 5	+ 9	e 30 11	SSP	41·8
Irkutsk		95·1	323	e 13 26	0	30 50	SS	17 12	PP	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Florissant		96·7	52	i 13 37	+ 4	i 24 55	+ 2	i 25 58	SP	—
St. Louis		96·7	52	i 13 37	+ 4	i 25 0	+ 7	i 17 30	PP	—
Chicago		99·4	49	e 16 36	?	e 25 22	+ 7	e 26 52	PS	e 42·3
Calcutta	N.	100·0	291	e 17 48	PP	e 25 30	+10	—	—	e 39·3
La Paz		103·0	111	e 18 20	PP	—	—	i 28 34	PPS	50·3
Columbia		103·1	58	—	—	e 24 53	[+11]	e 33 5	SSP	e 48·1
Colombo		104·5	273	e 16 53	?	—	—	—	—	—
Pittsburgh	N.W.	104·9	51	—	—	i 25 3	[+13]	e 28 26	PPS	—
Kodaikanal	E.	107·6	276	e 18 20	[− 8]	e 24 57	[− 5]	28 22	PPS	—
Hyderabad	N.	108·1	284	—	—	33 51	SS	—	—	55·9
Ottawa		108·4	46	—	—	e 28 22	PS	e 34 32	SSP	e 47·8
Philadelphia		108·5	52	e 18 50	PP	e 25 10	[+ 4]	e 28 23	PS	e 44·2
Fordham		109·5	51	e 19 9	PP	e 28 40	PS	e 29 37	PPS	—
Vermont		110·2	48	e 15 26	P	e 24 50	[−23]	e 18 49	PKP	e 46·8
New Delhi		110·9	295	e 19 54	?	e 26 4	{− 7}	28 42	PS	—
Harvard		111·3	50	i 19 20	PP	e 28 50	PS	e 29 52	PPS	e 53·8
Seven Falls		111·8	44	e 24 45	·?	e 28 51	PS	e 35 19	SSP	51·8
Bombay	E.	113·6	284	19 12	PP	25 15	[−12]	29 13	PS	—
San Juan		114·0	76	e 19 49	PP	e 25 58	[+30]	e 29 17	PS	e 49·2
Bermuda		116·6	61	e 19 55	PP	e 26 55	{+ 4}	e 36 11	SSP	e 54·1
Tashkent		117·6	309	19 4	[+16]	26 48	{−10}	29 52	PS	—
Sverdlovsk		120·1	327	e 15 15	P	—	—	18 53	PKP	—
Ivigtut		121·3	26	—	—	—	—	e 37 3	SS	e 58·5
Upsala		134·1	350	22 50	PKS	—	—	e 39 50	SS	e 63·8
Copenhagen		138·9	353	e 19 33	[+ 4]	22 18	PP	23 6	PKS	63·8
De Bilt		143·1	358	e 19 38	[+ 2]	e 41 20	SS	e 22 50	PP	e 66·8
Kew	Z.	143·6	3	i 19 36	[− 1]	e 29 13	{−29}	e 22 34	PP	e 66·8
Prague		143·9	347	—	—	—	—	e 22 50?	PP	e 58·8
Cheb		144·3	349	e 20 32?	[+54]	e 27 12	[+26]	—	—	e 67·8
Uccle		144·4	0	e 13 51	?	—	—	e 19 41	PKP	—
Bucharest		144·9	330	e 19 16	[−23]	—	—	i 22 47	PP	67·8
Ksara		145·0	307	e 19 40	[+ 1]	—	—	e 23 11	PP	—
Ogyalla		145·0	342	19 12	[−27]	—	—	—	—	—
Stuttgart		146·1	353	e 19 37	[− 4]	—	—	e 41 56?	SS	e 70·9
Paris		146·4	1	i 19 46	[+ 4]	—	—	—	—	71·8
Strasbourg		146·4	354	e 19 52	[+10]	—	—	i 20 30	?	—
Belgrade		146·9	336	e 19 41	[− 1]	—	—	—	—	e 72·4
Basle		147·4	354	e 19 46	[+ 3]	—	—	e 23 11	PP	—
Sofia		147·5	331	e 19 53	[+10]	—	—	—	—	—
Zürich		147·5	353	e 19 45	[+ 2]	—	—	—	—	—
Chur		147·9	352	e 19 45	[+ 1]	—	—	—	—	—
Triest		148·3	346	i 19 55	[+10]	—	—	e 42 31	SS	—
Milan	Z.	149·3	351	19 52	[+ 6]	—	—	—	—	—
Clermont-Ferrand		149·4	0	i 19 51	[+ 5]	—	—	—	—	e 61·8
Helwan		150·2	303	i 19 55	[+ 7]	23 29	SKP	—	—	—
Florence		150·6	347	i 19 55k	[+ 7]	i 26 40	[−15]	i 23 15	SKP	e 71·2
Lisbon		154·1	21	20 1k	[+ 8]	43 49	SS	48 59	SSS	71·3
Tortosa	N.	154·3	3	e 20 16	[+22]	—	—	—	—	e 78·8
Toledo		154·5	12	i 20 0	[+ 6]	27 6	[+ 7]	i 20 10	PKP_2	71·8
Granada		157·2	14	i 20 16	[+19]	27 13	[+11]	i 20 42	PKP_2	75·1
San Fernando		157·2	20	e 19 57	[0]	e 44 58	SSP	e 24 25	PP	73·3
Almeria		157·8	11	20 1	[+ 3]	26 45	[−18]	20 14	pPKP	74·3

Additional readings :—
Auckland i = 6m.30s., 9m.35s., 10m.20s. ?, and 10m.55s., Q = 11m.50s.
Wellington sPPZ = 7m.7s., i = 10m.0s., sSZ = 11m.6s., S_cPZ = 12m.15s., Q = 12m.40s.
Christchurch Q = 12m.46s.
Riverview iPE = 6m.53s., ipP = 7m.0s., iPPPZ = 8m.25s., isSZ = 12m.28s., iSSN = 14m.40s., iSSSZ = 15m.0s.
Perth i = 25m.50s.
Pasadena iZ = 12m.19s.
Tucson iP = 12m.7s., i = 12m.36s., e = 14m.59s., 20m.0s., 24m.33s., and 26m.50s.
Sitka eSS = 27m.58s.
Logan iP = 12m.25s.
Bozeman e = 16m.22s. and 27m.34s.
Irkutsk PPS = 25m.17s.

Continued on next page.

Florissant iPPZ = 17m.27s., iSKSE = 24m.15s., iSE = 25m.8s., eSS = 32m.30s.
St. Louis iSKSE = 24m.29s., iSE = 25m.10s., eSPE = 25m.40s.
Chicago ePP = 17m.43s., eSKS = 24m.28s., eSS = 32m.12s.
Pittsburgh eNW = 26m.16s.
Kodaikanal eE = 26m.32s.
Philadelphia e = 29m.28s., eSS = 34m.10s., e = 40m.4s.
Fordham e = 34m.49s.
Vermont ePP = 19m.58s.
New Delhi PPS = 29m.43s.
Harvard eSS = 35m.10s.
Bombay PPPE = 21m.44s., SKKSE = 25m.54s.
San Juan eSS = 37m.12s.
Tashkent PP = 20m.0s., PPS = 31m.2s.
Sverdlovsk PP = 20m.6s.
Upsala PKP?E = 22m.53s., eN = 35m.7s., eE = 54m.50s.?
Kew ePKSNZ = 23m.22s., eSS? = 41m.50s.?, eSSSZ = 46m.50s.?, eQEN = 61m.50s.?
Bucharest eP?E = 19m.21s., eN = 19m.41s., eP = 20m.13s., iN = 20m.17s. and 21m.41s., iE = 23m.29s., iN = 23m.35s., iE = 24m.31s., iN = 25m.9s., iE = 25m.51s.
Stuttgart iZ = 19m.41s. and 19m.45s., eZ = 20m.15s., 20m.44s. and 21m.23s., ePP?Z = 22m.28s.
Belgrade i = 19m.44s. and 20m.1s., e = 23m.55s.
Clermont-Ferrand i = 20m.39s. and 22m.9s.
Helwan PKKPZ = 20m.59s., iZ = 21m.19s., PPZ = 24m.44s.
Florence iPPN = 23m.45s., iPPPN = 26m.50s., iSKKSN = 30m.14s., iPPSN = 37m.0s.
Lisbon PKPE = 20m.10s., PKP_2Z = 20m.55s. ?, PKP_2E = 21m.9s., SSE = 43m.54s., SSSE = 49m.16s.
Toledo ePP = 23m.35s., SS = 42m.55s
Granada iPP = 24m.20s., eSKKS = 31m.40s., SKSP = 34m.12s., iSS = 44m.21s., SSS = 49m.15s., Q = 64m.32s.?
Almeria PKP_2 = 20m.33s., PP = 24m.10s., pPP = 24m.24s., PPP = 27m.38s., SKKS = 30m.20s., SS = 43m.43s., SSS = 49m.25s.
Long waves were also recorded at Stonyhurst, Aberdeen, Potsdam, Edinburgh, and Tananarive.

Oct. 21d. Readings also at 0h. (Riverview, Mount Wilson, Tinemaha, Tucson, and Riverside), 1h. (New Delhi and Riverview), 2h. (Riverview and near Tashkent), 3h. (Riverview and near Tashkent), 4h. (Riverview and La Paz), 5h. (Riverview), 6h. (near Ksara), 11h. (Belgrade, Stuttgart, Helwan, Bucharest, Sofia, Ksara, and near Istanbul), 13h. (near Almata, Tashkent, Andijan, and near La Paz), 14h. (Pasadena, Mount Wilson, Riverside, Tinemaha, and Tucson), 15h. (Pasadena, Mount Wilson, Riverside, Tucson, and Tinemaha), 16h. (Riverview and near La Paz), 20h. (Fort de France), 22h. (Tacubaya).

Oct. 22d. 10h. 41m. 17s. Epicentre 48°·2N. 9°·0E. (as on 17d.).

	△	Az.	P.	O−C.	S.	O−C.
	°	°	m. s.	s.	m. s.	s.
Ebingen	0·0	—	i 0 3?a	P*	0 3?	S*
Ravensburg	0·6	135	—	—	e 0 22	− 4
Stuttgart	0·6	13	e 0 11	P_g	i 0 17	S_g
Zürich	0·9	198	e 0 19	− 1	e 0 32	− 2
Basle	1·2	235	e 0 24k	0	e 0 40	− 1
Chur	1·4	165	e 0 29	+ 2	e 0 48	+ 2
Neuchatel	1·8	229	e 0 37	+ 5	—	—
Jena	3·2	32	e 1 24	?	e 1 28	− 4

Stuttgart also gives i = 0m.21s.
Long waves were recorded at Strasbourg.

Oct. 22d. 11h. 38m. 21s. Epicentre 48°·2N. 9°·0E. (as at 10h.).

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ebingen	0·0	—	i 0 5a	− 2	i 0 5?	S*	—	—	—
Ravensburg	0·6	135	e 0 16	+ 1	i 0 24	− 2	—	—	—
Stuttgart	0·6	13	i 0 13k	P*	i 0 19	S_g	i 0 16	P	—
Strasbourg	0·9	295	—	—	i 0 32?	− 2	—	—	—
Zürich	0·9	198	e 0 22	+ 2	e 1 34	+60	—	—	—
Basle	1·2	235	e 0 25	+ 1	e 0 43	+ 2	—	—	—
Chur	1·4	165	e 0 30	+ 3	e 0 51	+ 5	—	—	—
Neuchatel	1·8	229	e 0 39	+ 7	e 1 3	+ 7	—	—	—
Jena	3·2	32	e 0 51	− 1	e 1 25	− 7	—	—	—

Oct. 22d. 16h. 1m. 15s. Epicentre 24°·3N. 122°·3E.

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

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Hukuoka		11·6	36	2 44	− 6	6 45	L	—	—	(6·7)
Pehpei		15·2	295	e 3 39	+ 1	e 7 13	SSS	—	—	7·9
Yokohama		18·7	50	e 5 3	PPP	e 8 5	SS	—	—	—
Tokyo		18·9	49	e 4 25	+ 1	—	—	—	—	—
Mizusawa	E.	21·7	43	4 56	+ 1	15 7	L	—	—	(15·1)
Irkutsk		31·1	338	6 23	+ 1	e 11 38	+10	—	—	—
Calcutta	N.	31·2	274	e 6 25	+ 2	e 11 27	− 2	13 5	SS	—
Dehra Dun		39·6	290	e 9 39	PPP	e 16 54	SS	—	—	—
New Delhi		40·4	287	e 7 39	− 2	i 13 46	− 4	16 19	SS	—
Frunse		43·2	308	e 8 6	+ 2	e 14 45	PS	—	—	—
Colombo	E.	44·1	255	8 6	− 6	—	—	—	—	—
Kodaikanal	E.	44·8	261	e 8 17	0	e 14 53	− 2	18 27	SS	24·2
Bombay		46·1	274	i 8 25	− 3	i 15 7	− 7	i 15 49	PPS	—
Tashkent		46·9	305	e 8 30	− 4	e 15 28	+ 3	—	—	—
Riverview		64·0	153	e 10 38	0	e 19 14	+ 1	e 19 34	PS	e 31·1
Moscow		67·4	323	e 10 59	0	19 53	− 2	—	—	—
College		68·2	27	e 11 22	+18	e 20 27	PS	e 25 8	SS	e 28·8
Ksara		74·1	300	e 11 42	+ 2	e 21 34	PS	—	—	—
Sitka		76·2	33	e 12 2	+10	e 21 33	− 3	—	—	e 31·1
Upsala	E.	76·3	330	—	—	e 21 28?	− 9	30 43	SSS	e 38·7
Bucharest		77·6	313	e 21 39?	?	e 21 50	− 1	i 22 26	PS	i 43·7
Helwan		79·1	298	i 12 7	− 1	22 8	+ 1	22 50	PS	—
Sofia		80·1	312	e 12 15	+ 2	e 22 8	−10	e 14 57?	PP	—
Copenhagen		80·7	327	e 12 18	+ 2	22 24	0	32 9	?	41·7
Scoresby Sund		82·2	348	12 32	+ 8	23 43	PPS	19 5	?	—
Prague		82·4	322	—	—	e 22 42	+ 1	—	—	e 42·2
Cheb		83·5	323	e 18 45?	?	e 22 45?	− 7	—	—	e 41·8
Stuttgart		86·0	322	e 12 39	− 4	e 23 17	0	e 16 2	PP	47·2
De Bilt		86·2	327	i 12 46k	+ 2	e 23 25	+ 6	i 16 10k	PP	e 42·8
Aberdeen	E.	86·4	333	—	—	i 23 33	+12	—	—	e 44·2
Florence		87·4	317	e 12 49a	− 1	e 23 54	+24	i 24 40	PS	—
Uccle		87·4	326	e 12 51	+ 1	e 23 19	[+ 2]	e 23 26	S	e 42·8
Edinburgh		87·7	332	e 20 45	?	—	—	—	—	—
Stonyhurst		88·8	331	(e 12 45?)	−12	—	—	—	—	12·7
Kew		89·3	328	i 13 1	+ 2	e 24 19	+31	e 25 0	PS	e 41·8
Clermont-Ferrand		91·1	322	e 13 9	+ 1	e 25 16	PS	e 16 43	PS	e 50·7
Bozeman		95·2	34	—	—	e 23 58	[− 4]	—	—	e 45·9
Tinemaha		96·5	45	i 13 35	+ 3	—	—	—	—	—
Mount Wilson	Z.	98·3	47	i 13 41	0	—	—	e 17 42	PP	—
Pasadena	Z.	98·3	47	e 13 40	− 1	—	—	—	—	e 49·1
Almeria		100·0	318	e 18 1	PP	27 42	PPS	e 18 22	PKP	56·8
Granada		100·4	319	e 17 58	PP	27 40	PPS	36 28	SSS	49·6
San Fernando	E.	102·5	320	e 26 22	?	—	—	—	—	56·8
Lisbon		102·6	323	12 37k	?	—	—	—	—	54·6
Tucson		104·3	45	e 14 11	+ 3	e 27 30	PS	e 18 22	PP	e 53·0
Ottawa		108·7	13	—	—	e 28 27?	PS	—	—	e 54·8
Florissant		110·2	27	e 19 11	PP	e 34 53	SSP	e 29 2	PS	—
St. Louis		110·4	27	e 19 12	PP	e 25 6	[− 8]	e 28 43	PS	—
Fordham		113·5	13	—	—	—	—	e 29 11	PS	i 63·8
Philadelphia		114·0	14	—	—	—	—	e 29 12	PS	e 52·6
Bogota		147·1	31	e 18 47	[−56]	—	—	i 18 53	?	—
La Paz	Z.	167·5	53	i 20 14a	[+ 6]	—	—	—	—	—

Additional readings :—
New Delhi eP =7m.44s.
Kodaikanal iE =9m.20s.
Bombay iE =8m.51s., PPN =10m.6s., PPE =10m.9s., eSN =15m.3s., SSN =18m.17s., iN =18m.41s., iE =18m.44s.
Riverview eSS?N =23m.46s.
Upsala eN =30m.50s.
Helwan eZ =12m.51s. and 13m.18s.

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Stuttgart ePZ =12m.44s.
Florence iPPE =16m.20s., eSKSE =23m.6s., ePPSE =25m.16s.
Uccle ePPZ =16m.12s., eSSEN =29m.31s.
Kew iPPZ =16m.28s., ePPPZ =18m.29s., eSSS =34m.45s. ?
Almeria e =21m.58s.
Granada S =29m.25s.
Tucson e =17m.49s.
St. Louis eSKKSE =25m.59s., eSE =26m.27s., ePPSE =29m.2s., eE =30m.2s., ePPPSE =30m.45s., eE =32m.43s., eSSE =34m.54s.
Long waves were also recorded at Sapporo, Bermuda, Christchurch, and at other European stations.

Oct. 22d. Readings also at 0h. (St. Louis, Pasadena, Mount Wilson, Tucson, Riverside, Tinemaha and Helwan), 2h. (Wellington, near Tchimkent, Tashkent, and Andijan), 4h. (Wellington), 6h. (near Fort de France), 8h. (near Pehpei), 14h. (Suva), 15h. (Riverview), 17h. (near Mizuasawa), 19h. (La Paz), 20h. (near Triest), 23h. (near Branner).

Oct. 23d. 17h. 23m. 17s. Epicentre 26°·8N. 94°·0E.
Violent at Johrot, earth cracks. Epicentre (U.S.C.G.S.) 28°·0N. 94°·0E.
"Annales de l'Institut de Physique du Globe de Strasbourg," 2ème partie, Séismologie, tome VII-VIII, p. 39, Strasbourg 1950.

$A = -\cdot0623$, $B = +\cdot8916$, $C = +\cdot4485$; $\delta = -2$; $h = +3$;
$D = +\cdot998$, $E = +\cdot070$; $G = -\cdot031$, $H = +\cdot447$, $K = -\cdot894$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Pehpei		11·4	71	i 2 39	− 8	i 4 40	−16	—	—	i 5·1
Dehra Dun	N.	14·4	288	i 4 28 a	+61	i 6 52	+43	—	—	i 8·3
New Delhi		15·0	281	i 3 34	− 1	i 6 15	− 8	i 6 44	SS	—
Hyderabad		17·1	241	4 1	− 1	6 58	−14	—	—	—
Bombay		21·0	253	i 4 49	+ 2	i 8 29	− 8	—	—	—
Frunse		22·5	321	5 5	+ 3	—	—	—	—	—
Kodaikanal	E.	22·7	228	i 5 8 a	+ 4	i 9 9	0	—	—	—
Colombo	E.	23·9	217	5 16	0	—	—	—	—	9·7
Stalinabad		24·2	307	5 21	+ 2	i 9 35	0	—	—	—
Tashkent		24·9	313	i 5 29	+ 3	i 9 51	+ 4	—	—	—
Tchimkent		25·2	315	i 5 33	+ 4	i 10 3	+11	—	—	—
Irkutsk		26·6	15	5 45?	+ 3	9 59?	−17	—	—	—
Zinsen		29·5	61	6 6	− 2	10 54	− 8	—	—	—
Naha		30·1	84	6 18	+ 5	—	—	—	—	—
Tomie		30·7	70	e 6 17	− 2	—	—	—	—	—
Ituhara		31·2	67	e 6 21	− 2	13 37	SS	—	—	—
Hukuoka		32·1	69	5 53	−38	11 7	−36	—	—	15·8
Kumamoto		32·3	70	e 6 33	0	11 51	+ 5	—	—	—
Miyazaki		32·9	72	6 39	+ 1	11 59	+ 3	—	—	—
Hamada		33·5	67	e 6 44	+ 1	—	—	—	—	—
Koti		34·7	69	e 6 54	0	12 14	−10	—	—	—
Vladivostok		34·7	52	6 51	− 3	11 59	−25	—	—	—
Kobe		36·1	67	i 7 5	0	12 39	− 6	—	—	—
Hikone		36·9	66	7 12	0	12 50	− 8	—	—	—
Nagoya		37·5	66	7 18	+ 1	13 10	+ 3	—	—	—
Wazima		37·6	62	e 7 17	− 1	13 12	+ 4	—	—	—
Nagano		38·6	63	i 7 27	+ 1	—	—	—	—	—
Osima		39·5	68	e 7 30	− 4	13 38	+ 1	—	—	—
Yokohama		39·7	66	e 7 43	+ 7	e 13 56	+16	—	—	—
Tokyo Cen. Met. Ob.		39·8	65	7 45	+ 9	—	—	—	—	8·2
Mori		40·8	55	e 7 48	+ 3	i 14 2	+ 6	i 10 2	PPP	—
Sendai		40·8	62	7 43	− 2	13 39	−17	—	—	—
Mizusawa		41·0	60	7 45	− 1	13 32	−27	—	—	17·2
Sapporo		41·5	53	e 7 54	+ 4	14 4	− 3	9 28	PP	e 17·8
Miyako		41·7	60	e 7 11	−41	13 2	−68	—	—	—
Erevan		42·9	302	7 7	−55	—	—	—	—	—
Moscow		49·5	322	i 7 24	−90	14 16	−106	7 55	pP	—
Ksara		50·1	292	e 9 2	+ 3	i 16 12	+ 2	—	—	—
Helwan		54·6	290	9 33	+ 1	i 17 11	0	11 37	PP	—
Istanbul		54·6	303	9 29	− 3	17 12	+ 1	11 40	PP	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Focsani		55·5	309	e 9 43	+ 4	i 17 25	+ 1	e 17 21	?	27·7
Bacau		55·6	311	e 9 39	− 1	e 17 21	− 4	17 53	PS	—
Bucharest		56·4	308	i 9 47 a	+ 2	i 17 36	0	i 11 46	PP	28·2
Campulung		57·0	309	e 9 52	+ 2	e 17 39	− 4	—	—	28·2
Sofia		58·6	306	i 10 2	+ 1	i 18 1	− 3	e 21 59	SS	31·7
Belgrade		60·3	308	i 10 13	0	i 18 25	− 1	e 12 35	PP	—
Ogyalla		61·4	313	9 44	−36	18 0	−40	12 24	PP	e 26·7
Perth		62·0	159	—	—	18 43	− 5	i 22 58	SS	26·7
Prague		63·4	316	i 10 33	− 1	19 2	− 4	e 13 7	PP	—
Copenhagen		63·6	322	i 10 35 a	0	i 19 6	− 2	12 59	PP	—
Potsdam		63·8	318	i 10 37	+ 1	i 19 10	− 1	e 13 13?	PP	e 32·7
Tananarive		64·0	230	i 10 38	0	i 19 8	− 5	12 53	PP	e 30·1
Cheb		64·7	316	e 10 43	+ 1	e 19 23	+ 1	e 13 12	PP	e 37·7
Triest		64·8	311	i 10 42	− 1	i 19 18	− 5	e 14 38	PPP	e 33·7
Jena		65·0	317	i 10 44	0	i 19 23	− 3	i 13 3	PP	e 30·7
Bergen	z.	66·5	328	i 10 54	0	13 22	PP	11 12	pP	26·7
Florence		67·0	309	i 10 57 a	0	i 19 43	− 7	e 11 16	pP	—
Stuttgart		67·1	315	e 10 55 a	− 2	i 19 47	− 4	e 13 22	PP	e 35·1
Zürich		67·8	314	e 11 1 a	− 1	e 19 52	− 8	e 13 52	PP	—
Milan		67·9	312	i 11 13	+11	20 5	+ 4	—	—	—
Strasbourg		68·0	315	i 11 6?	+ 3	19 55?	− 7	i 12 40?	PP	34·7
Basle		68·4	314	e 11 6	0	e 20 12	+ 5	e 12 41	PP	—
De Bilt		68·6	319	i 11 6 a	− 1	i 20 7	− 2	i 24 13	SS	e 33·7
Neuchatel		69·0	313	e 11 9	0	e 20 8	− 6	—	—	—
Besançon		69·5	314	e 11 13	+ 1	—	—	—	—	38·7
Uccle		69·5	318	i 11 12 a	0	i 20 16	− 4	i 13 46	PP	i 33·7
Aberdeen		71·1	325	i 11 22	0	i 20 35	− 3	i 16 2	PPP	35·4
Marseilles		71·2	310	e 11 23?	0	e 20 46	+ 6	25 13?	SS	35·7
Paris		71·3	316	i 11 23	0	i 20 37	− 4	i 14 3	PP	36·7
Clermont-Ferrand		71·9	312	i 11 29 a	+ 2	i 20 43	− 5	i 25 18	SS	e 33·8
Edinburgh		72·1	324	11 28	0	20 43	− 7	11 48	pP	(38·0)
Kew		72·1	319	i 11 28	0	i 20 49	− 1	i 14 19	PP	e 37·2
Stonyhurst		72·4	322	i 11 29	− 1	i 20 55	+ 2	e 14 11	PP	32·7
Scoresby Sund		73·1	342	i 11 36	+ 2	i 21 1	0	14 31	PP	33·7
Barcelona		74·1	309	11 36	− 4	21 5	− 7	i 25 57	SS	38·6
Tortosa		75·5	308	i 11 48	0	i 21 20	− 8	14 35	PP	e 36·3
College		77·0	23	e 11 6?	−50	e 20 47?	−58	e 25 48?	SS	e 31·6
Brisbane		78·3	129	i 12 2 a	− 1	i 21 55	− 4	—	—	—
Toledo		79·0	309	i 12 7	0	e 22 1	− 5	15 9	PP	—
Almeria		79·2	308	i 12 10	+ 2	i 22 1	− 7	12 25	pP	37·7
Granada		79·9	306	i 12 13	+ 1	i 22 12	− 4	12 37	pP	41·6
Riverview		81·1	135	i 12 20 a	+ 2	i 22 23	− 5	i 22 57	PS	e 36·4
Sydney		81·1	135	e 12 13	− 5	e 22 16	−12	—	—	—
San Fernando		82·1	307	i 12 23	− 1	i 22 34	− 4	i 23 8	PS	41·7
Lisbon		83·1	310	i 12 29 k	0	i 22 45	− 3	14 33	PP	39·7
Sitka		86·3	24	e 12 40	− 5	i 23 8	[− 1]	e 16 33	PP	e 41·0
Ivigtut		87·1	343	e 12 39	−10	e 23 7	[− 8]	e 29 2	SS	e 35·6
Honolulu		95·6	62	e 19 8	PPP	e 23 57	[− 7]	e 26 23	PS	e 39·0
Victoria		97·9	24	14 8?	+29	24 13?	[− 4]	31 43?	SS	39·7
Auckland		98·8	126	i 18 13	PP	24 14	[− 7]	25 46	PS	40·7
Seattle		99·0	23	e 22 24	?	e 29 58	?	e 37 58	?	e 48·4
Saskatoon		99·3	12	—	—	e 24 20	[− 3]	e 26 49?	PS	42·7
Christchurch		100·3	133	13 52	+ 2	24 16	[−12]	17 58	PP	48·8
Wellington		100·8	131	13 53	+ 1	24 23	[− 8]	14 11	pP	46·7
Bozeman		104·4	17	e 18 38	PP	e 24 30	[−18]	e 27 33	PS	e 43·4
Seven Falls		105·2	348	18 37	PP	24 48	[− 3]	25 59	SKKS	45·7
Ukiah		105·8	29	e 14 17	+ 3	e 24 52	[− 2]	e 18 56	PP	e 44·5
Halifax		106·0	343	e 28 51	PPS	e 37 43	SSS	—	—	47·7
Shawinigan Falls		106·0	350	e 17 13?	?	e 24 49?	[− 6]	e 33 43?	SS	58·7
Berkeley		107·2	29	e 14 27	+ 7	e 24 56	[− 4]	e 18 38	PP	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.			L.
				m. s.	s.	m. s.	s.	m. s.			m.
		°	°								
Ottawa		107·5	353	18 31?	PP	24 57	[− 5]	26 19	SKKS	e	52·7
Logan		107·7	19	e 17 10	?	i 25 0	[− 2]	i 19 0	PP		—
Rapid City		107·7	12	e 18 18?	PP	e 24 49?	[−13]	e 28 10?	PS	e	46·1
Santa Clara		108·1	29	e 18 35	PP	e 24 59	[− 4]	e 28 8	PS		—
Vermont		108·1	350	e 18 58	PP	i 25 3	[− 1]	e 28 2	PS	e	46·6
Salt Lake City		108·6	20	e 18 33	PKP	e 24 59	[− 7]	e 19 7	PP	e	45·6
Tinemaha	E.	109·6	26	e 14 41	P	—	—	e 18 42	PKP		—
Harvard		109·8	348	i 14 47	P	e 25 7	[− 4]	i 18 34	PKP	e	47·7
Buffalo		110·3	354	i 19 13	PP	e 28 32	PS	e 34 48	SS		—
Santa Barbara		111·2	29	i 18 39	[+ 4]	—	—	—	—		—
Chicago		111·7	2	e 19 21	PP	e 28 32	PS	e 34 35	SS	e	43·9
Fordham		111·8	350	e 19 24	PP	i 25 18	[− 1]	i 28 48	PS		—
Mount Wilson		112·1	28	e 14 47	P	e 33 34	PKKS	e 18 39	PKP		—
Pasadena		112·1	28	e 14 49?	P	e 25 7	[−14]	e 18 38	PKP	e	45·7
Riverside		112·6	28	i 18 41	[+ 3]	e 33 31	PKKS	i 29 27	PKKP		—
Philadelphia		112·8	351	e 19 19	PP	i 25 18	[− 5]	i 28 56	PS	e	44·9
Pittsburgh		112·9	355	i 19 38	PP	i 25 19	[− 5]	i 30 15	PPS		—
Georgetown		114·1	351	e 14 57	P	i 25 31	[+ 2]	e 18 44	PKP		—
St. Louis		114·8	4	i 15 4	P	i 25 22	[− 9]	i 18 43	PKP		—
Cape Girardeau	N.	116·1	3	e 18 50	[+ 5]	e 25 34	[− 2]	e 26 3	SKKS		—
Tucson		116·7	23	e 15 31	P	e 26 0	[+22]	i 18 48	PKP	e	47·6
Bermuda		117·7	339	20 6	PP	e 25 36	[− 6]	e 36 7	SS	e	48·9
Columbia		119·3	354	—	—	e 25 39	[− 9]	e 29 57	PS	e	48·2
Mobile		122·8	2	—	—	26 0	[+ 1]	—	—		—
San Juan		131·1	334	e 19 18	[+ 4]	i 31 36	PS	i 39 1	SS	e	53·6
Fort de France		132·2	325	e 19 16	[0]	—	—	e 22 38	PKS		—
Rio de Janeiro	E.	141·1	266	e 15 9	?	e 22 29	PKS	(e 32 54)	PS	e	32·9
Balboa Heights		143·9	349	e 19 39	[+ 2]	—	—	—	—		—
Bogota		146·7	338	i 19 46	[+ 4]	—	—	e 23 20	PP		—
La Plata		154·6	244	19 55?	[+ 1]	37 13	PPS	23 55?	PP		64·8
La Paz		160·5	297	i 20 3a	[+ 2]	i 26 43	[−22]	i 24 23	PP		75·7
Huancayo		162·2	323	i 20 7	[+ 4]	—	—	i 44 46	SS	i	80·0

Additional readings and notes :—
Dehra Dun iN =8m.1s.
Yokohama iE =8m.6s.
Tokyo i =7m.56s.
Mizusawa SE =13m.39s.
Sapporo PPP =10m.6s.
Helwan eE =9m.45s., PPPE =12m.52s., PPS?EN =17m.31s.
Bucharest iN =13m.0s., iSN =17m.32s., iPS?EN =18m.4s., iS$_c$SN =19m.31s., iSS?N =21m.30s., iSS?E =21m.34s.
Campulung eE =10m.21s.
Sofia iSE =18m.5s., PSN =18m.32s., eN =19m.40s., eN =24m.43s.
Belgrade i =10m.30s., e =14m.2s., iSS =22m.29s., i =26m.23s.
Ogyalla eE =10m.43s., eN =11m.10s., PSN =18m.34s., PSE =18m.40s., eSSSN =25m.4s.
Perth i =19m.33s.
Prague ePPP =14m.41s., eSS =23m.13s.
Copenhagen 10m.53s., 14m.44s., 19m.39s., 20m.26s., 23m.11s., and 25m.43s.
Potsdam iPPPE =14m.41s., iPPSN =19m.39s., iPPSE =19m.42s., iSSN =23m.19s., eSSSN =26m.5s., eSSSE =26m.11s.
Tananarive iP$_c$P =11m.10s., S$_c$S =20m.32s., SS =23m.37s.
Cheb e =14m.53s.
Jena iZ =14m.35s., iE =14m.59s., iPSN =19m.51s., iPSEN =19m.55s., iN =23m.31s., iEN =23m.43s. and 26m.43s.
Bergen PPPZ =15m.11s.
Florence iPPZ =13m.29s., iPPPE =14m.40., iPSN =20m.17s., iSSN =24m.9s., iSSSN =26m.25s.
Stuttgart iPP =13m.30s., iPPZ =13m.42s., ePPP =15m.14s., eS =19m.43s., i =20m.20s., iSS =24m.18s., eSSSN =27m.32s., eQ =32m.13s., ePKP,PKPZ =39m.24s.
De Bilt iSSS =28m.3s.
Uccle iEZ =13m.56s., iN =24m.25s., iSSN =24m.47s., iSSE =24m.52s., iSSSEN =28m.2s.
Aberdeen PSEN =21m.4s., iSSSEN =28m.22s.
Paris e =22m.53s.
Clermont-Ferrand iPS =21m.15s., eSSS =28m.49s.
Edinburgh PP =14m.9s., PPP =15m.50s., PS =21m.15s., SKS =21m.25s., SS =25m.20s., SSS =28m.27s., PKKP =30m.58s., PKKS =34m.38s., L is given as SKKS.
Kew iP$_c$P =11m.39s.?, iPPPEZ =16m.0s., iSN =20m.45s., iPS =21m.9s., iSKSN =21m.30s., eSSE =26m.27s., eSSS =28m.59s.?, eQEN =32m.13s.?.

Continued on next page.

Stonyhurst iP$_c$P? =12m.9s., iPPP =16m.3s., iPS =21m.26s., iSKS =21m.32s., iS$_c$S =21m.40s., SS =26m.29s., iSSS =29m.6s., iPKKP =30m.19s., iPKKS = 32m.44s.
Scoresby Sund 16m.12s. and 17m.16s., i =21m.37s., SS =25m.43s.?, SSS =29m.1s.
Barcelona SSS? =29m.28s.
Tortosa P$_c$P =12m.5s., PSN =21m.55s., SSN =25m.49s., QN =31m.25s.
College e =14m.14s.?, 16m.6s.?, and 29m.58s.
Brisbane iZ =12m.19s., eSZ =22m.3s.
Toledo SSE =27m.10s.
Almeria P$_c$P =12m.34s., PP =15m.9s., pPP =15m.28s., sPP =15m.35s., PPP =16m.57s., pPPP =17m.9s., pS =22m.19s., sS =22m.23s., PS =22m.54s., SS =26m.55s., sSS =27m.12s., SSS =30m.53s.
Granada P$_c$P =12m.29s., sP =13m.11s., PP =15m.15s., pPP =15m.34s., PPP =17m.26s., pPPP =18m.5s., sS =22m.57s., SS =27m.20s., sSS =28m.14s., SSS =32m.2s.
Riverview iEZ =12m.43s., eE =28m.0s., eN =28m.55s., eEN =31m.55s.?.
Lisbon Z =12m.45s., PPPN =15m.21s.?, PPPE =15m.31s.?, PPPZ =15m.42s.?, S$_c$S?N = 23m.15s., SSN =28m.5s.?, SSE =28m.17s.?.
Sitka iP =12m.51s., i =23m.32s., e =24m.18s., eSS =28m.59s., eSSS =32m.45s.
Ivigtut iS =23m.20s., e =33m.44s.
Honolulu e =20m.10s., eSS =31m.8s.
Auckland i =21m.4s. and 25m.4s., SS? =31m.59s., i =37m.13s.
Saskatoon e =32m.13s.?.
Christchurch PPS =26m.56s., SS =31m.54s., SSS =35m.58s., Q =42m.33s.
Wellington iZ =18m.24s., PPP?Z =19m.43s., SP? =23m.43s., PS =25m.50s., PPS = 26m.58s., PPPS?Z =27m.33s., e =30m.43s.?, SS? =32m.23s., SSS? =36m.28s., Q =40m.43s.
Bozeman eSS =33m.3s., e =37m.17s.
Seven Falls SS =33m.32s., SSS =38m.7s.?.
Ukiah e =20m.50s. and 25m.28s., eS =26m.18s., ePS =27m.50s., eSS =33m.47s., eSSS =37m.23s.
Berkeley ePPEN =18m.49s., eEN =28m.3s.
Ottawa PS =28m.1s.?, SS =33m.57s., SSS =37m.55s.
Logan iPS =28m.15s., iSS? =33m.44s., e =38m.28s.
Rapid City e =38m.15s.?.
Santa Clara iZ =28m.39s.
Vermont i =26m.31s., eSS =34m.1s., eSSS =38m.5s.
Salt Lake City ePS =28m.22s., e =29m.17s., eSS =34m.3s., e =38m.56s.
Harvard ePP =19m.7s., e =26m.31s., iPS =28m.27s., iSSP =34m.43s.
Buffalo e =20m.30s. and 20m.46s., i =22m.28s. and 29m.41s., e =33m.41s.
Chicago e =24m.12s., i =26m.16s., e =34m.41s., 38m.33s., and 39m.47s.
Fordham ePPP =21m.58s., iSKKS =26m.18s., iSS =34m.58s.
Mount Wilson iPKKPNZ =29m.29s., ePKP,PKPNZ =37m.14s.
Pasadena ePPEN =19m.31s.?, iPS =28m.49s., iPKKPZ =29m.29s. eSKKPZ = 33m.33s., ePKP,PKPZ =37m.56s., eSKP,PKPZ =40m.27s.
Philadelphia eS =27m.1s., eSS =35m.10s., iSS =35m.13s., eSSS =38m.58s.
Georgetown ePP =19m.49s., i =20m.41s. and 22m.6s., iSKKS =26m.34s., iPS = 29m.10s., SS =35m.18s.
St. Louis eZ =18m.19s., ePPN =19m.37s., iPPZ =19m.45s., iZ =20m.0s., iSKPZ = 21m.8s., iN =24m.47s. and 25m.57s., iSKKSN =26m.33s., iSE =27m.15s., iE = 27m.51s., iPSN =29m.6s., iPKKP?N =29m.26s., iPPSE =29m.59s., iPPPSE = 31m.20s.
Cape Girardeau ePPPP?N =23m.30s.
Tucson e =19m.55s., i =21m.15s., e =28m.1s., iPS =29m.34s., eSS =36m.4s., eSSS = 40m.25s.
Bermuda ePS =29m.50s., e =31m.32s. and 39m.45s.
Columbia eS =28m.0s., e =42m.11s.
Bogota e =20m.21s., i =21m.7s.
San Juan i =22m.34s., eSSS =44m.7s.
La Plata N =39m.43s.? and 43m.31s.?
La Paz iSKKS =31m.23s., iPSKS =34m.55s., SSS =51m.7s.
Huancayo iSSS =51m.0s.

Oct. 23d. Readings also at 0h. (New Delhi), 1h. (Helwan, Ksara, Zürich, and Tashkent), 6h. (near Tashkent and Tchimkent), 8h. (Calcutta, New Delhi, Frunse, and near Tashkent), 10h. (near Tashkent), 11h. (Cape Girardeau), 12h. (Ferndale), 13h. (Stuttgart), 17h. (Mount Wilson, Pasadena, Haiwee, Tucson, Tinemaha, Riverside, St. Louis, Cape Girardeau, La Paz, and La Plata), 21h.(Florence, Granada, San Fernando, and La Paz), 22h. (De Bilt, Paris, and Kew).

Oct. 24d. 13h. 40m. 22s. Epicentre 49°·5N. 156°·2E. (as on 1940, April 19d.).

$A = -\cdot5966$, $B = +\cdot2631$, $C = +\cdot7582$; $\delta = +2$; $h = -5$;
$D = +\cdot404$, $E = +\cdot915$; $G = -\cdot694$, $H = +\cdot306$, $K = -\cdot652$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Mizusawa		14·9	231	e 3 35	+ 1	5 57	−23	—	—	—
Vladivostok		17·9	258	e 4 4	− 8	7 43	+13	—	—	—
Irkutsk		32·3	297	6 28	− 5	12 14	+28	—	—	—
College		32·7	41	e 5 54	−42	e 11 8	−44	—	—	e 15·2
Sitka		40·0	53	e 7 56	+18	e 13 50	+ 6	e 9 17	PP	e 18·1
Tashkent		58·3	298	e 9 56	− 3	18 17	+16	—	—	—
Bozeman		58·8	56	—	—	e 18 14	+ 7	—	—	e 29·9
Calcutta	N.	58·9	269	e 9 45	−18	e 17 57	−11	e 24 40	SSS	—
Tinemaha	E.	60·3	68	e 10 18	+ 5	—	—	/ —	—	—
Haiwee		61·1	68	e 10 21	+ 3	—	—	—	—	—
Santa Barbara	Z.	61·2	71	e 10 22	+ 3	—	—	—	—	—
New Delhi	N.	61·9	282	—	—	i 20 28	?	—	—	—
Mount Wilson		62·3	70	i 10 26	0	—	—	e 39 31	P′P′	—
Pasadena		62·3	70	i 10 27	+ 1	e 19 4	+12	e 39 29	P′P′	e 26·4
Riverside		62·9	70	i 10 31	+ 1	—	—	e 39 32	P′P′	—
La Jolla	Z.	63·7	70	e 10 39	+ 3	—	—	—	—	—
Upsala		65·9	339	—	—	e 24 38?	?	—	—	e 31·6
Tucson		68·0	67	i 11 5	+ 2	—	—	—	—	e 34·0
Bombay		71·6	278	e 11 24	− 1	e 20 40	− 4	11 50	PcP	36·6
Florissant	E.	74·3	49	—	—	e 21 24	+ 9	e 26 13	SS	—
St. Louis		74·5	49	—	—	e 21 15	− 2	e 26 13	SS	—
Ottawa		75·2	35	e 11 46	0	e 21 26?	+ 1	—	—	38·6
Jena	N.	75·5	338	e 11 47	− 1	—	—	—	—	—
Seven Falls		75·5	32	—	—	e 21 35	+ 7	—	—	e 40·6
De Bilt		75·8	342	i 11 52	+ 2	e 21 30	− 1	—	—	e 38·6
Bucharest		76·8	326	—	—	e 21 14?	−28	—	—	e 38·6
Uccle		77·2	343	e 11 54	− 3	e 21 41	− 6	e 27 2	SS	e 38·6
Kew		77·4	345	i 11 57	− 1	e 22 48	PPS	e 28 38?	SS	e 39·6
Paris		79·5	343	e 12 10	0	—	—	—	—	e 39·6
Zürich		79·5	339	e 12 7	− 3	—	—	—	—	—
Basle		79·6	340	e 12 9	− 1	—	—	—	—	—
Chur		79·8	338	e 12 12	0	—	—	—	—	—
Fordham		79·8	37	e 12 10	− 2	—	—	—	—	—
Neuchatel		80·3	340	e 12 13	− 1	—	—	—	—	—
Milan		81·2	337	i 12 19	0	21 26	−63	—	—	—
Florence	N.	82·2	335	i 12 24	0	i 22 32	− 7	e 15 21	PP	—
Clermont-Ferrand		82·3	342	i 12 24	− 1	—	—	—	—	e 45·6
Helwan		87·0	315	12 47	− 1	e 23 14	[0]	—	—	—
Toledo		89·3	345	e 12 58	− 1	—	—	—	—	49·6
Bermuda		90·7	34	—	—	e 24 6	+ 5	—	—	e 46·8
Granada		91·9	344	—	—	22 18	?	—	—	52·3
La Paz		131·4	63	e 22 46	PP	—	—	—	—	65·6

Additional readings :—
Mizusawa eSE = 6m.0s.
Sitka e = 16m.55s.
Bombay PP?E = 13m.51s., eSN = 20m.37s., PPSE = 21m.28s.
Florissant eE = 21m.39s., ePS?E = 21m.56s.
St. Louis iN = 21m.41s., ePSN = 22m.5s., eSSSN = 29m.28s.
Jena eN = 12m.13s.
Basle e = 13m.5s.
Florence iPSN = 23m.16s., eSSN = 27m.35s., eSSSN = 31m.32s.
Helwan eZ = 13m.11s. and 14m.53s.
Long waves were also recorded at Honolulu, Auckland, Wellington, Riverview, and other European stations.

Oct. 24d. 16h. 4m. 37s. Epicentre 22°·3S. 174°·2W.

Felt in Tonga.
Epicentre : 22°S. 174°W. (Pasadena).
23°·5S. 173°·5W. (Wellington).
22°.5S. 174°W. (U.S.C.G.S.).
Annual Report for 1943, Apia Observatory, Wellington, 1950.

$A = -\cdot 9214$, $B = -\cdot 0936$, $C = -\cdot 3773$; $\delta = +9$; $h = +4$;
$D = -\cdot 101$, $E = +\cdot 995$; $G = +\cdot 375$, $H = +\cdot 038$, $K = -\cdot 926$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Suva		8·0	300	i 2 4	+ 4	e 4 29	S_g	—	—	—
Apia		8·7	15	i 2 10	0	i 3 37	−13	2 26	P*	e 5·4
Auckland		17·3	211	4 5	+ 1	7 23	+ 7	8 10	SSS	9·5
Tuai		18·0	202	4 13	0	7 16	−16	i 7 12	?	—
Wellington		21·1	204	4 43	− 5	8 41	+ 2	5 8	PP	10·4
Christchurch		23·8	204	5 11	− 4	9 11	−17	—	—	11·4
Riverview		32·5	242	i 6 35a	+ 1	i 11 47	− 2	i 7 55	PPP	e 15·7
Sydney		32·5	242	e 6 23	−11	e 10 44	−65	—	—	e 15·7
Honolulu		46·2	22	i 8 27	− 1	i 15 17	+ 2	e 18 44	SS	e 19·6
Perth		62·1	245	—	—	i 18 53	+ 4	i 20 23	S_cS	i 26·6
Mera		71·7	322	e 11 16	−10	21 48	+63	—	—	—
Yokohama		72·2	322	e 10 59	−30	i 20 53	+ 2	—	—	—
Tokyo, Cen. Met. Ob.		72·3	323	11 50	+21	—	—	—	—	—
Sendai		73·5	326	11 36	0	21 3	− 3	—	—	—
Nagano		73·9	322	e 11 36	− 3	—	—	—	—	—
Mizusawa		74·1	326	11 41	+ 1	e 21 11	− 1	21 14	S	—
Naha		74·1	307	e 11 41	+ 1	—	—	—	—	—
Osaka		74·1	319	11 40	0	21 13	+ 1	—	—	—
Koti		74·6	317	e 11 43	0	21 20	+ 2	—	—	—
Aikawa		74·8	323	11 42	− 2	21 20	0	—	—	—
Nemuro		75·0	331	e 11 33	−12	—	—	—	—	—
Kagosima		75·3	313	e 11 0	?	—	—	—	—	—
Kumamoto		76·0	315	11 51	0	21 36	+ 2	—	—	—
Mori		76·5	328	11 56	+ 2	21 43	+ 4	—	—	—
Hukuoka		76·6	315	e 10 42	−72	20 30	−70	—	—	—
Santa Barbara		76·6	45	i 11 52k	− 2	—	—	—	—	—
Sapporo		76·8	329	11 57	+ 2	21 44	+ 2	22 33	PPS	—
Branner		77·0	41	e 12 1	+ 5	e 21 45	0	—	—	—
Santa Clara		77·1	41	i 11 56	− 1	i 21 51	+ 5	—	—	e 32·7
Berkeley		77·2	41	i 11 56	− 1	i 21 49	+ 2	—	—	e 36·4
La Jolla		77·2	46	i 11 55k	− 2	—	—	—	—	—
Lick		77·2	41	e 11 57	0	e 21 55	+ 8	—	—	—
Pasadena		77·4	45	i 11 57k	− 1	i 21 51	+ 2	i 14 51	PP	e 31·4
Mount Wilson		77·5	45	i 11 58k	− 1	—	—	e 39 10	P′P′	—
Ukiah		77·5	39	—	—	e 21 43	− 7	e 27 22	SS	e 32·0
Ituhara		77·7	315	e 10 50	?	21 50	− 2	—	—	—
Palomar	Z.	77·8	47	e 11 59	− 2	—	—	—	—	—
Riverside		77·8	45	i 11 59k	− 2	—	—	—	—	—
Wakkanai		78·4	330	e 10 50	?	21 50	−10	—	—	—
Haiwee		78·7	44	e 12 6	0	—	—	—	—	—
Tinemaha	E.	79·2	44	e 12 3	− 5	—	—	—	—	—
Tucson		81·3	50	i 12 19	− 1	e 22 31	+ 1	i 15 19	PP	e 36·6
Vladivostok		81·8	323	12 22	0	22 40	+ 5	15 42	PP	—
Victoria		83·8	32	e 12 33	+ 1	e 22 58	+ 3	—	—	39·4
Salt Lake City		85·4	43	e 12 40	0	e 23 8	− 3	e 28 33	SS	e 35·5
Logan		85·9	42	i 12 43	0	e 23 10	− 6	e 16 11	PP	35·9
Sitka		85·9	20	e 12 40	− 3	e 23 11	− 5	e 24 36	PPS	e 38·1
Bozeman		88·6	39	e 12 53	− 3	e 23 9	[−15]	e 29 40	SS	e 36·5
College		89·2	11	e 12 27?	−32	e 23 17?	−30	e 15 40?	PP	e 36·0
Rapid City		92·5	42	e 13 10?	− 4	e 23 46?	[− 1]	e 25 29?	PS	e 44·6
Huancayo		93·5	104	e 13 21	+ 2	e 24 33	+ 8	e 25 30	PS	43·6
La Plata	N.	97·0	132	29 53?	?	—	—	—	—	41·8
Mobile		97·9	60	—	—	i 25 10	+ 7	—	—	—
La Paz	Z.	98·0	111	i 13 41a	+ 2	i 24 59	− 5	26 47	PS	45·4
Florissant		99·1	52	e 13 42	− 2	e 24 17	[− 6]	e 17 41	PP	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
St. Louis		99·1	52	e 13 46	+ 2	i 25 17	+ 4	i 26 46	PS	—
Chicago		102·1	49	—	—	e 24 35	[− 2]	e 25 41	S	e 47·2
Irkutsk		102·3	321	13 58	− 1	27 24	PS	18 15	PP	—
Columbia		104·6	59	—	—	e 24 48	[0]	—	—	e 52·5
Calcutta	N.	104·8	289	e 13 51	−19	26 1	+ 1	i 24 56	SKS	e 45·9
Pittsburgh	N.W.	107·2	52	e 20 11	?	e 25 7	[+ 7]	i 25 55	SKKS	e 49·3
Georgetown		109·0	54	e 19 1	PP	25 16	[+ 8]	28 24	PS	49·3
Kodaikanal	E.	110·7	273	e 14 43	P	e 25 33	[+18]	28 53	PS	51·9
Philadelphia		110·7	54	e 19 8	PP	e 25 17	[+ 2]	i 28 40	PS	e 49·3
Fordham		111·2	53	e 19 19	PP	e 26 45	{+32}	e 34 57	SS	—
Ottawa		111·3	48	e 27 3	?	—	—	e 34 51	SS	e 46·4
San Juan		113·0	78	e 19 41	PP	i 25 21	[− 3]	e 29 1	PS	e 47·7
Vermont		113·0	49	e 19 25	PP	e 26 25	{− 1}	e 28 51	PS	e 50·4
Harvard		113·8	52	e 19 29	PP	e 26 35	{+ 3}	e 29 8	PS	56·4
Rio de Janeiro	E.	114·5	130	e 19 35	PP	—	—	—	—	—
Seven Falls		115·0	47	e 19 35?	PP	e 29 22	PS	e 35 59?	SSP	45·4
New Delhi		116·1	292	e 19 31	PP	i 25 49	[+13]	i 29 41	PS	—
Bermuda		117·6	64	e 19 53	PP	e 25 47	[+ 5]	e 29 41	PS	e 55·7
Bombay		117·6	280	i 19 49	PP	i 25 56	[+14]	29 45	PS	—
Tashkent		123·8	305	i 19 0	[0]	e 25 45	[−17]	e 30 31	PS	—
Scoresby Sund		129·1	12	19 5?	[− 5]	31 23?	PS	21 19	PP	—
Upsala	N.	141·6	351	e 19 31	[− 2]	e 29 45	{+14}	e 41 23?	SS	e 54·4
Bergen		141·9	1	e 19 21	[−13]	—	—	e 22 31	PP	78·4
Aberdeen	E.	144·7	7	i 20 45	?	—	—	—	—	78·7
Edinburgh		145·8	9	19 42	[+ 1]	—	—	20 11	?	—
Copenhagen		146·3	353	i 19 42k	[+ 1]	—	—	22 53	PP	71·4
Stonyhurst		147·9	9	i 19 48	[+ 4]	—	—	i 20 0	PKP_2	e 75·4
Potsdam		149·5	351	i 19 52	[+ 5]	—	—	—	—	e 70·4
De Bilt		150·3	0	19 48k	[0]	—	—	i 23 27	PP	e 72·4
Kew		150·5	7	i 19 49	[+ 1]	—	—	e 23 23	PP	e 65·4
Jena		151·1	350	e 19 48	[− 1]	—	—	—	—	e 81·4
Ksara		151·2	299	e 19 52	[+ 3]	e 30 38	{+13}	e 23 38?	PP	—
Prague		151·5	348	e 19 51	[+ 1]	e 30 42	{+15}	e 23 33	PP	e 75·4
Uccle		151·5	3	i 19 49k	[− 1]	e 23 28	SKP	e 36 27	PPS	—
Cheb		151·8	352	e 20 10	[+20]	e 30 46	{+18}	—	—	e 75·4
Bucharest		152·3	328	e 19 51	[0]	—	—	e 20 0	PKP_2	54·4
Ogyalla		152·6	342	e 19 16	?	—	—	e 19 23?	PKP	—
Paris		153·4	5	i 19 53	[+ 1]	—	—	i 23 45	PP	76·4
Stuttgart		153·5	354	i 19 52k	[0]	e 34 4	PSKS	i 20 13	PKP_2	e 73·8
Belgrade		154·5	335	e 19 54	[0]	—	—	i 20 19	PKP_2	e 92·8
Basle		154·8	357	e 19 54	[0]	—	—	e 20 20	PKP_2	—
Zürich		154·9	356	e 19 53k	[− 1]	—	—	—	—	—
Sofia		155·0	328	e 19 56	[+ 1]	—	—	e 34 23?	?	—
Chur		155·3	354	e 20 4	[+ 9]	—	—	—	—	e 88·2
Neuchatel		155·4	357	e 20 1	[+ 6]	—	—	—	—	—
Triest		155·8	346	e 19 58	[+ 2]	—	—	—	—	—
Helwan		155·9	293	i 19 54	[− 2]	34 26	PSKS	20 24	PKP_2	—
Clermont-Ferrand		156·5	5	i 19 55	[− 1]	—	—	e 33 14?	?	e 59·4
Milan	E.	156·7	353	i 20 2	[+ 5]	—	—	—	—	79·8
Florence		158·1	348	i 19 56k	[− 3]	i 35 2	PSKS	i 20 55	PKP_2	—
Lisbon		159·2	34	19 58?	[− 2]	—	—	20 38	PKP_2	79·2
Toledo		160·6	23	i 20 1	[0]	—	—	i 24 6	PP	85·4
Tortosa		161·0	11	e 19 54	[− 8]	32 39	?	46 10	SSP	e 79·4
San Fernando		162·5	34	i 20 7	[+ 4]	32 56	?	24 56	PP	76·4
Granada		163·1	27	i 20 4	[0]	34 32	SKSP	21 2	PKP_2	87·7
Almeria		163·8	25	20 3	[− 1]	26 45	[−23]	20 53	PKP_2	80·4

Additional readings :—
Apia i = 2m.17s., sS = 4m.25s.
Auckland Q? = 8m.28s.
Wellington sP = 5m.23s., i = 6m.13s., 7m.6s., and 7m.33s., P_cP = 8m.20s., sS = 9m.30s., SS? = 9m.56s.
Riverview iSN = 11m.43s., iN = 14m.8s.
Sapporo P_cP? = 12m.12s., S_cS? = 22m.16s.
Berkeley iSN = 21m.52s., iSZ = 21m.55s.
Pasadena ePKP,PKPZ = 39m.6s.

Continued on next page.

Tucson iS = 22m.34s., e = 31m.5s.
Logan e = 26m.51s., eSS = 29m.3s.
Sitka e = 15m.29s. and 28m.29s., eSS = 29m.35s.
College e = 32m.48s.?.
Rapid City eSS = 30m.45s.?.
Huancayo eSKS = 23m.58s., iSS = 30m.43s.
La Paz iZ = 14m.32s., iPPZ = 17m.33s., iZ = 18m.57s., PPP = 19m.47s., iZ = 25m.48s., PSZ = 26m.11s.
Florissant eZ = 16m.57s., iSKKSE = 24m.52s.
St. Louis ePPN = 17m.48s., ePPPN = 19m.55s., eSKSN = 24m.18s., iSKKSE = 24m.52s., ePPSE = 27m.27s., iSSN = 32m.34s.
Chicago e = 36m.44s.
Calcutta iN = 31m.24s.
Kodaikanal iSKKSE = 26m.23s., SSE = 34m.3s.
Philadelphia eSS = 34m.40s., e = 38m.13s.
Fordham e = 20m.14s.
San Juan e = 27m.15s. and 35m.32s.
Vermont eSS = 35m.8s., e = 45m.25s.
Harvard e = 20m.30s., 30m.35s., 35m.39s., and 36m.51s.
New Delhi N iSS = 34m.18s., i = 35m.52s., 39m.2s., and 39m.50s.
Bermuda e = 36m.23s.
Bombay iE = 26m.57s., eN = 27m.1s., iEN = 29m.56s., PPSE = 31m.10s.
Tashkent iPP = 20m.45s., SKKS = 27m.43s.
Scoresby Sund i = 22m.32s., 23m.14s., 32m.2s., 33m.8s., and 37m.35s.?.
Upsala SKPN = 23m.6s., eN = 32m.40s., eE = 37m.23s.?, eSSE = 42m.23s.?.
Bergen e = 32m.31s.
Copenhagen 26m.14s.
Kew ePKP$_2$? = 20m.13s.
Jena eN = 19m.53s., iN = 19m.58s.
Uccle eN = 22m.50s., iPP?E = 23m.36s., eN = 33m.32s.
Bucharest iN = 20m.21s., iE = 20m.35s. and 21m.14s., iN = 22m.7s. and 25m.8s., iE = 25m.47s. and 37m.39s.
Ogyalla eN = 20m.18s.
Stuttgart ePPZ = 23m.40s., ePPP?Z = 27m.17s.
Belgrade ePP = 23m.57s., e = 26m.6s. and 31m.28s.
Basle ePP? = 23m.57s.
Helwan PPZ = 23m.59s., iE = 31m.8s., SS?N = 43m.38s.
Florence iSKPN = 23m.5s., iPPN = 24m.13s., iPPPN = 27m.41s., iSSN = 44m.14s., iSSSN = 50m.39s.
Lisbon PKPZ = 20m.2s., E = 22m.32s., PPE = 24m.13s., PPN = 24m.18s., N = 35m.17s.
Tortosa PPPN? = 32m.2s., PPSN? = 35m.30s., SSN? = 42m.7s.
San Fernando PSE = 35m.34s., SSE = 42m.51s.
Granada pPKP = 20m.35s., pPKP$_2$ = 21m.19s., SKP = 23m.17s., iPP = 24m.39s., pPP = 25m.0s., PPS = 39m.0s., pPPS = 40m.10s., SS = 45m.24s., sSS = 46m.54s., SSS = 51m.36s.
Almeria sPKP = 21m.11s., pPKP$_2$ = 21m.45s., sPKP$_2$ = 22m.8s., PP = 24m.28s., pPP = 25m.27s., pSKS = 27m.38s., PPP = 28m.11s., pPPP = 28m.54s., SKKS = 30m.18s., SPP = 37m.50s., SS = 44m.25s., SSS = 50m.28s.
Long waves were also recorded at Tananarive, Cape Girardeau, Little Rock, Ivigtut, and Barcelona.

Oct. 24d. 23h. 22m. 49s. Epicentre 53·5N. 160°·0E.

A = −·5625, B = +·1970, C = +·8030 ; δ = +2 ; h = −7;
D = +·331, E = +·944 ; G = −·758, H = +·265, K = −·596.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Nemuro		14·3	230	e 3 26	0	—	—	—	—	—
Sapporo		16·6	238	e 3 51	− 5	—	—	—	—	—
Mizusawa	E.	19·7	230	e 4 32	− 2	5 5	?	—	—	—
Sendai		20·5	228	i 4 43	+ 1	8 34	+ 7	—	—	—
Kumagaya		22·9	228	5 10	+ 4	7 1	?	—	—	—
Nagano		23·0	232	5 12	+ 5	9 15	+ 1	—	—	—
Nagoya		24·8	230	5 27	+ 2	—	—	—	—	—
Kobe		26·1	233	4 47	−50	—	—	—	—	—
College		27·8	45	e 5 50	− 3	e 10 29	− 6	e 12 6	SSS	e 14·0
Kagosima		30·9	236	e 6 5	−15	—	—	—	—	—
Irkutsk		33·4	292	6 40	− 2	12 1	− 2	—	—	—
Sitka		35·2	57	e 7 13	+15	e 12 39	+ 8	e 5 4	PP	e 15·2
Honolulu		45·1	118	—	—	e 15 3	+ 4	—	—	e 20·1
Tinemaha		56·2	72	i 9 46	+ 2	—	—	i 10 12	PcP	—
Haiwee		57·0	72	e 9 51	+ 1	—	—	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Santa Barbara		57·2	74	e 9 53	+ 2	—	—	—	—	—
Pasadena		58·3	73	1 9 59	0	e 18 0	− 1	i 39 46	P′P′	e 27·5
Mount Wilson		58·3	73	i 10 0	+ 1	—	—	i 39 47	P′P′	—
Riverside		58·9	73	i 10 3	0	—	—	e 39 40	P′P′	—
La Jolla		59·8	74	e 10 7	− 2	—	—	—	—	—
Calcutta	N.	61·8	270	e 10 16	− 7	—	—	—	—	e 33·2
Upsala		63·1	340	i 10 30	− 2	e 19 9	+ 7	—	—	e 36·2
New Delhi	N.	63·8	283	e 10 35	− 1	e 20 19	+68	—	—	—
Tucson		63·9	70	i 10 38	+ 1	e 19 22	+10	e 15 29	?	e 34·4
Copenhagen		68·0	342	i 11 3a	0	19 58	− .4	—	—	—
Florissant		69·5	52	i 11 12	0	e 20 17	− 3	i 11 25	pP	—
St. Louis		69·7	52	i 11 13	− 1	e 20 18	− 4	i 11 24	pP	—
Ottawa		70·3	38	e 11 16	− 1	—	—	—	—	39·2
Seven Falls		70·5	34	—	—	e 20 29?	− 3	—	—	37·2
Potsdam		71·0	340	e 11 23	+ 1	e 20 38	+ 1	i 20 55	PS	e 42·2
Cape Girardeau	N.	71·1	52	e 11 21	− 1	e 20 35	− 3	—	—	—
De Bilt		72·7	344	i 11 32a	0	e 20 55	− 2	—	—	e 38·2
Jena		72·7	340	i 11 32	0	—	—	—	—	—
Prague		72·9	338	e 11 34	+ 1	e 20 54	− 5	—	—	e 42·2
Bombay	E.	73·8	280	i 11 38	0	i 21 2	− 7	—	—	—
Kew		74·1	348	i 11 39	− 1	e 22 11?	+59	—	—	e 36·2
Uccle		74·1	345	i 11 40a	0	e 21 11?	− 1	—	—	e 36·2
Harvard		74·3	37	i 11 40	− 1	—	—	—	—	—
Bucharest		74·9	328	e 11 45	+ 1	e 21 15	− 7	e 21 38	PS	36·7
Fordham		74·9	39	i 11 42	− 2	—	—	—	—	—
Stuttgart		75·2	341	i 11 46a	0	e 21 18	− 7	e 21 36	S_cS	e 41·2
Georgetown		75·3	42	i 11 46	− 1	i 21 20	− 6	—	—	—
Belgrade		76·2	332	i 11 53	+ 1	—	—	—	—	e 47·4
Paris		76·3	345	i 11 43	− 9	—	—	—	—	e 49·2
Basle		76·7	341	i 11 55a	0	—	—	—	—	—
Zürich		76·7	341	i 11 54a	− 1	e 21 40	− 1	—	—	—
Chur		77·0	340	i 11 57	+ 1	—	—	—	—	—
Triest		77·2	337	—	—	e 21 36	−11	—	—	—
Neuchatel		77·3	341	i 12 7	+ 9	—	—	—	—	—
Clermont-Ferrand		79·2	344	i 12 10	+ 2	—	—	—	—	e 42·2
Florence		79·5	338	i 12 11a	+ 1	i 22 9	− 2	i 22 54	PS	—
Ksara		80·7	316	e 12 17	+ 1	e 22 42	+18	—	—	—
Helwan		86·0	317	i 12 43	0	e 23 11	− 6	e 24 29	PS	—
Toledo		86·0	348	i 12 43	0	—	—	i 12 56	P_cP	—
Granada		88·6	348	i 12 54	− 2	i 23 45	+ 3	—	—	47·9
Almeria		88·7	346	12 57	0	i 23 55	+12	—	—	—

Additional readings :—
Riverside iZ = 10m.51s.
Florissant esSE = 20m.41s.
Helwan eZ = 13m.2s.
Toledo eE = 14m.19s.

Oct. 24d. Readings also at 2h. (New Delhi), 7h. (near Tashkent), 10h. (St. Louis, Harvard, Tinemaha, Tucson, Pasadena, Mount Wilson, Riverside, and near San Juan), 12h. (Zürich), 15h. (near Irkutsk), 18h. (Tacubaya), 19h. (Wellington), 22h. (Stuttgart), 23h. (near Mizusawa).

Oct. 25d. Readings at 0h. (Wellington), 1h. (near Bogota), 5h. (Tacubaya), 9h. (near Balboa Heights (2)), 11h. (Pasadana (2), Mount Wilson (2), Riverside (2), Tinemaha (2), Tucson (2), and St. Louis), 13h. (Pasadena, Mount Wilson, Tucson, Wellington, Riverview, Colombo, Calcutta, and Bombay), 14h. (Pasadena, Tucson, Mount Wilson, Riverside, Jena, Strasbourg, Stuttgart, Belgrade, Sofia, Bucharest, and near Triest), 15h. (Stuttgart, Jena, Tucson, Mount Wilson, Pasadena, and Suva), 18h. (near La Paz), 20h. (St. Louis, Riverview, Auckland, Christchurch, and Wellington), 23h. (Riverview).

Oct. 26d. 4h. 50m. 33s. Epicentre 37°·3N. 121°·7W.

Intensity VI at Alviso, Boulder Creek, Castroville, Milpitas, Branner; V at Berkeley, Hollister, San Francisco, Stockton. Macroseismic epicentre as adopted, area approximately 20,000 square miles.
R. R. Bodle. United Stated Earthquakes 1943, Washington 1945, p. 15, isoseismic chart p. 13.

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

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Lick		0·0	—	i 0 3	P*	—	—	—	—	—
Santa Clara		0·2	284	i 0 4	P_g	—	—	—	—	—
Branner	N.	0·4	287	i 0 8	P_g	—	—	—	—	—
Berkeley		0·7	321	i 0 13	P_g	i 0 24	S_g	—	—	i 0·9
San Francisco	E.	0·7	308	i 0 14	P_g	—	—	—	—	i 0·6
Fresno	N.	1·6	110	e 0 29	− 1	i 0 50	− 1	i 0 37	P_g	—
Ukiah		2·2	327	e 0 33	− 5	—	—	e 0 47	P_g	e 1·2
Tinemaha		2·7	94	i 0 48	+ 3	i 1 17	− 2	—	—	—
Haiwee		3·2	111	e 0 53	+ 1	—	—	—	—	—
Santa Barbara		3·3	151	i 0 55	+ 2	—	—	—	—	—
Ferndale	E.	3·8	329	i 1 9	P*	i 2 18	S_g	—	—	—
Mount Wilson		4·2	136	i 1 7	0	—	—	—	—	—
Pasadena		4·2	137	i 1 6	− 1	i 2 6	S*	i 1 9	P*	—
Riverside		4·9	133	i 1 13	− 4	—	—	—	—	—
Palomar	Z.	5·6	133	e 1 24	− 3	—	—	—	—	—
Salt Lake City		8·4	63	e 2 13	+ 7	e 3 53	+10	—	—	e 4·2
Logan		8·8	57	i 2 16	+ 5	e 4 3	+10	i 2 50	P_g	1 4·7
Tucson		10·3	117	i 2 33	+ 1	e 4 59	S*	i 3 2	PPP	i 5·7
Rapid City		15·6	58	e 3 53?	PP	e 6 55?	SS	—	—	e 8·4
Florissant	E.	24·7	77	e 5 19	− 5	—	—	—	—	e 15·1
St. Louis		24·8	77	e 5 23	− 2	e 9 45	− 1	—	—	i 13·5
Pittsburgh		32·4	71	—	—	e 14 21	SSS	—	—	e 16·3
Riverview		107·5	241	e 13 45?	P	—	—	—	—	e 41·9

Logan also gives i = 4m.35s.
Long waves were also recorded at De Bilt and other American stations.

Oct. 26d. 11h. 58m. 56s. Epicentre 39°·2N. 122°·7W.

Intensity IV at Lakeport, Potter Valley, Ukiah, and Upper Lake.
Epicentre as adopted.
Bulletin of the Seismographic Stations in Northern California, vol. 13, No. 4, p. 121.

$A = -·4198$, $B = -·6538$, $C = +·6295$; $\delta = -4$; $h = -1$;
$D = -·842$, $E = +·540$; $G = -·340$, $H = -·530$, $K = -·777$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ukiah		0·4	261	i 0 1	P_g	—	—	—	—	—
Berkeley		1·4	166	e 0 20	− 7	i 0 54	S_g	i 0 29	P_g	—
San Francisco	E.	1·5	178	i 0 25	− 3	i 0 53	S_g	i 0 38	P_g	—
Branner		1·8	172	e 0 32	0	i 0 43	−13	i 0 40	P_g	i 1·2
Ferndale	E.	1·8	318	i 0 35	+ 3	i 1 2	+ 6	—	—	—
	N.	1·8	318	i 0 32	0	i 0 59	+ 3	—	—	—
Lick		2·0	156	i 0 36	+ 1	—	—	—	—	—
Fresno	N.	3·4	137	e 0 58	+ 3	—	—	—	—	—
Tinemaha	Z.	4·1	121	i 1 12	P*	—	—	—	—	—
Haiwee		4·9	128	e 1 25	P*	—	—	—	—	—
Mount Wilson		6·2	142	e 1 37	+ 2	e 2 58	+10	—	—	—
Pasadena		6·2	143	i 1 34	− 1	e 3 2	+14	—	—	—
Riverside		6·8	139	e 1 41	− 3	—	—	—	—	—

Berkeley also gives iPZ = 0m.25s.
Long waves were recorded at St. Louis.

Oct. 26d. Readings also at 2h. (Pasadena, Mount Wilson, Riverside, Tinemaha, and Tucson), 6h. (Riverview), 7h. (near Mizusawa), 10h. (Pasadena, Tucson, Tinemaha, and Riverside), 15h. (near Apia), 17h. and 18h. (La Paz), 20h. (St. Louis), 21h. (Prague).

Oct. 27d. 16h. 11m. 18s. Epicentre 25°·0N. 124°·8E.

$A = -\cdot5179$, $B = +\cdot7451$, $C = +\cdot4203$; $\delta = +5$; $h = +3$;
$D = +\cdot821$, $E = +\cdot571$; $G = -\cdot240$, $H = +\cdot345$, $K = -\cdot907$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Kumamoto		9·3	32	2 18	+ 1	6 7	L	—	—	(6·1)
Taikyu		11·3	16	2 44	− 2	6 21	L	—	—	(6·3)
Nagano		16·3	41	e 4 0	+ 8	—	—	—	—	—
Tokyo		16·7	47	e 4 14	PP	—	—	—	—	—
Sendai		19·0	42	e 4 34?	+ 8	7 49	− 6	—	—	—
Vladivostok		19·0	17	4 21	− 5	—	—	—	—	—
Irkutsk		31·4	335	e 6 27	+ 2	e 11 41	+ 9	—	—	—
Calcutta	N.	33·4	274	e 6 38	− 4	e 12 0	− 3	e 14 0	SS	—
New Delhi		42·4	286	e 7 59	+ 1	i 14 34	+14	17 31	SS	—
Colombo		46·5	255	8 31	0	15 19	0	—	—	—
Bombay		48·4	274	i 8 46	0	e 15 48	+ 2	10 39	PP	—
Tashkent		48·4	304	8 46	0	e 15 56	+10	—	—	—
Sverdlovsk		55·4	323	i 9 40	+ 2	i 17 23	+ 1	—	—	—
Baku		63·1	305	e 10 34	+ 2	—	—	—	—	—
Helwan	Z.	80·8	299	12 18	+ 1	—	—	e 12 29	P_cP	—
Copenhagen		81·3	328	i 12 20 a	0	—	—	—	—	41·7
Stuttgart		86·8	323	e 12 45	− 2	e 23 14	[+ 1]	e 13 0	P_cP	e 47·3
De Bilt		86·9	328	e 12 47	− 1	e 23 32	+ 6	—	—	e 43·7
Zürich		88·0	323	e 13 4	+11	—	—	—	—	—
Uccle		88·1	328	e 12 55	+ 1	e 23 21	[0]	e 16 24	PP	e 43·7
Florence	N.	88·4	318	e 13 5	+10	e 23 49	+ 9	e 23 22	SKS	—
Paris		90·3	326	—	—	—	—	e 24 42?	PS	e 46·7
Clermont-Ferrand		91·9	323	e 18 42?	PPP	—	—	—	—	—
Tinemaha	Z.	94·4	46	e 13 20	− 3	—	—	—	—	—
Pasadena	Z.	96·1	48	e 13 29	− 2	—	—	e 17 42	PP	e 45·7
Mount Wilson	Z.	96·2	48	e 13 28	− 3	—	—	e 17 32	PP	—
Riverside	Z.	96·8	48	e 13 33	− 1	—	—	—	—	—
Tucson		102·2	45	e 18 20	PP	—	—	—	—	e 51·1
Bogota		145·3	34	e 19 39	[− 1]	—	—	e 20 28	?	—

Additional readings :—
Bombay PPN = 10m.43s., S_cSEN = 18m.39s.
Uccle eSS?N = 29m.48s.
Florence eS?N = 24m.6s.
Long waves were also recorded at Hamada, Riverview, Arapuni, Christchurch, Wellington, and at other European stations.

Oct. 27d. Readings also at 1h. (New Delhi), 5h. (near Erevan), 6h. (Mount Wilson, Pasadena, Riverside, La Jolla, Tucson, Wellington, Christchurch, Auckland, Riverview, and Perth), 7h. (San Fernando, New Delhi, and Bombay), 8h. and 12h. (near Lick), 13h. and 14h. (Riverview and Wellington), 15h. (Pehpei), 16h. (near Mizusawa), 21h. (Calcutta, near Toledo, Granada, and Almeria).

Oct. 28d. Readings at 0h. (Pasadena, Riverside, Tinemaha, Tucson, near Stalinabad, Tashkent, and near Apia), 5h. (Tucson, and near La Paz), 7h. (near Tashkent), 9h. (Mount Wilson, Tucson, Pasadena, Riverside, and Tinemaha), 11h. (near Apia), 12h. (La Paz), 21h. (New Plymouth), 23h. (Almata, near Andijan, Stalinabad, and Tashkent).

Oct. 29d. Readings at 0h. (Auckland, Wellington, Riverview, near Apia, and near Mizusawa (2)), 1h. (New Delhi), 3h. (near Lick), 6h. (Colombo and near Mizusawa), 8h. (Mount Wilson, Pasadena, Riverside, Tucson, and Tinemaha), 14h. (Ksara), 17h. (Fordham, Florissant (2), St. Louis (2), Salt Lake City, Logan (2), Tucson (2), and Pasadena), 19h. (Fort de France), 21h. (Oaxaca and Tacubaya), 22h. (Ksara).

Oct. 30d. Readings at 0h. (Bombay, Calcutta, Colombo, and Andijan), 1h. (Riverview and Fort de France), 3h. (La Paz), 5h. (near Tashkent, Tchimkent, and Stalinabad), 8h. (near Mizusawa), 9h. (near Apia), 13h. (near Branner, Lick, San Francisco, and Berkeley), 14h. (near Almeria), 16h. (La Paz), 19h. (near La Paz and near Branner), 21h. (near Fort de France), 22h. (La Paz), 23h. (Tinemaha, Palomar, Tucson, and St. Louis).

Oct. 31d. Readings at 1h. (Fort de France), 3h. (Bogota and near Apia), 4h. (Tinemaha, Mount Wilson, Tucson, and Pasadena), 10h. (near Fort de France), 13h. (near Fresno, Palomar, Tucson, Haiwee, Pasadena, Mount Wilson, La Jolla, and Riverside), 15h. (Riverside and Tucson), 17h. (near Fresno, Berkeley, Branner, Lick, and near Mizusawa), 22h. (Bogota), 23h. (near Erevan).

Nov. 1d. Readings at 1h. (near Tashkent), 2h. (San Juan), 7h. (Kew and near Andijan), 9h. (Auckland (2), Wellington (2), and Suva), 10h. (Riverview, Arapuni, Christchurch, Wellington, Auckland, and Suva), 20h. (De Bilt, Bucharest, and near Istanbul).

Nov. 2d. 3h. 39m. 10s. Epicentre 38°·8N. 69°·7E. (as on 1943 Jan. 11d.).

$A = +\cdot2711$, $B = +\cdot7328$, $C = +\cdot6240$; $\delta = -13$; $h = -1$;
$D = +\cdot938$, $E = -\cdot347$; $G = +\cdot217$, $H = +\cdot585$, $K = -\cdot781$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tashkent		2·5	353	i 0 53	P_g	—	—	—	—	—
Andijan		2·8	46	e 0 53	P*	i 1 21	− 1	i 0 58	P_g	1·5
New Delhi	N.	12·0	146	e 2 52	− 3	e 5 19	+ 8	5 35	SS	6·3
Sverdlovsk		19·0	346	4 32	+ 6	i 8 6	+11	—	—	—
Bombay		20·0	170	e 4 38	+ 1	e 8 22	+ 5	4 56	PP	i 10·8
Hyderabad	N.	22·6	159	5 2	− 1	9 7	0	—	—	11·3
Calcutta	N.	22·7	128	e 5 2	− 2	i 9 8	− 1	i 10 4	SS	e 11·3
Kodaikanal	E.	29·3	165	—	—	e 11 31	+32	12 30	SS	—
Helwan		32·7	266	e 7 38	PP	e 12 8	+16	—	—	—
Stuttgart		43·7	304	e 8 16	+ 8	—	—	—	—	e 19·2
De Bilt		45·7	309	—	—	—	—	e 18 50	SS	e 25·5
Uccle		46·4	307	—	—	—	—	e 19 20?	SS	e 23·8
Toledo	z.	55·9	296	e 9 46	+ 4	—	—	—	—	—

Bombay ePE = 4m.41s., S_cSE = 8m.46s., SS = 8m.54s.
Long waves only were recorded at other European stations.

Nov. 2d. 17h. 50m. 42s. Epicentre 33°·1N. 116°·1W. (as on 1942 May 23d.).

Felt in San Deigo and Imperial Counties. Epicentre 32° 58′N. 116° 0′W.

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

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Palomar	z.	0·7	291	i 0 16	− 1	—	—	—	—	—
La Jolla		1·0	256	i 0 20	− 1	i 0 32	− 4	—	—	—
Riverside		1·4	277	i 0 27	0	i 0 50	+ 4	—	—	—
Mount Wilson	z.	2·0	305	i 0 38	+ 3	—	—	—	—	—
Pasadena		2·0	301	e 0 38	+ 3	i 1 6	+ 4	—	—	—
Haiwee		3·4	333	i 1 8	P_g	—	—	—	—	—
Tucson		4·5	100	i 1 11	0	—	—	i 1 33	P_g	i 2·4
Fresno	N.	4·8	321	i 1 30	P*	i 2 36	S_g	—	—	—
Santa Clara	z.	6·4	313	e 3 44	S_g	—	—	—	—	—
Branner		6·6	312	e 2 28	P_g	e 3 29	S*	—	—	e 4·7
Berkeley		6·9	315	i 2 42	P_g	i 2 50	−15	i 2 47	?	i 5·6
Logan		9·3	21	—	—	i 5 11	S_g	—	—	e 5·4

Long waves were also recorded at Potsdam and at other American stations.

Nov. 2d. 18h. 8m. 18s. Epicentre 56°·5S. 26°·3W.

Epicentre 58·25S. 25°W. Magnitude 7 (Pasadena).

$A = +·4971$, $B = -·2457$, $C = -·8322$; $\delta = +3$; $h = -8$;
$D = -·443$, $E = -·896$; $G = -·746$, $H = +·369$, $K = -·554$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
La Plata	E.	30·4	302	6 42?	PP	10 42?	−34	13 18?	SSS	16·3
	N.	30·4	302	6 14	− 2	11 27	+11	13 24?	SSS	20·1
	Z.	30·4	302	6 14	− 2	13 36	SSS	6 36?	PP	16·6
Rio de Janeiro		35·8	333	i 7 16	+13	i 12 57	+16	i 7 19	?	i 15·9
Montezuma		45·9	300	e 10 30	PP	e 18 34	SS	e 12 49	?	e 21·9
Johannesburg		49·0	75	—	—	(e 15 42?)	−13	—	—	e 15·7
La Paz		50·9	304	i 9 6k	+ 1	17 17	+56	i 26 10	Q	28·0
Huancayo		58·1	299	e 9 58	0	i 18 17	+19	e 13 32	PPP	e 24·1
Tananarive		65·5	87	10 47	0	e 19 28	− 4	20 2	PPS	29·2
Bogota		72·2	309	e 11 30	+ 1	e 21 19	PS	e 11 39	P_cP	e 51·8
Fort de France		76·7	326	e 11 56	+ 1	e 21 46	+ 5	—	—	—
Christchurch		79·1	194	12 13	+ 5	22 14	+ 7	26 56	SS	39·3
Wellington		81·0	196	12 17	− 1	22 27	0	23 22	PS	37·7
San Juan		81·8	322	e 12 41	+19	e 22 47	+12	e 15 47	PP	e 33·6
Arapuni		84·0	197	13 42?	+69	22 42?	−15	—	—	35·3
Auckland		85·3	196	12 38	− 2	23 7	− 3	24 12	PS	43·1
Perth		86·2	148	e 13 12	+28	23 32	+13	i 18 0	PPP	i 35·9
Riverview		90·0	178	i 13 8k	+ 5	i 23 45	{+ 3}	i 25 12	PS	e 42·9
Sydney		90·0	178	e 13 18?	+15	e 23 30	[− 3]	—	—	—
San Fernando		94·2	16	e 13 32	+10	e 24 10	{− 2}	—	—	41·7
Bermuda		94·3	328	e 13 46	+23	e 24 14	{+ 1}	e 26 14	PPS	e 39·2
Almeria		95·2	17	e 13 40	+13	i 24 56	+16	26 33	PPS	43·7
Granada		95·3	18	i 13 41	+14	i 25 0	+19	26 20	PS	45·3
Lisbon		96·0	13	13 48?	+18	25 5?	+18	19 26?	PPP	39·2
Brisbane		96·4	179	e 13 29	− 3	i 24 9	[+ 1]	e 17 27	PP	i 44·7
Tacubaya	N.	96·9	295	e 14 30	+56	—	—	—	—	—
Toledo		97·9	17	e 13 53	+14	i 24 29	[+13]	17 47	PP	47·7
Helwan		98·9	48	e 13 49	+ 6	25 24	+13	27 10	PPS	—
Tortosa		99·6	20	e 14 4	+18	e 24 34	[+ 9]	—	—	e 46·7
Barcelona		100·5	21	—	—	e 24 31	[+ 2]	—	—	e 42·0
Columbia		101·4	316	e 17 57	PP	e 24 47	[+13]	e 25 47	S	e 41·8
Suva		102·8	204	—	—	e 24 48	[+ 8]	e 48 42?	?	e 54·7
Ksara		104·2	49	e 18 42	PP	e 25 3	[+16]	—	—	—
Colombo	E.	104·6	100	—	—	e 33 42?	SS	—	—	—
Philadelphia		104·6	323	e 17 15	?	e 26 1	+ 2	e 27 55	PS	e 42·5
Clermont-Ferrand		104·8	20	—	—	e 25 2	[+13]	—	—	31·7
Florence		104·8	27	e 19 1	PP	e 28 34	PPS	i 37 26	SSS	—
Fordham		105·0	325	e 18 38	PP	e 25 9	[+18]	e 27 56	PS	—
Halifax		105·5	333	—	—	e 25 30?	{− 3}	e 33 30?	SS	53·7
Harvard		105·8	327	e 13 34	?	e 25 32	{− 4}	e 28 22	PS	e 56·7
Milan	E.	105·9	24	e 19 26	PP	—	—	—	—	—
Kodaikanal	E.	106·1	95	18 44	PP	24 57	[+ 2]	28 0	PS	—
Pittsburgh	N.W.	106·7	320	e 15 36	?	—	—	—	—	—
Neuchatel		106·8	23	—	—	e 24 35	[−23]	—	—	—
Triest		107·2	28	e 23 42	?	—	—	—	—	e 53·7
Chur		107·3	24	e 18 18	[−10]	—	—	—	—	e 56·4
Sofia		107·3	36	e 18 28	[0]	25 12	[+11]	i 19 2?	PP	—
Basle		107·5	23	e 19 0	PP	e 28 52	PPS	—	—	—
Zürich		107·5	23	—	—	(e 24 42)	[−19]	—	—	e 24·7
Cape Girardeau	N.	107·6	311	e 19 22	PP	e 25 5	[+ 3]	e 25 17	?	—
Paris		107·6	19	e 14 44	P	—	—	e 19 42?	?	e 51·7
Vermont		108·0	326	e 19 10	PP	e 25 14	[+10]	e 28 29	PS	e 44·0
Belgrade		108·3	33	e 17 12	?	e 25 11	[+ 6]	e 19 14	PP	e 62·1
Strasbourg		108·5	23	—	—	e 34 42?	SSP	—	—	e 56·7
Stuttgart		109·0	24	e 14 40	P	e 24 42	[−26]	e 28 27	PS	e 52·7

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

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
St. Louis		109·1	311	e 19 7	PP	i 25 26	[+18]	e 28 21	PS	—
Florissant		109·3	311	e 19 9	PP	e 25 25	[+16]	e 28 20	PS	—
Kew		109·7	17	e 31 0	?	—	—	—	—	e 40·8
Ottawa		109·7	325	19 14	PP	e 28 42	PS	e 34 42	SSP	51·7
Bucharest		109·8	37	e 19 5	PP	e 28 5	PS	e 21 47	PPP	36·7
Seven Falls		109·8	329	e 19 31	PP	e 34 53	SSP	e 26 54?	?	45·7
Uccle		109·9	19	e 19 12?	PP	e 25 15	[+ 3]	e 28 39	PS	52·7
Bombay		110·6	86	18 34	[0]	i 25 15	[0]	28 39	PS	—
Chicago		110·7	314	19 17	PP	e 25 24	[+ 9]	e 28 26	PS	e 46·9
Cheb		111·0	24	e 19 34	PP	e 28 33	PP	—	—	e 55·7
De Bilt		111·3	20	e 14 52	P	i 25 32	[+14]	i 29 2	PS	e 51·7
Prague		111·4	26	e 19 6	PP	e 28 42	PS	e 34 42	SS	e 53·7
Jena	N.	111·6	24	e 18 33	[− 3]	—	—	—	—	e 51·7
Stonyhurst		111·7	14	e 14 42	P	e 25 5	[−14]	e 27 7	?	e 43·7
Hyderabad	N.	112·5	92	19 27	PP	25 26	[+ 4]	28 57	PS	—
Tucson		113·4	293	i 18 45	[+ 5]	e 25 51	[+25]	e 29 19	PS	e 47·2
Edinburgh		113·6	13	e 27 42	?	37 2	?	29 52	PKKP	—
Lincoln		113·6	308	e 24 24	?	—	—	—	—	e 42·5
Aberdeen		115·0	13	i 26 23	?	i 26 42	{+ 2}	e 45 32	?	e 55·5
Copenhagen		116·2	23	19 57	PP	25 45	[+ 9]	29 48	PS	—
Palomar	Z.	117·4	289	i 18 22	[−26]	—	—	—	—	—
Riverside	Z.	118·1	289	i 18 44	[− 5]	—	—	i 19 2	?	—
Ivigtut		118·6	347	—	—	e 30 26	PS	e 35 55	SS	e 56·4
Mount Wilson	Z.	118·7	289	e 18 50	[0]	—	—	—	—	—
Pasadena		118·7	289	e 18 48	[− 2]	e 25 55	[+10]	e 29 55	PS	e 50·7
Rapid City		119·1	307	e 20 10	PP	e 25 35	[−12]	e 32 16	?	e 51·8
Bergen	E.	119·2	16	e 18 53	[+ 2]	e 30 17	PS	e 21 19	?	46·7
Salt Lake City		120·6	298	e 20 37	PP	e 26 5	[+13]	e 36 51	SS	e 54·6
New Delhi		120·7	83	e 20 24	PP	25 53	[+ 1]	30 6	PS	—
Upsala		121·1	23	—	—	e 25 56	[+ 2]	e 30 42?	PS	e 50·7
Logan		121·3	299	e 20 33	PP	i 26 6	[+12]	e 36 25	?	49·4
Calcutta	N.	122·1	97	e 20 32	PP	i 26 2	[+ 5]	i 30 38	PS	e 50·2
Santa Clara	N.	123·1	288	e 20 2	?	e 38 22	?	—	—	—
Berkeley	Z.	123·7	288	i 19 6	[+ 6]	—	—	i 21 11	PP	—
Bozeman		123·9	303	e 20 59	PP	e 26 17	[+14]	e 32 24	PPS	e 55·0
Ukiah		125·1	289	e 22 0	?	e 26 27	[+21]	e 31 52	PPS	e 61·8
Tashkent		126·0	67	i 21 7	PP	i 27 56	{+ 2}	i 31 2	PS	—
Saskatoon		126·7	310	—	—	e 26 30?	[+19]	e 38 24	SS	53·7
Scoresby Sund		126·7	1	21 36?	PP	22 41	PKS	30 59	PS	—
Andijan		127·2	70	e 16 0	?	—	—	—	—	—
Honolulu		130·0	246	—	—	—	—	e 34 44	?	e 63·6
Seattle		130·7	297	e 21 40	PP	e 26 34	[+13]	—	—	e 61·2
Victoria		131·9	297	e 21 54	PP	e 38 48?	SS	e 22 57	PKS	59·7
Sverdlovsk		132·8	48	19 38	[+21]	i 28 42	{+ 5}	21 44	PP	—
Pehpei		137·6	109	e 20 22	[+56]	—	—	—	—	—
Sitka		143·0	302	e 18 57	[−39]	e 29 12	{−27}	e 41 22	SS	e 59·4
College		151·2	311	e 20 26	[+37]	e 28 17	?	—	—	e 57·7
Irkutsk		151·4	76	19 13	[−36]	26 19	[−37]	—	—	—

Additional readings :—
La Plata QN = 15m.6s.
La Paz P_cP = 9m.48s., iPPZ = 11m.32s., iPSZ = 17m.58s., iZ = 24m.44s.
Huancayo e = 10m.14s. and 11m.23s.
Tananarive PP = 13m.8s., N = 19m.31s., SS = 23m.49s., SSS = 25m.34s.
Bogota iPP = 14m.30s., eS_cS? = 21m.56s.
Christchurch i = 12m.46s., SSS = 30m.55s., Q = 33m.24s.
Wellington pPZ = 12m.32s., sP?Z = 12m.52s., iZ = 13m.10s., 13m.32s., and 14m.48s., PPZ = 16m.1s., iZ = 17m.33s., e = 22m.5s., PS = 24m.12s., i = 24m.45s., SS?Z = 28m.2s., SSS = 32m.57s., iZ = 35m.49s.
San Juan iS = 22m.57s., e = 27m.13s.
Auckland sP? = 13m.7s., PP = 16m.7s., i = 19m.17s., 24m.42s., and 26m.33s., SSS = 32m.27s.
Perth SS = 29m.17s.
Riverview iPN = 13m.11s., iZ = 13m.33s., iPPN = 16m.37s., iE = 23m.56s., iN = 24m.0s., iSSN = 29m.44s., iE = 29m.59s. and 36m.32s.
Bermuda e = 17m.48s., eS = 25m.12s., e = 30m.30s., eSSS = 34m.58s.

Continued on next page.

Almeria pP =14m.4s., sP =14m.15s., PP =17m.31s., pPP =18m.2s., sPP =18m.11s., PPP =19m.45s., pPPP =20m.7s., SKS =24m.4s., SKKS =24m.15s., PS =25m.16s., sS =25m.32s., SS =31m.19s., sSS =32m.15s., SSS =35m.21s., PKP,PKP =38m.43s.
Granada pP =14m.11s., sP =14m.52s., PP =17m.30s., pPP =17m.55s., PPP =19m.50s., SKS =24m.5s., SS =31m.39s., SSS =35m.57s., Q =40m.20s.
Lisbon SKSN =24m.17s.?.
Brisbane eSKKSE =24m.25s., iSSE =31m.22s.
Toledo SS =32m.12s.
Helwan iZ =14m.20s., PPZ =17m.46s., eZ =18m.53s., iNZ =21m.49s., SKSN =24m.24s., SSN =32m.0s.
Columbia eSS =32m.4s., e =37m.52s.
Philadelphia ePP =18m.34s., iSKS =24m.59s., e =33m.27s.
Fordham i =19m.46s., e =34m.2s.
Harvard e =14m.40s., 17m.11s., 19m.0s., 20m.22s., 21m.2s., 21m.38s., 24m.24s., 26m.22s., 32m.42s., 33m.54s., 37m.37s., and 38m.0s., eQ =43m.59s.
Kodaikanal SSE =33m.42s.
Sofia eE =23m.42s.?.
Vermont eSS =34m.26s.
Belgrade e =29m.56s. and 34m.36s.
Stuttgart ePKPZ =18m.52s., ePPZ =19m.22s., ePSZ =28m.46s., ePPS =29m.36s., ePKKPZ =29m.54s., ePPS =29m.58s., eSS =34m.59s.
St. Louis eN =25m.57s., iSKKSN =26m.23s., iSE =26m.51s., eE =27m.13s., iE =28m.56s., iPPSE =29m.23s., iN =29m.54s.
Florissant eE =25m.54s., eSKKSE =26m.24s., eSE =26m.52s., eE =27m.14s. and 28m.53s., ePPSE =29m.25s., eE =29m.52s.
Kew eZ =37m.45s.
Ottawa e =45m.42s.?.
Bucharest iEN =23m.34s., iS_cS?N =28m.53s.
Uccle eE =24m.52s., eSE =27m.6s., iSSN =34m.57s., iSSSE =38m.51s., iE =45m.23s.
Bombay PPN =19m.35s., SKKSEN =26m.14s., SN =27m.0s., iE =29m.4s., SPPEN =29m.49s., SSE =34m.32s., SSPN =34m.47s., iN =35m.29s., SSSE =38m.39s.
Chicago eSS? =34m.17s.
De Bilt iPP =19m.27s., iS =27m.22s., iSS =35m.22s.
Hyderabad SKKSN =26m.25s., SSN =34m.44s.
Tucson ePP =19m.48s., e =22m.44s., 26m.24s., and 35m.59s.
Edinburgh SS =35m.44s.
Copenhagen 36m.6s.?.
Pasadena iPKPZ =18m.54s., ePPEZ =20m.20s., iSSEN =37m.11s.
Salt Lake City e =41m.56s.
New Delhi SKKSN =27m.14s., PPSN =31m.33s., SSN =36m.45s., SSSN =41m.15s.
Upsala eE =26m.4s., 36m.42s.?, and 41m.42s.?.
Calcutta iSSN =37m.42s.
Berkeley iEN =21m.23s., eN =38m.37s., eE =38m.49s.
Bozeman eSS =37m.59s.
Ukiah e =46m.54s.
Tashkent iSKSP =31m.22s., iSS =38m.12s.
Scoresby Sund 38m.18s.?.
Sverdlovsk iPPP =24m.55s., iSS =39m.18s.?.
Sitka e =24m.12s.
College e =20m.48s. and 31m.9s., eSS =42m.6s.
Irkutsk PPS =29m.46s., eSS =34m.18s.
Long waves were also recorded at Vera Cruz, Potsdam, Ogyalla, and Istanbul.

Nov. 2d. Readings also at 0h. (St. Louis, Pasadena, Mount Wilson (2), Riverside (2), Palomar (2), Tucson, Granada and Almeria), 2h. (St. Louis), 4h. (near Andijan), 6h. (near Mizusawa), 7h. (De Bilt and Stuttgart), 8h. (near Andijan and Tashkent), 9h. (near Mizusawa and near Andijan (2)), 10h. (La Paz and near Andijan), 13h. (near Neuchatel), 16h. (Tashkent, Bombay, and near Tucson (3)), 17h. (Paris, Potsdam, Cheb, Uccle, De Bilt, Stuttgart, Pehpei, New Delhi, Calcutta, and Tucson), 18h. (La Paz and Tucson), 19h. (Kew, Fort de France, St. Louis, Riverside, Mount Wilson, Tucson, and Pasadena), 20h. (Potsdam, La Paz, and near Mizusawa), 21h. (La Paz, and near Mizusawa), 22h. (College, Tacubaya, and La Paz), 23h. (La Paz, St. Louis, Riverside, Tucson, La Jolla, and Palomar).

Nov. 3d. 14h. 32m. 17s. Epicentre 61°·8N. 150°·9W.

Epicentre 62°N. 151°W. (U.S.C.G.S.). Magnitude 7·4.

$A = -·4151$, $B = -·2310$, $C = +·8799$; $\delta = -11$; $h = -9$;
$D = -·486$, $E = +·874$; $G = -·769$, $H = -·428$, $K = -·475$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
College		3·4	24	i 0 51	− 4	—	—	—	—	—
Sitka		9·0	112	i 2 14	+ 1	i 3 53	− 5	i 2 43	PPP	i 4·5
Victoria		20·4	118	i 4 34	− 7	8 26	+ 1	—	—	10·7
Seattle		21·5	118	e 4 40	−12	i 8 28	−19	—	—	e 9·6
Saskatoon		25·5	93	5 40	+ 8	10 1	+ 4	—	—	12·7
Ferndale		26·7	131	e 5 53	+10	e 10 21	+ 4	—	—	e 13·0
Bozeman		28·0	107	e 5 54	− 1	i 10 30	− 8	e 6 51	PP	e 12·4
Berkeley		29·8	130	e 6 10	− 1	e 11 10	+ 3	—	—	e 13·1
Branner	E.	30·2	130	e 6 13	− 1	e 11 16	+ 3	—	—	e 14·4
	N.	30·2	130	i 6 16	+ 2	e 11 21	+ 8	—	—	—
Santa Clara		30·4	130	i 6 18	+ 2	i 11 38	+22	i 7 19	PP	i 15·1
Lick		30·5	130	e 6 18	+ 1	e 11 22	+ 4	i 7 26	PP	e 13·2
Logan		30·7	112	i 6 20	+ 1	i 11 17	− 4	i 7 15	PP	i 13·3
Salt Lake City		31·5	114	e 6 26	0	i 11 31	− 3	i 7 38	PP	e 13·6
Fresno	N.	31·7	127	i 5 43	?	—	—	e 7 52	PPP	—
Tinemaha		32·0	126	e 6 32	+ 2	e 11 44	+ 2	—	—	—
Rapid City		32·8	100	i 6 41	+ 4	i 11 55	+ 1	i 6 59	?	i 14·2
Haiwee		32·9	126	i 6 40	+ 2	e 11 51	− 5	—	—	—
Boulder City		34·3	121	i 6 50	0	i 12 25	+ 8	—	—	—
Mount Wilson		34·6	128	i 6 52	− 1	e 12 25	+ 3	i 8 14	PP	—
Pasadena		34·6	128	i 6 52k	− 1	i 12 12	−10	i 8 16	PP	i 14·9
Riverside		35·0	128	i 6 56	0	e 12 28	0	i 13 8	S_cP	—
Palomar	Z.	35·8	127	i 7 1	− 2	—	—	—	—	—
La Jolla		36·1	128	e 7 6	+ 1	e 12 49	+ 4	—	—	—
Lincoln		38·4	98	e 7 10	−15	e 12 27	−53	—	—	—
Tucson		39·2	120	i 7 30	− 1	i 13 28	− 4	i 9 4	PP	i 16·7
Honolulu		40·8	190	e 7 43	− 2	e 13 53	− 3	—	—	e 16·5
Chicago		41·9	89	e 7 53	− 1	i 14 12	− 1	i 9 34	PP	i 17·3
Florissant		43·0	94	e 8 3	0	i 14 29	0	i 9 51	P_cP	i 21·7
Sapporo		43·1	278	e 8 6	+ 2	14 28	− 2	—	—	19·0
St. Louis		43·2	94	i 13 46	P_cS	i 14 31	− 1	i 14 43	PS	i 21·8
Scoresby Sund		43·3	23	8 5	0	i 14 32	− 1	i 9 53	PP	—
Ann Arbor		43·4	85	e 8 7	+ 1	—	—	—	—	—
Ivigtut		44·0	44	e 8 10	− 1	i 14 45	+ 2	e 9 52	PP	e 19·9
Mori		44·2	277	e 8 23	+11	e 14 46	0	—	—	e 20·3
Cape Girardeau	N.	44·6	95	e 8 14	− 2	e 14 52	0	e 14 15	S_cP	e 21·3
Ottawa		44·8	75	8 18	+ 1	14 55	0	9 55	PP	e 20·7
Buffalo		45·2	80	i 8 22	+ 2	i 15 33	+32	i 10 8	PP	—
Shawinigan Falls		45·2	72	8 22	+ 2	15 3	+ 2	10 6	PP	21·7
Little Rock		45·3	99	e 8 19	− 2	e 15 0	− 2	i 10 9	PP	—
Seven Falls		45·7	70	8 25	+ 1	15 6	− 2	18 13	SS	21·7
Mizusawa		46·2	274	e 8 30	+ 2	e 15 18	+ 3	e 15 25	PS	18·6
Pittsburgh		46·6	83	i 8 32	0	e 15 19	− 2	—	—	—
Vermont		46·6	75	e 8 33	+ 1	i 15 22	+ 1	e 10 13	PP	i 19·9
New Kensington		46·7	83	e 9 5	+33	e 15 31	+ 9	—	—	e 18·2
Sendai		47·0	273	8 33	− 2	14 52	−34	—	—	—
Vladivostok		47·4	285	e 8 37	− 1	15 25	− 7	8 42	?	—
Aikawa		48·5	276	e 8 49	+ 3	15 52	+ 4	—	—	—
Reykjavik		48·7	28	8 2	?	15 59	+ 9	10 45	PP	24·3
Harvard		48·9	74	i 8 49a	− 1	i 15 55	+ 2	i 10 51	PP	e 21·7
Fordham		49·1	77	i 8 52	+ 1	i 15 58	+ 2	i 10 53	PP	—
Weston		49·1	74	e 8 49	− 2	i 15 54	− 2	i 10 54	PP	—
Georgetown		49·2	82	i 8 52	0	i 15 57	− 1	i 10 51	PP	—
Philadelphia		49·2	80	i 8 52	0	i 15 51	− 7	e 10 50	PP	20·3
Kumagaya		49·5	274	9 0	+ 6	16 11	+ 9	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Nagano		49·6	276	e 8 59	+ 4	—	—	—	—	—
Tokyo Cen. Met. Ob.		49·7	272	(e 8 53)	− 3	(e 16 8)	+ 4	—	—(e	22·3)
Yokohama		49·9	272	9 10	+13	16 9	+ 2	—	—	20·1
Mobile		50·6	98	i 9 14	+12	i 16 23	+ 6	i 20 11	SS	—
Halifax		50·8	67	9 1	− 3	16 20	0	20 17	SS	23·7
Columbia		51·3	89	e 9 7	− 1	e 16 24	− 2	e 11 11	PP	i 23·8
Irkutsk		51·7	312	9 7	− 4	i 16 24	− 8	—	—	—
Kameyama		51·9	275	e 9 14	+ 2	—	—	—	—	—
Guadalajara	E.	52·5	119	—	—	e 17 49	+66	—	—	—
Kobe		52·6	276	9 16	− 2	16 49	+ 5	—	—	—
Koti		54·3	277	e 9 29	− 1	16 48	−19	—	—	—
Zinsen		54·4	285	e 9 31	0	17 7	− 2	—	—	—
Tacubaya	N.	55·4	116	e 9 40	+ 2	—	—	—	—	—
Kumamoto		56·3	279	9 41	− 4	17 33	− 1	—	—	—
Miyazaki		56·7	277	17 39	S	(17 39)	− 1	—	—	—
Bergen		56·8	15	e 9 46	− 2	17 43?	+ 2	12 6	PP	27·6
Vera Cruz	E.	56·9	113	e 9 58	+ 9	—	—	—	—	—
Upsala		58·4	7	9 58	− 2	17 57	− 5	e 19 35	S_cS	e 28·7
Aberdeen		58·9	19	i 10 5	+ 2	i 18 9	+ 1	i 22 12	SS	27·9
Sverdlovsk		59·2	341	i 10 24	+19	i 18 10	− 2	—	—	—
Edinburgh		59·9	21	10 5	− 5	18 13	− 8	18 31	PS	—
Bermuda		60·3	76	e 10 11	− 2	i 18 25	− 1	e 14 1	PPP	e 28·6
Stonyhurst		62·0	21	e 10 26	+ 2	i 18 49	+ 1	i 19 13	PPS	29·9
Copenhagen		62·1	11	e 10 24 a	− 1	18 48	− 1	19 37?	PPS	—
Moscow		62·6	355	10 29	+ 1	i 18 56	0	—	—	—
Naha		63·3	277	e 9 43	−50	—	—	—	—	—
Kew		64·7	20	i 10 40	− 2	i 19 21	− 1	i 19 35	PS	e 28·2
De Bilt		64·9	16	i 10 41 a	− 2	i 19 25	+ 1	i 24 8	?	e 30·7
Potsdam		65·5	11	e 10 49?	+ 2	i 19 31	− 1	i 20 39	SKS	e 26·7
Uccle		66·0	18	i 10 48 a	− 2	i 19 38	0	24 14	SS	31·7
Jena		66·8	12	i 10 54	− 2	i 19 44	− 4	e 23 56	SS	e 30·7
Cheb		67·7	12	e 10 3	−58	e 19 56	− 2	e 11 16	P	e 37·7
Paris		67·7	19	i 10 59	− 2	e 19 43?	−15	—	—	34·7
Prague		67·9	10	11 0	− 2	e 19 59	− 2	—	—	e 28·7
Strasbourg		68·6	15	11 1	− 6	i 20 5	− 4	24 47	SS	33·7
Stuttgart		68·6	14	i 11 5 a	− 2	i 20 8	− 1	i 11 39	P_cP	e 32·7
Basle		69·7	15	e 11 12	− 2	e 20 3	−19	e 21 13	PPS	—
Zürich		69·9	15	e 11 13 a	− 2	e 20 23	− 1	—	—	—
Neuchatel		70·1	16	e 11 15	− 1	e 20 27	0	—	—	—
Ogyalla	E.	70·3	8	(e 11 25)	+ 8	(20 29)	0	(e 21 31)	PPS	(e 39·2)
	N.	70·3	8	(11 11)	− 6	(20 41)	+12	—	—(e	39·7)
Chur		70·6	14	e 11 17	− 2	e 20 33	0	—	—	—
Clermont-Ferrand		70·8	19	i 11 20	0	i 20 37	+ 2	i 21 0	PS	e 28·1
San Juan		71·5	86	e 11 25	+ 1	e 20 31	−12	e 14 5	PP	e 31·6
Milan		71·9	15	i 11 25	− 2	20 45	− 3	—	—	35·1
Bacau		72·0	4	—	—	e 20 47?	− 2	—	—	34·7
Tashkent		72·2	330	11 28	− 1	i 20 48	− 3	—	—	—
Triest		72·2	12	e 11 36	+ 7	i 20 47	− 4	—	—	—
Focsani		72·8	3	e 11 45	+13	e 20 57	− 1	—	—	34·7
Campulung		73·2	5	e 11 37	+ 2	e 21 6	+ 4	—	—	34·7
Balboa Heights		73·4	102	e 11 40	+ 4	—	—	—	—	e 37·2
Belgrade		73·5	7	e 11 36	0	i 21 6	0	—	—	e 33·0
Marseilles		73·5	18	11 25?	−11	e 21 3	− 3	—	—	34·7
Florence		73·8	14	i 11 40 a	+ 2	i 21 10	+ 1	i 21 51	PS	i 35·6
Bucharest		74·1	3	e 11 36	− 4	i 21 11	− 1	i 21 49	PS	34·7
Barcelona		74·8	21	e 11 46	+ 2	21 23	+ 3	—	—	e 35·9
Stalinabad		75·0	330	e 11 50	+ 5	i 21 17	− 6	—	—	—
Tortosa		75·1	22	e 11 58	+12	i 21 24	0	22 28	PPS	32·2
Lisbon		75·2	30	11 46?	0	21 26	+ 1	14 32?	PP	34·9
Toledo		75·2	26	i 11 45	− 1	i 21 26	+ 1	14 36	PP	32·2
Sofia		75·8	5	e 11 49	− 1	i 21 30	− 1	—	—	34·7

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Fort de France		77·0	83	e 11 54	− 2	e 21 41	− 4	—	—	—
Apia		77·1	200	i 11 55	− 2	e 21 43?	− 3	22 15	PS	35·5
Istanbul		77·5	1	23 57	?	—	—	26 0	?	45·4
Granada		77·9	27	i 12 5	+ 4	i 21 56	+ 2	22 20	S_cS	38·1
San Fernando		78·0	29	i 12 4	+ 2	i 21 59	+ 4	15 5	PP	36·2
Almeria		78·4	26	12 2	− 2	21 53	− 7	22 34	PS	36·7
Bogota		79·7	100	e 12 11	0	e 22 41	PS	e 12 17	P_cP	44·5
Dehra Dun	N.	80·1	319	e 12 21	+ 8	e 22 27	+ 9	e 31 11	SSS	e 41·3
New Delhi		82·0	318	i 12 22	− 1	e 22 31	− 6	23 8	PS	37·8
Calcutta	N.	83·7	307	e 12 30	− 2	i 22 44	−10	23 37	PS	i 40·5
Ksara		84·6	355	e 12 37?	+ 1	e 23 4	+ 1	—	—	—
Helwan		88·6	358	i 12 55k	− 1	23 40	− 2	24 46	PS	—
Hyderabad	N.	91·9	313	13 14	+ 3	24 12	+ 1	25 26	PS	45·3
Bombay	E.	92·4	319	13 14	0	i 24 11	− 5	i 25 35	PS	—
	N.	92·4	319	e 13 11	− 3	e 24 8	− 8	25 30	PS	—
Huancayo		93·8	108	e 13 26	+ 6	e 23 46	[− 8]	i 24 1	SKKS	e 38·0
Kodaikanal	E.	98·9	312	17 51	PP	e 24 15	[− 7]	26 48	PS	46·8
Brisbane		99·7	228	i 13 52	+ 5	i 24 30	[+ 4]	i 35 28	SSS	e 41·9
La Paz		101·0	104	i 13 55	+ 2	i 25 38	+ 9	i 27 43	PPS	49·8
Colombo	E.	101·1	308	e 23 13?	?	—	—	—	—	54·3
Auckland		102·2	208	21 3	?	24 41	[+ 3]	27 8	PS	47·7
Arapuni		103·2	206	27 43?	PS	37 25?	SSS	45 43?	Q	50·7
Riverview		106·1	228	e 17 38	?	i 25 1	[+ 6]	e 28 52	PPS	e 49·3
Sydney		106·1	228	e 13 43?	P	—	—	e 23 19?	?	—
Wellington		106·4	207	21 28?	PPP	24 49	[− 8]	27 48	PS	50·2
Christchurch		109·0	207	e 19 43	PP	e 28 21	PS	34 30	SS	51·0
Rio de Janeiro	E.	118·3	85	—	—	e 30 5	PS	i 36 13	SS	i 49·9
Perth		119·1	256	i 19 58	PP	i 40 48	SSS	i 32 8	?	i 50·7
La Plata	N.	121·4	105	—	—	26 7?	[+12]	36 49?	SS	63·3
Tananarive		135·2	335	—	—	e 26 40	[+ 9]	33 48	PPS	66·1

Additional readings :—
Berkeley iEN =10m.9s., iZ =10m.21s.
Lick eE =7m.56s.
Logan i =11m.38s.
Mount Wilson iZ =7m.30s., iS_cPZ =13m.14s.
Pasadena eSN =11m.58s., iS_cPZ =13m.11s.
Tucson i =9m.21s. and 9m.55s., e =14m.11s.
Honolulu e =12m.31s. and 15m.25s.
Chicago iP =8m.2s., e =9m.55s. and 16m.58s.
Florissant iZ =8m.10s., 8m.35s., and 10m.55s., $eS_cP?E$ =13m.46s., iE =15m.14s., iSSE =16m.56s.
St. Louis iSS?E =17m.0s., iSSS?E =17m.42s.
Ivigtut ePPP =11m.32s., i =17m.57s.
Cape Girardeau eN =16m.20s., sSSN =18m.8s., eN =19m.53s.
Ottawa PPPN =10m.31s., SS =18m.11s., SSS =18m.55s.
Buffalo iPPP =10m.58s., iPS =16m.3s., iSS =18m.52s., iSSS =20m.8s.
Shawinigan Falls SS =18m.19s.?.
Vermont e =10m.35s. and 14m.45s., i =18m.0s., iSS? =18m.40s.
Reykjavik PP =9m.43s., i =13m.16s., SS =19m.43s.
Harvard eP_cP =10m.33s., i =13m.5s., iP_cS =14m.9s., i =15m.33s., 17m.1s., and 17m.37s., iS_cS =18m.43s., iSS =19m.27s.
Weston ePPP =11m.47s., eSS =19m.31s.
Georgetown iPPP =12m.9s., iSS =19m.31s.
Philadelphia e =15m.28s. and 18m.29s., i =19m.42s.
Tokyo Cen. Met. Obs. readings reduced by 2 minutes.
Columbia i =20m.20s.
Bergen iZ =9m.49s., eE =11m.17s., PPPZ =13m.1s., eZ =13m.12s., SSE =23m.13s.
Upsala eSSN =22m.19s., eSSSE =24m.25s., eN =25m.25s.
Aberdeen iSSSE =24m.11s.
Edinburgh P_cP =10m.51s., PP =12m.19s., PPP =13m.45s., P_cS =14m.51s., S_cS =19m.50s., SS =22m.11s., SSS =24m.42s., PKKP =31m.5s.
Bermuda $iS_cS?$ =20m.9s., e =24m.5s.
Stonyhurst eP_cP =11m.18s., ePP =12m.48s., iPS =18m.55s., iS_cS =20m.23s., SS =22m.55s., Q =27m.3s.
Copenhagen 20m.7s.? and 22m.57s.
Kew eP_cPNZ =11m.11s., iPPNZ =13m.2s., ePPPEN =14m.43s., eSKSN =20m.29s., eSSNZ =23m.33s., eSSS =26m.43s.?.
Potsdam iPN =10m.55s.
Jena eN =23m.43s.?, 27m.55s.?, and 28m.1s., eE =28m.4s.
Strasbourg eSSS =27m.58s.

Continued on next page.

Stuttgart iPPZ =13m.31s., iS =20m.11s., eSS =24m.25s., eQ =29m.13s., ePKP, PKPZ =39m.12s.
Ogyalla readings increased by 1 minute.
Clermont-Ferrand iS =20m.32s., eSS =25m.10s. and 25m.18s.
San Juan iS_cS =21m.32s., i =25m.44s., e =27m.31s., iSSS? =29m.34s.
Belgrade eSS =26m.30s., eSSS =30m.8s.
Florence iPPN =14m.24s., iPPPE =16m.9s., iSSE =25m.58s., iSSSE =28m.44s.
Bucharest ePE =11m.39s.?, eE =11m.47s., iPPE =14m.10s., ePPN =14m.21s., iE =14m.28s., iSSN =25m.45s.
Tortosa QN =30m.40s.
Lisbon PE =11m.49s., SZ =21m.29s.?, SSN =26m.18s.
Toledo SS =26m.31s.
Apia P_cP =12m.3s., ePP =14m.51s., PPP? =16m.43s.?, eSS =26m.43s.?, Q =32m.21s.
Granada P_cP =12m.24s., PP =15m.16s., SS =27m.54s., SSS =30m.2s.
San Fernando SSE =27m.14s., SSSE =31m.46s.
Almeria P_cP =12m.12s., PP =15m.2s., PPP =16m.52s., S_cS =22m.7s., sS =22m.43s., PPS =22m.57s., SS =27m.13s.
New Delhi PP =15m.37s., S_cSN =22m.51s., SSE =27m.40s., SSN =27m.48s., SSS =31m.33s.
Calcutta iSS =28m.14s.
Helwan eZ =15m.1s., SKSN =23m.21s., PPSE =25m.10s.
Hyderabad PPN =17m.2s., SKSN =23m.17s.
Bombay PPN =16m.57s., PPPE =19m.2s., SSN =30m.43s., SSSE =34m.20s.
Huancayo ePP =17m.10s., iSS =31m.13s.
Kodaikanal SSE =32m.3s.
Brisbane iSSN =31m.21s.
La Paz iPPZ =17m.59s., PPP =20m.18s., SKS =20m.58s., iSSZ =33m.13s., iSSS =36m.59s.
Auckland PPS? =28m.8s., e =32m.53s.?, SS? =34m.13s.?, SSS =36m.55s.?, Q =43m.13s.?.
Riverview iZ =23m.46s., iE =25m.9s., eQE =43m.43s.
Wellington iZ =22m.5s., i =25m.28s., S_cSP =28m.53s., PPPS? =29m.55s., SS =34m.23s. SSS =37m.25s., lZ =41m.43s., i =42m.29s., Q =44m.43s.?.
Christchurch e =24m.0s., 26m.52s., and 37m.19s., Q =45m.44s.
La Plata E =41m.7s., QE =54m.7s.?, QN =54m.11s.
Tananarive SKKS =30m.23s., SS =39m.44s., Q =60m.3s.
Long waves were also recorded at Montezuma, Port au Prince, Besançon, Johannesburg and Pehpei.

Nov. 3d. 22h. Undetermined shock.

Epicentre in region 13°S. 77°W. (U.S.C.G.S.).
Huancayo iP =2m.30s., i =2m.42s.
La Paz iPZ =4m.14s.k, SZ =6m.28s., LZ =7m.0s.
Bogota eP =6m.8s., e =9m.48s. and 10m.2s.
Fort de France e =8m.16s.
Cape Girardeau ePN =11m.1s.
St. Louis ePZ =11m.13s., eZ =11m.23s. and 11m.35s., eSE =18m.33s., eN =20m.57s.
Tucson iP =11m.32s., i =11m.41s., e =13m.15s. and 17m.21s., eL =30m.22s.
Palomar ePZ =12m.3s., iZ =12m.12s.
Riverside iPZ =12m.8s., iZ =12m.17s.
Mount Wilson ePZ =12m.13s., iNZ =12m.22s.
Pasadena iP =12m.14s., iNZ =12m.22s.
Tinemaha ePEN =12m.30s.
San Juan eS? =13m.29s., eL =25m.13s.
Rio de Janeiro ePE =14m.0s., ePN =14m.30s., eSE =20m.35s.
Almeria P =14m.28s., i =20m.35s.
Granada iP =14m.37s., eS =23m.58s.
Long waves were also recorded at De Bilt and Wellington.

Nov. 3d. Readings also at 2h. (Mount Wilson, Pasadena, and St. Louis), 4h. (near Lick and Fresno (2)), 8h. (Stuttgart, Fort de France, St. Louis, Pasadena, Mount Wilson, Riverside, Palomar, Tucson, and near Mizusawa), 9h. (Tacubaya), 15h. (Pasadena, Mount Wilson, and Riverside), 16h. (near La Paz (2)), 17h. (Potsdam Stuttgart, Tacubaya, and La Paz (2)), 21h. (near Fort de France).

Nov. 4d. 6h. 9m. 42s. Epicentre 57°·0N. 163°·0E. (as on 1937 Sept. 21d.).

$A = -·5233$, $B = +·1600$, $C = +·8370$; $\delta = +1$; $h = -8$;
$D = +·292$, $E = +·956$; $G = -·800$, $H = +·245$, $K = -·547$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Mizusawa	N.	22·9	228	5 12	+ 6	9 33	+20	—	—	—
Vladivostok		24·1	248	i 4 28	?	7 58	?	—	—	—
College		24·6	51	e 5 20	− 3	e 9 29	−13	—	—	e 13·8
Irkutsk		33·4	289	e 6 45	+ 3	e 12 5	+ 2	—	—	—
Victoria		43·3	69	—	—	e 14 23	−10	—	—	22·3
Saskatoon		48·9	55	—	—	e 15 48?	− 5	—	—	25·3
Sverdlovsk		50·6	316	e 9 4	+ 2	16 22	+ 5	—	—	—
Bozeman		51·4	63	—	—	e 16 23	− 5	—	—	e 26·5
Tinemaha		54·0	76	e 9 27	−·1	—	—	—	—	—
Haiwee		54·9	76	e 9 35	0	—	—	—	—	—
Mount Wilson		56·2	78	i 9 42	− 2	—	—	i 9 49	?	—
Pasadena		56·2	78	i 9 41	− 3	e 17 30	− 3	—	—	e 26·5
Rapid City		56·4	60	e 8 58?	−47	e 16 50?	−46	—	—	e 31·7
Riverside	Z.	56·8	78	i 9 45	− 3	—	—	—	—	—
Palomar	Z.	57·6	78	e 9 51	− 3	—	—	i 9 58	?	—
La Jolla	Z.	57·7	78	9 59	+ 4	—	—	—	—	—
Tashkent		58·4	299	e 9 45	−15	—	—	—	—	—
Moscow		59·3	328	—	—	e 18 11	− 3	—	—	—
Tucson		61·6	73	i 10 19	− 3	—	—	e 12 56	PP	e 29·4
Calcutta	N.	63·1	271	e 10 38	+ 6	—	—	—	—	i 36·7
New Delhi	N.	64·3	284	e 10 41	+ 2	—	—	—	—	—
Copenhagen		65·2	343	10 42	− 3	19 42?	+14	—	—	34·3
Florissant		66·4	56	e 10 47	− 6	e 19 31	−12	e 20 34	PPS	—
St. Louis		66·6	56	e 10 48	− 6	e 19 34	−11	i 10 55	PeP	—
Seven Falls		67·0	37	—	—	e 19 31	−19	—	—	27·3
Pittsburgh	N.W.	69·5	47	e 11 11	− 1	—	—	i 28 2	SSS	—
Cheb		70·6	341	—	—	—	—	e 26 18?	?	e 40·3
Uccle		71·1	347	e 11 18	− 4	—	—	—	—	e 45·5
Philadelphia		71·7	44	—	—	25 5	SS	e 28 51	SSS	e 31·3
Stuttgart		72·4	343	e 11 26	− 4	e 21 28	PS	—	—	—
Basle		73·8	344	e 11 51	+13	—	—	—	—	—
Bombay	E.	74·5	281	e 11 50	+ 8	21 30	+13	22 0	ScS	—
	N.	74·5	281	e 11 47	+ 5	e 21 26	+ 9	22 0	ScS	—
Florence		76·8	340	e 22 24	PS	—	—	—	—	47·2
Helwan		84·3	320	i 12 36	+ 1	e 23 0	0	12 54	PcP	—
Granada		85·5	350	e 12 26	−15	21 42	?	i 13 1	PcP	—
Almeria		85·7	349	12 41	− 1	—	—	13 9	PcP	—

Additional readings :—
Mizusawa PE =5m.15s.
Tucson i =10m.28s., e =15m.42s.
St. Louis eE =16m.22s.
Helwan eZ =13m.21s. and 15m.5s.
Almeria e =21m.18s.
Long waves were also recorded at Logan, Kodaikanal, and at other European stations.

Nov. 4d. 6h. 45m. 43s. Epicentre 56°·5S. 26°·3W. (as on 2d.).

$A = +·4971$, $B = -·2457$, $C = -·8322$; $\delta = +3$; $h = -8$.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Rio de Janeiro	35·8	333	i 7 5	+ 2	i 12 47	+ 6	i 12 54	PcS	i 17·1
La Paz	50·9	304	9 3	− 2	i 16 21	0	i 16 53	PPS	25·6
Huancayo	58·1	299	e 10 2	+ 4	e 24 42	SSS	e 13 29	PPP	e 28·1
Tananarive	65·5	87	—	—	e 19 28	− 4	20 30	ScS	e 30·7
Bogota	72·2	309	e 11 27	− 2	—	—	—	—	—
Fort de France	76·7	326	e 11 31	−24	—	—	—	—	—
Christchurch	79·1	194	12 5	− 3	22 3	− 4	27 42	SS	41·0
Wellington	81·0	196	12 17	− 1	22 29	+ 2	15 25	PP	40·3
San Juan	81·8	322	e 12 30	+ 8	e 22 30	− 5	—	—	e 36·8
Auckland	85·3	196	—	—	22 59?	[− 4]	—	—	39·3

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Riverview		90·0	178	i 13 2k	− 1	i 23 47	{+ 5}	e 29 52	SS	e 42·6
San Fernando		94·2	16	e 20 43	?	—	—	—	—	47·3
Bermuda		94·3	328	—	—	e 24 3	{−10}	e 24 52	S	e 46·4
Almeria		95·2	17	—	—	e 24 43	+ 3	i 26 27	PPS	33·3
Philadelphia		104·6	323	—	—	—	—	e 33 18	SS	e 51·2
Clermont-Ferrand		104·8	20	e 17 19	?	—	—	—	—	e 51·8
St. Louis		109·1	311	e 19 9	PP	e 24 35	[−33]	e 28 20	PS	—
Florissant		109·3	311	e 16 27	?	e 28 21	PS	e 19 2	PP	—
Bombay		110·6	86	—	—	26 8	{− 1}	28 35	PS	—
Tucson		113·4	293	i 18 45	[+ 5]	e 26 52	{+23}	e 19 38	PP	e 57·4
Palomar	z.	117·4	289	e 18 45	[− 3]	—	—	e 20 9	PP	—
Riverside	z.	118·1	289	e 18 47	[− 2]	—	—	—	—	—
Pasadena	z.	118·7	289	e 18 49	[− 1]	e 30 5?	PS	e 20 8	PP	e 60·3
Mount Wilson	z.	118·7	289	e 18 48	[− 2]	—	—	e 20 15	PP	—
Victoria		131·9	297	e 22 17?	?	—	—	—	—	74·3

Additional readings :—
La Paz iPPZ =11m.3s., SS =19m.47s.
Huancayo eS =19m.47s.
Christchurch Q =33m.25s.
Wellington iZ =14m.4s. and 15m.0s., SS? =28m.17s.?, Q =37·3m.
Riverview iQE =36m.48s.
Bermuda e =29m.27s.
St. Louis eE =28m.0s., ePPSE =28m.49s., ePPPSN =29m.47s.
Florissant ePPSE =28m.49s.
Bombay PPSE =29m.41s., SSE =34m.35s., SSSE =38m.42s.
Pasadena e =20m.21s. and 36m.59s.?.
Long waves were also recorded at La Plata, Arapuni, Rapid City, Calcutta, and at other European Stations.

Nov. 4d. Readings also at 4h. (La Paz), 5h. (De Bilt, near Stuttgart, and Ebingen), 6h. (Pasadena, Mount Wilson, Tucson, Riverside, Tinemaha, and Palomar), 8h. (near Mizusawa), 9h. (near Fort de France), 10h. (near Lick), 12h. (La Paz), 15h. (Upsala, Kodaikanal, Calcutta, Bombay, New Delhi, Dehra Dun, and Stalinabad), 16h. (Kew and De Bilt), 19h. (Fort de France), 22h. (Ksara, Calcutta, Bombay, and Kodaikanal).

Nov. 5d. 10h. 32m. 17s. Epicentre 72°·2N. 0°·5E.

A = +·3075, B = +·0027, C = +·9515 ; δ = −8 ; h = +7 ;
D = +·009, E = −1·000 ; G = +·951, H = +·008, K = −·308.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Upsala		14·1	142	e 3 18	− 5	e 6 56	SSS	e 3 32	PP	—
Edinburgh		16·4	187	—	—	e 6 43	−13	—	—	—
Copenhagen		17·3	157	i 4 3a	− 1	i 7 25	+ 9	i 4 19	PP	8·7
Stonyhurst		18·5	185	—	—	(i 7 44)	0	—	—	17·7
De Bilt		20·3	172	i 4 40a	0	e 8 25	+ 2	—	—	e 10·2
Potsdam		20·7	159	i 4 46	+ 2	e 8 37	+ 6	e 5 30	PPP	e 10·7
Kew		20·8	181	—	—	e 8 37	+ 4	—	—	e 9·7
Uccle		21·5	175	i 4 52a	0	i 8 46	− 1	—	—	e 10·2
Jena		21·9	160	e 4 56	− 1	—	—	—	—	—
Moscow		22·6	118	5 3	0	9 1	− 6	—	—	—
Cheb		22·8	161	e 7 43?	?	—	—	—	—	—
Prague		23·1	157	5 8	0	9 21	+ 5	—	—	e 11·7
Paris		23·5	178	i 5 14	+ 2	e 9 43?	+20	—	—	—
Strasbourg		23·9	168	e 5 8	− 8	e 9 50	+20	i 5 59	PPP	—
Stuttgart		23·9	166	e 5 16a	0	e 9 32	+ 2	e 10 43?	Q	e 11·6
Basle		25·0	169	e 5 27	0	—	—	e 5 43	PP	—
Zürich		25·2	168	e 5 29	0	—	—	—	—	—
Neuchatel		25·5	169	e 5 32	0	—	—	—	—	—
Sverdlovsk		28·5	90	e 6 3	+ 4	10 48	+ 2	—	—	—
Bucharest	N.	30·4	142	—	—	e 11 17	+ 1	—	—	16·7

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ksara		42·6	135	e 8 3?	+ 4	—	—	e 9 46	PP	—
Tashkent		44·8	95	e 10 15	PP	e 15 0	+ 5	e 17 59	SS	—
Irkutsk		45·1	58	—	—	e 14 56	− 3	—	—	—
Helwan		45·5	141	e 8 22	− 1	e 15 7	+ 2	e 8 47	?	—
Florissant		53·8	285	—	—	—	—	(e 22 43)	SSS	e 22·7
St. Louis		53·9	285	e 9 28	+ 1	e 19 25	S_cS	e 21 44	?	—
Tinemaha		63·1	308	e 10 36	+ 4	—	—	—	—	—
Haiwee		63·9	307	i 10 40	+ 3	—	—	—	—	—
Mount Wilson	z.	65·7	307	i 10 50	+ 2	—	—	e 13 13	PP	—
Pasadena	z.	65·8	307	i 10 51	+ 2	—	—	e 13 18	PP	e 32·4
Riverside	z.	65·8	307	e 10 49	0	—	—	—	—	—
Tucson		65·8	300	i 10 50	+ 1	—	—	e 13 11	PP	e 37·5
Palomar	z.	66·3	306	i 10 54	+ 2	—	—	i 11 3	P_cP	—
La Jolla	z.	66·8	306	e 10 55	− 1	—	—	—	—	—
Bogota		80·9	257	e 12 21	+ 4	—	—	—	—	—

Additional readings :—
Upsala iN = 3m.29s.
Stuttgart iS = 9m.39s.
Long waves were also recorded at Bergen, San Fernando, and Pittsburgh.

Nov. 5d. Readings also at 0h. (Istanbul), 4h. (Helwan, Pasadena, Mount Wilson, Riverside, Tucson, and Palomar), 8h. (Pasadena, Mount Wilson, Riverside, Tinemaha, Haiwee, Tucson, St. Louis, Huancayo, and La Plata), 9h. (Stuttgart, St. Louis, Pasadena, Mount Wilson, Riverside, Tucson, and Palomar), 10h. (near Mizusawa), 11h. (Stuttgart, Pasadena, Mount Wilson, Tucson, Riverside, and Palomar), 12h. (Stuttgart and Ksara), 13h. (near La Paz and near Mizusawa), 14h. (Stuttgart) 15h. (De Bilt, Pehpei, Bombay, Calcutta, and near Erevan), 17h. (Suva), 19h. (Riverview), 22h. (Ksara).

Nov. 6d. 6h. Undetermined shock.

Epicentre in region 16°S 176°E. (Pasadena).

Suva i = 22m.24s.
Apia iP = 24m.44s., ipP = 25m.9s., eS = 27m.22s.
Auckland P = 26m.20s., i = 26m.30s., pP? = 26m.55s., S = 30m.10s., SS = 31m.15s., i = 31m.40s., P_cS = 33m.25s., i = 34m.2s. and 36m.40s.
Brisbane iPEZ = 27m.3s., iSE = 31m.27s., eQE = 33m.1s.
Wellington PZ = 27m.9s., pPZ = 27m.26s., sPZ = 27m.37s., PPZ = 27m.56s., iZ = 28m.35s. and 28m.56s., P_cP? = 30m.30s., S = 31m.20s., i = 31m.39s. and 32m.45s., Q = 33m.0s., R = 34m. ?
Sydney e = 27m.18s. ?
Christchurch P = 27m.44s., S = 31m.54s., R = 32m.50s.
Riverview iPZ = 27m.48s. a, iE = 28m.58s., iSN = 32m.25s., iSSN = 33m.41s., eRE = 35·4m.
Arapuni S = 30m.42s. ?
Pasadena iPZ = 34m.7s., iZ = 34m.18s., eLN = 54m.42s. ?
Mount Wilson ePZ = 34m.8s.
Palomar iPZ = 34m.9s.
Riverside ePZ = 34m.9s.
Tucson e = 34m.32s., eL = 61m.17s.
Stuttgart eZ = 41m.30s., eL? = 100m.0s.
Helwan ePZ = 41m.39s., eZ = 42m.6s., 43m.57s., and 45m.15s.
Huancayo e = 45m.12s., 49m.37s., and 54m.7s., eL = 70m.17s.
La Paz PKPZ = 51m.24s., pPKPE = 52m.33s., isPKPE = 53m.36s., SKSE = 58m.6s., PSKS = 65m.22s., iSSE = 75m.40s., LE = 101m.0s.
Long waves were also recorded at Kew and De Bilt.

Nov. 6d. 8h. 31m.34s. Epicentre 5°·7S. 134°·1E. (as on 1941, May 24d.).

Epicentre 5°·5S. 134°E (U.S.C.G.S.). Magnitude 7.6.

$A = -·6925$, $B = +·7146$, $C = -·0987$; $\delta = -5$; $h = +7$;
$D = +·718$, $E = +·696$; $G = +·069$, $H = -·071$, $K = -·995$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane		28·2	143	i 5 56k	0	i 10 47	+ 6	—	—	—
Perth		31·2	211	6 28	+ 5	11 31	+ 2	7 36	PPP	15·4
Riverview		32·2	153	i 6 34k	+ 2	i 11 48	+ 3	6 46	pP	—
Sydney		32·2	153	e 6 44	+12	i 11 53	+ 8	i 6 59	pP	—
Naha		32·3	349	6 28	− 5	12 1	+15	—	—	—
Kagosima		37·2	356	5 22	?	10 26	?	—	—	—
Miyazaki		37·5	358	7 22	+ 5	13 38	+31	—	—	21·3
Kumamoto		38·4	357	e 7 23	− 2	13 8	−12	—	—	—
Hukuoka		39·2	356	7 37	+ 6	13 51	+19	—	—	21·4
Kobe		40·2	3	7 37	− 3	14 0	+12	—	—	—
Hamada		40·4	358	7 41	0	—	—	—	—	—
Nagoya		40·7	6	e 7 45	+ 1	14 22	+27	—	—	—
Husan		40·9	355	7 45	− 1	14 13	+15	—	—	—
Yokohama		41·3	7	7 51	+ 2	e 15 48	?	8 32	pP	20·9
Tokyo		41·5	7	e 7 54	+ 4	—	—	—	—	21·2
Tukubasan		42·1	7	7 53	− 2	14 47	+31	—	—	—
Nagano		42·3	4	7 57	0	14 4	−15	—	—	—
Wazima		42·9	3	8 3	+ 1	14 53	+26	—	—	—
Zinsen		43·5	351	e 8 4	− 3	14 10	−26	—	—	—
Pehpei		44·2	325	e 8 54	+42	e 15 1	+15	i 9 28	PP	—
Sendai		44·2	8	e 8 9	− 3	14 40	− 6	—	—	—
Suva		45·0	110	e 8 32	+13	—	—	i 8 52	?	—
Mizusawa		45·1	8	8 19	− 1	15 1	+ 2	8 22	?	20·4
Dairen		45·9	346	e 8 37	+11	16 3	+52	—	—	—
Hatinohe		46·5	8	e 8 27	− 4	15 37	+18	—	—	—
Mori		47·9	6	8 54	+12	15 48	+ 9	—	—	22·8
Auckland		48·4	134	8 48	+ 2	i 15 51	+ 5	11 12	PPP	25·4
Sapporo		49·0	7	8 51	+ 1	16 13	+18	11 9	PPP	24·4
Kaimata		49·3	145	9 16?	+23	16 11?	+12	21 26?	?	25·4
Arapuni		49·6	137	8 56?	+ 1	16 44?	+41	11 26	PPP	24·4
Nemuro		49·9	11	e 8 28	−29	16 11	+ 4	—	—	—
Christchurch		50·6	144	9 3	+ 1	16 18	+ 1	21 0	Q	24·3
Wellington		50·7	140	9 2	− 1	16 22?	+ 4	10 31	P_cP	23·4
Tuai		51·0	137	9 9	+ 3	16 49	+27	11 46	PPP	24·4
Calcutta	N.	52·8	304	e 9 18	− 1	i 16 29	−18	i 12 9	PPP	—
Apia		53·8	103	i 9 30k	+ 4	i 17 50	+49	11 33	PP	—
Colombo	E.	55·6	283	10 26?	+46	18 26?	+61	—	—	—
Kodaikanal	E.	58·6	287	i 10 1a	0	i 18 11	+ 7	—	—	—
Hyderabad		59·6	294	e 10 9	+ 1	18 24	+ 7	10 46	P_cP	29·5
Dehra Dun	N.	64·5	308	e 10 12	−29	e 18 29	−50	—	—	e 25·6
Bombay		65·1	294	e 10 41	− 4	i 19 34	+ 7	13 27	PP	—
Honolulu		71·9	66	e 11 26	− 1	e 20 47	− 1	e 14 45	PP	e 29·8
Andijan		72·9	316	e 11 32	− 1	21 16	+17	—	—	—
Stalinabad		74·7	313	i 11 49	+ 6	—	—	—	—	—
Tashkent		75·3	315	i 11 46	− 1	i 21 38	+12	—	—	—
Tananarive		84·9	252	e 12 58	+20	e 24 16	PS	i 15 34	PP	34·9
Sverdlovsk		85·8	328	i 12 40	− 2	i 22 57	[−10]	—	—	—
College		90·1	24	e 13 2	− 1	e 23 35	[+ 2]	e 17 1	PP	e 38·6
Grozny		92·7	313	e 13 29	+14	e 24 29	+11	—	—	—
Erevan		93·3	310	12 31?	?	—	—	—	—	—
Sitka		95·1	33	e 13 29	+ 3	i 24 29	−10	i 17 38	PP	e 39·3
Moscow		98·4	325	13 55	+14	24 31	[+12]	17 57	PP	—
Ksara		100·0	302	e 13 57?	+ 9	e 25 4?	−16	17 30	PP	44·4
Johannesburg		101·7	242	e 18 20	PP	e 24 38	[+ 3]	i 27 56	PS	e 48·4
Ferndale		102·5	49	e 14 32	+32	e 25 14	{+ 1}	e 14 40	?	e 47·4

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m. s.			m.
Victoria		102·5	41	14 32	+32	26 3	+22	—		—	48·4
Seattle		103·3	42	e 18 34	PP	e 25 36	−12	e 25 4		SKKS	e 43·9
Ukiah		103·4	51	e 14 38	+34	i 25 16	{− 3}	i 18 10		PP	e 42·9
Helwan		103·9	299	e 14 5	− 1	24 44	[− 1]	18 44		PP	—
Berkeley		104·2	53	i 14 9	+ 2	e 24 40	[− 7]	i 18 17		PP	e 44·0
Branner		104·3	53	e 13 58	−10	e 25 17	{− 8}	e 18 46		PP	e 31·7
Santa Clara		104·5	53	i 14 5	− 3	i 25 2	[+14]	i 18 55		PP	e 47·8
Lick		104·8	53	e 14 13	+ 3	e 24 50	[+ 1]	—		—	e 45·7
Istanbul		105·1	310	17 28	?	e 28 11	PS	e 18 59		PP	—
Bacau		105·9	316	e 15 6?	?	—	—	e 18 10		PKP	41·4
Focsani		105·9	315	e 19 5?	PP	—	—	e 19 32?		?	45·4
Fresno	N.	106·3	53	e 14 43	P	—	—	e 18 59		PP	—
Bucharest		106·8	314	e 14 17?	P	i 25 0	[+ 2]	e 18 36		PP	45·4
Campulung		107·4	315	e 14 47	P	—	—	—		—	45·4
Tinemaha		107·5	53	e 14 45	P	—	—	—		—	—
Haiwee		107·8	54	i 14 41	P	—	—	—		—	—
Pasadena		107·8	55	e 14 24	P	e 25 36	{−14}	e 19 2?		PP	i 44·8
Mount Wilson		107·9	55	i 14 25	P	—	—	e 38 6		P'P'	—
Upsala		108·0	331	e 14 47	P	e 25 2	[− 2]	e 18 59		PP	e 46·4
Riverside	z.	108·5	56	i 14 31	P	—	—	i 19 14		PP	—
La Jolla		108·7	57	e 14 45	P	—	—	—		—	—
Palomar	z.	109·0	56	e 14 34	P	—	—	e 38 21		P'P'	—
Sofia		109·1	313	e 14 44	P	25 12	[+ 4]	e 18 48		PP	53·6
Belgrade		110·7	315	e 15 0	P	i 25 20	[+ 5]	i 18 33		PKP	e 54·8
Bozeman		111·3	43	e 19 15	PP	e 25 45	[+27]	e 29 19		PS	e 46·5
Ogyalla		111·4	319	e 18 36	[0]	e 28 50	PS	e 19 8		PP	e 53·9
Logan		111·7	47	e 14 52	P	e 24 54	[−25]	i 19 37		PP	52·6
Salt Lake City		111·9	47	e 14 55	P	e 29 22	PS	e 19 40		PP	e 45·5
Copenhagen		112·2	328	e 15 5	P	25 39	[+18]	i 19 41		PP	—
Saskatoon		112·2	35	19 40	PP	25 26	[+ 5]	29 29		PS	e 52·4
Potsdam		113·1	325	i 19 51	PP	i 25 53	[+28]	i 22 18		PPP	e 47·4
Prague		113·1	323	e 17 26	?	e 25 42	[+17]	e 19 47		PP	53·4
Bergen		113·3	335	e 15 6	P	25 33	[+ 8]	e 19 26		PP	e 49·4
Scoresby Sund		113·5	352	18 50?	[+10]	29 26	PS	19 38?		PP	—
Tucson		114·2	57	e 14 54	P	e 25 51	[+22]	i 20 2		PP	e 46·9
Cheb		114·4	323	e 20 16	?	—	—	e 31 11		?	e 54·4
Jena		114·5	324	i 14 42	P	e 29 26	PS	i 19 45		PP	e 50·4
Triest		115·0	318	e 18 54	[+11]	—	—	—		—	—
Stuttgart		116·8	322	e 15 3	P	e 26 32	{−21}	i 20 18		PP	e 51·6
Denver		117·1	48	e 18 30	?	e 26 26	{−29}	e 18 42		PKP	e 54·4
Chur		117·3	320	e 16 4	?	e 30 10	PS	e 18 47		PKP	—
Florence		117·3	316	i 18 40 a	[− 8]	i 29 25	PS	i 20 14		pPKP	—
Strasbourg		117·3	322	e 18 54	[+ 6]	30 16	PS	i 20 2		PP	58·4
De Bilt		117·6	327	e 15 16	P	i 25 50	[+ 8]	e 18 46		PKP	—
Zürich		117·7	321	e 15 41	P	e 30 16	PS	e 18 49		PKP	—
Milan		118·1	318	e 18 46	[− 3]	26 5	[+22]	22 50		PPP	—
Aberdeen		118·3	334	i 20 29	PP	i 30 54	PPS	i 36 47		SSP	58·5
Basle		118·3	321	e 16 10	P	e 30 13	PS	e 18 48		PKP	—
Uccle		118·7	326	e 15 27	P	i 30 17	PS	i 19 3		PKP	58·4
Neuchatel		118·9	321	e 18 51	[0]	—	—	e 30 12		PS	—
Reykjavik		119·2	347	—	—	20 47	?	23 13		PPP	53·3
Besançon		119·4	321	e 20 38	PP	—	—	—		—	—
Edinburgh		119·5	333	19 27	[+35]	26 4	[+16]	23 1		PPP	—
Stonyhurst		120·5	331	i 28 46	?	i 30 36	PS	i 31 8		PPS	e 41·0
Paris		120·7	325	e 19 11	[+17]	—	—	—		—	—
Kew		120·8	328	e 15 51	P	i 26 17	[+25]	i 19 2		PKP	e 57·9
Marseilles		121·4	318	e 19 4	[+ 8]	e 31 58	PPS	e 20 59		PP	e 54·4
Clermont-Ferrand		121·8	321	i 19 1	[+ 5]	i 25 47	[− 8]	i 20 50		PP	e 58·4
Guadalajara	N.	122·4	68	—	—	e 25 42	[−16]	—		—	—
Lincoln		122·8	43	e 20 51	PP	e 27 39	{+ 6}	e 30 9		PS	e 56·6
Barcelona		124·4	317	e 18 14	?	—	—	i 21 14		PP	51·5
Ivigtut		124·6	2	e 19 15	[+13]	e 30 31	PS	i 21 23		PP	e 55·9
Tortosa		125·8	317	e 19 32	[+28]	32 37	PPS	i 21 27		PP	69·9
Tacubaya	N.	126·4	70	18 49	[−16]	—	—	—		—	—
Florissant		128·1	43	e 16 28	P	e 25 50	[−25]	e 19 12		PKP	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
St. Louis		128·2	43	i 19 12	[+ 3]	i 31 49	PS	i 21 31	PP	—
Little Rock		128·3	49	e 19 12	[+ 3]	e 22 57	PKS	e 21 50	?	e 69·4
Chicago		128·4	39	e 19 40	[+31]	e 31 30	PS	e 21 31	PP	e 52·4
Oaxaca	E.	129·0	71	23 29	?	—	—	—	—	—
Vera Cruz	N.	129·3	69	e 25 14	?	—	—	—	—	—
Cape Girardeau	N.	129·3	44	e 19 15	[+ 4]	e 29 5	{+50}	e 21 32	PP	—
Toledo		129·3	318	i 19 16	[+ 5]	—	—	i 21 57	PP	44·9
Almeria		129·7	314	e 19 6	[− 6]	28 46	{+28}	19 27	pPKP	63·4
Granada		130·3	315	i 19 15	[+ 2]	26 45	[+24]	i 21 21	PP	67·2
San Fernando		132·5	315	e 18 34	[−43]	—	—	i 22 1	PP	71·4
Ottawa		132·7	27	19 15	[− 2]	32 26	PS	22 14	PP	e 71·4
Buffalo		132·9	32	i 19 24	[+ 6]	i 32 12	PS	i 22 8	PP	—
Shawinigan Falls		133·2	24	19 21	[+ 3]	e 32 20?	PS	21 55	PP	68·4
Mobile		133·2	52	e 19 48	[+30]	—	—	i 22 16	PP	—
Lisbon		133·3	320	19 20k	[+ 2]	28 45	{+ 5}	22 3?	PP	60·2
Seven Falls		133·5	23	19 20?	[+ 1]	—	—	22 16	PP	60·4
New Kensington		133·9	35	e 18 35	?	e 29 8	{+24}	e 21 41	PP	—
Pittsburgh		133·9	35	i 18 56	[−23]	—	—	i 21 31	PP	—
Vermont		134·6	27	e 19 41	[+21]	e 32 8	PS	e 22 13	PP	56·6
Georgetown		136·6	35	i 19 28	[+ 4]	i 32 1	PSKS	i 22 26	PP	57·4
Harvard		136·9	27	e 19 20	[− 5]	i 26 38	[+ 4]	i 22 32	PP	e 62·4
Philadelphia		136·9	32	e 19 29	[+ 4]	—	—	i 22 34	PP	e 55·5
Columbia		137·0	43	e 19 49	[+24]	e 26 11	[−23]	e 22 26	PP	e 59·9
Fordham		137·0	30	i 19 27	[+ 2]	i 32 17	PSKS	i 22 9	PP	74·9
Weston		137·1	27	e 16 56	P	e 26 48	[+14]	i 19 29	PKP	—
La Plata	E.	138·0	165	19 56?	[+29]	23 26?	PSKS	22 32	PP	55·4
	N.	138·0	165	19 50?	[+23]	29 20?	{+11}	23 2	PKS	63·3
	Z.	138·0	165	19 26?	[− 1]	23 20?	PKS	22 32?	PP	66·4
Montezuma		144·0	142	e 19 52	[+15]	—	—	e 23 2	PP	e 67·4
Huancayo		145·8	121	i 19 49	[+ 8]	e 30 18	{+23}	e 23 48	PKS	e 53·6
Balboa Heights		146·5	81	e 19 47	[+ 5]	—	—	(42 33)	SSP	e 42·5
Bermuda		148·2	30	e 19 57	[+13]	e 34 4	PS	e 23 42	PP	e 62·5
Port au Prince		151·2	61	e 20 18	[+29]	—	—	i 23 55	PP	e 80·3
Rio de Janeiro		151·5	185	i 20 9	[+20]	i 23 58	PKS	i 23 54	PP	i 43·1
Bogota		151·9	89	e 19 53	[+ 3]	—	—	—	—	99·4
San Juan		156·6	54	e 20 7	[+10]	—	—	i 24 33	PP	e 64·9
Fort de France		162·5	57	e 20 3	[0]	26 50	[−17]	23 37	SKP	e 82·4

Additional readings :—
Riverview iZ = 7m.15s., iEN = 7m.22s. and 8m.44s., iN = 11m.41s., isSN = 12m.10s., iE = 12m.13s. and 12m.26s., iN = 12m.30s., iZ = 12m.44s.
Sydney i = 12m.20s.
Yokohama PP = 9m.48s.
Pehpei eP = 9m.10s., i = 10m.24s., 11m.20s., 12m.8s., 15m.38s., and 15m.51s.
Auckland i = 9m.8s., P_cP? = 9m.26s., S = 16m.31s., S_cS = 18m.21s., SS? = 21m.26s.?
Sapporo PPP = 12m.0s., SS = 19m.34s., SSS = 20m.53s.
Arapuni i = 9m.26s., SS = 20m.56s.
Christchurch i = 9m.19s., iE = 16m.8s., SS = 20m.16s.
Wellington iZ = 9m.18s., 9m.28s., 10m.12s., 12m.56s., 17m.0s., and 17m.56s., SS? = 21m.2s., Q = 22m.26s.?.
Tuai i = 9m.15s., 9m.34s., 12m.41s., and 17m.1s., SS = 20m.50s.?, Q = 22·4m.
Calcutta iPSN = 17m.5s.
Apia P_cP = 10m.1s., iPPP = 13m.22s.
Hyderabad iPN = 10m.19s., PPN = 12m.55s., PSN = 18m.49s., S_cSN = 20m.1s.
Bombay ePN = 10m.44s., iPN = 10m.52s., iE = 12m.3s. and 19m.11s., iN = 19m.14s., iE = 20m.4s., S_cSE = 20m.46s., SSN = 23m.37s., SSE = 23m.41s.
Honolulu i = 11m.56s. and 21m.28s.
Tananarive i = 13m.29s., iPPP = 16m.59s., SS = 25m.49s.
College eS = 24m.2s., i = 25m.32s., e = 29m.26s. and 34m.15s.
Sitka i = 13m.55s. and 25m.11s., iPS = 26m.27s., iSS = 31m.51s., i = 36m.1s.
Moscow S = 25m.1s.
Johannesburg ePPN = 18m.50s., eSSN = 32m.8s., eQN = 42·4m.
Victoria PP = 19m.3s., e = 43m.5s.
Seattle e = 28m.11s.
Ukiah e = 29m.18s.
Helwan iZ = 14m.16s. and 17m.20s., eEN = 17m.53s. and 23m.2s., iE = 23m.35s., iN = 26m.32s., PSN = 27m.56s., PPSN = 28m.56s., eN = 33m.26s.
Berkeley iPPZ = 18m.7s., ePPN = 18m.42s.
Branner ePE = 14m.20s., ePPE = 18m.53s.

Continued on next page.

Santa Clara iE =36m.30s.
Lick ePE =14m.23s., ePPEN =17m.29s., eE =26m.36s.
Bacau eE =18m.6s.
Bucharest ePZ =14m.31s., eN =16m.47s., ePPEN =18m.15s., iE =19m.4s. eN = 19m.15s., iN =19m.31s. and 21m.7s., iE =21m.54s., iN =22m.3s., iSE =25m.41s., iPSN =26m.58s., iE =28m.28s., iN =28m.42s., iE =29m.16s., iN =29m.44s., iSSE =32m.18s.
Pasadena iPKPZ =18m.2s., eZ =25m.26s., iSN =27m.2s.?, iPSE =27m.29s., iPPSEZ =28m.44s., iSSN =34m.38s.?, ePKP,PKPZ =38m.8s.
Mount Wilson iPKPNZ =18m.1s.
Upsala iPKPE =18m.14s., eE =18m.53s., iPPE =19m.14s., iPPPE =21m.47s., iN = 22m.52s., eN =24m.55s., eSKKSE =26m.6s., iN =26m.35s., iPSE =28m.46s., iN =28m.55s., iE =32m.56s., eSS?N =33m.23s.
Riverside ePKP.PKPZ =37m.51s.
Sofia eE =19m.38s.?, SKSEN =24m.36s., iE =28m.59s.
Belgrade iPP =19m.50s., ePPP =22m.45s., iPS =29m.15s., i =34m.21s.
Bozeman ePP =19m.40s., eS =26m.50s., i =36m.3s., e =40m.11s.
Ogyalla PE =19m.30s., iN =20m.50s., eSN =29m.14s., eN =30m.6s., PSN =30m.30s.
Logan i =15m.7s., ePKP =18m.32s., i =21m.19s., eS =27m.18s., iPS =29m.21s., i =36m.16s., iSSS =40m.1s.
Salt Lake City ePKP =18m.34s., e =27m.18s., 38m.22s., and 41m.23s.
Copenhagen e =18m.26s. and 18m.53s., 26m.37s., 28m.58s., 29m.23s., 35m.32s.?, and 39m.20s.?.
Saskatoon S =27m.26s., SS =35m.38s.?, SSS =39m.56s.
Potsdam iPPPN =22m.24s., iPSE =29m.31s., iPSN =29m.34s., iPPSN =30m.32s., iE =40m.45s.
Prague ePS =29m.26s., ePPS =30m.32s., eSS =35m.32s., eSSS =40m.2s.
Bergen eZ =19m.5s., PPE =20m.3s., PPZ =20m.6s., eZ =22m.0s., PPPZ =22m.26s., eE =27m.26s.?, PPSZ =29m.26s., PPSEN =29m.34s., eSSN =34m.9s., eZ = 38m.2s., eN =39m.46s., 45m.36s., and 48m.3s.
Scoresby Sund i =20m.28s., SS =36m.2s.
Tucson i =15m.17s., ePKP =18m.44s., e =20m.29s., iS =27m.12s., i =29m.44s. and 33m.52s., iSS =36m.5s., i =38m.26s., e =42m.22s.
Jena iPN =14m.56s.?, iP =15m.8s.?, iPKPN =18m.53s., and 18m.56s.?, iPKPE = 19m.2s.?, iPPPE =22m.19s., iPPPNZ =22m.26s., eE =30m.35s., eN =30m.41s., eZ =30m.50s., eEN =36m.50s.?.
Stuttgart eP =15m.26s., ePKP =18m.26s., ePKPZ =18m.45s., iPKPZ =18m.54s., iPP =20m.39s., iPPP =22m.58s., eS =28m.6s., iPKKPZ =29m.26s., ePS = 30m.9s., ePPS =31m.9s., eSS =36m.38s.
Denver eE =28m.26s., eN =28m.30s.
Chur e =20m.27s.
Florence iZ =20m.36s., iSKSN =28m.25s., iPPSN =30m.22s., isSN =31m.53s.
Strasbourg iPPP =22m.38s., ePPS =31m.44s., SS? =37m.16s.
De Bilt iPP =20m.16s.
Zürich ePP =20m.12s., ePPP =22m.42s.
Milan iPZ =19m.15s., SE =30m.41s. Readings wrongly identified.
Aberdeen iEN =23m.12s., 28m.39s., and 51m.39s.
Basle e =20m.34s., ePPP =22m.53s.
Uccle iZ =19m.23s., iPPEZ =20m.23s., iZ =20m.40s. and 21m.2s., iPPPZ =22m.58s., iPPSZ =31m.26s., iPPSEN =31m.29s.
Reyjavik i =30m.32s., 32m.42s., and 36m.13s.
Edinburgh PP =20m.55s., PPP =23m.27s., SKKS =27m.44s., PKKP =29m.28s., PKKP =30m.10s., PS =30m.41s., SS =37m.16s.
Stonyhurst iPS =30m.51s., iS$_e$S =32m.2s., iSS =34m.52s., iSSS =37m.46s.
Kew iPP =20m.53s., iPPPZ =22m.52s., ePPPEN =23m.22s., iSKKS =28m.2s., ePKKP?N =30m.35s., iPS =30m.54s., ePPSEN =32m.48s., eSS =37m.56s.?, eSSSNZ =41m.56s.?, eQN =52·4m.
Marseilles e =23m.28s., 30m.55s., eSS =36m.58s., e =37m.26s.
Clermont-Ferrand iPPP? =23m.37s., iS =28m.33s., iPS =30m.47s., i =31m.11s. and 32m.23s.
Ivigtut e =28m.23s., ePS =31m.35s., eSS =37m.56s.
Tortosa SSE? =38m.33s.
Florissant epPKP?Z =19m.42s., iPPZ =21m.11s., ipPPZ =21m.28s., iE =21m.40s. and 21m.47s., iSKPE =22m.30s., isSKP?E =22m.44s., eE =25m.10s., esSKSE = 26m.38s., eE =28m.36s. and 28m.43s.
St. Louis iN =21m.40s., isSKP?N =22m.46s., iS?N =30m.9s., isS? =30m.44s.
Chicago i =23m.0s., e =33m.26s., eSS? =37m.33s., e =41m.38s.
Cape Girardeau eE =21m.32s., eN =21m.43s., eSKPN =22m.32s., eS?N =29m.58s.
Almeria eP =19m.34s., iPKP =21m.42s., pPKP =22m.0s., PP =25m.1s., pPP = 25m.22s., SKKS =30m.34s., SKKP =33m.58s., SP =34m.57s., SS =43m.0s., SSS =48m.13s.
Granada PPP =23m.53s., SKKS =28m.14s., SKSP =29m.3s., PPS =33m.22s., SS = 40m.27s., Q =57m.56s.
San Fernando PPS?E =34m.41s.
Ottawa e =19m.30s., SKP =22m.40s., PPP =25m.31s., PPS =35m.28s., SS =40m.32s.?, SSS =46m.32s.
Buffalo e =23m.22s., i =30m.32s., 34m.30s., 40m.30s., and 45m.46s.
Shawinigan Falls SS =39m.44s.?.

Continued on next page.

Lisbon PZ = 19m.32s.a, PEN = 19m.35s.?, iPZ = 19m.47s.k, PKPZ = 22m.13s., SKPE = 23m.18s.?, SKPN = 23m.21s.?, E = 23m.45s., SKSPN = 32m.16s., N = 34m.27s., SSEN = 39m.45s.
Seven Falls e = 19m.48s., SKP = 22m.50s.?, e = 32m.50s., PPS = 35m.3s., SS = 39m.56s.?.
New Kensington ePS = 31m.58s., e = 38m.13s.
Vermont i = 23m.26s., eSS = 40m.0s., e = 50m.1s.
Georgetown i = 26m.5s., 28m.22s., 31m.5s., 33m.20s., and 41m.5s.
Harvard iPKP = 19m.26s., i = 19m.52s. and 21m.0s., iPKS = 22m.54s., i = 23m.22s. and 24m.40s., iPPP = 25m.44s., i = 26m.5s., and 27m.26s., iSKKS? = 29m.10s., iSKKKS = 29m.56s., i = 32m.42s., iPS = 33m.6s., i = 34m.26s., iPPS = 34m.52s., iSS? = 40m.52s., iSSS? = 46m.50s.
Philadelphia e = 19m.57s., 21m.33s., 34m.50s., and 39m.10s.
Columbia i = 23m.29s., ePS? = 32m.46s., e = 45m.59s.
Fordham i = 19m.56s., 22m.19s., and 22m.39s.
Weston i = 22m.30s. and 23m.28s., iSKKS = 29m.4s., e = 33m.24s., eSS = 40m.45s., eSSS = 45m.51s.
La Plata E 23m.8s., PPP = 26m.14s.?, SKSP = 31m.2s.?, SKSP ($\Delta > 180°$) = 33m.32s., 37m.8s., SS? = 40m.32s., 44m.14s.,?, SSS? = 45m.32s.?, 50m.26s.?.
La Plata N SKSP = 32m.32s., 38m.56s., SS = 41m.2s.?, SSS? = 45m.14s.?.
La Plata Z 19m.50s.? and 23m.50s.?, PPP = 25m.44s.?, 30m.50s.?, PS = 33m.50s.?, PSS = 41m.38s.?.
Montezuma e = 39m.1s.
Huancayo e = 33m.1s., 35m.23s., and 37m.29s., eSS = 42m.37s.
Bermuda eSS = 42m.49s.
Port au Prince i = 20m.33s.
Bogota i = 20m.13s. and 21m.57s.
Fort de France iPKP = 21m.36s., PP = 25m.25s., PPP = 29m.35s., SKKS = 32m.9s., PSKPS = 39m.14s., SSS = 54m.7s.
San Juan i = 20m.47s. and 34m.46s., e = 39m.37s. and 52m.12s.

Nov. 6d. Readings also at 0h. (Ottawa, Shawinigan Falls, and near Seven Falls), 1h. (Fort de France and near Bogota), 3h. (Suva), 5h. (La Paz), 7h. (Pasadena, Mount Wilson, Riverside, Palomar, and Suva (2)), 8h. (Kew and Suva), 9h. (Toledo and Tortosa), 16h. (near Istanbul), 18h. (San Juan), 20h. (Suva, St. Louis, Palomar, Tinemaha, Mount Wilson, Pasadena, Tucson, Bogota, and San Juan).

Nov. 7d. 6h. Undetermined shock. Pasadena suggests deep focus.

Apia eP = 38m.18s., eS? = 39m.29s.
Wellington P = 40m.17s., S = 44m.1s.
Auckland S? = 42m.56s., e = 48m.0s.?.
Tuai S = 43m.6s., i = 43m.10s.
Brisbane iN = 45m.41s., eN = 47m.33s.
Riverview eN = 46m.26s., iN = 46m.30s.
La Jolla iP = 47m.2s.
Pasadena iP = 47m.2s.a.
Mount Wilson iPNZ = 47m.3s.a.
Riverside iPNZ = 47m.4s.a.
Palomar iPZ = 47m.5s.a.
Haiwee iPEN = 47m.11s.
Tinemaha iPEN = 47m.11s.
Tucson iP = 47m.26s., i = 48m.13s.
Copenhagen P = 54m.38s.
Stuttgart eZ = 54m.52s., iZ = 54m.58s., eL = 97m.
Chur e = 55m.2s. Reading reduced by one hour.
Toledo iPZ = 55m.37s.
Granada P = 55m.53s.
Long waves were also recorded at Kew and De Bilt.

Nov. 7d. 7h. 6m. 0s. Epicentre 40°·3N. 73°·2E. (as on 1940 May 24d.).

$A = +·2211$, $B = +·7322$, $C = +·6443$; $\delta = +12$; $h = -2$;
$D = +·957$, $E = -·289$; $G = +·186$, $H = +·617$, $K = -·765$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Frunse		2·8	22	e 0 48	+ 1	i 1 33	S_g	1 0	P_g	—
Tashkent		3·1	289	0 56	+ 5	1 48	S_g	i 1 8	P_g	—
Almata		4·1	42	1 1	− 4	—	—	—	—	—
New Delhi	N.	12·2	163	e 2 41	−17	e 4 40	−36	—	—	—
Sverdlovsk		18·4	337	e 4 16	− 2	7 57	+16	—	—	—
Bombay	E.	21·3	182	—	—	i 8 26	−17	—	—	10·7
Kodaikanal	E.	30·2	173	—	—	e 11 20	+ 7	—	—	—
Stuttgart	Z.	45·2	303	e 8 11	− 9	—	—	—	—	—

Nov. 7d. 8h. 25m.45s. Epicentre 22°·0N. 119°·0E. Rough.

A = −·4500, B = +·8117, C = +·3724; δ = +4; h = +4;
D = +·875, E = +·485; G = −·180, H = +·326, K = −·928.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Zi-ka-wei		9·4	13	e 1 59	−19	—	—	—	—	i 5·3
Pehpei		13·7	307	e 4 15?	+57	e 7 15?	L	—	—	8·3
Vladivostok		23·7	24	e 4 17	−57	i 7 36	−111	—	—	—
Mizusawa	E.	25·5	43	e 5 30	− 2	9 53	− 4	—	—	—
Irkutsk		32·3	343	e 6 31	− 2	—	—	—	—	—
New Delhi	N.	38·2	289	e 7 44	+21	i 13 21	+ 4	i 16 16	SS	—
Colombo	E.	40·6	254	7 47	+ 4	14 11	+17	—	—	—
Almata		40·7	312	e 7 42	− 2	—	—	—	—	—
Kodaikanal	E.	41·5	261	e 7 50	0	—	—	—	—	—
Bombay	E.	43·3	274	e 8 5	0	14 40	+ 7	9 57	PP	i 21·1
Tashkent		45·8	307	8 31	+ 6	e 15 39	+30	—	—	—
Sverdlovsk		54·6	325	i 9 36	+ 4	i 17 20	+ 9	—	—	—
Ksara		72·6	300	e 11 35?	+ 4	e 21 22?	+26	—	—	—
Helwan		77·4	297	i 11 58k	0	21 57	+ 8	—	—	—
Stuttgart		85·9	321	e 12 43	0	e 23 5	−11	e 45 33?	Q	50·0
Chur		86·6	319	e 12 47	+ 1	—	—	—	—	—
Uccle		87·6	325	e 12 51?	0	e 23 21	−11	—	—	e 44·2
San Fernando	E.	102·2	318	—	—	e 24 40	[+ 2]	—	—	56·2
St. Louis		113·7	24	e 19 54	PP	e 27 14	S	e 29 17	PS	—
Bogota		150·6	27	e 19 50	[+ 2]	—	—	1 20 1	?	—

Additional readings :—
Mizusawa SN = 9m.56s.
Bombay iPE = 8m.18s., SSE = 17m.43s.
Helwan iZ = 12m.13s. and 12m.39s.
St. Louis ePP?Z = 20m.18s., eSKKS?N = 27m.45s.
Long waves were also recorded at Riverview, Pasadena, and other European stations.

Nov. 7d. Readings also at 0h. (Helwan, Brisbane, and Riverview), 3h. (La Paz), 6h. (near Stalinabad and near Lick), 17h. (Stalinabad, near Almata, Tashkent, and Tchimkent), 18h. (Bombay, Calcutta, and New Delhi), 19h. (Kew), 21h. (near Ebingen, Stuttgart, and Tchimkent), 22h. (Calcutta, Almata, Stalinabad, Tashkent, Tchimkent, Sverdlovsk, and New Delhi), 23h. (Fort de France (2) and near San Juan).

Nov. 8d. 6h. 59m. 18s. Epicentre 80°·3N. 3°·0E.

Epicentre 81°·0N. 2°·5E. (Pasadena).

A = +·1694, B = +·0089, C = +·9855; δ = −1; h = −14;
D = +·052, E = −·999; G = +·984, H = +·052, K = −·170.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Scoresby Sund		11·5	225	—	—	(4 42?)	−17	—	—	4·7
Bergen	E.	20·0	177	e 7 42?	?	—	—	—	—	—
Upsala		21·0	160	i 4 46	− 1	e 8 38?	+ 1	e 5 8	PP	—
Aberdeen		23·2	188	—	—	i 9 15	− 3	—	—	—
Ivigtut		24·0	249	e 5 17	0	e 9 23	− 9	—	—	e 14·0
Edinburgh		24·6	188	—	—	9 49	+ 7	—	—	—
Copenhagen		24·9	168	e 5 24	− 2	9 42	− 5	5 30	?	—
De Bilt		28·3	177	i 6 2a	+ 5	—	—	—	—	—
Sverdlovsk		29·2	108	6 5	0	10 59	+ 1	—	—	—
Jena	E.	29·6	168	e 6 6	− 3	—	—	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Uccle		29·6	180	e 6 6?	− 3	e 10 54	−10	—	—	e 12·7
Prague		30·6	166	—	—	e 10 48	−32	—	—	—
Stuttgart	z.	31·7	172	e 6 24	− 3	—	—	—	—	—
Toledo		40·6	188	e 7 41	− 2	—	—	9 18	PP	—
Irkutsk		40·8	68	6 58	−47	—	—	—	—	—
Seven Falls		41·2	265	—	—	e 13 47	−15	e 17 0?	SS	20·7
Saskatoon		42·2	301	—	—	e 14 12	− 5	e 17 12	SS	20·7
Granada		43·3	188	i 8 6	+ 1	i 14 36	+ 3	13 39	P_cS	22·5
Almeria		43·6	187	i 8 23	+15	e 15 11	PPS	—	—	22·7
Ottawa		43·7	269	8 9	+ 1	14 36?	− 3	—	—	19·7
San Fernando		44·1	192	e 4 8	?	e 14 47	+ 2	—	—	—
Harvard		44·8	264	e 8 20	+ 3	e 15 5	PPS	e 9 57	PP	e 23·7
Tashkent		45·6	105	e 8 26?	+ 2	—	—	—	—	—
Chicago		48·2	281	e 10 49	PP	—	—	e 18 30	S_cS	e 23·8
Rapid City		49·5	295	e 9 19	+25	—	—	e 20 13	?	e 25·0
Florissant		52·6	282	e 9 21	+ 3	e 16 23	−21	e 11 19	PP	e 23·8
St. Louis		52·8	282	e 9 13	− 6	e 16 39	− 8	e 11 9	PP	e 23·8
Logan		53·1	303	e 9 30	+ 9	—	—	—	—	e 25·0
Cape Girardeau	N.	53·9	281	e 9 23	− 4	—	—	e 13 32	?	—
Salt Lake City		54·1	303	—	—	—	—	e 22 21	SSS	e 23·5
Bermuda		54·6	255	e 9 32	0	e 17 6	− 5	—	—	e 25·5
Tinemaha	Z.	58·6	308	i 9 59	− 2	—	—	—	—	—
New Delhi	N.	59·4	101	e 10 4	− 2	—	—	—	—	—
Haiwee	Z.	59·6	307	i 10 6	− 2	—	—	—	—	—
Mount Wilson		61·4	307	i 10 20	0	—	—	—	—	—
Pasadena		61·5	307	i 10 21	0	—	—	e 10 25	?	e 28·7
Riverside	Z.	61·5	307	e 10 20	− 1	—	—	—	—	—
Palomar	Z.	62·1	305	e 10 23	− 2	—	—	—	—	—
Tucson		62·3	299	i 10 25	− 1	—	—	e 22 45	SS	e 32·5
Calcutta	N.	67·1	91	—	—	e 19 53	+ 2	—	—	e 38·3
Bombay	E.	68·1	107	—	—	20 11	+ 8	—	—	33·7
San Juan		68·5	253	—	—	e 20 3	− 5	—	—	e 31·4

Additional readings :—
Upsala eE = 8m.30s.
Granada S_cS = 20m.57s.
Florissant eSSE = 20m.14s.
St. Louis eSSN = 20m.19s.
Tucson e = 10m.35s., 11m.49s., and 22m.12s.
Long waves were also recorded at Sitka, Potsdam, and Kew.

Nov. 8d. 22h. South-west Pacific.

Brisbane iPNZ = 34m.3s.k, ePE = 34m.7s., ePPN = 34m.18s., iSN = 38m.1s., iSSN = 38m.28s., iLE = 40m.19s., iS_cSE = 44m.48s.
Riverview iP?NZ = 35m.16s., iZ = 36m.5s., iSN = 39m.42s., iEN = 39m.59s., eLE = 42·7m.
Sydney e = 39m.18s.?.
Tashkent eP = 41m.53s., eS = 52m.38s., ePS = 53m.48s.
Pasadena ePZ = 42m.41s., eLZ = 73m.12s.?.
Mount Wilson iPZ = 42m.42s.
Riverside ePZ = 42m.44s.
Palomar eZ = 43m.0s.
Sverdlovsk ePP = 46m.20s., ePS = 55m.11s.
Stuttgart eZ = 48m.14s., eQ = 92m., eL? = 96m.
La Paz PZ = 48m.40s.
Fort de France e = 49m.0s.
Long waves were also recorded at Christchurch, Wellington, Arapuni, and other European stations.

Nov. 8d. Readings also at 6h. (Stuttgart, Tucson, Palomar, La Jolla, Tinemaha, Riverside, Mount Wilson, Pasadena, Riverview, Brisbane, Wellington, Christchurch, and Arapuni), 7h. (near La Paz), 11h. (Fresno), 12h. (Bogota, Fort de France, and near La Paz), 16h. (near Lick (2)), 21h. (Huancayo, Fort de France, Pasadena, Mount Wilson, Riverside, Tinemaha, Palomar, Tucson, and near Apia).

Nov. 9d. 11h. 46m. 36s. Epicentre 43°·7N. 147°·6E. Depth of focus 0·010.
(as on 1940 April 29d.).

Intensity V at Nemuro ; IV at Hatinohe, Miyako ; II-III at Tukubasan and Urakawa.
Epicentre 43°·0N. 148°·0E. Radius of macroseismic area 300 km. Depth 120 km.
Seismological Bulletin of the Central Meteorological Observatory, Japan, for the year 1943, Tokyo 1950, pp. 49-50. One macroseismic chart p. 49.

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

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Nemuro		1·4	256	0 27k	+ 2	0 47	+ 3	—	—	—
Sapporo		4·6	264	1 11k	+ 2	2 3	+ 2	—	—	—
Mori		5·4	253	1 20k	0	2 21	0	—	—	—
Hatinohe		5·6	236	1 19k	− 3	2 19	− 7	—	—	—
Aomori		5·8	242	1 27k	+ 2	2 31	0	—	—	—
Miyako		5·8	228	1 25	0	—	—	—	—	—
Mizusawa		6·7	229	1 40	+ 3	2 50	− 3	—	—	—
Akita		6·8	237	1 22	−17	2 37	−18	—	—	—
Sendai		7·4	225	1 48	+ 1	3 7	− 3	—	—	—
Hukusima		8·0	225	1 57	+ 2	3 25	0	—	—	—
Onahama		8·5	219	1 54k	− 8	3 15	−22	—	—	—
Aikawa		9·0	234	2 9	0	3 46	− 3	—	—	—
Mito		9·1	219	2 10	0	3 49	− 3	—	—	—
Utunomiya		9·3	222	2 13	0	3 51	− 5	—	—	—
Kakioka		9·4	220	2 6	− 8	—	—	—	—	—
Tukubasan		9·4	220	2 13	− 1	3 53	− 6	—	—	—
Nagano		10·0	229	2 25	+ 3	4 15	+ 2	—	—	—
Tokyo Cen. Met. Ob.		10·0	220	2 27	+ 5	4 11	− 2	—	—	—
Wazima		10·3	236	2 46	+20	4 37	+17	—	—	—
Yokohama		10·3	219	2 43	+17	4 23	+ 3	—	—	—
Hunatu		10·6	223	2 32	+ 2	4 28	0	—	—	—
Kohu		10·7	224	2 36	+ 4	4 36	+ 6	—	—	—
Toyama		10·7	232	2 34	+ 2	4 31	+ 1	—	—	—
Misima		10·9	221	2 37	+ 3	4 33	− 2	—	—	—
Shizuoka		11·3	222	2 52	+12	4 45	+ 1	—	—	—
Vladivostok		11·4	272	i 2 44	+ 3	i 5 2	+15	—	—	—
Gihu		11·8	229	2 48	+ 2	4 58	+ 2	—	—	—
Hikone		12·1	230	2 51	+ 1	—	—	—	—	—
Kameyama		12·4	228	3 4	+10	—	—	—	—	—
Kyoto		12·6	230	3 0	+ 3	—	—	—	—	—
Toyooka		12·8	235	3 0	0	—	—	—	—	—
Hamada		14·9	239	3 27	0	—	—	—	—	—
Kôti		14·9	232	3 24	− 3	—	—	—	—	—
Husan		16·7	245	3 8	?	4 54	?	—	—	—
Hukuoka		16·8	239	4 5	+15	7 6	+13	—	—	—
Keizyo		16·8	256	3 49	− 1	—	—	—	—	—
Kumamoto		17·1	236	3 56	+ 2	—	—	—	—	—
Zinsen		17·1	255	3 55	+ 1	7 1	+ 1	—	—	—
Kagosima		18·1	233	4 12	+ 6	—	—	—	—	—
Dairen		20·0	264	3 48	?	—	—	—	—	—
Irkutsk		29·8	303	i 5 57	− 3	e 10 47?	− 1	—	—	—
College		40·9	35	e 7 34	0	e 13 39	+ 1	—	—	e 16·9
Sverdlovsk		53·4	318	i 9 10	−,2	16 31	− 4	e 9 16	?	—
Tashkent		55·7	297	i 9 29	0	17 9	+ 3	—	—	—
Stalinabad		57·5	294	i 9 43	+ 2	—	—	—	—	—
Moscow		64·7	324	i 10 28	− 2	i 18 56	− 5	—	—	—
Branner		65·5	60	e 10 34	− 1	—	—	—	—	—
Santa Clara		65·7	60	e 10 38	+ 2	—	—	—	—	—
Bombay	E.	66·3	273	e 10 46	+ 6	19 24	+ 4	23 46	SS	—
	N.	66·3	273	i 10 40	0	i 19 26	+ 6	11 0	PcP	—
Fresno	N.	67·5	61	e 10 48	0	—	—	—	—	—
Tinemaha		68·2	59	i 10 52k	0	—	—	e 39 19	P′P′	—
Grozny		68·8	309	e 10 58	+ 2	—	—	—	—	—
Haiwee		69·0	59	i 10 56k	− 1	—	—	—	—	—
Upsala		69·0	335	i 10 53	− 4	i 19 49	− 4	i 20 43	sS	e 32·4

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Logan		69·1	51	i 10 57	− 1	e 19 56	+ 2	e 11 33	pP	—
Mount Wilson		70·1	61	i 11 3k	− 1	e 20 7	+ 1	e 39 7	PʹPʹ	—
Pasadena		70·1	61	i 11 3k	− 1	i 20 6	0	i 11 20	pP	e 31·8
Riverside		70·7	61	i 11 7k	0	—	—	i 11 28	pP	—
Brisbane	z.	71·0	174	i 11 10	+ 1	—	—	i 11 32	pP	—
Palomar	z.	71·4	62	i 11 11	− 1	—	—	—	—	—
La Jolla	z.	71·5	61	i 11 12k	0	—	—	e 11 32	pP	—
Bergen		71·8	342	i 11 13	− 1	e 20 30	+ 5	e 11 37	pP	e 41·4
Rapid City		72·2	45	e 11 2	−14	e 20 16	−14	(e 20 51)	SP	e 20·8
Copenhagen		74·0	335	i 11 25a	− 2	20 47	− 3	12 25	sP	—
Tucson		76·0	58	i 11 37	− 1	e 21 15	+ 3	i 12 6	pP	e 35·6
Potsdam		76·6	334	i 11 42	0	i 21 19	+ 1	—	—	e 41·4
Riverview	z.	77·2	177	i 11 53a	+ 8	—	—	—	—	—
Bucharest		78·0	321	e 11 48	− 1	i 21 34	0	e 11 51	PcP	35·4
Prague		78·1	332	i 11 49	− 1	21 34	− 1	—	—	—
Jena	N.	78·2	332	i 11 50	0	e 21 36	0	—	—	—
De Bilt		79·2	337	i 11 55a	− 1	i 21 49	+ 3	—	—	e 38·4
Sofia		80·6	322	i 11 35	−28	i 22 3	+ 2	—	—	35·4
Uccle		80·6	338	i 12 2a	− 1	i 21 57	− 4	—	—	e 37·4
Ksara		80·9	307	e 12 7?	+ 2	e 22 20	+16	—	—	—
Stuttgart		80·9	333	i 12 5a	0	i 22 5	+ 1	i 12 22	pP	e 41·6
Kew		81·2	340	—	—	e 22 7	0	—	—	e 42·4
Strasbourg		81·6	334	e 12 5	− 4	e 22 4	− 7	i 12 25	pP	—
Zürich		82·4	333	e 12 11a	− 2	e 22 21	+ 2	—	—	—
Basle		82·5	334	e 12 13	0	e 22 22	+ 2	—	—	—
Chur		82·5	333	e 12 12	− 1	e 22 18	− 2	—	—	—
Florissant		82·6	41	i 12 15	+ 1	i 22 21	0	i 12 35	pP	—
St. Louis		82·8	41	i 12 13	− 2	i 22 31	+ 8	i 12 33	pP	—
Paris		82·9	337	i 12 25	+10	—	—	—	—	e 43·4
Neuchatel		83·2	334	e 12 16	− 1	—	—	—	—	—
Ottawa		83·3	29	12 6	−11	22 24	− 4	—	—	41·4
Shawinigan Falls		83·3	27	12 16	− 1	22 26	− 2	—	—	—
Seven Falls		83·4	25	e 12 30	+12	22 27	− 2	—	—	41·4
Cape Girardeau	N.	84·2	42	e 12 21	− 1	e 22 33	− 4	e 12 41	pP	—
Clermont-Ferrand		85·3	336	i 12 30	+ 3	e 22 50	+ 2	—	—	e 41·4
Helwan		86·4	309	i 12 33	0	22 50	[+ 3]	12 59	pP	—
Fordham		87·9	29	i 12 39	− 1	i 23 12	− 1	e 13 14	pP	—
Barcelona		89·8	334	—	—	i 23 29	− 2	—	—	—
Tortosa		90·8	335	e 13 34	sP	—	—	—	—	—
Toledo		93·0	339	i 13 1	− 3	—	—	15 59	?	—
Almeria		95·3	336	13 12	− 2	24 36	+18	13 48	pP	49·9
Granada		95·4	338	13 19	+ 4	24 25	+ 6	26 19	PPS	—

Additional readings :—
Bombay PPN =13m.11s., PSN =19m.41s., S_cSN =20m.36s., SSN =23m.43s.
Logan e =14m.50s., i =20m.51s.
Pasadena iZ =11m.12s., iE =20m.40s., eE =20m.56s., ePKP,PKPZ =39m.16s.
Riverside ePKP,PKPZ =38m.57s.
Bergen ePPZ =13m.41s.
Copenhagen 21m.25s.
Tucson i =11m.52s., iPP =14m.34s., e =21m.51s. and 22m.30s.
Stuttgart eZ =12m.31s., ePPZ =14m.56s., eS =22m.2s., ePS =22m.54s., e =33m.24s.?.
Strasbourg ePS =23m.5s.
Florissant iP_cPZ =12m.23s., ipP_cPZ =12m.43s., eSKSE =22m.40s., isSE =22m.56s.
St. Louis iP_cPZ =12m.23s., ipP_cPZ =12m.41s., iPPZ =15m.23s., iSEZ =22m.11s., isSE =22m.54s., eS_cSE =23m.6s., eN =23m.18s., eE =23m.28s., eN =24m.3s., eSSN =27m.45s.
Cape Girardeau eP_cP?N =12m.28s., epP_cP?N =12m.47s., eN =12m.50s., and 13m.0s.
Helwan P_cPZ =12m.37s., PPZ =15m.54s., sSN =23m.36s.
Fordham i =12m.46s. and 24m.14s.
Almeria PP =17m.25s., PPP =19m.46s., S =24m.42s., sS =25m.30s., PS =26m.54s.
Granada PP =17m.3s.

Nov. 9d. Readings also at 0h. (Colombo), 4h. (near Andijan), 7h. (Brisbane, near Stalinabad and Andijan, and near Granada), 8h. (Wellington, Riverview, and Tashkent), 10h. (Mizusawa), 13h. and 14h. (La Paz), 22h. (Riverview (2) and Apia), 23h. (Fort de France and near La Paz).

Nov. 10d. Readings at 17h. and 21h. (Fort de France), 22h. (La Paz).

Nov. 11d. 0h. North of New Zealand. Pasadena suggests depth of focus 550 km.

Suva e = 54m.0s.
Tuai P = 55m.20s., S = 57m.44s.
Auckland S = 57m.25s.
Wellington S? = 58m.37s.
Riverview iN = 61m.3s., iE = 67m.1s., eLZ = 68·9m.
Mount Wilson iPZ = 63m.52s. a, eSKPPKP,PKPZ = 92m.45s.
Pasadena iP = 63m.52s. a, ipP = 65m.53s., isPZ = 67m.15s., eSKP,PKP,PKPZ = 92m.47s.
La Jolla iPZ = 63m.53s. a.
Riverside iPNZ = 63m.54s. a, epPZ = 65m.55s.
Palomar iPZ = 63m.55s. a, ipPZ = 66m.0s.
Haiwee iP = 63m.59s. a.
Tinemaha iPZ = 64m.1s. a.
Tucson iP = 64m.13s., e = 66m.33s., 74m.22s. and 78m.3s.
Copenhagen P = 71m.2s., e = 73m.14s.
Stuttgart eZ = 71m.10s., 71m.19s., 71m.36s., and 73m.32s.
Jena eEN = 73m.24s.

Nov. 11d. Readings also at 0h. (La Paz), 2h. (Jena, Palomar (2), Tinemaha, Riverside, Mount Wilson, Pasadena, Tucson (2), and Honolulu), 3h. (Sydney, Riverview, Auckland, Brisbane, Bogota, Tucson, and Palomar), 4h. (Tinemaha, Palomar, Haiwee, La Jolla, Riverside, Pasadena, Tucson, Mount Wilson, Granada, Riverview, and Brisbane), 5h. (Toledo), 6h. (near Tashkent), 9h. (La Paz), 10h. (Riverview and near Ferndale), 15h. (Bucharest), 17h. (Palomar, Tinemaha, Riverside, Pasadena, Mount Wilson, and Riverview), 18h. (Pasadena, Mount Wilson, Riverside, Tucson, Tinemaha, Haiwee, Palomar, and Mizusawa), 20h. (near Erevan), 22h. (near Granada (2), Toledo (2), and Almeria (2)).

Nov. 12d. 5h. 11m. 5s. Epicentre 29°·8N. 139°·0E. Depth of focus 0·060.
(as on 1942 June 27d.).

$A = -·6560$, $B = +·5702$, $C = +·4945$; $\delta = -1$; $h = +2$;
$D = +·656$, $E = +·755$; $G = -·373$, $H = +·324$, $K = -·869$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.
		°	°	m. s.	s.	m. s.	s.	m. s.
Mizusawa		9·5	10	2 12	− 1	3 54	− 5	—
Vladivostok		14·5	339	e 3 9	0	i 5 39	− 1	—
Irkutsk		34·0	322	e 6 8	0	—	—	—
Tashkent		56·5	303	9 2	− 1	e 16 20	− 1	—
Tinemaha		81·7	53	i 11 36 a	+ 1	—	—	i 13 14 pP
Haiwee		82·4	53	i 11 39 a	+ 1	—	—	—
Pasadena		83·3	55	i 11 43 a	0	—	—	e 13 19 pP
Mount Wilson		83·4	55	i 11 44 a	+ 1	—	—	e 15 1 sP
Riverside	z.	84·0	55	i 11 45	− 1	—	—	e 13 28 pP
La Jolla	z.	84·6	56	i 11 50	+ 1	—	—	—
Palomar	z.	84·7	55	i 11 50 a	0	—	—	i 13 32 pP
Tucson		89·5	53	e 12 13	+ 1	e 22 28	+ 2	e 15 51 sP
Stuttgart	z.	89·8	330	e 12 13	− 1	—	—	—
Chur		91·1	328	e 12 19 a	− 1	—	—	—
Zürich		91·2	329	e 12 21	+ 1	—	—	—
Bogota		133·3	50	e 18 48	[+19]	—	—	e 21 15 PP
La Paz	z.	151·8	68	e 19 32	[+33]	—	—	—

Additional readings :—
Palomar eZ = 14m.16s.
Tucson e = 13m.4s.

Nov. 12d. Readings also at 2h. (Stuttgart, Tucson, Mount Wilson, Pasadena, Riverside, La Jolla, Tinemaha, Haiwee, Palomar, Riverview (2), Wellington, and Suva), 4h. (near Apia), 7h. (St. Louis, Pasadena, Tucson, Mount Wilson, Riverside, Tinemaha, Haiwee, La Jolla, Palomar, Wellington, Auckland, Riverview, and Brisbane), 11h. (La Plata, Bombay, and near Tashkent), 12h. (Tinemaha, Pasadena, Mount Wilson, Riverside, Tucson, and Palomar), 15h. (Riverview), 16h. (near Suva), 19h. (Fort de France and near Suva (2)), 20h. (Riverview and La Paz), 21h. (near Mizusawa), 23h. (La Plata and near Fort de France).

Nov. 13d. 10h. 47m. 46s. Epicentre 9°·0N. 125°·0E.

$A = -\cdot5666$, $B = +\cdot8092$, $C = +\cdot1554$; $\delta = -1$; $h = +7$;
$D = +\cdot819$, $E = +\cdot574$; $G = -\cdot089$, $H = +\cdot127$, $K = -\cdot988$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Calcutta	N.	37·6	296	—	—	e 13 8	0	—	—	—
Brisbane	E.	45·3	145	e 8 27	+ 6	—	—	—	—	—
Hyderabad		46·0	286	e 8 29	+ 2	15 13	+ 1	18 46	SS	22·2
New Delhi		48·9	301	e 8 48	− 2	i 15 46	− 7	18 58	SS	—
Riverview		49·3	152	i 8 51 a	− 2	i 15 55	− 4	i 9 2	pP	e 26·4
Bombay	N.	51·4	288	e 9 10	+ 1	i 16 28	0	16 44	PPS	—
Tashkent		58·6	314	i 10 1	0	18 8	+ 4	—	—	—
Christchurch		67·8	145	19 54	S	(19 54)	− 6	27 21	SSS	36·3
Sverdlovsk		68·6	329	11 5	− 2	i 20 6	− 3	—	—	—
Ksara		84·3	303	e 12 38	+ 3	e 23 32	+32	—	—	—
Helwan		88·7	299	12 55	− 2	e 23 42	− 1	—	—	—
Stuttgart		99·7	323	e 13 44	− 3	—	—	—	—	e 54·2
Mount Wilson		106·5	50	e 18 28	[+ 2]	—	—	—	—	—
Tucson		112·8	49	e 19 22	PP	—	—	—	—	—
St. Louis		122·4	32	e 18 50	[− 7]	—	—	(e 37 29)	SSP	e 37·5
La Paz	Z.	165·2	122	20 7	[+ 1]	—	—	—	—	80·2

Additional readings :—
Riverview ePPZ = 10m.43s., iSSN = 19m.30s.
Bombay P_cPN = 10m.21s., eN = 19m.14s.
Christchurch S_cS = 30m.8s., Q = 32m.41s.
Helwan eZ = 13m.33s., 15m.42s., and 17m.19s.
Long waves were also recorded at Auckland, Arapuni, Wellington, Pasadena, De Bilt, Uccle, Kew and Paris.

Nov. 13d. 16h. 43m. 32s. Epicentre 54°·5S. 129°·5W.

$A = -\cdot3710$, $B = -\cdot4501$, $C = -\cdot8123$; $\delta = +6$; $h = -7$;
$D = -\cdot772$, $E = +\cdot636$; $G = +\cdot517$, $H = +\cdot627$, $K = -\cdot583$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Christchurch		38·5	262	7 28	+ 2	13 27	+ 5	8 55	PP	18·0
Wellington		38·5	266	(8 48?)	PP	i 13 28	+ 6	(16 28)	SSS	16·5
Auckland		41·5	272	—	—	i 14 8	+ 1	(17 28)	SSS	17·5
La Plata		52·1	98	15 10?	?	—	—	19 28?	S_cS	21·0
Riverview		57·3	256	i 9 51 a	− 1	e 17 46	− 1	i 18 8	PS	e 26·7
Huancayo		59·8	66	e 10 12	+ 3	e 18 21	+ 1	—	—	e 25·3
La Paz	Z.	60·8	76	10 8	− 8	18 28	− 5	—	—	28·2
Rio de Janeiro		69·6	100	e 20 13	S	(e 20 13)	− 8	—	—	e 32·5
Tucson		87·9	15	e 12 52	− 1	—	—	—	—	e 41·6
Palomar	Z.	88·2	10	e 12 55	+ 1	—	—	—	—	—
Riverside	Z.	88·8	9	e 12 56	− 1	—	—	—	—	—
Pasadena	Z.	88·8	9	i 13 6	+ 9	—	—	—	—	e 40·7
Mount Wilson	Z.	88·9	9	e 12 58	0	—	—	—	—	—
New Delhi	N.	147·7	228	e 19 50	[+ 6]	—	—	—	—	—
Clermont-Ferrand		148·9	86	i 21 48	?	—	—	—	—	—
Helwan		151·8	142	19 55	[+ 5]	36 36	PPS	e 20 4	PKP_2	—
Stuttgart		154·0	84	e 19 59	[+ 6]	—	—	—	—	e 78·5

Additional readings :—
Christchurch Q = 16m.5s., S_cS = 16m.15s.
Wellington PP given as S.
Riverview eEN = 24m.28s.
Helwan eZ = 20m.13s. and 20m.28s.
Long waves were also recorded at Arapuni, Fordham, Philadelphia, Sitka, College, De Bilt, Paris, and Kew.

Nov. 13d. 18h. 43m. 55s. Epicentre 19°·9S. 169°·9E. (as on 1943 August 1d.).

Epicentre 20°S. 170°E. (Pasadena).

$A = -·9264$, $B = +·1651$, $C = -·3384$; $\delta = -1$; $h = +5$;
$D = +·175$, $E = +·984$; $G = +·333$, $H = -·059$, $K = -·941$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Suva		8·3	80	i 1 58	− 6	—	—	—	—	—
Brisbane		17·2	241	i 4 6	+ 3	i 7 30	SS	i 4 29	PPP	i 9·6
Auckland		17·4	168	4 10	+ 4	7 52	SSS	i 8 52	P_oP	—
Apia		18·6	74	(i 4 18)	− 3	i 4 18	P	—	—	e 9·1
Arapuni		18·8	167	4 5?	−18	7 47?	− 3	i 8 41?	SSS	10·1
Tuai		19·9	164	4 36	0	8 29	+14	—	—	—
Riverview		21·7	226	i 4 56k	+ 1	i 9 3	+12	i 5 8	PP	e 10·4
Sydney		21·7	226	i 4 59	+ 4	i 9 2	+11	—	—	10·8
Wellington		21·7	171	4 55	0	9 7	+16	5 30	PPP	11·1
Christchurch		23·7	176	5 15	+ 1	—	—	9 32	Q	11·1
Honolulu		51·7	39	e 8 52	−19	e 16 23	− 9	e 12 37	PPP	e 21·9
Tokyo		62·2	333	10 33	+ 7	—	—	—	—	—
Kumagaya		62·8	332	10 27	− 3	18 51	− 7	—	—	—
Kameyama		63·0	330	e 10 3	−28	—	—	—	—	—
Kobe		63·5	329	e 10 33	− 1	—	—	—	—	—
Kôti		63·5	326	e 10 33	− 1	—	—	—	—	—
Kagosima		63·6	323	e 10 22	−13	—	—	—	—	—
Sendai		63·9	335	e 10 34	− 3	19 11	− 1	—	—	—
Mizusawa		64·6	336	e 10 36	− 5	19 22	+ 1	19 14	?	—
Morioka		65·1	336	e 10 44	− 1	—	—	—	—	—
Husan		67·1	324	e 10 56	− 1	—	—	—	—	—
Vladivostok		71·8	332	e 11 27	+ 1	i 20 51	+ 5	—	—	—
Santa Clara		85·7	48	i 12 43	+ 1	e 23 11	− 3	—	—	e 40·8
Ukiah		85·7	46	e 12 48	+ 6	e 23 33	+19	—	—	e 38·5
Berkeley		85·8	48	i 12 42	0	i 23 6	[·0]	i 12 48	P_cP	e 39·1
Santa Barbara	z.	86·0	52	e 12 43	0	—	—	—	—	—
Pasadena		87·0	52	i 12 47	− 1	i 23 17	[+ 3]	i 12 52	P_cP	e 39·1
Mount Wilson	z.	87·1	52	e 12 47	− 2	—	—	i 12 55	P_cP	—
La Jolla		87·1	54	e 12 51	+ 2	—	—	—	—	—
Riverside	z.	87·5	52	e 12 49	− 2	—	—	—	—	—
Palomar	z.	87·6	54	e 12 50	− 1	—	—	i 12 57	P_cP	—
Haiwee		88·0	50	e 12 54	+ 1	—	—	—	—	—
Tinemaha	z.	88·2	50	i 12 56	+ 2	—	—	—	—	—
Sitka		89·6	26	e 19 23	?	i 23 32	[+ 2]	e 29 27	SS	e 39·3
Calcutta	n.	90·1	293	e 13 15	+12	i 23 42	{− 1}	e 16 40	PP	—
Victoria		90·3	38	e 22 5?	?	—	—	—	—	41·1
College		90·5	16	e 16 30	PP	e 23 30	[− 6]	e 29 41	SS	e 41·4
Irkutsk		91·6	325	e 13 7	− 3	e 23 59	{+ 6}	30 6	SS	—
Tucson		91·8	56	i 13 9	− 2	e 23 45	[+ 2]	e 30 31	SS	e 38·2
Colombo	e.	92·3	276	13 8	− 5	24 25	+10	—	—	—
Salt Lake City		94·3	48	e 17 13	PP	e 23 58	[+ 1]	—	—	e 44·1
Logan		94·7	47	e 14 31	+67	e 24 0	[0]	e 17 16	PP	e 46·0
Kodaikanal	e.	95·7	279	e 13 34	+ 5	e 24 15	[+10]	e 26 15	PS	—
Bozeman		96·3	44	e 14 37	+65	e 24 14	[+ 6]	e 26 22	PS	e 44·4
Hyderabad	n.	97·1	286	17 33	PP	24 18	[+ 6]	26 6	PS	—
Rapid City		101·4	47	e 13 9?	?	e 24 43?	[+ 9]	—	—	e 41·6
New Delhi	n.	101·5	296	e 13 54	− 1	i 24 35	[+ 1]	i 25 35	S	—
Saskatoon		101·6	38	—	—	—	—	e 26 41?	PS	47·1
Bombay	n.	102·6	285	e 17 6	?	24 37	[− 3]	27 21	PS	55·1
Huancayo		108·4	110	e 19 0	PP	e 28 23	PS	e 34 3	SSP	e 44·0
Florissant	e.	109·6	55	—	—	e 25 37	[+27]	e 29 16	PPS	—
St. Louis		109·7	55	e 19 6	PP	e 26 12	{+ 9}	i 28 30	PS	—
Tashkent		110·7	307	e 14 36	P	i 28 49	PS	i 19 11	PP	—
Chicago		112·2	51	—	—	e 29 11	PS	e 36 4	?	e49·5
La Paz		112·5	118	i 14 56a	P	26 25	{+ 2}	29 3	PS	53·1

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Sverdlovsk		117·0	325	e 19 52	PP	i 27 49	S	i 29 42	PS	—
Ottawa		120·9	48	e 18 53	[− 2]	—	—	—	—	e 54·1
Philadelphia		121·4	54	—	—	—	—	e 30 26	PS	e 60·3
Fordham		122·4	53	i 20 33	PP	—	—	i 30 37	PS	e 61·6
Seven Falls		124·2	45	—	—	e 30 41	PS	e 37 46	SS	58·1
San Juan		127·3	81	e 21 52	?	—	—	e 32 35	PPS	e 59·6
Bermuda		129·9	63	e 21 32	PP	e 32 55	PPS	e 41 8	?	e 62·1
Fort de France		131·1	88	e 19 12	[− 2]	—	—	i 22 37	SKP	—
Ksara		137·0	298	e 19 31	[+ 6]	e 23 4	SKP	e 27 39	?	—
Copenhagen		140·4	340	e 19 42	[+11]	—	—	23 10	SKP	—
Helwan		141·3	292	19 26	[− 7]	i 41 11	SS	20 7	pPKP	—
Sofia		143·9	315	e 21 44	?	—	—	e 23 2	SKP	—
Belgrade		144·5	321	i 19 42	[+ 4]	—	—	—	—	—
Jena		144·6	335	e 19 18	?	e 23 20	SKP	e 19 35	PKP	—
De Bilt		145·7	343	i 19 41 a	[+ 1]	—	—	e 23 15	PP	e 69·1
Uccle	Z.	147·1	344	i 19 44	[+ 1]	—	—	i 20 17	PKP_2	—
Stuttgart		147·3	336	e 19 41	[− 2]	—	—	i 20 18	PKP_2	e 77·1
Kew		147·6	348	e 19 47	[+ 3]	—	—	—	—	e 64·1
Triest		147·7	328	e 19 49	[+ 5]	—	—	—	—	—
Chur		148·7	334	e 19 45	[0]	—	—	—	—	—
Zürich		148·7	335	e 19 44 a	[− 1]	—	—	—	—	—
Basle		148·9	336	e 19 45	[− 1]	—	—	—	—	—
Paris		149·4	343	e 19 44	[− 2]	—	—	—	—	e 74·1
Neuchatel		149·6	336	e 19 51	[+ 4]	—	—	—	—	—
Milan		149·9	331	e 19 44	[− 3]	23 42	SKP	19 56	PKP_2	—
Florence		150·2	327	i 19 50 a	[+ 2]	i 23 35	SKP	i 19 58	PKP_2	—
Clermont-Ferrand		152·0	340	e 19 31	[−19]	—	—	—	—	—
Barcelona		156·2	336	e 22 28	?	(e 26 38)	[−23]	—	—	e 26·6
Tortosa	N.	157·3	338	i 24 18	PP	—	—	—	—	e 87·1
Toledo		159·4	346	19 59	[− 1]	31 14	{+ 5}	24 30	PP	89·1
Lisbon		161·2	356	20 2 a	[0]	50 47	SSS	i 20 54 a	PKP_2	79·4
Almeria		161·8	340	20 5	[+ 3]	26 50	[−16]	20 41	pPKP	82·6
Granada		161·9	344	i 20 5	[+ 2]	24 2	SKP	20 30	pPKP	e 85·4
San Fernando		163·1	349	e 21 24	?	e 27 4	[− 3]	—	—	84·1

Additional readings:—
Riverview iEN =5m.24s., iE =6m.32s., iZ =7m.45s., and 9m.7s., isSE =9m.44s., iSSN =10m.6s.
Wellington i =5m.56s., 6m.50s., and 7m.10s., P_cP? =8m.20s., sS =9m.45s., SS? = 10m.40s.
Pasadena iPP =16m.8s., eSSZ =29m.11s.
Calcutta ePPN =16m.40s., iPSN =24m.15s.
College e =25m.16s.
Irkutsk PS =25m.5s.
Tucson e =13m.17s., ePP =16m.48s., ePS? =25m.17s.
Bozeman eSS =31m.49s.
Rapid City e =15m.49s. and 22m.12s.?.
Bombay PPN =18m.12s., PPPN =20m.29s., SKKSN =25m.7s., SN =25m.54s., iN = 28m.27s. and 29m.25s.
Huancayo ePP =19m.12s., epPP? =21m.4s.
Florissant eE =27m.57s.
St. Louis eSE =26m.53s., eE =33m.17s., iSSE =34m.38s.
La Paz iPP =19m.25s., PPP =21m.9s., S =27m.23s., iPPS =29m.50s.
Helwan sPKP?Z =20m.37s., PP?EZ =23m.14s., sPP?Z =24m.10s., PPP?Z =26m.33s.
Belgrade e =20m.8s. and 22m.9s.
Jena eEN =22m.55s.
Stuttgart iZ =19m.45s., iPP?Z =23m.12s.
Florence isPZ =20m.13s., isSE =23m.50s., iSSN =24m.30s.
Lisbon PKPE =20m.21s., PKP_2?N =21m.28s., PKP_2?E =21m.38s., PP?Z =24m.40s., PP?E =25m.19s., PPP?Z =28m.21s., PPP?E =28m.45s.?.
Almeria i =20m.14s., PP =24m.29s., pPP =24m.57s., sPP =25m.11s., PPP =28m.23s., pPPP =28m.44s., sPPP =28m.59s., SKKS =30m.23s., SKSP =34m.0s., SPP = 37m.33s., SS =44m.7s., sSS =45m.24s., SSS =50m.19s.
Granada PKP_2 =20m.59s., $pPKP_2$ = =21m.15s., iPP =24m.34s., PPP =28m.16s., SS =44m.52s., sSS =45m.38s.
Long waves were also recorded at Bucharest, Tananarive, Columbia, Harvard, and Upsala.

Nov. 13d. Readings also at 2h. (Fort de France), 4h. (near Tucson), 6h. (Riverview), 7h. (Balboa Heights and near Bogota), 10h. (near Apia), 15h. (Pasadena, Palomar, Tucson, Riverview, Auckland, Wellington, Christchurch, and near Tashkent), 16h. (Stuttgart and Triest), 23h. (near Branner).

Nov. 14d. 23h. 47m. 29s. Epicentre 2°·5N. 122°·0E. (as on 1937 Oct. 28d.).

$A = -\cdot5294$, $B = +\cdot8473$, $C = +\cdot0433$; $\delta = +6$; $h = +7$;
$D = +\cdot848$, $E = +\cdot530$; $G = -\cdot023$, $H = +\cdot037$, $K = -\cdot999$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Kôti		32·7	18	i 6 40	+ 4	—	—	—	—	—
Kobe		34·3	20	e 6 53	+ 3	—	—	—	—	—
Kameyama		34·9	21	e 6 56	+ 1	—	—	—	—	—
Hikone		35·2	22	e 6 57	− 1	—	—	—	—	—
Nagoya		35·3	22	i 6 9	−50	—	—	—	—	—
Hunatu		36·3	24	7 9	+ 2	—	—	—	—	—
Tokyo		36·9	25	e 7 11	− 1	—	—	—	—	—
Nagano		37·1	22	8 0	?	—	—	—	—	—
Calcutta	N.	38·3	305	—	—	1 13 35	+16	14 32	?	—
Sendai		39·6	24	7 35	0	—	—	—	—	—
Mizusawa	E.	40·4	23	e 7 41	0	—	—	—	—	—
Riverview		45·4	146	i 8 21a	− 1	i 14 2	−62	—	—	e 22·7
New Delhi	N.	49·9	307	—	—	e 16 1	− 6	—	—	i 28·0
Bombay		50·8	293	—	—	e 16 26	+ 6	e 19 45	SS	—
Irkutsk		51·7	347	e 9 17	+ 6	—	—	—	—	—
Tashkent		61·0	317	10 23	+ 5	e 18 46	+11	—	—	—
Sverdlovsk		72·6	330	e 11 29	− 2	e 21 41	PPS	e 14 26	PP	—
Helwan	Z.	93·7	300	i 16 38	PP	—	—	—	—	—
Tinemaha		111·7	49	i 18 25	[−12]	—	—	e 19 8	PP	—
Haiwee	Z.	112·3	49	i 18 26a	[−12]	—	—	—	—	—
Pasadena		112·8	51	e 14 42	P	—	—	i 18 26a	PKP	—
Mount Wilson	Z.	112·9	51	e 14 44	P	—	—	i 18 26a	PKP	—
Riverside	Z.	113·5	51	i 14 45	P	—	—	i 18 27	PKP	—
La Jolla		114·0	53	e 18 29	[−12]	—	—	i 19 17	PP	—
Palomar	Z.	114·1	52	e 14 47	P	—	—	i 18 28	PKP	—
Tucson		119·2	51	e 18 39	[−12]	—	—	e 19 48	PP	—
St. Louis	Z.	129·4	33	i 18 58	[−13]	—	—	e 21 10	PP	—
Bogota		162·5	65	e 19 51	[−12]	—	—	i 20 39	PKP,	—

Additional readings :—
Mizusawa ePN = 7m.44s.
Riverview iZ = 8m.34s. and 14m.5s., iE = 17m.22s.
Bombay 17m.23s., eN = 18m.49s.
Pasadena eZ = 19m.9s. and 20m.15s.
Mount Wilson eZ = 19m.0s. and 19m.12s.
Riverside iZ = 19m.26s.
Palomar iZ = 19m.7s. and 19m.34s.
St. Louis eZ = 19m.38s., iP?Z = 22m.9s.

Nov. 14d. Readings also at 0h. (Riverview), 3h. (Riverview and Brisbane), 4h. (Neuchatel, Pasadena (2), Mount Wilson (2), Riverside (2), La Jolla, Tinemaha (2), Haiwee, Palomar (2), Tucson (2), St. Louis, San Juan, Bogota, and near Balboa Heights), 8h. (near Suva), 9h. (Bogota), 10h. (Pasadena, Mount Wilson, Riverside, Tucson, La Jolla, Tinemaha, Palomar, and Bombay), 12h. (Pasadena, Mount Wilson, Riverside, Haiwee, and Palomar), 13h. (Tucson), 17h. (Riverview and Suva), 18h. (Suva, Riverside, Mount Wilson, Palomar, Tucson, and near Fresno, Branner, Berkeley, and Lick), 22h. (near Fresno, Branner, Berkeley, and Lick).

Nov. 15d. 5h. 36m. 28s. Epicentre 39°·2N. 122°·2W.

Intensity V at Colusa and Oroville.
Epicentre 39° 13′N. 122° 14′W. (Berkeley).

A = −·4140, B = −·6575, C = +·6295; δ = −3; h = −1;
D = −·846, E = +·533; G = −·335, H = −·533, K = −·777.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		
		°	°	m. s.	s.	m. s.	s.	m. s.		
Berkeley		1·3	182	i 0 24	− 1	i 0 55	S_g	i 0 28		P_g
San Francisco		1·5	188	e 0 26	− 2	i 0 56	S_g	e 0 30		P_g
Branner		1·8	180	e 0 32	0	i 0 52	− 4	e 0 40		P_g
Lick		1·9	167	i 0 34	0	i 1 0	+ 1	e 0 38		P_g
Santa Clara		1·9	174	e 0 34	0	e 1 14	S_g	—		—
Fresno	N.	3·1	142	e 0 52	+ 1	i 1 42	S_g	e 1 2		P_g

Additional readings:—
Berkeley iN = 0m.33s.
San Francisco eN = 0m.37s.
Branner iEN = 0m.41s., iSN = 1m.4s.
Lick iN = 0m.54s.

Nov. 15d. 11h. 43m. 0s. Epicentre 36°·9N. 28°·8E.

A = +·7025, B = +·3862, C = +·5978; δ = +2; h = −2;
D = +·482, E = −·876; G = +·524, H = +·288, K = −·802.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Istanbul	4·2	2	1 13	+ 6	2 11	S*	1 22	P_g	—
Ksara	6·6	116	e 1 39	− 2	e 3 27	S*	—	—	—
Helwan	7·3	162	e 1 46	− 4	3 6	− 9	3 51	S*	i 5·0
Bucharest	7·8	346	e 3 5	?	e 3 18	−10	e 3 45	S*	i 4·7
Belgrade	10·1	324	—	—	e 4 9	−16	—	—	e 5·5
Florence	15·0	303	i 3 39	+ 4	e 7 1?	SSS	—	—	—
Prague	16·7	326	—	—	e 7 0	− 3	—	—	e 8·6
Milan	17·0	300	i 4 7	+ 6	7 31	SS	—	—	10·1
Chur	17·4	309	e 4 6	0	e 7 29	+10	—	—	—
Zürich	18·2	312	e 4 14	− 2	—	—	—	—	—
Stuttgart	18·6	316	i 4 19a	− 2	e 7 50	+ 4	—	—	—
Jena	18·7	325	e 4 20	− 2	—	—	e 5 15	PPP	—
Basle	18·9	312	e 4 23	− 1	—	—	—	—	—
Neuchatel	19·1	311	e 4 23	− 4	—	—	—	—	—
Clermont-Ferrand	21·2	302	i 4 46	− 3	—	—	—	—	—
Copenhagen	21·8	335	4 53	− 3	9 1	+ 9	—	—	—
Uccle	22·3	316	e 5 0	− 1	i 9 8	+ 6	—	—	e 12·0

Bucharest gives also iEN = 4m.26s.
Long waves were also recorded at other European stations.

Nov. 15d. Readings also at 1h. (Sofia and Bucharest), 3h. (near Bogota), 5h. (Bogota, La Paz, and near Huancayo), 6h. (Fresno, Berkeley, Branner, Pasadena, Mount Wilson, Riverside, Tucson, and Palomar), 11h. (near Berkeley), 14h. (La Plata), 15h. (Wellington, Christchurch, Auckland, Sydney, Brisbane, Riverview, Sverdlovsk, and Tashkent), 17h. (La Paz), 18h. (St. Louis), 20h. (Riverview and Brisbane), 21h. (Pasadena, Mount Wilson, Riverside, Tinemaha, Tucson, and Palomar), 22h. (near Sofia), 23h. (Wellington).

Nov. 16d. 5h. Undetermined shock.
Huancayo e = 30m.58s. and 31m.5s., eS = 36m.14s., eL = 38m.26s.
La Paz PZ = 31m.11s., LZ = 39m.0s.
Bogota e = 32m.59s.
Tucson eP = 35m.32s.
Palomar ePZ = 35m.45s.
Riverside ePZ = 35m.53s.
Pasadena ePZ = 35m.53s., eLZ = 58m.
Mount Wilson ePZ = 35m.54s.
St. Louis eZ = 35m.55s., eSE = 45m.45s., eSSE = 50m.47s.
Haiwee eZ = 36m.6s.
Tinemaha ePZ = 36m.8s.
Rio de Janeiro ePN = 40m.43s., eLN = 48m.0s.
Ksara e = 42m.31s. and 42m.47s.
Helwan ePE = 42m.45s., eE = 42m.49s.
Long waves were also recorded at La Plata and Philadelphia.

Nov. 16d. 6h. 15m. 26s. Epicentre 39°·2N. 122°·2W. (as on 15d.).

Intensity VI at Stonyford; V at Colusa, Oroville; IV at Butte City.
Epicentre 39° 14′N. 122° 11′W. (Berkeley).

$A = -·4140$, $B = -·6575$, $C = +·6295$; $\delta = -3$; $h = -1$;
$D = -·846$, $E = +·533$; $G = -·335$, $H = -·533$, $K = -·777$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Berkeley		1·3	182	i 0 22	− 3	i 0 47	+ 3	e 0 32	P_g	i 0·9
San Francisco	E.	1·5	188	0 29	+ 1	—	—	—	—	—
Branner		1·8	180	e 0 31	− 1	i 0 58	+ 2	i 0 34	P_g	—
Lick		1·9	167	e 0 32	− 2	i 0 58	− 1	e 0 36	P_g	i 1·3
Santa Clara	Z.	1·9	174	e 0 37	+ 3	—	—	—	—	—
Fresno	N.	3·1	142	e 0 51	0	e 1 33	+ 4	e 0 58	P_g	i 1·8

Additional readings :—
Branner iEN = 0m.42s.

Nov. 16d. 7h. Undetermined shock.

Zürich e = 12m.40s.
Florence eP = 14m.46s., iP*N = 14m.59s., eSN = 15m.51s.
Milan eP = 15m., SE = 16m.17s.
Prague eP = 15m.24s.?, eS = 18m.47s., L = 20m.
Chur e = 15m.29s.k.
Triest e = 15m.42s.
Stuttgart eZ = 15m.52s., e = 16m.32s. and 18m.24s.?.
Clermont-Ferrand eP = 15m.58s., eS = 19m.24s., eL = 20m.12s.
Sofia eEN = 16m.
Toledo ePZ = 16m.34s., P_cPE = 20m.43s., S_cS = 28m.1s., S = 40m.0s.
Helwan ePZ = 16m.45s., eZ = 16m.53s.
Belgrade e = 17m.11s., 17m.56s., 18m.22s., and 19m.7s.
Jena iN = 17m.17s., iE = 17m.20s.
Copenhagen eP = 17m.18s., S = 20m.47s., L = 23m.
Ksara e = 17m.18s., and 19m.34s.
Bucharest eN = 17m.54s. and 18m.35s., LEN = 19m.48s.?.
Long waves were also recorded at Potsdam, De Bilt, Uccle, Kew, Bergen, Upsala, and Lisbon.

Nov. 16d. 11h. 37m. 52s. Epicentre 15°·6S. 74°·6W.

Epicentre 15°S. 74°W. Depth 70 km.? (Pasadena).

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

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Huancayo		3·6	350	i 1 6	+ 8	i 1 53	S*	—	—	—
La Paz		6·3	101	i 1 38k	+ 2	i 2 49	− 1	i 2 44	?	3·2
Bogota		20·1	1	e 4 46	+ 8	e 8 42	SS	i 5 7	PPP	e 11·1
La Plata		24·4	144	5 12	− 9	9 32	− 7	9 26?	P_cP	11·8
Balboa Heights		24·9	349	e 5 29	+ 3	e 10 7	+20	—	—	—
Rio de Janeiro		30·5	108	e 6 28	+11	e 11 31	+13	e 10 43	?	e 16·1
Fort de France		32·9	26	e 6 35	− 3	—	—	i 13 29	SS	e 20·5
San Juan		34·8	15	e 6 56	+ 2	i 12 20	− 5	i 6 59	?	i 14·8
Bermuda		48·6	12	e 8 47	0	e 15 47	− 2	e 19 34	SS	e 26·4
Cape Girardeau	N.	54·5	346	e 9 30	− 2	e 17 6	− 4	—	—	—
Philadelphia		55·3	0	i 9 37	− 1	i 17 21	0	e 21 14	SS	e 26·4
St. Louis		55·9	345	e 9 40	− 2	i 17 25	− 4	i 9 54	pP	—
Pittsburgh	N.W.	56·0	355	i 9 43	0	i 17 23	− 7	—	—	—
Florissant		56·1	345	e 9 42	− 1	i 17 27	− 5	—	—	—
Fordham		56·2	2	i 9 45	+ 1	i 17 33	0	—	—	—
Harvard		57·9	4	i 9 55	− 1	e 21 48	SS	e 18 57	?	e 27·1
Chicago		58·4	348	e 9 56	− 4	e 17 55	− 7	—	—	e 27·1
Tucson		58·9	324	i 10 2	− 1	e 18 26	PS	i 11 1	P_cP	e 29·2
Ottawa		61·1	359	10 14	− 4	18 32	− 5	22 50?	SS	e 29·1
Seven Falls		62·5	3	—	—	e 18 52	− 2	—	—	26·1

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
La Jolla		63·1	320	i 10 33 a	+ 1	—	—	—	—	—
Palomar	z.	63·2	321	i 10 33 a	+ 1	—	—	i 10 52	PcP	—
Riverside	z.	64·1	321	i 10 38 a	0	—	—	i 10 55	PcP	—
Mount Wilson		64·5	321	i 10 41 a	0	—	—	i 13 2	PP	—
Pasadena		64·6	321	i 10 40 a	− 1	i 19 24	+ 3	i 11 0	PcP	e 31·1
Rapid City		64·9	337	e 11 12	PcP	e 19 51	PS	—	—	—
Santa Barbara		65·7	320	e 10 48	0	—	—	—	—	—
Haiwee		65·8	323	i 10 49 a	0	—	—	—	—	—
Logan		66·6	331	i 10 54	0	e 19 43	− 2	i 11 8	PcP	28·6
Tinemaha		66·6	323	i 10 55 a	+ 1	—	—	—	—	—
Santa Clara	z.	69·0	321	i 11 11	+ 2	—	—	—	—	—
Bozeman		69·3	334	e 11 6	− 5	e 20 16	− 1	—	—	e 34·3
Berkeley		69·5	321	e 11 5	− 7	i 20 32	+12	—	—	—
Saskatoon		73·0	340	—	—	e 20 59	− 1	30 32	?	38·1
Victoria		77·2	329	11 58	+ 1	21 49	+ 2	—	—	37·1
San Fernando		82·7	49	e 12 30	+ 3	e 22 48	+ 4	—	—	40·1
Granada		84·9	49	i 12 38	0	i 23 5	− 1	13 2	pP	42·9
Almeria		85·6	50	e 12 37	− 4	i 23 10	− 3	29 9	SS	45·1
Toledo		85·6	47	e 12 39	− 2	i 23 16	+ 3	—	—	—
Sitka		88·3	331	—	—	e 22 56	[−26]	e 24 40	PS	e 43·2
Kew		92·6	37	—	—	e 24 8	{+ 7}	e 25 32	PS	e 47·1
Clermont-Ferrand		92·7	44	—	—	e 24 8	{+ 6}	e 25 57	PPS	e 43·5
Christchurch		95·0	222	—	—	e 23 36	[−25]	e 25 53	PS	43·7
Uccle		95·1	38	—	—	e 23 58	[− 4]	e 25 58	PS	e 42·1
De Bilt		96·0	37	e 17 26	PP	e 26 8?	PS	e 31 8?	SS	e 41·1
Stuttgart		97·6	41	e 13 35	− 3	e 24 35	{− 2}	e 26 20	PS	e 42·1
Bergen	E.	98·5	29	e 28 28	?	—	—	—	—	e 48·7
Prague		101·2	41	—	—	e 24 26?	[− 7]	—	—	—
Upsala		104·5	31	—	—	e 27 8?	PS	e 45 8?	Q	e 47·1
Helwan		111·2	64	18 56	[+20]	e 35 2	SSP	i 19 14	PP	—
Riverview		114·3	220	e 19 32	PP	e 29 12	PS	—	—	e 52·7
New Delhi	N.	150·9	58	e 20 4	[+15]	—	—	—	—	—
Calcutta	N.	162·5	63	e 25 7	PP	e 31 5	{−21}	e 28 58	PPP	—

Additional readings :—
Bogota i =4m.49s., e =9m.15s.
La Plata PZ =5m.24s.
Philadelphia e =9m.50s., eS =17m.16s., e =23m.38s.
St. Louis isSE =17m.50s., eE =18m.48s.
Tucson e =12m.11s., iPPP =13m.40s., e =25m.53s.
Palomar ePKP,PKPZ =39m.40s.
Mount Wilson ePKP,PKPZ =39m.29s.
Pasadena iE =10m.55s., ePKP,PKPZ =39m.30s.
Logan e =11m.47s. and 21m.0s.
Berkeley ePN =11m.10s., iPZ =11m.14s.
Granada sP =13m.8s.
Almeria PP =16m.3s., PPP =18m.7s., SKS =23m.0s.
Sitka e =36m.38s.
Kew eZ =43m.8s.?
Christchurch e =30m.39s. and 35m.51s.
Uccle eN =29m.38s.
Stuttgart ePP?Z =17m.32s.?, eSS? =31m.32s.?
Helwan iZ =21m.30s., eZ =23m.8s., iN =27m.26s.
Long waves were also recorded at Colombo, Wellington, Auckland, Arapuni, Bucharest, Stonyhurst, Paris, and Potsdam.

Nov. 16d. Readings also at 0h. (near Mizusawa), 1h. (Ksara and near Mizusawa), 3h. (Bogota), 4h. (Fort de France and near Bogota), 9h. (Riverview, La Paz, near Tashkent and Tchimkent), 15h. (Fort de France), 16h. (Riverview, Sydney, and Brisbane), 17h. (De Bilt and Pasadena), 18h. (Pittsburgh, Tucson, near Santa Clara, Fresno, and Branner), 21h. (Harvard, near Lick, Santa Clara, Branner, San Francisco, and Berkeley), 22h. (near Branner and Berkeley),

Nov. 17d. 11h. 28m. 39s. Epicentre 33°·9N. 116°·7W.

Felt at San Gorgonio Pass.
Epicentre 33°55′N. 116°42′W. Magnitude 4.5 (Pasadena).

$A = -·3737$, $B = -·7431$, $C = +·5552$; $\delta = +10$; $h = +1$;
$D = -·893$, $E = +·449$; $G = -·249$, $H = -·496$, $K = -832$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Riverside		0·5	280	i 0 14a	0	i 0 22	− 1	—	—	—
Palomar	z.	0·6	194	i 0 16k	+ 1	—	—	—	—	—
La Jolla		1·1	204	i 0 24k	+ 2	i 0 39	0	—	—	—
Mount Wilson		1·2	287	i 0 24a	0	i 0 40	− 1	—	—	—
Pasadena		1·3	282	i 0 25a	0	i 0 41	− 3	—	—	—
Haiwee	z.	2·5	335	i 0 41	− 2	—	—	—	—	—
Santa Barbara		2·6	282	i 0 44	0	—	—	—	—	—
Tinemaha		3·4	339	i 0 55	0	—	—	—	—	—
Fresno	N.	3·8	319	e 1 1	0	i 1 59	S*	i 1 12	P*	—
Tucson		5·2	107	e 1 19	− 2	i 2 43	S*	e 1 29	P*	e 3·6

Tucson also gives i = 1m.43s.

Nov. 17d. 14h. 57m. 25s. Epicentre 33°·0N. 137°·8E. Depth of focus 0·050.
(as on 1942, April 20d.).

Intensity V at Tateyama; IV at Yokohama, Tokyo, Kakioka, Tukubasan; II-III at Kumagaya and Miyako.
Epicentre 33°·0N. 138°·0E. Radius of macroseismic area 300km. Depth 320km.
Seismological Bulletin of the Central Meteorological Observatory, Japan, for the year 1943, Tokyo 1950, pp. 50-51, macroseismic chart, p. 50.

$A = -·6225$, $B = +·5644$, $C = +·5421$; $\delta = -7$; $h = +1$;
$D = +·672$, $E = +·741$; $G = -402$, $H = +·364$, $K = -·840$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Omaesaki	1·6	12	1 2	+13	1 42	+15	—	—	—
Hatidyozima	1·7	87	0 49a	− 1	1 27	− 2	1 31	pP	—
Shizuoka	2·0	14	0 52k	0	1 32	0	—	—	—
Kameyama	2·2	329	0 53a	0	1 36	+ 1	—	—	—
Osima	2·2	37	0 53	0	1 33	− 2	—	—	—
Nagoya	2·3	342	0 54a	0	1 37	+ 1	—	—	—
Osaka	2·3	311	0 55	+ 1	1 40	+ 4	—	—	—
Misima	2·4	24	0 54	− 1	1 37	0	—	—	—
Wakayama	2·5	299	0 53a	− 2	1 37	− 2	—	—	—
Gihu	2·6	340	0 56	0	1 40	0	—	—	—
Hunatu	2·6	18	0 57a	+ 1	1 41	+ 1	—	—	—
Hikone	2·7	330	0 58	+ 1	1 41	− 1	—	—	—
Kohu	2·7	14	0 58k	+ 1	1 42	0	—	—	—
Kyoto	2·7	320	0 57k	0	1 41	− 1	—	—	—
Kobe	2·8	308	0 58	0	1 43	0	—	—	—
Sumoto	2·8	299	0 57a	− 1	1 41	− 2	—	—	—
Yokohama	2·9	32	0 47k	−12	1 29	−16	—	—	—
Tokyo	3·2	31	0 58	− 4	1 42	− 8	—	—	—
Toyooka	3·5	316	1 4a	0	1 56	+ 1	—	—	—
Kôti	3·6	279	1 6	+ 1	1 58	+ 1	—	—	—
Nagano	3·7	5	1 6a	0	1 57	− 1	—	—	—
Toyama	3·7	353	1 9	+ 3	2 1	+ 3	—	—	—
Tukubasan	3·7	30	1 5k	− 1	1 53	− 5	—	—	—
Tyosi	3·7	42	1 5	− 1	1 54	− 4	—	—	—
Kakioka	3·8	31	1 5k	− 2	1 52	− 8	—	—	—
Utunomiya	3·9	26	1 7k	− 1	1 57	− 5	—	—	—
Mito	4·0	33	1 7k	− 2	1 57	− 7	—	—	—
Wazima	4·4	351	1 12a	− 2	2 13	+ 2	—	—	—
Hirosima	4·7	288	1 18a	+ 1	2 18	+ 1	—	—	—
Onahama	4·7	33	0 57	−20	1 53	−24	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Aikawa		5·0	4	1 17	− 3	2 16	− 7	—	—	—
Hamada		5·2	294	0 47	?	1 53	−34	—	—	—
Hukusima		5·2	24	1 20	− 2	2 22	− 5	—	—	—
Miyazaki		5·5	260	1 17	− 9	2 24	− 9	—	—	—
Sendai		5·8	25	1 26	− 3	2 30	− 9	—	—	—
Izuka		6·0	278	1 29a	− 2	2 45	+ 2	—	—	—
Kumamoto		6·0	270	1 38a	+ 7	2 51	+ 8	—	—	—
Hukuoka		6·2	277	1 34a	0	2 51	+ 4	—	—	—
Kagosima		6·3	259	1 37	+ 2	2 56	+ 7	—	—	—
Unzendake		6·4	269	2 18	+42	3 34	+42	—	—	—
Mizusawa		6·7	23	e 1 40	0	2 52	− 6	—	—	—
Akita		6·9	15	1 58	+16	2 57	− 5	—	—	—
Miyako		7·4	26	1 49a	+ 1	3 10	− 3	—	—	—
Tomie		7·6	269	1 52	+ 2	3 15	− 2	—	—	—
Hatinohe		8·1	21	1 53	− 3	3 20	− 8	—	—	—
Aomori		8·2	16	1 56a	− 1	3 31	+ 1	—	—	—
Nake		8·5	239	2 1	0	—	—	—	—	—
Mori		9·4	13	2 15	+ 3	3 59	+ 3	—	—	—
Keizyo		9·9	300	2 19k	+ 1	4 9	+ 3	—	—	—
Zinsen		10·2	299	2 21k	0	4 16	+ 3	—	—	—
Sapporo		10·5	14	2 25	0	4 24	+ 5	—	—	—
Naha		11·2	235	2 34	+ 1	4 22	−12	—	—	—
Vladivostok		11·2	336	i 1 31	−62	e 2 59	?	—	—	—
Calcutta	N.	44·6	270	e 7 33	− 7	i 13 44	− 5	e 7 55	pP	—
Almata		48·0	301	8 7	+ 1	—	—	—	—	—
New Delhi		51·6	282	i 8 32	− 2	i 15 20	− 6	17 37	sS	—
Andijan		51·8	298	e 8 35	0	i 15 32	+ 3	—	—	—
Tashkent		54·0	300	i 8 52	+ 1	i 15 59	+ 1	—	—	—
College		54·1	31	e 8 48	− 4	e 16 0	0	e 18 1	sS	e 25·2
Hyderabad	E.	55·2	268	—	—	16 12	− 2	(18 12)	sS	18·2
Sverdlovsk		56·3	320	i 9 5	− 2	i 16 26	− 2	—	—	—
Bombay		59·3	273	i 9 26	− 2	i 17 5	− 2	10 39	sP	—
Colombo	E.	59·5	257	9 27	− 2	17 4	− 6	—	—	—
Riverview		67·7	168	i 10 21a	− 1	i 18 49	− 1	i 19 51	pS	—
Moscow		68·8	323	10 28	− 1	19 0	− 3	19 48	SP	—
Scoresby Sund		75·8	354	i 11 10	0	i 20 23	+ 1	22 49	sS	—
Copenhagen		80·1	332	11 33	0	i 21 5	− 2	12 33	pP	—
Tinemaha		80·6	52	i 11 35a	0	e 21 12	0	e 14 20	PP	—
Ksara		81·0	304	e 11 41?	+ 3	e 21 18	+ 2	—	—	—
Bucharest		81·1	317	e 11 38	0	i 21 16	− 1	i 21 13	?	34·6
Santa Barbara		81·1	55	i 11 38a	0	e 21 17	0	—	—	—
Haiwee		81·3	53	i 11 39a	0	e 21 19	0	i 13 17	pP	—
Mount Wilson		82·3	54	i 11 44a	0	e 21 30	+ 1	—	—	—
Pasadena		82·3	54	i 11 43a	− 1	i 21 29	0	i 12 44	pP	—
Potsdam		82·3	330	—	—	i 21 31	+ 2	—	—	e 46·6
Riverside		82·9	54	i 11 47a	0	e 40 57	SKP,P′	e 13 2	pP	—
Prague		83·3	327	—	—	e 21 39?	0	e 22 38	sS	—
La Jolla		83·7	55	i 11 51a	0	e 21 40	− 3	e 13 19	pP	—
Palomar	Z.	83·7	54	i 11 51a	0	i 41 1	SKP,P′	—	—	—
Sofia		83·7	317	e 11 53	+ 2	i 21 40	− 3	—	—	—
Jena		83·9	329	i 11 52	0	i 21 43	− 2	e 13 29	pP	—
Rapid City		85·3	39	i 12 36	+37	e 22 25	+27	i 22 36	PS	—
De Bilt		85·7	333	i 21 49	?	i 22 1	− 1	e 27 35?	SS	e 42·6
Helwan		86·5	303	i 12 3a	− 2	21 53	−17	12 49	pP	—
Stuttgart		86·6	329	e 12 5	0	i 22 11	0	e 13 3	pP	—
Triest		86·8	324	—	—	i 21 56	−16	—	—	—
Uccle		87·0	333	e 21 55	?	i 22 11	− 3	i 23 14	pS	—
Strasbourg		87·3	329	e 21 54	?	i 22 12	− 5	—	—	—
Zürich		87·9	328	e 12 10	− 2	—	—	e 21 35	?	—
Basle		88·2	329	e 12 12	− 1	e 22 25	0	—	—	—
Tucson		88·4	52	i 12 13	− 1	e 22 18	− 9	i 15 46	PP	e 43·2
Neuchatel		88·9	329	e 12 37	+21	—	—	—	—	—
Milan		89·1	327	e 21 59	?	—	—	—	—	—
Florissant		95·7	36	e 12 45	− 3	e 22 46	[− 2]	e 23 28	sS	—
St. Louis		95·9	36	i 12 49	0	i 22 49	[0]	e 23 33	sS	e 35·9
La Paz	Z.	151·4	53	i 19 8a	[+ 3]	—	—	22 58	PP	—

For Notes see next page.

NOTES TO NOVEMBER 17d. 14h. 57m. 25s.

Additional readings :—
Sendai 2m.34s.
Calcutta iSSN =16m.39s.
Bombay sPE =10m.43s., ePPN =11m.35s., isSE =18m.37s., SSN =20m.55s., SSE = 20m.59s.
Haiwee eSKP,PKP =41m.9s.
Pasadena iZ =13m.40s., iPPZ =14m.57s.
Palomar iZ =13m.43s., eZ =14m.52s.
Helwan iZ =13m.25s., eZ =15m.32s. and 17m.23s., eNZ =22m.35s., SS?Z =23m.14s.
Stuttgart esP?Z =13m.25s., eSKS? =21m.54s., eS? =23m.0s., esS? =24m.38s., eSS? = 28m.0s.
Uccle iNZ =21m.58s., eE =28m.4s.
Milan i =22m.33s.
Florissant ePPZ =16m.43s.
St. Louis iPPZ =16m.46s., eE =30m.19s.

Nov. 17d. Readings also at 7h. (Fresno, Berkeley, and Branner), 8h. (Riverside, Haiwee, Palomar, Tucson, Granada, Stuttgart, near Zürich, Basle, and Chur), 9h. (near Berkeley), 10h. (near Granada and Almeria), 12h. (Ksara, De Bilt, Triest, Stuttgart (2), Bucharest (2), Sofia (2), and near Mizusawa), 13h. (Sofia, near Focsani, Campulung, Bucharest, and near Mizusawa), 14h. (Copenhagen and near Granada), 18h. (Riverside, Palomar, Mount Wilson, Pasadena, Tinemaha and Brisbane), 20h. (New Delhi and Riverview).

Nov. 18d. 18h. South-West Pacific.

Sydney e =38m.30s.?
Suva i =40m.18s., e =42m.27s.
Brisbane iPZ =41m.31s., iSN =45m.2s.
Wellington PZ =43m.5s., iZ =43m.25s., SZ =48m.20s., RZ =52m.
Auckland S =46m.25s.
Riverview iSN =46m.54s., eLEN =49·3m.
Mount Wilson iPZ =50m.1s.
Pasadena iPZ =50m.1s., eZ =53m.24s., eLZ =76m.
Riverside iPZ =50m.4s.a.
Haiwee iPZ =50m.5s.
Palomar iPZ =50m.5s.a.
Tinemaha iPZ =50m.6s.a.
Tucson e =50m.27s. and 54m.13s., eL =80m.24s.
Stuttgart eZ =56m.46s.
Clermont-Ferrand iPKP? =57m.0s.
Calcutta iN =60m.33s.
Long waves were also recorded at Arapuni, Harvard, and De Bilt.

Nov. 18d. 21h. 50m. 41s. Epicentre 20°·5S. 64°·0W. Depth of focus 0·030.
(as on 1942 July 21d.).

$A = +·4110$, $B = -·8425$, $C = -·3481$; $\delta = -10$; $h = +5$;
$D = -·899$, $E = -·438$; $G = -·153$, $H = +·313$, $K = -·937$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
La Paz	Z.	5·6	314	i 1 40a	+17	2 30	+ 2	—	—	2·8
Huancayo		13·8	306	i 3 9	+ 1	i 5 44	+ 8	—	—	e 6·8
La Plata		15·3	161	i 3 23	− 3	i 6 12	+ 3	3 41	PP	8·1
Rio de Janeiro	N.	19·5	100	e 4 19	+ 7	e 7 45	+10	—	—	—
Bogota		26·9	338	i 5 27	+ 5	—	—	e 6 26	PP	—
San Juan		38·7	357	e 8 43	PP	e 12 45	+ 1	e 10 12	?	e 14·4
St. Louis		63·8	337	e 10 9	− 1	e 18 20	− 6	e 10 42	pP	—
Florissant		64·0	337	e 10 12	0	e 18 20	− 8	e 20 29	sS	—
Tucson		69·0	319	i 10 42	− 1	—	—	i 11 2	pP	—
La Jolla		73·5	315	i 11 9	− 1	—	—	—	—	—
Palomar	Z.	73·6	316	i 11 10k	0	—	—	i 12 28	pP	—
Riverside		74·3	316	i 11 14	0	—	—	e 12 38	pP	—
Mount Wilson		74·9	316	i 11 17k	− 1	—	—	e 12 35	pP	—
Pasadena		74·9	316	i 11 16k	− 2	i 22 41	?	—	—	—
Haiwee		76·0	318	i 11 24k	0	e 22 57	?	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Santa Barbara		76·1	315	e 11 24	− 1	—	—	—	—	—
Tinemaha		76·8	318	i 11 28k	0	e 23 3	?	i 12 38	pP	—
Uccle		92·8	36	—	—	i 23 1	[+ 2]	e 24 47	SP	—
Jena	N.	97·0	39	e 19 47	PPP	—	—	—	—	—
Copenhagen		99·4	33	—	—	23 36	[+ 3]	—	—	—
Bucharest		104·1	48	—	—	i 23 56	[+ 1]	—	—	—
Bombay	E.	139·4	84	—	—	i 24 30	[−17]	e 28 17	SKKS	—

Additional readings :—
Huancayo i = 4m.0s., e = 4m.23s.
La Plata Z = 4m.0s., iSE = 5m.19s.?, SN = 5m.27s., SZ = 5m.56s.
St. Louis epPZ = 11m.20s., eS_cSE = 19m.33s., esS = 20m.23s., esS_cSE = 21m.55s.
Florissant eS_cSE = 19m.34s., esS_cSE = 21m.56s.
Pasadena eZ = 12m.31s., and 13m.1s.

Nov. 18d. Readings also at 1h. (near Andijan and Tashkent), 4h. (Bucharest), 7h. (Tinemaha and Tucson), 9h. (near Lick), 10h. (near Chur), 12h. (Bucharest, Sofia, Prague, Stuttgart, De Bilt, and Uccle), 18h. (Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, Auckland, Wellington, Christchurch, Arapuni, Suva, and near Apia), 20h. (near Mizusawa), 21h. (Stuttgart), 22h. (near Apia).

Nov. 19d. Readings at 0h. (Bogota, La Paz, Tucson (2), Mount Wilson (2), Riverside (2), and Palomar), 1h. (Bogota), 2h. (Mount Wilson, Pasadena, Palomar, Tucson, Riverside, and Tinemaha), 3h. (Andijan, Tashkent, Sverdlovsk, Moscow, Bucharest, Stuttgart, and De Bilt), 5h. (La Paz, La Plata, St. Louis, Haiwee, Mount Wilson, Tucson, Pasadena, Palomar, Riverside, and Tinemaha), 6h. (near Erevan), 14h. (near Sofia), 20h. (Mount Wilson, Palomar, Tucson, and Riverside), 23h. (La Paz, Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Haiwee, Tucson, Suva, Arapuni, Auckland, Christchurch, Wellington, Riverview, near Apia and Mizusawa).

Nov. 20d. 7h. Undetermined shock.
Apia iP = 7m.52s., iS = 8m.12s.
Suva e = 9m.47s., 11m.29s., and 11m.49s.
Auckland P = 12m.35s., PP = 13m.40s., S = 16m.55s., L = 19m.
Wellington P?Z = 12m.44s., RZ = 23m.?.
Christchurch e = 15m.6s. and 18m.9s., L = 21m.28s.
Mount Wilson iPZ = 18m.44s.
Pasadena iPNZ = 18m.45s., iZ = 18m.59s., eLZ = 43m.
Palomar iPZ = 18m.48s.
Riverside ePZ = 18m.48s.
Haiwee eP = 18m.54s.
Tinemaha iPZ = 18m.54s.
Arapuni S? = 19m.0s.
Tucson eP = 19m.8s., e = 19m.32s., eL = 46m.31s.
Harvard e = 49m.13s. and 50m.13s., eL = 67m.
Long waves were also recorded at Riverview and De Bilt.

Nov. 20d. 8h. 25m. 25s. Epicentre 16°·8N. 106°·1W. (as on 1940 May 12d.).

A = −·2656, B = −·9203, C = +·2872 ; δ = −2 ; h = +5 ;
D = −·961, E = +·277 ; G = −·080, H = −·276, K = −·958.

		Δ	Az.	P.	O−C.	S.	O−C.	L.
		°	°	m. s.	s.	m. s.	s.	m.
Tucson		16·0	345	i 3 46	− 2	e 5 51	−55	e 7·1
Palomar	Z.	19·1	332	i 4 28	+ 1	—	—	—
Riverside	Z.	19·9	331	e 4 34	− 2	—	—	—
Mount Wilson	Z.	20·4	331	i 4 43	+ 2	—	—	—
Pasadena		20·4	331	i 4 42	+ 1	—	—	e 10·0
Santa Barbara	Z.	21·4	329	e 4 58	+ 7	—	—	—
Haiwee		22·5	334	e 4 58	− 4	—	—	—
Tinemaha		22·9	335	e 5 8	+ 2	—	—	—
Cape Girardeau	N.	25·1	32	e 5 29	+ 1	—	—	—
St. Louis		25·8	29	i 5 35	+ 1	e 10 8	+ 6	e 13·3
Florissant		25·9	29	e 5 34	− 1	e 10 13	+ 9	e 13·5

Long waves were also recorded at La Paz.

Nov. 20d. 10h. 1m. 52s. Epicentre 36°·9N. 28°·8E. (as on 15d.).

Felt in the south of Turkey and at Dalaman.
Epicentre as adopted (Strasbourg).
Bulletin météorologique, séismique et magnétique de l'Observatoire d'Istanbul 1948, p.45.

$A = +·7025$, $B = +·3862$, $C = +·5978$; $\delta = +2$; $h = -2$;
$D = +·482$, $E = -·876$; $G = +·524$, $H = +·288$, $K = -·802$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Istanbul		4·2	2	1 16	P*	2 15	S*	2 28	S_g	—
Ksara		6·6	116	e 1 40	− 1	3 30	S*	—	—	—
Sofia		7·2	326	e 1 49	0	3 8?	− 5	e 2 29	P_g	4·0
Helwan		7·3	162	i 1 46k	− 4	3 8	− 7	2 2	P*	—
Bucharest		7·8	346	e 2 3	+ 5	e 3 26	− 2	e 2 16	P*	—
Campulung		8·8	343	e 3 20	?	—	—	—	—	4·6
Focsani		8·9	353	e 3 2?	?	—	—	e 3 14?	?	5·4
Belgrade		10·1	324	e 2 46	PPP	e 4 8	−17	e 3 2	?	e 5·5
Florence		15·0	303	i 3 36a	+ 1	i 6 42	SS	i 3 46	PP	i 7·7
Prague		16·7	326	4 1k	+ 4	7 20	SS	—	—	e 9·1
Milan		17·0	306	i 4 10	+ 9	7 24	SS	—	—	9·5
Chur		17·4	309	e 4 6	0	e 7 33	SS	—	—	—
Cheb		17·7	324	e 4 13	+ 3	e 7 38	SS	—	—	e 11·1
Zürich		18·2	312	e 4 15k	− 1	e 7 49	+12	—	—	—
Stuttgart		18·6	316	i 4 19k	− 2	i 7 53	+ 7	—	—	e 10·1
Jena		18·7	325	i 4 21	− 1	e 7 50?	+ 2	e 8 0	SS	e 8·6
Basle		18·9	312	e 4 24	0	e 8 4	+11	—	—	—
Potsdam		19·0	329	i 4 29	+ 3	i 8 5	+10	i 8 11	SS	11·1
Neuchatel		19·1	311	e 4 25	− 2	e 8 8	+11	—	—	—
Strasbourg		19·3	315	i 4 21?	− 8	8 5?	+ 3	i 6 13?	?	e 11·4
Moscow		19·7	14	4 36	+ 2	8 17	+ 7	—	—	—
Clermont-Ferrand		21·2	302	i 4 48	− 1	i 8 46	+ 5	i 5 9	PP	e 11·6
Copenhagen		21·8	335	e 4 57	+ 1	8 57	+ 5	—	—	—
Uccle		22·3	316	i 5 1a	0	e 9 5	+ 3	i 9 10	?	e 12·1
De Bilt		22·5	321	i 5 5a	+ 3	i 9 12	+ 7	e 7 2	?	e 12·1
Paris		22·5	310	i 5 1	− 1	—	—	—	—	12·1
Upsala		24·1	345	e 5 26	+ 8	e 9 44	+10	—	—	—
Almeria		24·9	280	i 5 24	− 2	9 55	+ 8	5 59	PP	13·1
Kew		25·2	315	i 5 27	− 2	i 10 10	+18	i 10 59	SS	e 12·3
Granada		25·8	281	i 5 32	− 2	—	—	i 5 44	?	—
Toledo		25·8	287	e 5 31	− 3	e 10 3	+ 1	—	—	—
Stonyhurst		27·4	319	—	—	e 10 31	+ 3	i 11 35	SS	i 13·8
San Fernando	E.	28·0	280	e 7 50	?	—	—	—	—	e 13·8
Sverdlovsk		29·1	36	6 8	+ 4	i 10 55	− 1	—	—	—
Tashkent		31·5	68	6 31	+ 5	—	—	—	—	—
New Delhi		41·2	86	i 7 48	0	e 13 40	−22	9 22	PP	—
Bombay		42·4	102	e 7 59	+ 1	e 14 27	+ 7	9 41	PP	—
Scoresby Sund		42·8	337	—	—	14 29	+ 3	17 44?	SS	24·1

Additional readings :—
Istanbul P_g = 1m.40s.
Bucharest eN = 2m.49s., eE = 3m.5s., eS?E = 3m.33s., iS*?N = 3m.57s., iS_g?E = 4m.19s.
Florence iSSN = 7m.8s.
Jena eEN = 5m.26s.?, eSE = 7m.56s.
Clermont-Ferrand i = 5m.36s.
Almeria sP = 6m.11s., PP = 6m.22s., P_cP = 8m.29s., SS = 11m.26s., SSS = 11m.47s.
Granada i = 6m.8s.
Stonyhurst iPS = 10m.46s., iS_cS = 13m.4s.
Bombay PPPN = 10m.8s., SSN = 17m.30s., SSSN = 18m.26s.
Long waves were also recorded at Bacau and Bergen.

Nov. 20d. 18h. 57m. 0s. Epicentre 4°·5S. 106°·5W.

A = −·2832, B = −·9559, C = −·0779; δ = +2; h = +7;
D = −·959, E = +·284; G = +·022, H = +·075, K = −·997.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Huancayo		31·7	106	e 6 28	+ 1	e 11 27	−10	e 7 22	PP	e 13·4
Tucson		36·8	355	e 7 19	+ 8	—	—	e 13 42	PcS	16·7
Palomar	z.	38·9	347	i 7 28	− 1	—	—	—	—	—
La Paz	z.	39·5	110	e 8 0	+26	—	—	(e 16 30)	SS	e 16·5
Riverside		39·6	346	i 7 35	0	—	—	—	—	—
Mount Wilson		40·0	346	i 7 39	+ 1	—	—	—	—	—
Pasadena		40·0	346	e 7 37	− 1	i 13 57	+13	—	—	i 17·5
Santa Barbara	z.	40·7	344	e 7 45	+ 1	—	—	—	—	—
Haiwee		41·8	347	e 7 53	0	—	—	—	—	—
Tinemaha	z.	42·8	347	e 8 2	+ 1	—	—	—	—	—
Cape Girardeau	N.	44·5	20	e 8 15?	0	e 14 45	− 6	—	—	—
Salt Lake City		45·3	354	—	—	e 15 10	+ 8	—	—	e 23·5
St. Louis		45·5	18	e 8 19	− 4	e 15 3	− 2	(e 18 12)	SS	e 18·2
Florissant		45·6	18	e 8 22	− 2	e 15 4	− 2	(e 18 32)	SS	e 18·5
San Juan		45·8	59	e 8 56	+31	e 15 53	PPS	—	—	e 21·5
Ukiah		46·1	342	—	—	e 15 21	+ 7	—	—	e 21·1
Logan		46·3	355	e 8 25	− 4	e 15 22	+ 6	e 9 3	?	e 21·9
Rapid City		48·4	4	e 7 44	−62	e 14 52	−54	—	—	e 23·4
Christchurch		80·3	227	—	—	e 22 22	+ 2	e 27 30	SS	37·6

Long waves were also recorded at De Bilt, Bozeman, Harvard, Honolulu, Arapuni, Auckland, Wellington, and Riverview.

Nov. 20d. 20h. 1m. 56s. Epicentre 4°·5S. 106°·5W. (as at 18h.).

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Huancayo		31·7	106	e 6 27	0	e 11 31	− 6	e 7 10	PP	e 13·4
Tucson		36·8	355	e 7 10	− 1	—	—	e 8 32	PP	e 18·4
Palomar	z.	38·9	347	i 7 42	+13	—	—	—	—	—
Riverside	z.	39·6	346	e 7 34	− 1	—	—	—	—	—
Mount Wilson	z.	40·0	346	i 7 39	+ 1	—	—	—	—	—
Pasadena		40·0	346	e 7 38	0	—	—	i 7 53	?	e 17·1
Tinemaha	z.	42·8	347	e 7 54	− 7	—	—	—	—	—
St. Louis		45·5	18	e 8 19	− 4	e 15 1	− 4	—	—	e 18·6

Tucson gives also e = 7m.15s.
Long waves were also recorded at La Paz.

Nov. 20d. Readings also at 0h. (Harvard), 1h. (La Paz, La Plata, and Huancayo), 7h. (Wellington), 9h. (Triest), 19h. (Auckland and Wellington), 20h. (near Mizusawa), 21h. (Stuttgart, Triest, and near Apia).

Nov. 21d. 19h. 41m. 49s. Epicentre 16°·3N. 98°·6W. (as on 1941, Nov. 26d.).

A = −·1436, B = −·9496, C = +·2789; δ = +15; h = +5;
D = −·989, E = +·150; G = −·042, H = −·276, K = −·960.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Oaxaca	z.	1·9	68	0 40	P_g	—	—	—	—	—
Puebla	N.	2·8	8	0 46	− 1	—	—	—	—	—
Tacubaya	z.	3·1	350	i 0 55	+ 4	—	—	—	—	—
Tucson		19·4	328	i 4 27	− 3	e 8 6	+ 2	i 4 53	PPP	i 10·0
Cape Girardeau	N.	22·4	18	e 4 57	− 5	8 38	−26	—	—	—
St. Louis		23·4	16	i 5 10	− 1	e 9 11	−10	i 5 19	pP	—
Florissant		23·6	16	e 5 11	− 2	e 9 23	− 2	e 9 40	sS	—
La Jolla		23·6	318	e 5 14	+ 1	—	—	—	—	—
Palomar	z.	23·7	321	i 5 16	+ 2	—	—	i 5 24	pP	—
Riverside		24·4	321	i 5 22	+ 1	—	—	i 5 32	pP	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Lincoln		24·5	3	e 8 40	PcP	—	—	—	—	e 14·3
Pasadena		25·0	321	i 5 26	− 1	e 9 59?	+10	—	—	e 13·0
Haiwee		26·2	324	i 5 36	− 2	—	—	—	—	—
Santa Barbara		26·2	319	e 5 29	− 9	—	—	e 5 45	pP	—
Bogota		26·7	113	e 6 3	+20	—	—	—	—	—
Tinemaha		27·1	324	e 5 44	− 2	—	—	—	—	—
Logan		27·8	339	e 6 1	+ 8	—	—	e 7 31	?	e 14·7
Rapid City		28·0	353	e 6 1?	+ 6	—	—	—	—	e 15·0
San Juan		31·0	80	e 7 26	PP	e 11 26	0	—	—	e 18·6
Bermuda		34·6	56	e 8 16	PP	—	—	e 11 28	?	e 18·3
Ottawa		34·8	28	e 6 52	− 2	—	—	—	—	23·2
Huancayo		36·4	139	—	—	e 13 4	+14	(e 15 41)	SSS	e 15·7
Uccle		85·5	39	e 12 41	0	e 23 19	+ 7	—	—	e 43·2
Clermont-Ferrand		86·4	43	e 12 45	0	—	—	—	—	—

Additional readings :—
Tucson i = 6m.32s.
St. Louis esSN = 9m.26s.
Long waves were also recorded at La Paz, De Bilt, Salt Lake City, Bozeman, Philadelphia, and Harvard.

Nov. 21d. Readings also at 0h. (Auckland), 2h. (near Apia), 3h. (near Fort de France), 8h. (near Stuttgart), 16h. (near Sofia, Bacau, Focsani, Bucharest, and Campulung), 17h. (Ksara), 18h. (Stuttgart, Helwan, and near Mizusawa), 21h. (Bombay, Calcutta, Riverside, Guadalajara, Merida, Tacubaya, Puebla, Oaxaca, and Tucson), 22h. (De Bilt).

Nov. 22d. Readings at 0h. (Auckland, Christchurch, and Wellington), 3h. (Prague), 5h. (Tananarive and near Fort de France), 7h. (Sofia), 16h. (near Mizusawa), 18h. (Andijan, Tashkent, near Sofia, and near Mizusawa), 19h. (Riverview).

Nov. 23d. 21h. 51m. 35s. Epicentre 24°·6N. 121°·1E. (as on 1938, June 16d.).

Rough.

$A = -\cdot4702$, $B = +\cdot7794$, $C = +\cdot4140$; $\delta = -5$; $h = +3$;
$D = +\cdot856$, $E = +\cdot517$; $G = -\cdot214$, $H = +\cdot354$, $K = -\cdot910$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ituhara		11·9	35	e 2 47	− 7	6 30	L	—	—	(6·5)
Hukuoka		12·1	40	2 50	− 7	—	—	—	—	—
Taikyu		13·0	28	3 7	− 2	—	—	—	—	—
Keizyo		13·9	20	2 1	?	—	—	—	—	8·9
Kôti		14·1	48	e 3 11	−12	7 20	L	—	—	(7·3)
Kobe		15·8	47	4 7	+22	7 48	L	—	—	(7·8)
Vladivostok		20·5	23	e 4 42	0	e 8 27	0	—	—	—
Calcutta		30·1	273	e 6 22?	+ 9	e 11 14	+ 2	e 13 16	SS	e 15·9
Irkutsk		30·4	339	e 6 15	− 1	—	—	—	—	—
New Delhi	N.	39·3	287	e 7 38	+ 6	i 13 27	− 7	9 5	PP	18·7
Kodaikanal	E.	43·8	260	e 8 3	− 6	—	—	—	—	—
Bombay		45·0	273	i 8 12	− 7	i 14 54	− 4	10 1	PP	25·0
Tashkent		45·9	305	8 34	+ 8	15 27	+16	—	—	—
Stuttgart		85·1	323	e 12 25?	−14	—	—	—	—	e 48·4

Additional readings :—
New Delhi PPPN = 9m.40s., SSN = 16m.22s.
Bombay eSE = 14m.57s., SSN = 17m.21s., SSE = 17m.25s., SSSEN = 18m.19s.
Long waves were also recorded at Riverview and other European stations.

Nov. 23d. Readings also at 0h. (Calcutta, Kodaikanal, and Bombay), 1h. (Mount Wilson, Riverside, Tinemaha, Tucson, and Palomar), 6h. (near Stuttgart, Basle, Zürich, Triest, and Chur), 7h. (Mount Wilson, Palomar, Tucson, and St. Louis), 10h. (near Mizusawa), 11h. (Riverview), 13h. (near Berkeley, Branner, and Lick), 21h. (Pehpei).

Nov. 24d. 13h. 17m. 13s. Epicentre 23°·0N. 122°·0E. (as on 1940, August 5d.).

$A = -\cdot4883$, $B = +\cdot7814$, $C = +\cdot3885$; $\delta = -4$; $h = +4$;
$D = +\cdot848$, $E = +\cdot530$; $G = -\cdot206$, $H = +\cdot329$, $K = -\cdot921$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Pehpei		15·5	299	e 2 12	?	5 54	?	e 2 59	?	7·4
Mizusawa		22·9	42	e 5 7	+ 1	9 18	+ 5	—	—	—
Calcutta	N.	31·0	276	i 6 33	+12	i 11 32	+ 6	14 23	SS	—
Dehra Dun	N.	39·8	291	e 8 0	+24	e 13 41	− 1	—	—	e 21·5
New Delhi		40·5	288	e 7 43	+ 1	e 13 42	−10	9 11	PP	19·2
Hyderabad	N.	41·1	271	—	—	13 55	− 6	17 31	SSS	20·2
Almata		42·2	311	e 8 3	+ 7	—	—	—	—	—
Colombo	E.	43·6	255	8 4	− 4	14 36	− 2	—	—	24·8
Kodaikanal	E.	44·4	262	i 8 7a	− 7	i 14 52	+ 3	—	—	—
Bombay		46·0	275	i 8 24k	− 3	i 15 5	− 7	10 5	PP	21·0
Tashkent		47·5	306	i 8 40	+ 2	i 15 34	0	—	—	—
Stalinabad		47·7	303	e 8 40	0	e 15 33	− 3	—	—	—
Sverdlovsk		55·4	325	9 31	− 7	i 17 18	− 4	—	—	—
Brisbane		58·5	148	i 9 55	− 5	e 17 51	−12	—	—	—
Riverview		63·0	153	i 10 30a	− 1	i 19 1	0	i 11 5	PcP	e 29·1
Sydney		63·0	153	e 10 23?	− 8	e 18 47	−14	—	—	—
Moscow		68·3	323	e 10 59	− 6	i 19 55	−11	—	—	—
College		69·5	27	e 11 8	− 4	e 20 17	− 3	e 24 43	SS	e 32·3
Ksara		74·5	300	e 11 41	− 1	e 21 19?	+ 2	—	—	—
Upsala		77·3	331	—	—	e 21 40	− 8	i 22 12	PS	e 35·8
Sitka		77·4	33	—	—	e 22 2	+13	—	—	e 34·4
Auckland		77·6	139	13 47?	?	21 52	+ 1	i 26 42	SS	39·8
Bucharest		78·3	314	e 11 59	− 4	e 21 53	− 6	14 45	PP	34·8
Arapuni		78·9	140	—	—	22 47	PS	—	—	33·8
Helwan		79·4	298	12 5	− 4	i 22 7	− 3	23 20	PPS	—
Wellington	Z.	80·6	143	12 54	+38	23 32	PPS	24 2	?	40·8
Sofia		80·8	313	e 12 14	− 3	e 22 20	− 5	23 0	PS	—
Christchurch		80·9	145	—	—	22 18	− 8	23 19	PS	40·1
Copenhagen		81·6	328	e 12 26	+ 5	22 34	+ 1	—	—	36·8
Belgrade		81·9	315	e 12 29	+ 6	e 22 31	− 5	e 32 25	PS	e 44·4
Prague		83·2	323	e 12 32	+ 3	e 22 45	− 4	—	—	e 38·8
Scoresby Sund		83·4	349	i 12 36	+ 6	—	—	—	—	—
Tananarive		83·8	246	22 35	?	23 8	+13	23 55	PS	34·7
Cheb		84·4	323	e 12 37	+ 1	e 23 18	+17	—	—	e 46·8
Jena		84·4	324	e 12 31	− 5	—	—	i 12 39	PcP	e 42·8
Triest		85·7	319	—	—	e 22 47	[−19]	—	—	e 41·8
Stuttgart		86·8	322	e 12 43	− 4	e 23 19	{+ 1}	e 44 17?	Q	e 47·0
De Bilt		87·2	327	e 12 47	− 2	e 23 27	− 1	—	—	e 39·8
Zurich		87·9	322	e 12 50	− 3	—	—	e 16 5	PP	—
Victoria		88·0	38	—	—	e 23 23?	[+ 2]	e 29 23	SS	47·8
Florence		88·2	318	i 12 59k	+ 5	i 23 43	+ 5	i 24 44	PS	i 43·2
Uccle		88·3	327	e 12 59	+ 4	e 23 35	− 4	29 22	SS	e 38·8
Basle		88·4	322	e 12 59	+ 4	e 23 57	+17	—	—	—
Milan	E.	88·6	320	13 14?	+18	—	—	—	—	43·3
Neuchatel		89·1	322	e 13 2	+ 4	—	—	—	—	—
Stonyhurst		89·8	331	i 19 3	PPP	—	—	i 33 39	SSS	43·1
Kew		90·3	328	i 23 55	S	(i 23 55)	− 2	e 34 9	SSS	e 40·8
Paris		90·5	325	e 12 47?	−18	—	—	—	—	e 45·8
Saskatoon		94·0	28	—	—	e 24 9	{− 2}	e 29 47?	?	41·8
Bozeman		96·4	35	e 16 2	?	e 24 6	[− 2]	e 25 58	PS	e 47·1
Tinemaha	Z.	97·6	45	e 13 45	+ 7	—	—	—	—	—
Logan		98·6	38	e 13 54	+12	—	—	e 17 32	PP	e 53·2
Salt Lake City		99·2	38	e 22 58	?	e 24 7	[−16]	—	—	e 54·3
Pasadena		99·4	47	e 13 45	− 1	e 32 11?	SS	i 17 45	PP	e 39·2
Almeria		100·7	318	12 27	?	—	—	17 4	PP	—
Granada		101·2	319	i 13 39	−15	e 25 19	−11	32 28	SS	50·5
San Fernando	E.	102·3	320	e 18 44	PP	—	—	—	—	51·8
Tucson		105·4	44	e 17 6	?	—	—	i 18 40	PP	e 49·0
Seven Falls		109·3	9	—	—	e 28 5?	PS	e 41 47?	?	e 47·8
Chicago		109·9	24	e 18 59	PP	e 28 27	PS	e 36 59	?	e 53·2

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		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ottawa		110·0	13	e 18 47?	[+14]	e 25 47?	{−18}	e 38 59?	SSS	50·8
Florissant		111·4	27	e 19 14	PP	e 28 54	PS	e 34 42	SS	—
Vermont		111·4	12	—	—	e 26 17	{+ 2}	e 28 42	PS	e 51·3
St. Louis		111·6	27	e 18 13	[−23]	e 25 17	[− 2]	e 28 49	PS	—
Fordham		114·8	13	e 19 44	PP	e 26 54	{+15}	e 28 54	PS	—
Bermuda		124·6	7	—	—	—	—	e 30 20	PS	e 54·1
San Juan		138·1	11	—	—	e 32 13	PS	e 40 50	SSP	e 65·0
Bogota		148·4	31	i 19 46	[+ 1]	—	—	—	—	—
Huancayo		160·2	59	e 20 27	PKP_2	e 31 32	{+19}	e 44 38	SS	e 54·5
La Paz		168·5	58	i 20 13	[+ 5]	i 26 57	[−14]	i 24 47	PP	79·8

Additional readings :—
Calcutta iN = 10m.5s. and 11m.0s.
New Delhi PPPN = 9m.36s., SSS = 16m.57s.
Bombay iE = 8m.39s., P_cPN = 9m.51s., P_cPE = 9m.54s., PPPEN = 10m.48s., SSE = 18m.21s., iN = 19m.5s., and 19m.59s.
Brisbane iZ = 10m.0s., iN = 19m.5s. and 20m.55s.
Riverview iSE = 18m.58s., iE = 20m.27s.
College eSS = 25m.4s.
Upsala eSE = 21m.45s., eN = 24m.24s., eSSS?E = 30m.47s.?, eN = 31m.47s.?, eE = 34m.32s.
Auckland SSS? = 31m.47s.?, Q? = 36m.52s.
Bucharest ePN = 12m.5s., eSN = 21m.43s., ePSE = 22m.12s.
Helwan iZ = 12m.11s., 12m.24s., and 13m.11s., eZ = 15m.15s., PPZ = 15m.31s., SN = 22m.29s., eZ = 22m.49s.
Wellington SSZ = 29m.47s., SSS = 33m.47s.?
Christchurch SS = 27m.22s., SSS = 31m.37s., Q = 33m.31s.
Belgrade ePPP = 17m.45s.
Tananarive E = 28m.30s., N = 29m.8s.
Jena eN = 15m.11s.? and 21m.11s.
Florence iPPZ = 16m.39s., eSKSN = 23m.19s., iSN = 23m.57s., iPPSE = 25m.11s., iSSE = 29m.23s.
Uccle SSE = 29m.28s.
Stonyhurst i = 22m.31s., 35m.14s., 36m.22s., 37m.16s., and 41m.12s.
Kew ePP?N = 26m.29s., eS?N = 32m.41s., eSS? = 37m.1s.; readings wrongly identified.
Pasadena eZ = 16m.32s. and 17m.31s., iZ = 20m.26s.
Almeria PP = 15m.37s.
Tucson e = 20m.27s. and 22m.55s.
Ottawa eE = 32m.29s.?, eN = 35m.47s.?
Vermont e = 34m.19s. and 40m.2s.
St. Louis ePPZ = 19m.17s., eN = 19m.25s., ePPPE = 21m.47s., eSKKSN = 26m.27s., eN = 32m.50s., eSSN = 34m.47s.
Fordham e = 22m.18s.
Bogota e = 20m.0s. and 22m.34s.
Huancayo e = 35m.8s.
La Paz iZ = 29m.29s., SKKS = 30m.50s.
Long waves were also recorded at Harvard, Lincoln, and at other European stations.

Nov. 24d. Readings also at 6h. (Brisbane, Riverview, and Sydney), 7h. (Vermont, Pasadena, and La Paz), 8h. (Stuttgart and San Fernando), 11h. (Rio de Janeiro), 13h. (Almeria and near Tortosa), 16h. (Pasadena, Riverside, Tucson, and Palomar), 18h. (Fort de France), 23h. (near Bogota (2)).

Nov. 25d. Readings at 3h. (near Bogota), 7h. (Pasadena, Mount Wilson, Riverside, Tinemaha, Palomar, and Riverview), 10h. (near Mizusawa), 14h. (Sofia), 18h. (near La Paz), 19h. (near Bogota), 22h. (Pasadena, Mount Wilson, Palomar, Tucson, Berkeley, Tananarive, and near Stalinabad), 23h. (La Paz).

Nov. 26d. 21h. 25m. 22s. Epicentre 0°·8S. 100°·6E. Depth of focus 0·010.
(as on 1941 March 3d.).

A = −·1839, B = +·9828, C = −·0138 ; δ = −9 ; h = +7 ;
D = +·983, E = +·184 ; G = +·003, H = −·014, K = −1·000.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Colombo	E.	22·1	291	4 54	+ 6	8 42	+ 2	—	—	—
Kodaikanal	E.	25·5	298	i 5 18k	− 3	i 9 27	−12	—	—	—
Calcutta	N.	26·1	334	i 5 30k	+ 4	i 9 50	+ 1	i 5 58	PP	—
Hyderabad	E.	28·4	311	6 28	PP	11 34	SS	7 5	PPP	—
Bombay		33·6	308	i 6 33	0	i 11 9	−38	7 10	PP	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m. s.			m.
New Delhi		36·8	325	i 7 1	+ 1	i 12 19	−17	7 40	pP		—
Dehra Dun	N.	37·7	328	e 7 13	+ 5	e 12 34	−16	—	—		—
Andijan		48·7	331	8 34	− 2	i 15 25	− 5	—	—		—
Stalinabad		48·9	328	i 8 34	− 4	i 15 26	− 7	—	—		—
Tashkent		50·6	330	i 8 50	− 1	15 56	− 1	15 49	?		—
Vladivostok		52·0	29	i 9 0	− 1	e 16 11	− 5	—	—		—
Mizusawa	N.	54·4	39	e 9 17	− 2	16 59	+11	—	—		—
Tananarive		55·0	248	e 9 41	+17	17 1	+ 5	—	—		22·9
Brisbane		56·8	123	i 9 34	− 2	i 17 14	− 6	e 21 9	SS		i 28·0
Riverview		57·6	131	i 9 39a	− 3	i 17 26	− 5	i 10 22	pP		—
Sydney		57·6	131	—	—	e 16 50	−41	—	—		—
Grozny		65·7	319	e 10 56	+20	—	—	—	—		—
Sverdlovsk		65·8	338	i 10 34	− 3	i 19 6	− 8	—	—		—
Ksara		69·6	306	e 11 2	+ 1	e 20 1	+ 1	—	—		—
Helwan	Z.	72·5	302	i 11 17k	− 1	20 26	− 7	13 51	PP		—
Moscow		75·8	329	11 38	+ 1	i 21 3	− 7	—	—		—
Christchurch		76·5	135	11 39	− 2	21 13	− 4	25 20	SS		32·6
Auckland		76·9	127	11 38?	− 5	21 23	+ 1	—	—		35·6
Wellington	Z.	77·6	132	11 48	+ 1	21 53	SP	12 23	pP		39·6
Arapuni		77·8	128	10 38?	−70	—	—	—	—		—
Bucharest		79·5	316	i 11 54a	− 4	i 21 43	− 7	e 14 48	PP		32·6
Upsala	E.	87·1	330	e 12 28	− 8	i 22 48	[− 3]	—	—		—
Prague		88·0	320	e 12 44	+ 4	22 55	[− 3]	—	—		—
Triest		88·4	316	e 12 38	− 4	i 22 56	[− 4]	—	—		—
Jena		88·8	321	i 12 50	+ 6	i 23 6	[+ 4]	—	—		—
Copenhagen		89·6	326	e 12 46a	− 2	23 4	[− 4]	—	—		—
Florence		90·1	314	i 13 0	+10	i 23 29	− 4	i 23 6	SKS		—
Chur		91·3	317	e 12 54	− 2	e 23 10	[− 7]	—	—		—
Stuttgart		91·5	319	i 12 55a	− 2	i 23 42	− 4	i 13 29	pP		—
Milan	E.	91·6	316	—	—	i 23 9?	[−10]	—	—		—
Zürich		92·0	317	e 12 56	− 3	e 23 14	[− 7]	—	—		—
Basle		92·6	318	e 13 0	− 2	e 23 19	[− 5]	—	—		—
Neuchatel		93·1	317	e 13 2	− 2	—	—	—	—		—
De Bilt		94·0	323	—	—	i 24 8	+ 1	i 23 29	SKS		—
Uccle		94·6	321	e 13 8?	− 3	i 23 30	[− 4]	e 16 56?	PP		—
Clermont-Ferrand		95·8	316	—	—	e 23 42	[− 1]	—	—		—
Paris		95·9	319	—	—	i 24 10	−13	i 23 38	SKS		—
Kew		97·4	322	e 23 48	SKS	e 24 30	− 6	e 26 28	PS		e 30·6
Granada		101·8	308	e 13 56	+12	24 16	[+ 3]	e 28 26	PPS		—
San Fernando	E.	104·0	308	—	—	e 24 26	[+ 3]	—	—		—
Berkeley	Z.	126·0	42	i 18 50	[− 1]	—	—	i 20 45	PP		—
Tinemaha		129·1	41	i 18 57	[0]	—	—	i 22 5	PKS		—
Santa Barbara		129·6	44	i 18 59	[+ 1]	i 22 8	PKS	i 21 9	PP		—
Haiwee		129·9	40	i 18 58	[− 1]	—	—	i 22 8	PKS		—
Logan		129·9	31	i 19 0	[+ 1]	—	—	e 22 5	PKS		—
Salt Lake City		130·5	32	—	—	e 22 10	PKS	—	—		—
Mount Wilson		130·9	43	e 18 52	[− 9]	i 22 12	PKS	i 21 16	PP		—
Pasadena		130·9	43	e 18 53	[− 8]	i 22 12	PKS	i 21 15	PP		—
Riverside		131·5	43	e 18 55	[− 7]	—	—	i 22 13	PKS		—
La Jolla		132·2	44	e 19 5	[+ 2]	—	—	i 22 18	PKS		—
Palomar	Z.	132·2	43	i 19 3	[0]	—	—	i 22 16	PKS		—
Tucson		136·9	39	e 19 1	[−11]	—	—	e 21 48	PP		—
Harvard		137·9	351	e 19 12	[− 2]	i 22 33	PKS	e 22 3	PP		—
Fordham		139·8	353	i 19 19	[+ 1]	i 22 39	PKS	e 22 56	PP		—
St. Louis		141·0	13	e 19 11	[− 8]	e 26 36	[+18]	e 22 42	PP		—
Bermuda		145·7	337	e 19 27	[0]	e 36 10	PPS	e 41 29	SS		—
Fort de France		157·3	307	e 19 42	[− 2]	—	—	—	—		—
San Juan		158·2	324	e 19 54	[+ 9]	—	—	e 24 7	PP		—
Huancayo		166·6	196	e 20 33	[+39]	e 45 23	SS	e 25 15	PP		—
Bogota		173·5	305	e 19 59	[+ 1]	e 31 54	SKKS	—	—		—

Additional readings :—
Calcutta iPPPN = 6m.10s., iSSN = 10m.50s.
Hyderabad SSE = 12m.58s.
Bombay PPN = 7m.13s., iEN = 7m.31s., ipPE = 7m.49s., sPN = 8m.43s., P_cPE = 9m.5s., iEN = 10m.30s., iSN = 11m.12s., iE = 11m.43s., SSE = 14m.11s.

Continued on next page.

New Delhi pPE =7m.43s., PPN =8m.15s., pPPN =8m.30s., PPPN =8m.43s., P_cPN = 9m.22s., S_cPN =12m.4s., iE =12m.39s., sSEN =13m.27s., SSN =14m.35s., SSSEN =15m.56s., S_cSN =16m.55s., S_cSE =17m.1s.
Brisbane eSKSN =19m.9s.
Riverview iE =13m.36s., and 17m.59s., iN =18m.15s., isSE =18m.33s., iS_cSEN = 19m.15s., iE =20m.12s.
Helwan P_cPZ =11m.49s., eZ =14m.44s. and 19m.56s., PSZ =20m.59s.
Auckland i =21m.47s., 22m.18s., and 22m.48s.
Wellington iZ =13m.9s., PPZ =15m.8s., iZ =21m.24s., pSZ =22m.23s.
Bucharest ePE =11m.58s., ePPE =14m.53s., iPSE =22m.9s., iSSN =26m.19s., iSSE =26m.28s.
Upsala eE =22m.42s.?, i =22m.59s., iN =23m.39s., eE =23m.42s.?, eN =31m.42s.?.
Jena iPN =12m.56s., eN =13m.56s., iEN =23m.30s., eE =24m.20s.?.
Copenhagen S =23m.26s., 24m.22s.
Florence iPSN =24m.22s.
Stuttgart ePPZ =16m.38s., iSKS =23m.12s., isS =24m.36s.
Uccle iSKKSEN =24m.9s., iPSN =25m.3s., eZ =26m.4s.
Logan i =22m.9s.
Mount Wilson iPKPNZ =19m.1s.
Pasadena PKPZ =19m.1s., iZ =23m.10s. and 23m.55s.
Riverside iPKPZ =19m.1s.
Tucson i =19m.12s. and 19m.49s., iPP =21m.53s., i =23m.33s., e =31m.28s.
St. Louis iPKPZ =19m.21s., eSKPN =22m.59s., eSSE =40m.27s.
San Juan e =30m.35s. and 41m.48s.
Huancayo e =31m.18s. and 35m.24s.
Bogota e =21m.46s. and 25m.24s.

Nov. 26d. 22h. 20m. 32s. Epicentre 40°·5N. 34°·0E.

Intensity IX-X in the province of Samsun.
Epicentre 40° 55′N. 36°·0E. (Ladik).
41° 10′N. 35°·5E. (Vezirköprü).
40° 50′N. 36° 15′E. (Destek).
Linear epicentre of 65 km.
The shock appears to be a multiple one. The main shock was probably preceded by two or more slight shocks. The first one, which seems to have been recorded only at near distances occurred at 22h. 20m. 25s. Destructive in Anatolia especially in the neighbourhood of Amasra, Erba, Tokat, and Tchorum. The most affected region is situated about 250 km. to the north-east of Ankara.

M. Blumenthal.
Ligne sismique de Ladik, Vilat de Samsun, M.T.A. Sene 9, Sayi : 1-33, 1945 Ankara pp. 153-162, summary in French, p. 162-174, 3 plates of photos. Carte tectonique de la ligne sismique de Ladik.

F. Tillotson.
The recent earthquake in Turkey.
Nature, London, volume 152, pp. 684-685, 1943. The earthquake of 26-27 November 1943 in the east of Ankara ; damage and characteristics. A list of the principal earthquakes felt in the same region with the effects of the most important of them. Epicentre 41°·1N. 35°·0E.
In view of the macroseismic information it is difficult to assume an epicentre so far west. However, from the records of Asiatic stations it would appear that the position should be still nearer Europe and a systematic error in these observations seems probable.

$A = +\cdot6322$, $B = +\cdot4264$, $C = +\cdot6469$; $\delta = -3$; $h = -2$;
$D = +\cdot559$, $E = -\cdot829$; $G = +\cdot536$, $H = +\cdot362$, $K = -\cdot763$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ksara	6·8	167	e 2 0?	P*	i 3 20	S*	4 8	sS_g	—
Bucharest	7·0	306	i 1 42	− 4	3 8	0	i 2 2	P*	—
Focsani	7·2	318	e 1 48	− 1	i 3 16	+ 3	i 2 10	P*	—
Bacau	7·9	322	e 1 53	− 6	i 3 33	+ 3	i 2 18	P*	—
Erevan	8·0	89	2 15	P*	—	—	—	—	—
Campulung	8·1	309	e 1 56	− 6	i 3 29	− 6	i 2 25	P*	—
Sofia	8·3	289	e 2 6	+ 2	i 4 21	S*	i 2 55	P_g	i 4·7
Cernauti	9·7	326	e 2 15	− 7	i 4 8	− 7	—	—	—
Helwan	10·8	192	i 2 48	+ 9	5 28?	SSS	2 58	PPP	—
Belgrade	10·9	298	e 2 37	− 3	i 5 24	SSS	i 2 47	PP	i 6·0
Moscow	15·4	6	3 36	− 4	i 6 26	− 6	—	—	—
Triest	15·7	296	i 3 41	− 3	—	—	i 3 46	PP	e 8·5
Prague	16·7	312	i 3 54k	− 3	e 7 13	+10	i 3 57	PP	e 8·0
Florence	17·2	288	i 4 6k	+ 3	i 7 17	+ 3	i 4 16	PP	—
Cheb	17·9	310	e 4 14	+ 2	e 7 55	SS	e 4 20	PP	e 10·5

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Jena		18·7	313	e 4 21	− 1	e 7 48	0	i 4 30	PP	i 9·5
Chur		18·8	298	e 4 20	− 3	—	—	—	—	—
Milan	Z.	18·8	295	i 4 26	+ 3	7 55	+ 5	4 38	PP	—
Ravensburg		18·9	300	e 4 22	− 2	i 7 58	+ 5	i 4 30	PP	e 9·7
Ebingen		19·4	300	e 4 30	0	e 8 33	SS	i 4 40	PP	e 10·7
Stuttgart		19·4	305	i 4 22k	− 8	i 8 16	+12	i 4 38	PP	e 10·5
Zürich		19·5	300	e 4 28k	− 3	e 7 58	− 8	—	—	—
Basle		20·2	300	e 4 36	− 3	e 8 21	0	e 8 55	SS	—
Strasbourg		20·3	304	4 35?	− 5	8 45	SS	i 4 48?	PP	11·5
Neuchatel		20·5	299	i 4 40	− 2	e 8 45	SS	—	—	—
Copenhagen		20·8	325	e 4 42	− 3	8 37	+ 4	4 51	PP	—
Besançon		21·2	299	i 4 48	− 1	—	—	—	—	13·5
Upsala	E.	21·9	338	4 59	+ 2	i 9 1	+ 7	i 5 9	PP	—
	N.	21·9	338	i 5 2	+ 5	i 9 4	+10	—	—	—
De Bilt		22·9	312	i 5 10k	+ 4	i 9 28	+15	—	—	—
Uccle		23·0	308	i 5 6k	− 1	i 9 27	+13	i 5 17	PP	12·5
Clermont-Ferrand		23·1	294	i 5 8	0	e 8 59?	−17	i 5 15	PP	—
Paris		23·8	302	e 5 16	+ 1	i 10 12	SS	i 5 20	PP	13·5
Sverdlovsk		23·8	38	5 20	+ 5	—	—	—	—	—
Barcelona		24·0	284	i 5 23	+ 6	i 9 45	+13	6 4	PP	—
Tortosa		25·3	282	i 5 35	+ 5	i 10 4	+10	i 6 10	PP	12·0
Kew		26·0	307	i 5 36	0	i 10 19	+13	i 6 17?	PP	e 13·5
Tashkent		26·6	77	i 5 54	+12	i 10 21	+ 5	—	—	—
Bergen		26·7	330	e 5 45	+ 2	10 31	+14	5 54	pP	e 12·8
Stalinabad		26·8	82	i 5 59	+15	i 10 44	+25	—	—	—
Stonyhurst		27·8	312	e 6 0	+ 7	i 10 47	+12	i 6 51	PP	15·5
Almeria		28·6	275	i 6 5	+ 5	10 39	− 9	6 26	pP	14·0
Edinburgh		28·8	316	6 6	+ 4	10 49	− 2	6 56	PP	—
Toledo		28·9	281	e 6 2	− 1	11 12	+19	6 29	pP	—
Andijan		29·0	77	e 6 14	+10	—	—	—	—	—
Granada		29·3	276	i 6 17	+11	i 11 23	+24	6 43	pP	15·0
San Fernando	E.	31·5	276	e 6 34	+ 8	i 11 41	+ 7	i 7 11	PP	—
Lisbon	E.	33·1	282	6 51	+11	12 9	+10	8 5	PPP	15·7
	N.	33·1	282	6 50	+10	12 18	+19	8 26	PPP	15·8
	Z.	33·1	282	6 46k	+ 6	12 14	+15	7 58	PPP	—
Dehra Dun	N.	37·0	92	e 7 23	+10	i 13 12	+13	i 8 57	PPP	i 18·2
New Delhi		37·2	95	i 7 30	+15	i 13 10	+ 8	8 56	PPP	17·2
Bombay	N.	39·6	112	e 7 45	+10	i 13 55	+17	9 37	PPP	—
Reykjavik		39·7	326	7 51	+15	13 50	+10	9 21	PP	19·9
Scoresby Sund		41·2	336	7 59	+11	i 14 14	+12	i 9 39	PP	—
Hyderabad	E.	44·6	108	8 29	+13	15 17	PPS	—	—	—
Kodaikanal	E.	48·8	116	i 10 3	PcP	i 17 38	?	21 58	SS	—
Calcutta	N.	48·9	94	i 9 6k	+16	i 16 9	PPS	i 11 38	PPP	—
Ivigtut		52·0	323	e 9 25	+12	i 16 46	PS	e 12 7	PPP	e 22·5
Colombo	E.	52·8	117	9 34	+15	17 8	PPS	—	—	21·3
Pehpei		58·6	76	e 10 12	+11	e 18 19	PS	—	—	e 27·3
Tananarive		60·4	166	10 43	+30	18 47	PS	12 13	PP	27·3
Johannesburg		66·6	186	e 11 10	+16	i 20 10	PS	e 24 40	SS	e 28·5
Halifax		67·6	310	11 9	+ 8	20 11	+14	24 58?	SS	32·5
Vladivostok		68·7	52	i 11 23	+16	i 20 34	PS	i 15 32	PPP	—
Zinsen		68·7	59	e 11 16	+ 9	20 21	+11	—	—	—
Seven Falls		70·2	315	11 17	0	20 39	+11	28 46?	SSS	e 34·5
Husan		71·6	60	11 35	+10	20 55	+11	—	—	—
Shawinigan Falls		71·6	316	11 27	+ 2	21 1	+17	25 41	SS	e 36·5
Vermont		73·1	314	i 11 44	+10	e 21 9	+ 8	e 16 10	PPP	i 30·8
Hukuoka		73·4	61	11 45	+ 9	21 12	+ 7	(29 2)	SSS	29·0
Weston		73·4	312	i 11 38	+ 2	e 21 8	+ 3	e 14 36	PP	37·2
Harvard		73·5	312	e 11 37	+ 1	i 21 15	+ 9	i 22 9	PPS	e 37·5
Hamada		73·7	59	11 59	+21	21 31	+23	—	—	—
Ottawa		73·9	316	11 42	+ 3	i 21 24	+14	16 13	PPP	e 34·5
Kumamoto		74·1	61	11 47	+ 7	21 11	− 1	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Sapporo		74·1	47	e 11 50	+10	21 27	+15	14 18	PP	e 36·3
Mori		74·3	48	12 0	+19	21 47	+32	—	—	37·6
College		75·0	2	11 47	+ 2	e 21 16	− 7	e 14 40	PP	e 35·7
Miyazaki		75·1	62	11 57	+11	21 49	+25	—	—	41·7
Wazima		75·2	54	e 12 1	+15	21 36	+11	—	—	—
Kôti		75·5	59	e 11 54	+ 6	21 32	+ 4	—	—	—
Bermuda		75·7	300	e 12 9	+20	e 21 13	−17	i 14 53	PP	e 33·2
Fordham		75·9	311	e 11 59	+ 9	i 21 46	+14	i 12 13	P_cP	i 36·5
Hatinohe		75·9	48	e 11 41	− 9	21 39	+ 7	—	—	—
Wakayama		76·1	57	e 12 0	+ 9	21 52	+17	—	—	—
Morioka		76·2	49	i 11 58	+ 6	—	—	—	—	—
Nemuro		76·3	44	e 11 52	0	21 49	+12	—	—	—
Nagano		76·5	54	11 54	0	22 7	+28	—	—	—
Kameyama		76·6	55	12 9	+15	—	—	—	—	—
Mizusawa		76·6	50	12 9	+15	21 46	+ 6	—	—	30·8
Nagoya		76·7	55	e 12 3	+ 8	21 57	+16	—	—	—
Miyako		76·8	49	e 12 5	+10	21 42	0	—	—	—
Sendai		77·0	50	e 12 4	+ 8	21 48	+ 3	—	—	—
Buffalo		77·2	316	i 12 13	+16	22 5	+18	15 9	PP	—
Philadelphia		77·2	312	i 12 14	+17	i 21 44	− 3	e 26 41	SS	e 34·0
Hamilton		77·5	318	12 16	+17	22 9	+19	15 12	PP	e 37·5
Kumagaya		77·5	53	11 56	− 3	21 30	−20	—	—	—
Tokyo		78·1	53	e 12 16	+14	e 22 2	+ 6	—	—	—
Yokohama		78·1	54	12 10	+ 8	22 30	PS	12 46	pP	e 39·9
Georgetown		79·0	312	e 12 15	+ 8	22 12	+ 6	22 20	?	39·5
New Kensington		79·3	315	e 12 56	?	e 22 6	− 3	—	—	—
Pittsburgh		79·5	315	e 12 21	+11	i 22 34	+23	—	—	—
Saskatoon		81·6	337	12 31	+10	22 46	+13	29 5	?	39·5
Sitka		81·9	354	e 12 43	+20	i 22 56	+20	e 15 46	PP	e 33·9
Chicago		82·5	321	e 12 35	+ 9	e 22 53	+11	—	—	e 34·9
Fort de France		84·4	284	e 12 45	+ 9	23 25	+24	16 8	PP	41·4
Columbia		84·7	311	e 12 49	+12	e 23 6	+ 2	e 16 16	PP	e 38·1
San Juan		85·7	290	e 12 53	+11	i 23 18	+ 4	i 15 53	PP	e 34·0
Florissant		86·1	320	e 12 54	+10	i 23 22	+ 4	—	—	—
St. Louis		86·2	320	e 12 50	+ 6	i 23 24	+ 5	i 13 1	P_cP	—
Rapid City		87·4	330	e 13 2	+12	i 23 43	+13	e 16 15	PP	e 36·2
Lincoln		87·5	325	e 12 55	+ 4	e 23 39	+ 8	e 28 14	?	e 35·1
Bozeman		88·7	336	e 13 15	+18	e 23 57	+14	e 16 32	PP	i 35·9
Victoria		89·1	345	13 10	+12	24 1	+15	—	—	45·5
Seattle		89·7	344	e 13 48	+47	e 24 26	+34	e 31 48	?	e 37·4
Mobile		91·2	313	i 13 36	+28	i 24 10	+ 5	i 13 58	?	—
Denver		91·8	300	e 16 44	PP	e 23 46	[+ 3]	e 24 9	S	e 44·5
Logan		92·5	335	i 13 30	+16	i 24 7	{+ 7}	e 16 51	PP	i 37·6
Salt Lake City		93·4	335	e 13 39	+21	e 24 10	{+ 3}	e 17 36	PP	e 41·2
Rio de Janeiro	E.	95·4	245	e 13 58	+30	i 24 8	[+ 5]	i 17 28	PP	—
	N.	95·4	245	e 13 54	+26	i 24 20	{− 1}	—	—	i 36·5
Ferndale		96·9	344	—	—	e 25 28?	+34	e 27 28?	PPS	—
Ukiah		98·1	342	e 18 15	PP	e 24 58	− 6	e 26 56	PS	e 41·1
Berkeley		99·0	341	e 13 53	+ 9	e 26 41	PS	e 18 11	PP	e 44·1
San Francisco		99·2	341	e 18 3	PP	—	—	e 19 45	PPP	e 46·9
Branner	E.	99·4	341	—	—	e 32 2	SS	—	—	e 44·6
Lick		99·4	341	e 14 4	+18	—	—	e 18 10	PP	e 47·0
Santa Clara		99·4	341	e 18 9	PP	—	—	e 32 21	SSP	e 47·3
Fresno	N.	99·5	339	e 14 5	+19	e 24 48	{− 3}	—	—	e 48·6
Haiwee	Z.	99·5	337	i 13 57	+11	—	—	—	—	—
Tucson		100·6	330	e 13 55	+ 4	e 25 33	+ 8	i 17 59	PP	e 40·1
Riverside	Z.	101·3	336	e 14 7	+13	—	—	—	—	—
Mount Wilson	Z.	101·3	336	e 13 59	+ 5	—	—	i 14 7	P_cP	—
Pasadena		101·4	336	e 14 7	+12	e 24 40	[+ 6]	e 18 13	PP	i 42·2
Palomar	Z.	101·7	335	i 14 10	+14	—	—	—	—	—
Perth		104·4	120	e 12 26	?	25 8	[+20]	27 28	PS	46·5

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Vera Cruz	N.	104·7	311	i 18 21	PP	—	—	—	—	—
Tacubaya	N.	106·2	314	i 18 49	PP	—	—	—	—	—
Guadalajara	N.	107·3	319	e 30 16	?	—	—	—	—	—
La Paz		109·6	295	24 46	SKS	(24 46)	[−24]	—	—	—
Huancayo		112·4	273	e 15 34	?	e 25 42	[+20]	e 19 42	PP	e 43·3
La Plata	E.	112·9	243	19 52?	PP	25 46?	[+22]	22 16?	PPP	47·5
	N.	112·9	243	19 46?	PP	26 46?	{+21}	29 16?	PS	47·4
	Z.	112·9	243	19 58?	PP	—	—	29 46	PPS	58·8
Honolulu		117·5	12	e 18 42	[− 6]	e 25 19	[−22]	e 36 47	SSP	e 47·3
Brisbane		128·7	95	i 19 27	[+17]	e 26 36	[+20]	i 21 31	PP	—
Riverview		130·4	104	i 19 40a	[+27]	i 26 6	[−15]	e 22 57	PKS	60·3
Sydney		130·5	104	e 21 52	PP	e 38 40?	SS	e 29 16	?	e 53·0
Suva		142·2	65	e 20 35	[+61]	e 27 43	[+60]	e 35 1	PPS	e 59·8
Apia		145·1	47	i 20 4	[+25]	e 26 59	[+12]	33 47	PS	—
Christchurch		149·3	109	20 7	[+21]	30 45	{+30}	33 47	PS	69·9
Auckland		149·4	95	20 19	[+33]	i 43 8	SSP	23 43	PP	63·5
Arapuni		150·4	98	22 28?	?	—	—	—	—	73·5
Wellington	Z.	150·5	104	20 1	[+13]	i 30 3	{−18}	23 58	PP	74·5

Additional readings :—
Istanbul (△ = 3·8), P = 22h.20m.30s., P_g = 22h.20m.39s., S_g = 22h.21m.30s.
Bucharest iZ = 1m.47s., iP_gE = 2m.16s., iP_gN = 2m.19s., iS?E = 2m.49s.
Focsani iP_gE = 2m.32s., iP_gN = 2m.40s., iS_gE = 4m.1s.
Bacau iP_gE = 2m.35s.
Campulung eE = 2m.1s., iP_gN = 2m.43s., iS*E = 4m.0s., iS_gE = 4m.25s., iS_gN = 4m.28s.
Cernauti iN = 2m.25s., iSN = 4m.5s.
Helwan eZ = 3m.19s.
Belgrade i = 2m.42s., 3m.20s., 3m.24s., 3m.37s., and 3m.55s.
Florence iPPP = 4m.46s., iSS = 7m.29s., iSSS = 7m.58s.
Jena eSEN = 7m.28s., eSN = 7m.40s., iSEN = 8m.4s., iSZ = 8m.13s.
Ebingen eQ = 9m.40s.?
Stuttgart eQ = 9m.28s.?
Uccle SNZ = 9m.32s.
Barcelona i = 8m.36s.
Tortosa iPPPE? = 6m.48s., SSN = 10m.43s.
Kew iP = 5m.43s., iP_cPE = 9m.10s., iSS?Z = 11m.2s.
Bergen PPZ = 6m.28s., PPPE = 6m.51s., eSZ = 10m.43s.
Stonyhurst iP = 6m.4s., iPPP = 7m.4s., iSS = 12m.12s., iSSS = 12m.30s.
Almeria sP = 6m.40s., PP = 7m.3s., PPP = 7m.20s., P_cP = 9m.5s., sS = 11m.25s., PS = 12m.22s., PPS = 12m.40s.
Edinburgh PPP = 7m.8s., P_cP = 9m.22s.
Toledo PPN = 7m.15s., SS = 12m.58s.
Granada sP = 7m.7s., sS = 11m.51s., P_cS = 12m.20s., sSS = 13m.10s.
Lisbon Z = 7m.1s., E = 7m.18s. and 7m.23s., SE = 12m.29s.
Dehra Dun eN = 15m.3s.
New Delhi PPPN = 9m.17s., P_cPN = 9m.45s., iSE = 13m.13s., SSN = 15m.22s., SSSN = 15m.52s., SSSE = 15m.55s.
Bombay iPN = 7m.52s., PPE = 9m.31s., SSE = 16m.50s.
Reykjavik PPP = 10m.12s., SS = 16m.44s.
Calcutta iSSN = 19m.29s., iSSSN = 20m.39s.
Ivigtut i = 17m.5s., iS_cS = 18m.56s.
Tananarive PPP = 13m.13s., i = 18m.56s. and 19m.31s., iS_cS = 20m.31s., SS = 22m.40s., SSS = 24m.12s.
Halifax SSS = 27m.58s. ?
Shawinigan Falls SSS = 28m.58s.?
Vermont i = 13m.38s., e = 19m.44s., iS = 21m.17s., i = 22m.13s., iSS = 25m.49s., e = 27m.39s.
Weston i = 11m.42s., e = 21m.20s., ePS? = 21m.33s., e = 25m.37s.
Harvard iP = 11m.47s., iP_cP = 12m.3s., i = 15m.28s., 16m.15s., 18m.13s., and 22m.51s., eQ = 34·5m.
Ottawa SS = 26m.28s., SSS = 29m.28s.
Sapporo PPP = 16m.20s., SS = 26m.14s., SSS = 30m.2s.
College iS = 21m.33s., e = 22m.40s., 26m.28s., and 29m.56s.
Bermuda e = 15m.33s., i = 21m.43s., eSS = 26m.9s., e = 29m.48s.
Buffalo PPP = 16m.47s., SS = 27m.13s., SSS = 30m.17s.
Philadelphia i = 12m.56s. and 22m.0s., e = 24m.35s.?
Hamilton SS = 27m.2s., SSS = 30m.16s.
New Kensington e = 17m.47s. and 24m.35s.
Sitka i = 23m.52s., iSS = 28m.38s.
Chicago eS? = 22m.13s., e = 32m.55s.
Fort de France PPP = 18m.5s., PS = 24m.19s., PPS = 24m.44s., SS = 29m.15s., SSS = 32m.53s.
Columbia e = 13m.11s., eSS = 28m.27s.

Continued on next page.

San Juan iP =13m.6s., i =17m.6s., e =25m.15s., eSS =29m.3s.
Rapid City i =13m.16s., e =18m.34s., eSS =29m.40s.
Bozeman e =29m.41s.
Denver eE =18m.1s.
Logan i =13m.39s., e =18m.15s., iPS =25m.25s., e =26m.25s. and 31m.6s.
Salt Lake City e =24m.44s., eSS =30m.58s., e =35m.36s.
Ukiah eSS =31m.25s.
Berkeley iPZ =13m.57s., ePPE =18m.16s., eZ =26m.49s., eN =27m.8s.
Lick ePE =14m.7s.
Tucson i =14m.16s. and 22m.1s., e =22m.43s., eSKS =24m.47s., e =27m.13s., eSS = 32m.39s., e =37m.1s.
Pasadena iZ =18m.32s., ePSN =27m.4s.?, ePKKPZ =30m.44s., eSSN =34m.4s.?, ePKP,PKPZ =38m.33s., eQN =40m.22s.
Perth PP =17m.33s., PPP =19m.43s., SKS =23m.23s., SSS =35m.8s.
Huancayo iPS =29m.11s., e =31m.55s.
La Plata PSN =22m.40s., PPSE =23m.52s.?, E =26m.34s.?, SSE =29m.16s.?, PSSE = 30m.16s.?, SKSP($\Delta > 180°$) =32m.40s.?, SSSE =34m.28s.?, SSSN =35m.24s., E =36m.10s., QEN =40·5m.; readings wrongly identified.
Honolulu eS? =28m.17s., e =30m.29s.
Brisbane iPPZ =21m.31s., eSKSZ =26m.39s., eSKKSN =28m.40s., iSSN =38m.57s.
Riverview iZ =24m.8s. and 25m.21s., iE =26m.49s., 28m.37s., 29m.58s., and 33m.52s., iN =34m.47s., iE =36m.29s., iSSE =38m.40s., iE =39m.17s., iN =39m.22s., iE = 39m.51s., QEN =54·3m.
Suva ePP =22m.10s., iPPP =24m.53s., iPS =31m.41s., ePPS =32m.58s., e =38m.30s., 40m.54s., 41m.43s., and 47m.16s.
Apia e =23m.20s., ePPP =26m.17s., eSKKS =29m.51s., PPS =35m.34s.
Christchurch i =21m.24s., PKP =22m.40s., PP =25m.15s., PPP =28m.42s., SKSP = 36m.4s., e =41m.46s., SS =44m.10s., SSS =48m.57s., SSSS? =55m.47s., Q =62m.1s.
Auckland i =20m.43s., 21m.28s., and 22m.14s., SSS? =48m.43s., i =52m.43s.?, e = 59m.28s.?
Arapuni i =39m.46s., SS? =44m.28s.?, i =54m.28s.?, e =57m.28s.?
Wellington PKP,Z =20m.11s., PPPZ =28m.14s., iZ =29m.18s., PPPZ =32m.37s., PPSZ =36m.35s., SSZ =45m.48s., SSSZ =49m.28s., QZ =66·5m.
Long waves were also recorded at Aberdeen.

Nov. 26d. Readings also at 11h. (Riverview), 15h. (Calcutta, Bombay, and Riverview), 20h. (Saskatoon), 21h. (near Apia), 22h. (near Ferndale), 23h. (La Paz and near Branner).

Nov. 27d. 6h. 6m. 17s. Epicentre 40°·5N. 34°·0E. (as on 26d.).

A = +·6322, B = +·4264, C = +·6469; $\delta = -3$; $h = -2$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m. s.			m.
Istanbul		3·8	279	0 51	−10	1 48	+ 1	—		—	—
Ksara		6·8	167	e 2 3	P•	—	—	—		—	4·3
Bucharest		7·0	306	e 2 2	P•	e 3 7	− 1	e 2 7	P_g		—
Sofia		8·3	289	—	—	e 3 7?	−33	e 4 1?	S•		—
Stuttgart	z.	19·4	305	e 4 32	+ 2	e 8 12	+ 8	—		—	—
Sverdlovsk		23·8	38	5 17	+ 2	9 31	+ 3	—		—	—
Tashkent		26·6	77	5 48	+ 6	—	—	—		—	—

Long waves were also recorded at Cheb.

Nov. 27d. 8h. 9m. 45s. Epicentre 40°·5N. 34°·0E. (as at 6h.).

		△	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m. s.			m.
Istanbul		3·8	279	0 39	−22	1 38	− 9	1 26	P_g		—
Ksara		6·8	167	e 2 9	P_g	—	—	—		—	e 4·0
Bucharest		7·0	306	e 1 41	− 5	i 2 55	−13	i 2 2	P•		—
Sofia		8·3	289	e 2 15?	+11	e 4 21?	S•	—		—	—
Helwan	z.	10·8	192	e 3 14	PPP	—	—	—		—	5·8
Belgrade		10·9	298	e 5 29	SSS	—	—	—		—	e 6·1
Moscow		15·4	6	e 3 29	−11	e 6 11	−21	—		—	—
Chur		18·8	298	e 4 15	− 8	—	—	—		—	—
Stuttgart	z.	19·4	305	e 4 22	− 8	e 7 59	− 5	—		—	—
Upsala		21·9	338	i 8 41	P_cP	—	—	—		—	—
Sverdlovsk		23·8	38	5 17	+ 2	9 35	+ 7	—		—	—
Tashkent		26·6	77	e 6 5?	PP	e 10 46?	+30	—		—	—

Bucharest gives also iP_gN =2m.17s., $iS^•E$ =3m.21s., iS_gE =3m.37s,
Long waves were also recorded at Cheb and Riverview,

Nov. 27d. 8h. 44m. 50s. Epicentre 31°·8N. 70°·2E. given by Bombay.

$A = +·2884$, $B = +·8012$, $C = +·5244$; $\delta = +9$; $h = +1$;
$D = +·941$, $E = -·339$; $G = +·178$, $H = +·493$, $K = -·852$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
New Delhi	E.	6·8	116	e 1 48	+ 4	—	—	3 47	S_g	—
	N.	6·8	116	i 1 45a	+ 1	i 3 16	+13	3 42	S_g	—
Stalinabad		6·8	351	e 1 44	0	—	—	—	—	—
Dehra Dun	N.	6·9	100	e 0 53	−52	e 2 33	−32	—	—	—
Tashkent		9·5	356	e 2 19	− 1	4 7	− 3	—	—	—
Tchimkent		10·5	358	i 2 30	− 5	i 4 26	− 9	—	—	—
Bombay		13·1	169	3 9	− 1	e 5 31	− 7	3 18	PP	6·5
Hyderabad	E.	16·1	150	e 3 21	−28	—	—	7 2	SS	8·1
Calcutta	N.	18·5	115	e 4 24	+ 5	i 7 49	+ 5	—	—	—
Sverdlovsk		25·9	348	5 35	0	10 2	− 2	—	—	—
Colombo	E.	26·5	158	5 57	+16	10 16	+ 2	—	—	—
Ksara		28·8	284	e 6 4?	+ 2	e 11 28?	+37	—	—	—
Helwan	Z.	33·3	277	6 43	+ 2	e 12 13	+11	8 2	PP	—
Stuttgart		48·2	309	e 8 41	− 3	—	—	—	—	e 28·2

Additional readings and notes:—
New Delhi P*N = 2m.8s., P_gN = 2m.33s., S_gN = 4m.7s. The S_g entered is given as S*.
Bombay PPPN = 3m.27s., SN = 5m.34s., SSE = 5m.48s., SSSN = 6m.1s.
Helwan eZ = 6m.50s., SZ = 12m.43s.
Long waves were also recorded at other European stations.

Nov. 27d. 9h. 54m. 0s. Epicentre 31°·8N. 70°·2E. (as at 8h.).

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
New Delhi	N.	6·8	116	e 1 48	+ 4	e 3 19	S*	(2 13)	P_g	—
Stalinabad		6·8	351	e 1 49	+ 5	3 50?	S_g	—	—	—
Dehra Dun	N.	6·9	100	e 1 59	P*	—	—	—	—	—
Tashkent		9·5	356	e 2 13	− 7	e 3 59	−11	—	—	—
Tchimkent		10·5	358	i 2 27	− 8	i 4 24	−11	—	—	—
Bombay		13·1	169	e 3 16	+ 6	i 5 49	+11	6 22	SS	6·8
Hyderabad	E.	16·1	150	e 5 52	?	—	—	—	—	i 8·1
Calcutta	N.	18·5	117	—	—	i 8 28	SS	—	—	(i 10·2)
Colombo		26·5	158	e 11 49	?	—	—	—	—	—
Stuttgart		48·2	309	e 8 33	−11	—	—	—	—	34·0

Additional readings:—
New Delhi P_gN = 2m.37s., S*N = 3m.43s., S_gN = 4m.8s., P_g is recorded as P*.
Calcutta readings are recorded as iN and iSN respectively.
Long waves are also recorded at De Bilt and Granada.

Nov. 27d. 23h. 29m. 28s. Epicentre 40°·5N. 34°·0E. (as at 8h.).

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Istanbul		3·8	279	0 42	−19	1 42	− 5	—	—	—
Ksara		6·8	167	e 1 52	+ 8	e 3 5	S_g	—	—	—
Bucharest		7·0	306	e 1 53	+ 7	e 3 11	+ 3	e 2 3	P*	i 4·4
Sofia		8·3	289	e 2 32?	P*	i 3 50	+10	—	—	—
Helwan	Z.	10·8	192	e 2 52	PP	e 4 24	−18	—	—	—
Chur		18·8	298	e 4 19	− 4	—	—	—	—	—
Stuttgart	Z.	19·4	305	e 4 30	0	e 8 7	+ 3	e 4 55	PPP	—
Zürich		19·5	300	e 4 31	0	—	—	—	—	—
Basle		20·2	300	e 4 38	− 1	—	—	—	—	—
Sverdlovsk		23·8	38	5 16	+ 1	9 29	+ 1	—	—	—

Bucharest gives also eZ = 1m.59s., iS?EN = 3m.15s., iN = 3m.43s.
Long waves were also recorded at Belgrade and Granada.

Nov. 27d. Readings also at 0h. (Johannesburg, near San Francisco, and near Berkeley), 1h. (Istanbul, Bucharest (2), and near Frunse), 2h. (Stuttgart, Zürich, Chur, Basle, and Ksara), 4h. (near Bogota), 8h. (Toledo, Rio de Janeiro, and Bogota), 19h. (Branner, Pasadena, Mount Wilson, Riverside, Tinemaha, Haiwee, Palomar, Tucson, and near Apia), 20h. (Riverview and Stuttgart), 21h. (near Apia), 22h. (Sofia, Ksara, Stuttgart, near Bucharest, and near Bogota).

Nov. 28d. 6h. 19m. 58s. Epicentre 9°·7N. 125°·7E.

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

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Naha		16·5	6	3 58	+ 4	—	—	—	—	—
Zi-ka-wei	N.	21·8	350	e 4 54	− 2	8 56	+ 4	i 9 18	SS	—
Miyazaki		22·7	13	5 3	− 1	9 22	+13	—	—	—
Titizima		23·3	39	e 5 14	+ 4	9 8	−12	—	—	—
Hukuoka		24·2	9	e 5 13	− 6	—	—	—	—	—
Kôti		24·8	15	e 4 42	−43	9 40	− 6	—	—	—
Husan		25·5	7	5 24	− 8	10 18	+21	—	—	—
Kobe		26·4	17	e 5 35	− 5	—	—	—	—	—
Yokohama		28·6	24	e 6 44	+44	—	—	—	—	—
Calcutta	N.	38·0	294	i 9 10	PP	i 13 3	−11·	—	—	e 19·7
Colombo	E.	45·4	270	8 23	+ 1	—	—	—	—	—
Brisbane	N.	45·5	145	i 8 20	− 3	e 14 42	−23	e 18 8	S_cS	i 21·9
Irkutsk		45·9	342	8 25	− 1	—	—	—	—	—
Kodaikanal	E.	47·5	276	i 8 40a	+ 2	e 15 38	+ 4	10 32	PP	25·0
New Delhi	N.	49·1	300	e 8 50	− 1	i 16 12	+16	19 50	SS	—
Riverview		49·6	152	i 8 57a	+ 2	i 15 52	−11	i 9 9	pP	e 23·7
Sydney		49·6	152	e 9 50?	+55	—	—	—	—	e 22·6
Bombay		51·9	286	i 9 11	− 1	e 16 29	− 6	11 11	PP	27·0
Tashkent		58·6	313	i 10 1	0	18 4	0	—	—	—
Suva		58·9	118	11 2?	+59	17 2	−66	—	—	—
Auckland		65·3	138	—	—	19 19	−10	—	—	28·0
Arapuni		66·6	139	11 32?	+38	20 32?	+47	24 32?	SS	34·0
Wellington	Z.	67·9	142	11 1	− 1	21 2?	+61	13 42	PP	34·0
Christchurch		68·0	145	11 20	+17	19 50	−12	20 54	S_cS	33·8
Sverdlovsk		68·4	328	11 3	− 3	20 2	− 5	—	—	—
Moscow		81·0	325	10 15?	?	e 20 12?	?	—	—	—
Ksara		84·5	303	e 12 39?	+ 3	e 23 11	+ 9	—	—	—
Helwan		89·0	300	12 56	− 2	e 23 37	− 8	—	—	—
Bucharest		90·1	315	—	—	i 23 44	[+11]	—	—	46·0
Upsala		90·6	331	—	—	e 23 45	[+ 9]	—	—	e 44·0
Copenhagen		94·7	329	—	—	24 11	[+11]	—	—	—
Victoria		96·2	39	—	—	26 9	PS	—	—	46·0
Scoresby Sund		97·0	350	—	—	24 26	{− 7}	—	—	54·0
Cheb		97·1	324	—	—	e 22 2?	?	—	—	e 56·0
Stuttgart		99·5	324	e 13 43	− 3	e 24 29	[+ 4]	e 17 50?	PP	e 51·1
De Bilt		100·2	328	—	—	e 24 32	[+ 4]	—	—	e 49·0
Tinemaha	Z.	104·2	48	i 14 4	− 3	—	—	—	—	—
Mount Wilson	Z.	105·5	51	e 18 16	PP	—	—	—	—	—
Tucson		111·8	50	e 19 6	PP	e 28 42	PS	—	—	e 52·6
Almeria		112·9	317	i 19 56	PP	e 29 22	PS	i 30 31	PPS	61·0
Granada		113·4	318	e 19 7	PP	29 11	PS	32 11	?	39·7
San Fernando	E.	115·6	319	—	—	e 25 34	[0]	e 29 19	PS	54·0
Florissant		121·2	33	e 20 29	PP	e 27 0	{−21}	e 29 34	PS	—
St. Louis		121·4	33	e 19 59	PP	e 30 12	PS	e 36 53	SS	—
Fordham		126·6	18	e 20 56	PP	—	—	—	—	—
Philadelphia		126·9	20	—	—	e 47 11	?	—	—	e 68·5
Fort de France		154·8	16	e 20 7	[+13]	—	—	—	—	—
Huancayo		159·2	99	e 20 13	[+13]	e 31 4	{− 4}	e 44 29	?	e 74·6

Additional readings :—
Kodaikanal SSE =19m.32s.
Riverview iNZ =11m.1s., iE =16m.7s., iSSE =19m.21s., iNZ =19m.31s.
Bombay ePN =9m.15s., PPE =11m.14s., SPN =16m.37s., SPE =16m.41s., SPPE =16m.49s., SPPN =16m.52s., iN =17m.6s., eN =18m.30s., S_cSN =19m.11s., SSN =20m.21s., SSE =20m.27s.
Christchurch SS =23m.45s., Q =28m.12s.
Helwan eZ =13m.29s.
Upsala eN =23m.55s.
Stuttgart eS =25m.27s., ePS =26m.56s., eSS =32m.32s.?.
Florissant ePPSE =31m.3s.
St. Louis ePPZ =20m.20s.
Long waves were also recorded at Pasadena, Pittsburgh, Tananarive, and other European stations.

Nov. 28d. 17h. 11m. 12s. Epicentre 55°·0N. 157°·0E.

$A = -·5304$, $B = +·2251$, $C = +·8173$; $\delta = -3$; $h = -7$;
$D = +·391$, $E = +·920$; $G = -·752$, $H = +·319$, $K = -·576$.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Nemuro		13·8	217	e 2 42	?	6 15	SS	—	—	—
Sapporo		15·7	227	e 3 41	− 3	6 33	− 6	—	—	7·3
Mizusawa	E.	19·1	220	e 4 41	PP	e 9 10	L	—	—	(e 9·2)
	N.	19·1	220	3 46	?	e 9 20	L	—	—	(e 9·3)
Sendai		20·0	219	4 23	−14	8 5	−12	—	—	9·2
Aikawa		21·2	215	e 4 47	− 2	8 35	− 6	—	—	11·2
Tokyo Cen. Met. Ob.		22·7	219	e 5 4	0	—	—	—	—	—
Toyama		22·8	225	e 5 16	+11	—	—	—	—	—
Yokohama		23·0	219	5 17	+10	9 22	+ 8	—	—	e 12·1
Gihu		24·1	222	e 5 24	+ 6	9 32	− 2	—	—	13·0
Nagoya		24·2	222	e 5 22	+ 3	—	—	—	—	11·7
Keizyo		26·8	242	e 6 56	PPP	—	—	—	—	e 14·1
Hukuoka		28·3	232	e 5 56	− 1	e 12 58	L	—	—	(e 13·0)
Ituhara		28·4	235	6 32	PP	—	—	—	—	—
College		28·4	48	e 6 11	+13	e 10 35	−10	(12 20)	SS	12·3
Miyazaki		29·3	228	—	—	11 23	+24	—	—	—
Irkutsk		30·8	288	6 15	− 5	—	—	—	—	—
Zi-ka-wei	N.	34·6	242	e 8 16	PP	—	—	—	—	—
Sitka		36·3	58	e 6 59	− 8	—	—	(i 15 38)	SSS	i 15·6
Sverdlovsk		49·6	315	9 38	?	17 17	?	—	—	—
Scoresby Sund		54·8	0	—	—	17 30?	PS	—	—	26·8
Bozeman		55·3	58	—	—	e 17 22	+ 1	—	—	e 25·5
Tashkent		56·3	295	e 9 44	− 1	17 32	− 2	—	—	—
Logan		57·8	62	i 9 56	+ 1	e 18 3	+ 9	i 12 5	PP	32·7
Tinemaha	Z.	57·8	71	e 9 58	+ 3	—	—	—	—	—
Salt Lake City		58·5	63	e 9 57	− 3	e 18 8	+ 5	—	—	e 25·2
Stalinabad		58·6	294	e 10 6	+ 5	e 18 10	+ 6	—	—	—
Haiwee	E.	58·7	71	10 5	+ 3	—	—	—	—	—
Moscow		59·1	325	e 11 12?	P_cP	e 20 6	S_cS	—	—	—
Calcutta	N.	59·7	266	—	—	i 18 15	− 4	i 22 24	SS	e 28·8
Mount Wilson		60·0	72	e 10 9	− 2	—	—	e 39 37	P′P′	—
Pasadena		60·0	72	e 10 8	− 3	e 18 18?	− 5	e 39 41	P′P′	e 28·2
Rapid City		60·3	55	e 10 14	+ 1	e 18 26	0	—	—	e 29·2
Riverside	Z.	60·6	72	e 10 15	0	—	—	—	—	—
Upsala		61·0	338	—	—	e 18 48?	PS	e 22 48?	SS	e 28·8
Palomar	Z.	61·3	72	e 10 19	− 1	—	—	—	—	—
New Delhi	N.	61·4	280	e 10 14	− 6	i 18 33	− 7	—	—	29·6
La Jolla		61·5	73	e 10 21	0	—	—	—	—	—
Tucson		65·4	68	e 10 46	− 1	e 20 0	PPS	e 11 13	P_cP	e 27·0
Lincoln		65·8	53	—	—	e 19 36	+ 1	—	—	e 32·8
Copenhagen		65·9	340	—	—	19 39	+ 2	—	—	33·8
Edinburgh		68·3	349	—	—	—	—	e 26 48	?	—
Florissant		70·3	50	e 11 16	− 1	i 20 32	+ 3	—	—	—
Ottawa		70·5	37	e 11 17	− 1	—	—	—	—	26·8
St. Louis		70·5	50	e 11 17	− 1	e 20 27	− 5	e 11 28	P_cP	—
Jena		70·6	337	e 12 18	+59	—	—	—	—	e 33·8
Seven Falls		70·6	32	—	—	e 20 36	+ 3	(27 48?)	SSS	27·8
Prague		70·7	336	—	—	e 21 25	S_cS	—	—	e 31·1
Cheb		71·2	337	e 17 48?	?	—	—	—	—	e 32·8
Bombay		71·4	276	11 21	− 3	e 20 35	− 7	21 4	PS	—
Buffalo		71·5	40	e 11 35	+11	—	—	e 14 37	PP	—
Cape Girardeau	N.	71·9	51	e 11 26	− 1	—	—	—	—	—
Bucharest		72·6	326	e 14 6?	PP	e 21 4	+ 8	e 16 4	PPP	28·8
Stuttgart		73·1	339	e 11 13	?	e 20 58	− 3	e 11 32	P	e 35·8
Belgrade		73·9	330	e 11 39	0	e 21 48	PS	—	—	e 39·3
Paris		74·4	343	—	—	—	—	e 23 48?	?	e 36·8
Basle		74·6	339	e 11 39	− 4	—	—	—	—	—
Zürich		74·6	339	e 11 35	− 8	—	—	—	—	e 40·8
Chur		74·9	338	e 11 41	− 3	—	—	—	—	e 39·8
Sofia		75·0	326	e 11 48?	+ 3	—	—	(29 48)	SSS	e 29·8

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Fordham		75·1	37	e 11 43	− 3	—	—	—	—	e 39·8
Neuchatel		75·3	339	e 11 44	− 3	—	—	—	—	—
Kodaikanal	E.	75·7	268	e 12 51	+62	—	—	—	—	—
Ksara		78·2	313	e 12 3?	0	e 22 28?	PS	—	—	—
Helwan		83·5	315	12 29	− 2	e 23 0	+ 8	i 15 34	PP	—
Toledo		84·1	346	i 12 36	+ 2	23 15	+17	—	—	43·8
Bermuda		85·9	34	—	—	e 23 22	+ 6	e 28 57	SS	e 41·0
Lisbon		85·9	350	12 41a	− 2	24 0	PS	—	—	43·7
Granada		86·7	345	i 12 47	0	i 23 6	[− 6]	13 32	pP	45·5
Almeria		86·8	344	12 44	− 3	23 6	[− 6]	25 0	PPS	44·8
San Fernando	E.	87·8	347	—	—	e 23 43	+ 9	e 26 24	?	45·3
Riverview		88·6	184	—	—	e 23 48	+ 6	e 38 12	Q	e 41·6
San Juan		98·2	40	—	—	e 26 55	PS	e 35 13	SSS	e 42·0
Huancayo		120·9	64	—	—	e 37 30	SSP	—	—	e 50·3

Additional readings :—
Calcutta iSSSN =24m.27s.
Upsala eN =20m.48s. ?
Tucson e =15m.5s.
Bombay PPN =14m.1s., PSN =21m.1s., S_cSE =21m.18s., SSN =24m.57s.
Bucharest eE =16m.36s.?, eN =20m.38s. and 23m.16s., eE =23m.32s., iE =27m.0s.
Stuttgart eSZ =21m.8s.
Belgrade e =25m.18s. and 28m.37s.
Sofia eEN =20m.48s.? and 25m.18s.?
Helwan iZ =13m.24s.
Bermuda ePS =35m.24s.
Granada sP =13m.48s., sS =25m.22s.
Almeria PP =16m.34s., SKKS =23m.31s., S =23m.44s., PPS =25m.36s.
Long waves were also recorded at Wellington, Christchurch, Auckland, Colombo, Tananarive, Ivigtut, and at other American and European stations.

Nov. 28d. 21h. 42m. 42s. Epicentre 29°·3S. 178°·2W. Depth of focus 0·040.
(as on 1943, April 29d.).

A = −·8730, B = −·0274, C = −·4869 ; δ = −5 ; h = +2 ;
D = −·031, E = +1·000 ; G = +·487, H = +·015, K = −·873.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Auckland		9·6	216	2 18	+ 4	4 8	+ 8	—	—	i 5·3
Tuai		10·2	200	2 25	+ 3	4 5	− 8	i 2 45	PPP	—
Suva		11·5	344	i 2 31	− 7	i 4 38	− 4	i 2 57	PPP	5·5
Wellington		13·3	203	e 2 54	− 6	5 9	−13	—	—	6·0
Apia		16·5	23	i 3 32	− 5	e 6 18	−12	3 57	PP	—
Riverview		26·4	251	i 6 40k	PPP	i 11 11	SSS	—	—	—
Santa Barbara	z.	84·1	46	e 12 1	+ 1	—	—	—	—	—
La Jolla		84·6	48	e 12 4	+ 2	—	—	—	—	—
Pasadena		84·8	47	i 12 3k	0	—	—	e 15 23	PP	—
Mount Wilson		85·0	47	i 12 4k	0	—	—	i 12 21	P_cP	—
Palomar	z.	85·2	48	i 12 5	0	—	—	—	—	—
Riverside	z.	85·3	47	i 12 5	− 1	—	—	—	—	—
Haiwee		86·3	45	i 12 12	+ 1	—	—	—	—	—
Tinemaha		86·7	44	i 12 13	0	—	—	—	—	—
Tucson		88·5	51	i 12 22	+ 1	—	—	e 16 5	PP	—
Ksara		150·7	287	e 19 19	[+ 7]	—	—	e 19 31	PKP_2	—
Jena		157·2	342	e 19 54	PKP_2	—	—	—	—	—
Stuttgart	z.	159·7	346	e 19 22	[− 3]	—	—	e 20 1	PKP_2	—
Basle		161·2	348	e 20 9	PKP_2	—	—	—	—	—
Zürich		161·2	346	e 20 8	PKP_2	—	—	—	—	—
Chur		161·5	345	e 20 9	PKP_2	—	—	—	—	—
Neuchatel		161·9	347	e 20 10	PKP_2	—	—	—	—	—

Additional readings :—
Suva i =3m.22s.
Apia isS =6m.42s.
Pasadena iZ =12m.55s.
Mount Wilson iZ =12m.39s.
Tucson e =12m.40s. and 12m.54s.
Long waves were recorded at Christchurch,

Nov. 28d. Readings also at 1h. (New Delhi, near Tchimkent and Tashkent), 4h. (Aberdeen and Stuttgart), 5h. (Tacubaya, Fort de France, Triest, and near Mizusawa), 16h. (Tacubaya), 17h. (Rio de Janeiro, and Harvard), 19h. (Mizusawa), 20h. (Kodaikanal, Calcutta, Bombay, near New Delhi, and Stalinabad), 22h. (Mount Wilson, Riverside, Tucson, and Palomar), 23h. (Ksara, Tashkent, Pasadena, Mount Wilson, Riverside, and Riverview).

Nov. 29d. 2h. 4m. 24s. Epicentre 46°·9N. 15°·3E.

Felt at Leibnitz, Kaposzvar, Keszthely, and Lenti (Hungary), also (Scale V) in Austria. Macroseismic area 9000 sq. km.
E. Trapp.
Makroseismische Beobachtungen in den Jahren, 1941-1945, Anhang 8, Jahrbuch für 1947 der Zentralanstalt für Meteorologie und Geodynamik in Wien, p. D48.
Macroseismic Chart, p. D51.
Seismological Notes, Bulletin of the Seismological Society of America, Vol. 34, 1944, p. 66.
Annales de L'Institut de Physique du Globe de Strasbourg 2e partie Seismologie, tomes VII-VIII, p. 41. Epicentre as adopted.

A = +·6614, B = +·1810, C = +·7279 ; δ = +5 ; h = −4 ;
D = +·264, E = −·965 ; G = +·702, H = +·192, K = −·686.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Triest		1·7	221	e 0 28	− 3	—	—	e 0 35	P_g	—
Prague		3·2	350	e 0 52$_a$	0	e 1 51	S_g	e 1 2	P_g	—
Cheb		3·7	330	e 1 42	S	(e 1 42)	− 3	e 2 5	S_g	e 2·2
Chur		4·0	272	e 1 5	+ 1	—	—	—	—	—
Ravensburg		4·0	285	e 1 3	− 1	i 1 57	+ 5	e 1 20	P_g	i 2·4
Belgrade		4·1	118	e 0 42	−23	i 1 47	− 8	—	—	—
Florence		4·2	224	i 1 22$_k$	P_g	i 2 11	S*	i 2 25	S_g	e 2·7
Milan	z.	4·5	254	e 1 28	P*	2 49	?	i 1 38	P_g	—
Ebingen		4·5	289	e 1 13	+ 2	i 2 12	+ 7	i 1 35	P_g	—
Stuttgart		4·5	297	i 1 10	− 1	i 1 58	− 7	e 1 32	P_g	i 2·8
Zürich		4·6	279	i 1 12$_k$	0	e 2 14	+ 7	—	—	—
Jena		4·7	331	i 1 0	−14	i 2 9	− 1	—	—	e 2·6
Basle		5·3	280	e 1 21	− 1	e 2 31	+ 6	—	—	—
Strasbourg		5·4	292	e 1 53	P_g	2 37	+ 9	3 18	S_g	—
Potsdam		5·6	346	—	—	e 2 47	S*	i 3 3	S_g	i 3·2
Neuchatel		5·7	274	e 1 27	− 1	e 2 41	+ 6	—	—	e 3·5
Uccle		8·2	303	e 2 30?	P*	—	—	—	—	i 4·7
Clermont-Ferrand		8·5	267	i 2 27	P*	i 4 13	S*	—	—	i 5·4
Paris		8·8	287	—	—	e 4 12	+19	i 5 13	S_g	e 6·0

Additional readings :—
Prague ePS = 1m.44s.
Ravensburg e = 1m.12s. and 1m.26s., iS = 2m.0s.
Belgrade eP_g = 52s., i = 55s., 1m.10s., and 1m.33s., iS_g = 1m.37s.
Florence iP_gZ = 1m.33s.
Ebingen eP*Z = 1m.23s., e = 1m.44s., eS_g? = 2m.46s.
Stuttgart iP*Z = 1m.21s., eS_g?Z = 2m.41s.
Jena ePEN = 1m.11s., iN = 2m.14s., iE = 2m.18s.
Long waves were also recorded at De Bilt, Kew, Bucharest, and Granada.

Nov. 29d. 18h. 45m. 35s. Epicentre 38°·5N. 41°·5E.

A = +·5876, B = +·5199, C = +·6199 ; δ = −15 ; h = −1 ;
D = +·663, E = −·749 ; G = +·464, H = +·411, K = −·785.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Ksara	6·5	226	e 1 40?	+ 1	3 34	S_g	—	—	—
Istanbul	9·9	289	4 29	S	(4 29)	+ 9	5 28	S_g	—
Helwan	12·1	227	2 54	− 3	—	—	—	—	e 7·3
Bucharest	13·0	302	e 5 25?	S	i 7 18	L	—	—	(i 7·3)
Sofia	14·4	292	e 3 31	+ 4	—	—	—	—	e 7·3
Moscow	17·5	352	e 4 5	− 2	e 7 21	0	—	—	—
Tashkent	21·5	74	4 50	− 2	8 55	+ 8	—	—	—
Sverdlovsk	22·3	29	5 2	+ 1	9 3	+ 1	—	—	—
Prague	22·4	311	—	—	e 9 9	+ 5	—	—	e 12·4
Florence	23·3	294	e 5 19	+ 9	i 9 30	+10	e 5 54	PP	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Cheb		23·7	310	—	—	e 9 41	+14	—	—	e 14·4
Jena		24·5	311	e 5 25	+ 3	—	—	—	—	e 14·4
Chur		24·8	299	e 5 23	− 2	—	—	—	—	—
Milan	z.	24·9	297	5 25	− 1	—	—	—	—	—
Stuttgart	z.	25·4	305	e 5 28	− 3	—	—	—	—	—
Zürich		25·5	302	e 5 27	− 5	—	—	—	—	—
Copenhagen		25·9	322	—	—	8 18	?	—	—	16·4
Basle		26·2	302	e 5 12	−26	—	—	—	—	—
Neuchatel		26·6	302	e 5 39	− 3	—	—	—	—	—
New Delhi		31·2	97	—	—	e 12 2	+33	—	—	—
Bombay	E.	33·5	117	—	—	i 12 59	+54	e 14 27	SS	19·4
Calcutta	N.	42·9	98	—	—	e 14 25	− 2	—	—	—

Additional readings :—
Helwan eZ = 3m.25s. and 4m.25s.
Florence ePPPE = 6m.6s., eSSSE = 10m.22s.
Bombay eE = 15m.34s.
Long waves were recorded at Belgrade, De Bilt, Kew, Potsdam, and Granada.

Nov. 29d. 19h. 37m. 1s. Epicentre 27°·8S. 67°·4W.

Epicentre 29°S. 68°W. Depth 100 km. (Pasadena).

A = +·3404, B = −·8178, C = −·4639 ; δ = −13 ; h = +3 ;
D = −·923, E = −·384 ; G = −·178, H = +·428, K = −·886.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Montezuma		5·3	345	e 1 22	0	e 2 28	+ 3	—	—	e 3·0
La Plata	E.	10·8	134	2 38	− 1	4 38	− 4	—	—	5·4
La Paz		11·3	356	i 2 51	+ 5	i 5 28	+34	—	—	6·9
Huancayo		17·4	331	i 4 8	+ 2	i 7 31	+12	i 4 57	PP	e 9·6
Rio de Janeiro	N.	22·4	80	i 4 59	− 3	i 9 15	+11	—	—	i 12·2
Bogota		32·9	346	e 6 39	+ 1	—	—	—	—	e 20·0
Balboa Heights		38·4	340	e 7 26	+ 1	—	—	—	—	—
Fort de France		42·7	9	i 8 1	+ 1	e 14 25	+ 1	—	—	—
San Juan		45·9	1	e 8 21	− 5	e 15 2	− 9	i 10 22	PP	e 26·3
Bermuda		59·9	2	e 10 8	− 2	e 18 19	− 2	—	—	e 30·5
Philadelphia		67·8	354	—	—	e 20 52	+52	—	—	e 33·2
Fordham		68·6	355	e 11 7	0	i 20 10	+ 1	—	—	—
Pittsburgh	N.W.	68·7	349	i 11 8	+ 1	i 20 9	− 1	—	—	—
St. Louis		69·5	340	i 11 10	− 2	i 20 15	− 5	e 20 48	PS	—
Florissant		69·7	340	i 11 12	− 2	i 20 18	− 4	—	—	—
Harvard		70·1	356	i 11 17	+ 1	—	—	—	—	e 39·0
Tucson		72·6	322	i 11 32	+ 1	e 20 52	− 4	i 14 3	PP	e 36·6
Ottawa		73·2	353	11 35	0	21 3	+ 1	25 39	SS	e 35·0
Seven Falls		74·6	357	—	—	e 21 22	+ 4	—	—	32·0
La Jolla		76·7	318	11 55	0	—	—	—	—	—
Riverside		77·6	318	i 11 59a	− 1	—	—	—	—	—
Mount Wilson		78·1	318	i 12 3a	+ 1	—	—	—	—	—
Pasadena		78·1	318	i 12 3a	+ 1	i 21 59	+ 3	—	—	e 38·0
Santa Barbara	z.	79·3	317	e 12 10	+ 1	—	—	—	—	—
Haiwee		79·5	320	i 12 6	− 4	—	—	—	—	—
Tinemaha		80·3	320	i 12 14a	0	e 22 24	+ 4	—	—	—
Lisbon		85·7	41	12 46k	+ 4	i 23 23	+ 9	i 23 11	SKS	46·0
San Fernando		86·0	44	i 22 48	?	e 23 13	− 4	e 25 5	PS	47·0
Granada		88·1	45	i 13 7a	+13	23 43	+ 6	13 36	pP	e 46·8
Almeria		88·6	46	i 13 3	+ 7	23 25	[+ 1]	16 35	PP	45·0
Toledo		89·5	43	i 13 3	+ 3	23 57	+ 7	23 38	SKS	43·0
Auckland		93·1	225	—	—	e 24 59?	+37	—	—	44·0
Clermont-Ferrand		97·1	41	i 13 39	+ 4	—	—	—	—	e 51·0
Stonyhurst		98·7	32	—	—	e 33 59?	?	—	—	e 53·0
Florence	z.	101·2	45	—	—	e 34 10	?	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Stuttgart		102·2	40	e 14 0	+ 2	—	—	—	—	e 50·0
Cheb		104·7	40	e 16 59?	?	—	—	—	—	56·0
Ksara		115·2	63	e 19 28	PP	—	—	e 21 42	PPP	—
Bombay	E.	142·5	94	19 35	[0]	29 38	{+ 2}	22 52	PP	75·0
Calcutta	N.	157·4	97	e 24 43	PP	e 44 18	SS	—	—	—

Additional readings :—
La Plata SN =4m.29s.
La Paz iSZ =5m.37s.
San Juan e =16m.0s., eSS =18m.32s.
Philadelphia e =21m.58s.
St. Louis iZ =12m.4s., eN =21m.13s. and 21m.35s.
Florissant iE =20m.29s.
Tucson e =12m.11s. and 17m.7s.
Pasadena iZ =12m.9s.
Granada sP =14m.6s.
Toledo SS =29m.32s.
Bombay iE =23m.21s., PPSE =35m.22s.
Long waves were also recorded at Bozeman, Chicago, Colombo, and other European stations.

Nov. 29d. 21h. 18m. 24s. Epicentre 49°·5N. 156°·2E. (as on Oct. 24d.).

A = −·5966, B = +·2631, C = +·7582 ; δ = +2 ; h = −5 ;
D = +·404, E = +·915 ; G = −·694, H = +·306, K = −·652.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Nemuro		9·6	234	e 3 0	PPP	6 27	L	—	—	(6·4)
Abashiri		9·8	240	2 22	− 2	—	—	—	—	—
Sapporo		12·1	243	e 2 51	− 6	5 28	SS	—	—	—
Mizusawa	E.	14·9	231	3 51	PPP	7 10	SSS	—	—	—
	N.	14·9	231	3 59	PPP	6 51	SSS	—	—	—
Sendai		15·7	230	3 42	− 2	6 36	− 3	—	—	—
Vladivostok		17·9	258	i 4 9	− 3	—	—	—	—	—
Kumagaya		18·1	229	4 20	+ 6	7 56	SS	—	—	—
Nagano		18·3	233	e 4 31	PP	—	—	—	—	—
Tokyo		18·3	228	4 21	+ 4	—	—	—	—	—
Wakayama		21·7	232	4 52	− 3	8 52	+ 1	—	—	—
Zinsen		24·4	252	5 17	− 4	—	—	—	—	—
Irkutsk		32·3	297	e 7 39	PP	—	—	—	—	—
College		32·7	40	e 8 33	PPP	e 11 54	+ 2	—	—	e 15·6
Sitka		40·0	53	—	—	e 13 28	−16	—	—	e 18·0
Honolulu		45·9	110	—	—	e 14 16	−55	—	—	e 20·3
Tashkent		58·3	298	e 10 31	PcP	e 18 6	+ 5	—	—	—
Calcutta	N.	58·9	269	e 10 0	− 3	i 18 10	+ 2	18 40	PS	e 28·7
Tinemaha		60·3	68	e 10 11	− 2	—	—	e 10 23	pP	—
New Delhi	N.	61·9	282	e 10 26	+ 2	e 18 54	+ 7	—	—	—
Mount Wilson	Z.	62·3	70	e 10 23	− 3	—	—	e 10 33	pP	—
Pasadena		62·3	70	e 10 32	+ 6	—	—	—	—	e 26·9
Riverside	Z.	62·9	70	e 10 35	+ 5	—	—	—	—	—
Palomar	Z.	63·6	70	e 10 39	+ 4	—	—	—	—	—
Tucson		68·0	67	e 11 1	− 2	—	—	—	—	e 33·0
Bombay		71·6	278	i 11 22	− 3	20 44	0	21 17	ScS	e 35·6
Florissant	E.	74·3	49	—	—	e 20 15	−60	—	—	e 35·2
St. Louis		74·5	49	e 11 41	− 1	e 20 17	−60	—	—	—
Seven Falls		75·5	31	—	—	e 21 35	+ 7	—	—	39·6
Jena		75·5	338	e 11 48	0	—	—	—	—	e 40·6
Bucharest		76·8	326	—	—	e 22 6?	+24	—	—	42·6
Stuttgart		78·1	339	e 12 2	0	—	—	—	—	e 41·6
Sofia		79·3	326	e 12 15	+ 6	e 21 57	−12	—	—	e 36·6
Fordham		79·8	37	—	—	e 22 18	+ 4	—	—	—
Milan	Z.	81·2	337	i 12 21	+ 2	—	—	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Florence	z.	82·2	335	e 12 23k	− 1	—	—	—	—	—
Helwan	z.	87·0	315	e 12 48	0	—	—	—	—	—
Toledo		89·3	345	e 12 58	− 1	—	—	40 55	?	49·6
San Juan		102·7	41	e 19 43	?	e 25 45	+ 2	e 32 58	SS	e 52·7
La Paz	z.	131·4	63	23 56	PPP	—	—	—	—	79·6

Additional readings :—
Calcutta eSSN = 22m.20s.
Bombay iEN = 11m.52s., iE = 12m.45s. and 21m.52s., eN = 23m.37s., SSE = 25m.27s.
St. Louis eE = 24m.49s.
Helwan iZ = 12m.56s., eZ = 13m.18s.
Long waves were also recorded at Harvard, La Plata, Auckland, Wellington, Christchurch, Riverview, and other European stations.

Nov. 29d. Readings also at 0h. (Pasadena, Palomar, Tucson, Riverside, Victoria, and Ksara), 3h. (Fort de France), 6h. (Ksara), 7h. (La Paz), 9h. (near Apia and near Mizusawa), 10h. (La Paz, Mount Wilson, Pasadena, Palomar, Riverside, Tucson, and Tinemaha), 11h. (near Mizusawa), 14h. (Sofia (2) and near Mizusawa), 18h. (Ksara), 20h. (near Chur), 21h. (near Erevan), 22h. (Riverview), 23h. (La Paz and La Plata (2)).

Nov. 30d. Readings at 0h. (near Granada, Toledo, Almeria, San Fernando, and Tortosa), 5h. (near Mizusawa), 13h. (Ksara, Tashkent, Bucharest, and Stuttgart), 14h. (Tuai, Suva, Wellington, Pasadena, Mount Wilson, Riverside, Palomar, Tinemaha, Tucson, Haiwee, Basle, Stuttgart, and near Sofia (2)), 15h. (near Apia), 16h. (near Erevan), 17h. (Calcutta), 20h. (Ksara and Apia), 21h. (Ksara, near Berkeley, Fresno, Branner, and Lick), 22h. (Fresno).

Dec. 1d. 6h. 4m. 57s. Epicentre 4°·1S. 143°·8E. Depth of focus 0·010.

Epicentre 4°·75S. 144°E. Depth 120 km. (Pasadena).

$A = -·8049$, $B = +·5891$, $C = -·0710$; $\delta = -6$; $h = +7$;
$D = +·591$, $E = +·807$; $G = +·057$, $H = -·042$, $K = -·997$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	z.	24·9	161	i 5 12k	− 3	e 9 33	+ 4	i 5 34	PP	—
Riverview		30·4	169	i 6 2k	− 3	i 10 54	− 3	i 7 2	PP	—
Sydney		30·4	169	e 6 6	+ 1	e 9 51	−66	—	—	—
Suva		36·6	115	e 7 54	+56	e 13 13	+40	e 8 30	pP	—
Kagosima		37·7	341	i 6 9	−59	—	—	—	—	—
Miyazaki		37·7	343	7 10	+ 2	9 16	?	—	—	—
Simidu		38·1	346	7 7	− 4	13 48	+52	—	—	—
Perth		38·2	220	7 8	− 4	12 58	0	8 33	PP	—
Kumamoto		38·8	344	e 7 18	+ 1	—	—	—	—	—
Shizuoka		39·2	355	7 17	− 3	13 19	+ 6	—	—	—
Sumoto		39·2	350	7 21	+ 1	13 6	− 7	—	—	—
Kameyama		39·3	352	7 29	+ 8	—	—	—	—	—
Kobe		39·4	350	i 7 22	0	9 40	?	—	—	—
Yokohama		39·5	355	7 26	+ 4	e 13 17	0	—	—	—
Tokyo Cen. Met. Ob.		39·8	356	e 7 28	+ 3	—	—	—	—	—
Nagano		40·9	353	7 34	0	—	—	—	—	—
Zi-ka-wei	N.	41·1	331	e 7 33	− 3	i 14 25	+44	—	—	—
Husan		41·4	341	7 39	+ 1	14 33	+47	—	—	—
Sendai		42·2	358	7 44	− 1	13 14	−43	—	—	—
Mizusawa		43·1	357	e 7 48	− 4	13 56	−14	—	—	—
Auckland		43·3	143	7 51	− 3	14 11	− 2	8 19	pP	20·2
Miyako		43·6	358	e 7 58	0	14 46	+28	—	—	—
Zinsen		44·3	340	e 7 58	− 4	15 14	+46	—	—	—
New Plymouth		44·3	146	8 3	+ 1	14 31	+ 3	8 31	pP	—
Arapuni		44·6	144	7 3?	−61	14 9?	−23	—	—	—
Tuai		45·9	146	8 14	0	14 47	− 4	—	—	—
Mori		46·1	357	8 5	−11	—	—	—	—	—
Wellington	z.	46·3	147	8 16	− 2	14 51	− 5	8 43	pP	22·0
Christchurch		46·8	151	8 20	− 2	15 0	− 4	i 8 46	pP	22·3
Sapporo		47·0	358	8 24	+ 1	10 13	PP	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Vladivostok		48·2	349	i 8 33	+ 1	15 58	pS	9 53	PcP	—
Calcutta	N.	60·3	299	i 10 3a	+ 2	i 18 9	+ 3	i 10 51	sP	—
Honolulu		62·5	63	e 10 3	−13	e 18 36	+ 2	—	—	e 26·2
Colombo	E.	64·7	279	10 29	− 1	19 5	+ 4	—	—	—
Kodaikanal		67·6	283	i 11 47	+59	i 21 21	?	—	—	—
Hyderabad	N.	67·9	291	10 48	− 2	19 38	− 2	20 28	ScS	—
New Delhi	N.	71·7	302	i 11 10k	− 3	i 20 19	− 5	11 40	pP	—
Bombay		73·4	291	i 11 21	− 2	i 20 44	+ 1	11 44	pP	—
Stalinabad		80·9	310	e 12 6	+ 1	—	—	—	—	—
Tashkent		81·1	313	i 12 7	+ 1	i 22 3	− 3	i 15 4	PP	—
College		84·7	23	e 12 21	− 3	e 22 31	−11	e 15 39	PP	e 35·6
Sitka		88·5	33	e 12 42	− 1	e 23 14	− 4	e 16 31	PP	e 36·9
Sverdlovsk		89·7	327	i 12 46	− 2	i 23 26	− 4	i 16 21	PP	—
Tananarive		94·6	251	—	—	e 23 36	[+ 2]	24 31	S	—
Ukiah		94·9	51	e 22 16	?	e 24 31	+16	—	—	e 41·5
Victoria		94·9	41	13 11	− 1	23 36	[− 1]	17 3	PP	e 42·0
Berkeley	Z.	95·6	52	i 13 22	+ 6	i 26 25	PPS	e 17 6	PP	—
Santa Clara		95·8	52	i 15 10	?	e 24 38	+16	e 32 16	?	e 44·0
Lick		96·1	52	e 12 21	−57	—	—	e 17 2	PP	—
Tinemaha		98·8	53	e 13 31	+ 1	—	—	—	—	—
Pasadena		98·9	56	i 13 29a	− 1	i 23 57	[− 2]	i 13 59	pP	e 44·8
Mount Wilson	Z.	99·0	56	i 13 30	− 1	i 17 33	PP	i 14 3	pP	—
Haiwee		99·1	54	e 13 30	− 1	—	—	—	—	—
Riverside	Z.	99·6	56	e 13 31	− 3	—	—	e 14 4	pP	—
La Jolla	N.	99·7	57	e 13 33	− 1	—	—	—	—	—
Palomar	Z.	100·0	56	i 13 36	0	i 30 49	PKKP	i 14 8	pP	—
Logan		103·4	47	i 18 10	PP	e 24 12	[− 8]	e 27 17	PS	e 43·6
Bozeman		103·5	43	e 18 9	PP	i 24 21	[+ 1]	i 25 15	S	e 43·2
Salt Lake City		103·5	48	e 19 15	?	e 24 22	[+ 2]	—	—	e 43·5
Saskatoon		105·2	36	—	—	e 25 22	−19	—	—	44·0
Tucson		105·2	57	e 13 57	− 2	e 27 19	SP	i 18 18	PP	e 47·9
Ksara		107·1	303	e 18 11	PP	e 28 30	PPS	—	—	—
Rapid City		109·3	44	e 18 45	PP	e 25 38	SKKS	e 28 8	PS	e 54·5
Upsala		111·0	333	e 23 40	?	e 25 44	SKKS	e 28 28	PS	e 52·0
Helwan		111·5	300	e 14 30	P	30 9	PPS	35 33	SS	—
Bucharest		112·4	316	e 18 33?	[+ 8]	e 25 54	SKKS	(35 3)	SS	35·1
Scoresby Sund		113·1	355	18 56	PP	25 55	SKKS	34 21?	SS	—
Lincoln		114·8	46	—	—	e 29 7	PS	e 40 36	?	e 53·4
Sofia		114·9	315	e 19 36	PP	e 26 5	SKKS	e 30 27	PPS	—
Bergen		115·6	338	19 36	PP	27 9	?	e 29 11	PS	56·0
Copenhagen		115·6	332	19 35	PP	35 33?	SS	29 10	PS	—
Belgrade		116·1	317	18 51	[+19]	i 26 21	SKKS	e 19 37	PP	e 62·8
Potsdam		117·1	328	i 19 50	PP	e 29 39?	PS	e 36 32	SS	e 54·0
Prague		117·5	325	e 18 33?	[− 2]	e 29 39?	PS	e 19 45	PP	e 59·0
Cheb		118·7	326	e 19 59	PP	29 52	PS	—	—	e 60·0
Florissant		120·0	47	i 20 5	PP	e 25 26	[− 1]	i 20 44	pPP	—
Triest		120·1	321	e 19 50	PP	i 26 3	SKKS	—	—	—
St. Louis		120·2	47	e 18 42	[+ 2]	i 25 25	[− 3]	i 20 5	PP	—
Aberdeen		120·6	339	i 20 39	PP	—	—	i 30 17	PS	58·5
Chicago		120·8	43	e 20 7	PP	e 37 18	SSP	e 29 58	PS	e 51·9
Stuttgart		121·1	326	e 18 40	[− 2]	e 28 51	?	e 30 48	PS	e 60·0
De Bilt		121·2	331	e 18 46	[+ 4]	e 37 3?	SSP	i 20 7	PP	—
Chur		122·0	324	e 18 42	[− 2]	—	—	e 32 30	PPS	—
Zürich		122·2	325	e 18 42a	[− 2]	—	—	—	—	—
Ivigtut		122·3	6	e 20 23	PP	—	—	e 30 14	PS	—
Uccle		122·4	330	e 18 48a	[+ 3]	i 30 25	PS	i 20 55	PP	e 59·0
Florence		122·5	320	i 20 13a	PP	i 30 28	PS	i 31 4	PPS	—
Basle		122·7	325	e 18 47	[+ 2]	—	—	e 21 26	PP	—
Milan	E.	122·9	323	—	—	—	—	e 38 54	?	—
Stonyhurst		123·3	336	20 28	PP	29 38	SKSP	30 24	PS	e 58·0

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.	L.
		°	°	m. s.	s.	m. s.	s.	m. s.	m.
Neuchatel		123·4	325	e 18 45	[− 2]	—	—	— —	—
Kew		124·1	333	i 18 47	[− 1]	e 25 43?	[+ 3]	i 20 37 PP	e 57·0
Paris		124·6	329	i 20 41	PP	—	—	i 21 23 ?	63·0
Ottawa		126·3	33	18 50	[− 2]	27 33?	SKKS	20 45 PP	e 57·0
Pittsburgh	N.W.	126·6	40	e 20 42	PP	e 26 44	[+56]	e 30 43 PS	—
Seven Falls		127·8	28	18 56	[+ 1]	32 33	PPS	38 33? SS	59·0
Vermont		128·3	33	i 21 0	PP	e 30 37	PS	i 38 35 SS	e 50·4
Columbia		128·8	47	—	—	e 22 18	PKS	e 31 13 PS	e 62·7
Philadelphia		129·9	38	e 21 7	PP	i 31 55	PS	e 38 47 SS	e 54·8
Fordham		130·2	36	e 18 57	[− 2]	i 23 5	PKS	i 21 9 PP	—
Harvard		130·5	33	e 18 58	[− 2]	i 22 13	PKS	— —	—
Tortosa		130·8	322	i 22 27	PKS	33 15	PPS	23 58 PPP	—
Toledo		134·0	324	e 19 7	[0]	26 20	[+14]	19 38 pPKP	64·0
Almeria		135·0	320	i 19 8	[0]	26 8	[0]	19 38 pPKP	69·0
Granada		135·5	321	e 18 12	[−57]	29 4	SKKS	— —	—
San Fernando	E.	137·6	322	e 19 11	[− 2]	26 9	[− 3]	i 22 52 PKS	72·5
Lisbon		137·7	327	19 56?	[+42]	—	—	22 52a PKS	65·6
Huancayo		137·9	113	e 19 17	[+ 3]	e 31 56	PS	i 40 18 SS	e 56·0
Bermuda		141·2	39	e 22 19	PKS	e 32 24	PS	— —	—
Bogota		142·2	87	e 19 18	[− 3]	—	—	i 19 53 pPKP	—
La Paz		142·4	124	i 19 20s	[− 2]	i 32 33	PS	22 34 PP	e 67·4
San Juan		147·5	61	i 19 29	[− 1]	e 27 16	[+48]	e 41 56 SS	e 67·9
Rio de Janeiro	E.	152·3	166	e 19 43	[+ 6]	—	—	— —	e 42·6
Fort de France		153·2	65	e 21 16	?	—	—	— —	—

Additional readings :—
Riverview iN =12m.19s., iSS =12m.23s.
Suva iPP =9m.24s., iP_cP =10m.13s., isP_cS =15m.16s.
Perth SS =15m.8s.
Mizusawa SN =13m.52s.
Auckland sPP? =10m.8s.?, sS =14m.58s., S_cS? =17m.48s., pS_cS? =18m.33s.
Wellington sP =9m.13s., P_cPZ =9m.53s., PP =10m.8s., sPP =10m.48s., P_cS =13m.33s., sS =15m.28s., pS_cS =18m.43s., Q? =20·0m.
Christchurch PP =10m.29s., P_cS =13m.36s., e =17m.1s., Q =18m.38s.
Vladivostok iPP =10m.27s.
Calcutta iN =19m.35s.
Honolulu e =10m.18s. and 14m.14s.
Colombo iE =15m.45s. and 21m.8s.
New Delhi PPN =13m.35s., iN =14m.45s., PSN =20m.59s., sSN =21m.7s., SSN =24m.50s., SSSN =27m.36s.
Bombay sPE =11m.54s., iEN =12m.7s., iN =13m.45s., iE =13m.49s. and 14m.18s., sSN =21m.21s., iEN =21m.34s. and 24m.19s.
Tashkent PS =22m.57s.
College e =23m.28s., eSS =28m.36s.
Sitka e =23m.57s.
Sverdlovsk SKS =23m.3s.
Tananarive PS =25m.20s., SS =30m.33s.
Ukiah e =26m.17s. and 31m.33s.
Berkeley iZ =14m.15s.
Pasadena iPPEZ =17m.30s., iSE =24m.53s., eSSE =31m.45s.
Palomar iSKKPZ =34m.43s.
Logan e =18m.48s., i =25m.9s.
Salt Lake City e =25m.19s., 26m.20s., and 33m.29s.
Tucson e =17m.52s., i =18m.55s., e =26m.20s. and 29m.15s.
Rapid City e =19m.31s.
Upsala eE =23m.44s. and 26m.45s., eN =33m.3s.?, eE =35m.3s.?, and 39m.3s.?.
Helwan ePKPZ =18m.15s., PPEZ =19m.12s., PS?E =29m.3s.
Scoresby Sund 19m.45s., 21m.55s., i =27m.1s., 28m.50s., 29m.30s., and 30m.33s.?.
Sofia eN =35m.29s. and 36m.15s.
Bergen PPPN =22m.8s., eN =29m.23s., SSE =35m.26s., SKKSN =36m.33s., eE =47m.25s.
Copenhagen 20m.4s., 22m.3s., 22m.33s., 27m.10s., 28m.2s., 29m.55s., and 30m.54s.
Belgrade e =20m.29s. and 22m.41s., PPS =30m.14s., e =36m.53s.
Potsdam ePPPE =22m.19s., ipPSE =29m.54s., epPSN =30m.3s.?.
Prague ePPP =22m.27s.?, e =26m.15s., eSS =36m.21s.?.
Florissant esSKSE =26m.24s., eSKKSE =26m.50s., iPSE =29m.55s.
St. Louis epPPE =20m.50s., ePPPN =22m.58s., epPPP?E =23m.22s., esSKSE =26m.25s., eSKKSE =26m.55s., esSKKSN =27m.48s., eSE =27m.54s., eE =28m.30s., esSN =28m.47s., eE =29m.24s., iPSE =29m.55s.
Aberdeen iEN =30m.46s.
Chicago e =30m.31s.
Stuttgart ePKP? =18m.44s., ePP? =20m.10s., ePPP?Z =22m.50s., eSS? =36m.51s.

Continued on next page.

De Bilt iPPP =22m.44s., ePS =30m.3s.?.
Uccle i =20m.25s., iZ =21m.4s., iPPPZ =23m.4s., eZ =23m.23s., iSN =28m.15s., iN =30m.58s.
Florence iPPZ =23m.28s., iPPPZ =25m.4s., iPSE =31m.59s., phases are wrongly identified.
Stonyhurst 21m.9s. and 21m.54s., PPP =23m.9s., 28m.7s., and 31m.11s., PKKS =32m.6s., 32m.30s., and 37m.54s.
Kew eP?Z =13m.53s.?, iPPPZ =21m.53s.?, ePS?Z =30m.2s., ePPSZ =31m.3s., iPPSEN =31m.15s., iSKKSEZ? =33m.29s., eSS =36m.53s.?, eSSSEN = 42m.33s.?.
Ottawa PS =31m.27s.?, PPS =33m.3s.?, SS =38m.27s.?, SSS =43m.45s.?.
Seven Falls e =21m.33s.?.
Vermont e =22m.13s., 32m.39s. and 44m.17s.
Philadelphia i =22m.22s., e =31m.16s. and 44m.31s.
Fordham iPS? =31m.59s.
Harvard i =19m.31s. and 23m.8s.
Tortosa eN =33m.48s.
Toledo PP =21m.40s., SS =40m.17s.
Almeria sPKP =19m.57s., PP =21m.48s., sPP =22m.31s., PPP =24m.48s., pSKS = 26m.47s., SKKS =27m.54s., SPP =33m.12s., PPS =33m.32s., SS =39m.8s., sSS = 39m.56s., SSS =44m.12s.
Granada ePP =20m.15s., PPP =23m.54s.
San Fernando PP?E =23m.25s.
Lisbon Z =23m.33s., SKP?N =23m.40s., SKP?E =23m.43s., N =23m.54s., Z =24m.25s., E =24m.53s., PPS? =34m.56s., N =35m.38s., E =35m.43s., N =35m.57s., SS?E = 41m.5s., SS? =41m.53s., SSS?E =45m.45s.?.
Huancayo i =22m.54s., e =29m.40s. and 41m.15s.
La Paz iZ =23m.50s. and 24m.26s., PPP =25m.40s., iPPS =34m.49s., iZ =40m.10s.
San Juan i =20m.22s. and 33m.11s.
Long waves were also recorded at Jena.

Dec. 1d. 10h. 34m. 44s. Epicentre 21°·0S. 69°·0W. Depth of focus 0·010.

Scale VI in Chili. Radius of macroseismic area 1000 km. Depth 100 km.
"Annales de l'Institut de Physique du Globe de Strasbourg," 2e partie, Séismologie, tome VII-VIII, Strasbourg 1950, p. 41. Epicentre 21°S. 68°W.

$A = +·3349$, $B = -·8723$, $C = -·3563$; $\delta = +1$; $h = +4$;
$D = -·934$, $E = -·358$; $G = -·128$, $H = +·333$, $K = -·934$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Montezuma		1·6	175	e 0 22	− 6	i 0 36	−13	—	—	—
La Paz		4·6	11	i 1 11	+ 2	i 1 43	−18	—	—	—
Huancayo		10·8	325	e 2 33	0	i 4 37	+ 5	i 3 7	PP	i 5·5
La Plata	E.	16·9	147	3 56	+ 4	6 58	+ 3	4 22	PP	8·2
	N.	16·9	147	4 16?	PP	6 52	− 3	—	—	8·1
	Z.	16·9	147	3 53	+ 1	7 4?	+ 9	4 22	PP	8·6
Rio de Janeiro	E.	24·0	98	i 5 12	+ 6	i 9 14	0	—	—	i 11·2
Bogota		25·9	348	i 5 26	+ 1	e 9 36	− 9	—	—	e 13·5
Balboa Heights		31·5	341	e 6 17	+ 2	i 11 18	+ 3	—	—	—
Fort de France		36·3	14	i 8 28	PP	e 13 48	P_eS	9 24	P_eP	e 17·5
San Juan		39·2	4	e 7 17	− 3	i 12 53	−20	e 8 43	PP	e 16·0
Port au Prince		39·4	355	i 7 18	− 4	i 13 14	− 2	—	—	—
Bermuda		53·2	5	e 9 2	− 8	i 16 22	−10	—	—	e 22·4
Columbia		55·9	348	e 9 29	− 1	e 17 3	− 5	e 9 59	PP	e 24·4
Georgetown		60·1	353	i 9 57	− 2	i 17 59	− 4	—	—	—
Philadelphia		60·9	355	i 10 5	0	i 18 11	− 2	i 19 43?	—	—
Cape Girardeau	N.	61·2	342	e 10 5	− 2	e 18 14	− 3	e 10 34	pP	—
Fordham		61·7	356	e 10 7	− 3	i 18 20	− 3	i 18 58	PPS	—
Pittsburgh	N.W.	62·0	351	i 10 14	+ 2	i 18 21	− 6	—	—	—
St. Louis		62·6	341	e 10 14	− 2	18 32	− 3	i 10 43	pP	—
Florissant		62·8	341	i 10 18	0	i 18 35	− 2	i 10 47	pP	—
Harvard		63·2	359	i 10 19	− 1	i 18 41	− 1	—	—	e 25·3
Chicago		64·8	344	e 10 29	− 2	i 18 55	− 7	e 11 3	pP	e 28·5
Vermont		65·3	357	e 10 42	+ 8	i 19 8	0	e 14 53	PPP	e 26·4
Halifax		65·5	5	—	—	e 19 7	− 4	—	—	27·3
Ottawa		66·4	355	10 39	− 2	19 20	− 2	23 46?	SS	e 29·3

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tucson		66·4	332	i 10 40	− 1	c 19 24	+ 2	—	—	c 27·8
Lincoln		66·7	338	e 10 34	− 9	e 19 17	− 8	e 23 1	SS	e 43·9
Shawinigan Falls		67·3	358	10 48	+ 2	19 34	+ 2	27 16?	SSS	—
Seven Falls		67·8	359	10 54	+ 4	19 33	− 5	—	—	—
La Jolla		70·7	318	e 11 8	+ 1	e 20 17	+ 5	—	—	—
Palomar	Z.	70·8	319	i 11 8k	0	—	—	—	—	—
Pierce Ferry		71·0	323	i 11 11	+ 2	e 20 12	− 4	i 11 41	pP	—
Boulder City		71·4	322	i 11 12	0	e 20 22	+ 2	i 11 31	pP	—
Riverside		71·5	319	i 11 14k	+ 2	e 20 25	+ 3	—	—	—
Rapid City		71·9	335	i 11 15	+ 1	i 20 25	− 1	e 24 17	SS	e 31·8
Mount Wilson		72·1	319	i 11 17k	+ 1	—	—	e 39 34	P′P′	—
Pasadena		72·1	319	i 11 17k	+ 1	i 20 36	+ 7	i 11 45	pP	e 28·7
Salt Lake City		73·2	328	e 11 26	+ 4	e 20 46	+ 5	e 25 3	SS	e 33·4
Santa Barbara		73·2	318	e 11 25	+ 3	—	—	—	—	—
Haiwee		73·3	320	i 11 24	+ 1	e 20 45	+ 3	—	—	—
Logan		73·9	328	e 11 27	+ 1	i 20 52	+ 3	e 25 23	SS	e 30·7
Tinemaha		74·1	321	i 11 29k	+ 2	e 20 54	+ 3	e 39 7	P′P′	—
Fresno	N.	74·8	320	e 11 34	+ 3	—	—	—	—	—
Lick		76·3	319	e 11 37	− 3	e 21 20	+ 5	—	—	—
Santa Clara		76·5	319	i 12 38	+57	(e 21 2)	−15	—	—	e 21·0
Bozeman		76·6	331	e 11 43	+ 1	i 21 17	− 1	e 26 24	SS	e 31·8
Branner	E.	76·7	319	e 11 44	+ 2	e 21 24	+ 4	—	—	—
Berkeley	Z.	77·0	319	i 11 43	− 1	i 21 28	+ 5	—	—	—
Ukiah		78·4	320	—	—	e 21 43	+ 5	—	—	e 32·9
Saskatoon		79·9	337	12 18	+18	21 52	− 2	27 16?	SS	36·3
Lisbon	E.	81·7	43	12 14k	+ 5	22 21?	+ 9	17 3?	PPP	38·8
	N.	81·7	43	12 19?	+10	22 17?	+ 5	14 17?	PP	38·3
	Z.	81·7	43	12 14?k	+ 5	—	—	—	—	38·5
San Fernando	E.	82·3	46	e 12 23	+11	i 22 34	+16	i 23 31	PPS	38·8
Seattle		83·4	327	—	—	—	—	(e 23 47)	PPS	e 23·8
Ivigtut		83·6	10	e 12 20	+ 1	e 22 27	− 4	e 31 26	SSS	—
Granada		84·5	47	i 12 32k	+ 9	i 22 37	− 3	12 52	pP	40·5
Victoria		84·5	327	12 28	+ 5	22 40	0	—	—	35·3
Almeria		85·1	48	i 12 26	0	i 22 51	+ 5	12 56	pP	39·3
Toledo		85·6	45	i 12 30	+ 1	i 22 52	+ 1	13 4	pP	40·8
Tortosa		89·1	45	13 2	+16	23 22	− 2	16 50	PP	e 44·3
Barcelona		90·4	45	e 12 8	−44	i 23 16	[+ 4]	—	—	e 42·6
Kew		93·8	36	i 13 15	+ 8	i 23 33	[+ 4]	i 16 48	PP	—
Stonyhurst		93·8	33	13 20	+13	23 33	[+ 4]	16 33	PP	38·7
Paris		94·1	39	e 13 7	− 2	i 23 30	[− 1]	e 16 41	PP	44·3
Wellington		94·4	223	13 17	+ 7	23 52	SKKS	13 48	pP	42·3
Christchurch		94·5	220	13 15	+ 5	23 34	[+ 1]	16 57	PP	43·5
Besançon		95·5	41	—	—	i 23 45	[+ 4]	—	—	45·3
Arapuni		95·6	226	12 16?	−60	23 34?	[− 7]	—	—	44·3
Sitka		95·6	330	e 13 48	+32	e 24 8	−13	e 30 58	SS	e 40·5
Aberdeen		95·7	29	i 16 31	PP	i 23 46	[+ 4]	i 30 41	SS	41·3
Neuchatel		96·0	42	e 13 16	− 1	e 23 48	[+ 4]	—	—	—
Uccle		96·1	38	e 13 21	+ 3	i 23 27	[−17]	e 16 46	PP	40·3
Basle		96·6	42	e 13 22	+ 2	e 23 51	[+ 4]	e 17 17	PP	—
Milan		96·8	44	i 13 22	+ 1	23 49	[+ 1]	17 12	PP	43·8
Auckland		96·8	227	e 15 16?	?	24 2	[+14]	17 33	PP	45·3
Scoresby Sund		97·0	14	13 40	+18	i 23 53	[+ 4]	30 34?	SS	—
De Bilt		97·1	37	i 13 29k	+ 7	i 23 54	[+ 5]	i 17 15	PP	e 40·3
Strasbourg		97·1	41	e 13 39?	+17	23 50	[+ 1]	—	—	—
Zürich		97·2	42	e 13 21	− 2	e 23 46	[− 4]	e 13 53	pP	—
Florence		97·5	46	i 13 36a	+12	i 23 53	[+ 2]	i 17 25	PP	—
Chur		97·6	43	e 13 26	+ 1	e 24 19	−19	—	—	—
Stuttgart		98·1	41	e 13 26	− 1	i 23 59	[+ 4]	e 13 59	pP	46·3
Triest		99·9	45	e 17 37	PP	i 24 6	[+ 3]	i 31 59	SS	e 47·0
Jena		100·3	40	e 17 11	PP	i 24 13	[+ 8]	i 24 58	S	e 30·3

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Cheb		100·5	40	e 13 44	+ 6	e 24 10	[+ 4]	e 17 45	PP	e 47·3
Bergen		100·6	29	13 40	+ 2	24 10	[+ 3]	17 44	PP	41·3
Potsdam		101·7	38	e 18 0	PP	i 24 14	[+ 2]	i 25 6	S	e 45·3
Prague		101·7	40	e 14 26	+43	e 24 19	[+ 7]	e 17 48	PP	e 47·3
Copenhagen		102·4	35	e 13 57	+11	24 22	[+ 7]	17 52?	PP	44·3
Belgrade		104·1	48	e 18 15	PP	e 27 29	PS	e 32 58	SS	e 56·7
College		104·2	335	e 18 56	PP	e 25 37	+ 4	e 32 52	SS	e 46·6
Upsala		106·2	32	18 21?	PKP	e 24 33	[0]	18 40	PP	e 46·3
Tananarive		106·3	118	—	—	24 55	[+22]	26 16	S	51·0
Bucharest		107·9	49	18 30	PKP	i 24 43	[+ 3]	i 27 6	PS	31·8
Helwan		108·8	65	e 14 8	P	e 26 34	S	e 18 49	PP	—
Ksara		113·4	62	e 18 26	[− 1]	e 29 12	PS	e 19 33	PP	—
Riverview		113·4	216	i 19 29	PP	i 25 8	[+ 6]	i 29 3	PS	e 52·7
Moscow		116·4	37	19 35	PP	i 25 16	[+ 2]	40 16	SSS	—
Brisbane	E.	116·9	223	i 20 52	?	i 25 30	[+15]	—	—	—
Sverdlovsk		128·7	33	e 19 11	[+15]	i 27 48	SKKS	e 20 58	PP	—
Tashkent		139·4	50	e 19 19	[+ 2]	i 29 5	SKKS	i 22 16	PP	—
Stalinabad		139·8	54	e 19 36	[+19]	—	—	e 22 25	PP	—
Bombay		144·1	87	e 19 22	[− 2]	i 29 35	SKKS	i 22 51	PP	69·3
Colombo	E.	146·8	111	19 46?	[+17]	29 52	SKKS	—	—	70·3
Morioka		148·2	313	e 19 37	[+ 6]	—	—	—	—	—
Mizusawa		148·5	312	19 35	[+ 3]	24 30	?	—	—	—
New Delhi	N.	148·5	69	19 53	[+21]	i 30 13	SKKS	23 12	PP	—
Sendai		149·0	310	19 43	[+10]	—	—	—	—	—
Hyderabad	N.	149·1	91	e 19 58	PKP_2	30 2	SKKS	42 16	SS	62·3
Kumagaya		151·0	307	19 2	[−34]	—	—	—	—	—
Yokohama		151·1	306	e 19 39	[+ 3]	—	—	—	—	—
Misima		151·7	306	e 19 48	[+11]	—	—	—	—	—
Nagano		151·7	308	e 18 55	[−42]	—	—	—	—	—
Vladivostok		151·9	327	e 22 17	PP	—	—	e 22 53	PKS	—
Nagoya		153·2	308	e 19 48	[+ 9]	—	—	—	—	—
Calcutta	N.	158·9	82	e 20 27	[+40]	i 44 10	SS	i 49 7	SSS	e 69·5

Additional readings :—
Montezuma i=28s.
La Paz iN=1m.16s. and 1m.21s.
La Plata N=4m.34s., E=7m.16s., NZ=8m.28s.
Rio de Janeiro iPN=5m.18s.
Bogota iPE=5m.29s., i=5m.38s., 5m.47s., and 10m.16s.
Fort de France PPP=9m.43s.
San Juan i=14m.24s.
Port au Prince i=8m.3s., SS=15m.21s.
Bermuda i=17m.12s. and 19m.34s.
Columbia esS=17m.53s., i=19m.11s.
Philadelphia i=10m.10s., e=25m.2s.
Cape Girardeau esSN=18m.57s.
Fordham iP=10m.10s., i=19m.51s.
St. Louis iP_cPZ=10m.53s., eSN=18m.27s., isSE=19m.18s.
Florissant isSE=19m.20s.
Harvard i=19m.30s.
Chicago e=13m.28s., isS=19m.37s., i=20m.12s., e=22m.24s.
Vermont eS=19m.3s., i=19m.55s., e=23m.16s.
Ottawa i=20m.6s., e=26m.46s.
Tucson i=10m.48s. and 15m.34s., e=20m.10s., ePKP,PKP=39m.15s.
Pierce Ferry e=21m.6s.
Boulder City i=11m.41s., e=23m.16s.
Rapid City e=28m.58s.
Salt Lake City e=12m.54s., and 28m.14s.
Logan iP=11m.30s., e=12m.23s., i=22m.12s.
Lick eSN=21m.23s.
Berkeley ePE=11m.46s., eEN=22m.26s.
Saskatoon SSS=29m.4s.?.
Lisbon iPZ=12m.27s.?, E=14m.1s., N=25m.9s.
San Fernando iPPSE=25m.8s.
Ivigtut e=34m.47s.
Granada SKS=22m.31s., iPS=23m.33s., SS=27m.44s.
Almeria iP_cP=12m.32s., sP=13m.2s., sP_cP=13m.9s., PP=15m.57s., pPP=16m.12s., sPP=16m.25s., PPP=17m.52s., SKS=22m.40s., pS=23m.19s., sS=23m.38s., SP=23m.49s., sSP=24m.30s., SS=28m.24s., sSS=29m.22s., SSS=32m.11s., PKP,PKP?=38m.15s.
Toledo SS=28m.44s.

Continued on next page.

Tortosa PPPN =18m.30s., SKSE =22m.45s., S_cSE =23m.43s., iN =24m.8s., PSN = 24m.58s., PPSE? =25m.27s.
Kew ePPPZ =18m.53s., iSKKS =23m.46s., iS =24m.23s., iPSEN =25m.21s., iPPSZ = 25m.51s., iSS =30m.46s.?, eSSSE =33m.46s.?.
Stonyhurst PPP =17m.7s., S_cS =15m.44s., PS =24m.12s.
Wellington sP =14m.0s., PP =18m.6s., sPPZ =18m.47s., e =23m.17s.?, i =24m.31s., sS =25m.1s., SP?Z =26m.16s., iZ =28m.56s., SS =30m.21s., SSS =34m.10s.?, i =36m.58s.
Christchurch PPP =19m.1s., PPS =24m.37s., SS =30m.39s., SSS =33m.14s., Q = 36m.46s.
Sitka e =24m.45s., 26m.22s., and 37m.1s.
Aberdeen iE =17m.14s., iEN =24m.41s., iE =30m.51s.
Uccle iZ =13m.30s.
Auckland S =24m.56s., i =27m.1s., SS =31m.29s., i =37m.14s.
Scoresby Sund i =24m.37s. and 26m.43s.
Zurich ePP =16m.46s.
Florence iPPPZ =19m.31s., iSE =24m.7s., iPSN =24m.53s.
Stuttgart ePZ =13m.30s., ePPZ =17m.21s. and 17m.27s., epPP? =18m.0s., ePPPZ = 19m.35s., ePPPN =19m.46s., iS =24m.50s. and 24m.54s., ePS =26m.16s., ePKKP?Z =30m.34s., eSS =31m.36s., eSSS? =34m.46s.
Triest iS? =25m.1s.
Jena ePPN =17m.17s., ePPZ =17m.21s., iZ =17m.37s., iE =17m.40s., iNZ =17m.53s.
Cheb e =24m.28s.?.
Bergen eZ =17m.51s., SN =24m.13s., eE =32m.29s.
Potsdam ePPN =18m.4s.?, esPPE =18m.36s., eSKSN =24m.16s.?, iSKKSN = 24m.25s., eSN =25m.16s.?.
Prague ePS =25m.10s.?, eSS =27m.28s.?.
Copenhagen 18m.8s., 25m.13s., 26m.13s., and 27m.14s.
Belgrade i =18m.25s. and 18m.55s., e =22m.52s., i =23m.28s., e =43m.39s.
College e =37m.52s.
Upsala iN =22m.35s., eN =23m.38s., eSKSN =24m.37s., eSKKSE =25m.21s.?, ePSE =27m.16s.?, eN =32m.16s.?, eSSE =33m.16s.?, eSSS =37m.16s.?.
Tananarive SS =33m.33s., SSS =37m.28s.
Bucharest eN =18m.52s. and 19m.42s., iP_cPE =20m.24s., eP_cPN =20m.27s., iN = 21m.31s. and 22m.26s., iSN =24m.54s., iN =25m.31s., iE =25m.48s., iSS?N = 27m.25s., iS_cS?E =28m.20s., iS_cSN =28m.35s.
Helwan eZ =17m.49s., ePPPZ =21m.3s., eE =24m.46s., and 25m.43s., PSE =28m.27s., eE =29m.22s.
Riverview iSKSN =25m.14s., iN =26m.1s., iPSEN =29m.10s., eSSN =35m.0s., iSSSN =39m.25s., eQN =47m.10s.?.
Sverdlovsk iPS =31m.6s.
Tashkent iPKS =22m.56s.
Bombay iPKPEN =19m.32s., PKS =23m.3s., iE =30m.21s., PSN =33m.29s., SSN = 41m.21s., SSE =41m.27s.
Mizusawa SE =24m.37s.
New Delhi iSKSPN =33m.30s., iN =40m.58s., SSN =42m.3s.
Hyderabad PKS =26m.13s., PS =35m.11s.

Dec. 1d. Readings also at 0h. (Wellington and Arapuni), 3h. (Ksara), 5h. (La Paz and Rio de Janeiro), 7h. (Granada), 9h. (Bucharest, Sofia, and Istanbul), 13h. (La Paz), 14h. (Haiwee, Mount Wilson (2), Pasadena, Palomar, Riverside (2), Tinemaha (2), Tucson (2), La Paz (2), and La Plata), 15h., 20h., and 21h. (near La Paz), 22h. (Wellington and La Paz).

Dec. 2d. 1h. 54m. 2s. Epicentre 30°·1S. 177°·8W. (as on Sept. 27d.).

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

		△	Az.	P.	O−C.	S.	O−C.		Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m.	s.		m.
Auckland		9·2	221	2 8	− 8	3 52	−11	i 2	26	PP	4·8
Arapuni		9·6	213	2 28?	+ 7	4 34?	SSS	—		—	—
Tuai		9·6	204	2 13	− 8	3 51	−21	—		—	—
New Plymouth		11·2	215	3 8	PPP	5 0	+ 8	i 4	36	?	—
Suva		12·4	343	e 2 45	−16	e 5 54	SSS	e 3	5	PP	—
Wellington		12·7	207	3 1	− 4	5 0	−28	3	10	pP	6·0
Kaimata		15·1	212	3 46	+10	6 1	−24	—		—	—
Christchurch		15·4	207	3 44	+ 4	6 0	−32	—		—	7·6
Brisbane	z.	25·7	268	i 5 31a	− 2	i 8 21	?	—		—	—
Riverview		26·5	254	i 5 38a	− 3	i 10 12	− 2	i 6	32	PPP	e 12·4

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Sydney		26·5	254	i 5 40	− 1	—	—	e 8 28?	?	—
Santa Barbara	z.	84·4	45	e 12 37	+ 1	—	—	i 12 41	PcP	—
La Jolla		84·9	47	e 12 40	+ 2	—	—	—	—	—
Pasadena		85·1	46	i 12 38a	− 1	i 23 9	+ 1	i 12 44	PcP	e 35·3
Berkeley	z.	85·2	41	i 12 38	− 1	—	—	—	—	—
Mount Wilson	z.	85·3	46	e 12 39a	− 1	—	—	i 12 46	PcP	—
Palomar	z.	85·4	47	i 12 40a	0	—	—	i 12 46	PcP	—
Riverside		85·5	46	i 12 40a	− 1	—	—	i 12 47	PcP	—
Ukiah		85·6	39	—	—	e 23 13	0	—	—	e 39·2
Haiwee		86·6	44	e 12 47	+ 1	e 24 15	PS	i 13 3	PcP	—
Tinemaha		87·0	33	e 12 45	− 3	e 23 37	+10	e 12 51	PcP	—
Tucson		88·7	51	i 12 56	− 1	e 23 26	[+ 1]	e 24 4	ScS	e 36·7
Victoria		92·1	33	—	—	e 23 50	[+ 5]	—	—	43·0
Salt Lake City		93·2	44	—	—	e 23 20	[−31]	—	—	e 43·1
Logan		93·8	43	e 13 19	− 1	e 23 40	[−14]	e 24 22	S	e 43·6
Huancayo		94·6	107	e 13 49	+25	i 24 6	[+ 7]	e 26 9	PS	e 42·4
La Paz		98·0	114	e 13 45	+ 6	i 26 31	PS	17 47	PP	46·0
Rapid City		100·4	43	e 17 55	PP	e 26 48	PS	e 20 35	PPP	e 48·8
Calcutta	N.	104·1	287	e 18 31	PP	e 24 43	[− 3]	—	—	—
Florissant	E.	106·3	54	—	—	e 24 55	[− 1]	e 25 49	SKKS	—
St. Louis	E.	106·3	54	—	—	e 24 55	[− 1]	e 25 47	SKKS	—
Bombay	E.	115·7	277	e 18 38	[− 6]	25 29	[− 6]	19 31	PP	—
New Delhi	N.	115·8	289	—	—	i 29 29	PS	—	—	—
San Juan		117·4	83	e 20 0	PP	i 25 35	[−16]	e 29 49	PS	e 47·1
Ottawa		118·8	51	e 18 46	[− 4]	—	—	e 35 58?	SS	e 51·0
Vermont		120·3	53	—	—	e 27 22	{+ 6}	e 30 13	PS	e 57·5
Tashkent		125·6	301	e 18 57	[− 6]	e 26 6	[− 1]	e 20 50	PP	—
Sverdlovsk		131·8	321	—	—	e 28 22	{− 9}	e 33 28	PPS	—
Scoresby Sund		137·4	11	23 7	?	—	—	—	—	—
Moscow		144·3	326	e 19 39	[+ 1]	29 40	{− 6}	22 54	PP	—
Upsala		148·5	345	e 19 50	[+ 5]	e 29 34	{−36}	e 47 58?	SSS	e 71·0
Bergen		149·6	356	e 19 45	[− 2]	—	—	—	—	e 72·0
Ksara		151·3	285	e 19 58	[+ 9]	e 27 9	[+14]	—	—	—
Copenhagen		153·4	347	e 19 55	[+ 3]	—	—	23 49	PP	—
Helwan	Z.	154·8	275	19 52	[− 2]	—	—	23 52	PP	—
Bucharest		156·3	314	e 20 27	PKP_2	—	—	—	—	81·0
De Bilt		157·9	355	i 20 2k	[+ 4]	e 34 28	PSKS	e 24 12	PP	76·0
Cheb		158·6	343	e 23 58?	PP	—	—	—	—	e 76·0
Uccle		159·3	357	i 20 2	[+ 2]	e 23 34	SKP	i 20 43	PKP_2	—
Belgrade		159·4	320	e 20 0	[0]	—	—	e 21 6	PKP_2	e 30·6
Stuttgart		160·6	345	e 19 59	[− 3]	e 31 14	{− 2}	i 20 46	PKP_2	e 77·8
Paris		161·3	359	e 20 6	[+ 4]	—	—	—	—	80·0
Basle		162·1	347	e 20 0	[− 3]	—	—	—	—	—
Chur		162·3	345	e 19 59k	[− 4]	—	—	—	—	—
Lisbon		167·3	44	20 14?a	[+ 6]	—	—	—	—	—
Toledo		169·0	26	e 20 8	[− 1]	—	—	—	—	103·0
San Fernando	E.	170·5	45	20 35	[+26]	—	—	e 46 6	SS	86·0
Granada		171·5	32	i 20 15	[+ 5]	32 22	{+11}	i 21 37	PKP_2	80·4
Almeria		172·2	28	20 9	[− 1]	26 58	[−14]	20 40	pPKP	71·0

Additional readings :—
Auckland i = 2m.50s.
New Plymouth i = 3m.25s. and 3m.50s.
Suva e = 3m.29s.
Wellington iZ = 3m.33s. and 3m.48s., PcS = 12m.15s.
Riverview iEZ = 5m.43s., E = 8m.34s., iZ = 10m.31s., iSSN = 11m.22s.
Santa Barbara iZ = 12m.55s.
Pasadena iZ = 12m.49s., iNZ = 12m.57s., eZ = 16m.19s., eZ = 32m.22s.?.
Mount Wilson iZ = 12m.59s., ePKKPZ = 30m.41s.
Palomar iZ = 13m.1s., iPKKPZ = 30m.45s.
Riverside iZ = 12m.56s., eZ = 15m.55s., ePKKPZ = 30m.45s.
Tinemaha iZ = 13m.10s.
Tucson i = 13m.20s., e = 15m.27s., 17m.45s., and 30m.33s.
Huancayo e = 25m.24s., eSS = 31m.7s., eSSS? = 35m.3s.
La Paz SS = 32m.3s., SSS = 36m.1s.
Rapid City eSSS? = 36m.11s., e = 36m.44s.
Florissant ePSE = 28m.6s.

Continued on next page.

St. Louis ePSE =28m.2s., ePPSE =29m.7s.
Bombay PPPE =22m.3s., PSE =29m.25s., PPSN =30m.36s., PPSE =30m.42s., iE = 31m.37s.
San Juan eSS =36m.26s.
Vermont e =36m.8s., eSS =37m.8s., e =41m.20s.
Tashkent eSKKS =27m.49s.
Sverdlovsk eSS =40m.18s.
Moscow PS =33m.12s.
Upsala eE =20m.0s., eN =33m.39s.
Helwan PKKP?Z =20m.17s., eZ =20m.40s.
De Bilt ePPS =37m.33s.
Uccle iPPZ =24m.21s., eN =32m.10s.?, iN =52m.39s.
Stuttgart iPKPZ =20m.4s., eZ =20m.18s., ePPZ =24m.18s., ePPS?Z =37m.58s.?, eSS =44m.58s.?.
Lisbon E =40m.34s., N =41m.52s., Z =42m.28s.?.
Granada iPP =25m.29s., PPP =29m.40s., iSS =46m.31s., eQ =68m.28s.?.
Almeria PKP_2 =21m.48s., PP =25m.26s., PPP =29m.25s., pPPP =30m.4s., SS =46m.37s SSS =53m.36s.
Long waves were also recorded at Harvard, Bozeman, Tananarive, Colombo, and at other European stations.

Dec. 2d. 5h. 8m. 57s. Epicentre 22°·9N. 121°·5E. (as on 1942 May 24d.).

Scale V at Shinko, Taito, and Takao; IV at Tainan and Taikohu; II-III at Giran. Radius of macroseismic area 200-300 km. Shallow. Damage sustained at Kasho. Casualties and much damage caused by landslides in several districts. Seismological Bulletin of the Central Meteorological Observatory, Japan, for 1943. Tokyo 1950, p.p. 52-53, with macroseismic chart.
H. Kawasumi.
Seismology in Japan for 1939-1947. Bulletin of the Seismological Society of America, vol. 39, 1949, p. 161. Epicentre 22°·9N. 121°·6E.

$A = -·4818$, $B = +·7862$, $C = +·3869$; $\delta = -7$; $h = +4$;
$D = +·853$, $E = +·522$; $G = -·202$, $H = +·330$, $K = -·922$.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m.	s.	m.
Shinko	0·2	332	0 7a	− 3	0 12	− 4	—	—	—
Taito	0·3	245	0 7k	− 4	0 14	− 4	—	—	—
Arisan	0·9	314	0 21	+ 1	0 36	+ 2	—	—	—
Tainan	1·2	275	0 20	− 4	0 42	+ 1	—	—	—
Takao	1·2	256	0 23	− 1	0 38	− 3	—	—	—
Taityu	1·5	329	0 29	+ 1	0 36	−13	—	—	—
Giran	1·9	7	0 33	− 1	1 2	+ 3	—	—	—
Sintiku	1·9	346	0 38	+ 4	1 10	S_g	—	—	—
Taihohu	2·1	0	0 35a	− 2	1 9	+ 5	—	—	—
Miyakozima	3·9	61	0 57	− 5	1 44	− 6	—	—	—
Naha	6·5	59	1 33	− 6	3 3	+ 8	—	—	—
Zi-ka-wei	8·3	356	e 2 1	− 3	i 4 45	S_g	—	—	5·1
Nahe	9·0	51	2 5	− 8	5 27	L	—	—	(5·4)
Kagosima	11·8	41	2 58	+ 5	—	—	—	—	—
Unzendake	12·5	38	3 7	+ 5	—	—	—	—	—
Kumamoto	12·8	38	2 43	−23	5 18	−12	—	—	—
Hukuoka	13·2	33	3 10	− 1	—	—	—	—	—
Simidu	14·1	43	3 22	− 1	6 55	SSS	—	—	—
Siomisaki	16·4	47	3 51k	− 2	7 6	SS	—	—	—
Sumoto	16·4	43	3 20	−33	—	—	—	—	—
Wakayama	16·6	44	4 2	+ 8	—	—	—	—	—
Kobe	16·8	43	4 7	+ 9	7 32	SS	—	—	—
Kyoto	17·3	43	4 5	+ 1	7 45	SS	—	—	—
Kameyama	17·7	44	4 19	+ 9	—	—	—	—	—
Hikone	17·8	43	4 16	+ 5	8 42	P_cP	—	—	—
Gihu	18·2	45	4 22	+ 6	7 48	+11	—	—	—
Hamamatu	18·4	47	4 24	+ 6	8 1	SS	—	—	—
Omaesaki	18·7	47	4 23	+ 1	8 13	SS	—	—	—
Shizuoka	19·0	47	4 17	− 9	8 16	SS	—	—	—
Hatidyozima	19·1	52	4 28	+ 1	—	—	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Misima		19·5	46	4 32	+ 1	—	—	—	—	—
Hunatu		19·6	46	4 31	− 1	8 20	+12	—	—	—
Nagano		19·9	42	4 39	+ 3	8 2	−13	—	—	—
Mera		20·0	49	4 32	− 5	—	—	—	—	—
Yokohama		20·1	48	4 42	+ 4	8 22	+ 3	—	—	—
Kumagaya		20·4	44	4 32	− 9	8 36	+11	—	—	—
Tokyo		20·4	46	4 26	−15	—	—	—	—	—
Aikawa		20·8	39	4 46	+ 1	8 44	+11	—	—	—
Tukubasan		20·9	45	4 45	− 1	—	—	—	—	—
Mito		21·2	45	4 50	+ 1	—	—	—	—	—
Hukusima		22·0	44	4 59	+ 1	9 7	+11	—	—	—
Sendai		22·6	43	5 6	+ 3	9 3	− 4	—	—	—
Mizusawa		23·3	42	5 9	− 1	9 23	+ 3	—	—	—
Aomori		24·1	38	5 19	+ 1	—	—	—	—	—
Miyako		24·1	42	5 18	0	9 38	+ 4	—	—	—
Sapporo		26·0	34	5 39	+ 3	10 1	− 5	—	—	—
Calcutta	N.	30·6	276	i 6 22	+ 4	i 11 40	+20	i 7 23	PP	e 15·6
Dehra Dun	N.	39·4	291	e 6 54	−39	e 12 55	−40	—	—	e 20·2
New Delhi		40·1	288	i 7 41	+ 2	i 13 48	+ 2	9 30	PPP	—
Colombo	E.	43·1	254	8 1	− 3	14 28	− 2	—	—	24·0
Bombay		45·5	274	i 8 23	0	i 15 6	+ 1	8 35	pP	—
Tashkent		47·2	306	i 8 35	− 1	15 33	+ 4	—	—	—
Stalinabad		47·3	302	i 8 39	+ 2	e 15 34	+ 3	—	—	—
Brisbane	Z.	58·6	147	i 9 58	− 3	i 12 49	?	i 10 17	?	—
Riverview		63·1	-152	i 10 30k	− 2	i 19 0	− 2	i 19 33	PPS	e 29·2
Moscow		68·0	323	i 11 8	+ 5	20 0	− 2	—	—	—
Suva		69·0	121	—	—	20 3?	−11	—	—	—
College		69·8	27	e 11 13	− 1	e 20 33	+10	e 13 43	PP	e 32·2
Honolulu		73·8	73	e 11 41	+ 3	e 20 58	−11	—	—	e 64·8
Ksara		74·2	300	e 11 44	+ 4	e 21 20	+ 6	—	—	—
Focsani		76·9	315	e 11 57?	+ 1	—	—	—	—	43·1
Upsala		77·2	330	e 11 57	0	e 21 48	+ 1	15 22	PP	e 35·1
Auckland		77·8	139	13 13	?	21 55	+ 2	27 3	SS	37·1
Bucharest		78·0	313	i 12 2a	0	i 21 55	0	i 14 53	PP	38·1
Arapuni		79·1	139	—	—	22 3?	− 4	27 21?	SS	40·1
Helwan		79·1	297	12 6	− 2	22 9	+ 2	12 48	pP	—
Sofia		80·5	313	e 12 17	+ 2	e 22 25	+ 3	—	—	—
Wellington		80·7	142	12 17	+ 1	22 20	− 4	15 20	PP	39·1
Christchurch		81·1	145	12 12	− 6	22 21	− 7	23 21	PS	39·0
Copenhagen		81·5	327	e 12 20	− 1	22 31	− 1	23 22	PS	40·1
Belgrade		81·6	314	i 12 23	+ 2	e 23 36	PS	e 15 25	PP	e 44·7
Bergen		82·3	334	i 12 24	− 1	—	—	e 32 8	?	39·1
Potsdam		82·7	325	i 12 30	+ 3	e 22 51?	+ 7	e 23 9?	ScS	e 41·1
Prague		83·0	322	e 12 25	− 3	e 22 45?	− 2	—	—	e 41·1
Tananarive		83·3	247	e 12 48	+18	22 43	− 7	e 23 7	ScS	35·0
Scoresby Sund		83·4	349	—	—	23 59	PPS	—	—	—
Cheb		84·2	323	e 12 37	+ 3	e 21 57	−62	—	—	e 47·1
Jena	N.	84·2	323	—	—	e 21 3?	?	—	—	—
Triest		85·5	318	e 12 41	0	e 23 13	+ 1	e 15 59	PP	—
Stuttgart		86·6	322	e 12 41	− 5	e 23 23	0	1 16 9	PP	e 43·6
De Bilt		87·0	327	i 12 49a	+ 1	e 23 17	[+ 3]	i 16 14a	PP	e 39·1
Aberdeen		87·3	333	—	—	i 23 29	0	—	—	e 33·4
Chur		87·4	322	e 12 46	− 4	—	—	—	—	45·5
Zürich		87·7	322	e 12 50a	− 2	e 23 25	{ 0}	e 16 15	PP	—
Florence		88·0	318	i 12 53k	0	e 23 22	[+ 1]	i 16 26a	PP	e 42·7
Basle		88·2	321	e 12 53	− 1	e 23 44	+ 6	—	—	—
Uccle		88·2	326	i 12 52a	− 2	e 23 3	[−19]	i 16 21	PP	e 40·1
Milan	E.	88·4	319	13 16	+21	24 23	PS	—	—	—
Victoria		88·4	37	e 16 15?	PP	e 23 45?	+ 5	—	—	51·1
Neuchatel		88·9	321	e 12 55	− 3	—	—	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Stonyhurst		89·6	331	—	—	i 24 36	PS	i 28 45	?	43·1
Kew		90·1	328	e 16 36	PP	—	—	e 36 3	Q	e 45·1
Paris		90·3	325	i 13 3	− 1	—	—	16 37	PP	48·1
Tortosa	N.	96·2	319	e 15 50	?	e 27 9	PPS	—	—	e 51·1
Bozeman		96·7	34	e 17 17	PP	—	—	e 31 28	SS	e 46·4
Tinemaha	Z.	98·0	44	e 13 40	+ 1	—	—	e 17 32	PP	—
Logan		98·9	37	e 17 23	PP	e 24 51	{+ 5}	—	—	56·9
Toledo		99·5	320	i 17 51	PP	i 28 31	?	29 33	?	50·1
Salt Lake City		99·6	38	—	—	25 12	− 5	e 37 57	?	e 51·5
Mount Wilson	Z.	99·8	47	13 43	− 4	—	—	i 17 52	PP	—
Pasadena		99·8	47	e 13 47	0	—	—	e 17 44	PP	e 41·1
Riverside	Z.	100·4	47	e 17 50	PP	—	—	—	—	—
Almeria		100·5	318	17 52	PP	27 47	PPS	18 14	pPP	51·1
Granada		101·0	318	18 5	PP	e 27 40	PPS	18 27	pPP	i 54·5
Palomar	Z.	101·1	47	e 13 53	0	—	—	i 18 0	PP	—
Rapid City		101·8	31	e 17 54	PP	e 25 25	−10	e 33 37	?	e 53·5
San Fernando	E.	103·0	318	e 18 30	PP	e 24 44	[+ 3]	e 28 7	PPS	51·6
Lisbon		103·2	323	18 19k	PP	—	—	—	—	50·9
Tucson		105·8	44	e 14 9	P	e 28 16	PS	i 18 35	PP	e 50·2
Seven Falls		109·4	8	—	—	—	—	e 34 27?	SS	50·1
Chicago		110·1	23	—	—	e 28 29	PS	e 38 36	SSS	e 54·3
Ottawa		110·3	12	—	—	—	—	e 27 51	?	e 51·1
Vermont		111·6	11	e 29 10	PS	—	—	e 45 43	?	e 50·6
Florissant		111·7	26	i 19 24	PP	e 28 56	PS	—	—	—
St. Louis	N.	111·9	26	e 18 21	[−16]	e 25 14	[− 6]	—	—	—
Pittsburgh	N.W.	113·9	18	i 24 6	?	—	—	—	—	e 43·6
Fordham		115·0	12	e 19 55	PP	e 29 15	PS	—	—	—
San Juan		138·3	11	e 19 27	[0]	e 45 46	SSS	e 22 6	PP	e 58·7
Bogota		148·7	31	e 19 46	[+ 1]	—	—	i 19 50	?	—
Huancayo		160·7	59	e 20 9	[+ 7]	e 50 39	SSS	e 24 30	PP	—
La Paz		168·9	56	i 20 10	[+ 1]	i 26 52	[−19]	i 21 44	pPKP	80·4

Additional readings :—
Calcutta iSSN = 13m.18s.
New Delhi SSN = 16m.37s.
Bombay P_cPN = 10m.3s., PPE = 10m.13s., PPN = 10m.17s., PSE = 15m.15s., iE = 15m.47s., SSN = 18m.18s., SSE = 18m.35s., iN = 18m.44s., SSSE = 19m.27s.
Upsala ePPP?N = 16m.38s., ePSE = 22m.37s., eSSE = 26m.34s., eSSS?E = 29m.30s., eN = 32m.3s.?.
Auckland Q = 32m.51s.?.
Bucharest iE = 12m.53s., iN = 13m.54s., iE = 14m.4s., eN = 21m.47s., eSSE = 26m.55s
Helwan P_cPEZ = 12m.9s., eZ = 13m.33s., PPZ = 15m.18s., PPPZ = 17m.6s., sSE = 23m.0s., eE = 23m.39s., and 25m.12s.
Wellington iZ = 14m.25s. and 16m.18s., SS = 27m.38s., Q = 34·1m.
Christchurch SS = 27m.37s., SSS = 31m.35s., Q = 33m.50s.
Belgrade e = 16m.56s. and 31m.34s.
Stuttgart iP = 12m.46s., eSPZ = 24m.20s.
Florence iSE = 23m.57s., iPSE = 24m.47s., iSSN = 29m.32s.
Uccle eSSE = 29m.27s.?.
Pasadena iZ = 14m.26s., eZ = 16m.55s.
Almeria sP = 18m.26s., PP = 21m.10s., pPP = 21m.33s., eS = 28m.6s., pS = 28m.35s., PS = 29m.18s., SS = 33m.39s., SSS = 37m.22s.
Granada PP = 22m.9s., PPP = 25m.17s., iS = 31m.12s., SS = 37m.3s., Q = 47m.40s.
Palomar eZ = 17m.54s.
Tucson i = 18m.8s.
St. Louis eSKP?N = 20m.46s., eN = 28m.7s.
San Juan e = 31m.26s., 35m.15s., and 54m.55s.
Huancayo eSS? = 34m.30s., e = 43m.38s.
La Paz iPKP$_3$ = 21m.20s., isPKP = 22m.36s., iPPZ = 25m.9s., PPP = 29m.20s., iSKKS = 31m.36s., PSKS = 35m.40s.
Long waves were also recorded at Ivigtut, Besançon, Strasbourg, and Barcelona.

Dec. 2d. Readings also at 0h. (Cheb and near Lick), 1h. (near Berkeley), 2h. (Apia, Tucson, Pasadena, Mount Wilson, Tinemaha, and Palomar), 3h. (near Apia), 5h. (Sofia, Bucharest, and near Istanbul), 6h. (Bombay and Zi-ka-wei), 7h. (Prague, Uccle, De Bilt, Upsala, and Tacubaya), 9h. and 13h. (Ksara), 15h. (Pasadena, Tucson, Mount Wilson, Riverside, Tinemaha, Haiwee, Palomar, and near Sofia), 18h. (New Delhi, near Tchimkent, Tashkent, and Stalinabad), 19h. (Tashkent and near Granada (2)). 20h. (near Granada), 21h. (near Stuttgart), 22h. (near Lick).

Dec. 3d. 4h. 38m. 0s. Epicentre 3°·3S. 139°·8E. (as on 1939 July 12d.).

$A = -\cdot7625$, $B = +\cdot6444$, $C = -\cdot0572$; $\delta = -7$; $h = +7$;
$D = +\cdot645$, $E = +\cdot764$; $G = +\cdot044$, $H = -\cdot037$, $K = -\cdot998$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	Z.	27·2	153	i 5 45a	− 2	i 9 58	−27	i 11 19	SS	i 14·2
Titizima		30·3	5	6 10	− 5	12 26	+71	—	—	—
Riverview		32·2	162	i 6 32a	0	i 11 46	+ 1	i 6 43	pP	e 15·5
Sydney		32·2	162	e 6 54	+22	e 11 42	− 3	—	—	e 15·6
Nake		33·0	344	6 40	+ 1	11 58	+ 1	—	—	—
Kagosima		35·8	347	7 3	0	—	—	—	—	—
Miyazaki		35·9	349	7 12	+ 8	8 59	PPP	—	—	—
Perth		36·3	215	i 7 10	+ 3	i 12 55	+ 7	i 14 25	SS	—
Koti		37·1	352	e 6 59	−15	13 1	0	—	—	—
Hukuoka		37·7	348	7 20	+ 1	e 13 27	+17	—	—	—
Osima		37·9	0	e 7 14	− 6	13 0	−13	—	—	—
Kobe		38·0	355	e 7 22	+ 1	13 9	− 5	—	—	—
Kameyama		38·1	357	e 7 23	+ 1	—	—	—	—	—
Hamada		38·7	350	e 7 33	+ 6	13 29	+ 4	—	—	—
Tokyo		38·8	0	7 26	− 2	13 20	− 6	—	—	19·6
Husan		39·5	347	7 35	+ 1	13 35	− 2	—	—	—
Nagano		39·8	359	7 24	−12	—	—	—	—	—
Suva		40·6	114	7 53	+10	i 14 0	+ 6	e 8 30	pP	—
Aikawa		41·1	359	7 49	+ 2	13 56	− 5	—	—	—
Sendai		41·4	3	7 48	− 2	13 47	−18	—	—	—
Mizusawa	E.	42·2	3	e 7 58	+ 2	14 9	− 8	—	—	—
Zinsen		42·4	344	e 7 56	− 2	14 13	− 7	—	—	—
Mori		45·2	2	e 8 7	−13	i 14 36	−25	—	—	—
Sapporo		46·2	2	e 8 26	− 2	—	—	—	—	—
Auckland		46·4	142	8 33	+ 3	15 28	+10	10 35	PP	20·5
Vladivostok		46·8	353	e 8 33	0	i 15 20	− 4	—	—	—
Arapuni		47·6	141	e 5 0	?	15 48?	+13	—	—	22·7
Apia		48·9	105	i 8 50	0	16 8	+15	9 6	pP	—
Wellington		49·1	145	8 55	+ 4	15 58	+ 2	9 17	pP	24·0
Christchurch		49·5	149	9 0	+ 6	16 0	− 2	11 6	PP	24·8
Calcutta	N.	56·4	300	e 9 46	+ 1	i 17 36	0	i 20 26	SS	—
Colombo	E.	60·7	280	10 0?	−15	18 30	− 2	—	—	—
Irkutsk		63·0	337	i 10 30	− 1	i 19 1?	0	—	—	—
Kodaikanal		63·5	284	i 10 37a	+ 3	e 19 2	− 5	12 53	PP	—
Hyderabad	N.	63·9	292	e 10 44	+ 7	19 16	+ 4	19 50	PS	31·8
Honolulu		65·7	65	i 11 5	+17	e 19 35	+ 1	—	—	e 31·2
New Delhi	N.	67·9	303	e 10 56	− 6	i 19 57	− 4	20 25	PS	31·4
Bombay		69·4	292	e 11 11	− 1	20 19	+ 1	13 33	PP	31·0
Andijan		75·3	314	e 11 47	0	—	—	21 43	PS	—
Tashkent		77·7	314	i 12 1	+ 1	i 21 52	0	—	—	—
College		85·6	24	e 12 47	+ 6	e 23 1	[− 4]	—	—	e 35·2
Sverdlovsk		86·8	328	12 46	− 1	i 23 21	− 4	i 16 9	PP	—
Sitka		90·0	33	e 23 12	?	i 23 30	[− 3]	i 24 55	PS	e 42·4
Tananarive		91·1	251	5 4	?	23 40	[+ 1]	25 16	PS	44·5
Grozny		95·2	314	e 13 44	+17	—	—	e 17 44	PP	—
Victoria		97·0	43	—	—	e 24 11	[− 1]	—	—	44·0
Ukiah		97·5	52	—	—	e 24 7	[− 7]	—	—	e 45·2
Berkeley	Z.	98·3	53	1 13 39	− 2	—	—	—	—	—
Santa Clara		98·6	53	e 24 22	SKS	(e 24 22)	[+ 2]	—	—	e 52·2
Moscow		99·6	327	13 43	− 3	i 24 33	[+ 8]	e 17 25	PP	—
Santa Barbara	Z.	100·5	56	e 13 49	− 2	—	—	—	—	—
Tinemaha	Z.	101·5	53	e 13 52	− 3	—	—	e 17 47	PP	—
Pasadena		101·8	56	i 13 56	0	i 24 34	[− 2]	e 17 28	PP	e 41·3
Mount Wilson	Z.	101·9	56	e 13 55	− 2	—	—	e 17 24	PP	—
Riverside	Z.	102·5	56	e 13 58	− 2	—	—	e 17 30	PP	—
La Jolla	Z.	102·7	58	e 14 10	+10	—	—	—	—	—
Palomar	Z.	102·9	57	e 14 1	0	—	—	e 18 17	PP	—
Ksara		103·4	304	e 17 11?	PP	e 27 38	PS	—	—	—
Bozeman		105·7	44	—	—	i 24 53	[− 1]	e 28 45	PS	e 43·4
Logan		105·9	47	e 17 57	PP	e 24 31	[−24]	e 21 1	PPP	e 49·7

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Salt Lake City		106·0	48	—	—	e 24 47	[− 8]	e 33 15	SS	e 43·8
Saskatoon		106·9	36	—	—	e 34 30?	SS	—	—	44·0
Helwan		107·6	301	e 17 36	PKP	e 25 0	[− 2]	e 18 54	PP	—
Tucson		108·1	57	e 14 17	P	e 25 44	{− 8}	e 28 23	PS	e 30·1
Upsala		108·5	333	i 18 59	PP	e 26 23	{+28}	e 28 5?	PS	e 42·0
Bucharest		109·1	317	e 17 54?	[−37]	e 26 32	{+33}	i 28 36	PS	34·0
Rapid City		111·5	43	e 19 25	PP	e 28 44	PS	e 29 47	PPS	e 58·7
Sofia		111·5	315	e 18 6	[−30]	e 29 0	PS	—	—	—
Scoresby Suud		111·9	354	28 54	PS	30 19	PPS	34 48?	SS	—
Belgrade		112·9	318	e 19 32	PP	e 28 29	PS	e 21 55	PPP	e 63·6
Copenhagen		113·0	332	19 32	PP	29 2	PS	35 20	SS	49·0
Bergen		113·4	338	—	—	e 29 5	PS	e 35 5	SS	e 54·0
Prague		114·6	325	e 21 30	PPP	e 27 18?	{+41}	e 35 30?	SS	e 48·0
Cheb		115·8	326	e 19 48	PP	e 29 34	PS	—	—	e 60·0
Jena		115·8	326	e 19 36	PP	—	—	—	—	e 41·0
Triest		116·9	321	e 20 0	PP	—	—	—	—	e 63·5
Stuttgart		118·2	326	e 18 50	[+ 1]	e 37 6	SS	i 20 9	PP	e 61·4
De Bilt		118·5	330	i 20 12	PP	e 37 0	SS	i 30 15	PS	e 49·0
Chur		119·0	325	e 18 51k	[0]	—	—	—	—	—
Florence	E.	119·3	320	e 23 6	PPP	i 33 27	?	—	—	—
Uccle		119·7	330	i 20 14	PP	e 37 22	SS	e 30 6	PS	e 52·0
Basle		119·8	326	e 19 5	[+13]	—	—	—	—	—
Stonyhurst		120·9	336	—	—	e 30 26	PS	e 41 1	SSS	58·0
Kew		121·6	332	—	—	e 26 0?	[+ 5]	—	—	e 54·0
Florissant		122·4	45	—	—	e 25 54	[− 4]	e 27 27	SKKS	—
St. Louis		122·5	45	e 18 58	[0]	e 25 59	[+ 1]	e 20 43	PP	—
Chicago		122·8	42	—	—	e 30 56	PS	e 37 34	SS	e 51·4
Tortosa		127·7	321	e 19 43	[+35]	—	—	—	—	e 58·3
Ottawa		127·8	31	e 19 8	[0]	—	—	e 32 30?	PS	e 53·0
Seven Falls		128·9	26	—	—	e 34 30?	?	e 38 30?	SS	55·0
Toledo		131·1	323	i 19 16	[+ 2]	39 14	SS	21 37	PP	62·0
Columbia		131·3	46	e 22 38	PKS	e 26 23	[0]	e 41 17	SS	e 67·5
Almeria		131·9	319	19 15	[− 1]	26 12	[−13]	19 30	pPKP	61·0
Fordham		131·9	34	e 19 14	[− 2]	i 22 39	PKS	—	—	—
Harvard		132·0	31	i 19 18	[+ 2]	—	—	i 19 28	pPKP	e 66·0
Granada		132·4	320	i 19 3	[−13]	26 0	[−26]	19 26	pPKP	i 66·0
San Fernando		134·5	321	e 22 8	PP	e 27 0	[+30]	—	—	64·5
Lisbon		134·8	326	19 21k	[0]	—	—	21 50	PP	60·7
Huancayo		141·9	115	e 19 36	[+ 2]	e 29 59	{+27}	e 42 2	SSP	e 58·1
Bermuda		143·0	35	e 20 40	[+64]	e 29 42	{+ 3}	e 41 18	SS	e 59·1
La Paz		146·1	127	i 19 45a	[+ 4]	26 35	[−13]	i 23 36	PP	71·0
Bogota		146·2	86	e 19 41	[0]	—	—	—	—	—
San Juan		150·5	57	e 19 58	[+10]	e 37 18	PPS	e 43 50	SS	e 61·0
Fort de France		156·4	60	e 19 57	[+ 1]	—	—	—	—	—

Additional readings :—
Riverview iPPZ = 7m.40s.
Tokyo i = 9m.56s.
Suva e = 8m.7s., ePP = 8m.54s., isP = 9m.13s., ePcS = 11m.50s., isScP = 15m.11s., eSS = 17m.1s.
Auckland i = 8m.42s., PPP? = 11m.25s., i = 15m.46s., SS = 19m.0s.
Apia sS = 16m.38s.
Wellington PcPZ = 10m.0s., sPcPZ = 10m.52s., iZ = 12m.0s., sS = 16m.50s., i = 17m.26s., ScS = 18m.30s., SS = 19m.30s., sSS = 20m.5s., Q = 21m.0s.
Christchurch Q = 19m.54s.
Calcutta iPSN = 18m.8s., iSSSN = 22m.1s.
Kodaikanal SS = 23m.14s.
Honolulu e = 16m.52s.
New Delhi iN = 11m.13s. and 11m.45s., ScSN = 21m.10s.
Bombay PcPE = 11m.27s., iN = 15m.32s. and 20m.27s., iE = 20m.33s., PSN = 20m.45s., SSE = 24m.55s., SSSE? = 28m.9s.
Sitka iS = 23m.55s.
Tananarive S = 24m.21s.
Tinemaha iZ = 14m.11s., eZ = 19m.28s.
Pasadena eE = 18m.9s., eEZ = 27m.0s.
Mount Wilson iZ = 14m.9s., eZ = 19m.10s.
Ksara e = 18m.42s.
Bozeman i = 25m.39s.

Continued on next page.

Salt Lake City eSKS? =25m.2s.
Helwan eZ =19m.51s.
Tucson e =18m.14s. and 23m.54s.
Upsala iPPPN =21m.53s., iSKKSN =26m.31s., ePS?N =28m.0s.?, eSS =34m.0s.?.
Bucharest eN =18m.1s., iEZ =19m.8s., iN =22m.23s.
Sofia eN =19m.0s.? and 32m.18s.
Belgrade e =33m.57s.
Copenhagen 27m.9s. and 39m.4s.
Prague e =31m.18s.
Jena eN =19m.54s. and 24m.0s., eE =24m.7s.
Stuttgart ePPP =23m.0s., ePKKPZ =29m.14s., eSSS =42m.0s., eQ =52·9m.
Florence iSE =34m.5s.
Florissant ePS?E =30m.38s.
St. Louis eSKKSE =27m.27s., eSN =28m.52s., ePSE =30m.51s.
Chicago e =41m.54s.
Almeria sPKP =19m.37s., PP =21m.35s., pPP =21m.49s., sPP =22m.0s.?, PKS = 22m.36s., pPKS =22m.53s., sPKS =23m.6s., PPP =24m.36s., pPPP =25m.2s., pSKS =26m.46s., SKKS =27m.44s., SP =31m.31s., SKKP($\Delta > 180°$) =31m.53s., SS =39m.37s., SSS =43m.40s.
Granada iPP =21m.25s., pPP =22m.2s., sPP =22m.22s., iPPP =24m.41s., SKKS = 28m.18s., SKSP =32m.20s., SS =39m.3s., SSS =44m.6s.
San Fernando eSE =36m.3s.
Lisbon PKPN =19m.25s.?, PPZ =22m.0s.?.
Huancayo e =20m.0s. and 23m.10s.
Bermuda e =32m.52s.
La Paz ipPKP =21m.5s., isPKP =21m.50s., PSKS =33m.37s.
Bogota i =19m.44s.
San Juan e =31m.22s. and 46m.45s.
Long waves were also recorded at Lincoln, Philadelphia, Aberdeen, and Paris.

Dec. 3d. 6h. 52m. 59s. Epicentre 42°·1N. 143°·5E. Depth of focus 0·020.

Intensity V at Kusiro, Nemuro, Urakawa, Miyako ; IV at Abashiri, Hatinohe, Mizusawa ; II-III at Sapporo, Sendai, Kakioka, Mito, Tukubasan.
Epicentre as adopted. Radius of macroseismic area 300 km. Shallow.

$A = -·5982$, $B = +·4427$, $C = +·6679$; $\delta = -8$; $h = -2$;
$D = +·595$, $E = +·804$; $G = -·537$, $H = +·397$, $K = -·744$.

	Δ	Az.	P.	O−C.	S.	O−C.		Supp.	L.
	°	°	m. s.	s.	m. s.	s.	m.	s.	m.
Sapporo	1·9	301	0 29k	− 6	0 52	−10	—	—	—
Nemuro	2·0	51	0 16k	−20	0 31	−33	—	—	—
Hatinohe	2·2	223	0 35a	− 3	1 5	− 3	—	—	—
Aomori	2·4	238	0 38	− 3	1 13	+ 1	—	—	—
Miyako	2·7	205	0 41a	− 4	1 18	− 1	—	—	—
Akita	3·5	229	0 51	− 4	1 36	− 1	—	—	—
Mizusawa	3·5	213	i 0 53	− 2	1 37	0	i 0 56	PP	—
Sèndai	4·3	209	1 3a	− 2	1 56	+ 1	—	—	—
Hukusima	4·9	210	1 13a	0	2 15	+ 5	—	—	—
Onahama	5·5	201	1 20	− 1	2 25	+ 1	—	—	—
Aikawa	5·7	227	1 26	+ 2	2 33	+ 5	—	—	—
Utunomiya	6·2	208	1 30	0	2 47	+ 7	—	—	—
Mito	6·2	204	1 30a	0	2 43	+ 3	—	—	—
Kakioka	6·4	205	1 24a	− 9	2 30	−15	—	—	—
Tukubasan	6·4	205	1 33	0	—	—	—	—	—
Tyosi	6·7	199	1 37	0	2 48	− 4	—	—	—
Nagano	6·8	219	1 40k	+ 2	2 28	−27	—	—	—
Tokyo	7·0	206	1 42	+ 1	3 5	+ 5	—	—	—
Yokohama	7·3	206	1 45a	0	3 10	+ 3	—	—	—
Kohu	7·5	212	2 2	+14	3 31	+19	—	—	—
Hunatu	7·6	211	1 47a	− 2	3 15	+ 1	—	—	—
Misima	7·8	209	1 53	+ 1	—	—	—	—	—
Osima	8·0	205	1 53	− 1	3 23	− 1	—	—	—
Shizuoka	8·2	212	1 59	+ 2	3 25	− 3	—	—	—
Gihu	8·5	221	2 2	+ 1	3 45	+10	—	—	—
Omaesaki	8·5	211	2 3a	+ 2	3 2	−33	—	—	—
Nagoya	8·6	219	2 4	+ 2	3 30	− 8	—	—	—
Hamamatu	8·7	214	2 3	− 1	—	—	—	—	—
Vladivostok	8·7	281	i 2 4	0	i 3 59	+19	—	—	—
Hikone	8·9	222	2 8	+ 2	3 51	+ 6	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Kameyama		9·1	220	2 12	+ 3	2 54	−56	—	—	—
Kyoto		9·3	223	2 15	+ 3	4 33	+39	—	—	—
Hatidyozima		9·4	199	2 15	+ 2	3 56	− 1	—	—	—
Toyooka		9·4	229	2 17	+ 4	—	—	—	—	—
Kobe		9·9	224	2 21k	+ 2	4 16	+ 7	—	—	—
Owase		9·9	218	2 23k	+ 4	—	—	—	—	—
Wakayama		10·2	223	2 26k	+ 3	5 11	+55	—	—	—
Sumoto		10·3	224	2 27k	+ 3	4 40	+22	—	—	—
Siomisaki		10·6	218	2 31	+ 3	—	—	—	—	—
Hamada		11·5	235	2 29	−11	6 21	?	—	—	—
Muroto		11·5	223	3 10a	+30	6 22	?	—	—	—
Simidu		12·5	226	3 13	+20	—	—	—	—	—
Hukuoka		13·4	235	3 15	+10	—	—	—	—	—
Kumamoto		13·7	232	3 14	+ 6	—	—	—	—	—
Zinsen		13·8	256	3 7	− 3	—	—	—	—	—
Tomie		15·1	236	3 25	− 1	7 3	+54	—	—	—
Irkutsk		28·2	305	i 5 41	+ 1	i 10 25	+13	—	—	—
College		44·0	35	e 7 48	− 5	e 14 13	+ 1	e 9 34	PP	e 20·6
Calcutta	N.	49·6	265	e 8 49	+13	i 15 49	+18	i 16 17	sS	—
Andijan		51·9	294	e 8 58	+ 4	e 16 18	+15	—	—	—
Sverdlovsk		52·5	317	i 9 0	+ 1	i 16 20	+ 9	—	—	—
Tashkent		53·7	296	9 12	+ 5	i 16 42	+15	—	—	—
New Delhi	N.	54·5	279	e 9 34	+21	i 16 53	+15	17 5	PS	—
Stalinabad		55·4	295	e 9 29	+ 9	—	—	e 17 15	PS	—
Hyderabad	N.	60·1	267	e 9 57	+ 4	18 8	+17	10 18	P_cP	28·0
Bombay		63·4	272	e 10 21	+ 6	e 18 39	+ 6	i 10 38	pP	—
Colombo	E.	65·9	257	11 1?	pS	20 1?	PPS	—	—	—
Scoresby Sund		67·2	355	10 39	0	19 25	+ 6	—	—	32·0
Grozny		67·5	309	e 10 45	+ 4	e 19 38	+16	—	—	—
Berkeley	Z.	68·6	58	i 10 46	− 2	—	—	—	—	—
Upsala		69·1	334	i 10 52	+ 1	e 19 48	+ 7	e 20 44	PPS	e 33·6
Bozeman		70·3	46	—	—	i 19 58	+ 3	—	—	e 39·1
Tinemaha		71·6	57	e 11 5	− 1	e 20 25	+15	i 11 30	pP	—
Bergen		72·3	340	i 11 9	− 1	—	—	e 11 44	pP	40·0
Santa Barbara		72·3	60	i 11 9	− 1	e 20 24	+ 6	—	—	—
Haiwee		72·4	57	i 11 11	+ 1	i 20 26	+ 7	i 11 26	pP	—
Salt Lake City		73·1	50	e 11 13	− 1	i 20 33	+ 6	—	—	e 40·1
Mount Wilson		73·5	59	e 11 15a	− 2	e 20 36	+ 4	i 11 31	pP	—
Pasadena		73·5	59	i 11 16a	− 1	i 20 39	+ 7	i 11 33	pP	e 33·1
Copenhagen		74·1	334	i 11 21	+ 1	20 49	+11	21 23	pS	—
Riverside		74·1	59	e 11 18a	− 2	e 20 43	+ 5	i 11 44	pP	—
La Jolla		74·9	60	i 11 24	− 1	e 20 53	+ 6	—	—	—
Palomar	Z.	74·9	59	i 11 24	− 1	—	—	i 11 40	pP	—
Riverview		75·9	173	i 11 34	+ 4	—	—	—	—	e 32·2
Bucharest		77·3	320	e 11 40	+ 2	i 21 26	+13	i 21 53	SP	36·0
Jena		78·3	331	i 11 44	0	i 21 34	+10	i 21 52	SP	e 36·0
Cheb		78·7	331	e 18 1?	?	e 21 42	+14	—	—	e 47·0
Tucson		79·4	56	i 11 49	− 1	e 21 42	+ 6	e 14 46	PP	e 37·2
De Bilt		79·5	336	i 11 53	+ 3	i 21 51	+14	—	—	e 39·0
Ksara		79·5	306	e 11 56?	+ 6	e 21 54	+17	—	—	—
Belgrade		79·6	322	i 11 57	+ 6	i 21 53	+15	e 12 25	P_cP	e 40·7
Sofia		79·9	320	e 11 57	+ 5	e 21 55	+14	—	—	40·7
Uccle		80·9	336	11 59	+ 1	e 21 59	+ 8	—	—	e 39·0
Stuttgart		81·0	331	i 11 59a	+ 1	e 22 1	+ 9	i 12 17	P_cP	e 41·3
Kew		81·6	338	—	—	e 22 9	+11	—	—	e 41·0
Triest		81·8	327	—	—	i 22 8	+ 8	—	—	—
Zürich		82·4	331	e 12 5a	0	e 22 14	+ 8	—	—	—
Chur		82·5	330	e 12 3	− 3	e 22 16	+ 9	—	—	—
Basle		82·6	332	e 12 8	+ 2	e 22 20	+12	—	—	—
Neuchatel		83·3	332	e 12 13	+ 3	—	—	—	—	—
Florence	N.	84·4	327	e 12 19	+ 4	i 22 34	+ 8	i 23 47	PS	—
Helwan		85·0	306	12 24	+ 6	22 41	+ 9	23 27	SP	—
Florissant		85·8	39	i 12 38	+16	e 22 38	− 2	i 15 39	PP	—
St. Louis		86·0	39	i 12 23	0	e 22 39	− 3	i 28 28	SS	—
Ottawa		86·1	27	12 23	− 1	22 41	− 2	—	—	43·0

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Cape Girardeau	N.	87·3	39	e 12 30	0	e 22 48	− 6	23 1	S_cS	—
Harvard		90·0	25	i 12 43	+ 1	—	—	—	—	—
Fordham		90·8	28	i 12 44	− 2	i 22 50	[−10]	i 23 32	S	—
Toledo		93·2	336	i 13 1	+ 4	—	—	16 40	PP	—
Almeria		95·5	334	14 14	?	i 24 1?	− 6	23 20	SKS	49·0
Granada		95·6	335	24 0	S	(24 0)	− 8	—	—	51·5
San Fernando		97·0	337	e 17 21	PP	i 23 56	−24	—	—	51·5
Bermuda		101·5	24	—	—	e 24 8	[+11]	—	—	e 50·5
La Paz		142·8	56	19 22	[+ 7]	—	—	i 22 22	PP	82·0

Additional readings :—
New Delhi S_cS =18m.58s.
Bombay eN =10m.47s., iSEN =18m.50s., eN =19m.11s., iE =19m.14s., S_cSN = 20m.6s., iE =20m.39s., eE =22m.31s., iE =23m.22s., iN =23m.30s.
Mount Wilson isPZ =11m.41s.
Pasadena isPZ =11m.42s.
Palomar isPZ =11m.50s.
Bucharest ePP?N =14m.4s., iPPE =14m.12s., iN =22m.45s., iE =22m.54s., iN = 25m.50s. and 27m.44s.
Jena iPEN =11m.50s., iSN =21m.37s., iN =21m.48s.
Cheb e =29m.24s., and 34m.9s.
Tucson i =12m.16s., e =19m.38s.
Belgrade e =14m.35s., e =23m.35s.
Stuttgart ePPZ =14m.51s., iS =22m.14s.
Florence iSN =23m.7s.
Helwan eZ =13m.4s., PPZ =15m.36s.
Florissant eSSE =28m.25s.
St. Louis iSN =22m.47s.
Fordham i =24m.38s.
Almeria PP =16m.55s., PPP =18m.58s., SKKS =23m.39s., sS =24m.50s., SP =25m.15s., PS =25m.33s., SS =30m.18s.
Long waves were also recorded at Wellington, Auckland, Paris, and Prague.

Dec. 3d. Readings also at 0h. (Bucharest and near Istanbul), 1h. (New Delhi, Bucharest, and Istanbul), 2h. (Helwan, Ksara, Bucharest, Sofia, Belgrade, Basle, Chur, Neuchatel, Zürich, Stuttgart, and Cheb), 6h. (Brisbane (2), Riverview (2), Upsala, and La Paz), 7h. (Rio de Janeiro), 8h. (De Bilt and Cheb), 9h. (Bogota), 10h. (Fort de France), 13h. (Triest and Ksara), 14h. (Riverview), 15h. (La Paz, Ksara, Sofia, Bucharest, and near Istanbul), 16h. (Belgrade, Bucharest, Sofia, and near Istanbul), 20h. (near Almeria and Granada).

Dec. 4d. 20h. 13m. 42s. Epicentre 39°·2N. 122°·2W. (as on Nov. 16d.).

Intensity IV at Colusa, Meridian, and Willows. Felt at Sacremento.
Epicentre 39° 11′N. 122° 12′W. (Berkeley).

$A = -·4141$, $B = -·6575$, $C = +·6295$; $\delta = +6$; $h = -1$;
$D = -·846$, $E = +·533$; $G = -·335$, $H = -·533$, $K = -·777$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Berkeley		1·3	182	i 0 25	0	e 0 41	− 3	i 0 35	P_g	—
San Francisco		1·4	188	e 0 30	+ 3	i 0 44	− 2	i 0 40	P_g	—
Branner		1·8	180	e 0 31	− 1	i 0 59	+ 3	i 0 44	P_g	—
Lick		1·9	167	e 0 34	0	i 0 59	0	e 0 38	P_g	—
Santa Clara		1·9	174	e 0 33	− 1	e 1 9	S_g	—	—	—
Fresno	N.	3·1	142	e 0 52	+ 1	i 1 37	+ 8	e 1 3	P_g	—
Tinemaha		3·8	123	i 0 59	− 2	i 1 57	+10	—	—	—
Haiwee		4·5	131	i 1 21	P*	i 2 26	S*	—	—	—
Mount Wilson		6·0	145	i 1 33	+ 1	i 2 51	+ 8	—	—	—
Pasadena		6·0	146	i 1 31	− 1	i 2 57	S*	—	—	—
Riverside	Z.	6·5	142	e 1 39	0	—	—	—	—	—
Palomar	Z.	7·3	142	i 1 49	− 1	—	—	—	—	—
Tucson		11·5	123	e 3 12	PPP	—	—	—	—	e 6·2

Additional readings :—
Branner iN =0m.50s.
Lick iSN =1m.6s.
Fresno iS_gN =1m.45s.

Dec. 4d. Readings also at 0h. (La Paz), 4h. (near Apia), 6h. (La Paz), 12h. (Ksara and La Paz), 14h. (near Sofia (2)), 15h. (Riverview), 18h. (La Paz), 19h. (Auckland, Tuai, and Wellington), 23h. (Ksara).

Dec. 5d. 3h. 16m. 17s. Epicentre 36°·3N. 71°·0E. Depth of focus 0·025.
(as on 1943 Sept. 9d.).

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

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Andijan		4·6	14	i 1 12	+ 2	—	—	—	—	—
Tashkent		5·2	347	i 1 16	− 2	e 2 12	− 6	—	—	—
Tchimkent		6·1	351	i 1 26	− 3	—	—	—	—	—
Frunse		7·1	22	1 45	+ 3	—	—	—	—	—
Almata		8·3	32	2 1	+ 3	—	—	—	—	—
New Delhi	N.	9·3	144	i 2 13k	+ 2	3 55	+ 1	—	—	—
Bombay		17·4	174	i 3 56	+ 4	i 7 6	+ 8	4 12	PP	—
Hyderabad	N.	19·9	159	4 21	+ 3	7 58	+11	15 30	ScS	—
Calcutta	N.	20·4	127	e 4 34	+11	i 8 6	+10	i 9 30	SS	10·2
Sverdlovsk		21·7	345	4 35	− 1	i 8 21	+ 2	5 11	pP	—
Kodaikanal	E.	26·6	166	e 8 26	?	e 9 16	−25	—	—	—
Irkutsk		28·4	44	5 39	0	—	—	—	—	—
Moscow		29·8	321	5 49	− 2	e 10 28	− 4	—	—	—
Colombo	E.	30·4	163	e 7 43?	?	12 3	SS	—	—	—
Helwan		33·7	270	6 24	− 1	e 11 31	− 2	e 7 5	pP	—
Copenhagen		43·6	315	7 45	− 2	13 58	− 3	9 30	PP	—
Cheb		43·8	308	e 7 43?	− 5	—	—	—	—	—
Jena		44·2	308	i 7 50	− 2	—	—	—	—	—
Stuttgart		46·0	306	i 8 4a	− 2	e 14 32	− 3	e 9 13	pP	—
Chur		46·1	304	e 8 3a	− 4	—	—	—	—	—
Zürich		46·6	304	e 8 7	− 3	—	—	—	—	—
Basle		47·3	304	e 8 13a	− 3	—	—	—	—	—
Neuchatel		47·8	304	e 8 16	− 4	—	—	—	—	—
De Bilt		48·1	312	i 8 21a	− 1	e 15 3	− 2	e 9 34	pP	—
Clermont-Ferrand		50·7	303	e 8 40	− 2	—	—	—	—	—
Toledo	z.	57·5	298	i 9 29	− 2	—	—	—	—	—
Tinemaha	z.	106·5	7	e 18 4	PP	—	—	—	—	—
Mount Wilson	z.	109·3	7	e 18 16	PP	—	—	i 18 46	pPP	—
Pasadena		109·4	7	e 18 22	PP	—	—	—	—	—
Riverside	z.	109·6	7	e 18 54	PP	—	—	—	—	—
Palomar	z.	110·5	6	e 18 51	PP	—	—	—	—	—
Tucson		111·8	1	e 18 10	[− 1]	—	—	i 19 1	PP	—

Additional readings and notes:—
New Delhi $P^* = 2m.30s.$, $P_g = 2m.47s.$, phases wrong in view of the depth of focus.
Bombay iE = 4m.46s., iN = 4m.49s. and 5m.1s., iE = 5m.8s., iSN = 7m.9s., iEN = 7m.19s., iE = 8m.1s. and 8m.31s.
Copenhagen 17m.31s.
Stuttgart iPPZ = 9m.56s., esS? = 15m.53s., eSS? = 19m.13s.
De Bilt iZ = 10m.15s., esS? = 16m.23s.

Dec. 5d. Readings also at 13h. (Suva), 15h. (Focsani, near Campulung, and Bucharest), 16h. (Riverview), 21h. (Calcutta and near Tchimkent), 22h. (Auckland, Arapuni, Wellington, Christchurch, Cheb, De Bilt, Stuttgart, Uccle, Riverview, near Stalinabad, and Tashkent), 23h. (Prague).

Dec. 6d. 6h. 10m. 7s. Epicentre 15°·0N. 93°·6E. Epicentre given by Bombay.

Record slight.

$A = -·0607$, $B = +·9645$, $C = +·2572$; $\delta = +10$; $h = +6$;
$D = +·998$, $E = +·063$; $G = -·016$, $H = +·257$, $K = -·966$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Calcutta	N.	9·0	327	e 2 15	+ 2	i 3 48	−10	i 4 42	S_g	—
Colombo	E.	15·7	241	3 45	+ 1	6 59	+20	—	—	10·0
Kodaikanal	E.	16·4	255	i 4 0	+ 7	— *	—	—	—	—
Bombay		20·2	284	4 38?	− 1	e 8 28	+ 7	4 57	PP	—
New Delhi	N.	20·3	316	i 4 48a	+ 8	i 8 18	− 5	4 54	PP	—
Sverdlovsk		48·7	337	i 9 42	+54	16 41	+51	—	—	—
Ksara		55·1	301	e 9 36	0	e 17 50	+32	—	—	—
Helwan		58·8	296	e 9 59	− 3	e 19 41	?	—	—	—
Stuttgart		75·2	317	e 11 41	− 5	—	—	—	—	e 44·9
Chur		75·2	315	e 11 41	− 5	—	—	—	—	—
Zürich		75·8	316	e 11 41k	− 9	—	—	—	—	—
Toledo		86·3	310	i 12 41	− 4	—	—	16 31	PP	—
Tinemaha	z.	120·1	29	i 18 50	[− 3]	—	—	—	—	—
Haiwee	z.	121·0	29	i 18 50	[− 5]	—	—	—	—	—
Riverside	z.	123·0	31	i 18 52	[− 6]	—	—	—	—	—
Tucson		127·5	26	i 19 3	[− 4]	—	—	e 22 15	PKS	—

Additional readings and notes :—
Calcutta iS*N =4m.18s.
Bombay PPPE =5m.13s., SSE =8m.42s., SSN =8m.45s., SSSN =9m.8s., SSSE = 9m.12s.
New Delhi SS =8m.40s., P_cP =8m.57s.
Helwan iZ =10m.17s.
Tucson i =19m.25s.
The readings for the two Swiss stations are given as for 7h.
Long waves also recorded at De Bilt.

Dec. 6d. Readings also at 1h. (Helwan, Ksara, and Tashkent), 3h. (near Lick), 4h. and 5h. (2) (Brisbane), 7h. (Shawinigan Falls and near Ottawa), 14h. (Tacubaya and near La Paz), 15h. (La Paz and La Plata), 19h. (Tacubaya).

Dec. 7d. 1h. 7m. 18s. Epicentre 16°·0N. 94°·0W.

Not an approximate epicentre. Pasadena suggests deep focus.

$A = -·0671$, $B = -·9594$, $C = +·2739$; $\delta = -3$; $h = +6$;
$D = -·998$, $E = +·070$; $G = -·019$, $H = -·273$, $K = -·962$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Oaxaca	N.	2·8	291	0 53	P*	—	—	—	—	—
Vera Cruz	N.	3·8	328	1 6	P*	—	—	—	—	—
Puebla	E.	5·0	308	1 20	+ 2	—	—	—	—	—
Tacubaya	N.	6·0	305	1 35	+ 3	—	—	—	—	—
Guadalajara	E.	10·0	299	—	—	e 5 8	S*	—	—	—
Mobile		15·6	19	i 3 50	+ 7	1 6 31	− 6	—	—	—
Columbia		21·4	29	e 4 54	+ 3	e 8 48	+ 3	—	—	e 10·1
Cape Girardeau	N.	21·6	9	e 4 50	− 4	e 8 44	− 5	e 5 8	pP	—
Tucson		22·2	320	i 5 0	0	e 9 4	+ 4	—	—	e 11·9
Bogota		22·6	118	e 5 6	+ 3	—	—	—	—	—
St. Louis		22·8	7	i 5 4	− 1	i 9 8	− 3	i 5 23	pP	—
San Juan		26·7	80	e 5 40	− 3	e 10 40	+23	—	—	e 12·0
La Jolla		26·9	313	e 5 45	0	—	—	e 6 0	pP	—
Palomar	z.	26·9	315	i 5 44	− 1	—	—	i 6 2	pP	—
Riverside	z.	27·6	315	i 5 51	0	—	—	i 6 9	pP	—
Mount Wilson	z.	28·2	315	i 5 57	+ 1	—	—	i 6 14	pP	—
Pasadena		28·3	315	e 5 56	− 1	i 16 28	S_cS	e 6 12	pP	e 14·5
Philadelphia		29·0	31	e 6 30	+26	e 11 25	+31	—	—	e 12·6
Rapid City		29·0	347	e 5 57	− 7	e 11 25	+31	—	—	e 13·4
Salt Lake City		29·1	332	—	—	e 10 47	− 9	—	—	e 16·8

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Haiwee		29·3	318	e 6 26	+20	—	—	e 16 13 ·	S_cS	—
Santa Barbara	z.	29·5	313	e 6 32	+24	—	—	—	—	—
Logan		29·9	333	e 6 17	+ 5	e 11 6	− 3	—	—	e 14·9
Tinemaha		30·0	319	e 6 13	+ 1	—	—	e 16 18	S_cS	—
Fordham		30·3	32	e 7 16	PP	12 12?	SS	—	—	—
Bermuda		31·2	53	e 6 12	−11	e 11 38	+ 9	—	—	e 13·2
Harvard		32·7	32	e 6 46	+10	e 13 46	SS	e 7 55	PP	e 20·7
Bozeman		32·9	339	—	—	e 11 9	−47	—	—	e 16·8
Ottawa		33·1	23	e 6 56	+16	—	—	—	—	14·7
Huancayo		33·4	145	e 6 46	+ 4	e 12 0	− 3	—	—	e 14·6
Seven Falls		36·5	27	e 8 0?	PP	—	—	—	—	15·7
Scoresby Sund		69·0	20	—	—	20 9	− 5	—	—	34·7
Toledo		79·9	52	i 12 2	−10	—	—	—	—	41·7
Granada		80·8	54	i 12 16	− 1	17 30	PPP	12 47	pP	—
Almeria		81·8	54	12 20	− 2	—	—	16 37	PP	36·2
Uccle		82·9	39	e 12 25	− 3	e 22 40	− 6	—	—	e 38·7
De Bilt		83·1	37	i 12 27	− 2	i 22 53	+ 5	—	—	e 38·7
Clermont-Ferrand		83·6	44	i 12 27	− 4	—	—	—	—	e 39·7
Strasbourg		85·7	40	e 12 36	− 6	—	—	—	—	—
Neuchatel		85·7	42	e 12 38	− 4	—	—	—	—	—
Basle		86·0	41	e 12 41a	− 2	—	—	—	—	—
Zürich		86·6	41	e 12 44a	− 2	—	—	—	—	—
Stuttgart		86·6	39	i 12 44	− 2	e 23 12 [0]		e 43 42?	Q	47·4
Chur		87·4	42	e 12 49	− 1	—	—	—	—	—
Cheb		88·0	38	—	—	e 22 42?	?	—	—	—
Triest		90·6	42	—	—	i 23 31 [− 5]		—	—	—

Additional readings :—
Tucson i =5m.18s. and 7m.8s., iS =9m.14s.
St. Louis isSN =9m.42s., iE =9m.50s., iSSE =10m.6s.
Harvard i =8m.18s., e =14m.53s. and 16m.49s.
Huancayo e =12m.38s.
Toledo i =13m.2s.
Granada sP =12m.59s., P_cP =13m.26s.
Almeria i =13m.1s. and 19m.42s.
Clermont-Ferrand i =13m.12s.
Strasbourg e =13m.20s.

Dec. 7d. Readings also at 3h. (Ksara), 6h. (near Erevan), 8h. (near Reykjavik), 11h. (Arapuni, and Wellington), 12h. (near Sofia), 16h. (Mount Wilson, Tucson, Pasadena, Palomar, and Riverside), 17h. (Andijan and near Stalinabad).

Dec. 8d. 19h. 38m. 52s. Epicentre 15°·2N. 94°·4W. (as on 1941, Feb. 11d.).

$A = -·0741$, $B = -·9626$, $C = +·2606$; $\delta = 0$; $h = +6$;
$D = -·997$, $E = +·077$; $G = -·020$, $H = -·260$, $K = -·966$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Oaxaca	N.	2·9	309	0 42	− 6	—	—	—	—	—
Vera Cruz	E.	4·4	337	1 11	+ 1	—	—	—	—	—
Puebla	E.	5·2	317	1 18	− 3	—	—	—	—	—
Tacubaya	N.	6·2	313	1 39	+ 4	—	—	—	—	—
Columbia		22·3	30	e 5 0	− 1	e 9 5	+ 3	—	—	e 11·9
Bogota		22·6	116	e 5 6	+ 3	—	—	—	—	—
Tucson		22·6	322	i 5 7	+ 4	e 9 20	+13	—	—	e 11·4
St. Louis		23·6	7	i 5 14	+ 1	i 9 37	+12	—	—	—
Florissant		23·8	7	i 5 16	+ 1	e 9 45	+17	—	—	—
Lincoln		25·6	358	—	—	e 10 7	+ 8	—	—	e 15·6
Chicago		27·1	10	e 5 45	− 1	e 10 28	+ 4	e 8 48	P_cP	e 11·8
San Juan		27·2	79	e 5 44	− 3	e 11 19	SS	—	—	e 13·8
La Jolla		27·2	315	e 5 49	+ 2	—	—	—	—	—
Palomar	z.	27·2	316	i 5 49a	+ 2	—	—	—	—	—
Riverside	z.	27·9	316	i 5 56	+ 2	—	—	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Mount Wilson	Z.	28·5	316	e 6 0a	+ 1	—	—	—	—	—
Pasadena		28·5	316	i 6 2a	+ 3	e 11 8	+22	—	—	e 13·8
Haiwee	Z.	29·6	320	e 6 11	+ 2	—	—	—	—	—
Salt Lake City		29·6	332	e 6 6	− 3	e 11 11	+ 7	—	—	e 15·9
Rapid City		29·7	348	e 6 8	− 2	e 11 37	+31	—	—	e 15·0
Philadelphia		29·8	31	—	—	e 12 17	SS	—	—	e 15·1
Tinemaha		30·4	320	e 6 19	+ 3	—	—	—	—	—
Bermuda		31·8	53	e 6 34	+ 6	e 12 0	+22	—	—	e 13·3
Santa Clara		32·9	318	e 8 30	PP	—	—	—	—	e 17·3
Huancayo		33·0	145	e 6 41	+ 2	e 11 58	+ 1	—	—	e 14·2
Bozeman		33·4	339	—	—	e 12 9	+ 6	—	—	e 18·9
Ottawa		34·0	23	e 6 46	− 2	e 12 20?	+ 7	—	—	e 18·1
Seven Falls		37·4	26	e 8 50?	PP	—	—	—	—	e 19·1
College		61·2	337	—	—	e 27 20	?	—	—	e 34·2
Rio de Janeiro	E.	62·8	125	e 18 50	S	(e 18 50)	− 8	—	—	e 31·1
Scoresby Sund		69·9	20	11 13	− 2	20 36	+12	—	—	34·1
Edinburgh		78·2	35	12 12	+ 9	22 8	+11	22 16	S_cS	—
Aberdeen	E.	78·6	34	—	—	i 21 45	−17	—	—	e 40·0
San Fernando	E.	79·7	56	e 12 59	?	—	—	—	—	37·6
Toledo		80·7	52	i 12 18	+ 2	e 22 32	+ 8	—	—	38·3
Kew		80·8	40	—	—	e 22 27	+ 2	—	—	e 40·1
Granada		81·6	54	i 12 23	+ 2	i 22 29	− 4	13 2	pP	i 41·0
Almeria		82·6	54	12 24	− 2	22 32	−11	12 55	pP	—
Paris		83·2	42	e 12 29	0	—	—	—	—	44·1
Uccle		83·8	40	i 12 32a	0	e 22 55	0	e 28 41	SS	e 39·1
De Bilt		83·9	38	i 12 34a	+ 1	i 23 0	+ 4	—	—	e 40·1
Clermont-Ferrand		84·4	45	i 12 35	− 1	e 23 8	+ 7	e 24 3	PS	e 42·4
Strasbourg		86·6	41	12 50	+ 4	—	—	—	—	e 48·1
Basle		86·8	42	e 12 37a	−10	—	—	—	—	—
Copenhagen		86·8	34	12 49	+ 2	23 22	− 3	—	—	43·1
Stuttgart		87·4	40	i 12 50a	0	e 23 26	− 4	e 16 11	PP	e 43·3
Zürich		87·5	42	e 12 48a	− 3	—	—	—	—	—
Upsala	E.	87·6	28	—	—	e 23 42	+10	—	—	e 46·1
Chur		88·3	42	e 12 54	− 1	—	—	—	—	—
Cheb		88·9	38	e 21 8	?	e 23 8	[−18]	e 39 8?	?	e 51·1
Prague		90·1	37	—	—	e 24 8?	+13	—	—	—
Florence		90·5	44	e 13 20	+15	e 24 59	PS	—	—	—
Trieste		91·5	42	e 13 8	− 2	i 23 44	[+ 2]	—	—	—

Additional readings and notes :—
Bogota i =5m.17s.
Tucson i =6m.3s., iS =9m.30s.
Palomar iZ =6m.0s.
Bermuda e =8m.14s.
Ottawa eE =16m.15s.
Seven Falls e =14m.8s.?.
College e =31m.32s.
Granada P_cP =12m.31s., pP_cP =13m.5s., sP =13m.40s., PP =15m.33s., pPP =16m.34s., iS =22m.50s., sS =23m.26s., SS =28m.6s., sSS =29m.56s., SSS =31m.24s. S and SKS appear to be interchanged.
Almeria P_cP =12m.30s., sP =13m.11s., PP =15m.53s., pPP =16m.20s., PPP =17m.36s., eS =23m.4s., SP =23m.36s., SS =27m.51s., SSS =31m.36s.
Copenhagen 23m.38s.
Stuttgart ePS =24m.36s., eSS =29m.2s.?.
Upsala eN =23m.46s.
Long waves were also recorded at Guadalajara and other American stations.

Dec. 8d. 20h.

Scale V at Travnik. Radius of macroseismic area 20 km.
J. Mihailovic.
"Annuaire microséismique et macroséismic" 1943, Belgrade 1950, p. 44. Epicentre suggested 44° 13′N. 16° 32′E., but the P phases do not fit.

Bucharest EN =34m.0s.?.
Florence iPZ =35m.20s.k, iP_gZ =35m.24s., iSN =35m.49s., iS_g =35m.56s.
Triest e =35m.38s., i =35m.57s.
Chur eP =35m.58s., eS_g =36m.50s.
Milan PEZ =36m.0s.?.
Zürich eP =36m.7s.
Basle eP =36m.16s., eS_g =37m.29s.
Stuttgart ePZ =36m.19s., eZ =36m.33s., e =36m.45s., eZ =36m.47s., and 37m.26s.
Belgrade eP =36m.27s., e =36m.32s. and 36m.44s., eS_g =37m.2s., e =37m.46s., i = 37m.53s. and 37m.56s.
Sofia eP =37m.12s., eS =39m.0s.?.
Strasbourg S_g =37m.20s., e =38m.2s., i =38m.59s.
Jena eN =37m.30s. and 38m.3s.
Prague e =38m.19s., eS =38m.46s.
Potsdam eN =39m.48s.?, eE =40m.0s.?, iN =40m.11s.

Dec. 8d. Readings also at 3h. (Bogota, Fort de France, Fordham, near Berkeley, Branner, Fresno, and Lick), 9h. (Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, Santa Barbara, Tinemaha, Tucson, and St. Louis), 11h. (2) and 13h. (2) (Ksara), 14h. (Strasbourg), 18h. (Granada), 19h. (Fort de France), 22h. (near Ferndale).

Dec. 9d. Readings at 3h. (College, Sitka, Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, Tucson, Bozeman, Chicago, St. Louis, Fordham, Harvard, Ottawa, Pittsburgh, Philadelphia, Columbia, De Bilt, Stuttgart, Uccle, Triest, Bombay, and New Delhi), 4h. (Cheb, and San Juan), 8h. (near Logan), 14h. (Fort de France), 15h. (Auckland, Wellington, Arapuni, Brisbane, Sydney, and Riverview), 19h. (Fort de France), 23h. (Ksara and near Fort de France).

Dec. 10d. Readings at 2h. (near Erevan), 3h. (near Tashkent), 4h. (near Stalinabad and Tashkent), 14h. (near Mizusawa (2)), 15h. (Harvard).

Dec. 11d. Readings at 0h. (Huancayo, La Paz, and La Plata), 1h. (St. Louis, Riverside, Tucson, Tinemaha, near Bacau, Bucharest, Campulung, and Focsani), 3h. (Mizusawa), 9h. and 13h. (near Andijan), 16h. (La Plata and Palomar), 18h. (near Mizusawa), 19h. (Arapuni, Christchurch, Wellington, and Sofia), 20h. (Auckland and Riverview).

Dec. 12d. 15h. 54m. 17s. Epicentre 35°·9N. 70°·0E. Depth of focus 0·020.
(as on 1939 June 6d.).

A = +·2777, B = +·7630, C = +·5838; δ = +11; h = 0;
D = +·940, E = −·342; G = +·200, H = +·549, K = −·812.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Stalinabad		2·8	340	i 0 44	− 2	—	—	—	—	—
Andijan		5·2	21	e 1 12	− 5	—	—	—	—	—
Tashkent		5·4	358	i 1 15	− 5	—	—	—	—	—
Dehra Dun	N.	8·7	128	e 2 13	+ 9	i 3 15	−25	—	—	—
Almata		9·1	34	2 4	− 5	—	—	—	—	—
New Delhi		9·5	138	i 2 9	− 5	i 3 48	−11	i 2 37	pP	i 4·8
Bombay		17·1	173	i 3 50	− 1	i 6 50	− 4	4 6	pP	—
Hyderabad	N.	19·9	157	4 22	+ 1	8 7	+16	4 58	pP	10·2
Grozny		20·0	299	e 4 33?	+11	—	—	—	—	—
Calcutta	N.	20·8	126	e 4 32	+ 2	i 8 5	− 3	i 5 3	pP	9·5
Sverdlovsk		21·9	347	4 41	0	i 8 32	+ 5	i 5 14	pP	—
Kodaikanal	E.	26·4	164	e 5 13	−10	e 9 13	−30	—	—	—
Ksara		28·0	275	e 5 53	+15	e 10 24	+15	—	—	—
Irkutsk		29·2	45	i 5 49	0	—	—	—	—	—
Moscow		29·6	323	6 28	+36	11 21	+47	7 1	pP	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Colombo	E.	30·2	162	e 10 43?	S	(e 10 43?)	− 1	—	—	—
Upsala		41·0	322	i 9 13	PP	e 14 30	+62	—	—	—
Prague		42·1	308	e 9 26	PP	—	—	—	—	—
Copenhagen		43·3	317	i 7 49	+ 2	14 7	+ 5	9 58	PP	—
Cheb		43·4	308	e 8 34	+46	e 14 13?	+ 9	—	—	e 21·7
Jena	E.	43·9	309	i 7 54	+ 2	—	—	i 8 37	pP	—
Stuttgart		45·6	306	i 8 7a	+ 1	e 14 43	+ 8	i 8 36	pP	—
Chur		45·6	304	e 8 6a	0	—	—	—	—	—
Zürich		46·2	305	e 8 10a	0	—	—	—	—	—
Basle		46·8	306	e 8 16	+ 1	—	—	—	—	—
Vladivostok		47·3	62	e 8 19	0	—	—	—	—	—
De Bilt		47·7	312	—	—	e 15 43?	+38	e 19 13	SS	—
Clermont-Ferrand		50·2	303	i 8 43	+ 2	—	—	—	—	—
Toledo	Z.	57·0	298	i 9 33	+ 2	—	—	—	—	—
Tananarive		58·5	206	23 27	SSS	—	—	—	—	29·2
Tinemaha	Z.	107·0	7	e 18 14	PKP	—	—	—	—	—
Mount Wilson	Z.	109·8	7	e 17 53	[−18]	—	—	e 19 33	PP	—
Riverside	Z.	110·1	7	e 18 7	[− 5]	—	—	e 19 34	PP	—
Palomar	Z.	110·8	6	e 18 6	[− 7]	—	—	—	—	—
Tucson		112·2	1	e 18 57	PP	—	—	—	—	—

Additional readings :—
New Delhi iEN =3m.0s., iN =4m.22s.
Bombay PPPN =4m.24s., SSEN =7m.10s., SSSEN =7m.23s.
Hyderabad SSN =8m.51s.
Calcutta iSSN =8m.45s.
Upsala i =10m.28s., eN =16m.12s., eE =16m.49s.?.
Copenhagen 10m.13s., 15m.0s., 17m.33s., 18m.5s., and 18m.20s.
Cheb e =17m.43s.?.
Stuttgart eZ =8m.48s., ePP?Z =10m.27s., e =15m.34s., eSS =18m.13s.
Tananarive S =26m.46s., SS =27m.31s., phases all wrongly identified.
Mount Wilson eZ =18m.46s.
Long waves were also recorded at Potsdam and Riverview.

Dec. 12d. Readings also at 0h. (near Andijan), 5h. (La Paz and Riverview), 9h. (near Andijan), 10h. (Fort de France), 11h. (Bogota, Palomar, Tucson, and Riverside), 13h. (Ebingen, Stuttgart, and near Zürich), 18h. (Fort de France), 20h. (Bergen).

Dec. 13d. 15h. 53m. 14s. Epicentre 9°·7N. 125°·7E. (as on 1943 Nov. 28d.).

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Naha		16·5	6	e 4 5	+11	—	—	—	—	—
Hukuoka		24·2	9	e 5 15	− 4	12 46	L	—	—	(12·8)
Ituhara		24·6	5	e 5 21	− 2	—	—	—	—	—
Hamada		25·8	12	e 6 19	+45	—	—	—	—	—
Kobe		26·4	17	5 41	+ 1	10 51	+39	—	—	—
Kameyama		26·9	19	e 6 12	+27	—	—	—	—	—
Zinsen		27·7	1	e 6 39	+47	11 35	+62	—	—	—
Tokyo		28·9	23	e 6 7	+ 4	—	—	—	—	—
Nagano		29·1	19	e 5 28	−36	—	—	—	—	—
Sendai		31·5	24	e 6 20	− 6	—	—	—	—	—
Vladivostok		33·7	8	e 6 46	+ 1	e 12 3	− 5	—	—	—
Calcutta	N.	38·0	294	e 7 39	+18	i 13 44	+30	e 8 58	PP	18·9
Colombo	E.	45·4	270	8 22	0	16 0	+56	—	—	28·8
Brisbane		45·5	145	e 8 14	− 9	i 14 50	−15	e 18 6	SS	—
Irkutsk		45·9	342	e 8 27	+ 1	—	—	—	—	—
Kodaikanal	E.	47·5	276	e 8 43	+ 5	e 16 8	+34	—	—	24·8
New Delhi	N.	49·1	300	e 9 43	+52	i 16 57	+61	19 54	SS	—
Riverview		49·6	152	e 8 56	+ 1	i 15 52	−11	—	—	e 24·7
Sydney		49·6	152	e 8 46	− 9	e 15 43	−20	—	—	e 21·5
Bombay		51·9	286	e 9 15	+ 3	e 16 41	+ 6	11 19	PP	27·8
Tashkent		58·6	313	e 10 0	− 1	e 18 3	− 1	—	—	—
Auckland		65·3	138	12 1	PP	19 42	+13	—	—	28·8
Arapuni		66·6	139	—	—	19 46?	+ 1	—	—	35·8
Wellington		67·9	142	11 7	+ 5	19 51	−10	11 46?	sP	32·8
Christchurch		68·0	145	11 7	+ 4	(19 51)	−11	11 59	PP	35·1

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Sverdlovsk		68·4	328	11 8	+ 2	20 0	− 7	—	—	—
College		79·8	25	—	—	e 21 59	−15	e 29 30	?	e 38·2
Moscow		81·0	325	e 12 13	− 5	—	—	—	—	—
Ksara		84·5	303	e 12 38	+ 2	e 24 11	PPS	—	—	—
Helwan		89·0	300	e 13 49	+51	e 24 1	+16	—	—	—
Upsala	N.	90·6	331	e 16 46	PP	e 24 29	+29	—	—	e 41·8
Prague		95·9	323	e 14 57	+87	e 24 52?	+ 6	e 25 52?	PS	—
Cheb		97·1	324	e 17 46?	PP	e 24 46?	−10	—	—	e 69·8
Stuttgart		99·5	324	e 13 44	− 2	—	—	—	—	e 48·8
Florence		100·4	318	e 15 0	+70	i 25 29	+ 5	e 19 0	PP	—
Uccle		101·3	327	—	—	e 25 28	− 3	—	—	e 49·8
Tinemaha	Z.	104·2	48	e 18 27	PP	—	—	—	—	—
Mount Wilson	Z.	105·5	51	i 18 27	PP	—	—	—	—	—
Pasadena		105·5	51	—	—	e 28 35	PPS	e 34 52?	SSP	e 43·8
Riverside	Z.	106·1	51	e 19 17	PP	—	—	—	—	—
Palomar	Z.	106·8	51	e 18 40	PP	—	—	—	—	—
Tucson		111·8	50	e 19 13	PP	—	—	e 29 28	PPS	e 52·4
St. Louis	E.	121·4	33	—	—	e 30 17	PS	e 31 17	PPS	—
San Juan		149·7	22	e 20 4	[+17]	e 26 12	PPP	e 38 10	SS	—
Fort de France		154·8	16	e 19 51	[− 3]	—	—	—	—	—
Huancayo		159·2	99	e 20 36	[+36]	e 36 41	PPS	e 45 14	SS	e 57·9
Rio de Janeiro	E.	163·1	218	e 24 46	PP	—	—	—	—	—
La Paz	Z.	164·9	118	i 20 10k	[+ 4]	—	—	i 25 0	PP	78·8

Additional readings and notes :—
Calcutta ePPPN =9m.26s., iSSN =15m.7s., iSSSN =15m.39s.
Brisbane iN =9m.11s., eN =18m.10s.
New Delhi S_cSN =19m.9s., SSSN =21m.4s.
Riverview i =9m.49s.
Bombay P_cPE =10m.28s., iN =16m.57s., iE =17m.2s., iE =17m.52s., iN =20m.7s., SSE =20m.25s ; also records a second shock for which readings referred to the above T_s are iPE =10m.4s., iPPE =12m.7s., iSN =17m.28s., SSE =20m.48s.
Auckland sS? =20m.17s.
Wellington sP_cP?Z =11m.56s., S_cS =20m.46s., SP?Z =21m.25s., SS =24m.21s., SSS? = 28m.16s.?, Q =29·8m.
Christchurch i =20m.39s., SS =23m.59s., SSS =27m.47s., Q =29m.43s ; the reading entered as S is given as PPS.
Upsala eE =22m.40s., e =37m.46s.?
Cheb e =29m.46s.?
Florence iPSE =27m.53s., ePPSE =28m.41s.
Mount Wilson iZ =19m.31s. and 20m.21s.
Palomar eZ =19m.26s.
Huancayo e =25m.52s. and 31m.53s.
Long waves were also recorded at Tananarive, Fordham, and other European stations.

Dec. 13d. Readings also at 0h. (near Balboa Heights and near Mizusawa), 6h. (La Paz, Fort de France, Mount Wilson, Tucson, Pasadena, Palomar, Riverside, and Tinemaha), 7h. (Bombay, Calcutta, New Delhi, Frunse, Sverdlovsk, and Tashkent), 8h. (Kodaikanal and Upsala), 11h. (near Bogota), 15h. (Ksara), 20h. (Stuttgart), 21h. (Aberdeen).

Dec. 14d. 15h. 55m. 57s. Epicentre 30°·8S. 71°·5W. (as on 1941, Dec. 21d.).

$A = +·2730$, $B = -·8160$, $C = -·5095$; $\delta = -2$; $h = +2$;
$D = -·948$, $E = -·317$; $G = -·162$, $H = +·483$, $K = -·861$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
La Plata		12·1	114	3 4	+ 7	5 27?	+13	—	—	6·2
La Paz	Z.	14·6	13	i 3 32a	+ 2	i 6 33	+20	—	—	8·6
Huancayo		19·0	349	e 4 27	+ 1	e 8 1	+ 4	—	—	e 9·8
Rio de Janeiro	N.	26·4	80	e 5 36	− 4	e 10 25	+13	—	—	e 14·2
Bogota		35·3	354	e 7 0	+ 1	—	—	—	—	—
St. Louis	Z.	71·3	345	i 11 22	− 1	—	—	—	—	—
Tucson		72·9	326	e 11 31	− 2	—	—	—	—	e 38·1
La Jolla	Z.	76·7	322	e 11 56	+ 1	—	—	—	—	—
Palomar	Z.	76·9	323	i 11 55	− 1	—	—	—	—	—
Riverside	Z.	77·6	323	i 11 59	− 1	—	—	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Mount Wilson	Z.	78·2	323	i 12 2	− 1	e 18 55	?	—	—	—
Pasadena	Z.	78·2	323	e 12 3	0	—	—	—	—	e 41·8
Santa Barbara	Z.	79·2	322	e 12 35	+27	—	—	—	—	—
Haiwee		79·6	324	e 12 10	0	—	—	—	—	—
Tinemaha		80·5	324	e 12 15	0	—	—	—	—	—
Bombay	N.	145·7	102	e 19 27	[−13]	—	—	—	—	—

Additional readings :—
Huancayo e = 4m.56s., i = 5m.9s., iS = 8m.6s.
St. Louis eZ = 11m.36s.
Bombay iE = 19m.38s.
Long waves were also recorded at Riverview.

Dec. 14d. Readings also at 4h. (Ksara (2)), 8h. (near Tashkent), 11h. (Ksara (2), Belgrade, near Bucharest, and Sofia), 18h. (Brisbane), 19h. (Riverview), 20h. (St. Louis, Tucson, Haiwee, La Jolla, Pasadena, Palomar, Riverside, Santa Barbara, and Tinemaha), 23h. (Tacubaya).

Dec. 15d. 23h. 0m. 42s. Epicentre 45°·2N. 8°·1E. (as on 1943, Oct. 16d.).

A = +·6999, B = +·0996, C = +·7072 ; δ = −9 ; h = −4 ;

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Milan	0·8	71	i 0 14	− 4	0 35	+ 4	—	—	—
Chur	1·9	31	e 0 33	− 1	—	—	—	—	—
Neuchatel	2·0	336	e 0 35	0	e 1 2	0	—	—	—
Zürich	2·2	9	e 0 38	0	—	—	—	—	—
Basle	2·4	351	e 0 40 k	− 1	e 1 20	S_g	e 1 33	?	—
Ravensburg	2·8	22	e 0 57	P_g	e 1 24	+ 2	e 1 41	S_g	—
Clermont-Ferrand	3·6	279	i 1 0	+ 2	i 1 40	− 2	i 2 6	S_g	—
Strasbourg	3·6	356	e 1 19	P_g	1 44	+ 2	1 56	S_g	2·2
Stuttgart	3·6	11	e 0 56	− 2	e 1 43	+ 1	e 1 12	P_g	—
Jena	6·2	21	e 2 0	P_g	—	—	—	—	—

Stuttgart gives also eS_gZ = 2m.2s.

Dec. 15d. Readings also at 0h. (Haiwee, Tucson, Mount Wilson, Palomar, Riverside, and Tinemaha), 2h. (La Paz, Haiwee, Mount Wilson, Pasadena, Palomar, Riverside, Tucson, and Tinemaha), 3h. (near Ksara, Bucharest, and Stuttgart), 8h. (Andijan, and Grozny), 9h. (near Grozny), 11h. (near Erevan), 15h. (Wellington), 17h. (Bucharest, Istanbul, and Sofia), 18h. (Bombay, Calcutta, near Dehra Dun, and New Delhi).

Dec. 16d. Readings at 0h. (Stuttgart, Bucharest, and Ksara), 4h. (Ksara), 16h. (Huancayo, La Paz, Rio de Janeiro, and Stuttgart), 17h. (near La Paz), 18h. (near Mizusawa), 19h. (Ksara), 20h. (near Mizusawa), 21h. (near Lick), 22h. (Ksara and near Mizusawa), 23h. (Mount Wilson, Pasadena, Tucson, Palomar, and Tinemaha).

Dec. 17d. 13h. 53m. 49s. Epicentre 29°·4N. 130°·6E. (as on 1942, March 21d.).

Identification doubtful.

A = −·5679, B = +·6626, C = +·4884 ; δ = +8 ; h = +2 ;
D = +·759, E = +·651 ; G = −·318, H = +·371, K = −·873.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Kôti	4·8	30	e 1 16	+ 1	—	—	—	—	—
Hamada	5·6	12	e 1 43	P*	—	—	—	—	—
Kobe	6·5	35	1 35	− 4	—	—	—	—	—
Miyakozima	6·6	228	e 1 46	+ 5	—	—	—	—	—
Nagoya	7·9	41	1 59	0	—	—	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Zi-ka-wei		8·1	285	2 21	P*	—	—	—	—	i 5·3
Zinsen		8·7	339	2 11	+ 1	—	—	—	—	—
Nagano		9·6	39	e 2 37	+16	—	—	—	—	—
Tokyo		10·0	48	e 2 40	+13	—	—	—	—	—
Sendai		12·3	41	2 57	− 2	—	—	—	—	—
Mizusawa		13·0	39	e 3 16	+ 7	7 34	L	—	—	(7·6)
Vladivostok		13·7	4	e 3 15	− 3	e 5 55	+ 3	—	—	—
Irkutsk		30·0	327	e 6 21	+ 9	e 11 19	+ 9	—	—	—
Calcutta	N.	38·4	271	e 7 35	+10	e 13 35	+15	—	—	—
New Delhia	N.	46·4	284	—	—	1 15 25	+ 7	i 18 46	SS	—
Tashkent		50·4	320	e 8 20	−41	—	—	e 10 58	PP	—
Colombo	E.	52·7	255	e 6 11?	?	—	—	—	—	—
Bombay		53·3	273	e 9 17	− 6	i 17 8	+14	11 20	PP	—
College		60·3	29	—	—	e 18 23	− 3	—	—	e 31·4
Brisbane	Z.	60·5	157	i 10 6	− 8	—	—	—	—	—
Riverview		65·8	162	—	—	1 19 34	− 1	—	—	e 32·4
Jena		83·7	326	e 12 27	− 5	—	—	—	—	—
Stuttgart		86·2	326	e 12 41	− 3	—	—	—	—	e 46·7
Basle		87·8	325	e 12 48	− 4	—	—	—	—	—
Mount Wilson	Z.	89·4	50	e 12 57	− 3	—	—	—	—	—
Pasadena		89·4	50	e 12 58	− 2	—	—	—	—	e 37·5
Riverside	Z.	90·0	50	e 13 0	− 3	—	—	—	—	—
Palomar	Z.	90·7	51	i 13 0	− 6	—	—	—	—	—
Tucson		95·4	49	i 13 26	− 2	—	—	—	—	—
Toledo		99·2	326	e 13 41	− 4	24 22	[− 1]	17 45	PP	56·2

Additional readings :—
Bombay PP?E =12m.14s., PP?N =12m.21s., iN =19m.5s.
Riverview iE =20m.50s.
Mount Wilson eZ =13m.6s.
Palomar iZ =13m.19s.
Tucson i =13m.34s.
Toledo SSN =32m.11s.
Long waves were also recorded at La Paz and other European stations.

Dec. 17d. Readings also at 0h. (Branner, Tucson, near Fresno, and Lick), 3h. (near Fresno), 4h. (Tucson, near Branner, Lick, Fresno, and Santa Clara), 14h. (Stuttgart and Colombo), 15h. (Haiwee, Mount Wilson, Tucson, Palomar, and Riverside), 17h. (Haiwee, Tucson, Mount Wilson, Pasadena, Palomar, and Riverside), 22h. (near Erevan), 23h. (near Branner).

Dec. 18d. Readings at 1h. (near Erevan), 2h. (near Apia), 7h. (Mount Wilson, Pasadena, Palomar, Riverside, Tucson, and near Mizusawa), 12h. (Mount Wilson, Tucson, Pasadena, and Riverside), 13h. (Bombay, Calcutta, and Riverview), 15h. (Haiwee, Mount Wilson, Pasadena, Riverside, Tucson, and near Mizusawa), 16h. (Haiwee, Riverside, Tucson, and near Mizusawa), 19h. (Arapuni, Auckland, Christchurch, Wellington, Brisbane, Sydney, Riverview, Tucson, Mount Wilson, Pasadena, Palomar, Bogota, near Fort de France (2), and near La Paz), 20h. (Huancayo), 21h. (near Basle).

Dec. 19d. Readings at 0h. (Stuttgart), 1h. (near Berkeley, Branner, Lick, San Francisco, and Santa Clara), 7h. (Riverside and Tucson), 9h. (near Harvard), 11h. (near Fort de France), 15h. (near Granada), 20h. (Fort de France and near Apia).

Dec. 20d. Readings at 0h. (near Berkeley, Branner, Lick, and San Francisco), 1h. (near Fort de France), 5h. (near La Paz), 8h. (Bombay), 9h. (La Paz), 10h. (Riverview, Wellington, Christchurch, Haiwee, Mount Wilson, Pasadena, Tucson, Palomar, Riverside, and Tinemaha), 11h. (near Mizusawa), 13h. (Brisbane, Riverview, Suva, Haiwee, La Jolla, Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, Tucson, and Tacubaya), 17h. and 21h. (La Paz), 22h. (Auckland, Christchurch, Wellington, and Riverview), 23h. (Auckland, Christchurch, Wellington, and Riverview).

Dec. 21d. 13h. 46m. 20s. Epicentre 13°·0N. 71°·0W.

Not approximate.

$A = +·3173$, $B = -·9216$, $C = +·2235$; $\delta = -2$; $h = +6$;
$D = -·946$, $E = -·325$; $G = +·073$, $H = -·211$, $K = -·975$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Port au Prince		5·7	347	i 1 30	+ 2	i 2 7	−28	i 2 50	S*	i 5·2
San Juan		7·1	40	i 1 41	− 7	i 2 58	−12	—	—	e 3·4
Bogota		8·9	200	i 2 11	− 1	i 3 58	+ 3	i 4 12	S*	—
Balboa Heights		9·3	243	e 2 13	− 4	e 3 54	−11	—	—	—
Fort de France		9·7	80	0 54	?	2 18	P	—	—	—
Bermuda		20·1	16	i 4 37	− 1	i 8 27	+ 8	—	—	e 10·0
Columbia		22·8	339	e 5 5	0	e 9 16	+ 5	—	—	e 11·4
Mobile		23·7	321	5 8	− 6	9 35	+ 8	—	—	—
Huancayo		25·3	191	i 5 28	− 2	i 9 42	−12	i 7 33	?	i 11·5
Georgetown		26·4	351	i 5 39	− 1	i 10 11	− 1	i 6 12	PP	—
Philadelphia		27·1	354	i 5 47	+ 1	i 10 23	− 1	e 6 12	PP	i 11·6
Fordham		27·9	357	e 5 29	?	i 10 35	− 2	e 5 52	P	—
Pittsburgh	N.W.	28·4	347	i 5 59	+ 1	e 10 48	+ 3	—	—	—
Harvard		29·4	359	i 6 6a	− 1	e 11 2	+ 1	e 11 52	SS	e 14·7
La Paz		29·4	175	6 9	+ 2	10 56	− 5	—	—	15·3
St. Louis	N.	30·7	330	e 6 16	− 3	e 11 19	− 2	—	—	—
Vermont		31·4	357	e 6 25	0	i 11 35	+ 3	e 7 45	PPP	i 13·0
Chicago		32·1	336	i 6 30	− 1	i 11 42	− 1	—	—	e 13·3
Ottawa		32·5	354	6 34	0	11 58	+ 9	—	—	e 16·7
Seven Falls		34·0	0	6 50	+ 2	12 15	+ 2	14 28?	SS	16·7
Lincoln		35·7	326	e 6 50	−12	e 12 35	− 4	e 8 15	PP	e 15·3
Tucson		41·2	305	i 7 46	− 2	i 14 1	− 1	i 9 22	PP	e 17·2
Rapid City		41·5	326	e 7 42	− 8	e 13 53	−14	e 9 25	PP	e 18·3
Rio de Janeiro	N.	44·9	142	i 14 50	S	(i 14 50)	− 6	i 18 29	SS	e 22·0
Salt Lake City		45·1	317	e 8 18	− 2	e 14 58	− 1	e 18 13	SS	e 18·8
Logan		45·6	318	i 8 22	− 2	e 15 0	− 6	e 10 35	PP	e 18·2
Palomar	Z.	46·3	305	i 8 28	− 1	—	—	e 10 32	PP	—
La Jolla		46·5	304	i 8 30	− 1	—	—	—	—	—
Riverside		46·9	306	i 8 32	− 2	e 15 24	− 1	e 10 27	PP	—
Bozeman		47·0	323	e 8 41	+ 6	e 15 23	− 3	e 18 23	SS	e 21·6
Mount Wilson		47·5	306	i 8 39	+ 1	e 15 33	− 1	i 10 38	PP	—
Pasadena		47·6	306	i 8 38	− 1	i 15 36	+ 1	e 10 39	PP	e 23·7
Haiwee		48·0	308	i 8 41	− 2	e 15 43	+ 2	—	—	—
Saskatoon		48·4	332	—	—	e 15 44	− 2	e 19 26	SS	22·7
Tinemaha		48·4	309	i 8 45	− 1	e 15 47	+1	—	—	—
Santa Barbara		48·9	305	i 8 48	− 2	15 46	− 7	—	—	—
La Plata		49·2	167	8 51	− 1	15 52	− 6	19 46	SS	25·7
Ivigtut		50·9	15	—	—	e 16 21	0	e 18 55	S_cS	e 26·6
Santa Clara		51·4	308	e 9 8	− 1	—	—	—	—	—
Lisbon	E.	60·1	54	16 40?	?	—	—	—	—	29·6
San Fernando		62·2	56	i 10 28	+ 2	i 18 58	+ 7	—	—	—
Toledo		64·1	53	i 10 39	+ 1	19 15	+ 1	—	—	—
Granada		64·3	56	e 8 48	?	i 17 36	?	—	—	28·6
Scoresby Sund		64·8	17	10 46	+ 3	19 25	+ 2	20 43	S_cS	—
Almeria		65·2	56	10 12	−33	e 18 52	−36	10 21	pP	31·7
Sitka		65·4	328	—	—	e 19 24	− 6	e 20 43	S_cS	e 29·9
Paris		69·5	43	e 11 18	+ 6	—	—	—	—	41·7
Clermont-Ferrand		69·7	47	i 11 11	− 3	e 20 50?	PS	—	—	e 34·0
Uccle		70·8	41	e 11 23	+ 3	e 20 34?	− 1	—	—	e 28·7
De Bilt		71·4	39	i 11 28k	+ 4	i 20 46	+ 4	—	—	e 29·7
Neuchatel		72·4	45	e 11 29	− 1	—	—	—	—	—
College		72·7	335	—	—	e 20 50	− 7	e 29 23	SSS	e 34·9
Basle		72·8	44	e 11 32	0	—	—	e 14 15	PP	—
Zürich		73·5	45	e 11 35a	− 1	—	—	e 14 16	PP	—
Stuttgart		73·9	43	e 11 38	− 1	e 21 10	0	e 21 48	PS	31·2

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Chur		74·2	45	e 11 35	− 5	—	—	—	—	—
Jena		75·4	41	e 11 48	+ 1	e 21 56	S_cS	e 22 0	PS	—
Florence		75·6	48	e 11 46k	− 2	e 21 25	− 4	e 22 4	PS	—
Copenhagen		75·7	36	i 11 49s	0	21 32	+ 2	14 36	PP	32·7
Cheb		75·9	42	e 11 52	+ 2	e 21 36	+ 4	—	—	e 36·7
Potsdam	N.	76·2	39	e 11 58?	+ 6	—	—	—	—	—
Prague		77·2	41	e 11 51	− 6	e 21 49	+ 2	e 26 46?	SS	—
Triest		77·2	46	i 11 58	+ 1	i 20 45	−62	—	—	—
Upsala		78·2	31	e 21 15	?	e 21 48?	− 9	e 30 22	SSS	e 34·4
Sofia		84·5	48	e 12 38	+ 2	e 23 2	0	—	—	—
Bucharest		86·0	47	e 12 46	+ 3	e 23 7	[0]	e 23 51	PS	40·7
Ksara		96·4	54	e 14 16	?	e 24 15?	[+ 6]	e 17 57	PP	—
Bombay		132·3	49	21 34	PP	28 30	{− 4}	31 59	PS	—
Riverview		136·5	234	e 22 58?	PKS	—	—	—	—	e 67·0
Calcutta	N.	139·3	30	e 23 8	PKS	e 29 16	{− 1}	—	—	—

Additional readings :—
Bogota iP? =2m.14s.
Fort de France P_g =1m.11s., SS_g =2m.23s.
Philadelphia eS =10m.18s.
Fordham e =7m.9s.
Tucson i =8m.9s., eS =13m.52s.
Rapid City e =17m.19s.
Salt Lake City e =9m.22s.
Palomar iZ =8m.47s.
Mount Wilson iZ =8m.48s.
La Plata SE =15m.40s., N =18m.40s.
Almeria sP =10m.38s., P_cP =10m.42s., PP =12m.40s., P_cS =14m.41s., PS =19m.15s. S_cS =19m.51s., SS =22m.53s.
Sitka e =27m.35s.
Stuttgart eSS =25m.40s.?.
Florence eSSS?E =29m.11s.
Copenhagen 26m.19s.
Upsala eN =27m.26s.
Bucharest ePN =12m.55s., ePPE =15m.56s., ePPN =16m.8s., iPSE =23m.41s., eSSE =28m.23s.
Bombay PPN =21m.40s., iPKSE =22m.45s., PPPN =24m.42s., PPSE =33m.53s.
Long waves were also recorded at Kew, Bergen, and Tortosa.

Dec. 21d. 22h. 5m. 56s. Epicentre 0°·0, 81°·2W.

A = +·1530, B = −·9882, C = ·0000 ; δ = −5 ; h = +7 ;
D = −·988, E = −·153 ; G = ·000, H = ·000, K = −1·000.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bogota		8·5	57	e 2 9	+ 2	—	—	—	—	e 4·6
Huancayo		13·3	154	e 3 11	− 2	e 5 41	− 1	—	—	i 7·2
La Paz		20·9	142	4 50	+ 4	9 8	+33	—	—	13·1
San Juan		23·5	39	e 5 8	− 4	e 9 25	+ 2	—	—	—
Fort de France		24·6	55	e 4 2	?	—	—	—	—	—
St. Louis		39·3	350	e 7 30	− 2	e 13 33	− 1	e 16 26	SS	—
La Plata		41·0	150	7 46	0	—	—	—	—	26·2
Tucson		42·6	323	e 8 0	+ 1	e 14 1	−22	—	—	22·4
Rio de Janeiro	N.	43·4	124	e 15 4	S	(e 15 4)	+29	—	—	—
Palomar	Z.	47·2	319	i 8 36	0	—	—	—	—	—
Riverside	Z.	47·9	319	e 8 41	− 1	—	—	—	—	—
Mount Wilson	Z.	48·5	319	e 8 48	+ 2	—	—	—	—	—
Pasadena		48·5	319	e 8 47	+ 1	—	—	—	—	e 24·1
Haiwee	N.	49·6	321	e 9 3	+ 8	—	—	—	—	—
Tinemaha	N.	50·4	321	e 9 15	+14	—	—	—	—	—
Toledo	Z.	80·1	50	e 12 12	− 1	—	—	—	—	—
Bombay	E.	148·3	52	e 19 49	[+ 4]	—	—	—	—	—

Additional readings :—
Bogota e =2m.37s.
Huancayo i =6m.35s.
La Paz S =9m.30s.
Mount Wilson iZ =8m.53s.
Pasadena iZ =8m.54s.
Bombay eN =19m.54s.

Dec. 21d. Readings also at 0h. (Christchurch, Wellington, Auckland, Riverview, La Paz, and near Andijan), 6h. (near La Paz near San Francisco, Berkeley, and Lick), 7h. (near Tucson), 10h. (near Tchimkent), 13h. (Fort de France), 14h. (Mount Wilson, Tucson, Riverside, Tinemaha, and Palomar), 15h. (Bogota), 19h. (Bogota and near Mizusawa), 20h. (Mount Wilson, Tucson, Riverside, and La Paz), 21h. (Tacubaya and La Paz).

Dec. 22d. 7h. 1m. 50s., Epicentre 3°·0S. 76°·9W. Depth of focus 0·010.

A = +·2263, B = −·9726, C = −·0520; δ = −13; h = +7;
D = −·974, E = −·227; G = −·012, H = +·051, K = −·999.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Bogota		8·2	20	i 1 58	0	i 4 16	L	—	—	(1 4·3)
Huancayo		9·1	172	i 2 13	+ 3	i 3 46	− 6	—	—	—
Balboa Heights		12·2	347	e 2 54	+ 2	—	—	—	—	—
La Paz	Z.	16·0	150	3 45a	+ 5	e 6 47	+12	—	—	8·1
Fort de France		23·5	42	e 3 37	?	e 7 57	?	—	—	—
San Juan		23·8	27	e 5 3	− 2	i 9 0	−10	i 5 20	pP	e 12·0
La Plata		36·3	154	6 55	− 1	12 30	+ 1	9 16?	PPP	16·4
Bermuda		37·0	17	e 7 46	+44	e 12 38	− 2	—	—	e 16·6
Columbia		37·0	354	e 7 27	+25	e 12 32	− 8	—	—	e 16·4
Rio de Janeiro	N.	38·2	125	i 12 56	S	(i 12 56)	− 2	—	—	—
Philadelphia		42·8	3	e 8 4?	+14	i 13 52	−14	—	—	e 17·4
St. Louis		43·2	344	e 7 49	− 4	i 14 5	− 7	i 8 20	pP	—
Pittsburgh	N.W.	43·3	357	—	—	e 15 40	?	—	—	e 21·4
Fordham		43·7	4	e 8 24	+27	—	—	—	—	—
Tucson		47·6	320	i 8 27	− 1	e 15 16	+ 1	i 8 57	pP	e 24·6
Ottawa		48·2	2	e 8 31	− 1	e 15 22	− 1	—	—	e 25·8
La Jolla		52·2	316	e 9. 4	+ 1	—	—	—	—	—
Palomar	Z.	52·3	317	i 9 3k	− 1	—	—	i 9 34	pP	—
Rapid City		52·5	337	i 9 5	0	e 16 20	− 3	i 9 35	pP	—
Riverside	Z.	53·0	317	i 9 7k	− 2	—	—	i 9 37	pP	—
Mount Wilson		53·6	317	i 9 12k	− 1	—	—	i 9 41	pP	—
Pasadena		53·6	317	i 9 12k	− 1	i 16 39	+ 1	i 9 43	pP	e 26·4
Salt Lake City		54·0	327	e 9 16	0	e 16 45	+ 2	e 17 30	sS	e 31·6
Haiwee		54·6	319	i 9 21	0	—	—	i 9 51	pP	—
Santa Barbara	Z.	54·8	316	i 9 23	+ 1	—	—	—	—	—
Tinemaha		55·4	319	i 9 25	− 1	—	—	i 19 57	pP	—
Bozeman		57·2	332	—	—	e 17 1	−24	—	—	e 34·5
Victoria		65·3	328	—	—	e 19 10	+ 2	—	—	e 32·2
Granada		78·6	51	e 13 46a	?	21 49	+ 9	—	—	—
Toledo		78·9	48	i 11 54	0	e 20 12	?	14 24	PP	—
Almeria		79·4	52	e 13 49	?	22 16	+28	14 16	PP	—
Scoresby Sund		81·7	16	12 39	+30	22 8	− 4	—	—	—
Clermont-Ferrand		85·2	44	i 12 29	+ 2	—	—	—	—	—
Uccle		86·8	38	—	—	i 22 48	[− 1]	—	—	—
De Bilt		87·5	37	—	—	e 23 10?	+ 1	—	—	—
Stuttgart	Z.	89·7	41	e 12 48	0	—	—	e 13 18	pP	—
Cheb		91·8	40	—	—	e 22 10?	?	—	—	—
Copenhagen		92·1	34	—	—	23 23	[+ 2]	23 53	pSKS	—
Bombay		146·4	60	i 19 34	[+ 6]	—	—	—	—	—

Additional readings :—
Bogota i = 2m.3s.
Huancayo i = 3m.2s.
La Paz iSZ = 6m.51s.
San Juan esS? = 9m.53s.
La Plata N = 7m.22s., E = 7m.28s., Z = 8m.24s., E = 11m.4s., SN = 12m.22s., SZ = 12m.34s., E = 13m.16s., N = 13m.20s.
Bermuda e = 12m.13s.
Columbia e = 13m.27s.
Philadelphia e = 14m.44s.
St. Louis iPZ = 7m.52s., ePP?Z = 9m.39s., epPP?Z = 10m.13s., esSE = 14m.57s., eE = 17m.38s.
Tucson iPP = 10m.28s., e = 19m.10s.
Palomar isPZ = 9m.49s.
Rapid City e = 10m.32s., isS = 17m.11s.

Continued on next page.

Riverside isPZ =9m.48s.
Mount Wilson isPZ =9m.51s.
Pasadena isPZ =9m.52s., iZ =10m.16s.
Salt Lake City e =21m.23s.
Haiwee isPZ =10m.4s.
Tinemaha isPZ =10m.12s.
Bombay eEN =19m.55s.

Dec. 22d. 12h. 53m. 7s. Epicentre 13°·0N. 71°·0W. (as on 21d.).

$A = +\cdot3173$, $B = -\cdot9216$, $C = +\cdot2235$; $\delta = -2$; $h = +6$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Port au Prince		5·7	347	i 1 41	P*	i 2 36	+ 1	—	—	i 3·6
San Juan		7·1	40	e 1 41	− 7	i 3 1	− 9	i 1 58	P*	i 3·7
Bogota		8·9	200	e 1 48	−24	i 3 52	− 3	i 2 14	P	—
Balboa Heights		9·3	243	e 2 15	− 2	e 3 53	−12	—	—	—
Fort de France		9·7	80	e 0 52?	?	e 2 40?	PPP	—	—	—
Bermuda		20·1	60	i 4 29	− 9	i 8 26	+ 7	i 6 11	?	e 9·4
Columbia		22·8	339	e 5 5	0	e 9 20	+ 9	e 5 26	PP	e 11·4
Huancayo		25·3	191	i 5 33	+ 3	i 9 52	− 2	i 10 25	SS	i 11·3
Philadelphia		27·1	354	i 5 47	+ 1	i 10 29	+ 5	—	—	e 13·1
Tacubaya	E.	27·8	287	5 56	+ 3	—	—	—	—	—
Fordham		27·9	357	e 5 51	− 3	i 10 41	+ 4	i 11 0	?	—
Pittsburgh	N.W.	28·4	347	i 5 57	− 1	—	—	—	—	—
Harvard		29·4	359	i 6 7	0	e 11 3	+ 2	—	—	e 13·9
La Paz		29·4	175	i 6 6k	− 1	i 11 0	− 1	i 13 26	SSS	15·3
Buffalo		30·6	350	e 6 8	−10	—	—	—	—	—
St. Louis		30·7	330	e 6 18	− 1	i 11 26	+ 5	i 6 22	?	i 14·5
Chicago		32·1	336	e 6 30	− 1	e 11 49	+ 6	e 13 35	SS	e 14·2
Ottawa		32·5	354	e 6 34	0	—	—	—	—	e 11·9
Lincoln		35·7	326	e 7 7	+ 5	e 12 5	−34	—	—	e 17·3
Tucson		41·2	305	i 7 46	− 2	e 14 6	+ 4	i 9 24	PP	e 17·7
Rapid City		41·5	326	i 7 49	− 1	—	—	—	—	e 19·5
Rio de Janeiro		44·9	142	e 8 23	+ 5	i 14 55	− 1	—	—	i 22·8
Salt Lake City		45·1	317	e 8 19	− 1	e 15 1	+ 2	e 10 17	PP	e 20·6
Palomar	Z.	46·3	305	i 8 26a	− 3	—	—	e 10 21	PP	—
La Jolla		46·5	304	e 8 37	+ 6	—	—	—	—	—
Riverside		46·9	306	e 8 32	− 2	—	—	e 10 27	PP	—
Bozeman		47·0	323	e 8 34	− 1	e 15 31	+ 5	e 10 24	PP	e 23·8
Mount Wilson	Z.	47·5	306	e 8 38	0	—	—	i 10 32	PP	—
Pasadena		47·6	306	i 8 38a	− 1	i 15 36	+ 1	i 10 29	PP	e 22·9
Haiwee		48·0	308	e 8 42	− 1	—	—	—	—	—
Saskatoon		48·4	332	—	—	e 15 51	+ 5	e 18 35	S_cS	21·9
Tinemaha	Z.	48·4	309	i 8 46	0	—	—	—	—	—
Santa Barbara	Z.	48·9	305	e 8 48	− 2	—	—	—	—	—
La Plata		49·2	167	8 54	+ 2	—	—	19 17	SS	23·0
Santa Clara		51·4	308	i 9 9	0	e 17 5	+37	—	—	e 28·2
Berkeley	Z.	51·7	308	i 8 58	−13	—	—	—	—	—
Victoria		55·8	321	—	—	e 17 31	+ 3	—	—	28·9
Lisbon		60·1	54	—	—	25 17?	SSS	—	—	—
San Fernando	E.	62·2	56	—	—	e 18 56	+ 5	—	—	28·4
Toledo		64·1	53	i 10 38	0	e 19 18	+ 4	12 56	PP	30·4
Scoresby Sund		64·8	17	10 44	+ 1	19 39	+ 7	21 45	?	26·9
Almeria		65·2	56	e 10 24	−21	e 19 28	0	i 12 24	?	29·9
Sitka		65·4	328	—	—	e 19 33	+ 3	—	—	e 30·9
Aberdeen		67·8	34	i 17 10	?	i 20 5	+ 5	—	—	28·1
Kew		67·9	40	—	—	(e 19 53?)	− 8	—	—	e 19·9
Clermont-Ferrand		69·7	47	i 11 12	− 2	i 20 50	PS	—	—	e 33·1
Uccle		70·8	41	e 11 19?	− 1	i 21 30	S_eS	—	—	e 29·9
De Bilt		71·4	39	—	—	e 21 33	S_eS	—	—	e 29·9
Bergen		72·0	31	11 26	− 2	e 21 15	PS	e 12 28	?	30·9
Neuchatel		72·4	45	e 11 29	− 1	—	—	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
College		72·7	335	—	—	e 21 23	PS	—	—	e 36·3
Basle		72·8	44	e 11 31	− 1	—	—	—	—	—
Stuttgart		73·9	43	i 11 38	− 1	e 21 13	+ 3	—	—	e 30·4
Jena		75·4	41	e 11 49	+ 2	—	—	—	—	—
Florence		75·6	48	e 11 44a	− 4	e 21 32	+ 3	—	—	—
Copenhagen		75·7	36	e 11 49	0	21 35	+ 5	—	—	31·9
Cheb		75·9	42	e 10 55	−55	e 21 40	+ 8	—	—	e 34·9
Prague		77·2	41	e 11 59?	+ 2	e 21 53	+ 6	—	—	e 31·9
Triest		77·2	46	e 11 53	− 4	i 21 52	+ 5	—	—	—
Upsala		78·2	31	—	—	e 21 51	− 6	e 22 1?	S_eS	e 32·9
Sofia		84·5	48	e 12 37	+ 1	e 23 2	0	—	—	—
Bucharest		86·0	47	e 12 35	− 8	e 23 11	{− 1}	i 15 58	PP	39·9
New Delhi	N.	128·5	36	e 23 29	PPP	—	—	—	—	e 72·5
Bombay		132·3	49	i 22 45	PKS	—	—	—	—	—
Riverview		136·5	234	e 21 47?	PP	—	—	—	—	e 65·5
Calcutta	N.	139·3	30	e 23 15	PKS	e 29 15	{− 2}	e 38 8	?	—
Kodaikanal	E.	141·1	55	e 18 9	?	—	—	i 23 15	PKS	—

Additional readings :—
San Juan i = 2m.21s.
Philadelphia e = 7m.31s., eS = 10m.15s.
La Paz iSN = 10m.57s.
Buffalo e = 6m.18s. and 6m.24s.
Rapid City iPP = 8m.32s., e = 13m.4s. and 16m.14s.
Salt Lake City e = 18m.11s.
Bozeman e = 14m.2s. and 18m.31s.
Pasadena eZ = 15m.22s.
Lisbon E = 25m.47s.?
Toledo SS = 23m.42s.
Bucharest ePE = 12m.43s.?, ePP?N = 16m.18s., iPSE = 23m.41s., ePSN = 23m.47s.
Bombay SSS?N = 45m.10s., SSS?E = 45m.19s.
Long waves were also recorded at Montezuma, Wellington, and at other European stations.

Dec. 22d. 15h. 50m. 27s. Epicentre 34°·3N. 115°·8W. (given by Pasadena).

A = −·3603, B = −·7453, C = +·5609 ; δ = −10 ; h = 0 ;
D = −·900, E = +·435 ; G = −·244, H = −·505, K = −·828.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Palomar	Z.	1·3	223	i 0 26	+ 1	—	—	—	—	—
Riverside		1·3	257	i 0 26a	+ 1	i 0 43	− 1	—	—	—
La Jolla		1·9	220	e 0 34	0	i 0 56	− 3	—	—	—
Mount Wilson		1·9	267	i 0 33a	− 1	i 1 1	+ 2	—	—	—
Pasadena		2·0	266	i 0 34a	− 1	i 1 2	0	—	—	—
Haiwee		2·6	316	i 0 42a	− 2	i 1 20	+ 3	—	—	—
Santa Barbara		3·2	272	e 0 54	+ 2	i 1 46	S_g	i 1 1	P_g	—
Tinemaha		3·4	325	i 0 55a	0	i 1 46	S*	—	—	—
Fresno	N.	4·0	308	i 1 4	0	i 1 15	P*	—	—	—
Tucson		4·6	115	i 1 11	− 1	i 2 32	S_g	i 1 19	P*	i 3·7
Lick		5·6	304	i 1 25	− 2	—	—	—	—	—
Santa Clara		5·8	303	e 1 52	P_g	e 3 11	S_g	—	—	—
Branner		6·0	303	e 0 35	−57	—	—	—	—	—
Berkeley	Z.	6·3	306	i 1 50	P*	i 3 39	S_g	—	—	—

Long waves also recorded at St. Louis.

Dec. 22d. Readings also at 1h. (Tashkent and Tchimkent), 6h. (Bogota, and near Balboa Heights), 9h. (near Fort de France), 10h. (Riverview, Christchurch, Wellington, Suva, and Stuttgart), 11h. (Bogota (2)), 12h. (Bombay), 13h. (Fort de France and Mobile), 14h. (Bogota and Fort de France), 15h. (near Bacau, Cernauti, Bucharest, Campulung, and Focsani), 18h. (Bogota, San Juan, Fort de France, La Paz (2), and near Branner), 19h. (Auckland and Bogota), 20h. (Bogota).

Dec. 23d. 15h. 56m. 3s. Epicentre 13°·0N. 71°·0W. (as on 22d.).

$A = +\cdot3173$, $B = -\cdot9216$, $C = +\cdot2235$; $\delta = -2$; $h = +6$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Port au Prince		5·7	347	i 1 33	+ 5	i 2 38	+ 3	i 3 0	S*	—
San Juan		7·1	40	e 1 43	?	i 3 1	− 9	i 1 46	P	i 4·5
Bogota		8·9	200	e 2 10	− 2	i 3 57	+ 2	—	—	—
Balboa Heights		9·3	243	e 2 17	0	e 3 53	−12	—	—	—
Fort de France		9·7	80	e 0 57	?	e 2 47	PPP	—	—	—
Bermuda		20·1	16	i 4 37	− 1	i 8 23	+ 4	—	—	i 10·3
Columbia		22·8	339	e 5 9	+ 4	e 9 19	+ 8	e 5 47	PPP	e 11·6
Huancayo		25·3	191	e 5 30	0	i 9 48	− 6	i 6 41	PPP	i 11·0
Philadelphia		27·1	354	i 5 47	+ 1	i 10 28	+ 4	—	—	e 12·0
Fordham		27·9	357	i 5 54	0	i 10 44	+ 7	—	—	e 13·5
Harvard		29·4	359	i 6 8a	+ 1	e 11 12	+11	—	—	e 13·0
La Paz	z.	29·4	175	i 6 8k	+ 1	i 10 58	− 3	—	—	16·0
St. Louis		30·7	330	e 6 18	− 1	i 11 26	+ 5	i 6 24	?	—
Vermont		31·4	357	e 6 26	+ 1	e 11 34	+ 2	e 7 14	PP	13·3
Chicago		32·1	336	e 6 24?	− 7	e 11 54	+11	e 11 11	?	e 12·6
Halifax		32·2	11	6 35	+ 3	11 57?	+12	—	—	17·0
Ottawa		32·5	354	6 34	0	11 57	+ 8	13 47	SS	16·0
Seven Falls		34·0	0	6 49	+ 1	12 20	+ 7	—	—	16·0
Lincoln		35·7	329	e 6 59	− 3	e 12 4	−35	—	—	e 18·0
Tucson		41·2	305	i 7 46	− 2	e 14 5	+ 3	i 9 24	PP	e 17·1
Rapid City		41·5	326	i 7 49	− 1	e 14 30	+23	i 9 38	PP	e 19·7
Rio de Janeiro		44·9	142	i 8 17	− 1	i 14 50	− 6	i 8 20	?	i 23·7
Salt Lake City		45·1	317	e 8 17	− 3	e 15 0	+ 1	e 18 12	S_cS	e 24·6
Boulder City		45·5	310	e 8 22	− 1	e 15 10	+ 5	i 10 2	PP	—
Logan		45·6	318	i 8 24	0	e 15 22	+16	i 9 49	PP	e 24·4
Palomar	z.	46·3	305	i 8 29	0	—	—	i 10 20	PP	—
La Jolla		46·5	304	i 8 30	− 1	—	—	—	—	—
Riverside		46·9	306	e 8 36	+ 2	—	—	—	—	—
Bozeman		47·0	323	e 8 34	− 1	e 15 29	+ 3	—	—	e 24·3
Mount Wilson	z.	47·5	306	e 8 38	0	—	—	i 10 9	P_cP	—
Pasadena		47·6	306	i 8 39a	0	e 15 49	PS	i 10 9	P_cP	e 22·0
Haiwee		48·0	308	i 8 41	− 2	—	—	i 10 10	P_cP	—
Saskatoon		48·4	332	—	—	e 15 39	− 7	—	—	21·0
Tinemaha		48·4	309	8 46	0	—	—	—	—	—
Santa Barbara		48·9	305	i 8 50	0	—	—	—	—	—
La Plata		49·2	167	10 45?	PP	15 57?	− 1	20 33	SSS	24·6
Santa Clara		51·4	308	i 9 10	+ 1	—	—	—	—	e 30·0
Berkeley		51·7	308	i 9 10	− 1	—	—	—	—	e 30·0
Victoria		55·8	321	e 9 57?	+16	17 25	− 3	—	—	27·0
Lisbon		60·1	54	10 10	− 1	18 29	+ 5	10 13	?	25·2
San Fernando		62·2	56	i 10 18	− 8	19 0	+ 9	—	—	—
Toledo		64·1	53	i 10 39	+ 1	i 19 24	+10	—	—	30·6
Granada		64·3	56	10 43	+ 4	i 19 33	PS	20 31	S_eS	29·5
Scoresby Sund		64·8	17	10 47	+ 4	i 19 34	+11	—	—	27·0
Almeria		65·2	56	10 47	+ 2	e 19 29	+ 1	11 15	P_cP	29·0
Sitka		65·4	328	—	—	—	—	e 20 35	S_cS	e 27·2
Edinburgh		66·9	36	—	—	19 37	−12	—	—	—
Stonyhurst		67·0	38	—	—	e 19 57?	+ 7	—	—	—
Tortosa	E.	67·6	52	e 11 0	− 1	e 20 36	PPS	—	—	e 32·0
Aberdeen		67·8	34	—	—	e 19 57	− 3	—	—	28·2
Kew		67·9	40	e 11 3	+ 1	e 20 7	+ 6	e 21 6	S_eS	e 28·0
Paris		69·5	43	i 11 15	+ 3	e 24 47	SS	—	—	33·0
Clermont-Ferrand		69·7	47	i 11 15	+ 1	—	—	—	—	—
Uccle		70·8	41	e 11 21	+ 1	e 20 37	+ 2	i 20 59	PS	e 33·0
De Bilt		71·4	39	i 11 27k	+ 3	i 20 48	+ 6	e 25 27	SS	e 30·0
Bergen		72·0	31	e 9 51	?	e 20 57?	+ 8	e 11 20	P	27·8
Neuchatel		72·4	45	e 11 30	0	—	—	—	—	—
College		72·7	335	e 11 31	− 1	e 21 2	+ 5	—	—	e 30·5
Basle		72·8	44	11 31	− 1	—	—	—	—	—
Zürich		73·5	45	e 11 37	+ 1	—	—	—	—	—

Continued on next page.

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Stuttgart		73·9	43	i 11 40a	+ 1	e 21 14	+ 4	e 25 57	SS	e 31·4
Chur		74·2	45	e 11 41a	+ 1	—	—	—	—	—
Florence		75·6	48	i 11 52a	+ 4	e 21 32	+ 3	e 14 39k	PP	—
Copenhagen		75·7	36	e 11 49	0	21 37	+ 7	—	—	32·0
Cheb		75·9	42	e 11 54	+ 4	e 21 43	+11	—	—	e 35·0
Potsdam		76·2	39	e 11 57?	+ 5	i 21 45	+ 9	—	—	e 34·0
Prague		77·2	41	e 22 0	S	(e 22 0)	+13	e 26 51?	SS	e 32·0
Upsala		78·2	31	—	—	e 21 57	0	e 26 52	SS	e 32·0
Belgrade		82·0	47	i 12 25	+ 2	e 22 44	+ 7	e 14 4	?	—
Sofia		84·5	48	e 12 38	+ 2	e 23 10	+ 8	—	—	—
Bucharest		86·0	47	e 12 42	− 1	i 23 24	+ 7	i 24 11	PS	38·0
Moscow		89·5	33	e 13 2	+ 2	e 23 33	[+ 3]	—	—	—
Christchurch		117·9	227	29 57	PS	40 13	SSS	—	—	56·2
New Delhi	N.	128·5	36	21 17	PP	22 31	SKP	32 59	PPS	—
Bombay		132·3	49	21 44	PP	i 22 49	PKS	32 5	PS	—
Calcutta	N.	139·3	30	i 23 16	PKS	e 29 21	{+ 4}	—	—	—
Kodaikanal	E.	141·1	55	e 20 37	[+65]	—	—	—	—	—
Colombo		145·0	58	19 55	[+16]	—	—	—	—	—

Additional readings :—
Huancayo iP =5m.34s.
Vermont iS =11m.43s.
Tucson e =8m.28s., i =14m.44s.
Rapid City e =16m.25s.
Salt Lake City e =19m.2s.
Boulder City e =10m.18s., i =10m.53s., e =12m.7s., i =13m.30s., 15m.18s., and 15m.52s.
Logan i =9m.36s., eS_cS =18m.12s.
Palomar eZ =9m.57s., iZ =13m.29s. and 17m.2s.
Mount Wilson iZ =13m.43s.
Pasadena iPPEZ =10m.35s., iZ =12m.22s.. eE =17m.51s.
La Plata E =22m.15s.
Berkeley iPN =9m.13s., eE =27m.17s.
Lisbon SE =18m.32s.
Almeria P_cS =15m.11s., PS =19m.41s., PPS =20m.0s., SKS =20m.29s., SS =23m.38s., SSS =27m.27s.
Kew eSSE =24m.47s.
Uccle SSE =25m.27s.?, iN =29m.47s.
Bergen ePPPZ =12m.14s., eN =17m.10s. and 18m.57s.?
Stuttgart eQ =31m.27s.?
Florence ePSN =22m.7s.
Prague eSS =31m.56s. ; phases wrongly identified.
Upsala eS?N =22m.0s., eN =25m.29s., eE =26m.57s.?
Bucharest eE =12m.47s., iE =23m.12s.
New Delhi iN =29m.33s., SSN =38m.40s., SSSN =43m.35s.
Bombay eE =31m.46s.
Long waves were also recorded at Montezuma and Wellington.

Dec. 23d. 19h. 0m. 8s. Epicentre 5°·6S. 153°·6E.

A = −·8915, B = +·4426, C = −·0969 ; δ = +6 ; h = +7 ;
D = +·445, E = +·896 ; G = +·087, H = −·043, K = −·995.

	△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	21·8	182	i 4 57	+ 1	i 8 56	+ 4	i 5 16	PP	i 10·2
Riverview	28·2	184	i 5 56a	0	i 10 43	+ 2	i 11 0	sS	e 12·8
Sydney	28·2	184	i 5 54	− 2	i 10 22	−19	e 7 34	?	—
Titizima	34·3	343	6 51	+ 1	12 25	+ 8	—	—	—
Apia	35·1	106	e 6 55	− 2	12 17	−13	7 9	pP	14·7
Auckland	36·7	152	7 13	+ 3	12 52	− 2	7 22	pP	17·9
Arapuni	38·0	152	7 22?	+ 1	13 16?	+ 2	16 16?	Q	16·9
New Plymouth	38·1	154	7 31	+ 9	13 32	+16	16 22?	Q	17·9
Tuai	39·3	154	7 32	0	13 27	− 7	—	—	16·8
Kaimata	40·0	160	8 1	+23	13 23	−21	—	—	17·3
Wellington	40·3	156	7 37	− 3	13 40	− 9	7 48	pP	19·0
Naha	40·4	322	7 43	+ 2	—	—	—	—	18·0
Miyakozima	40·9	320	e 7 55	+ 9	14 4	+ 6	—	—	—
Christchurch	41·3	159	7 48	− 1	13 53	−11	9 13	PP	19·3
Miyazaki	42·9	332	8 3	+ 1	9 43	PP	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Yokohama		42·9	344	8 1	− 1	e 16 16	?	e 11 2	?	e 20·2
Tokyo		43·1	344	e 8 11	+ 7	—	—	e 9 42	PP	—
Kôti		43·3	335	e 8 3	− 2	14 30	− 3	—	—	—
Gihu		43·7	341	e 8 6	− 2	—	—	—	—	18·4
Kobe		43·7	339	8 4	− 4	14 26	−13	—	—	—
Perth		44·0	228	8 12	+ 1	14 47	+ 4	9 42	PP	19·2
Nagano		44·4	343	8 16	+ 2	14 55	+ 6	—	—	—
Hukuoka		44·7	333	e 8 14	− 2	e 13 56	−58	—	—	e 18·2
Hamada		45·1	335	8 20	0	—	—	—	—	19·5
Sendai		45·2	347	e 8 12	− 8	14 45	−16	—	—	e 17·8
Mizusawa	N.	46·0	347	8 29	+ 2	15 32	PPS	—	—	—
Morioka		46·5	347	e 8 28	− 3	15 7	−12	—	—	e 22·1
Zi-ka-wei	E.	47·8	322	8 40	− 1	15 32	− 6	—	—	—
Mori		48·9	348	e 8 53	+ 3	—	—	i 9 22	?	—
Sapporo		49·7	349	e 8 59	+ 3	16 34	PPS	—	—	24·2
Zinsen		49·7	331	e 8 35	−21	—	—	—	—	e 20·0
Honolulu		54·6	59	i 9 34	+ 2	i 17 13	+ 2	e 12 35	PPP	e 23·0
Calcutta	N.	69·6	297	i 11 23a	+10	i 20 28	+ 7	i 11 53	pP	—
Colombo	E.	74·6	278	7 54	?	21 21	+ 3	11 46	P	37·1
Kodaikanal	E.	77·4	282	e 9 15	?	e 22 25	PS	e 13 4	?	—
Hyderabad	N.	77·6	289	12 2	+ 2	21 53	+ 2	22 19	PS	37·7
Dehra Dun	N.	80·4	302	e 7 22	?	—	—	e 17 20	PPP	—
New Delhi		80·8	300	i 12 19	+ 2	i 22 23	− 2	22 57	PS	38·6
College		82·3	21	e 12 20	− 5	e 22 30	−10	e 23 58	PPS	e 33·3
Bombay		83·1	290	e 8 46	?	i 22 48	0	e 12 29	P	—
Sitka		84·7	31	i 12 37	0	i 22 59	− 5	e 15 52	PP	e 34·9
Andijan		87·0	311	e 12 49	+ 1	i 23 28	+ 1	—	—	—
Ferndale		87·7	49	—	—	e 23 38	+ 5	—	—	e 39·9
San Francisco	E.	88·6	52	e 13 4	+ 8	—	—	—	—	e 40·9
Berkeley	E.	88·8	52	i 13 5	+ 8	i 23 24	[− 1]	i 16 12	PP	e 40·2
	N.	88·8	52	i 13 3	+ 6	e 23 36	{+ 3}	i 23 42	S	e 36·4
	Z.	88·8	52	i 12 59	+ 2	i 22 24	[−61]	i 16 28	PP	—
Branner		88·8	52	i 13 3	+ 6	e 23 43	− 1	e 23 2	SKS	e 40·5
Santa Clara		89·0	52	i 12 59	+ 1	e 23 41	− 4	i 16 33	PP	e 40·2
Lick		89·2	52	e 13 4	+ 5	—	—	e 16 31	PP	e 40·3
Stalinabad		89·4	309	e 13 4	+ 4	i 24 0	+11	e 16 25	PP	—
Tashkent		89·4	311	i 13 7	+ 7	i 23 55	+ 6	—	—	—
Victoria		89·5	42	13 4	+ 4	23 47	− 3	16 28?	PP	36·9
Seattle		90·1	43	e 15 36	?	e 25 47	PPS	e 19 16	?	e 44·6
Santa Barbara	Z.	90·4	56	e 13 2	− 2	—	—	—	—	—
Fresno	N.	90·6	53	e 28 12	?	—	—	—	—	—
Pasadena		91·6	56	e 13 6	− 4	i 24 4?	− 5	e 24 57	PS	e 37·3
Mount Wilson	Z.	91·7	56	e 13 7	− 3	—	—	e 38 57	P′P′	—
Tinemaha	Z.	91·9	53	e 13 9	− 2	—	—	e 38 40	P′P′	—
Haiwee	Z.	92·0	54	13 13	+ 1	—	—	—	—	—
La Jolla		92·3	57	e 13 12	− 1	—	—	—	—	—
Riverside	Z.	92·3	56	13 10	− 3	—	—	—	—	—
Palomar	Z.	92·6	57	i 13 13	− 1	—	—	e 38 35	P′P′	—
Sverdlovsk		96·3	327	i 13 31	− 1	i 24 41	− 8	i 17 28	PP	—
Logan		97·1	48	e 14 1	+26	e 24 7	[− 5]	i 17 32	PP	e 37·0
Salt Lake City		97·1	50	e 13 43	+ 8	e 24 10	[− 2]	e 35 16	SSS	e 40·6
Bozeman		97·7	45	e 13 48	+10	i 24 14	[− 1]	e 17 33	PP	e 41·1
Tucson		97·7	59	i 13 38	0	e 24 12	[− 3]	i 17 39	PP	e 45·3
Saskatoon		100·4	38	17 59	PP	24 19	[−10]	26 52?	PS	e 38·9
Tananarive		103·2	250	e 21 57	PKS	24 45	[+ 3]	27 27	PS	48·4
Rapid City		103·4	46	e 14 27	+23	e 24 37	[− 6]	e 18 8	PP	e 38·2
Grozny		106·8	314	e 18 34	PP	e 27 59	PS	34 6	SSP	—
Lincoln		108·6	49	e 18 15	[−15]	e 26 25	{+30}	e 34 20	SS	—
Moscow		109·1	328	i 14 28	P	25 0	[− 8]	i 18 58	PP	—
St. Louis		113·8	50	e 14 52	P	i 25 22	[− 5]	e 19 33	PP	—
Chicago		115·0	47	e 19 35	PP	e 29 21	PS	e 22 29	PKS	e 51·1
Scoresby Sund		115·1	359	19 45	PP	35 40?	SS	40 10?	SSS	51·9

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.			L.
		°	°	m. s.	s.	m. s.	s.	m. s.			m.
Ksara		116·0	305	e 19 55	PP	e 29 42	PS	36 35	SSP		56·5
Upsala		116·4	337	e 15 42	?	e 26 30	{−20}	e 19 53	PP		47·9
Cernauti		118·6	320	e 20 9	PP	—	—	—	—		44·9
Bucharest		120·1	319	e 20 2	PP	i 29 54	PS	i 22 58	PPP		45·9
Bergen		120·3	343	15 35	?	27 5	{−11}	20 33	PP		46·9
Helwan		120·6	302	e 18 52	[− 2]	27 22	{+ 4}	20 28	PP		—
Buffalo		120·8	43	e 20 18	PP	—	—	e 20 36	?		—
Pittsburgh	N.W.	120·9	45	i 20 34	PP	i 25 49	[− 4]	i 30 23	PS		—
Copenhagen		121·3	336	20 2	?	30 20	PS	20 22	PP		50·9
Ottawa		121·7	39	18 55	[− 1]	25 52?	[− 3]	20 28	PP		e 59·9
Columbia		122·2	53	e 20 29	PP	e 30 40	PS	e 37 3	SS		e 46·4
Ivigtut		122·2	13	e 22 46	PKS	e 30 14	PS	e 37 8	SS		e 56·4
Sofia		122·7	318	e 19 3	[+ 5]	—	—	e 20 39	PP		—
Shawinigan Falls		123·0	36	18 59	[0]	37 16?	SS	20 46?	PP		e 59·9
Potsdam		123·2	333	e 20 39	PP	e 30 15	PS	i 20 45	PP		e 44·9
Belgrade		123·5	321	e 19 18	[+18]	—	—	i 20 38	PP		e 70·0
Vermont		123·7	39	e 20 57	PP	e 25 52	[−10]	i 30 40	PS		i 51·7
Seven Falls		123·8	35	19 3	[+ 3]	27 40?	{0}	20 41	PP		59·9
Prague		124·0	330	e 18 52	[− 9]	e 30 40	PS	e 20 50	PP		e 51·9
Philadelphia		124·5	44	i 20 45	PP	e 30 37	PS	i 32 2	PPS		51·7
Jena		124·9	332	e 19 14	[+12]	e 26 22?	[+17]	i 20 52?	PP		e 49·9
Aberdeen		125·1	345	i 13 53	?	—	—	i 20 54	PP		58·4
Cheb		125·0	331	e 16 35	?	e 30 50	PS	e 20 39	PP		e 49·9
Fordham		125·0	43	i 19 4	[+ 2]	e 30 46	PS	i 20 48	PP		—
Harvard		125·7	40	e 19 4	[0]	e 38 12	SSP	i 20 49	PP		—
De Bilt		126·8	337	i 19 10k	[+ 4]	i 30 42	PS	i 21 8a	PP		e 54·9
Triest		127·1	326	i 21 10	PP	—	—	e 29 52	?		e 53·9
Stuttgart		127·5	331	e 19 4	[− 3]	e 28 1	{− 2}	i 21 2	PP		e 55·7
Stonyhurst		128·1	343	21 14	PP	31 19	PS	22 33	PKS		60·9
Uccle		128·2	337	i 19 12k	[+ 4]	e 31 16?	PS	i 21 15	PP		54·9
Huancayo		128·3	110	e 19 26	[+17]	e 31 25	PS	e 21 28	PP		i 50·7
Strasbourg		128·3	332	e 19 29	[+20]	—	—	e 21 15	PP		63·9
Chur		128·6	329	e 19 6	[− 3]	—	—	—	—		e 62·3
Zürich		128·7	330	e 19 9	[− 1]	—	—	e 21 13	PP		—
Basle		129·1	331	e 19 16	[+ 6]	—	—	e 21 23	PP		—
Kew		129·4	340	e 21 24	PP	e 26 2	[−16]	i 22 26	PKS		—
Florence		129·6	325	i 19 12k	[+ 1]	i 29 20	{+63}	i 21 26k	PP		e 54·4
Milan	E.	129·7	327	18 52	[−19]	30 25	?	i 21 36	PP		51·5
Neuchatel		129·8	331	e 19 14	[+ 2]	—	—	—	—		—
La Plata	E.	130·0	146	22 33	PKS	32 46	PPS	38 52?	SS		54·3
	N.	130·0	146	21 40	PP	31 4?	PS	22 36	PKS		54·8
	Z.	130·0	146	21 34	PP	—	—	43 52?	SSS		60·9
Besançon		130·1	331	e 21 27	PP	—	—	—	—		55·9
Paris		130·4	335	i 19 14	[+ 1]	i 22 34	PKS	i 21 24	PP		56·9
Bogota		132·5	89	e 19 18	[+ 1]	—	—	e 22 48	PKS		68·9
Clermont-Ferrand		132·5	332	i 19 18	[+ 1]	i 22 49	PKS	i 21 38	PP		—
La Paz		133·3	119	i 19 23	[+ 5]	26 23	[− 5]	22 13	PP		60·9
Port au Prince		133·4	70	e 22 49	PKS	—	—	—	—		63·3
Bermuda		135·5	48	e 20 23	[+61]	e 33 49	PPS	e 22 51	PKS		e 54·3
Barcelona		136·2	329	e 22 5	PP	—	—	i 22 56	PKS		—
Tortosa		137·5	329	18 56	[−30]	i 27 3	[+28]	21 52	PP		e 57·9
San Juan		139·2	68	e 19 29	[0]	e 40 32	SS	e 22 16	PP		e 56·1
Toledo		140·4	333	i 19 27	[− 4]	30 7	{+44}	i 23 17	PKS		—
Almeria		142·0	328	19 23	[−11]	i 23 27	PKS	19 57	PKP2		59·9
Granada		142·3	330	i 19 32	[− 3]	32 52	SKSP	22 22	PP		62·0
Lisbon		143·5	337	19 35a	[− 2]	42 20	SSP	23 7	PP		59·6
San Fernando		144·1	332	i 19 32	[− 6]	33 10	SKSP	22 46	PP		69·9
Fort de France		144·7	73	e 17 13	?	—	—	—	—		—
Rio de Janeiro		147·3	151	i 19 44	[+ 1]	e 32 17	?	—	—		e 41·0

Additional readings :—
Riverview iPNZ = 5m.59s., iPPPZ = 7m.7s., iZ = 11m.8s., eEN = 11m.22s.?.
Apia PP = 8m.17s., esS = 12m.49s.
Auckland sP? = 7m.39s., i = 8m.12s., 13m.42s., and 14m.37s., SS = 14m.57s., Q = 15m.42s.

Continued on next page.

New Plymouth i = 7m.34s.
Wellington sP?Z = 8m.4s., iZ = 8m.52s., PPZ = 9m.20s., P_cP = 9m.30s., sP_cPZ = 10m.7s., i = 10m.49s. and 15m.52s., SS = 16m.42s., Q = 16m.57s.?.
Christchurch Q = 17m.6s., S_cS = 17m.23s.
Perth PPP = 10m.22s., SS = 17m.32s., SSS = 18m.12s.
Honolulu e = 20m.37s.
Calcutta isSN = 21m.30s., iSSN = 25m.18s.
Hyderabad SSN = 26m.10s.
New Delhi PPN = 15m.7s., iN = 15m.41s., PPPN = 16m.52.s, S_cSN = 22m.42s., PSE = 23m.1s., iN = 24m.4s., and 26m.32s., iE = 27m.17s., SSN = 27m.54s., iE = 28m.57s., SSSN = 30m.47s.
College e = 27m.35s., eSS = 28m.6s.
Bombay iS?E = 22m.43s., iEN = 23m.28s., SS?E = 28m.28s.
Sitka eS = 22m.52s., e = 24m.54s. and 28m.10s., eSSS? = 32m.20s.
Berkeley iPE = 13m.8s., iPN = 13m.13s.
Branner eN = 36m.32s.
Santa Clara eE = 26m.8s. and 29m.35s.
Victoria SS = 28m.28s.?.
Pasadena eSKSE = 23m.6s., ePKP,PKPZ = 38m.42s.
Sverdlovsk iPS = 26m.7s., SS = 31m.30s.
Logan ePP = 16m.51s., e = 25m.29s., 26m.13s., and 30m.41s.
Salt Lake City e = 16m.24s.
Bozeman e = 27m.5s., eSS = 31m.24s., e = 35m.9s.
Tucson i = 14m.24s. and 17m.25s., ePS = 26m.20s., e = 30m.57s., eSS = 31m.43s., e = 35m.0s.
Saskatoon SS = 32m.25s.
Tananarive SS = 33m.0s.
Rapid City e = 27m.51s. and 32m.6s.
Moscow S = 26m.28s., PS = 28m.9s., PPS = 29m.16s., SS = 34m.15s.
St. Louis ePKP?Z = 18m.23s., iE = 19m.49s., iSKKSE = 26m.33s., eSN = 27m.11s., iPS?E = 29m.21s., iPPS?E = 30m.38s., iN = 30m.58s.
Chicago e = 35m.22s. and 39m.33s.
Scoresby Sund Q = 46·9m.
Upsala eN = 19m.28s. 19m.48s., 24m.52s.?, and 33m.52s.?, eE = 35m.52s.? and 39m.52s.?
Bucharest i = 20m.22s., iPS?E = 30m.49s.
Bergen PPPZ = 23m.14s., EN = 29m.52s., eEN = 30m.11s., PSZ = 30m.26s., eE = 32m.26s., SSZ = 36m.22s., eE = 37m.52s.? and 41m.22s.
Helwan 21m.1s., SKPZ = 21m.52s., PPSE = 31m.52s.
Copenhagen 28m.13s., 30m.8s., and 36m.40s.
Ottawa SKKS = 27m.28s.?, PSE = 30m.20s., SS = 37m.6s., SSS = 41m.30s.
Sofia eN = 24m.11s.
Belgrade e = 23m.16s., 29m.0s., and 32m.51s.
Vermont e = 31m.59s. and 37m.1s., iSS = 37m.39s., e = 41m.7s.
Seven Falls S = 28m.28s.?, PS = 30m.27s., SS = 37m.10s.
Prague ePPP? = 23m.10s.?, eSS = 37m.28s.?, eSSS = 42m.40s.?.
Philadelphia e = 27m.3s., eSS = 37m.29s., e = 41m.18s., and 46m.22s.
Jena ePN = 19m.18s., iEN = 21m.6s., eE = 23m.22s.?, eN = 23m.34s., eE = 26m.46s.?, eN = 30m.22s.?, eEN = 42m.52s.
Aberdeen iEN = 36m.10s., QE = 51m.6s.
Fordham iPPS = 32m.27s., iSS = 37m.55s.
Harvard i = 23m.37s., e = 26m.57s., i = 38m.50s.
De Bilt iSKP = 22m.32s., eSS = 39m.22s.
Stuttgart ePKPZ = 19m.8s., iPKPZ = 19m.13s., iSKP = 22m.27s., ePPPZ = 23m.50s., ePS = 31m.3s., ePPS = 32m.35s., eSS = 38m.24s., eSSS = 43m.15s. and 43m.37s.?.
Stonyhurst SS = 38m.40s., 39m.35s., Q = 54m.20s.
Uccle iSKPN = 22m.27s., iSKPE = 22m.33s., ePPSN = 33m.4s.,?, iSSEN = 39m.22s., eSSSE = 43m.11s.
Huancayo i = 21m.14s., e = 33m.19s., iSS = 38m.14s.
Strasbourg i = 22m.2s.
Basle e = 23m.34s. and 25m.25s.
Kew ePPP? = 24m.22s.?, eSS?EN = 39m.12s., eSSS?E = 43m.52s.?
Florence iPKP = 24m.2s., eSE = 30m.29s., iSKKS?E = 31m.30s., iSSE = 32m.48s.; phases wrongly identified.
La Plata PPPN = 28m.34s. and 33m.4s., SKKS ($\Delta > 180°$) = 39m.4s., PPSE = 42m.58s., PSSN = 43m.22s.
La Paz iZ = 19m.45s., SKPN = 22m.52s., SKKS = 28m.19s., iZ = 32m.21s. and 34m.22s., iSSZ = 40m.40s., iSSS = 45m.43s., QN = 56m.34s.
Bermuda e = 36m.17s., eSS = 39m.43s.
Tortosa SKPE = 22m.53s., PPPE = 25m.25s., SE = 30m.1s., SSE = 42m.23s.
San Juan e = 32m.28s., eSSS? = 46m.30s.
Toledo SS = 43m.4s.
Almeria PP = 23m.14s., PPP = 26m.31s., PPS = 35m.57s., SS = 42m.5s., SSS = 47m.57s.
Lisbon iPKPNZ = 19m.38s.a, PKPE = 19m.45s., E = 21m.20s., PP?Z = 22m.9s., PP?E = 22m.13s., N = 47m.28s.?
Long waves were also recorded at Denver and Montezuma.

Dec. 23d. Readings also at 1h. (near Bogota), 6h. (near Mizusawa), 7h. (Logan, Christchurch, Auckland, and Wellington), 8h. (near Ferndale), 9h. (Tinemaha, Pasadena, Mount Wilson, Riverside, Palomar, Tucson, St. Louis, and La Paz), 11h. (Pasadena, Mount Wilson, Riverside, Tucson, and Palomar), 14h. (Palomar, Tucson, Stuttgart, and La Paz), 16h. (Palomar (3), Tucson (3), Tinemaha (2), Mount Wilson (2), Pasadena (2), St. Louis (2), Port au Prince and Fort de France), 18h. (near Sofia and Bucharest), 19h. (Pasadena, Mount Wilson, Tinemaha, Riverside, Palomar, Andijan and Brisbane), 20h. (Pasadena, Mount Wilson, Tinemaha, Riverside, Palomar, Tucson, and Andijan).

Dec. 24d. 1h. 0m. 14s. Epicentre 13°·0N. 71°·0W. (as on Dec. 23d.).

$A = +\cdot3173$, $B = -\cdot9216$, $C = +\cdot2235$; $\delta = -2$; $h = +6$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Port au Prince		5·7	347	i 0 28	−60	i 1 38	−57	—	—	—
San Juan		7·1	40	e 1 42	− 6	i 3 4	− 6	—	—	i 3·6
Bogota		8·9	200	i 2 9	− 3	i 3 57	+ 2	i 3 9	P_g	—
Balboa Heights		9·3	243	e 2 18	+ 1	e 3 50	−15	—	—	—
Fort de France		9·7	80	e 0 57	?	e 2 43	?	—	—	—
Bermuda		20·1	16	i 4 41	+ 3	e 8 13	− 6	i 8 45	SS	e 10·5
Columbia		22·8	339	e 5 6	+ 1	e 9 16	+ 5	—	—	e 12·1
Huancayo		25·3	191	e 5 26	− 4	i 9 47	− 7	e 6 18	PP	i 13·7
Philadelphia		27·1	354	e 5 44	− 2	e 10 26	+ 2	—	—	e 13·3
Fordham		27·9	357	e 5 51	− 3	e 10 37	0	—	—	—
Pittsburgh	N.W.	28·4	347	—	—	i 11 23	+38	—	—	—
Harvard		29·4	359	i 6 7	0	—	—	—	—	e 12·8
La Paz		29·4	175	i 6 7k	0	i 10 40	−21	—	—	14·5
St. Louis		30·7	330	e 6 19	0	i 11 21	0	e 13 44	SSS	—
Vermont		31·4	357	—	—	e 11 46	+14	—	—	—
Chicago		32·1	336	—	—	e 11 38	− 5	e 13 34	SS	e 16·7
Ottawa		32·5	354	e 6 34	0	e 11 46?	− 3	—	—	e 16·8
Seven Falls		34·0	0	e 6 48	0	e 12 4?	− 9	—	—	15·8
Tucson		41·2	305	i 7 48	0	e 14 2	0	i 9 30	PP	e 21·4
Rapid City		41·5	326	e 7 52	+ 2	—	—	e 16 18	SS	e 18·8
Rio de Janeiro	E.	44·9	142	e 14 26	S	(e 14 46)	−10	—	—	e 23·1
Salt Lake City		45·1	317	e 8 16	− 4	e 14 59	0	e 18 17	S_cS	e 25·0
Logan		45·6	318	i 8 23	− 1	e 15 8	+ 2	—	—	18·9
Palomar	Z.	46·3	305	i 8 29a	0	—	—	—	—	—
La Jolla	Z.	46·5	304	e 8 29	− 2	—	—	—	—	—
Riverside	Z.	46·9	306	e 8 34	0	—	—	e 10 6	PP	—
Bozeman		47·0	323	—	—	e 15 25	− 1	e 18 27	S_cS	e 24·7
Mount Wilson	Z.	47·5	306	e 8 38	0	—	—	—	—	—
Pasadena		47·6	306	i 8 39	0	i 15 35	0	e 10 9	PP	e 24·8
Haiwee	Z.	48·0	308	e 8 43	0	—	—	—	—	—
Saskatoon		48·4	332	—	—	e 15 46?	0	—	—	25·8
Tinemaha		48·4	309	e 8 46	0	e 15 53	+ 7	—	—	—
Toledo		64·1	53	i 10 38	0	18 36	−38	—	—	—
Almeria		65·2	56	e 10 9	−36	18 41	−47	—	—	35·8
Clermont-Ferrand		69·7	47	i 11 13	− 1	—	—	—	—	—
Uccle		70·8	41	e 11 30?	+10	e 20 52?	+17	—	—	e 29·8
Basle		72·8	44	e 11 32	0	—	—	—	—	—
Zürich		73·5	45	e 11 35	− 1	—	—	—	—	—
Stuttgart		73·9	43	e 11 37	− 2	—	—	—	—	e 43·3
Chur		74·2	45	e 11 40	0	—	—	—	—	—
Cheb		75·9	42	—	—	e 21 46?	+14	—	—	—

Additional readings and notes :—
Bogota $eP^* = 2m.34s.$, $iS_g = 5m.3s.$
Huancayo $i = 11m.28s.$
Philadelphia $iS = 10m.44s.$
St. Louis $eN = 11m.53s.$
Tucson $i = 9m.37s.$
Rio de Janeiro readings are given as ePE and ePN respectively.
Long waves were also recorded at La Plata, Sitka, De Bilt, and Kew.

Dec. 24d. 1h. 47m. 57s. Epicentre 5°·6S. 153°·6E. (as on 23d.).

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	Z.	21·8	182	i 4 52	− 4	e 8 24	−28	i 4 57	pP	—
Riverview		28·2	184	i 6 6a	+10	i 10 35	− 6	i 11 48	SS	e 12·8
Sydney		28·2	184	e 5 51	− 5	e 10 33	− 8	—	—	e 12·8
Auckland		36·7	152	7 8	− 2	12 47	− 7	13 10	sS	17·0
Arapuni		38·0	152	—	—	13 3?	−11	—	—	17·0
New Plymouth		38·1	154	7 43?	+21	—	—	—	—	—
Tuai		39·3	154	7 31	− 1	13 24	−10	—	—	—
Wellington		40·3	156	7 37	− 3	13 37	−12	7 54	pP	19·0
Christchurch		41·3	159	7 39	−10	13 54	−10	9 33	P_cP	19·8
Perth		44·0	228	—	—	i 14 48	+ 5	i 17 43	SS	i 24·2
Honolulu		54·6	59	e 9 27	− 5	e 17 29	+18	—	—	e 23·2
Calcutta	N.	69·6	297	e 11 22	+ 9	i 20 30	+ 9	i 26 2	SS	—
Colombo	E.	74·6	278	11 46	+ 3	21 21	+ 3	—	—	—
Kodaikanal	E.	77·4	282	i 12 5	+ 7	21 51	+ 2	15 6	PP	—
New Delhi	N.	80·8	300	e 12 18	+ 1	i 22 26	+ 1	—	—	—
College		82·3	21	—	—	e 22 13	−27	e 31 50	SSS	e 35·3
Bombay		83·1	290	e 12 30	+ 1	22 50	+ 2	28 23	SS	—
Sitka		84·7	31	e 12 59	+22	e 23 6	+ 2	—	—	e 34·8
Andijan		87·0	311	e 12 54	+ 6	i 23 32	+ 5	—	—	—
Ukiah		88·2	51	—	—	e 23 59	+21	—	—	e 40·3
Berkeley		88·8	52	i 12 57	0	i 24 16	+32	—	—	—
Santa Clara	E.	89·0	52	e 16 32	PP	—	—	—	—	e 42·4
Tashkent		89·4	311	13 0	0	i 23 56	+ 7	—	—	—
Victoria		89·5	42	e 16 3?	PP	e 24 3?	+13	—	—	41·0
Santa Barbara		90·4	56	e 13 4	0	—	—	—	—	—
Pasadena		91·6	56	e 13 7	− 3	e 29 15?	SS	e 33 51?	SSS	e 37·2
Mount Wilson	Z.	91·7	56	e 13 8	− 2	—	—	—	—	—
Tinemaha		91·9	53	e 13 12	+ 1	—	—	—	—	—
Haiwee	Z.	92·0	54	e 13 11	− 1	—	—	—	—	—
La Jolla		92·3	57	i 13 15	+ 2	—	—	—	—	—
Riverside	Z.	92·3	56	e 13 14	+ 1	—	—	—	—	—
Palomar	Z.	92·6	57	e 13 12	− 3	—	—	—	—	—
Sverdlovsk		96·3	327	e 17 29	PP	e 24 3	[− 5]	26 21	PS	—
Salt Lake City		97·1	50	—	—	—	—	e 26 20	PS	e 46·0
Tucson		97·7	59	e 13 41	+ 3	e 26 23	PS	e 17 32	PP	—
Saskatoon		100·4	38	—	—	—	—	e 27 3?	PS	45·0
Rapid City		103·4	46	e 18 29	PP	e 25 17	{− 2}	e 40 50	?	e 49·1
Moscow		109·1	328	19 9	PP	26 16	{+17}	28 32	PS	—
St. Louis		113·8	50	e 19 22	PP	e 25 40	[+13]	e 29 14	PS	—
Chicago		115·0	47	—	—	e 29 15	PS	e 35 1	SS	e 50·9
Scoresby Sund		115·1	359	—	—	29 31	PS	—	—	57·0
Upsala		116·4	337	—	—	e 36 3?	SS	—	—	e 54·0
Bergen		120·3	343	—	—	e 28 18	?	—	—	e 64·0
Pittsburgh		120·9	45	—	—	30 40	PS	—	—	—
Copenahgen		121·3	336	—	—	30 21	PS	—	—	56·1
Ottawa		121·7	39	e 18 55	[− 1]	—	—	—	—	53·0
Vermont		123·7	39	—	—	e 30 30	PS	e 38 22	SS	e 54·7
Seven Falls		123·8	35	—	—	e 26 21?	[+19]	e 30 21?	PS	51·0
Philadelphia		124·5	44	—	—	e 28 16	{+32}	e 31 0	PS	e 56·8
Cheb		125·0	331	e 21 3	PP	e 30 43	PS	—	—	e 62·0
Triest		127·1	326	i 22 7	PP	—	—	—	—	e 57·0
Stuttgart		127·5	331	e 19 9	[+ 2]	e 39 27	SS	e 21 9	PP	e 61·4
Uccle		128·2	337	e 22 29	PKS	—	—	e 37 33?	SS	e 58·0
Huancayo		128·3	110	e 22 33	PKS	e 32 18	PPS	e 38 36	SS	e 55·6
Florence		129·6	325	i 21 26k	PP	—	—	e 31 33	PS	—
La Paz		133·3	119	i 19 34	[+16]	—	—	23 36	PKS	63·6
Bermuda		135·5	48	e 22 53	PP	—	—	—	—	e 55·7
San Juan		139·2	68	e 19 53	[+24]	e 32 26	PS	e 42 40	SS	e 58·6

For Notes see next page.

NOTES TO DECEMBER 24d. 1h. 47m. 57s.

Additional readings :—
Riverview i = 11m.1s.
Auckland Q = 15m.18s.
Tuai i = 7m.43s.
Wellington i = 7m.47s., PP?Z = 9m.23s., P_cP = 9m.30s., sPPZ = 9m.48s., pP_cP = 9m.58s., i = 10m.31s., sS? = 14m.7s., SS? = 16m.58s., S_cS? = 17m.45s.
Christchurch P_cS = 13m.20s., Q = 16m.23s., S_cS = 17m.16s.
Perth i = 18m.3s.
Berkeley iPE = 13m.26s., iPN = 13m.39s.
Pasadena i = 13m.10s.
Palomar iZ = 13m.16s.
Sverdlovsk SS = 32m.17s.
Tucson i = 14m.32s.
St. Louis eE = 28m.19s., eN = 34m.34s.
Chicago e = 40m.31s.
Upsala eN = 44m.41s.
Bergen eE = 29m.28s.
Ottawa eE = 28m.3s.? and 38m.3s.?
Seven Falls e = 37m.21s.?
Philadelphia eSS = 38m.24s.
San Juan e = 46m.25s.
Long waves were also recorded at other American and European stations.

Dec. 24d. 4h. 57m. 49s. Epicentre 6°·5S. 155°·0E. (as on 1942, Oct. 6d.).

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

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	z.	20·9	187	i 4 47	+ 1	i 8 52	+17	—	—	—
Riverview		27·4	188	i 5 55k	+ 6	i 10 30	+ 2	—	—	e 14·3
Auckland		35·2	153	6 46?	−12	e 12 41	+10	—	—	16·2
Arapuni		36·6	153	6 11?	−59	—	—	—	—	17·2
Wellington		38·9	157	7 31	+ 2	13 46	+18	7 56	pP	20·2
Christchurch		40·0	161	7 42	+ 4	13 50	+ 6	17 16	S_cS	19·8
Bombay		84·7	290	12 31	− 6	i 22 49	−15	28 16	SS	—
Andijan		88·6	311	e 12 48	− 8	e 23 35	− 7	—	—	—
Pasadena		91·0	56	i 13 6	− 1	—	—	—	—	e 41·2
Mount Wilson	z.	91·1	56	i 12 46	−22	—	—	—	—	—
Tinemaha	z.	91·2	53	e 13 8	0	—	—	—	—	—
Riverside	z.	91·6	56	e 13 8	− 2	—	—	—	—	—
Tucson		96·9	58	e 13 34	0	—	—	e 17 29	PP	e 46·8
St. Louis		113·3	50	e 14 5	P	e 29 19	PS	e 18 55	PP	—
La Paz	z.	131·6	119	19 32	[+17]	—	—	—	—	64·2

Additional readings :—
Riverview i = 10m.57s.
Wellington SS = 16m.51s.
Christchurch Q = 17m.1s.
Long waves were also recorded at Pittsburgh, Vermont, Fordham, De Bilt, and Cheb.

Dec. 24d. 11h. 44m. 32s. Epicentre 6°·5S. 155°·0E. (as at 4h.).

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

		△	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	z.	20·9	187	e 4 50	+ 4	—	—	—	—	—
Riverview		27·4	188	i 6 3a	+14	i 10 30	+ 2	—	—	e 12·7
Sydney		27·4	188	e 6 4?	+15	e 10 31	+ 3	—	—	—
Apia		33·5	106	e 6 28?	−15	—	—	—	—	—
Auckland		35·2	153	7 0	+ 2	12 38	+ 7	15 10?	Q	16·5
Arapuni		36·6	153	—	—	16 28?	SS	—	—	—
Wellington		38·9	157	7 28	− 1	13 39	+11	9 14	P_cP	19·0
Christchurch		40·0	161	7 42	+ 4	13 47	+ 3	9 18	P_cP	19·6
Calcutta	N.	71·3	296	e 11 29	+ 6	i 20 34	− 7	—	—	—
Colombo		76·1	279	11 46	− 5	21 24	−11	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
College		82·6	20	—	—	e 23 3	+20	—	—	e 36·6
Bombay		84·7	290	i 12 31	− 6	i 22 53	−11	28 19	SS	—
Sitka		84·8	31	—	—	e 22 46	−19	—	—	e 36·7
Santa Barbara	z.	89·8	56	e 13 3	+ 1	—	—	—	—	—
Pasadena		91·0	56	i 13 6	− 1	—	—	—	—	e 40·5
Tashkent		91·0	311	e 13 41?	+34	e 23 53	(+ 4)	—	—	—
Mount Wilson	z.	91·1	56	i 13 7a	− 1	—	—	—	—	—
Tinemaha	z.	91·2	53	e 13 9	+ 1	—	—	—	—	—
Haiwee	z.	91·4	54	e 13 9	0	—	—	—	—	—
La Jolla	z.	91·6	57	e 13 10	0	—	—	—	—	—
Riverside	z.	91·6	56	e 13 9	− 1	—	—	—	—	—
Tucson		96·9	58	e 13 35	+ 1	—	—	e 17 25	PP	e 44·7
Rapid City		103·0	45	—	—	—	—	e 35 19	?	e 48·4
St. Louis		113·3	50	—	—	e 29 19	PS	e 34 55	SS	—
Scoresby Sund		116·1	359	—	—	29 38	PS	—	—	58·5
Cheb		126·5	331	—	—	e 29 28?	PS	—	—	e 63·5
Huancayo		126·7	110	e 22 30	PKS	—	—	e 43 32	SSS	e 52·1
Stuttgart		128·9	331	e 20 10	PP	—	—	e 39 52	SSP	e 64·5
San Juan		138·3	67	—	—	—	—	e 41 9	SSP	e 65·9

Additional readings :—
Riverview iEZ = 10m.33s., iNZ = 10m.55s.
Wellington i = 8m.14s., sP_cP? = 10m.8s., P_cS? = 13m.20s., SS = 16m.47s., sSS = 17m.28s.
Christchurch Q = 16m.44s., S_cS = 17m.17s.
Huancayo e = 49m.3s.
San Juan e = 41m.52s. and 59m.50s.
Long waves were also recorded at Honolulu, Bermuda, and other American and European stations.

Dec. 24d. Readings also at 1h. (Mount Wilson, Pasadena, Riverside, Tinemaha, Fort de France, and Brisbane), 2h. (Mount Wilson (3), Tinemaha, Tucson, Palomar, St. Louis, and near Stuttgart), 3h. (Mount Wilson, Pasadena, Riverside, and Tinemaha), 4h. (Andijan, Auckland, Mount Wilson, Tucson, and Tinemaha), 5h. (Bogota), 6h. (Arapuni, Auckland, Christchurch, Wellington, Brisbane, Riverview, Mount Wilson, Tinemaha, Tucson, and La Paz), 7h. (Andijan, Tashkent, and Harvard), 8h. (La Paz, San Juan, and near Bogota), 9h. (La Paz, Mount Wilson, Tucson), 11h. (Riverview), 12h. (Mount Wilson, Pasadena, Riverside, Tinemaha, Tucson, St. Louis, Bogota, and La Paz), 14h. (Riverside and Mount Wilson), 17h. (Mount Wilson and Bogota), 18h. (Christchurch, Arapuni, Wellington, Auckland, Riverview, Haiwee, Tucson, Mount Wilson, Pasadena, Riverside, Vermont, Oaxaca, Tacubaya, Huancayo, and La Paz), 19h. (Mount Wilson), 20h. (near Reykjavik), 21h. (Riverview, Mount Wilson, Pasadena, Palomar, Riverside, and Bogota).

Dec. 25d. 4h. 32m. 7s. Epicentre 5°·6S. 153°·6E. (as on 24d.).

$A = -·8915$, $B = +·4426$, $C = -·0969$; $\delta = +6$; $h = +7$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Riverview		28·2	184	e 5 55	− 1	i 10 31	−10	i 10 57	?	e 12·7
Sydney		28·2	184	—	—	e 10 11?	−30	—	—	—
Apia		35·1	106	i 8 12	PP	i 14 58	SS	—	—	17·9
Auckland		36·7	152	7 20	+10	12 53	− 1	i 15 25	SS	17·4
Wellington		40·3	156	7 33	− 7	13 38	−11	9 10	PP	18·9
Christchurch		41·3	159	7 42	− 7	13 46	−18	13 26	P_cS	19·8
Perth		44·0	228	—	—	i 14 48	+ 5	i 18 8	SS	—
Calcutta	N.	69·6	297	e 11 16	+ 3	i 20 31	+10	—	—	—
New Delhi	N.	80·8	300	—	—	i 22 27	+ 2	—	—	—
Bombay		83·1	290	e 12 35	+ 6	i 22 52	+ 4	i 23 14	S_cS	—
Sitka		84·7	31	—	—	e 23 16	+12	—	—	e 35·3
Pasadena		91·6	56	i 13 8	− 2	—	—	—	—	e 36·9
Mount Wilson	z.	91·7	56	i 13 9	− 1	—	—	—	—	—
Tinemaha	z.	91·9	53	e 13 10	− 1	—	—	i 13 13	P_cP	—
Haiwee	z.	92·0	54	i 13 14	+ 2	—	—	—	—	—

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.	92·3	56	i 13 13	0	—	—	—	—	—
Palomar	z.	92·6	57	i 13 13	− 2	—	—	i 13 42	?	—
Bozeman		97·7	45	—	—	e 24 13	[− 2]	—	—	e 45·2
Tucson		97·7	59	e 13 37	− 1	—	—	e 17 13	PP	e 47·0
St. Louis	E.	113·8	50	—	—	e 29 10	PS	e 34 44	?	—
Cheb		125·0	331	—	—	e 31 20	PS	—	—	e 74·9
Stuttgart		127·5	331	e 19 8	[+ 1]	—	—	—	—	e 72·9
Uccle		128·2	337	e 40 59	?	—	—	—	—	e 57·9
Huancayo		128·3	110	e 21 21	PP	e 33 5	PPS	e 39 1	SSP	e 51·0
San Juan		139·2	68	e 22 47	PP	e 46 13	SSS	e 37 23	?	e 66·1

Additional readings :—
Auckland i = 13m.8s.
Wellington PPP?Z = 9m.48s., Q = 16m.48s.
Christchurch P_cP = 9m.26s., Q = 17m.2s., S_cS = 17m.14s.
Bombay ePN = 12m.38s., iE = 23m.44s., SSE = 28m.22s.
Stuttgart eZ = 19m.31s., e = 37m.41s.?.
Long waves were also recorded at Arapuni, Honolulu, Kew, De Bilt, Bermuda, and at other American stations.

Dec. 25d. 8h. 17m. 32s. Epicentre 25°·3N. 110°·5W. (as on 1943 Oct. 13d.).

A = −·3170, B = −·8479, C = +·4250 ; δ = +5 ; h = +3 ;
D = −·937, E = +·350 ; G = −·149, H = −·398, K = −·905.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Chihuahua	z.	5·2	49	0 39	?	—	—	—	—	—
Tucson		6·9	358	i 1 40	− 5	i 3 16	+11	i 1 59	P*	i 4·1
La Jolla		9·6	323	e 2 22	+ 1	i 4 52	S*	—	—	—
Palomar	z.	9·7	327	e 2 22	0	i 5 4	S*	—	—	—
Riverside		10·5	327	e 2 35	0	e 5 22	SSS	—	—	—
Mount Wilson	z.	11·0	325	e 2 41	− 1	—	—	—	—	—
Pasadena		11·0	325	i 2 40a	− 2	(e 4 40)	− 7	—	—	e 4·7
Tacubaya	N.	12·0	297	3 5	PP	—	—	—	—	—
Santa Barbara	z.	12·1	320	e 2 55	− 2	—	—	—	—	—
Haiwee		12·5	331	i 3 2	0	—	—	—	—	—
Tinemaha	z.	13·5	333	e 3 14	− 1	—	—	—	—	—
Fresno	N.	13·9	327	e 5 28?	?	e 9 6	L	—	—	(e 9·1)
Vera Cruz	E.	14·6	112	e 2 47	?	—	—	—	—	—
Denver		15·2	16	e 1 48	?	i 6 18	−10	—	—	—
Lick	N.	15·3	324	e 3 40	+ 1	—	—	—	—	—
Salt Lake City		15·5	357	e 3 38	− 4	e 6 46	+11	e 5 51	?	e 7·9
Santa Clara		15·5	324	e 3 41	− 1	e 6 50	+15	—	—	e 7·4
Berkeley		16·1	324	e 3 43	− 6	(e 7 2)	+13	i 3 53	?	e 7·0
Logan		16·4	355	e 3 54	+ 1	—	—	—	—	i 8·6
Ukiah		17·4	326	e 4 17	+11	e 7 15	− 4	—	—	e 8·1
Rapid City		19·7	15	i 4 32	− 2	i 8 9	− 1	i 5 4	PPP	e 10·1
Bozeman		20·3	0	e 4 42	+ 2	e 8 28	+ 5	—	—	e 10·9
St. Louis		21·7	47	e 4 56	+ 1	i 8 52	+ 1	—	—	e 10·9
Seattle		24·2	341	e 6 41	?	—	—	—	—	e 14·5
Chicago		25·1	43	e 5 40	+12	e 9 54	+ 3	—	—	e 11·6
Victoria		25·3	340	5 34?	+ 4	9 58?	+ 4	—	—	11·5
Saskatoon		27·0	5	5 43	− 2	10 35	+13	—	—	14·5
Pittsburgh	N.W.	29·6	52	—	—	i 11 8	+ 4	i 13 21	SSS	—
New Kensington		29·8	52	—	—	e 11 47	+40	—	—	e 15·8
Buffalo		31·3	48	(6 7)	−17	(11 13)	−18	(7 26)	PPP	—
Philadelphia		32·9	56	—	—	e 12 3	+ 7	—	—	e 13·9
Fordham		34·1	54	i 6 49	+ 1	e 12 22	+ 8	—	—	e 17·2
Ottawa		34·3	45	e 6 53	+ 3	—	—	e 14 46?	SSS	17·5
Harvard		36·2	52	i 7 10	+ 4	—	—	i 18 40	?	e 21·0
Shawinigan Falls		36·7	45	e 7 40?	+30	—	—	—	—	16·5

Continued on next page.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Seven Falls	38·2	45	e 7 22?	− 1	—	—	—	—	18·5
Bermuda	40·4	69	e 8 58	PP	—	—	—	—	e 17·1
Bogota	40·5	114	e 8 0	+18	—	—	e 8 11	?	—
San Juan	41·6	90	e 7 53	+ 2	e 14 15	+ 7	—	—	e 16·9
Huancayo	50·5	133	—	—	e 16 36	PPS	e 20 46	SSS	e 23·7
Uccle	85·0	36	e 12 52?	+14	—	—	—	—	e 39·5

Additional readings :—
Denver e?N =5m.28s., eE =5m.40s., iN =5m.52s., iE =6m.12s.
Logan i =5m.14s. and 8m.12s.
St. Louis iPZ =5m.0s., eZ =6m.46s.
Buffalo e =(6m.29s.), PP =(6m.55s.), readings reduced by 10 minutes.
Long waves were also recorded at Guadalajara, Columbia, Ferndale, Sitka, College, Ivigtut, La Paz, Honolulu, Riverview, and at other European stations.

Dec. 25d. Readings also at 0h. (Pasadena, Mount Wilson, Riverside, Tinemaha, and Palomar), 1h. (Jena and near Stuttgart (2)), 5h. (Bogota, La Paz, and Granada), 7h. (Chicago, St. Louis, and Tucson), 10h. (Chicago, Logan, St. Louis, Haiwee, Riverside, Mount Wilson, Pasadena, and Tucson), 12h. (Prague, Kew, Florence, De Bilt, Uccle, Stuttgart, Pasadena, Tucson, and near Bogota), 13h. (Cheb), 19h. (St. Louis, Mount Wilson, Tucson, and Riverside), 20h. (La Paz), 21h. (Ksara).

Dec. 26d. 4h. 57m. 29s. Epicentre 18°·7N. 105°·2W. (as on 1939 Sept. 26d.).

$A = -·2485$, $B = -·9147$, $C = +·3187$; $\delta = 0$; $h = +5$;
$D = -·965$, $E = +·262$; $G = -·084$, $H = -·308$, $K = -·948$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Manzanillo	E.	0·9	67	i 0 9	−11	—	—	—	—	—
Guadalajara	N.	2·6	41	i 0 38	− 6	—	—	—	—	—
Tacubaya	E.	5·8	80	1 21	− 8	—	—	—	—	—
Oaxaca	N.	8·2	101	e 1 55	− 8	—	—	—	—	—
Vera Cruz	N.	8·6	86	e 2 43	P_g	—	—	—	—	—
Tucson		14·4	341	i 3 30	+ 3	—	—	e 6 36	SSS	e 8·0
La Jolla		17·8	325	e 4 15	+ 4	—	—	—	—	—
Palomar	Z.	17·9	327	e 4 21	+ 9	—	—	—	—	—
Riverside		18·7	326	e 4 24	+ 2	e 8 16	SS	—	—	—
Mount Wilson		19·3	326	e 4 34	+ 5	—	—	—	—	—
Pasadena		19·3	326	i 4 33	+ 4	i 8 17	SS	—	—	e 11·1
Tinemaha		21·6	330	i 4 56	+ 2	—	—	—	—	—
Salt Lake City		22·7	346	e 5 5	+ 1	e 9 16	+ 7	e 5 45	PPP	e 11·9
Cape Girardeau	N.	23·0	34	e 5 4	− 3	e 9 10	− 4	—	—	e 12·5
Logan		23·7	349	i 5 16	+ 2	e 9 29	+ 2	—	—	e 11·8
Santa Clara		23·7	326	i 5 18	+ 4	—	—	e 11 15	?	e 15·5
St. Louis		23·8	30	i 5 8	− 7	e 9 27	− 1	e 9 45	?	—
Berkeley		24·2	326	i 5 24	+ 5	i 9 49	+14	i 9 52	?	e 15·6
Rapid City		25·4	5	e 5 37	+ 6	—	—	e 11 7	SSS	e 13·4
Ukiah		25·7	327	—	—	e 10 2	+ 1	—	—	e 14·7
Bozeman		27·3	352	—	—	e 10 37	+10	—	—	e 14·9
Chicago		27·5	28	—	—	e 10 50	+20	e 11 53	SS	e 13·7
San Juan		37·0	83	e 12 27	?	e 12 58	− 1	—	—	e 20·2
Huancayo		42·4	134	e 8 3	+ 5	e 14 7	−13	—	—	e 18·0

Tucson gives also i =4m.21s. and 7m.5s.
Long waves were also recorded at Columbia, Pittsburgh, Seattle, College, and Riverview.

Dec. 26d. 13h. 42m. 18s. Epicentre 43°·0N. 0°·2E.

Intensity VI at Heches, Arreau, Banios, and Esterre. Felt in the central Pyrenees and the region of Campan.
Epicentre 42° 58′ N. 0°13′ E. (Strasbourg). Macroseismic area about 5000 sq. km.
Annales de l'Institut de Physique du Globe de Strasbourg, 2e partie Séismologie, tomes VII-VIII, Strasbourg, 1950, p. 43.

J. P. Rothé.
" Le Séisme Pyrénées du 26 déc., 1943." Bull. mensuel de la Soc. d'Astronomie populaire de Toulouse, 36e année, Août-Sept., 1945, No. 262, pp. 236-239.

J. P. Rothé.
" Séismes et Volcans," un volume, Presses universitaires, 2e édition, 1948, p. 50, fig. 12.

$A = +\cdot7336$, $B = +\cdot0026$, $C = +\cdot6795$; $\delta = -10$; $h = -3$;
$D = +\cdot003$, $E = -1\cdot000$; $G = +\cdot679$, $H = +\cdot002$, $K = -\cdot734$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Barcelona		2·1	129	0 38	+ 1	1 3	− 1	—	—	—
Tortosa	N.	2·2	172	0 39	+ 1	1 6	0	0 43	P_g	—
Clermont-Ferrand		3·5	36	i 0 50	− 7	i 1 50	S*	i 1 2	P*	—
Toledo		4·4	227	i 1 9	− 1	2 20	S*	1 23	P*	—
Paris		6·1	16	e 1 42	+ 8	i 3 12	S*	—	—	i 3·9
Neuchatel		6·3	48	e 1 44	+ 8	e 3 13	S*	e 1 55	P*	—
Almeria		6·4	199	e 2 18	P_g	i 3 21	S*	—	—	4·2
Granada		6·5	208	—	—	e 3 10	S*	—	—	—
Basle		6·9	46	e 2 6	P*	e 3 37	S*	—	—	—
Zürich		7·3	51	e 2 13	P*	e 3 54	S_g	—	—	—
Chur		7·7	57	e 3 42	S	(e 3 42)	+17	—	—	—
Strasbourg		7·7	41	—	—	e 3 39	+14	e 3 55	S*	—
Uccle		8·3	18	e 2 36	P_g	e 4 28	S_g	—	—	—
Stuttgart		8·5	44	e 2 42	P_g	e 3 56	+11	e 4 20	S*	—

Additional readings :—
Tortosa PN = 0m.49s., 0m.55s. and 1m.2s., S_gN = 1m.12s.
Clermont-Ferrand iP_g = 1m.5s., iP_gP_g = 1m.16s.
Strasbourg eS_g = 4m.18s.
Long waves were also recorded at Jena.

Dec. 26d. Readings also at 4h. (Harvard and Buffalo), 6h. (Cheb), 16h. (Ksara), 23h. (Rio de Janeiro).

Dec. 27d. 3h. 55m. 16s. Epicentre 31°·0S. 178°·5W. (as on 1943, Aug. 14d.).

$A = -\cdot8584$, $B = -\cdot0225$, $C = -\cdot5125$; $\delta = +1$; $h = +2$;
$D = -\cdot026$, $E = +1\cdot000$; $G = +\cdot512$, $H = +\cdot013$, $K = -\cdot859$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Arapuni		8·5	212	2 20?	+13	4 8?	S*	—	—	4·4
Tuai		8·6	203	1 53	−16	3 15	−33	—	—	4·1
New Plymouth		10·1	215	—	—	e 4 9	−16	5 2	S*	6·7
Wellington		11·6	206	3 12	+22	5 6	+ 5	—	—	5·8
Christchurch		14·4	207	3 18	− 9	5 29	−40	—	—	—
Apia		18·2	23	i 7 57	S	(i 7 57)	+20	—	—	e 13·0
Brisbane	E.	25·1	271	e 5 28	0	i 10 10	+19	—	—	e 14·2
	N.	25·1	271	e 5 31	+ 3	i 10 22	+31	—	—	i 13·8
Riverview		25·7	255	e 5 34	+ 1	i 10 14	+13	i 6 16	PP	e 13·0
Sydney		25·7	255	e 5 8	−25	e 9 32	−29	—	—	e 12·8
Pasadena		86·2	46	i 12 45	+ 1	e 23 17	− 2	—	—	e 35·7
Mount Wilson	Z.	86·3	46	i 12 47	+ 2	—	—	—	—	—
Palomar	Z.	86·5	47	i 12 43	− 3	—	—	—	—	—
Riverside	Z.	86·6	46	i 12 47	+ 1	—	—	—	—	—
Ukiah		86·7	39	—	—	e 28 6	SS	—	—	e 38·0

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Tucson		89·9	50	i 13 2	0	e 23 37	[+ 5]	e 30 51	SS	e 44·3
Salt Lake City		94·3	44	—	—	e 33 13	?	—	—	e 41·3
Logan		94·9	43	—	—	e 24 54	+17	—	—	e 46·0
Huancayo		94·9	107	—	—	e 24 2	[+ 1]	e 25 31	PS	e 43·6
Calcutta	N.	103·8	287	—	—	e 24 48	[+ 3]	—	—	—
St. Louis	E.	107·4	55	—	—	e 24 56	[+ 5]	e 25 55	SKKS	—
Bombay		115·4	276	—	—	25 33	[− 1]	29 25	PS	—
New Delhi	N.	115·5	290	—	—	i 25 31	[− 3]	—	—	e 72·0
San Juan		118·1	84	—	—	—	—	e 29 34	PS	e 59·5
Philadelphia		118·7	58	—	—	e 34 4	?	e 36 38	SS	e 58·1
Bermuda		124·5	70	—	—	e 31 12	PS	e 37 26	SS	e 54·1
Stuttgart		161·3	343	e 20 32?	[+30]	—	—	e 20 57	?	e 49·7

Additional readings :—
Wellington i = 3m.36s., iZ = 4m.4s., i = 4m.26s. and 4m.44s.
Apia ipP = 8m.13s., iS = 12m.13s., isS = 12m.16s ; phases wrongly identified.
Riverview iZ = 10m.22s., iE = 10m.25s., iN = 11m.4s.
Tucson e = 13m.11s. and 25m.8s.
Huancayo i = 31m.13s.
St. Louis ePSE = 28m.5s.
Bombay eE = 29m.31s., PPSN = 30m.45s., iE = 30m.56s.
Long waves were also recorded at Kodaikanal, La Plata, and other American and European stations.

Dec. 27d. 18h. 50m. 31s. (I)
56m. 58s. (II)
19h. 45m. 58s. (III)
53m. 45s. (IV)
56m. 55s. (V)
21h. 51m. 49s. (VI)

Epicentre 48°·2N. 9°·0E. as on 1943, Oct. 22d.

Scale VI-VII in the epicentral region—Balingen ; V in North Switzerland.

Annales de l'Institut de Physique du Globe de Strasbourg, 2e partie, Séismologie, tomes VII-VIII, Strasbourg, 1950, p. 43. Epicentre as adopted.

$A = +·6609$, $B = +·1046$, $C = +·7432$; $\delta = +8$; $h = -5$;
$D = +·156$, $E = -·988$; $G = +·734$, $H = +·116$, $K = -·669$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
I	Ebingen	0·0	—	i 0 5a	P_g	—	—	—	—	—
II		0·0	—	i 0 4a	P_g	i 0 5	S_g	—	—	—
III		0·0	—	i 0 4	P_g	i 0 6	S_g	—	—	—
IV		0·0	—	i 0 3	P_g	i 0 4	S_g	—	—	—
V		0·0	—	i 0 5	P_g	i 0 9	S_g	—	—	—
VI		0·0	—	i 0 5	P_g	i 0 5	S_g	—	—	—
I	Ravensburg	0·6	135	i 0 15	P_g	i 0 23	S_g	—	—	—
II		0·6	135	i 0 14	P_g	i 0 23	S_g	—	—	—
III		0·6	135	—	—	i 0 22	S_g	—	—	—
IV		0·6	135	—	—	i 0 21	S_g	—	—	—
I	Stuttgart	0·6	13	i 0 14k	P_g	i 0 21	S_g	—	—	—
II		0·6	13	i 0 14k	P_g	i 0 20	S_g	—	—	—
III		0·6	13	i 0 13k	P_g	i 0 20	S_g	i 0 16	?	—
IV		0·6	13	e 0 12	P_g	i 0 19	S_g	—	—	—
V		0·6	13	e 0 14	P_g	i 0 21	S_g	—	—	—
VI		0·6	13	e 0 15	P_g	i 0 21	S_g	—	—	—
I	Strasbourg	0·9	295	0 22	+ 2	i 0 31	− 3	—	—	—
II		0·9	295	0 21	+ 1	i 0 32	− 2	—	—	—
III		0·9	295	e 0 24?	− 4	i 0 32	− 2	—	—	—
IV		0·9	295	—	—	i 0 32	− 2	—	—	—
V		0·9	295	—	—	i 0 33	− 1	—	—	—
VI		0·9	295	—	—	i 0 31	− 3	—	—	—
I	Zürich	0·9	198	e 0 21	+ 1	i 0 33	− 1	—	—	—
II		0·9	198	e 0 20	0	e 0 33	− 1	—	—	—
III		0·9	198	i 0 20	0	i 0 31	− 3	—	—	—
IV		0·9	198	e 0 19	− 1	e 0 31	− 3	—	—	—
VI		0·9	198	e 0 22	+ 2	e 0 34	0	—	—	—

Continued on next page.

			Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
			°	°	m. s.	s.	m. s.	s.	m. s.		m.
I	Basle		1·2	235	i 0 24	0	e 0 42	+ 1	—	—	—
II			1·2	235	e 0 24	0	e 0 41	0	—	—	—
III			1·2	235	i 0 24	0	i 0 41	0	—	—	—
IV			1·2	235	e 0 24	0	e 0 40	− 1	—	—	—
V			1·2	235	e 0 26	+ 2	e 0 42	+ 1	—	—	—
I	Chur		1·4	165	e 0 29	+ 2	e 0 50	+ 4	—	—	—
II			1·4	165	e 0 29	+ 2	e 0 48	+ 2	—	—	—
III			1·4	165	e 0 29	+ 2	e 0 49	+ 3	—	—	—
I	Neuchatel		1·8	229	e 0 33	+ 1	i 1 6	S_g	i 0 38	P_g	—
II			1·8	229	i 0 53	S	(i 0 53)	− 3	e 1 2	S_g	—
III			1·8	229	e 0 33	+ 1	e 1 2	S_g	e 0 38	P_g	—
IV			1·8	229	e 0 36	P_g	e 1 0	S_g	—	—	—
I	Milan	z.	2·7	177	i 0 53	P_g	—	—	—	—	—
II		z.	2·7	177	i 0 53	P_g	1 22	+ 3	—	—	—
I	Cheb		2·9	50	0 57	P_g	e 1 18	− 6	i 1 35	S_g	—
V			2·9	50	e 1 3	P_g	e 1 38	S_g	—	—	—
I	Jena		3·2	32	e 1 2	P_g	i 1 29	− 3	e 1 5	P_g	i 1·7
II			3·2	32	e 0 58	P*	i 1 39	S*	i 1 6	P_g	i 1·7
III		N.	3·2	32	—	—	i 1 30	− 2	i 1 42	S_g	—
V		N.	3·2	32	—	—	i 1 37	+ 5	—	—	—
I	Prague		4·0	62	e 1 35	P_g	i 2 13	S_g	—	—	—
II			4·0	62	—	—	i 2 12	S_g	—	—	—
I	Paris		4·4	278	—	—	e 2 9	S*	—	—	—
II			4·4	278	—	—	e 2 2	0	—	—	—
I	Clermont-Ferrand		4·7	236	i 1 32	P_g	i 3 7	?	—	—	—
II			4·7	236	i 1 32	P_g	i 2 28	S*	—	—	—
I	Potsdam		4·9	33	—	—	e 2 29?	S*	e 2 43	S_g	—
II		N.	4·9	33	—	—	—	—	e 2 42	S_g	—

Additional readings :—
Strasbourg IV i = 45s., V i = 38s., VI i = 37s.
Neuchatel II iP_g = 58s.
Jena I iEN = 1m.14s. and 1m.32s., II iN = 1m.2s.?.
Prague I eS_g = 2m.32s.?, II eS_g = 2m.29s.
Clermont-Ferrand II i = 2m.51s. and 3m.6s.
Potsdam I eN = 2m.39s., II eE = 2m.45s.

Dec. 27d. Readings also at 0h. (Brisbane, Riverview, Tananarive, Bombay (2), La Paz, Basle and Stuttgart), 1h. (Wellington, Auckland, Riverview, Christchurch, De Bilt, and Florence), 3h. (Harvard), 4h. (Bogota), 13h. (Huancayo, La Paz, La Plata, and Rio de Janeiro), 16h. (Christchurch, Arapuni, Wellington, Riverview (2), Bombay, and Calcutta), 17h. (near Andijan), 18h. (near Ebingen), 21h. (Stuttgart, near Ebingen and near Ksara), 22h. (Bombay, Stuttgart, Zürich, and near Ebingen).

Dec. 28d. 14h. 56m. 30s. Epicentre 36°·3N. 71°·0E. Depth of focus 0·025 (as on 5d.).

Felt at Peshawar, Rawalpindi, Muzaffarabad and Drosh.
Epicentre Hindu Kush 36°·0N. 72°·6E. (Bombay). Depth 280 km.

$A = +·2630$, $B = +·7638$, $C = +·5894$; $\delta = -5$; $h = 0$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Stalinabad		2·9	322	0 46	− 3	1 18	− 8	—	—	—
Andijan		4·6	14	1 6	− 4	i 1 58	− 6	1 16	P	—
Tashkent		5·2	347	i 1 16	− 2	2 8	−10	2 2	?	—
New Delhi	N.	9·3	144	i 2 13k	+ 2	i 3 51	− 3	i 4 20	SSS	—
Bombay		17·4	174	i 3 56	+ 4	e 7 2	+ 4	7 25	SS	—
Hyderabad	N.	19·9	159	4 23	+ 5	8 1	+14	—	—	—
Grozny		20·6	299	e 5 26	+61	e 8 4	+ 5	—	—	—
Sverdlovsk		21·7	345	e 4 35	− 1	8 23	+ 4	—	—	—
Kodaikanal	E.	26·6	166	—	—	—	—	e 10 22	?	12·7
Jena	N.	44·2	308	e 8 30	+38	—	—	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Stuttgart	Z.	46·0	306	e 8 5	− 1	—	—	e 8 48	?	—
Chur		46·1	304	e 8 39	+32	—	—	—	—	—
Zürich		46·6	304	e 8 9	− 1	—	—	—	—	—
Neuchatel		47·8	304	e 8 18	− 2	—	—	—	—	—
Mizusawa	E.	54·3	64	—	—	e 22 10	SSS	—	—	—
Toledo	Z.	57·5	298	i 10 14	P_cP	—	—	—	—	—

Additional readings :—
Andijan P_gP_g = 1m.20s.
New Delhi iN = 4m.49s.
Bombay iN = 4m.46s., iE = 7m.10s. and 8m.1s.

Dec. 28d. Readings also at 3h. (Strasbourg, near Basle, Zürich, Stuttgart, and Ebingen), 6h. (Erevan), 7h. (La Paz), 8h. (Rio de Janeiro and La Paz (3)), 10h. (La Paz), 11h. (near Granada and near Apia), 12h. (Pasadena, Riverside, Tinemaha, Tucson, Palomar, and near Mizusawa), 15h. (La Paz and near New Delhi), 16h. (La Paz, Tuai, near Stuttgart, Zürich, and Neuchatel), 19h. (Riverview), 22h. (near Bogota).

Dec. 29d. 13h. 5m. 20s. Epicentre 39°·9N. 78°·3E. (as on 1943 July 15d.).

Doubtful identification.

A = +·1560, B = +·7533, C = +·6389 ; δ = −1 ; h = −2 ;
D = +·979, E = −·203 ; G = +·130, H = +·626, K = −·769.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Almata		3·5	344	0 44	−13	1 20	−20	—	—	—
Frunse		4·1	318	1 8	+ 3	1 54	− 1	i 2 4	P*	—
Tashkent		7·0	284	e 1 50	+ 4	e 3 4	− 4	2 21	P_g	—
Tchimkent		7·0	293	i 2 12	P*	—	—	i 2 31	P_g	—
Stalinabad		7·5	263	2 7	P*	4 23	S_g	—	—	—
New Delhi	N.	11·3	185	i 2 47	+ 1	e 5 1	+ 7	5 23	SS	—
Calcutta	N.	19·3	151	4 24	− 5	8 0	− 2	—	—	e 9·0
Sverdlovsk		20·5	332	—	—	8 17	−10	—	—	—
Bombay		21·5	194	e 4 51	− 1	8 52	+ 5	—	—	—
Hyderabad	N.	22·4	179	4 56	− 6	9 17	+13	—	—	(14·4)
Kodaikanal	E.	29·6	182	—	—	e 10 5	−59	—	—	—
Colombo	E.	32·9	177	e 12 58	SS	—	—	—	—	—

Additional readings :—
Almata P* = 49s., S_g = 1m.31s.
Tashkent eS* = 3m.22s., iS_g = 3m.54s.
Bombay iEN = 9m.3s.
Hyderabad L is given as S_cS.
Long waves were also recorded at De Bilt, Kew, and Stuttgart.

Dec. 29d. Readings also at 1h. (near Andijan), 2h. (Stuttgart (2), Zürich (2), and near Ebingen (2)), 3h. (Auckland, Christchurch, Tuai, Wellington, Riverview, and La Paz), 7h. (Riverview, Christchurch, and Wellington), 8h. (Harvard, Ukiah, and near Berkeley), 9h. (near Lick), 11h. (near Ravensburg, Strasbourg, Stuttgart, Neuchatel, Chur, and Zürich), 14h. (Cheb and near Mizusawa), 17h. (near La Paz), 18h. (La Jolla, Mount Wilson, Pasadena, Palomar, and Riverside), 20h. (Mount Wilson, Pasadena, Palomar, Riverside, and near Mizusawa), 21h. (Riverview, Mount Wilson, Pasadena, Palomar, and Riverside (2)).

Dec. 30d. 6h. 24m. 18s. Epicentre 5°·6S. 153°·6E. (as on 25d.).

A = −·8915, B = +·4426, C = −·0969 ; δ = +6 ; h = +7.

	Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
	°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane	21·8	182	i 4 57	+ 1	i 8 47	− 5	—	—	i 10·2
Riverview	28·2	184	e 6 1	+ 5	i 10 31	−10	i 10 55	?	e 12·7
Sydney	28·2	184	—	—	e 10 12	−29	—	—	—
Auckland	36·7	152	6 32	?	8 12	PP	i 7 5	P	8·6
Arapuni	38·0	152	—	—	8 42?	PP	—	—	—

Continued on next page.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
New Plymouth		38·1	154	7 23	+ 1	8 49	PP	—	—	—
Tuai		39·3	154	6 29	−63	7 55	?	(8 49)	PP	8·8
Wellington		40·3	156	7 32	− 8	9 57	P_cP	19 2	PP	10·7
Christchurch		41·3	159	—	—	10 7	PPP	—	—	11·6
New Delhi	N.	80·8	300	—	—	e 22 28	+ 3	—	—	—
Bombay	E.	83·1	290	e 12 37	+ 8	i 22 56	+ 8	e 28 24	SS	—
Pasadena		91·6	56	i 13 9_a	− 1	—	—	i 17 21	PP	e 42·8
Mount Wilson	Z.	91·7	56	i 13 9	− 1	—	—	i 17 22	PP	—
Tinemaha	Z.	91·9	53	e 13 11	0	—	—	e 17 31	PP	—
Riverside	Z.	92·3	56	e 13 12_a	− 1	—	—	e 17 19	PP	—
Palomar	Z.	92·6	57	i 13 14	− 1	—	—	i 17 23	PP	—
Tucson		97·7	59	e 13 41	+ 3	—	—	e 17 39	PP	—
St. Louis		113·8	50	e 18 39	[− 2]	—	—	e 29 26	PS	—
Huancayo		128·3	110	—	—	e 27 0	[+45]	—	—	e 50·1

Additional readings:—
Auckland i=6m.55s.
Wellington iZ=7m.47s. and 10m.18s.
Riverside iZ=17m.27s.
Palomar iZ=17m.28s.
Long waves were also recorded at De Bilt, College, San Juan, and at other American stations.

Dec. 30d. 7h. 36m.18s. Epicentre 31°·0S. 178°·5W. (as on 27d.).

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Auckland		8·1	222	1 47	−15	3 22	−13	i 2 24	P*	3·8
Arapuni		8·5	212	2 42?	P_g	3 48?	+ 3	—	—	—
Tuai		8·6	203	1 27	−42	3 11	−37	—	—	4·0
New Plymouth		10·1	215	2 43	+15	4 8	−17	i 4 35	S	—
Wellington		11·6	206	2 49	− 1	5 13	+12	—	—	6·2
Christchurch		14·4	207	—	—	4 25	?	—	—	5·6
Apia		18·2	23	i 4 18	+ 2	e 7 13	−24	i 4 37	PP	e 7·7
Brisbane		25·1	271	i 5 29_k	+ 1	i 10 16	+25	i 11 13	SS	—
Riverview		25·7	255	i 5 36_a	+ 3	i 10 24	+23	i 6 11	PP	e 12·8
Sydney		25·7	255	e 5 6	−27	e 9 42?	−19	—	—	e 12·0
Pasadena		86·2	46	e 12 40	− 4	—	—	—	—	e 40·7
Mount Wilson	Z.	86·3	46	e 12 41	− 4	—	—	—	—	—
Palomar	Z.	86·5	47	i 12 40	− 6	—	—	—	—	—
Riverside	Z.	86·6	46	i 12 43	− 3	—	—	—	—	—
Haiwee	Z.	87·6	45	e 12 48	− 3	—	—	—	—	—
Tinemaha	Z.	88·1	44	e 12 49	− 5	—	—	—	—	—
Tucson		89·9	50	e 12 56	− 6	—	—	—	—	—
Salt Lake City		94·3	44	—	—	e 24 35	+ 3	e 39 58	?	e 51·6
Huancayo		94·9	107	e 14 30	+65	e 23 50	[−11]	e 31 0	SS	e 43·8
Colombo	E.	103·5	269	—	—	e 23 30	?	—	—	—
Kodaikanal	E.	107·2	272	e 16 44	?	—	—	—	—	—
St. Louis	N.	107·4	55	—	—	e 23 31	?	—	—	—
Bombay		115·4	276	—	—	25 27	[− 7]	29 15	PS	—
San Juan		118·1	84	—	—	e 25 34	[− 9]	e 29 51	PS	e 57·9
Stuttgart	Z.	161·3	343	e 19 48?	[−14]	—	—	—	—	—
Zürich		162·8	344	e 20 53	[+49]	—	—	—	—	—
Toledo		170·1	25	31 32	?	50 56	?	—	—	—
Granada		172·5	33	20 4	[− 7]	26 29	[−43]	i 25 34	PP	98·5

Additional readings:—
Auckland i=2m.7s.
Wellington iZ=3m.42s., i=4m.20s., iZ=5m.26s., Q?=5·7m.
Riverview iE=10m.28s., iZ=10m.38s.
Huancayo e=25m.39s.
Bombay SKSE=25m.30s., PPSE=30m.22s., iE=30m.41s., iN=30m.44s.
San Juan e=41m.5s.
Stuttgart eZ=20m.8s. and 20m.44s.
Granada $iPKP_2$=21m.38s.
Long waves were also recorded at De Bilt, Florence, Kew, and other American stations.

Dec. 30d. 22h. 2m. 34s. Epicentre 6°·1S. 150°·5E. (as on 1942 Dec. 4d.).

$A = -\cdot8655$, $B = +\cdot4897$, $C = -\cdot1055$; $\delta = +3$; $h = +7$;
$D = +\cdot492$, $E = +\cdot870$; $G = +\cdot092$, $H = -\cdot052$, $K = -\cdot994$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Brisbane		21·4	174	i 4 52k	+ 1	i 8 52	+ 7	i 9 46	SS	i 11·2
Riverview		27·6	178	e 5 45	− 6	i 10 30	− 2	i 6 16	pP	e 13·1
Sydney		27·6	178	e 9 14	?	e 10 38	+ 6	—	—	—
Arapuni		39·2	148	—	—	13 26?	− 6	—	—	19·4
Wellington		41·2	152	7 54	+ 6	14 8	+ 6	8 13	pP	20·4
Christchurch		42·1	156	8 3	+ 8	14 10	− 6	9 51	PcP	19·9
Misima		42·4	347	e 7 54	− 4	—	—	—	—	—
Kôti		42·6	338	e 8 46	+47	15 6	+43	—	—	—
Tokyo		42·8	348	e 7 26?	?	—	—	—	—	—
Kobe		43·1	342	7 59	− 5	14 21	− 9	—	—	—
Toyooka		44·0	342	e 7 1	−70	—	—	—	—	—
Nagano		44·1	346	e 8 9	− 3	—	—	—	—	—
Sendai		45·0	350	e 8 13	− 6	—	—	—	—	—
Mizusawa	E.	45·8	350	8 27	+ 2	15 24	+15	—	—	—
	N.	45·8	350	e 8 23	− 2	14 56	−13	—	—	—
Zinsen		48·7	334	e 8 38	−10	14 56	−54	—	—	—
Vladivostok		51·8	343	i 9 9	− 3	16 32	− 1	—	—	—
Honolulu		57·5	60	e 12 21	PP	e 17 54	+ 4	—	—	e 27·6
Calcutta	N.	67·1	297	e 11 13	+16	i 20 5	+14	—	—	—
Colombo	E.	71·6	279	e 17 26?	?	—	—	—	—	—
Kodaikanal	E.	74·5	283	e 11 3	−39	—	—	—	—	—
New Delhi	N.	78·4	301	—	—	e 17 45	?	—	—	—
Bombay		80·4	290	e 12 16	+ 1	22 7	−14	15 22	PP	—
College		83·9	32	—	—	—	—	e 23 39	PS	e 37·7
Tashkent		87·4	312	i 12 50	0	24 56	PPS	e 16 26	PP	—
Tchimkent		87·4	313	e 12 35	−15	23 6	[−11]	—	—	—
Pasadena		94·5	56	e 13 24	+ 1	—	—	(e 26 38)	PPS	25·6
Mount Wilson	Z.	94·6	56	i 13 25	+ 1	—	—	—	—	—
Riverside	Z.	95·1	56	e 13 26	0	—	—	—	—	—
Palomar	Z.	95·5	57	e 13 31	+ 3	—	—	—	—	—
Bozeman		100·2	45	—	—	e 26 51	PS	—	—	e 37·5
Tucson		100·6	58	e 13 57	+ 6	e 24 36	[+ 6]	e 17 57	PP	e 45·0
Rapid City		105·9	45	—	—	e 24 37	[−18]	—	—	e 51·8
St. Louis		116·5	50	e 18 42	[− 4]	e 29 42	PS	e 19 53	PP	—
Ottawa		124·0	37	e 18 57	[− 3]	—	—	e 37 56?	SS	52·4
Seven Falls		126·0	33	—	—	e 30 44?	PS	e 38 14?	SS	53·4
Vermont		126·0	38	—	—	e 33 2	PPS	e 37 42	SS	e 52·3
De Bilt		126·0	334	—	—	e 31 26?	PS	e 38 26?	SS	e 57·4
Stuttgart		126·4	329	e 19 2	[− 3]	e 22 55	PPP	e 32 14?	PPS	e 66·4
Philadelphia		127·0	43	—	—	—	—	e 45 8	?	e 53·8
Uccle		127·3	333	e 14 26?	P	e 38 18	SS	e 21 8?	PP	e 60·4
Huancayo		131·0	111	e 19 21	[+ 7]	e 31 43	PS	e 21 56	PP	e 51·5
Clermont-Ferrand		131·4	329	e 22 33	PKS	—	—	—	—	e 64·4
La Paz		135·7	121	i 19 17	[− 6]	—	—	—	—	65·4
Toledo		139·4	329	e 19 27	[− 2]	26 37	[− 1]	22 46	PP	67·4
San Juan		142·3	67	e 19 38	[+ 3]	e 22 50	PP	e 34 55	PPS	e 59·8

Additional readings :—
Brisbane iPZ = 4m.55s.
Riverview iPPNZ = 6m.37s., ePPPN = 6m.50s., iN = 10m.36s., iZ = 10m.42s., iN = 10m.59s.
Wellington iZ = 8m.3s., PPZ = 9m.41s., pPPZ = 9m.56s., sPPZ = 10m.17s., pP_cP? = 13m.58s., Q? = 17m.26s.?, SS = 17m.38s.
Christchurch P_cS = 13m.36s., Q = 17m.19s., S_cS = 17m.36s.
Calcutta iN = 20m.29s.
Bombay ePN = 12m.19s., P_cPN = 12m.29s., PSN = 22m.52s., SSE = 27m.22s.
Palomar iZ = 14m.3s.
Tucson e = 28m.4s.
St. Louis eE = 30m.11s.
Stuttgart eQ = 61m.56s.?.
Huancayo i = 22m.48s., e = 25m.28s., eSS = 39m.38s., eSSS = 44m.19s.
San Juan e = 46m.35s.
Long waves were also recorded at Auckland, Tananarive, Bermuda, and other American and European stations.

Dec. 30d. Readings also at 2h. (Riverview), 3h. (La Paz, Stuttgart, and near Ebingen), 4h. (near Apia), 6h. (Mount Wilson, Pasadena, Palomar, Riverside, Tinemaha, and La Paz), 9h. (Wellington), 10h. (Auckland, Christchurch, New Plymouth, Tuai, Wellington (2), Brisbane, Riverview, Mount Wilson, Pasadena, Tucson, Palomar, Riverside, Tinemaha, and Cheb), 11h. (Auckland (2), Tuai, Riverview, Balboa Heights, and La Paz), 12h. (Riverview), 14h. (near La Paz), 17h. (Riverview and Wellington). 18h. (Christchurch, Auckland, and Riverview), 19h. (Salt Lake City), 22h. (Fort de France).

Dec. 31d. 9h. 35m. 35s. Epicentre 28°·0N. 61°·0E. (as given by Bombay).

$A = +\cdot4287$, $B = +\cdot7734$, $C = +\cdot4670$; $\delta = +2$; $h = +2$;
$D = +\cdot875$, $E = -\cdot485$; $G = +\cdot226$, $H = +\cdot408$, $K = -\cdot884$.

		Δ	Az.	P.	O−C.	S.	O−C.	Supp.		L.
		°	°	m. s.	s.	m. s.	s.	m. s.		m.
Stalinabad		12·4	30	3 9	+ 8	—	—	—	—	—
Bombay		14·1	127	i 3 17	− 6	e 6 0	− 2	3 28	PP	6·5
New Delhi	N.	14·3	84	—	—	i 5 59	− 7	—	—	—
Tashkent		14·9	25	i 3 38	+ 4	6 25	+ 5	—	—	—
Ksara		22·3	291	e 4 59†	− 2	e 9 4	+ 2	—	—	—
Calcutta	N.	25·3	96	5 25?	− 5	i 10 1	+ 7	e 7 1	?	e 11·7
Helwan		26·0	281	5 31	− 5	i 10 1	− 5	e 6 31	PPP	—
Colombo	E.	27·6	137	5 43	− 8	—	—	—	—	—

Additional readings :—
Bombay iSE = 5m.53s.
Helwan eEZ = 5m.49s., eE = 11m.14s.

Dec. 31d. Readings also at 3h. (Triest), 8h. (Jena), 9h. (Palomar and Tacubaya), 10h. and 11h. (Riverview), 17h. (near Fresno, Branner, and Berkeley), 18h. (Riverview, Toledo, near Stuttgart, Christchurch, and Ebingen), 19h. (near Toledo, Granada and Almeria).

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

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

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

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